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development agency**

Boston's Economy 2024: Recovery, Resilience, and Growth



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Author: Boston Planning & Development Agency, Research Division.

Date: Spring 2024.

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Research Division

Director

Alvaro Lima

Senior Demographer

Phillip Granberry

Research Associates

Emily Korest

Ethan McIntosh

Camille Bergeron

Interns

Elizabeth Beckett

Deputy Director

Christina Kim

Senior Researchers

Kevin Kang

Michael Endale

Research Assistants

Sam Klugherz

Grace Julien

Nicolas De Mello

Senior Economist

Matthew Resseger

Research Coordinator

Cecilia Takacs



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Arthur Jemison, Director

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Executive Summary

In 2023, Boston continued its recovery from the COVID-19 pandemic, showing signs of both resiliency and settling into a post-pandemic “new normal”. Inflation in the seasonally unadjusted Consumer Price Index (CPI) reached its peak in the Boston Metro area in September 2022 at 8.1% before falling to just 2.0% in January 2024. According to the U.S. Bureau of Labor Statistics’ Current Employer Statistics, nominal wages in the region increased more slowly over the past year and failed to keep pace with inflation. As a result, average real wages fell somewhat over the course of 2023. The changes in average wages may reflect changes in occupational composition of employment; we await additional data that will allow us to explore that issue in greater depth at the Boston level.

Boston payroll employment returned to 2019 levels and gained almost 10,000 additional payroll jobs in 2023. Accommodation and Food Services rebounded in 2023, adding 3,774 payroll jobs, yet it remains 8.6% below its 2019 employment. Health Care and Social Assistance added 2,649 payroll jobs in 2023, continuing a growth trend to end the year 7,775 jobs above 2019 levels. Retail employment continues to lose ground, losing 2,391 jobs in 2023 and ending the year down 19.7% from pre-pandemic levels.

Overall foot traffic levels in Boston reached 94% of 2019 levels in 2023, coming close to pre-pandemic levels and representing a slight increase from the 2022 average. Foot traffic in Boston’s commercial hubs increased in 2023 but remains ~15% below 2019 levels in Downtown, the South Boston Waterfront, and Back Bay. Average weekday bus ridership on routes through Boston was 70%-80% of 2019 levels in 2023, while rapid transit (subway and light rail) ridership

for gated MBTA stations within Boston totaled just 58% of 2019 levels. Meanwhile, air travel experienced a particularly robust recovery from pre-pandemic levels. Total passenger volume at Logan Airport exceeded 2022 levels during every month of 2023, and exceeded 2019 levels in both October and November. Hotel occupancy rates in Boston exceeded 2022 rates every month of 2023. In October, the month when hotel occupancy in Boston typically peaks, 89% of Boston hotel rooms were occupied in 2023, just shy of the 91% occupancy rate recorded in 2019.

Adjusted for inflation, consumer spending in 2023 fell relative to 2022. Overall average 2023 consumer spending in Boston was 96% of 2019 spending, while 2022 spending averaged 98% of 2019 levels. In-person spending at restaurants continues to lag behind with spending in 2023 making up just 86% of that in 2019, a modest improvement over 2022 spending which was 84% of 2019 levels.

Boston’s office market continues to soften. According to CoStar, in Q4 2023, office vacancy rates hit 12%, continuing a rise from a low of 5.3% in Q4 2019. In contrast, the market for residential units remains strong, with high rents and low vacancies in rental properties. However, high interest rates slowed sales volume and prices for ownership properties.

2023 was an above average year for BPDA development approvals, with over 16.5 million square feet of development in newly approved projects. However, high interest rates and financing costs caused construction permitting activity to be lower in 2023.

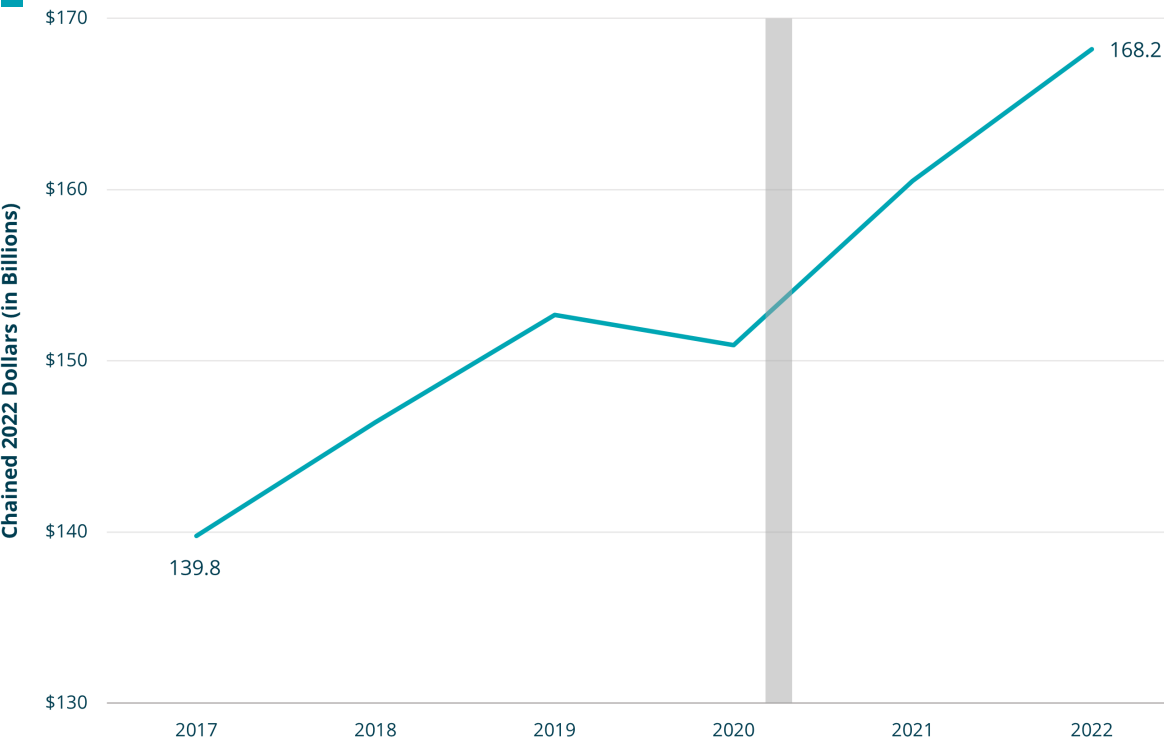
Boston's Gross City Product (GCP)

Gross City Product (GCP), the municipal equivalent of Gross Domestic Product (GDP), is defined as the total monetary value of all the finished goods and services produced within the city. In 2022, Boston's GCP reached \$168.2 billion (in 2022 chained dollars), a 4.8% increase from 2021, concluding the second year of growth after the economic recession caused by the COVID-19 pandemic. Figure 1 summarizes Boston's annual GCP from 2017 to 2022.

Breaking down real GCP by industry, Transportation and Warehousing, Accommodation and Food Services, and Arts, Entertainment and Recreation had the

highest real GCP growth rate in 2022. These in-person industries suffered substantial output losses during the pandemic recession in 2020, declining by 40-50% in real GCP. However, they rebounded quickly in 2021 and extended their rally in 2022. From 2021 to 2022, real GCP of Accommodation and Food Services and Arts, Entertainment and Recreation grew by 25% to 40%, repeating their growth rate from 2020 to 2021. As a result, they ended 2022 only 4% short of the output peak in 2019. The recovery pace of Transportation and Warehousing was slower, but still saw 20% growth in 2022, leaving output at the end of 2022 just 12% behind the peak in 2019.

FIGURE 1 Boston Annual Real GCP (Billions of 2022 Chained Dollars)
2017-2022



Note: Gray bars represent recessions
Source: U.S. Bureau of Economic Analysis (BEA), and Massachusetts Executive Office of Labor and Workforce Development, (EOLWD), BPDA Research Division Analysis.

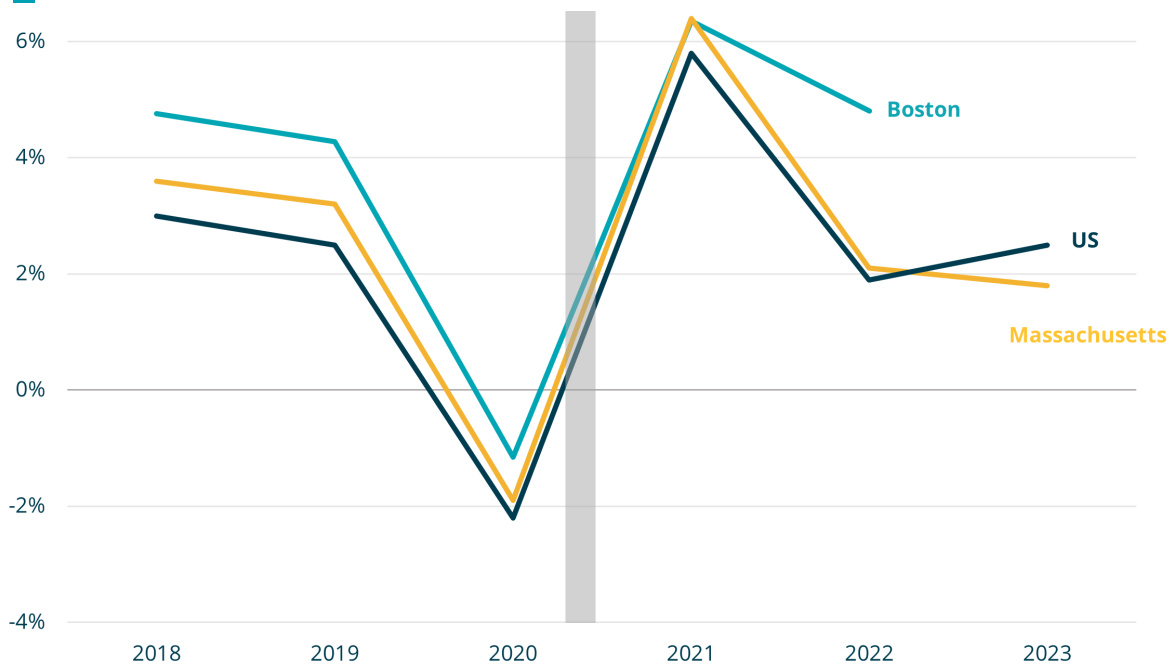
Information and Professional, Scientific, and Technical Services have had five consecutive years of growth since 2017, including growth during the COVID-19 pandemic recession. The two industries contributed to 30% of Boston's real GCP in 2022, increasing their share of the city's GCP from 22% in 2017. Growing 2% in real GCP from 2020, Finance and Insurance kept its output level and contributed to 19% of the city's GCP in 2022.

While the state and country's output growth slowed down to 2% in 2022, Boston output growth remained robust in 2022, thanks to strong growth in professional and financial services sectors and the continuing rebound in in-person services.

The City's 2023 GCP has not yet been published, but the positive GDP growth in the U.S. and

Massachusetts suggests that Boston is likely to have experienced economic expansion in 2023. As shown in Figure 2, the U.S. economy grew by 2.5% in 2023, surprising many as it avoided the widely expected recession in 2023. The increase in real GDP in 2023 was mainly driven by strong consumer spending, nonresidential fixed investment, government spending and exports. The strong consumer spending was underpinned by a robust job market and increasing wages, which helped counteract the decline in purchasing power caused by rising prices. Meanwhile, the Massachusetts real Gross State Product (GSP) grew at an annual rate of 1.8%, slower than the national level. As pointed out by MassBenchmarks¹, sluggish labor force growth, weaker wage income growth, higher interest rates, and tight housing markets may have limited economic growth in Massachusetts.

FIGURE 2 Real GDP Growth Rate Year-over-Year
2018-2023



Note: Gray bars represent recessions
Source: U.S. Bureau of Economic Analysis (BEA), and Massachusetts Executive Office of Labor and Workforce Development, (EOLWD), BPDA Research Division Analysis.

Inflation

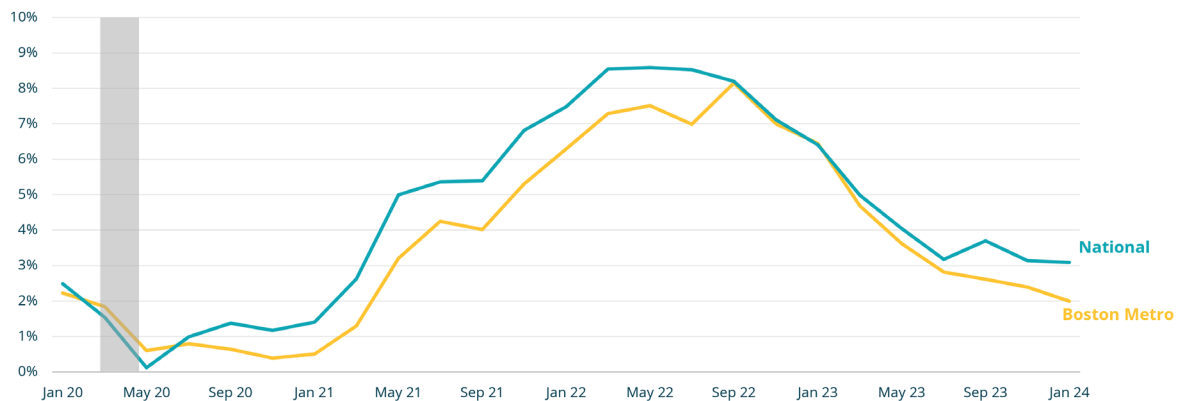
In June 2022, year-over-year inflation hit 8.6% for the first time since 1981, before beginning to recede over the next year. This period of rapid inflation was a sharp contrast to the decade that preceded it. The period between the end of the Great Recession in late 2009 and the onset of the COVID-19 pandemic in early 2020 was characterized by low interest rates and robust economic expansion, except for downturns in 2011 and 2016. During this period, the unemployment rate plummeted from its peak of 10% in 2010 to 3.5% in February 2020. Additionally, stable low inflation persisted at an annual average rate of 1.2% nationally and 1.8% in Metropolitan Boston.

The COVID-19 pandemic led to a global economic downturn, prompting significant job losses and business closures. The U.S. government responded with an unprecedented rescue plan, including massive stimulus payments and increased defi-

cit spending. Simultaneously, the Federal Reserve cut the federal funds rate to near zero accompanied by quantitative easing (purchase of government bonds and other financial assets). These measures, implemented from March 2020 to the end of 2021, facilitated a rapid economic recovery.

In early 2021, inflation began accelerating, surpassing the Federal Reserve's 2% target in the second quarter. This was thought to be a result of upward pressure on prices due to the economy's reopening, increased spending, and supply-side bottlenecks. The Federal Reserve maintained a near-zero funds rate through March 2022, but then began to increase rates rapidly, acknowledging that inflation was proving persistent. In May 2022, national inflation, as measured by the year-on-year change in the Consumer Price Index (CPI)², reached its peak at 8.6%, while the Boston Metro area experienced a peak of 8.1% in September 2022.

FIGURE 3 Metropolitan Boston and US Headline Year-over-Year Inflation
January 2020 to January 2024



Note: Gray bars represent recessions. BLS All items CPI-U; National and Boston - Cambridge - Newton, MA-NH, not seasonally adjusted
Source: U.S Bureau of Labor Statistics, BPDA Research Division Analysis

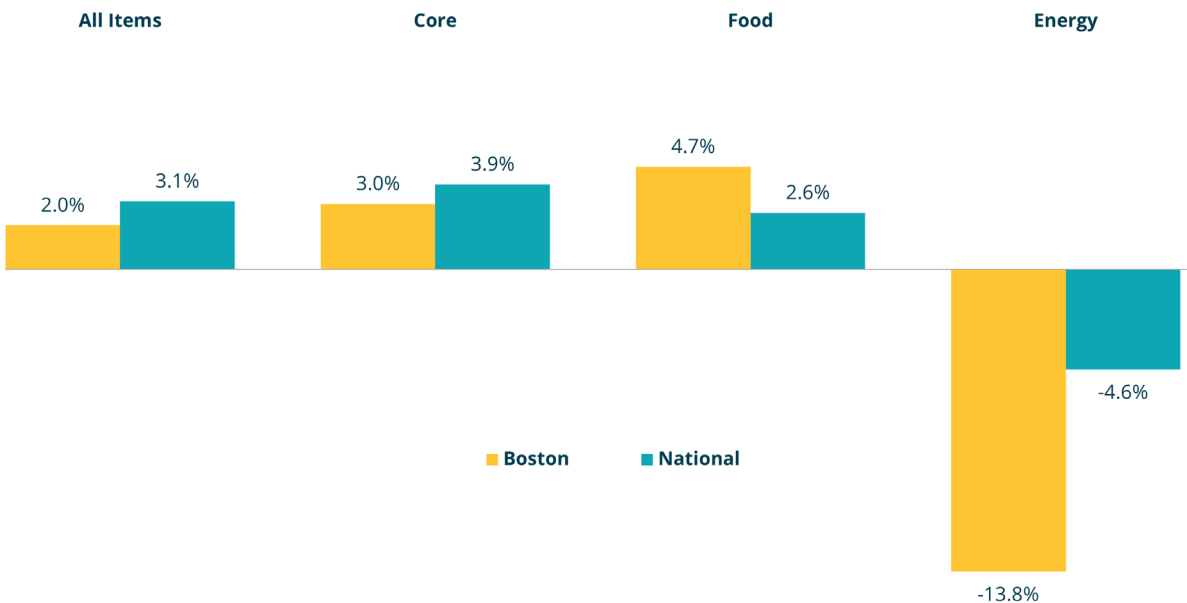
The Federal Reserve implemented substantial tightening of monetary policy by raising the funds rate by nearly 500 basis points from March 2022 to May 2023. The Federal Open Market Committee (FOMC) has maintained its target range for the federal funds rate at 5-¼ and 5-½% since July 2023.

