Socioeconomic Indicators for Massachusetts

November 29, 2023

UMassAmherst
Donahue Institute
Economic and
Public Policy Research

Prepared by the UMass Donahue Institute's
Economic & Public Policy Research Group

This report was prepared by the UMass Donahue Institute and the information in text, tables, charts, and graphs are the most recently available information as of November 20, 2023.

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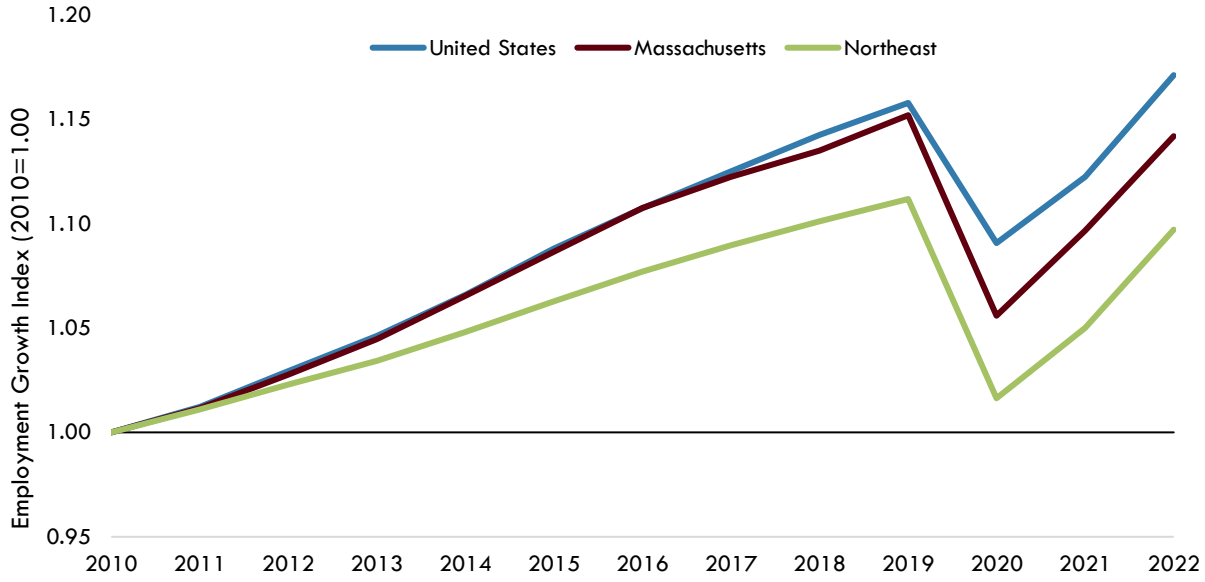
Economy

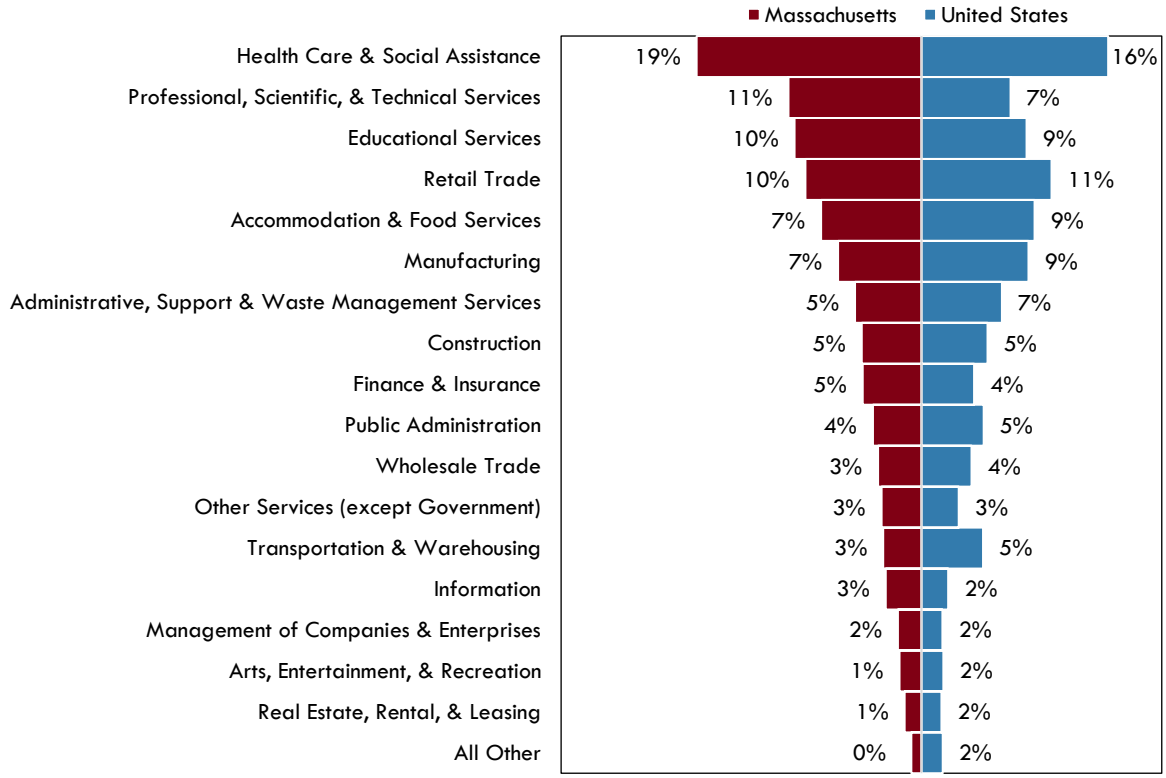
Over the past decade, Massachusetts has been a leader in job growth in the Northeast (Figure 1), driven largely by the state's highly-educated workforce, the overall diversity of industries, and strengths in knowledge-based industries, such as health care, education, and professional services (Figure 2). Professional and technical services have been increasingly important in the state, both as a share of employment and in terms of its contribution to state gross domestic product (GDP). During the pandemic, professional and technical services moved from being fourth in the state in terms of employment, to second. In 2022, the industry accounted for 11 percent of jobs and the sector was first in the state as a share of GDP, making up 14 percent of the state GDP. While the sector includes everything from legal services to veterinary services, in Massachusetts the two leading subsectors in terms of employees are computer systems design and related services, and scientific research and development services. These subsectors benefit from the Commonwealth's well-established higher education and health care sectors.

Figure 1. Employment Growth Index in Massachusetts, the Northeast, and the United States, 2010-2022 (2010=1.00)



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW); UMDI analysis

Figure 2. Industry Mix in Massachusetts and the United States, 2022 (Percent of Total Jobs)

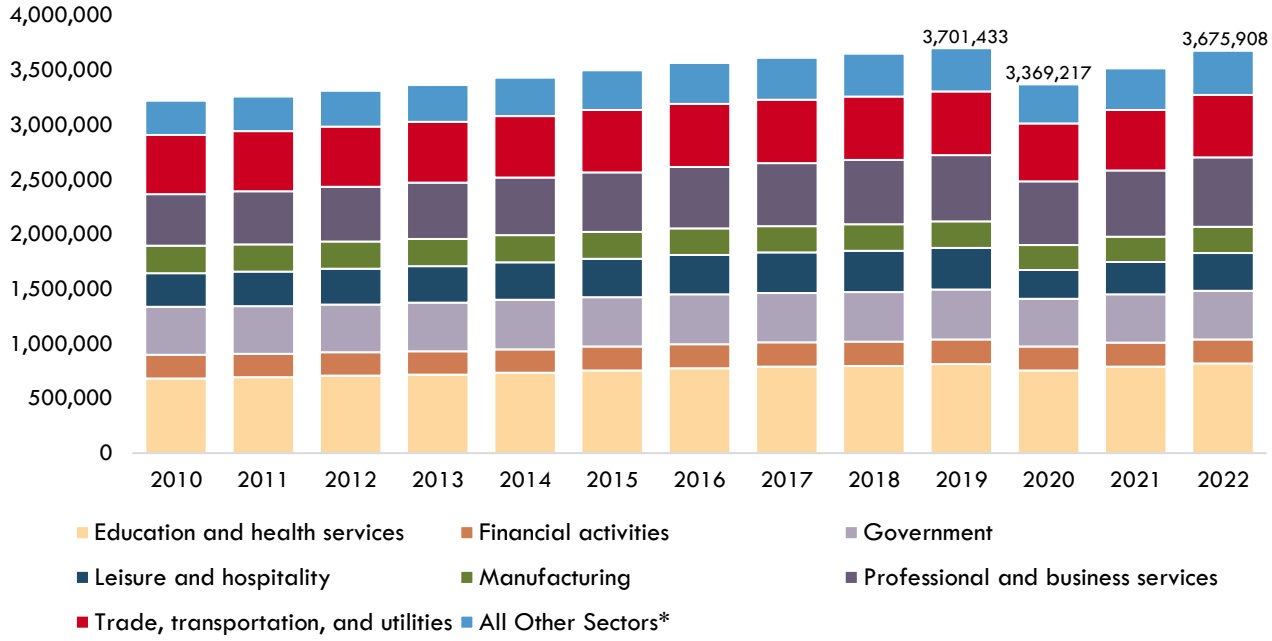


Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), UMDI analysis.
Note: All Other includes: Utilities; Agriculture, Forestry, Fishing, & Hunting; and Mining, Quarrying, and Oil & Gas Extraction. Not seasonally adjusted.

Educational services and health care and social assistance have consistently been among the top industries in the state. The clusters of colleges, universities, and teaching hospitals contribute to Massachusetts being a hub for technology and research. Finance and insurance have played an important role in the Massachusetts economy making up roughly 5 percent of jobs but contributing 9 percent to the state GDP. While sixth in terms of employment in 2022, manufacturing has historically experienced declines. In recent years the decline has slowed considerably, but the Commonwealth's share of manufacturing employment has remained lower than the share of employment in the United States as a whole.

Several NAICS service sectors, education and health services, professional services, and leisure and hospitality have grown to take the place of manufacturing in driving the Massachusetts economy and now account for almost half of total payroll employment, while financial activities, government, information, and trade, transportation and utilities have remained relatively level or declined in share (Figure 3).

Figure 3. Annual Average Employment in Massachusetts, 2010-2022 by NAICS Supersector



Source: U.S. Bureau of Labor Statistics, Current Employment Statistics (CES); UMDI analysis. *Includes Mining & Natural Resources, Construction, Information, and Other Services.