The total Personal Consumption Expenditure index³, the Federal Reserve’s preferred inflation gauge, saw substantial decline from the June 2022 peak of 7.1% to 2.6% for the 12 months ending in December 2023. Additionally, core Personal Consumption Expenditure Index prices, excluding volatile food and energy categories, decreased from 5.2% to 2.9% during the same period. Similarly, by January 2024, CPI inflation had substantially declined, reaching

2.0% in the Boston Metro area and 3.1% nationally. In 2023, there was a notable deceleration in inflation compared to 2022, which had witnessed widespread increases in both goods and services prices.

The unadjusted Consumer Price Index (CPI-U) rose by 3.1% nationally for the 12 months ending in January 2024, contrasting with Boston Metro’s lower headline inflation at 2.0%. Notably, food inflation in Boston Metro (4.7%) surpassed the national rate (2.6%), while energy in Boston Metro saw a significant deflation (-13.8%), compared to a smaller decline nationally (-4.6%). However, core inflation (all items less food and energy) in Boston (3.0%) more closely mirrors the national rate (3.9%).

FIGURE 4 Metropolitan Boston and US All Items and Core Year-over-Year Inflation Comparison January 2023 to January 2024

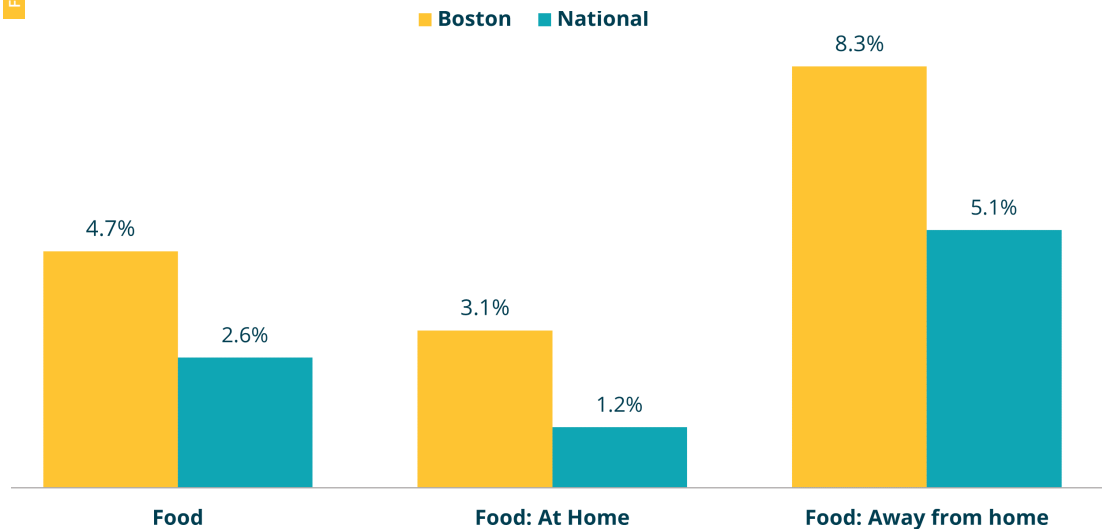


Note: BLS All items, All items less Food and Energy, Food, and Energy CPI-U; National and Boston - Cambridge - Newton, MA-NH, not seasonally adjusted
Source: U.S Bureau of Labor Statistics, BPDA Research Division Analysis

The increase in food prices in 2023 was largely driven by food away from home, nationally and in Metropolitan Boston. However, both food at home and away from home saw larger year-over-year price

increases in Boston relative to the US. The 8.3% increase in food away from home can be understood in the context of increased post-COVID restaurant spending as dining returned to more “normal” levels.

FIGURE 5 Metropolitan Boston and US Food Year-over-Year Inflation January 2023 to January 2024



Note: BLS Food CPI-U; National and Boston - Cambridge - Newton, MA-NH, not seasonally adjusted

Source: U.S. Bureau of Labor Statistics, BPDA Research Division Analysis

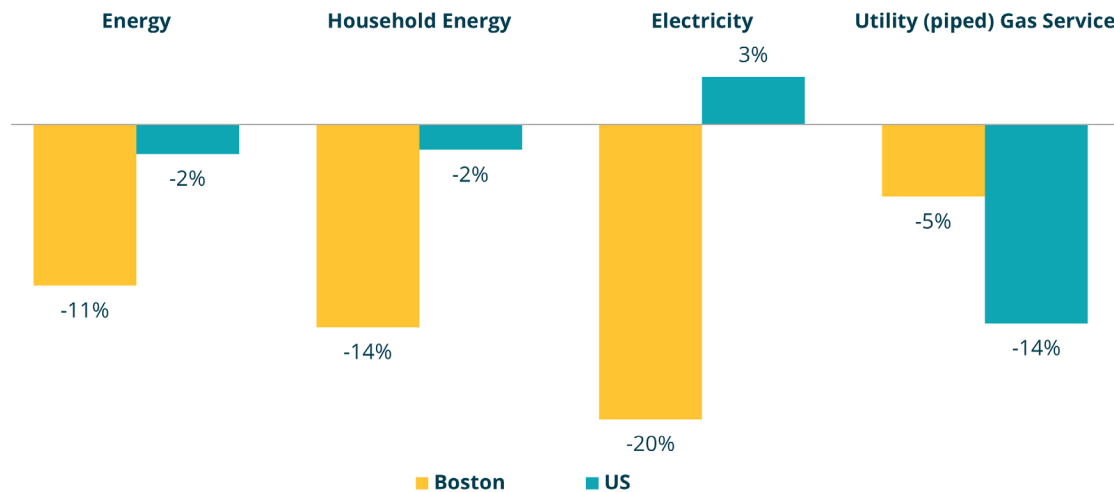
In the year ending December 2022, national shelter yearly inflation surpassed that of Metropolitan Boston, with rates of 7.5% and 4.1%, respectively. However in 2023, the situation reversed, with Boston experiencing a higher increase in shelter prices (7.7%) compared to the national rate of (6.2%). The increase in the shelter index, which holds a substantial weight in the CPI, played a significant role in driving overall inflation recently. According to the BLS, the

rise in the shelter index contributed to more than half of the monthly increase in headline inflation in December 2023.⁴ Shelter prices remain elevated compared to their pre-pandemic levels, with December 2023 marking a 24.5% increase nationwide compared to January 2019, while Boston saw a 21.6% rise during the same period. Real estate market and development sections will provide further analysis of housing development and market trends in Boston.

After 23.3% year-over-year inflation in energy prices ending in December 2022, Metropolitan Boston saw an 11.1% yearly decrease ending in December 2023. Both the increase and decrease were significantly lower nationally at 7.3% and -2.0% respectively. While

the US change in 2023 household energy prices were largely driven by a 13.8% decrease in utility gas service prices, Metropolitan Boston's reduction was heavily impacted by a 20.4% deflation in electricity prices.

FIGURE 6 Metropolitan Boston and US Energy Year-over-Year Inflation
December 2022 to December 2023



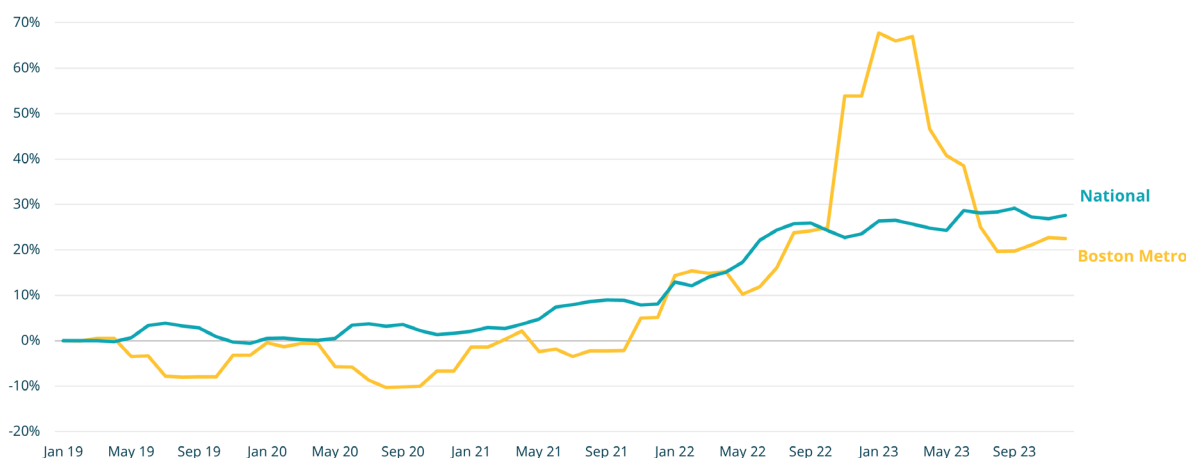
Note: BLS Energy CPI-U; National and Boston - Cambridge - Newton, MA-NH, not seasonally adjusted

Source: U.S. Bureau of Labor Statistics, BPDA Research Division Analysis

Boston saw a 46.4% increase in electricity prices from December 2021 to December 2022, significantly higher than 14.3% in the nation. By the end of 2023, electricity prices were 26.6% and 28.3% higher in Boston and the nation, respectively, when compared

to the same time in 2019. Electricity prices were more volatile in Massachusetts, mainly due to its reliance on natural gas—the third highest share in the country—and the state's biannual energy auction system, which caps energy prices between auctions.⁵

FIGURE 7 Percent Change in Electricity Prices Relative to January 2019
January 2019 to December 2023



Note: BLS Electricity CPI-U; National and Boston - Cambridge - Newton, MA-NH, not seasonally adjusted
Source: U.S. Bureau of Labor Statistics, BPDA Research Division Analysis

According to the U.S. Energy Information Administration (EIA), natural gas prices data based on delivery at Henry Hub in Louisiana increased by 87.3% from January to August 2022.⁶ This contributed to an increase in national electricity prices during that period, while Metropolitan Boston's remained lower due to auction capped energy prices from earlier in 2022. However, the timing of the fall 2022 auction meant that Massachusetts's energy prices were locked in when natural gas prices remained high. Thus, despite natural gas prices falling by 39% from December 2022 to February 2023, electricity inflation remained elevated in Boston between November 2022 and late spring 2023. Ultimately, significant electricity

inflation has been a national trend since the turn of the decade, with Boston following this trend despite more extreme recent year-over-year variation.

Despite significant efforts to curb inflation, the inflation rate remains around 3%. Consumer prices rose 0.3% in January, mainly due to escalating shelter and auto insurance prices. In the US, auto insurance premiums rose by 20.6% annually, contributing over a half percentage point to the inflation index.⁷ Factors such as rising prices of new cars and increased interest rates have driven this surge in insurance premiums.

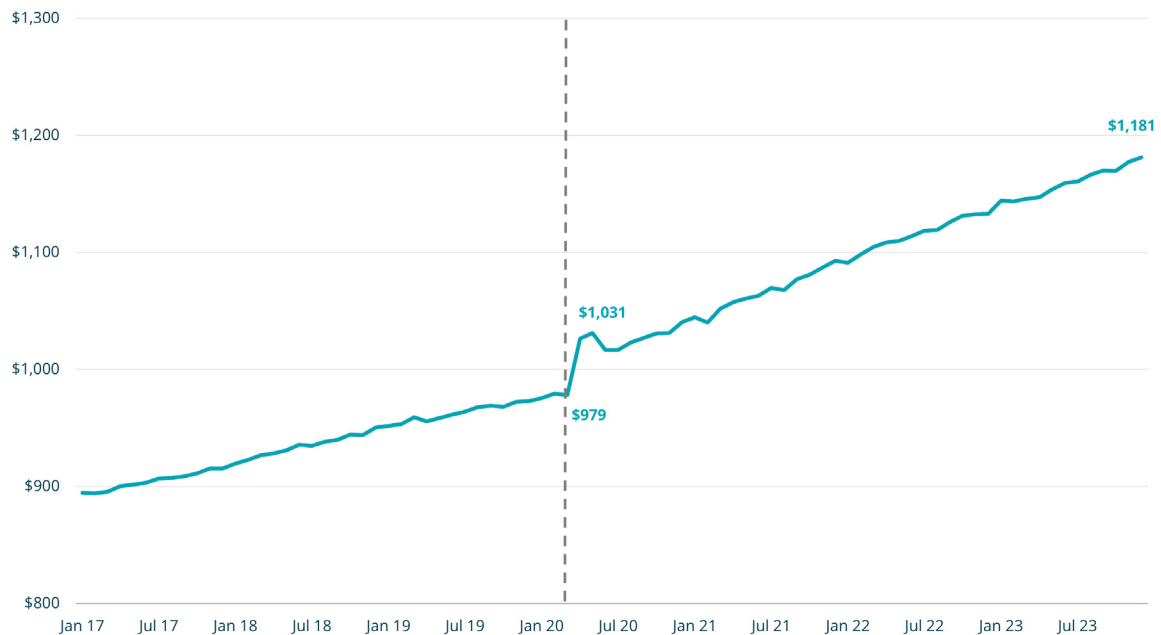
Wages

Amidst this period of high inflation, wages have also been changing rapidly. The years since the onset of the COVID-19 pandemic have undoubtedly been strong years for nominal wage growth – wages as measured in dollars at the time a worker is paid. Labor demand recovered rapidly, fueled by strong consumer demand for goods in the short term aftermath of the onset of the pandemic and a strong return to services consumption as the early waves of the virus abated. At the same time, labor supply contracted due to a mixture of early retirements, people taking time out of the labor force to attend to health or family needs, and sharply reduced immigration. With strong

demand and diminished labor supply, businesses competed for scarce workers by increasing wages at the fastest rate since the turn of the 21st century.

With inflation also surging, have these wage gains been enough to increase the buying power of the average worker over the four years since the onset of the pandemic? To answer this question we look at real wage data – nominal wages adjusted for inflation. Much of our focus in this section will be on the national picture, though we will also discuss the Boston area where data are available.

FIGURE 8 US Nominal Weekly Earnings (Seasonally adjusted)
2017-2023

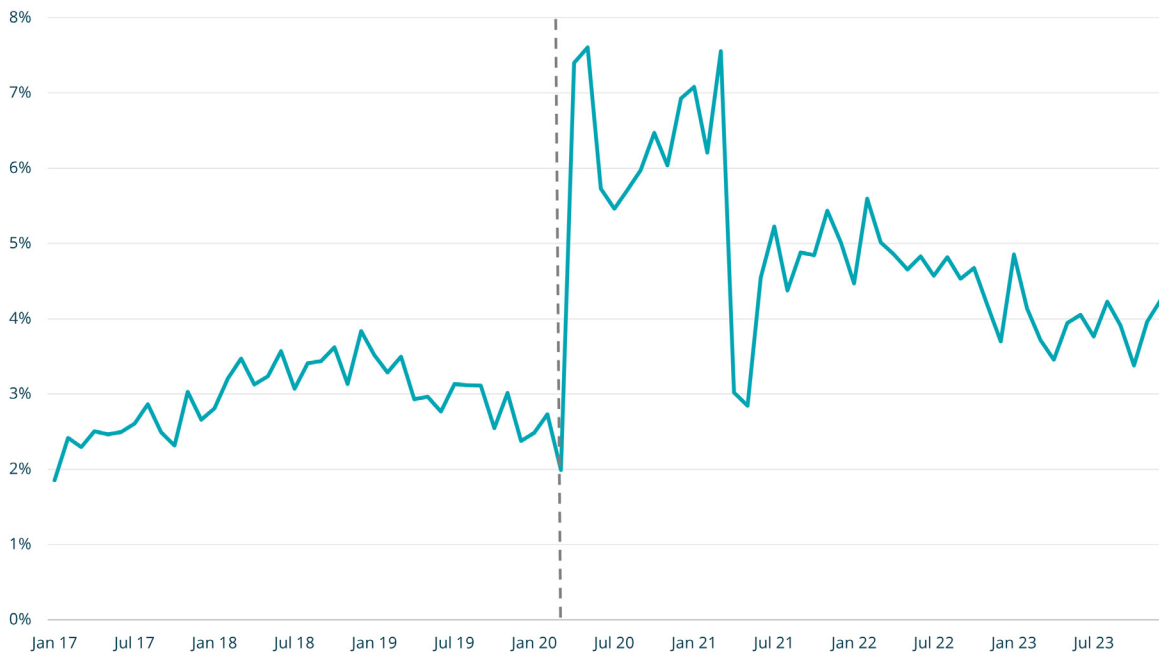


Source: U.S. Bureau of Labor Statistics, Current Employment Statistics 2017-2023, BPDA Research Division Analysis

Figure 8 shows the path of average nominal wages at the national level over the pre-pandemic and post-pandemic periods. These data are seasonally adjusted and come from the U.S. Bureau of Labor Statistics' Current Employer Statistics (CES), data collected through a survey of a large representative set of firms about employment and total wages. Average wages are calculated by dividing the total wage bill by monthly employment. The CES wages discussed here are for private employers only. Average nominal weekly wages were generally rising over the period, but the pace of growth post-pandemic has been somewhat steeper than pre-pandemic.

There was also a brief period between March and May of 2020 where average weekly wages grew particularly rapidly, for reasons that will be discussed in the next paragraph. These patterns are easier to see when plotted in 12 month percent changes, as shown in Figure 9. Average wage growth in the pre-pandemic period was between 2% and 4%, peaking at 3.8% between December 2017 and December 2018. It spiked to 7.6% in the immediate aftermath of the pandemic, and remains elevated in the most recent data, measuring 4.3% between December 2022 and December 2023.

FIGURE 9 US Nominal Weekly Earnings Year-over-Year Change 2017-2023

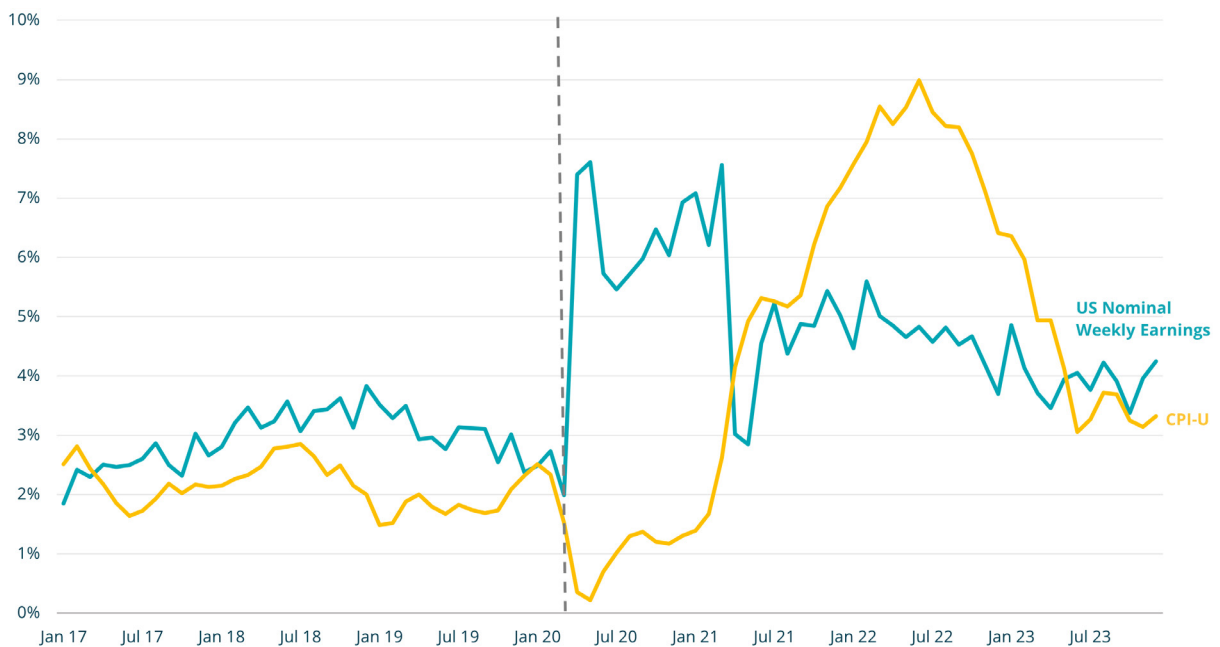


Source: U.S. Bureau of Labor Statistics, Current Employment Statistics 2017-2023, BPDA Research Division Analysis

The spike in average wages between March and May of 2020 does not signal large wage increases received by individual workers, but rather reflects the rapidly changing composition of the workforce at the onset of the pandemic. The shutdown of in-person service businesses at the beginning of COVID-19 led to unprecedented job loss over a two month period, skewed towards those at the bottom of the wage dis-

tribution. With layoffs concentrated disproportionately in in-person services sectors, those remaining employed in May 2020 had a higher average wage level than the much larger workforce that was employed in early March 2020. This compositional bias in the average wage is a disadvantage of using average wage data in times of significant economic upheaval, and leads us to explore two alternatives below.

FIGURE 10 US Nominal Weekly Earnings versus Price Growth (CPI-U) Year-over-Year Change 2017-2023



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics 2017-2023, BPDA Research Division Analysis

Before turning to other datasets, there is still more we can learn about real average wages from the CES data despite this compositional bias. Figure 10 plots the 12-month change in average nominal wages against inflation as measured by the 12-month change in the CPI-U. Nominal wage growth outpaced inflation between early 2017 and the onset of the pandemic. The first year of the pandemic shows rapid average wage growth and low inflation, though this wage growth largely results from the compositional bias just discussed. The surge of inflation from late 2021 through much of 2022 considerably outpaced the large nominal wage gains earned over that time period. By the middle of 2023 nominal wage growth and inflation were roughly in line with each other. Figure 11 shows what these growth rates imply for

the real wage level, here reported in 2023 dollars. Real weekly wages in February 2020 stood at \$1,148, having risen slowly but steadily over the prior three years. With the rapidly changing composition of the workforce the average real weekly wage rose quickly to \$1,228 in May 2020, but then began to fall over the subsequent two years driven first by the gradual re-entry of more low-wage workers back into the workforce, and then increasingly by rapid inflation in late 2021 and early 2022. By the middle of 2022 the national workforce had returned to its pre-pandemic size, so little compositional bias remained in the average wage level. This also coincided with slowing inflation, and we see the real wage stabilize in late 2022 and then hold steady throughout all of 2023.

FIGURE 11 US Real Weekly Earnings Year-over-Year Change (in 2023 dollars)
2017-2023

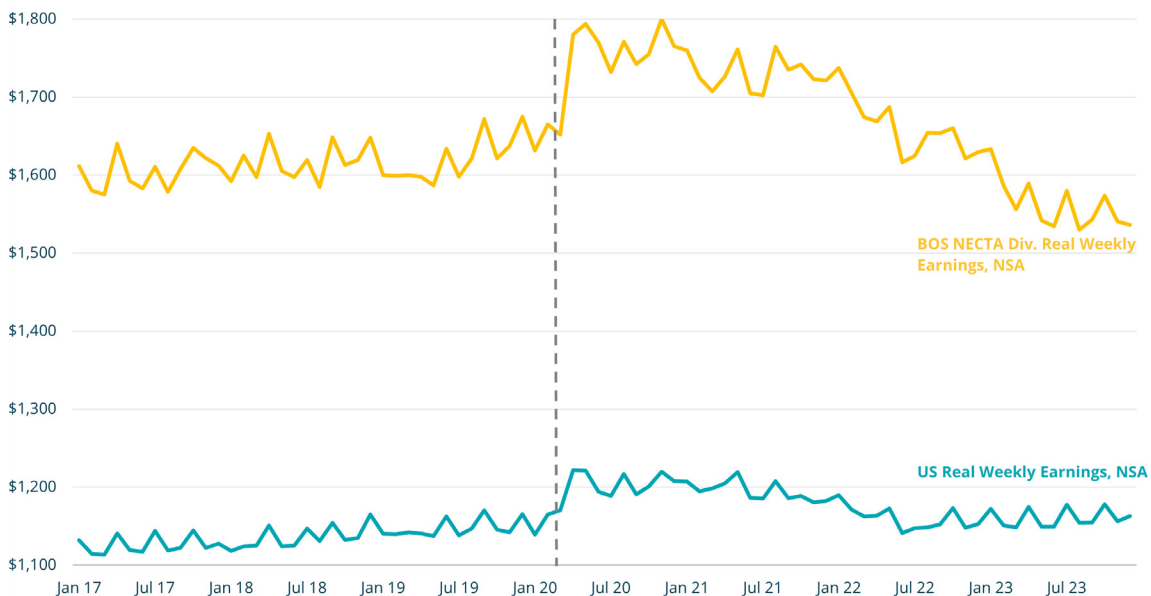


Source: U.S. Bureau of Labor Statistics, Current Employment Statistics 2017-2023, BPDA Research Division Analysis

As of December 2023 the average real weekly wage was \$1,166 compared to \$1,148 before the pandemic. Despite strong inflation over the past two years the buying power of the average wage at the national level still equals, and in fact slightly exceeds the average

real wage prior to the pandemic. This finding is not a relic of compositional bias – the nation has been at full employment again for some time now. Rather this reflects that rapid inflation was, on average, matched over time by equally rapid increases in nominal wages.

FIGURE 12 US and Boston NECTA Division, Real Weekly Earnings (in 2023 dollars)
2017-2023



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics 2017-2023, BPDA Research Division Analysis

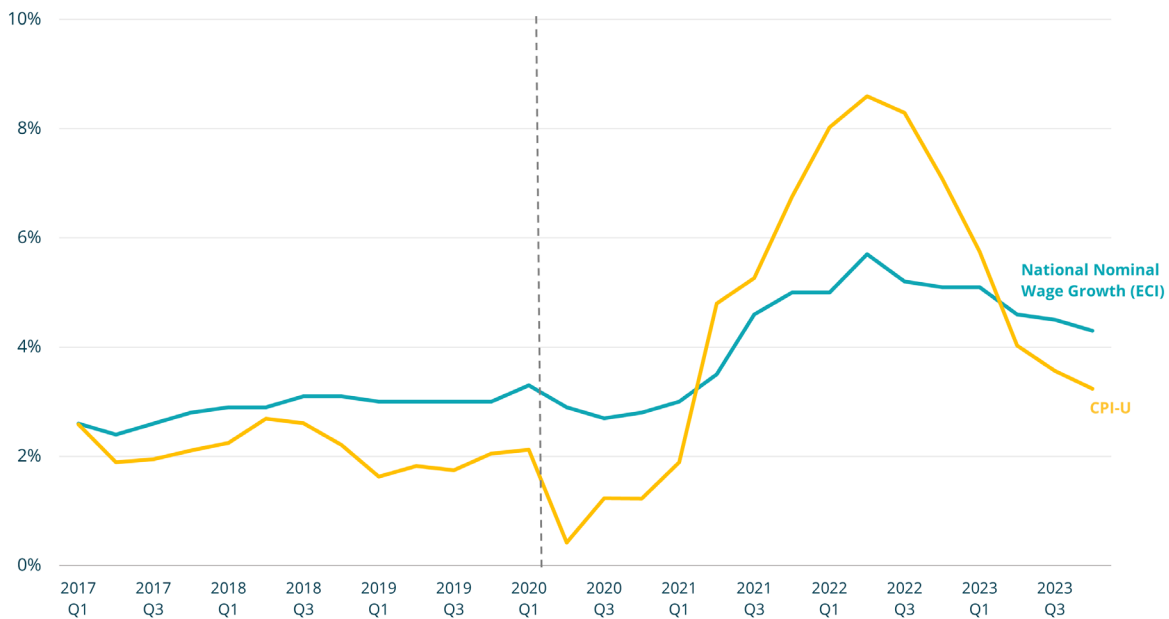
At the regional level real wages have actually fallen somewhat over the past year. The smallest geography available from the CES is the Boston-Cambridge-Newton NECTA Division, covering Boston and many of the surrounding communities. As can be seen in Figure 12, average real wages in the Boston-Cambridge-Newton NECTA Division, adjusted using the national CPI-U, were close to on par with pre-pandemic levels at the end of 2022 but fell over

the course of 2023 and by December 2023 were more than \$100 below the December 2019 level. These data for the NECTA Division are not available on a seasonally adjusted basis, so there is more volatility in the graph. This trend bears watching and confirming at the city level when full year data for average wages in the city become available from the Quarterly Census of Employment and Wages (QCEW) later this year.

While CES average wage data are informative about how current wage levels compare with pre-pandemic wages, other data sources are better able to capture the time path of wages over the intervening years, spared of compositional bias. The Employment Cost Index (ECI), also calculated based on survey data by the BLS, measures the change in hourly labor cost to employers over time. This measure uses a fixed “basket” of labor hours of different occupations within industries rather than allowing the composition of employment to change over time.

Figure 13 shows how the nominal ECI in the nation changed over time, in twelve month percent changes, compared to inflation. Rather than surging in March 2020, nominal wage growth is now observed to have picked up in the summer of 2021, peaking at 5.7% in the second quarter of 2022. This time coincided with even faster price growth, meaning real wages were falling. Nominal wage growth remained elevated through 2023 even as inflation has fallen, so real wages have been growing throughout 2023.

FIGURE 13 US Nominal Wage Growth (ECI) versus Consumer Prices (CPI-U) Year-over-Year Change 2017-2023



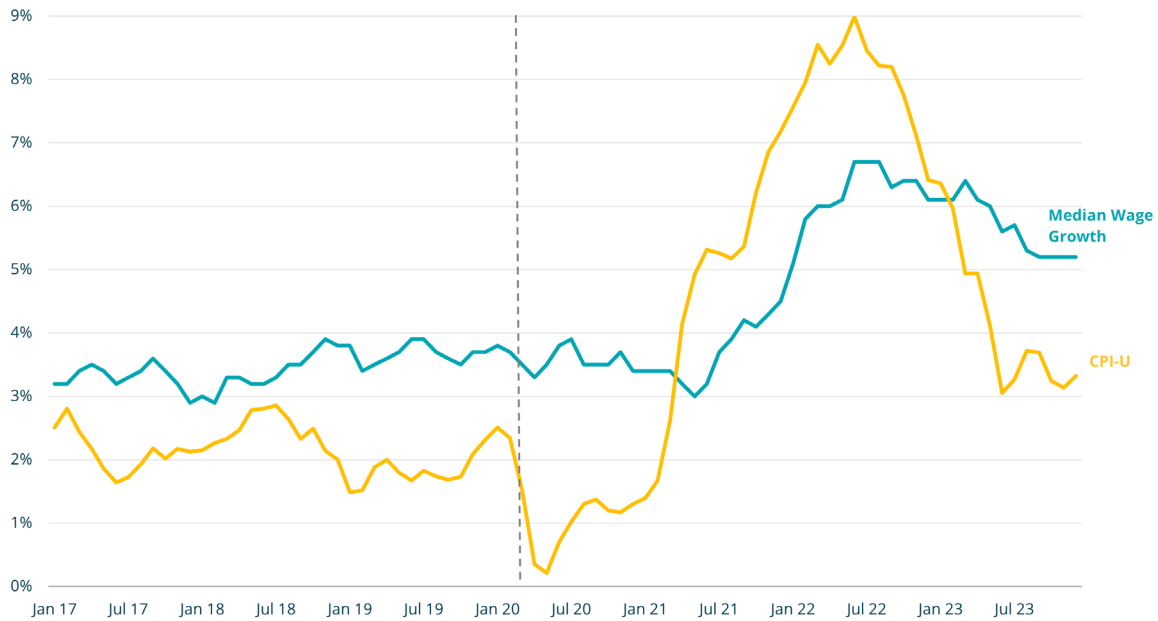
Source: U.S. Bureau of Labor Statistics, Employment Cost Index 2017-2023, BPDA Research Division Analysis

While this measure better captures the time path of when wage growth occurred, over longer time horizons we may be less interested in the cost of a fixed basket of labor, and more interested in the wages people are earning in the jobs they are actually performing. If the overall employment distribution

moves over time towards more productive sectors, workers' standard of living will improve even if the wage rates in the jobs that used to employ more people grow slowly. In the longer run the CES average wage concept is a better measure of the buying power of the average worker.

FIGURE 14

US Median Wage Growth versus Consumer Prices (CPI-U) Year-over-Year Change 2017-2023



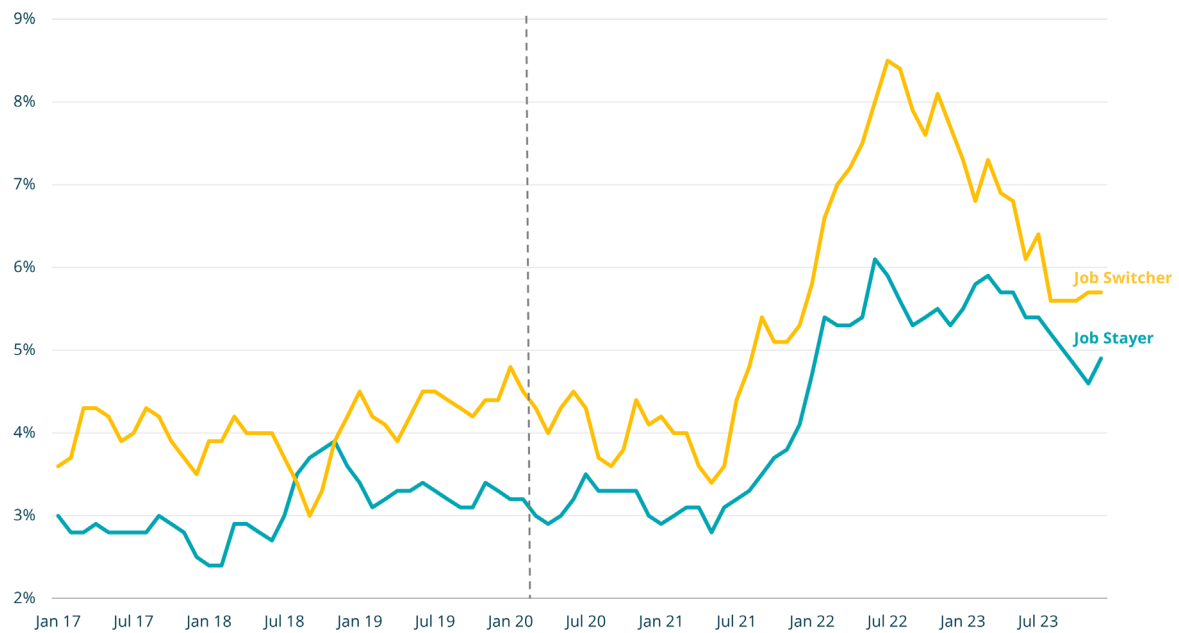
Source: Federal Reserve Bank of Atlanta, U.S. Bureau of Labor Statistics, Current Population Survey 2017-2023, BPDA Research Division Analysis

Finally, we turn to the Federal Research Bank of Atlanta's Wage Growth Tracker,⁸ which measures the wage growth experienced by individual workers. The Current Population Survey (CPS) re-interviews respondents twelve months after their initial interview, and the Atlanta Fed compares these responses to calculate the rate of wage growth for each individual worker in the survey over a twelve month period. Figure 14 shows the path of median nominal wage growth over the pre- and post-pandemic periods. This median measures the middle of the distribution of wage gains, that is, fifty percent of workers gained more than the number shown here, and fifty percent gained less. The shape over time is very similar to what was seen for the ECI, ris-

ing throughout 2021 and peaking in June 2022, but outpaced by inflation. As of the end of 2023, median nominal wage growth over the past 12 months remained at 5.2%, roughly 2% higher than inflation. Again, this measure does better than the CES at capturing wage trends in the early days of the COVID-19 pandemic. An advantage of the CES is that it measures wages for all workers, including new labor market entrants, whereas the Atlanta Fed only captures workers who are working in both of the months when wages are measured. Because of the focus on wage trajectories of individual workers in the Atlanta Fed's measure, they are able to highlight some other interesting aspects of changes in wages over the past several years.