The COVID-19 pandemic interrupted the trajectory of the state's economic growth and had short- and long-term ramifications for the state's economy. Over 690,000 jobs were lost in spring 2020. In 2023 the Commonwealth finally surpassed the pre-pandemic employment levels. As of October 2023, there were 39,000 more jobs than in February 2020 (Figure 4). The growth of professional and technical services during the pandemic occurred during a period when retail trade, other services (which includes equipment repair, laundry and drycleaning, barbershops, and pet care among others), and accommodations and food services all suffered losses in terms of jobs. These generally lower-paying industries have been among the slowest sectors to recover in terms of absolute number of jobs lost and as a share of jobs lost compared to levels prior to the pandemic (Figure 4). The higher paying industries of construction and professional and technical services have both returned to well above their pre-pandemic levels, and construction in particular has seen growth that outpaces the U.S. overall. Since the onset of the pandemic through 2022, professional and technical services saw the largest gains in employment, this includes growth in scientific research and development services.

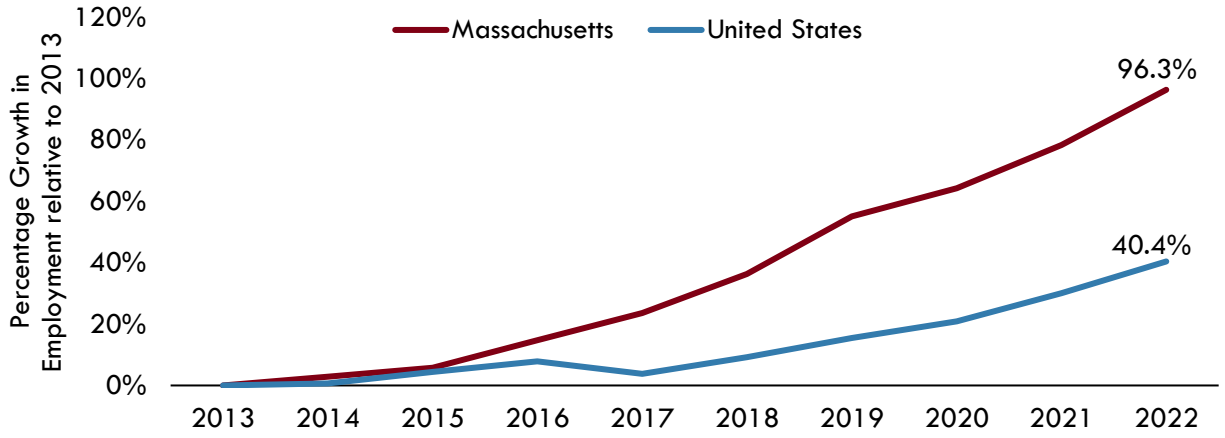
Figure 4. Jobs Deficit in Massachusetts Relative to February 2020 Peak by 2-Digit NAICS Industry

	Massachusetts				U.S.
Industry	**Feb-20**	**Oct-23**	**Change (N)**	**Change (%)**	**Change (%)**
Accommodation and food services	323,900	296,900	(27,000)	(8.3%)	(1.6%)
Retail trade	351,000	333,500	(17,500)	(5.0%)	0.2%
Manufacturing	242,800	236,100	(6,700)	(2.8%)	1.4%
Government	464,300	458,200	(6,100)	(1.3%)	0.1%
Management of companies and enterprises	73,500	71,000	(2,500)	(3.4%)	1.7%
Other services	142,000	140,500	(1,500)	(1.1%)	(0.9%)
Arts, entertainment, and recreation	63,100	62,800	(300)	(0.5%)	0.5%
Mining and logging	1,000	1,000	0	0.0%	(5.8%)
Real estate and rental and leasing	48,800	49,200	400	0.8%	3.3%
Information	95,600	96,500	900	0.9%	4.1%
Educational services	184,100	188,400	4,300	2.3%	4.3%
Administrative and waste services	184,700	190,100	5,400	2.9%	3.2%
Finance and insurance	177,900	184,300	6,400	3.6%	3.2%
Wholesale Trade	123,100	130,000	6,900	5.6%	3.4%
Transportation, warehousing and utilities	105,300	112,900	7,600	7.2%	15.6%
Health care and social assistance	645,600	658,000	12,400	1.9%	4.6%
Construction	166,100	180,100	14,000	8.4%	5.6%
Professional and technical services	350,900	393,200	42,300	12.1%	12.9%
Total nonfarm	**3,743,700**	**3,782,700**	**39,000**	**1.04%**	**3.0%**

Source: Massachusetts Executive Office of Labor and Workforce Development, Current Employment Statistics (CES-790); UMDI analysis

Scientific research and development (R&D) is intensely clustered in Massachusetts compared to the U.S. and has become more concentrated over the past decade. This is true when we look at both jobs in the industry and establishments. The concentration of research universities, hospitals, research institutes, and private companies pursing advances in biomedical research, life sciences, and other areas of research and development has contributed to the competitiveness of this industry. Over the past decade, employment in this area has nearly doubled in the Commonwealth with roughly 99,000 individuals working in scientific R&D (Figure 5). While these numbers are meaningfully large, they likely understate the significance of the industry in the Massachusetts economy, when considering employment in other industries supports research and development. R&D activity here also constitutes a large portion of national scientific activity: in 2022, more than one in every 10 scientific research and development jobs in the nation were in Massachusetts. This is despite the Commonwealth being home to only one in every 40 jobs overall in the nation. Jobs in scientific R&D pay notably higher wages than average for both Massachusetts and the US; average real annual wages for scientific R&D in Massachusetts peaked at over $250,000 in 2021and remain well above other industries in the state and higher than the U.S. average for the industry.

Figure 5: Employment Growth in Scientific Research and Development, 2013-2022



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages. NAICS Code 5417, Scientific Research and Development Activities

Much of the funding for research and development comes from the federal government. Looking at trends in three prominent sources of this funding, National Institutes of Health, Small Business Administration, and National Science Foundation, illustrate the competitiveness of Massachusetts in research and development.

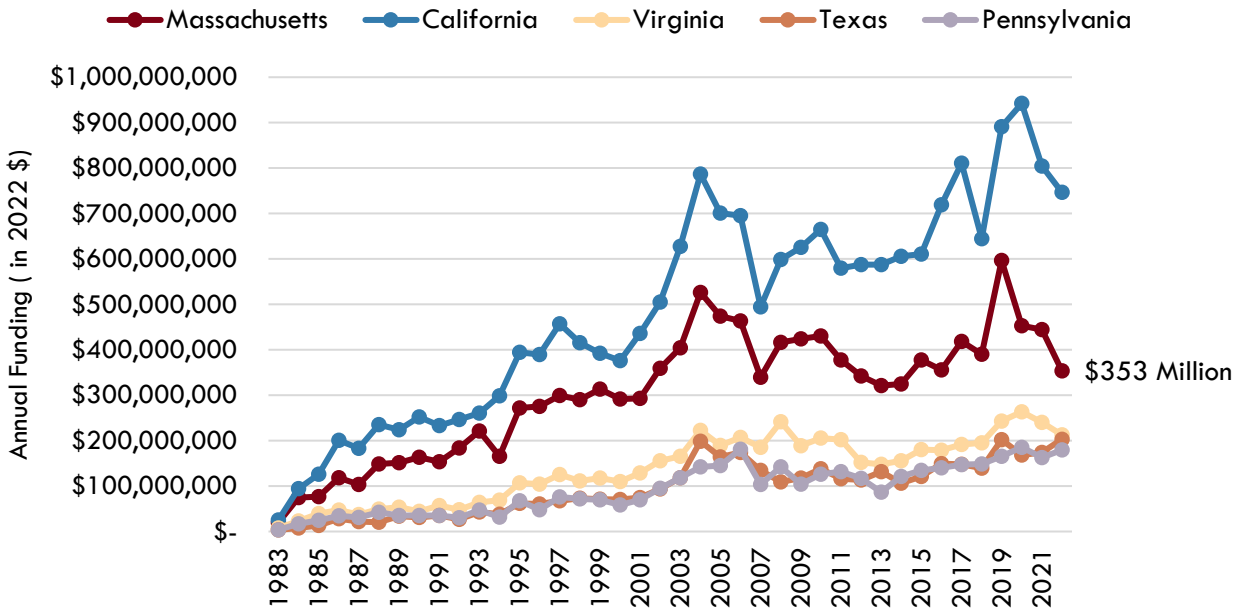
The National Institutes of Health has a budget of nearly $48 billion. Over 80 percent of that budget goes towards funding research through competitive grants. Researchers in Massachusetts have been successful at securing NIH awards at consistently high levels. In 2022 Massachusetts researchers were awarded over $3.1 billion in funding from the NIH, behind only New York and California. When considered on a per capita level, Massachusetts has been first in the nation every year for the last decade at least. Within Massachusetts the vast majority of the funding is focused in the Greater Boston area, though Worcester (home of UMass Chan Medical School) and Western Massachusetts (home of UMass Amherst) have also received large shares of grants from the NIH.

Similar to NIH funding, Massachusetts also leads in the US Small Business Administration's (SBA) innovation-focused programs (Figure 6). The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs, administered by SBA, are highly competitive award programs that encourage American small businesses to engage in federal R&D with the potential for commercialization. Focused on stimulating high-tech innovation, the purpose of the SBIR/STTR program is tech transfer and to bridge the gap between basic science and commercialization of the resulting innovations for small businesses while meeting federal research needs. Businesses must be owned and located in the US and have less than 500 employees. In addition, for the STTR program, small businesses are required to do at least 40% of the research, while formally collaborating with nonprofit research institutions. The available funding pool is based on percentages of existing federal R&D projects and is currently over $57 million.[1] In FY2022

[1] Phase I projects establish feasibility and Phase II can follow on Phase I based on the initial results and the commercial potential. Phase I awards are generally $50,000 - $250,000 for 6 months (SBIR) or 1 year (STTR). Awards caps are adjusted for inflation and currently capped at around $2M for each Phase II project. https://www.sbir.gov/sites/default/files/SBA_SBIR_Overview_March2020.pdf

Massachusetts organizations and businesses received over $353 million in SBIR and STTR funding, behind California in total awards, but first in the nation when considered on a per capita basis.

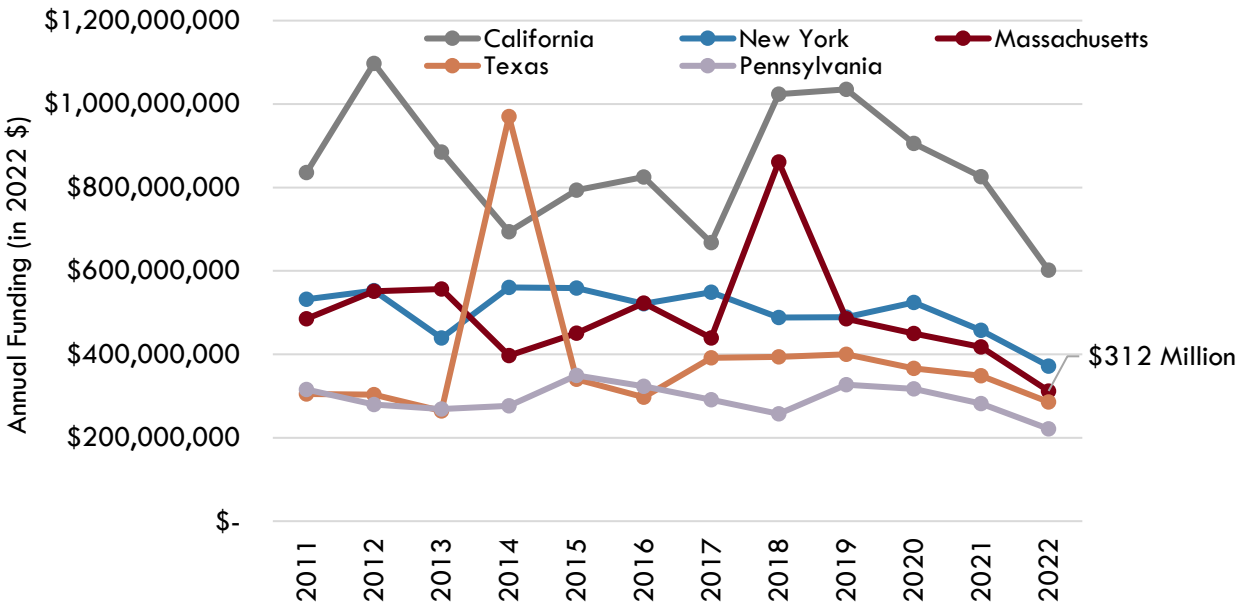
Figure 6: Annual SBIR and STTR Funding for Top 5 States with Highest Funding in 2022



Source: Small Business Administration, Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. Bureau of Labor Statistics Consumer Price Index, All Urban Consumers, U.S. City Average.

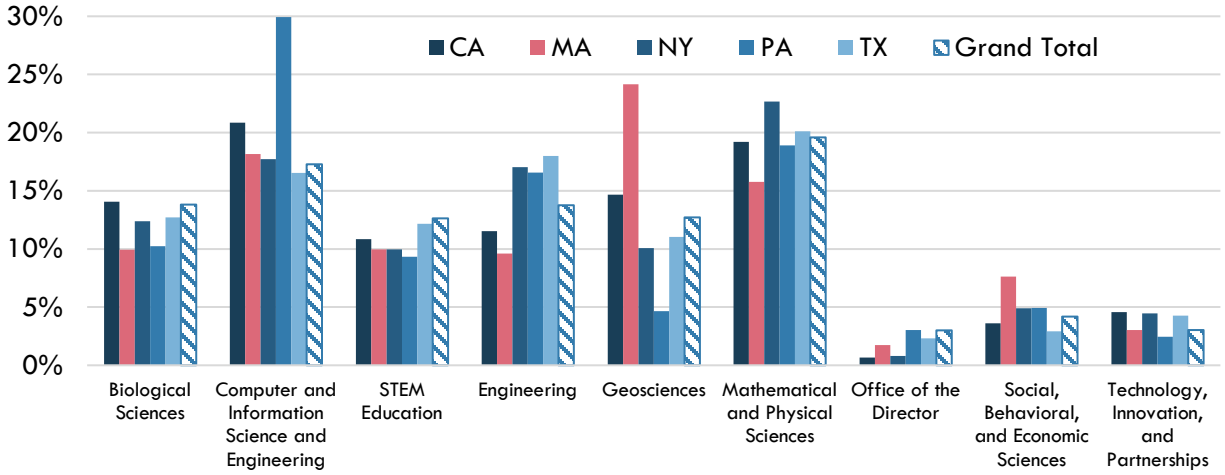
National Science Foundation (NSF) funding is another area where Massachusetts leads, among the top states in terms of overall funding, and first when funding is adjusted to reflect population size. In 2022, Massachusetts researchers were awarded over $312 million in NSF funding (Figure 7), placing Massachusetts behind California and New York in terms of total funding, but first in the nation on a per capita basis. Within the state, the majority of funding is directed to universities in the Greater Boston area, though Woods Hole Oceanographic Institution on the Cape and University of Massachusetts in Western Massachusetts are consistently among the five top-funded institutions in the Commonwealth. NSF funds research in many disciplines: geosciences, computer and information sciences, and mathematical physical sciences account for more than half of NSF funding in the Commonwealth. Massachusetts is particularly competitive in the field of Geosciences and Social, Behavioral, and Economic Sciences (Figure 8).

Figure 7: Annual National Science Foundation Funding for Top 5 States with Highest Funding in 2022



Source: National Science Foundation. Bureau of Labor Statistics Consumer Price Index, All Urban Consumers, U.S. City Average.

Figure 8: Percent of State Funding by NSF Directorate for Massachusetts and Peer States, 2022



Source: National Science Foundation

At nearly $5 billion dollars in university expenditures in 2021, Massachusetts is among the top states in university research and development spending, and the states whose universities outspend Massachusetts

have much larger populations, these include California, New York, Texas, Pennsylvania and Maryland.[2] After adjusting for population size, Maryland and Massachusetts' per capita research spending at universities is noticeably higher than all other states in the U.S. Both states are home to large concentrations of urban research institutions.

The investment of federal funding for research may be a driving factor in Massachusetts' standing as leader in terms of patents. In 2020, 8,790 patents were awarded in Massachusetts, among the top five states in the country. California by far has the most, but again Massachusetts was nearly on par with California on a per capita basis.

The Commonwealth has also attracted venture capital funding. Though Greater Boston has been consistently behind San Francisco and Silicon Valley, the region has received similar levels of venture capital funding as the New York City and Los Angeles areas, which are the two most populous regions in the country. In the third quarter of 2023, Greater Boston's venture capital deals totaled $4 billion, exceeding New York City and Los Angeles totals (of $3.6 billion and $3.1 billion, respectively). This was the first time since at least 2017 that Boston's venture capital has been second only to that of Silicon Valley.

Investment in research and development has also attracted talent from around the globe. Over the past two decades H-1B approvals in Massachusetts have increased dramatically, peaking in 2019 at almost 20,000 before retreating to 17,000 in 2020 and 2021 at the height of the COVID-19 Pandemic. Approvals increased in 2022 to nearly 19,000. Over the same period, the number of approvals in Cambridge, Waltham, and Sommerville all more than tripled. In 2022, Boston was ninth in the nation among cities for total approved H-1B visas.

[2] The National Center for Science & Engineering Statistics conducts an annual Higher Education R&D survey which solicits responses directly from all universities and colleges that generate at least $150,000 in R&D expenditures in a year. This survey accounts for R&D funding from all sources, including federal, state, and local governments; businesses and non-profit foundations; and the institution's own funding.

According to MassBenchmarks, the journal of the Massachusetts economy produced by the University of Massachusetts Donahue Institute (UMDI) and Federal Reserve Bank of Boston, in the third quarter of 2023, Massachusetts real gross domestic product (GDP) increased at a 3.8 percent annualized rate while U.S. GDP increased at a 4.9 percent annualized rate, according to the U.S. Bureau of Economic Analysis (BEA). In the second quarter of 2023, Massachusetts GDP increased at a 3.6 percent annualized rate according to MassBenchmarks while U.S. GDP increased at a 2.1 percent annualized rate according to the BEA.

The strong performance in the third quarter came as a surprise as in July MassBenchmarks was projecting an annualized rate of growth of less than one percent in the third quarter (+0.7 percent) and the Wall Street Journal Economic Forecasting Survey forecast a 0.6 percent rate of growth for the U.S. Vigorous job creation and robust consumer spending during the summer months accounted for the unexpectedly strong growth, in addition to a meaningful uptick in inventories. Growth is expected to slow substantially in the fourth quarter and into 2024.

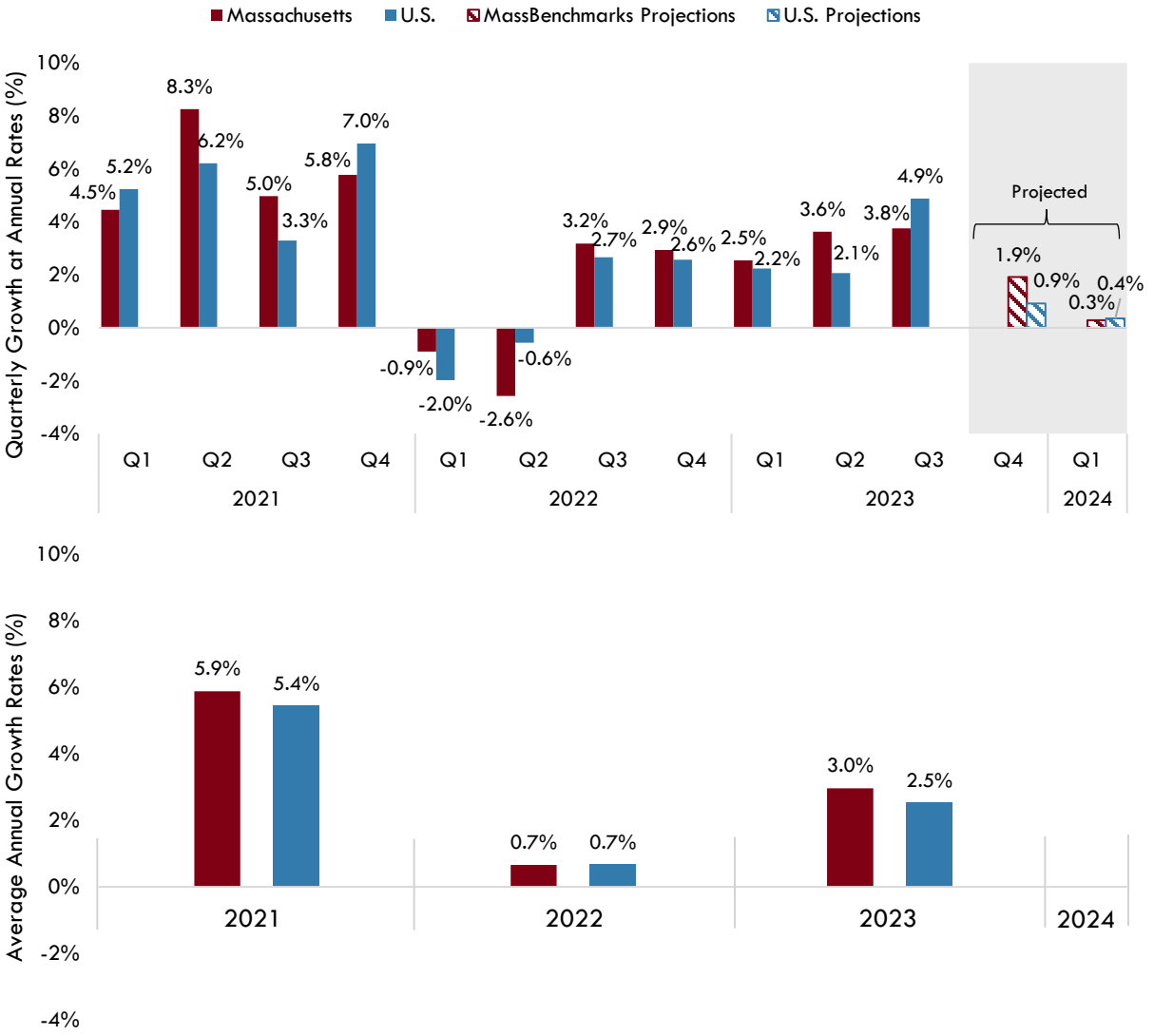
Payroll employment grew by 1.7 percent on an annualized basis in the third quarter in both Massachusetts and the U.S., a notable pace given the efforts of the Fed to slow the economy. It is unlikely that this pace can be maintained in the final quarter of 2023. Nationally, payroll growth slowed in October.