FIGURE 15

US Average Wage Growth for Job Stayers versus Job Switchers Using 12 Month Moving Averages of Monthly Median Wage Growth (2017-2023)

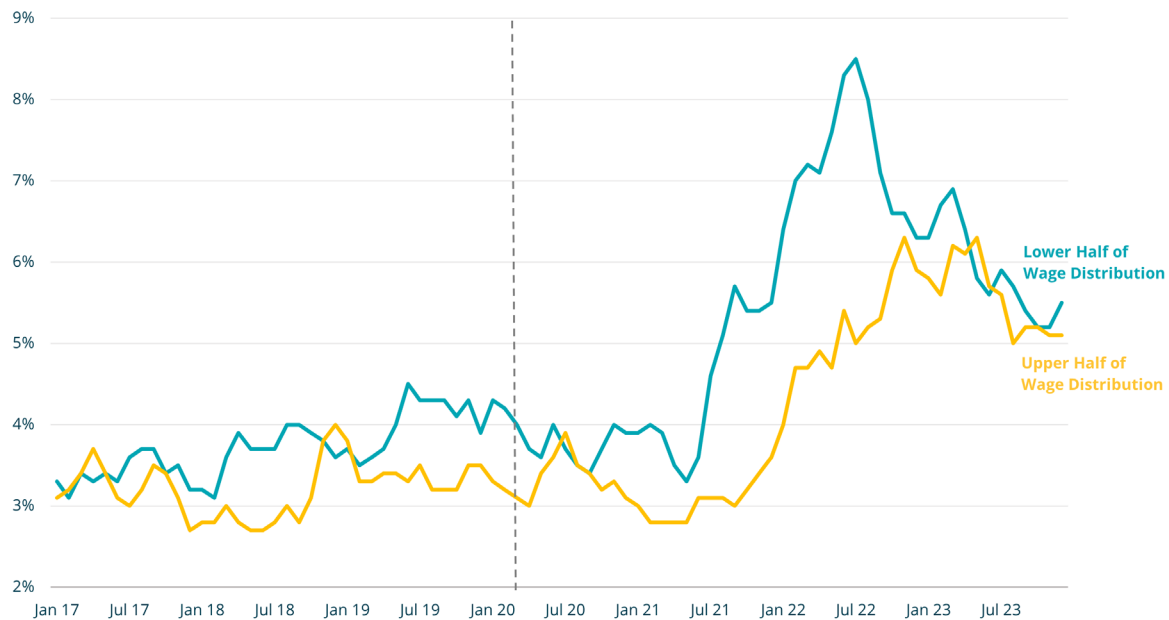


Source: Federal Reserve Bank of Atlanta, U.S. Bureau of Labor Statistics, Current Population Survey 2017-2023, BPDA Research Division Analysis

Figure 15 shows how wage changes for those who changed jobs compared to those who remained in the same jobs. Job changers generally have somewhat higher wage growth than those who stay in the same job, but that gap was particularly pronounced during 2022, coinciding with tight labor markets and elevated quit rates during a period sometimes known as the “Great Resignation.”

Figure 16 compares wage growth between those in the bottom and top half of the wage distribution and shows that 2021 and 2022 were particularly strong years for wage growth in the bottom half of the wage distribution. Strong wage growth at the bottom of the distribution also likely helped new entrants to the labor market who are not tracked in the Atlanta Fed measure.

FIGURE 16 US Average Wage Growth Year-over-Year Change for Lower versus Upper Half of Wage Distribution (2017-2023)



Source: Federal Reserve Bank of Atlanta, U.S. Bureau of Labor Statistics, Current Population Survey 2017-2023, BPDA Research Division Analysis

Taken together, these three data sources show a period of very strong nominal wage growth against a backdrop of rapidly rising prices. Over 2021 and 2022, when nominal wages were growing fastest, they were likely outpaced by price growth, but low inflation in 2020 and continuing wage growth in 2023 even as inflation receded allowed average real wages at the end of 2023 to be roughly on par with

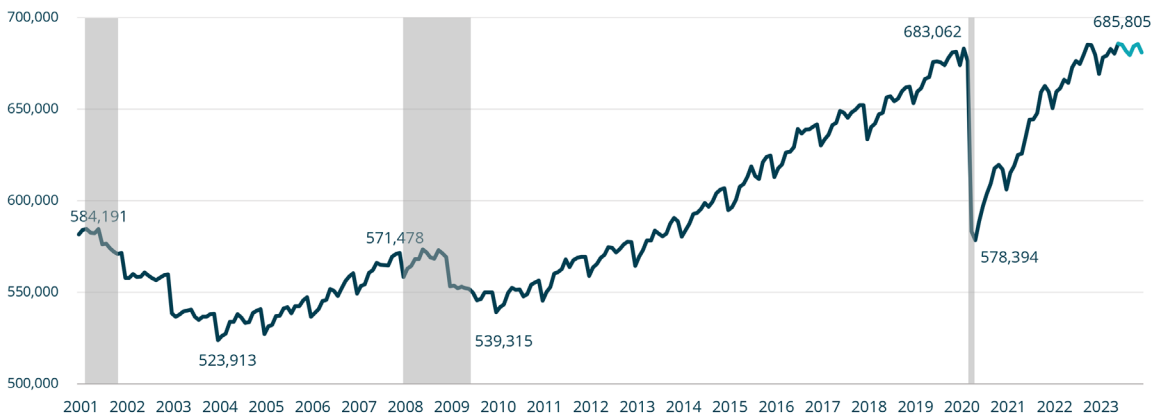
where they were when the pandemic began. This average obscures very different experiences across workers, where some saw nominal wage gains well in excess of inflation whereas others have not seen their wages keep pace. We also see slowing nominal wage growth in Greater Boston for 2023 in the data currently available, and await additional data that will allow us to explore that issue in greater depth.

Employment

Between February and April 2020, Boston lost over 100,000 payroll jobs, but employment steadily recovered from the summer of 2020 through nearly full recovery in late 2022. In June 2023, 41 months since February 2020, Boston's employment had not only fully recovered but also surpassed its pre-pandemic peak by 0.4%. This represents a significant departure from the employment trends

observed during previous recessions. In the 2001 "Dot-Com" recession the City hit its lowest employment levels 34 months into the downturn and employment did not fully recover before the Great Recession began in 2007. In the case of the Great Recession, employment took 54 months to return to pre-recession levels. In contrast, Boston's recovery from the sudden pandemic shock has been rapid.

FIGURE 17 Monthly Payroll Employment in Boston
2001-2023



*Payroll employment for the second half of 2023 (in light blue) is estimated using Current Employment Statistics for Boston-Cambridge-Newton MA NECTA Division and ratios of city and NECTA division employment from recent QCEW employment data. See appendix for a description of the estimation methodology

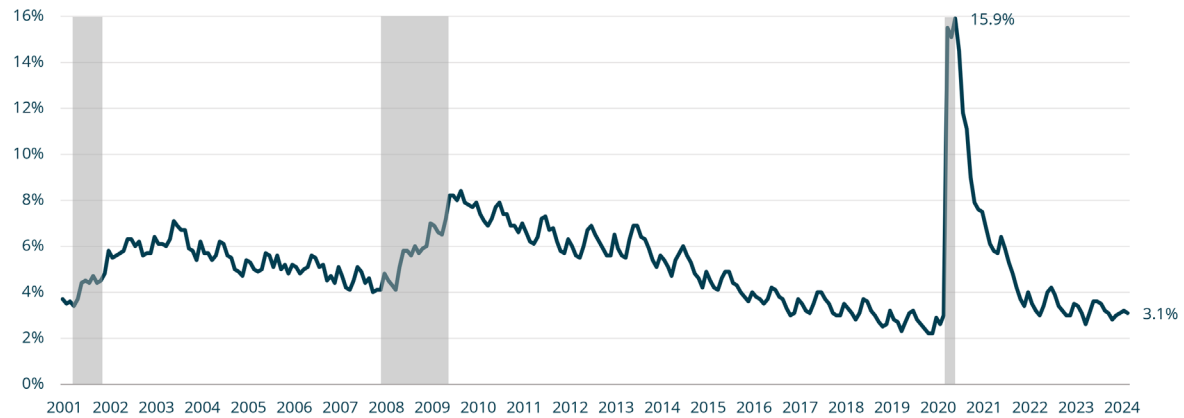
**Gray bars represent recessionary periods

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

With the onset of the COVID-19 pandemic, Boston's unemployment rate skyrocketed from 2.8% in March 2020 to 15.7% in May 2020, well above the Great Recession peak of 8.4% reached in September 2009. By March 2024 Boston's un-

employment rate had fallen to 3.1% with approximately 12,400 residents unemployed. The city's average unemployment rate for 2023 was 3.2%, 0.4 percentage points below the national rate.

FIGURE 18 Unemployment Rate in Boston (Monthly)
2001 to 2024



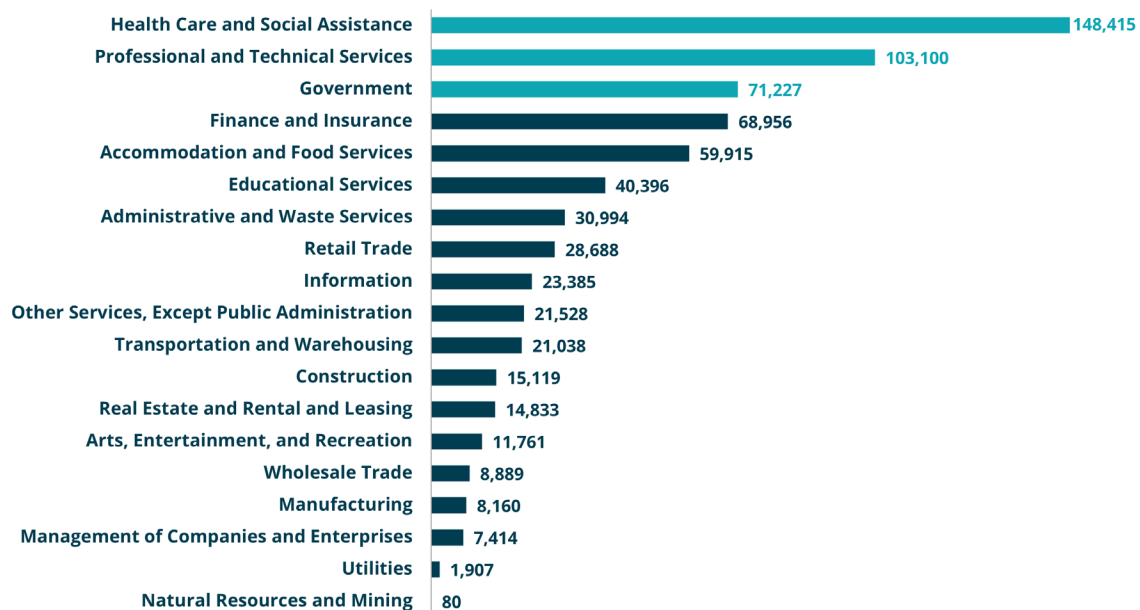
Note: Gray bars represent recessionary periods

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Of the 686,000 payroll jobs in June 2023, figure 19 highlights that the Health Care and Social Assistance, Professional and Technical

Services, and Government sectors had the highest share of payroll employment in Boston.

FIGURE 19 Payroll Employment by Sector
June 2023



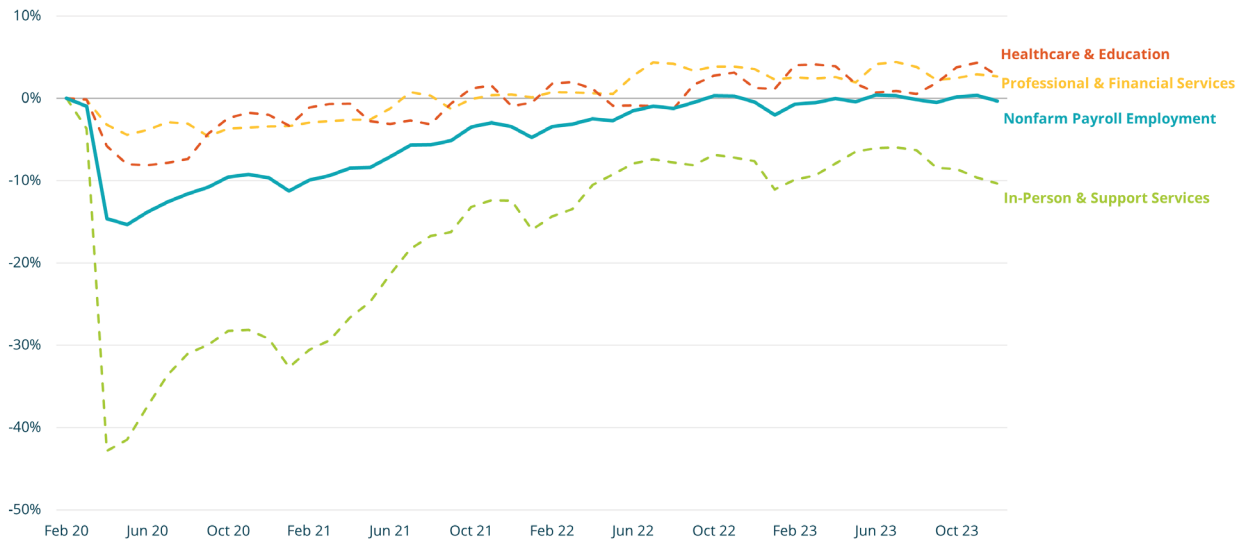
Note: Payroll employment data by sector from ES-202 for Boston is only available through the second quarter of 2023

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Figure 20 shows the change in payroll employment in Boston relative to February 2020 for major industry sectoral groups. In-Person and Support Services shed 42.8% of employment between February and April of 2020, then recovered significant-

ly through mid 2022, before stabilizing at approximately 10% below pre-pandemic levels. Professional and Financial Services and Healthcare and Education saw much more minor job losses in 2020 and have since recovered past February 2020 levels.

FIGURE 20 Change in Payroll Employment by Sector Relative to February 2020 in Boston
February 2020 to December 2023



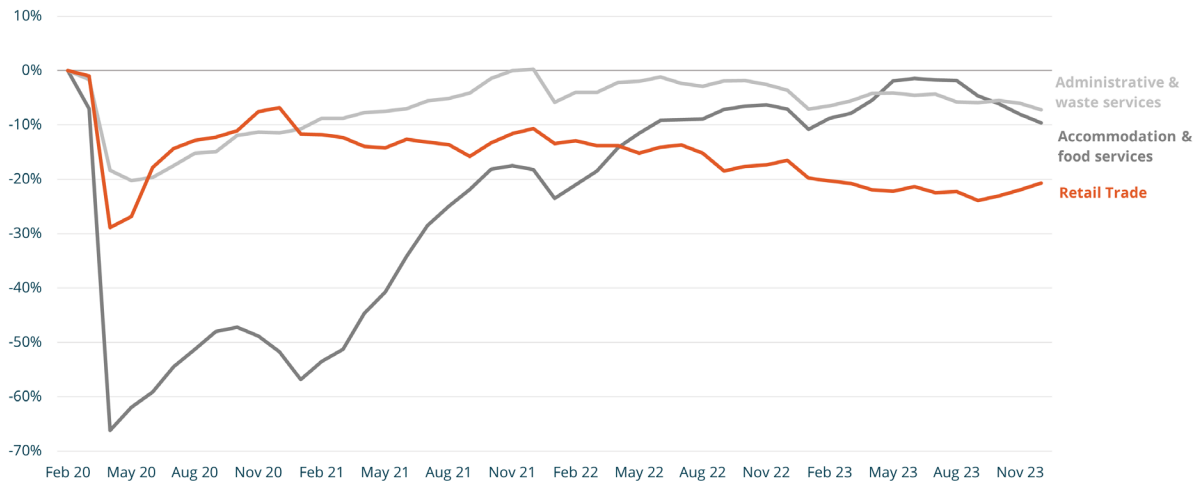
Note: Payroll employment for the second half of 2023 is estimated using Current Employment Statistics for Boston-Cambridge-Newton MA NECTA Division and ratios of city and NECTA division employment from recent QCEW employment data. See appendix for a description of the estimation methodology

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Figure 21 breaks down In-Person and Support Services into its largest components: retail trade, accommodation and food services, and administrative and waste services. Retail trade hit its peak post-pandemic employment in December 2020 and has been declining since then. Administrative

and waste services employment peaked in November 2021 and has seen a moderate decline since. In contrast, accommodation and food services employment recovered close to pre-pandemic levels only in the summer of 2023, before dipping later in the year.

FIGURE 21 In-Person and Support Services Payroll Employment Breakdown in Boston
Relative to February 2020 (2020 to 2023)



*Payroll employment for the second half of 2023 is estimated using Current Employment Statistics for Boston-Cambridge-Newton MA NECTA Division and ratios of city and NECTA division employment from recent QCEW employment data. See appendix for a description of the estimation methodology

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Figure 22 highlights annual employment changes, comparing 2023 with 2022 and pre-pandemic 2019 levels across different industries. Overall, the Boston economy gained 9,821 payroll jobs in 2023 compared to 2022, and maintains a surplus of 10,243 jobs compared to 2019 levels.