Income and spending indicators in Massachusetts – based on tax revenues – indicate some weakness in the state's economy relative to the U.S. While wage and salary income nationally rose at a 5.6 percent annualized rate in the third quarter, in Massachusetts it rose at a slower 3.5 percent rate. The national measure is estimated by the BEA and the state number by MassBenchmarks using state withholding tax revenue data.

Inflation, as measured by the Bureau of Labor Statistics headline consumer price index, was more moderate in the Boston metropolitan area than nationally. On an annualized quarterly basis in the third quarter, prices in the Boston area rose 2.2 percent versus 3.6 percent for the U.S. Excluding food and energy, core prices rose 1.8 percent in Boston versus 2.8 percent in the U.S. in the third quarter. Year over year, since the third quarter of 2022 overall prices in the Boston area were 2.7 percent higher in the third quarter of 2023, as compared to a 3.6 percent increase for the U.S., while core prices were 3.5 percent higher in Boston and 4.4 percent higher nationally over the same period.

Growth in Massachusetts GDP is expected to slow to a 1.9 percent annualized rate in the fourth quarter and to a 0.3 percent rate in the first quarter of next year. The average expectations for U.S. GDP growth from the Wall Street Journal's October Survey of Economic Forecasters is for 0.9 percent growth in the fourth quarter and 0.4 percent growth in the first quarter of 2024.

Figure 9. Growth in Real Product, Massachusetts and the United States, 2023 Q3

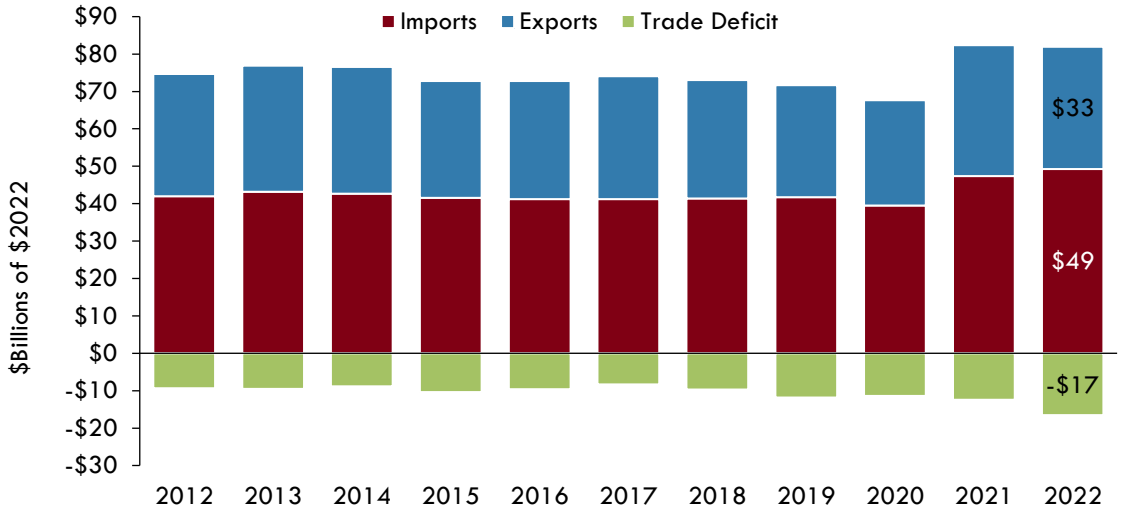


Source: U.S. Bureau of Economic Analysis, MassBenchmarks calculations by Dr. Alan Clayton-Matthews. U.S. projections from Wall Street Journal. Note: average annual growth is calculated by averaging the four quarters of annual growth rates for the calendar year. 2023 annual averages include projections for Q4.

Massachusetts trade has stabilized since the pandemic declines in 2020 and after a large rebound in 2021. The Commonwealth's total trade volume (exports and imports) increased 21.7 percent from 2020-2021 and fell 0.5 percent from 2021-2022; the total trade volume was $82 billion in 2022 (Figure 10). Canada was by far our most valuable trading partner, with a trade volume of $17 billion, 20.8 percent of the total state trade (Figure 11). The Massachusetts' trade deficit, $16.6 billion, increased 33.3 percent in 2022. Massachusetts ranked 19th in the U.S. in 2022 and first in New England with $32.7 billion in exports. This was a 6.6 percent decrease from the previous year's export value, while national exports increased by 8.8 percent and total exports from New England decreased by 4.1 percent (Figure 12).

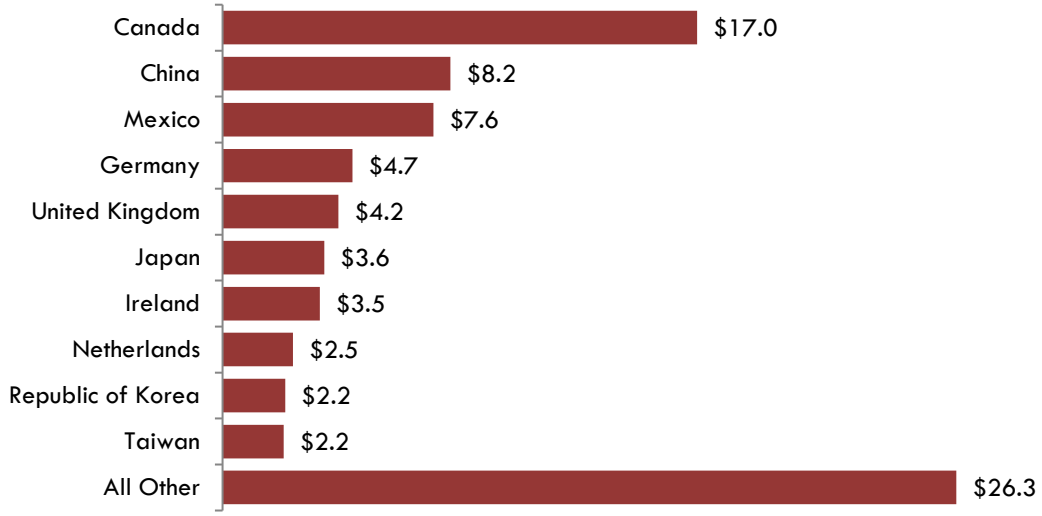
Canada and China were our top two export destinations in 2022 with $3.7 billion each. Imports increased 3.9 percent year-over-year to $49.3 billion in 2022. Canada was the largest source for Massachusetts imports in 2022, from which we imported $13.3 billion, or 27.1 percent, of our total.

Figure 10. Massachusetts Imports, Exports, and Trade Deficit, 2012-2022 (in Billions of $2022)



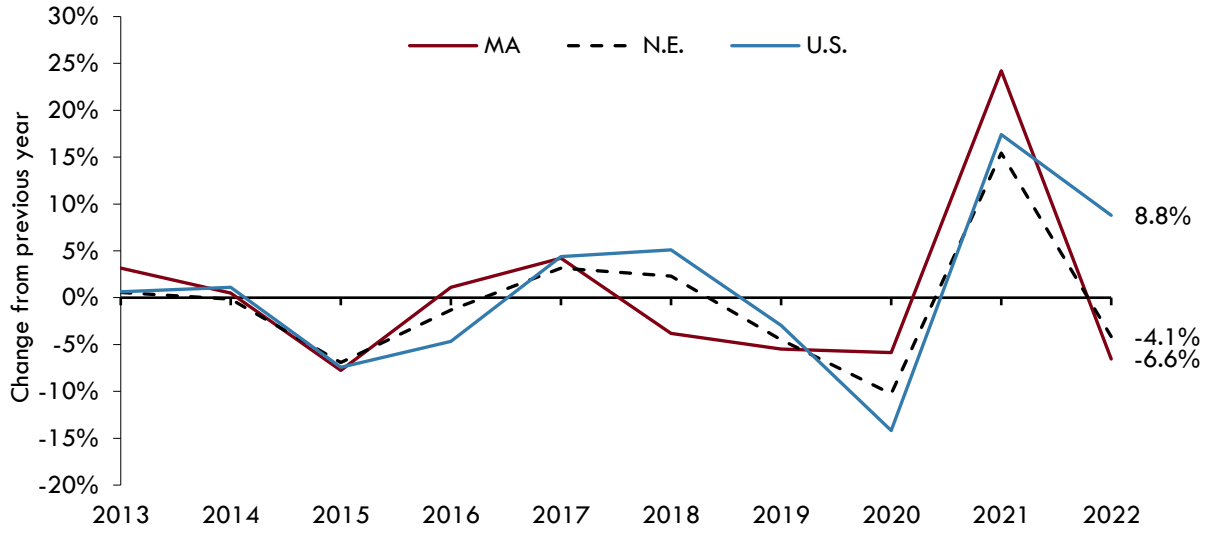
Source: WISERTrade.org; UMDI analysis

Figure 11. Massachusetts Top 10 Trade Partners in 2022 (in Billions of $2022)



Source: WISERTrade.org; UMDI analysis

Figure 12. Export Growth for Massachusetts, the United States, and New England, 2013-2022

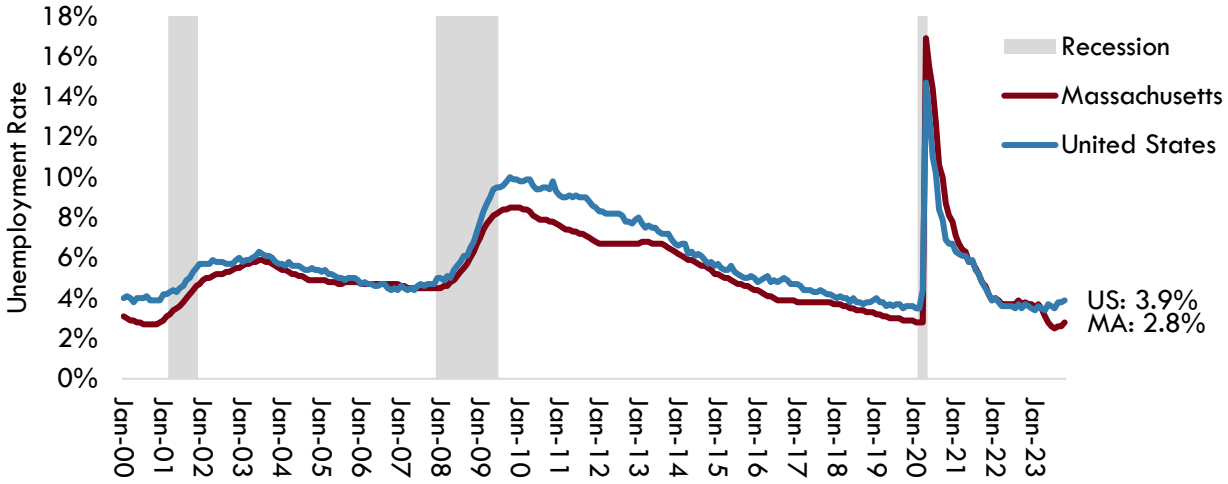


Source: WISERTrade.org; UMDI analysis

Workforce

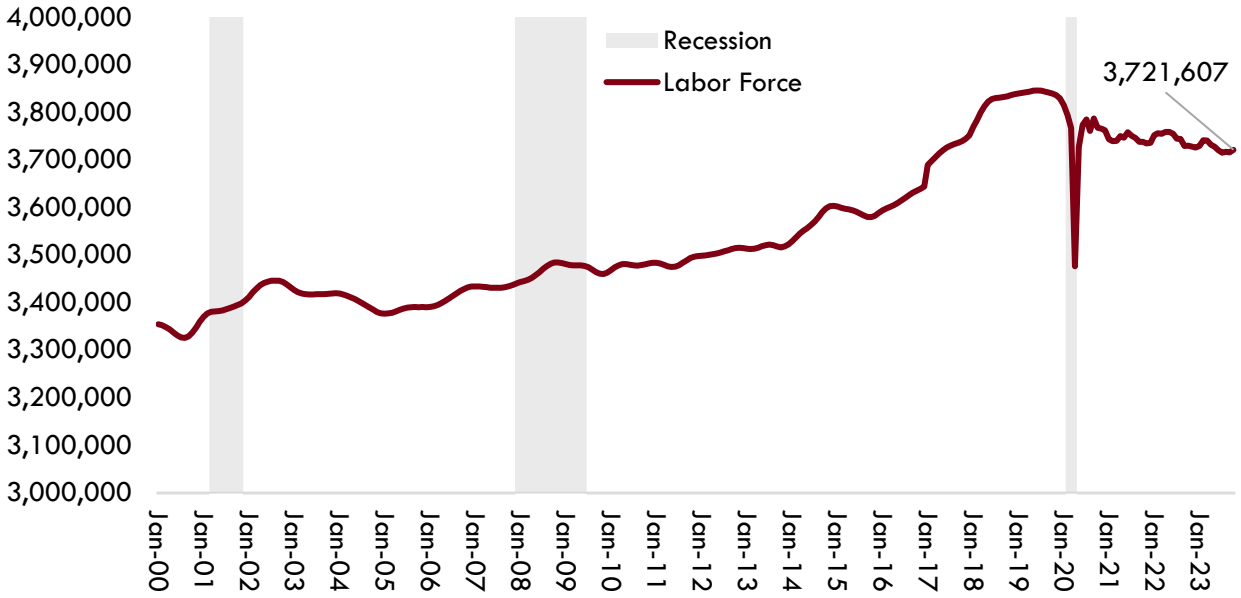
In recent history, the Massachusetts economy has generally outperformed the U.S., with the state unemployment rate typically below the nation. This was especially the case during and the period following the Great Recession. The Commonwealth's mix of knowledge-based industries and well-educated workforce led to high levels of labor force participation and low levels of unemployment in the state overall. The tightness of the current labor market is reflected in the unemployment rate, which has recently reached historically low levels. The October unemployment rate for Massachusetts was 2.8 percent, just above the historic low of 2.7 percent recorded at the end of the tech boom in the summer and fall of 2000 and among the lowest since these data were first collected in 1969. The U.S. unemployment rate, which was 3.9 percent in October, reached its nadir in January of 3.4 percent, the lowest level since the end of the 1960s (Figure 13).

Figure 13. Unemployment Rates in Massachusetts and the United States as of October 2023 (Seasonally Adjusted)



Source: Massachusetts Executive Office of Labor and Workforce Development, Local Area Unemployment (LAU) Statistics; UMDI analysis

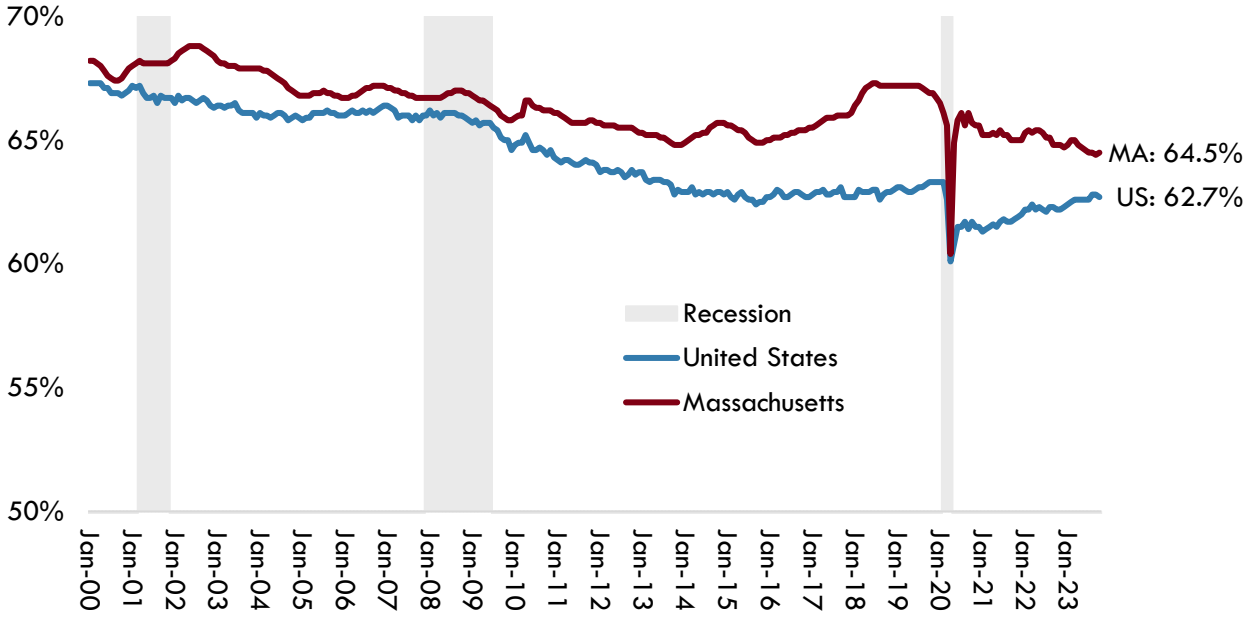
Figure 14. Massachusetts Labor Force, January 2000-October 2023 (Seasonally Adjusted)



Source: Massachusetts Executive Office of Labor and Workforce Development, Local Area Unemployment (LAU) Statistics; UMDI analysis

After recovering from the initial collapse at the start of the pandemic, the size of the labor force has generally been trending down since Fall 2020 (Figure 14). At the same time, Massachusetts has consistently maintained higher rates of labor force participation than the U.S., though the difference has narrowed considerably. As of October 2023, 64.5 percent of Massachusetts working-age residents were in the workforce (Figure 15). The rate is down 0.3 percentage points from October 2022 to October 2023 and below the pre-pandemic level of 66.5 percent in January 2020. Labor force participation rates and unemployment rates vary across race, gender, age, and education levels. Higher peak unemployment rates during the pandemic were experienced by people of color, women, and younger workers, with lower levels of education who were more likely to be working in sectors impacted by the pandemic. While all groups have benefited from the economic recovery, rates of recovery have varied across demographics. The fact that educational attainment, age, race, and gender are all interconnected with access to job opportunities in the more resilient sectors of the economy has meant that historically marginalized populations have faced greater challenges during all stages of the pandemic. For example, in the spring of 2020, Massachusetts' residents of color experienced the highest levels unemployment in decades with unemployment rates exceeding 26 percent in April 2020—nearly 12 percentage points higher than their white counterparts.