Several industries with strong institutional and public

sector presence grew employment in 2023 and now exceed pre-pandemic levels. Health Care and Social Assistance added 2,649 payroll jobs in 2023, continuing a growth trend to end the year 7,775 jobs above 2019 levels. Educational Services added 566 jobs in 2023 and employment ended the year 17.5% above pre-pandemic levels. Transportation/Warehousing and Government continued growth trends, adding

Professional, Scientific and Technical Services and Information changed course, reversing the strong growth of prior years. Professional Services lost 467 payroll jobs in 2023, although it remains 8,825 jobs above 2019 levels. Information lost 100 payroll jobs in 2023, but remains 2,096 jobs above pre-pandemic levels. The Boston Business Journal reported that more than 50 tech companies with presence in Massachusetts eliminated over 4,700 positions in 2023, a portion of which were located in Boston.⁹

Hospitality and service industry jobs increased in 2023, although they have still not fully recovered from the pandemic. Accommodation and Food Services rebounded in 2023, adding 3,774 payroll jobs, yet it remains 5,368 (8.6%) jobs below its 2019 levels. Other services, which includes personal care and repair and maintenance services, inched up in 2023, but employment remains 778 (3.5%) below 2019 levels.

FIGURE 22 Changes in Payroll Employment in Boston
Comparing Average Monthly Employment in 2019 and 2022 to 2023



*Payroll employment for the second half of 2023 is estimated using Current Employment Statistics for Boston-Cambridge-Newton MA NECTA Division and ratios of city and NECTA division employment from recent QCEW employment data. See appendix for a description of the estimation methodology

**Categories with less than 20,000 employees are not included

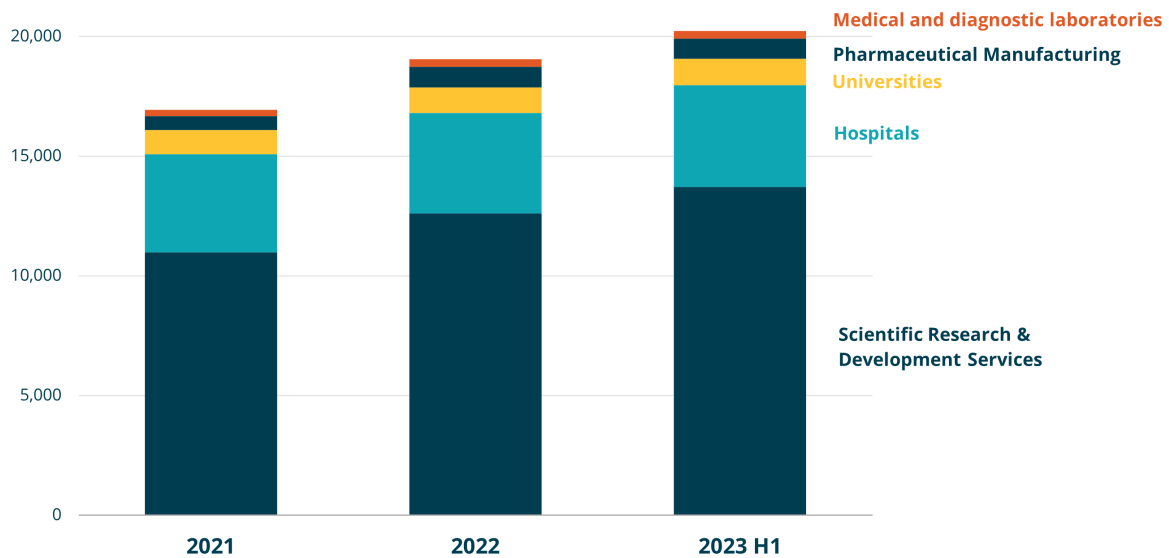
***Average monthly employment in 2019 and 2022 is compared to average monthly employment in 2023

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Life Science employment, which is defined as subsets of the Professional, Scientific, and Technical Services, Education, Health Care, and Manufacturing industries has grown significantly in Boston. Payroll employment in life sciences increased by 2,109 (19%) from 2021 to the first half of 2023.

In that period, the largest increase in jobs came from the Scientific Research and Development Services sub-category with 1,634 new employees (a 25% increase). Additionally, Pharmaceutical Manufacturing employment grew by 45% from 2021 to the first half of 2023 (reaching 841 employees).

FIGURE 23 Life Sciences Payroll Employment in Boston by Sub-Category
Average Monthly Employment for 2021, 2022, and H1 2023



Source: Massachusetts EOLWD, BPDA Research Division Analysis.¹⁰

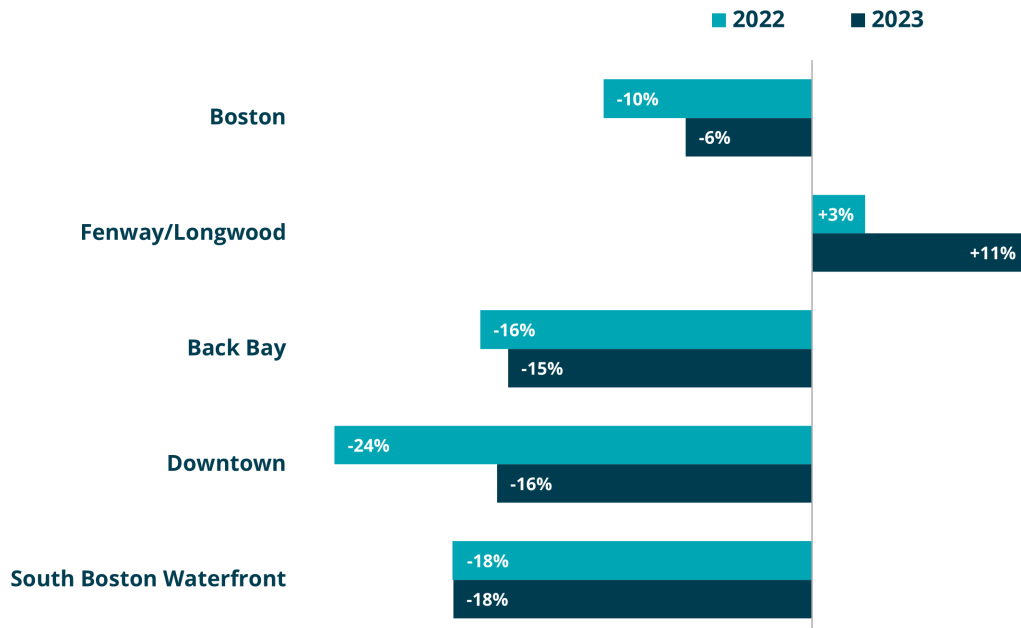
Mobility and Travel

Foot Traffic

Overall foot traffic levels in Boston, as measured by cell phone location data from Cuebiq, reached 94% of 2019 levels in 2023, coming close to pre-pandemic levels and representing a slight increase from the 2022 average. However, this overall figure includes foot traffic in more residential neighborhoods in Boston, most of which saw flat or increased overall foot traffic during COVID-19. With remote and hybrid

work altering the economic landscape since the onset of COVID-19, it has been central business districts and other commuter hubs around the country which have lost the most foot traffic, with negative consequences for the viability of many local businesses in those areas. Foot traffic in Boston's four key commercial hubs is largely still down from 2019, but increased in some hubs in 2023 relative to 2022.

FIGURE 24 Average Foot Traffic in Boston
Annual Average Levels Relative to 2019



Note: Cuebiq collects first-party data from anonymized users who have opted-in to provide access to their location data anonymously, through a GDPR-compliant framework. To preserve privacy home and work locations are aggregated to the census-block-group level.

Source: Cuebiq mobility data, BPDA Research Division Analysis

Fenway/Longwood, the only commercial hub to have fully recovered to 2019 foot traffic levels, saw another increase in average foot traffic in 2023, reaching levels 11% higher than 2019. The Greater Downtown¹¹ area, which saw the slowest recovery in foot traffic through 2022, saw a solid increase in average foot traffic from 2022 to 2023. Meanwhile, average foot traffic levels in Back Bay and in the South Boston Waterfront were effectively flat from 2022 to 2023. Greater Downtown, Back Bay, and the South Boston Waterfront

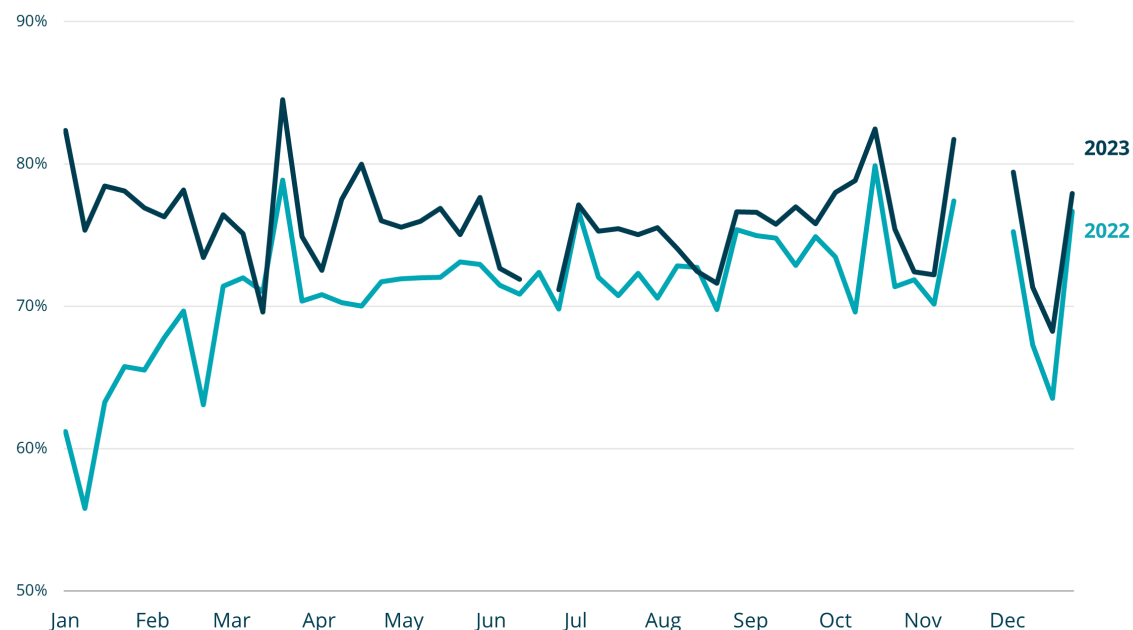
all had average 2023 foot traffic levels between 80-85% of 2019 levels, reflecting the enduring reality of remote and hybrid work in some important sectors of Boston's economy. Fenway/Longwood's relatively strong recovery in foot traffic may reflect the fact that it's anchored by a large health care & life sciences sector (giving it a relatively high share of non-telecommuting jobs) and by multiple large colleges and universities with growing student enrollments.

MBTA Ridership

Trends in MBTA ridership represent another key indicator of local demand in Boston. Average weekday bus ridership on routes through Bos-

ton has stayed consistently between 70% and 80% of 2019 levels in 2023, showing some marginal improvement over 2022 bus ridership.

FIGURE 25 MBTA Bus Ridership on Routes through Boston
Weekly Average Weekday Ridership relative to 2019



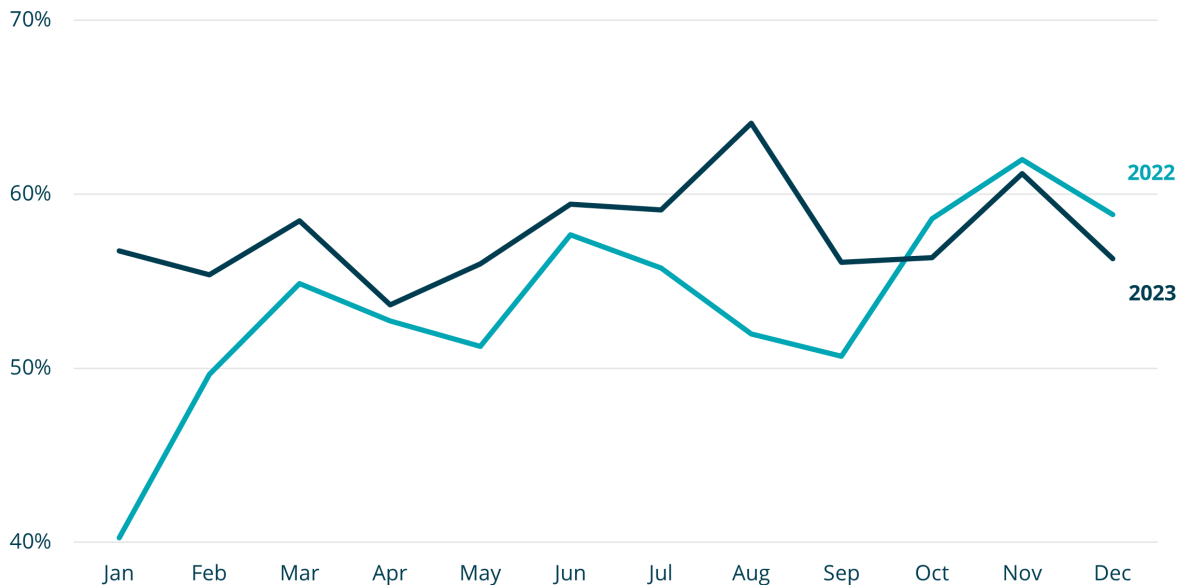
Note: Data gaps reflect weeks when year-over-year ridership figures for particular week numbers are not comparable due to different holiday timings and/or major service disruptions.

Source: MBTA Data Blog, BPDA Research Division Analysis

Rapid transit (subway and light rail) ridership for gated MBTA stations within Boston, however, totaled just 58% of 2019 levels, up slightly from 54% in 2022. Ridership on weekends has shown a somewhat more robust recovery compared to

weekdays, but has also plateaued in 2023, showing only a modest year-over-year increase. Total 2023 weekend ridership for stations in Boston came in at 75% of 2019 levels, up from 71% in 2022.

FIGURE 26 **MBTA Rapid Transit Ridership**
Monthly Gated Station Validations in Boston relative to 2019



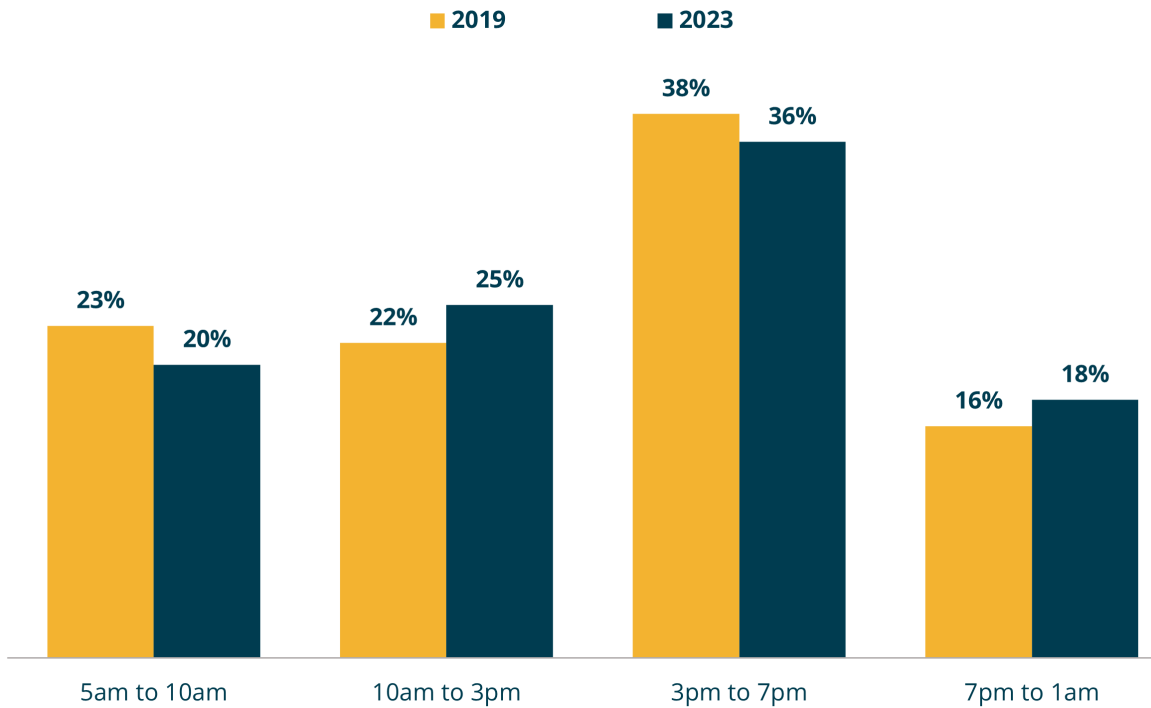
Source: MBTA Data Blog, BPDA Research Division Analysis

While overall MBTA ridership has remained below pre-pandemic levels, the distribution of MBTA rapid transit ridership by time of day has also shifted, with Boston seeing lower shares of riders traveling during morning and evening hours and higher shares of midday and late-night ridership in 2023 compared to 2019. This shift in the time-of-day distribution of rider-

ship away from traditional peak-hour trips, along with the relatively robust recovery in weekend rapid transit ridership compared to weekdays, both reinforce the idea that changes in traditional 9-to-5 commuting are important drivers of Boston's overall changes in foot traffic coming out of COVID-19, with other kinds of trips generally seeing more recovery by comparison.