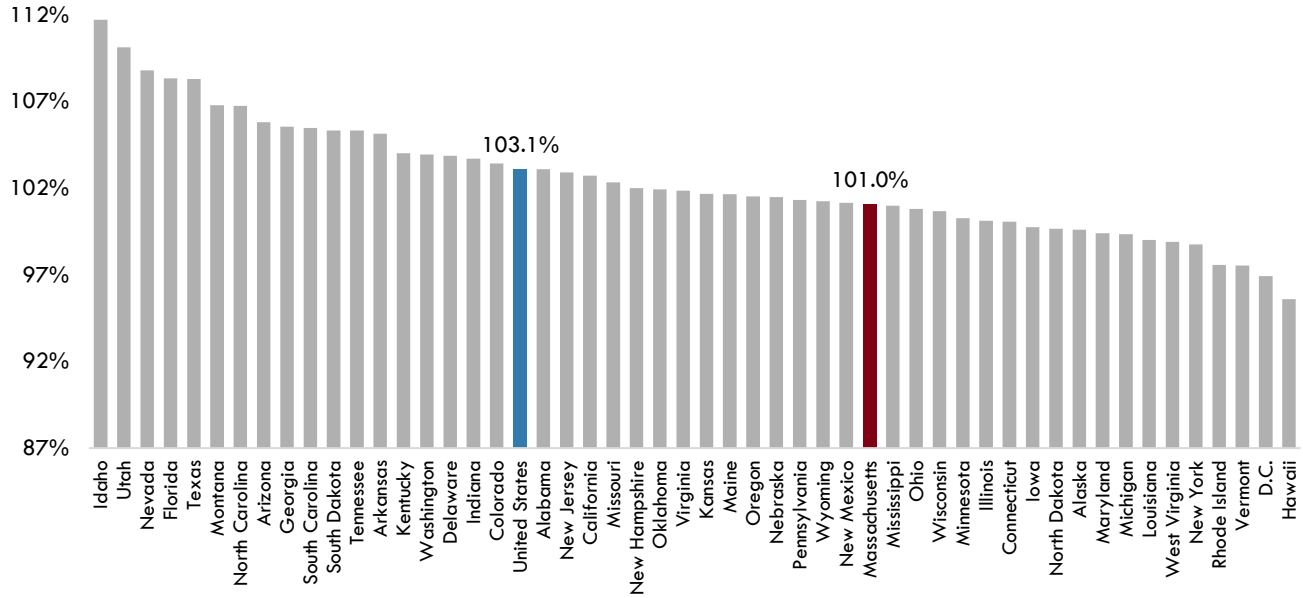
Figure 15. Labor Force Participation Rates in Massachusetts and the United States, January 2000-October 2023 (Seasonally Adjusted)



Source: Massachusetts Executive Office of Labor and Workforce Development, Local Area Unemployment (LAU) Statistics; UMDI analysis

Over the past three years, labor market conditions improved dramatically for many workers in the U.S. following the initial wave of COVID-19 related shutdowns. Jobs recovered at a fast rate, with employment totals above pre-pandemic levels for the nation and 39 states, including Massachusetts. The remaining 11 states are mostly within one percentage point of their February 2020 job peak (Figure 16).

Figure 16. Job recovery rates in Massachusetts and all states, February 2020 and October 2023 (Seasonally adjusted)



Source: Massachusetts Executive Office of Labor and Workforce Development, Current Employment Statistics (CES-790); UMDI analysis

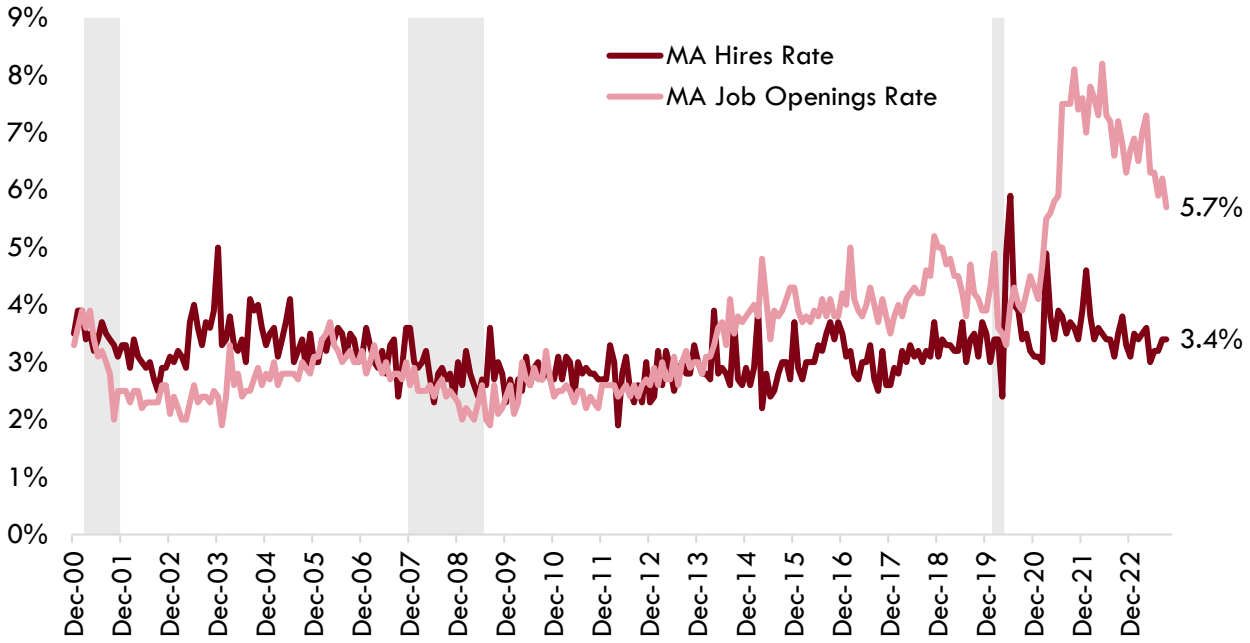
The combination of uneven job losses and recovery, as well as an overall decline in the total labor force size in the state have led to several hiring and staffing challenges for employers. An examination of the Bureau of Labor Statistics' Job Opening and Labor Turnover Survey (JOLTS) shows some interesting trends in job postings, hiring, and quits. On the one side, employers were routinely expressing an inability to find available workers to fill current vacancies. On the other side, there was a significant increase in voluntary job separations (or "quits") during the recovery period following initial COVID job losses. The national media and popular discourse initially referred to this as "the Great Resignation" or "the Big Quit" and often attributed hiring challenges to a fundamental shift in workers' views on work-life balance.[3] However, quits in the labor market seem to be tied more to the extremely tight labor market conditions caused by pent up labor demand, reduced labor force size caused by demographic factors, and competition for available workers, and not the ongoing challenges related to childcare shortages and costs, or the need for flexible work arrangements.

The following graphic (Figure 17) shows the ongoing tension in Massachusetts between current job openings and hires. The pink line shows the job opening rate in the state, or the number of job postings over the total number of jobs. The red line shows the hiring rate, or the number of jobs filled over the total number of jobs in the state. Over time, the hiring rate and the job opening rates have moved closely together. In the pre-COVID period, the strong economic conditions in Massachusetts helped to increase demand, and the

[3] Newport, Cal. 2021. "Why Are So Many Knowledge Workers Quitting?" *The New Yorker*, August 16, 2021. https://www.newyorker.com/culture/office-space/why-are-so-many-knowledge-workers-quitting.

opening rate separated from the hiring rate between 2016 and 2019. Unsurprisingly, the hiring rate dipped in the pandemic and then jumped dramatically as social distancing restrictions started to lift. Since 2021 there has developed a significant gap between job openings and hires in the state, supporting the narrative from employers that they are having a hard time filling current openings.

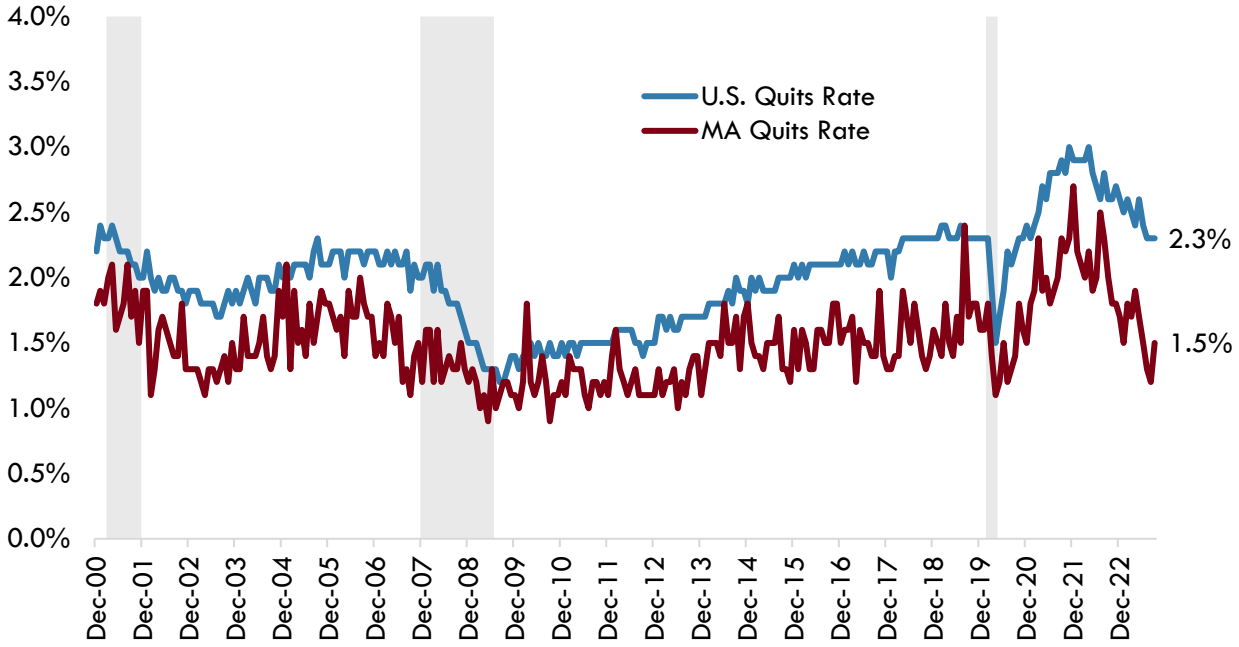
Figure 17. Job openings rate and hire rate in Massachusetts, December 2000 – September 2023 (Seasonally adjusted)



Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS); UMDI analysis

Similarly, the pandemic appeared to impact voluntary job changes. The graphic below (Figure 18) shows the monthly job quit rate for Massachusetts and the U.S. dating back to 2001. As one would expect, quits tend to go down during recessionary periods in the economy and increase when labor demand is stronger. The quit rate for the U.S. tends to be a bit higher than Massachusetts historically. This is likely due to the high education attainment of Massachusetts workers coupled with the state's industry mix.

Figure 18. Job quits rate in Massachusetts and the United States, December 2000 - September 2023 (Seasonally adjusted)



Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS); UMDI analysis

Predictably, voluntary separations or "quits" dropped during the COVID recession. With layoffs and involuntary separations spiking throughout the economy, those who were able to stay in their current jobs were unlikely to quit during the economic downturn. As the economy opened back up quits spiked dramatically, especially in 2021. While there are a host of factors that would influence increased voluntary separations in the aggregate (e.g. health, family care responsibilities, pay, etc.), the primary cause of the increased quits is tight labor market conditions, reflected in the high number of job openings, low unemployment rates, and wage increases (though, not at the pace of current inflation). While some workers have not returned to the workforce, many seized the opportunity to find new employment. In short, with increased demand in the labor market and fewer available workers to draw from, workers were better positioned to seek out higher paying opportunities and more flexible work arrangements than they were during the early stages of the pandemic.