FIGURE 27

MBTA Rapid Transit Ridership Distribution of Gated Station Validations in Boston by Time of Day



Source: MBTA Data Blog, BPDA Research Division Analysis

However, ridership is also sensitive to changes in travel “supply”, and the MBTA has implemented service cuts as well as more frequent maintenance-related closures and slow zones in 2022 and 2023, factors which have likely placed some

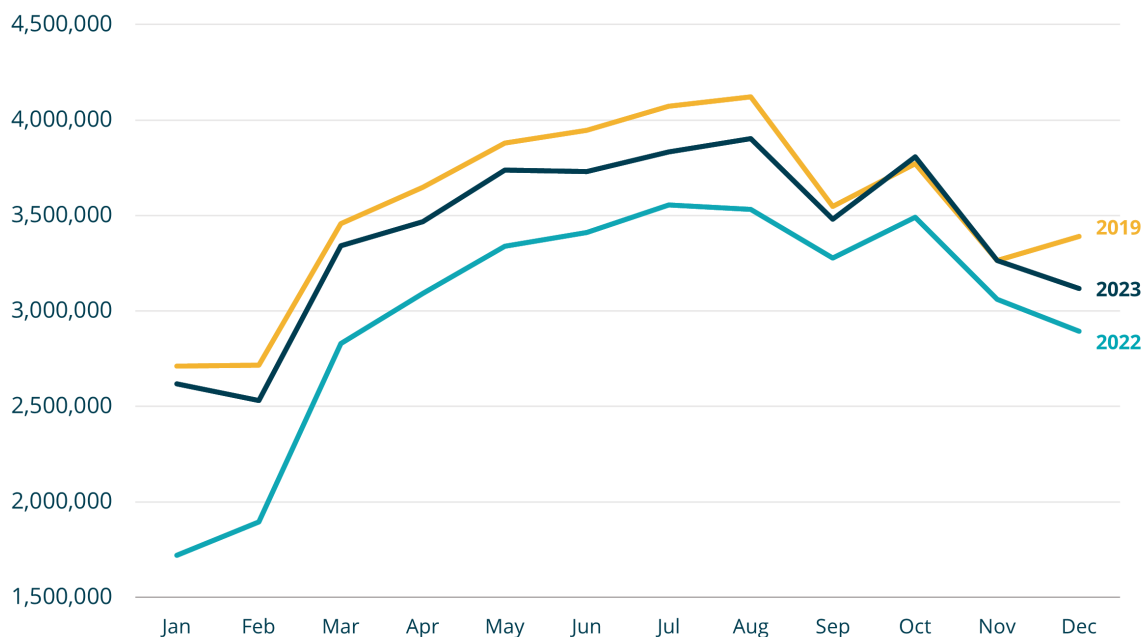
downward pressure on ridership relative to 2019 that isn’t explained by local demand alone. Some of the volatility in the weekly and monthly year-over-year ridership figures presented here can also be attributed to the effects of service closures.

Air Travel

Air travel has seen more robust recovery from pre-pandemic levels than MBTA ridership has. Total passenger volume at Logan Airport exceeded 2022 levels during every month of 2023, and exceeded 2019 levels in both October and November. About three-quarters of the travelers that Logan serves in a typical month are taking domestic trips,

but international travel has been an important driver of Logan's recent increases in total volume. International passenger counts through Logan exceeded 2019 levels from June through December of 2023, peaking in August with a single-month record of 917,256 international passengers.

FIGURE 28 Total Monthly Logan Airport Passengers
2019, 2022, 2023



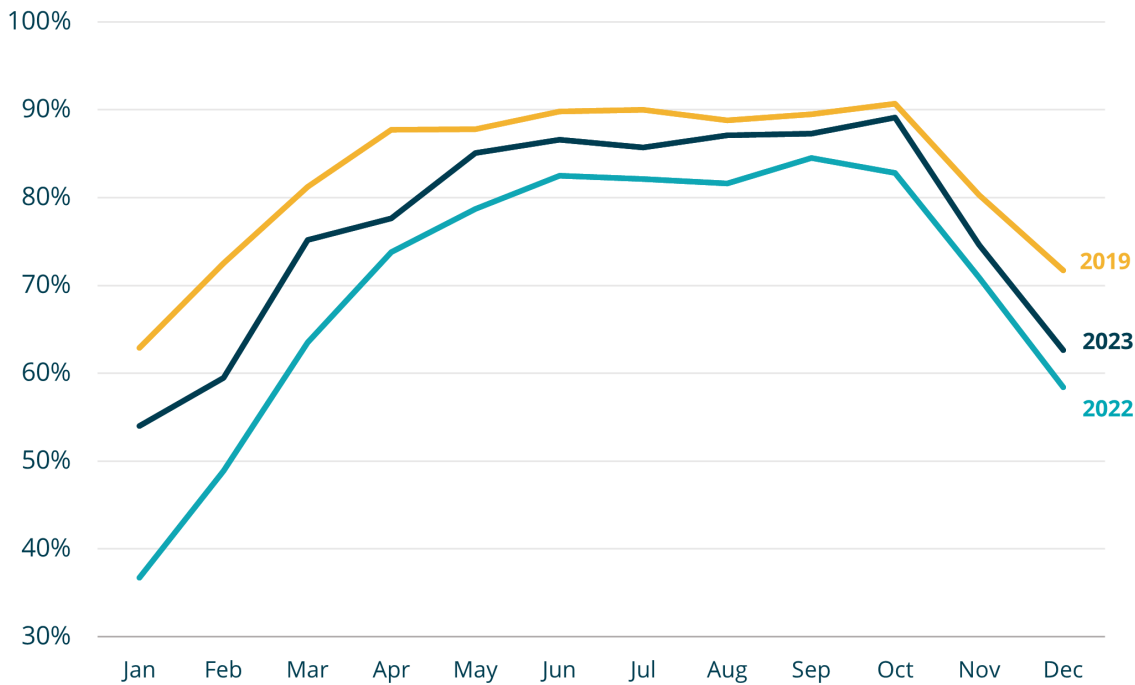
Source: Massachusetts Port Authority, Aviation General Management, BPDA Research Division Analysis

Hotel Occupancy

Another indicator of demand from leisure and business travelers in Boston is the percentage of hotel rooms that are occupied. Hotel occupancy rates in Boston exceeded 2022 rates during every month of 2023. In October, the month when

hotel occupancy in Boston typically peaks, 89% of Boston hotel rooms were occupied in 2023, just shy of the 91% occupancy rate recorded in 2019 by the Pinnacle Perspective Monthly Report.

FIGURE 29 Monthly Hotel Occupancy Rates
2019, 2022, 2023



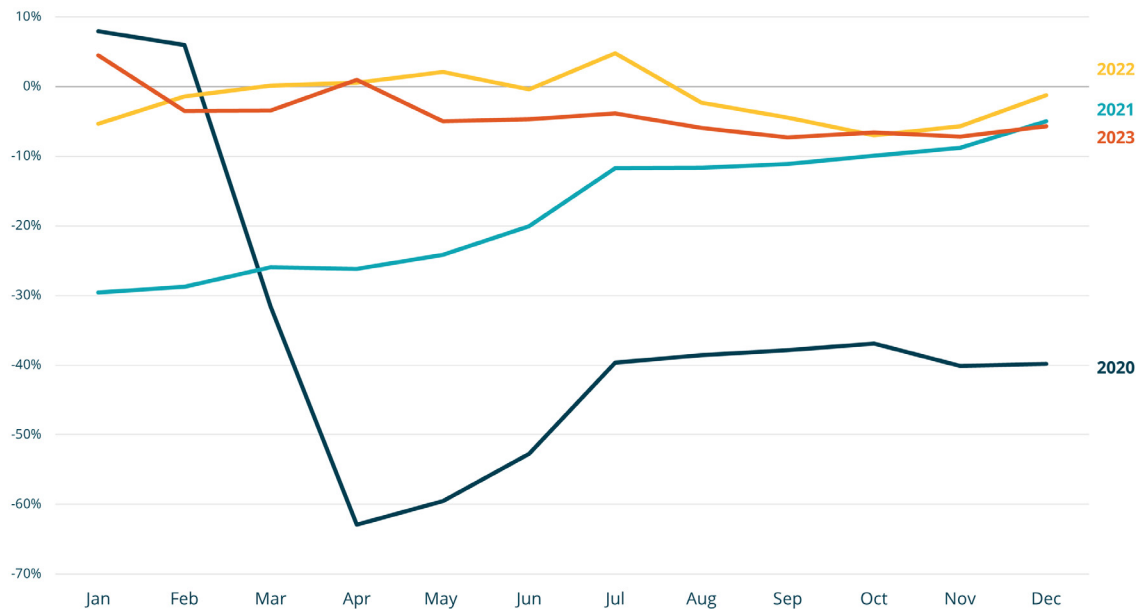
Source: The Pinnacle Perspective Boston Monthly Report, BPDA Research Division Analysis

In-Person Consumer Spending

In-person consumer spending, measured by transaction volumes and values at physical vendors located in Boston, took a hit as a result of the COVID-19 pandemic. At the onset, in-person spending fell to just 37% of spending in 2019, but has since stabilized. Ad-

justed for inflation, however, consumer spending in 2023 fell relative to 2022. Overall average 2023 consumer spending in Boston was 96% of 2019 spending, while 2022 spending averaged 98% of 2019 levels.

FIGURE 30 Percentage Change in In-Person Spending Compared to Same Month in 2019 For All Retail Transactions in Boston



Note: Data have been adjusted to 2019 dollar amounts, so that the relative buying power for all data points remains stable and directly comparable.

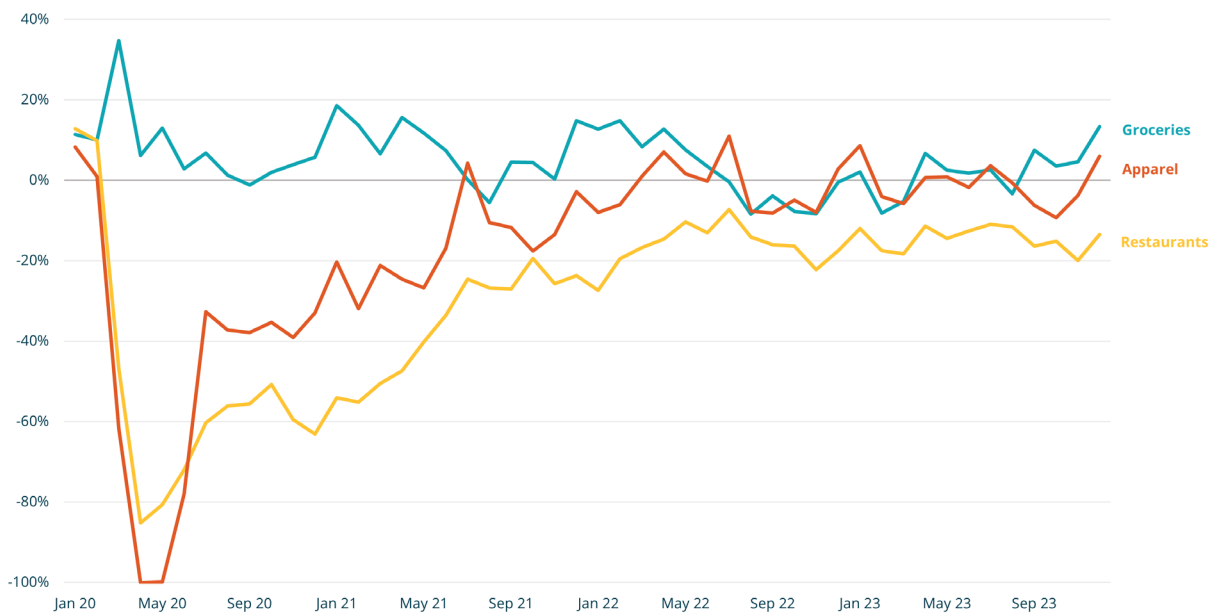
Source: MasterCard Geographic Insights, BPDA Research Division Analysis.

In-Person Consumer Spending by Sector

Restaurant and Apparel spending dropped dramatically at the beginning of the pandemic, contrasted by a spike in grocery spending. By the fall of 2021, consumer spending had substantially recovered, but post-pandemic recovery for restaurants and dining has not yet been achieved. In-per-

son spending at restaurants continues to lag behind with spending in 2023 making up just 85% of that in 2019. Apparel spending has largely recovered and remains stable with overall transaction amounts for 2023 comprising 99% of that in 2019.

FIGURE 31 Percentage Change in In-Person Spending by Sector Compared to Same Month in 2019 For All Retail Transactions in Boston



Note: Data have been adjusted to 2019 dollar amounts, so that the relative buying power for all data points remains stable and directly comparable.

Source: MasterCard Geographic Insights, BPDA Research Division Analysis.

In-Person Consumer Spending by Neighborhood

When compared to pre-pandemic times, approximately half of Boston's neighborhoods have recovered in terms of in-person spending. Residential neighborhoods such as West Roxbury, Jamaica Plain, Roxbury, Mission Hill, and Hyde Park have all shown signs of recovery with local in-per-

son spending levels higher in 2023 than in 2019. Commercial neighborhoods or neighborhoods whose economies are more dependent on mobile populations such as Longwood, Downtown, Back Bay and Fenway have yet to fully recover.

FIGURE 32 Percentage Change in Total In-Person Spending Compared to 2019
By Neighborhood



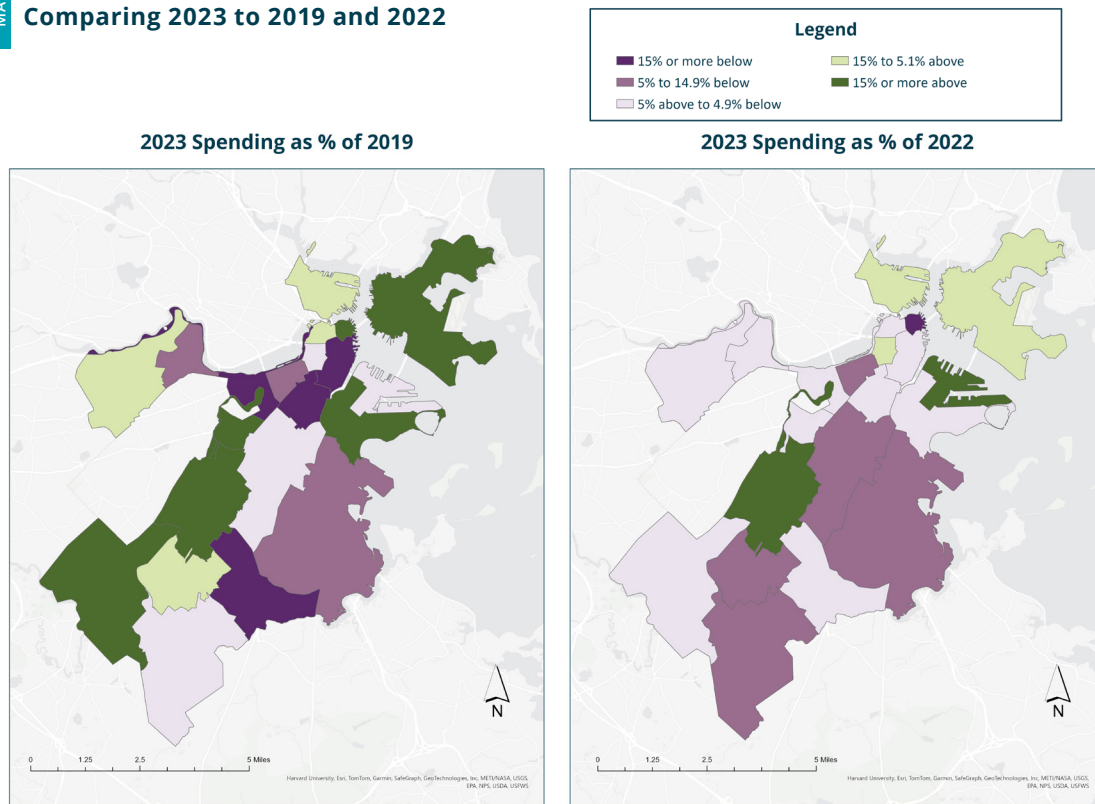
Note: Data have been adjusted to 2019 dollar amounts, so that the relative buying power for all data points remains stable and directly comparable.

Source: MasterCard Geographic Insights, BPDA Research Division Analysis.

Neighborhoods with significant changes in consumer spending in 2023 from the previous year are the North End and the South Boston Waterfront. Consumer spending in the North End in 2022 was significantly higher than in 2019, likely due to the popularity of outdoor dining. In 2023, outdoor dining in the North End was scaled back and consumer

spending fell, although it remained at 119% of 2019 levels. The South Boston Waterfront has shown significant gains from 2022 almost to the point of a full recovery with a YoY increase of 34%. The increase in consumer spending in the South Boston Waterfront may reflect increased convention activity at the Boston Convention and Exhibition Center.

**MAP 1 In-Person Consumer Spending for Boston Neighborhoods
Comparing 2023 to 2019 and 2022**



Source: MasterCard Geographic Insights, BPDA Research Division Analysis.

The map on the left shows spending in 2023 relative to 2019 and the map on the right shows the same spending levels but relative to 2022. Neighborhoods near Downtown have had the hardest time recovering from pandemic-era policies while distal or resi-

dential neighborhoods experienced a rise in spending that have been sustained through the end of 2023. Jamaica Plain experienced notable increases in consumer spending relative both to 2019 and 2022.

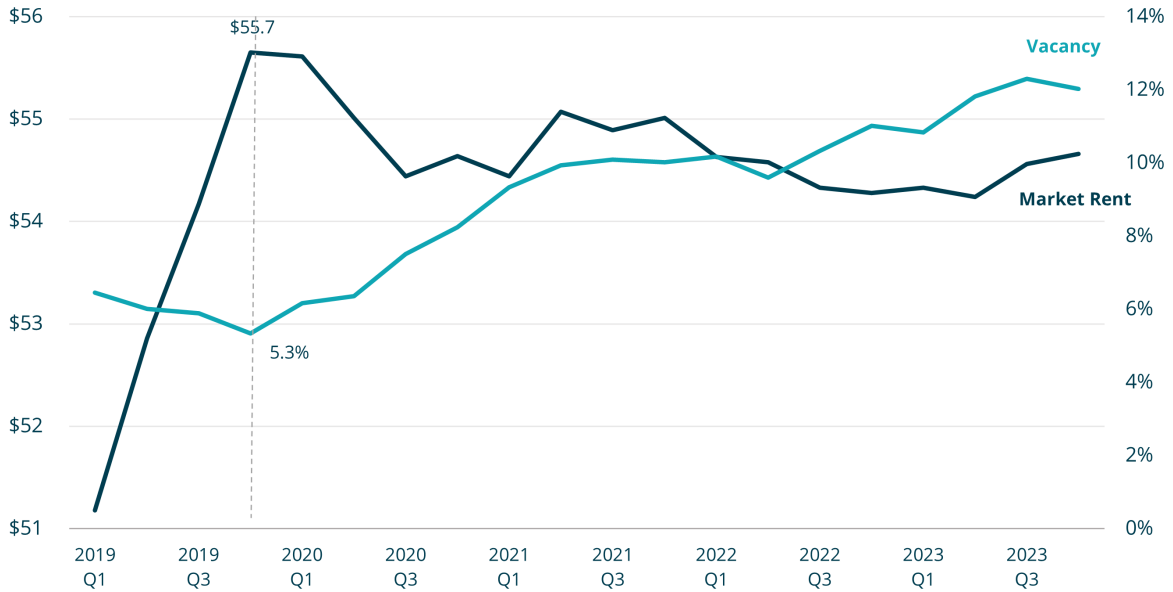
Real Estate Market

Office

The Boston Office Market has not returned to the peak in rent and low vacancy seen pre-pandemic. According to CoStar, in Q4 2023, office vacancy rates hit 12%, continuing a rise from a low of 5.3% in Q4 2019. An additional 6% of Boston office space was under lease (not vacant) but was available for rent, bringing the total office availability rate to 18.6% at the end of 2023. Average rent per square foot was

\$54.66 in Q4 2023, below the \$55.65 asking rent in Q4 2019. Office asking rent is down 1.8% in nominal terms over the four year period - a period in which the seasonally unadjusted shelter inflation rose 20.7% in the Boston Metro Area. In the greater Downtown area, office vacancy rates were higher at 14.4% and office rents were lower at \$39 per square foot.

FIGURE 33 Office Market Asking Rent per s.f. and Vacancy Rate
2019 to 2023 Quarterly

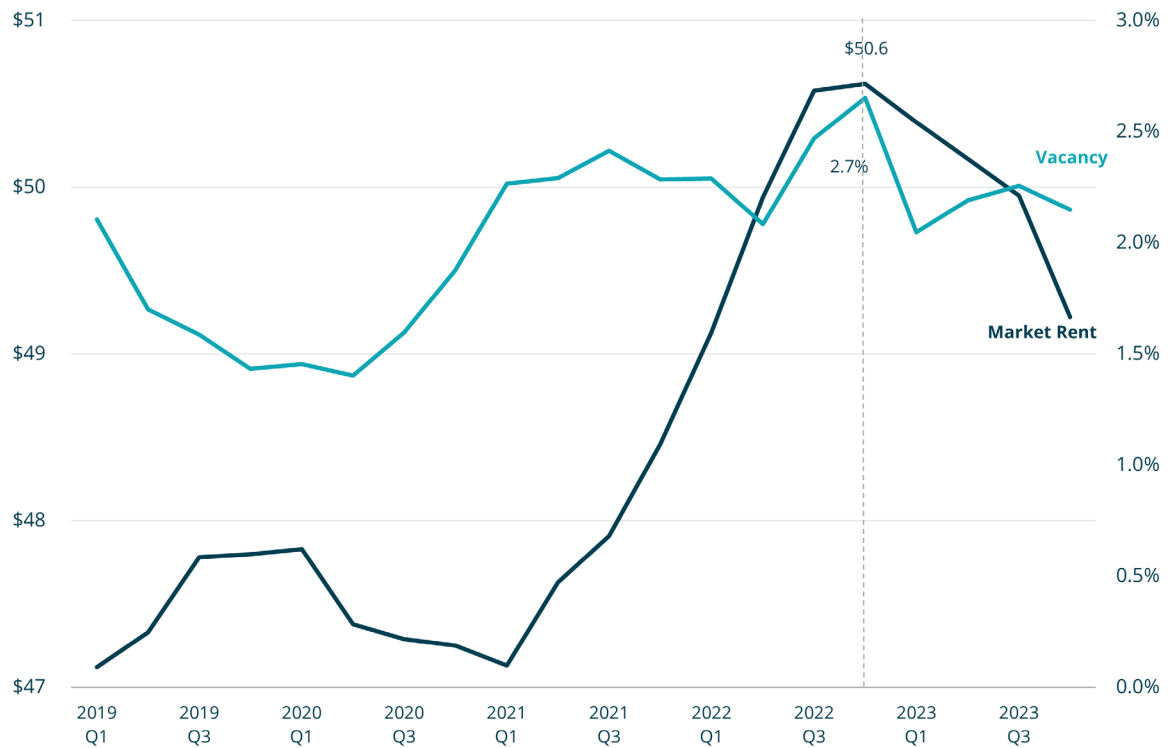


Source: CoStar Real Estate Analytics, nominal rents, BPDA Research Division Analysis.

Retail

From Q4 2022 to Q4 2023, the retail vacancy rate fell to 2.15% and rent per square foot fell to \$49.22. Nominal retail rents in Boston dropped by 2.8% while shelter inflation in the Boston Metro Area rose 7.1% during the same period.

FIGURE 34 Retail Market Asking Rent per s.f. and Vacancy Rate
2019 to 2023 Quarterly



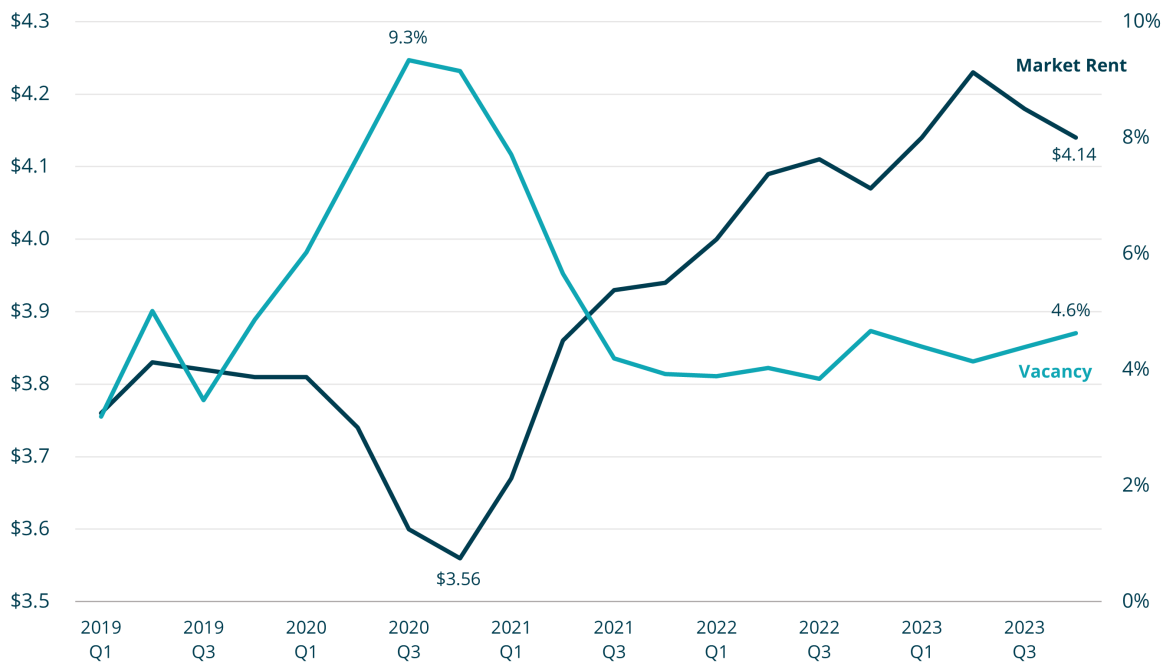
Source: CoStar Real Estate Analytics, nominal rents, BPDA Research Division Analysis.

Multifamily Residential

As Residential leases are often on much shorter timelines than Commercial leases, the impact of the pandemic was immediately obvious on multifamily units. Vacancy peaked and rents fell drastically in quarters three and four of 2020. By mid-

2021 both vacancy and rents had returned to pre-pandemic levels, indicating a return of residential demand as college campuses and many offices returned to in-person operations. Vacancy has since remained low, registering at 4.6% in Q4 2023.

FIGURE 35 Multifamily Market Asking Rent per s.f. and Vacancy Rate
2019 to 2023 Quarterly



Source: CoStar Real Estate Analytics, BPDA Research Division Analysis.

Residential Rents by Neighborhood

Residential asking rents for market rate apartments continue to rise in Boston. As shown in Table 1, the nominal average monthly asking

rent for newly apartments rose 5.5% from 2022 through the first half of 2023, reaching \$3,053.

TABLE 1 Average Monthly Rent of Newly Rented Apartments in Boston Neighborhoods
In Nominal Dollars

Neighborhood	2021 Weighted Average Rent	2022 Weighted Average Rent	Q1-Q2 2023 Weighted Average Rent	Percent Change, 2022-2023
Allston	\$2,161	\$2,474	\$2,668	7.8%
Back Bay	3,250	3,737	3,900	4.4%
Bay Village	2,508	3,167	4,261	34.5%
Beacon Hill	2,567	3,116	3,178	2.0%
Brighton	2,183	2,487	2,651	6.6%
Charlestown	2,852	3,308	3,384	2.3%
Chinatown	2,784	3,247	3,576	10.1%
Dorchester	2,352	2,667	2,713	1.7%
Downtown	3,534	4,038	4,114	1.9%
East Boston	2,293	2,690	2,887	7.3%
Fenway	2,500	2,881	2,908	0.9%
Hyde Park	2,071	2,253	2,357	4.6%
Jamaica Plain	2,511	2,799	2,988	6.8%
Longwood Medical Area	2,478	2,508	2,800	11.6%
Mattapan	2,169	2,450	2,518	2.8%
Mission Hill	2,419	2,837	2,936	3.5%
North End	2,586	3,295	3,380	2.6%
Roslindale	2,152	2,418	2,629	8.7%
Roxbury	2,465	2,671	2,863	7.2%
South Boston	2,961	3,408	3,565	4.6%
South Boston Waterfront	4,269	4,496	5,095	13.3%
South End	3,076	3,685	3,829	3.9%
West End	3,278	3,831	3,916	2.2%
West Roxbury	2,175	2,451	2,711	10.6%
Citywide	2,534	2,895	3,053	5.5%

Note: Averages weighted to match bedroom composition of units by neighborhood in ACS 2017-2021 5-Year Estimates.

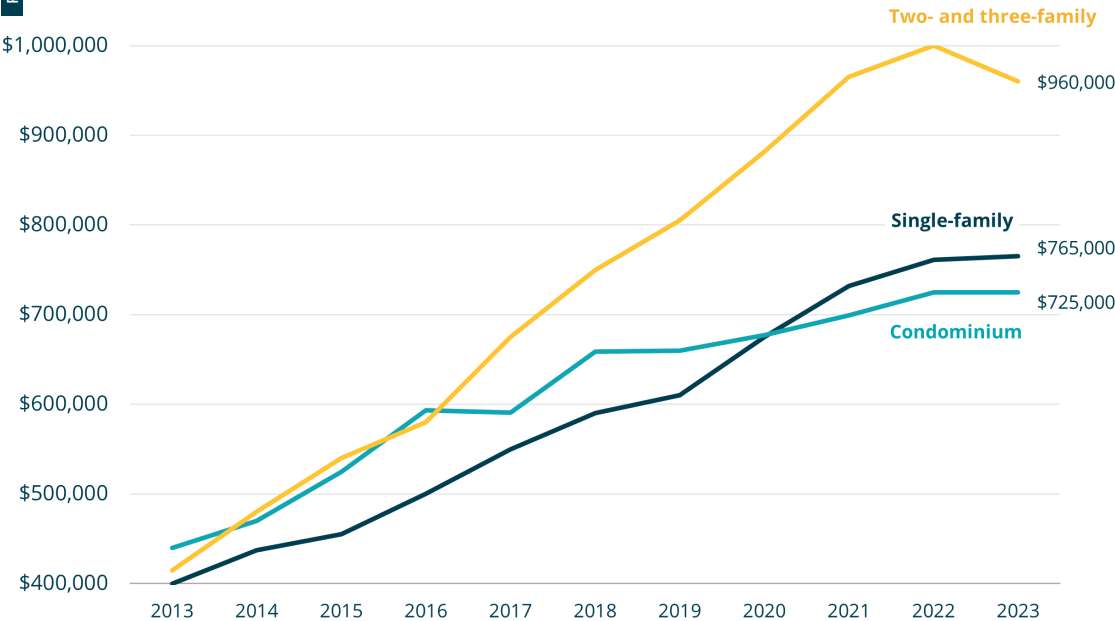
Data includes studios, 1-, 2-, and 3-bedroom listings

Source: City of Boston, Mayor's Office of Housing (MOH) using Rental Beast, January 2023, BPDA Research Division Analysis.

Residential Sales

The residential sales market cooled in 2023 following increases in interest rates starting in the third quarter of 2022. The 2023 median residential condominium price was \$725,000, flat from 2022 following a decade of increases, while sales prices of two and three-family structures fell 4.0% between 2022 and 2023, according to the Mayor's Office of Housing using Warren Group home sales data. The median sales price for a single-family home in Boston increased slightly from \$761,000 in 2022 to \$765,000 in 2023, but overall price levels grew more quickly during the same period.

FIGURE 36 Median Sale Prices By Building Type in Boston
2013 to 2023



Source: City of Boston Mayor's Office of Housing (MOH) using data from The Warren Group, BPDA Research Division Analysis

Numbers of sales transactions for all types of buildings in Boston fell substantially from 2022 to 2023, with potential sellers and buyers of homes

responding to the high interest rates for loans and mortgages by delaying or forgoing their plans.

TABLE 2 Residential Sales Volumes in Boston by Building Type

	2022	2023	Percentage Change
Single-family	1,138	834	-27%
Condominium	5,338	4,060	-24%
Two- and three-family	927	598	-35%

Source: City of Boston, Mayor's Office of Housing (MOH) using Banker & Tradesman data, January 2023, BPDA Research Division Analysis

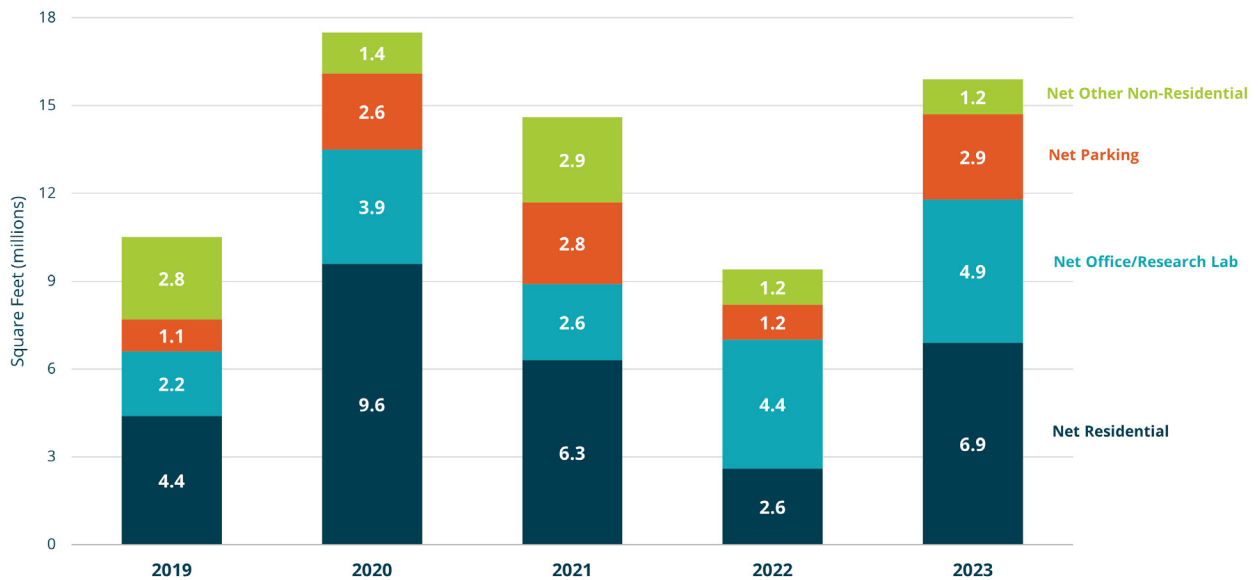
Real Estate Development

Article 80 Approvals

The BPDA oversees a development review process (Article 80) that requires BPDA Board approval of all development projects that either are larger than 20,000 square feet or are residential projects with 15 or more units. The volume of projects approved by the BPDA Board is an indicator of future real estate growth. 2023 was an above-average

year for development approvals, with over 16.5 million square feet of development in newly-approved projects and a small net reduction of square feet in previously approved projects (NPCs). Residential approvals dominated in 2023, with a net 6.9 million square feet in new residential space approved.