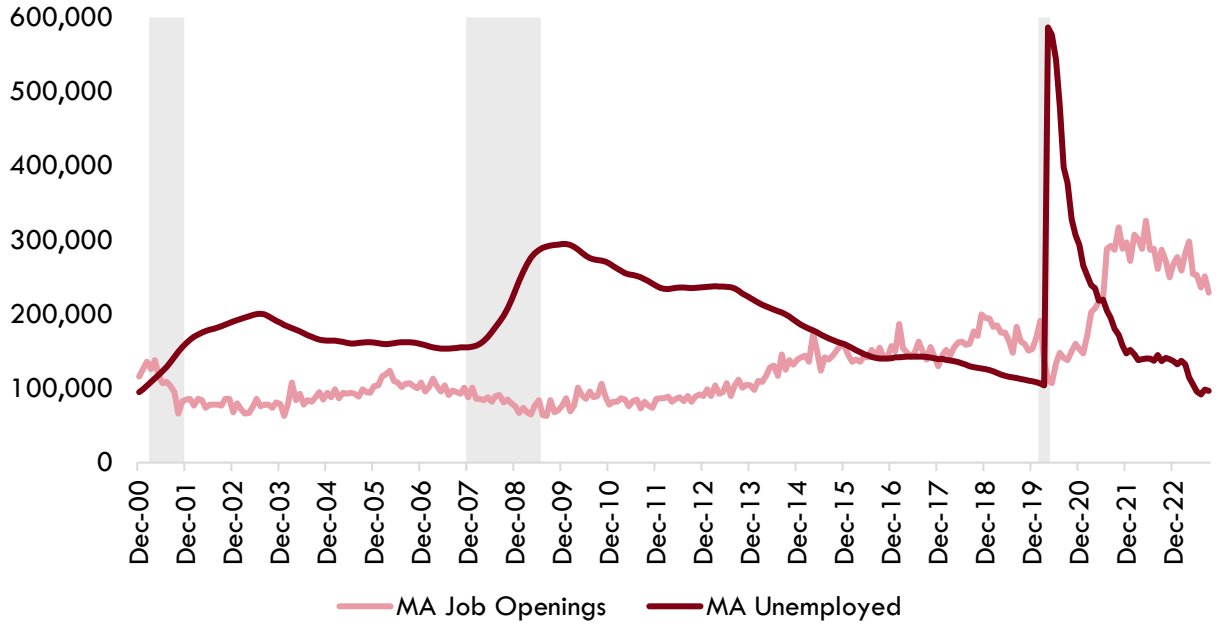
Competition for workers in a tight labor market led to wage increases across the Massachusetts economy in 2020 and 2021. While in recent quarters wage growth has declined, year-over-year wages increased 11 percent from 2019 to 2020 and five percent from 2020 to 2021. Despite the wage gains experienced by many workers in the economic recovery period, those gains have failed to keep up with the rate of inflation, leading to households having reduced spending power, despite any wage gains experienced over the economic recovery period.

This tension between labor demand and available workers is likely to continue for the foreseeable future due to several factors. As we will cover in the "Resident" section later in this report, the pandemic led to both an uptick in deaths in the state, as well as a dramatic decrease in international migration. This

coupled with losses in net domestic migration is helping to lead to a slightly smaller labor force in Massachusetts than before the pandemic. In addition, with baby boomers approaching traditional retirement ages, Massachusetts (along with the rest of the U.S.) will be facing labor shortages in the coming decades.

Focusing on the current labor market, the uneven economic downturn and recovery signals some elements of skills mismatches in the economy. In 2021, U.S. workers with a bachelor's degree had an unemployment rate of 3.5 percent, compared to 6.2 percent for individuals with a high school diploma, and 8.3 percent for workers with less than a high school education. Regardless, there are currently fewer unemployed workers in the state than current job openings, meaning that short of an increase in labor force participation in the current population and/or an influx of new workers, there simply are not enough available workers to fill vacancies in the current economy.

Figure 19. Job Openings and Number of Unemployed in Massachusetts (Dec 2000 - September 2023)



Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (JOLTS); UMDI analysis

In addition to upending the labor market, the pandemic has had lasting impacts on transportation in the Commonwealth. Transportation and mobility are essential to the economy and workforce. On one side, the industry sectors – transportation, warehousing, and wholesale trade – are indicative of the activities related to the movement of people and freight in Massachusetts and can be measured by jobs and contribution to the state's GDP. On the other side, indicators like congestion levels, vehicle miles traveled (VMT), public transit ridership, and air passengers have traditionally served as proxy measures of how the economy is performing. It remains to be seen to what extent employees will resume commuting to work and how the relationship between mobility and employment will evolve.

For many workers the transition to remote or hybrid work has been beneficial as it reduced or eliminated commuting. Leading up to the pandemic, the delays that Massachusetts drivers faced for their commutes had risen dramatically. The typical driver in Boston sat in traffic for nearly 90 hours per year as compared to just over 30 in the early 1980s. Nationally, the Boston urban area has consistently ranked among the highest in the nation in terms of annual hours of delay and Boston's traffic congestion has outpaced other areas of the Commonwealth for this period, at times more than doubling the hours of delay incurred by Worcester or Springfield area drivers. All areas of the state saw unprecedented declines in 2020 as overall travel declined due to the COVID-19 pandemic.

Freeway daily vehicle miles traveled (VMT) throughout the three most populous regions of the state thoroughly outpaced population growth for the period of 1982-2019, increasing roughly 120 percent for the Boston, Springfield, and Worcester urban areas, regardless of the varying changes in population growth that each area experienced. This points potentially to statewide changes in driving behavior (e.g., more cars taking more and longer-distance trips) independent of population growth as well as land use patterns potentially favoring vehicle-focused types of development. Traffic volumes across the state have largely reversed and almost fully recovered from the significant dip in VMT that occurred in 2020 due to the pandemic, with average weekday and weekend VMT in October 2023 hovering between 85-100 percent of their pre-pandemic October 2019 levels.[4]

In contrast to daily VMT, public transit ridership has largely lagged the economic recovery in Massachusetts following the beginning of the COVID-19 pandemic in spring 2020 (Figure 20). Immediately following the emergence of COVID-19 and subsequent "stay at home" orders, transit authorities uniformly experienced a sharp decline in ridership. Total public transit ridership across the state has since started recovering, showing signs of seasonal variation with dips in the winters of 2020-21 and 2021-22 and relative peaks in summers.

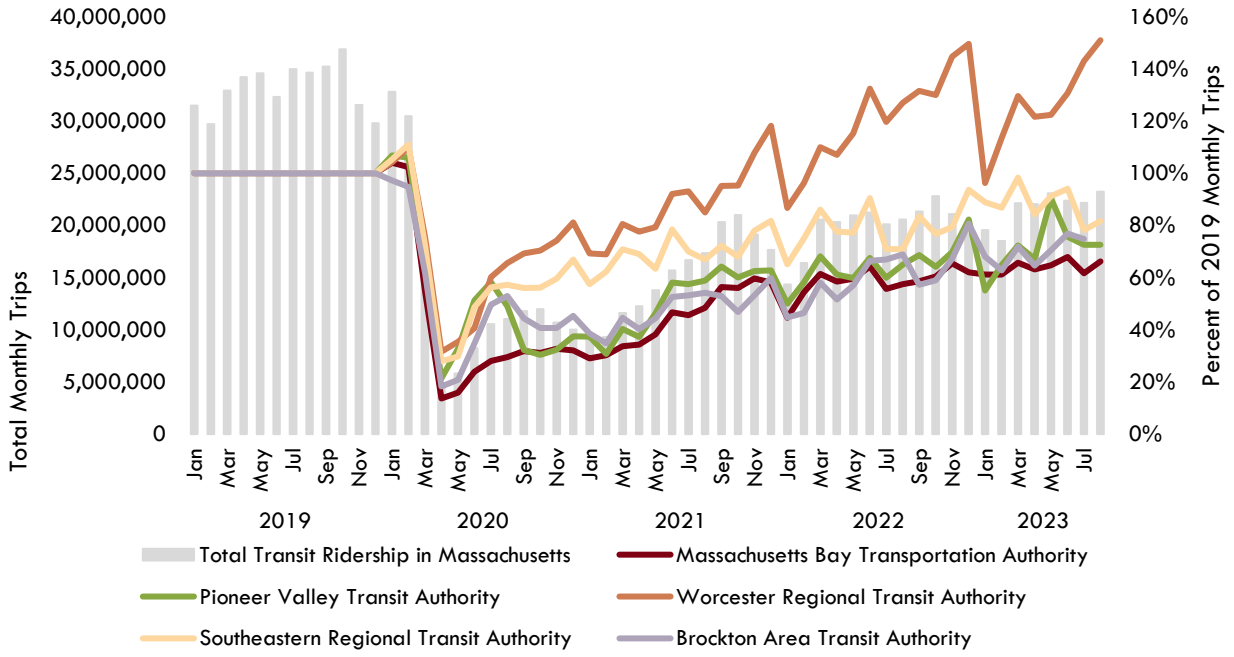
The Massachusetts Bay Transportation Authority (MBTA) and the Commonwealth's regional transit authorities (RTAs) have seen highly variable rates of recovery. Among the top five largest transit authorities in the state measured by February 2020 ridership, one has surpassed its pre-pandemic ridership (the Worcester RTA), while the other four have recovered between 66 to 81 percent of pre-pandemic ridership. The Worcester RTA has suspended fare collection on its buses since the beginning of the pandemic, and this is one possible explanation for why the region has consistently exceeded the state's ridership recovery overall. The new initiative named "Try Transit" removed fares from all RTAs (but not the MBTA) throughout December 2022 and created the opportunity to test the effect of fare free transit for Massachusetts communities. Funding in the FY24 state budget, representing new investment from the Fair Share Amendment, is directed at the Commonwealth's Regional Transit Authorities, a portion of which may be used to extend fare free transit programs.