FIGURE 37 Net Square Feet Approved by Year and by Use
2019-2023

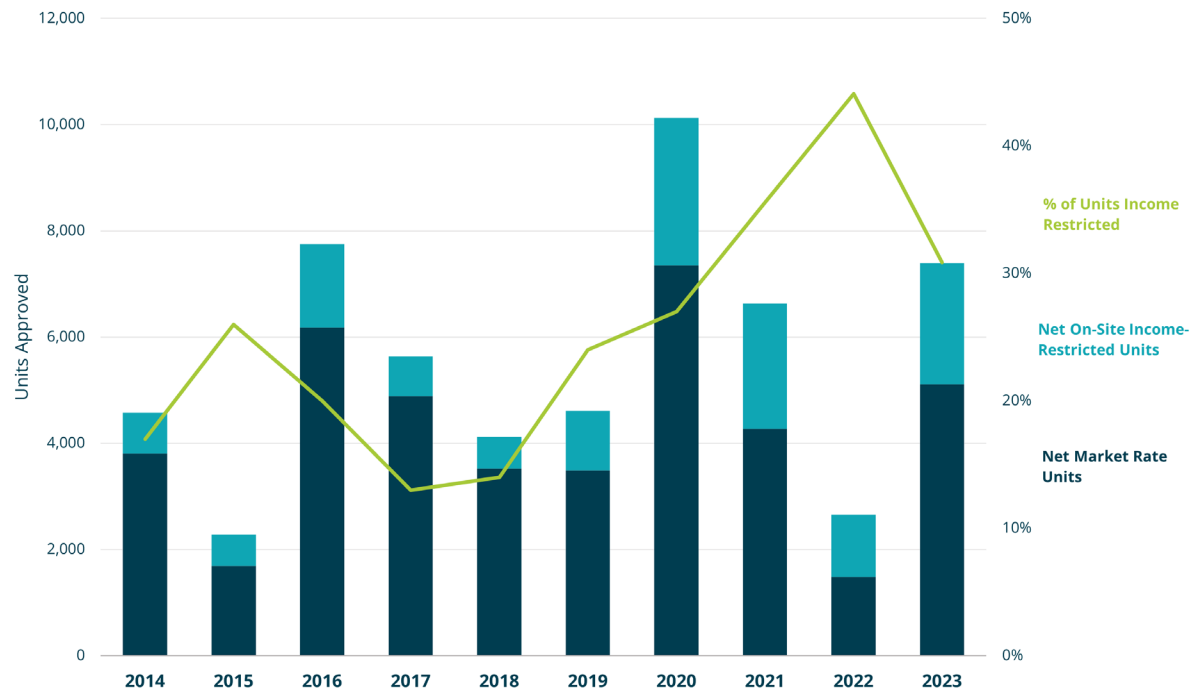


Note: 12.7 million square feet approved in 2020 was in a single project: Suffolk Downs
Source: BPDA Development Review Development Database, BPDA Research Division Analysis

In 2023, the BPDA Board approved 7,451 new housing units in newly approved projects. While several previously-approved developments revised projects to reduce the number of housing units,

the reduction in units was minimal. Including all changes to previously-approved projects, 7,390 net units were approved in 2023. Of these units, 2,281 (31%) are on-site income-restricted units.

FIGURE 38 Net Residential Units Approved Per Year (including new projects and project changes) 2014 to 2023



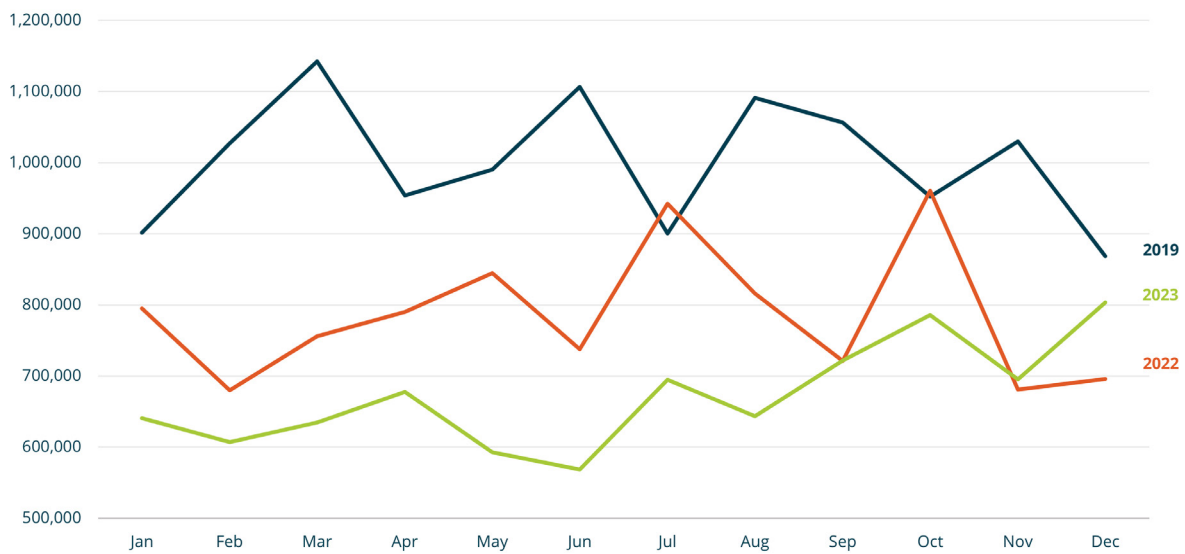
Source: BPDA Development Review Development Database, BPDA Research Division Analysis

Construction Activity

In 2023, construction hours worked in Boston development projects were 14.4% lower than 2021 and 32.9% below 2019 levels. Non-residential construction start permits slowed

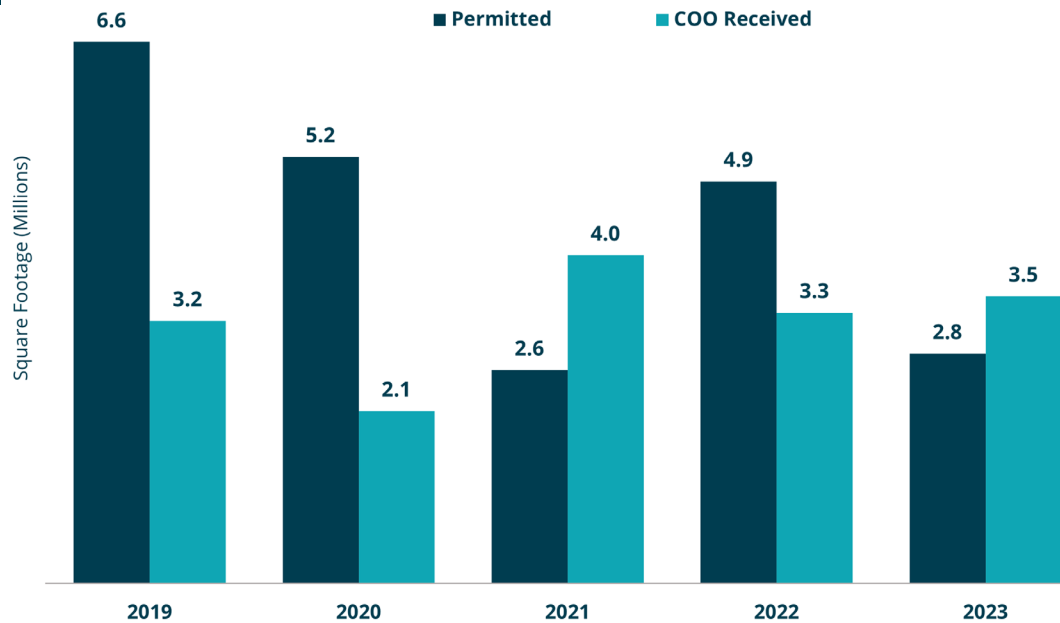
down in 2023, dropping to just above the number of permits in 2021. A total of 2.8 million square feet of commercial space was permitted in 2023.

FIGURE 39 Total Construction Hours Worked
2019, 2022, and 2023



Source: The Boston Residents Job Policy (BRJP) Office, Boston Jobs Policy Compliance Reports, BPDA Research Division Analysis

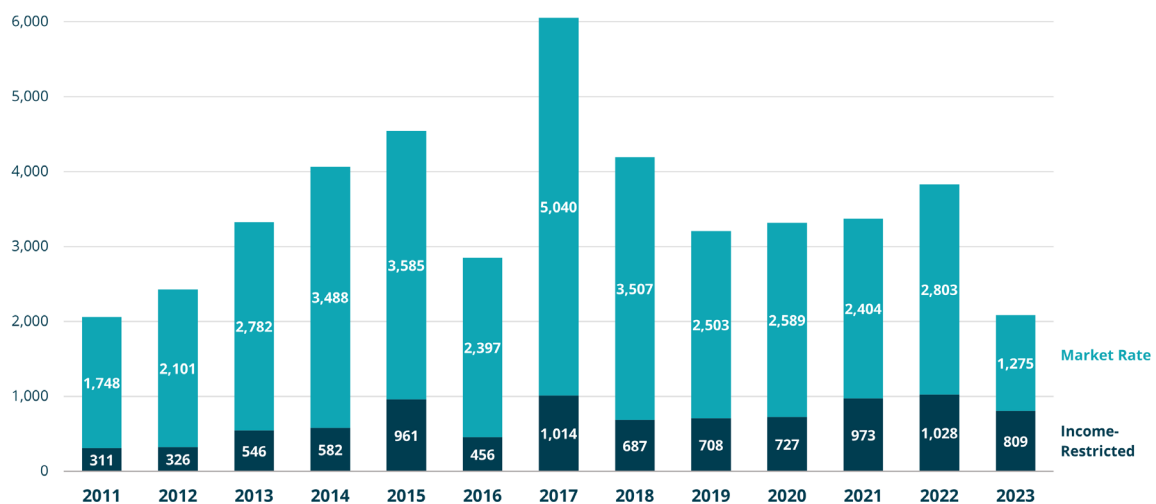
FIGURE 40 Square Footage of Non-Residential Construction Start Permits Issued and COOs Received 2019 to 2023



Source: City of Boston Mayor's Office of Housing, BPDA Research Division Analysis.

In 2023, 2,084 new housing units (including 809 income-restricted units) received construction permits — the lowest level of permitting net of demolitions since 2011.

FIGURE 41 Housing Units: Net Construction Permits by Year (Net of Demolitions) 2011 to 2023



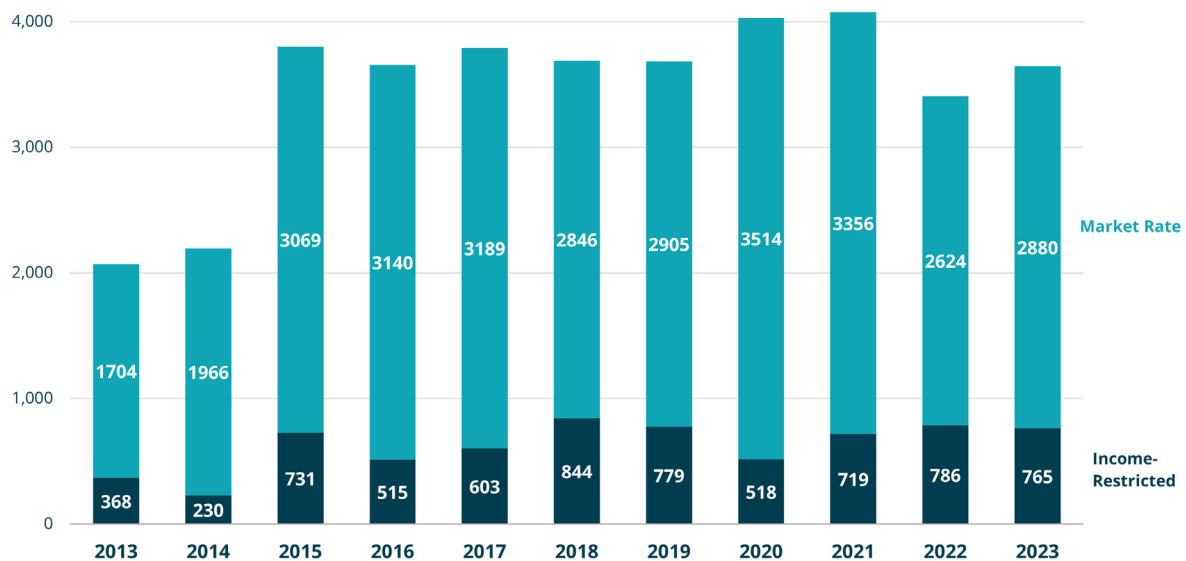
Source: City of Boston Mayor's Office of Housing, BPDA Research Division Analysis.

In 2023, Boston's total permitting of new housing units amounted to just 0.62% of the city's total 2020 housing stock, down from the city's 1.03% annualized monthly average rate of permitting for the decade 2013-2023. For Massachusetts as a whole, new housing units were permitted in 2023 at an annualized monthly average rate of 0.47% of the commonwealth's total housing stock,

slightly below its rate of 0.52% for the decade.

In 2023, 3,645 new housing units were completed (net of demolitions and replacement units), 765 of which were income-restricted, a similar increase in housing supply compared to 2022, but below the historically-high housing production in 2020 and 2021.

FIGURE 42 Housing Units: Completed by Year (Net of Demolitions)
2013 to 2023



Source: City of Boston Mayor's Office of Housing, BPDA Research Division Analysis.

Conclusion

Boston's economic recovery demonstrates remarkable resilience and growth across various sectors. The labor market remains tight, with payroll employment rising by almost 10,000 jobs over the past year, and the unemployment rate at or below 3% since March 2023. Accommodation and Food Services, Health Care and Social Assistance and Transportation and Warehousing all saw significant job increases in 2023. Tourism and leisure and hospitality sectors returned to at or near pre-pandemic levels in 2023. Residential demand in Boston appears strong with increasing rents and low vacancy rates, although high inflation and interest rates impacted the pace of new housing production.

Despite signs of strong economic recovery, Boston is in the midst of a full transition to the post-pandemic "new normal". Persistent remote/hybrid work trends have decreased commuter activity and softened demand for office space and the retail and transportation services that cater to commuters. Foot traffic trends in Boston's commercial hubs remain below pre-pandemic levels, and the office commercial real estate market is working to pivot to changing demand. Boston's ability to reinvent itself in the world of virtual work and commerce, the city's assets in educational, health care, and cultural institutions, and our diverse, youthful, and skilled population are reasons for optimism for Boston's vibrancy and growth in 2024 and beyond.

Appendix 1: Payroll Employment Estimation Methodology

To estimate Boston monthly payroll employment in the second half of 2022, we take the monthly employment by industry in the second quarter of 2022 in Boston City from Quarterly Census of Employment and Wages (QCEW) and monthly employment by industry in the same period in Boston-Cambridge-Newton MA NECTA Division from Current Employment Statistics (CES). We calculate the ratios between the two monthly employment datasets for every industry. Then we average the ratios and apply them to the Boston NECTA employment (from CES) by industry in the second half of 2022 to get Boston City payroll employment by industry in the second half of 2022. The assumption is that the Boston City employment (from QCEW) share of Boston NECTA employment (from CES) stays the same between the second quarter and the second half of 2021. This assumption is based on the fact that the sampling frame and weighting for the CES is built upon QCEW. Also, Boston City employment makes up nearly one-third of Boston NECTA Division employment in QCEW. Monthly employment trends in the Boston-Cambridge-Newton MA NECTA Division in CES should give informative early estimates of the second half of 2022 Boston City payroll employment.

There are some limitations in these assumptions. There may be subtle differences between the universes of employment measured in QCEW and CES. Perhaps more importantly, Boston City and Boston-Cambridge-Newton MA NECTA Division are two geographic levels with different industrial structures. For example, as an urban center, Boston City concentrates more service jobs in the leisure and hospitality industries. As long as these differences remain consistent over time the methodology can account for this. However, if one area was hit particularly hard at a given time, as might have been the case for restaurants and retail in Downtown Boston compared to suburban locations during the early pandemic, this methodology would miss that shift. Further, employment in some industries has a stronger seasonal pattern, such as Arts, Entertainment, and Recreation. For strongly seasonal industries we use QCEW to CES ratios from the same month in the prior year rather than ratios from the second quarter of 2022 to estimate employment for 2022.

Endnotes

- 1 Massachusetts Current and Leading Economic Indices, MassBenchmarks, February 1, 2024, https://donahue.umass.edu/documents/Index_Dec_2023.pdf
- 2 The Consumer Price Index (CPI) <https://www.bls.gov/cpi/overview.htm> is collected by the Bureau of Labor Statistics and focuses on consumer payments. The Bureau of Labor Statistics (BLS) collects data on prices of food, clothing, shelter, fuels, transportation, doctors' and dentists' services, drugs, and other goods and services that people buy for day-to-day living. Prices are collected each month in 75 urban areas across the country from about 6,000 housing units and approximately 23,000 retail and service establishments. All taxes directly associated with the purchase and use of items are included. These prices are then weighted and averaged together to form a market basket, whose indexed price level is measured by the CPI. By comparing the CPI between a pair of months, we can determine the change in the total price level between those two months. Picking months twelve months apart, as is typical, helps to abstract away from seasonal factors, smooth out month-to-month price volatility and offer an intuitive interpretation as a rate of annual change. We use December 2023 numbers where possible for year end analysis, or January 2024 numbers as a proxy.
- 3 The Personal Consumption Expenditures (PCE) is collected by the Bureau of Economic Analysis (BEA) and has a broader scope than the CPI, including prices paid by government entities and nonprofits nationwide. <https://www.bea.gov/resources/learning-center/what-to-know-prices-inflation>
- 4 https://www.bls.gov/news.release/archives/cpi_01112024.htm
- 5 <https://www.wbur.org/news/2022/09/08/new-england-electricity-prices-natural-gas-utility-auctions>
- 6 https://www.eia.gov/dnav/ng/NG_PRI_FUT_S1_D.htm
- 7 <https://www.nytimes.com/2024/02/29/business/economy/auto-insurance-inflation.html>
- 8 The Atlanta Fed Wage Growth Tracker can be accessed at <https://www.atlantafed.org/chcs/wage-growth-tracker>
- 9 Maffei, Lucia, "Thousands of Boston tech jobs were lost in 2023. The definitive tracker" Boston Business Journal, December 23, 2023, <https://www.bizjournals.com/boston/news/2023/12/29/total-boston-tech-layoffs-2023-annual.html>
- 10 To estimate life sciences employment, the employment for relevant NAICS codes is multiplied by the estimated proportion of workers that specialize in life sciences. The methodology used for data collected before 2021 is as follows: 3254 (Pharmaceutical Manufacturing) : 100%, 5417 (Scientific Research and Development Services): 84%, 6215 (Medical Testing Laboratories): 100%, 622 (Hospitals): 4.5%, 6113 (Universities): 1.9%. For data collected after 2021, the methodology is amended to 2.9% for NAICS code 6113 (Universities) and 3.8% for NAICS code 6223 (Hospitals) to reflect changing market trends.
- 11 "Greater Downtown" encompasses the Downtown, Chinatown, Leather District, West End, North End, and Beacon Hill neighborhoods