Industry mix may explain some variation in ridership recovery across the Commonwealth as well. Worcester, with its emphasis on health care jobs, likely has many commuters who must still travel to their

[4] Massachusetts Department of Transportation Mobility Dashboard, Average Traffic Volumes at Select Count Locations. https://mobility-massdot.hub.arcgis.com/

place of work. Boston, on the other hand, has a greater share of financial, tech, and professional services jobs - employees who are much more likely to work from home at least part of the time. Incomes may play a role as well. Low-income residents of Worcester may still rely on buses, whereas the MBTA serves different income groups across its commuter rail, rapid transit rail lines, and bus network. High-income workers may be less likely to return to transit if they have easier access to a personal vehicle.

Figure 20. Monthly Transit Ridership, 2019-2023



Source: National Transit Database. Note: total ridership is the sum of MBTA and Regional Transit Authority ridership per month. Top five transit authority by February 2020 ridership are shown as a share of their monthly ridership relative to the comparable month in 2019, e.g. September 2020 / September 2019.

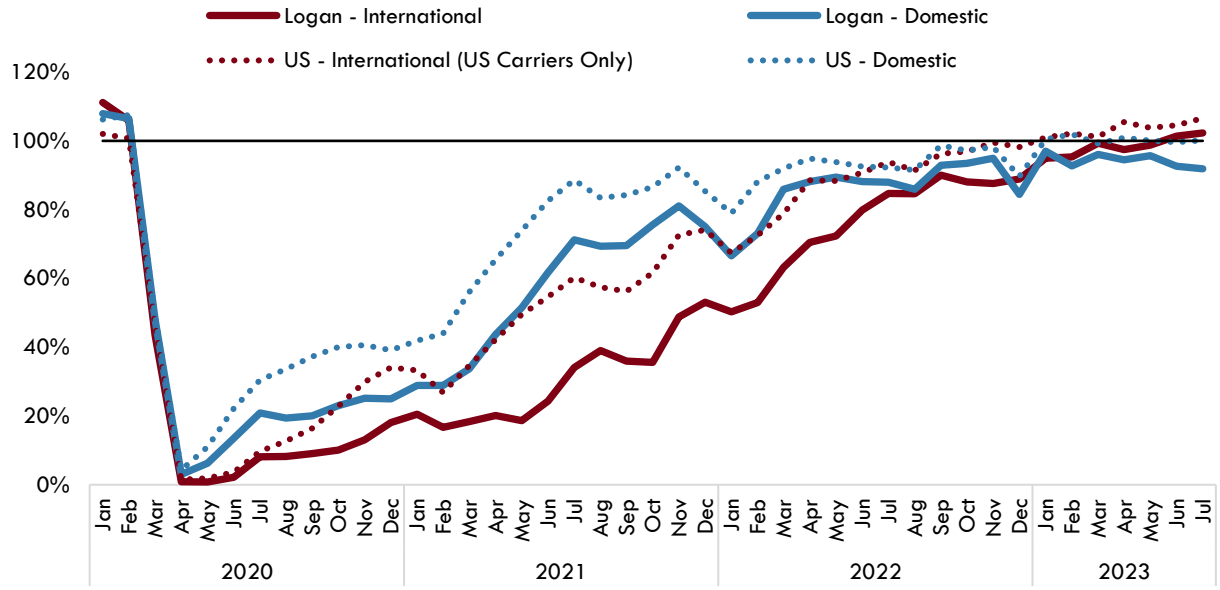
There are several MBTA expansion and redesign plans under construction or consideration that have potential to benefit tens of thousands of current and new riders. The Green Line Extension of light rail north of Lechmere opened in 2022 in phases; the Union Square Branch in Somerville opened in March 2022 and the Medford Branch opened in December 2022. New Bedford and Fall River, both Gateway Cities, will gain a Commuter Rail connection to Boston in 2024 through the South Coast Rail project. The MBTA's Bus Network Redesign project released a draft of its complete reconfiguration of Greater Boston region bus routes in May 2022 (a revised draft was released in October 2022); the review process for this project is underway and is expected to be phased in over the course of several years. In October 2023, the Massachusetts Department of Transportation released details on Compass Rail, and initiative that combines East-West Rail, a plan to connect Boston, Worcester, Springfield, and Pittsfield by passenger rail, with

improvements in other rail routes particularly in Western Mass.[5] The effects of these expansion and redesign plans remain to be seen considering the uncertainty of future travel patterns from the pandemic.

Logan International Airport, like the state's transit agencies, logged a significant decline in passenger volume in 2020 and 2021 below record numbers seen in 2019 (Figure 21). After reaching over 42 million domestic and international passengers in the calendar year before the COVID-19 pandemic, passenger volumes collapsed to less than 13 million in 2020. Many air carriers expanded service to Asian, European, Middle Eastern, South American, and African destinations from Logan during the 2010s, but with the onset of COVID-19 and its travel restrictions, international passenger volumes were still only a fraction of the 2019 peak.

Logan initially lagged the U.S. overall in passenger recovery throughout 2020 and 2021 for both domestic flights and international flights carried out by U.S. carriers. Throughout 2022, resumption in overseas service and resurgent domestic travel helped passenger levels at Logan and across the country to continue their recovery. By July 2023, domestic and international passenger recovery was within 8 percentage points of the U.S. as overall passenger numbers return to pre-pandemic levels. As a global hub of education, technology, finance, medicine, and tourism, Massachusetts benefits from higher service levels and the passengers they bring into the state via Logan Airport.

Figure 21. Logan Airport and U.S. Monthly Passenger Volumes in 2023 as a Percent of 2019



Source: MassPort; Bureau of Transportation Statistics, T-100 Domestic & International Market
Note: U.S. International passenger data are from U.S. carriers only.

[5] Compass Rail: Passenger Rail for the Commonwealth. October 18, 2023. https://www.mass.gov/doc/compass-rail-passenger-rail-for-the-commonwealth-presentation-to-the-board-on-october-18-2023/download

In late June 2023, the Healey-Driscoll Administration released the FY24 – FY28 Capital Investment Plan (CIP).[6] This document, in addition to the MassDOT and MBTA CIPs, as well as those from Massachusetts Municipal Planning Organizations (MPOs) steer significant funding toward transportation priorities in the Commonwealth. The Commonwealth's CIP includes a commitment to replacing the aging Cape Cod Bridges as well as funding repair and modernization efforts at the MBTA and building out electric vehicle charging facilities across the state, in addition to many other projects.

[6] *Five-Year Capital Investment Plan FY2024–FY2028*. (2023). Commonwealth of Massachusetts Executive Office for Administration and Finance. https://budget.digital.mass.gov/capital/fy24/static/1475dce8ff3a8e8167606105e8acb94f/fy24capitalplanma.pdf

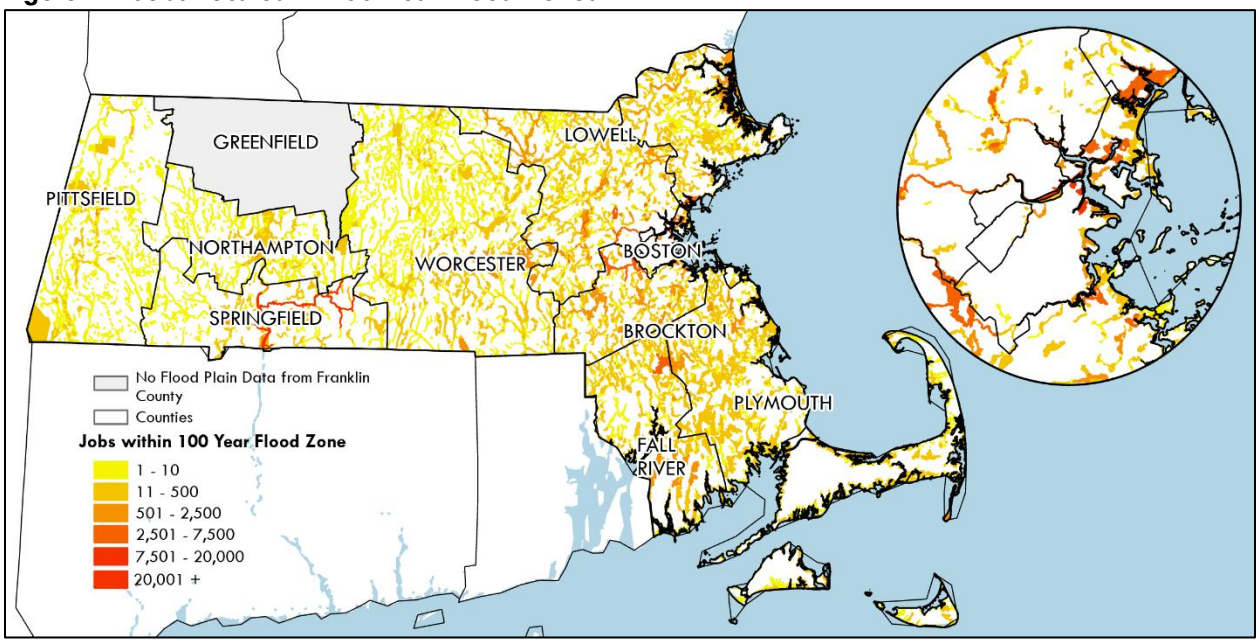
Environment

Massachusetts faces diverse risks related to climate change that will have broad economic impacts, depending on the extent to which adaptive measures are taken, at the state, national, and global levels. The threat posed by sea-level rise is of particular concern in Massachusetts because so much of the state's economic activity is concentrated along the coast, where the effects of climate change are already being felt. For example, in Boston the average number of flood days per a year has increased from 2.8 days during the 1950s and 1960s to 13.8 days from 2010 through 2020. Furthermore, the 2022 Sea Level Rise Technical Report released by the National Oceanic and Atmospheric Administration, estimated that sea levels along the East Coast will rise by 10-14 inches by 2050. The impact of coastal alteration, larger storm surges, and greater storm damage may be acutely felt where economic activity and residents are clustered. In 2020, approximately 370,000 jobs in Massachusetts were located in 100-year flood plains (Figure 22).[7] Considering the economic recovery that has since occurred of jobs lost during the pandemic, the number of jobs in flood zones in 2023 is most certainly greater than this. With rising sea levels, flooding in these areas is likely to be more frequent and intense. The summer of 2023 illustrated that flooding can occur far from the coast, as Central and Western Massachusetts experienced flooding that endangered residents and resulted in the loss of crops. Hurricanes are expected to threaten the East Coast more frequently.[8] The number of jobs potentially effected by hurricanes is significant in Massachusetts. There are almost 800,000 jobs in areas designated by the Army Corps of engineers as being in hurricane inundation zones (Figure 23).

[7] This estimate excludes jobs located in Franklin County because flood maps for Franklin County were not available.

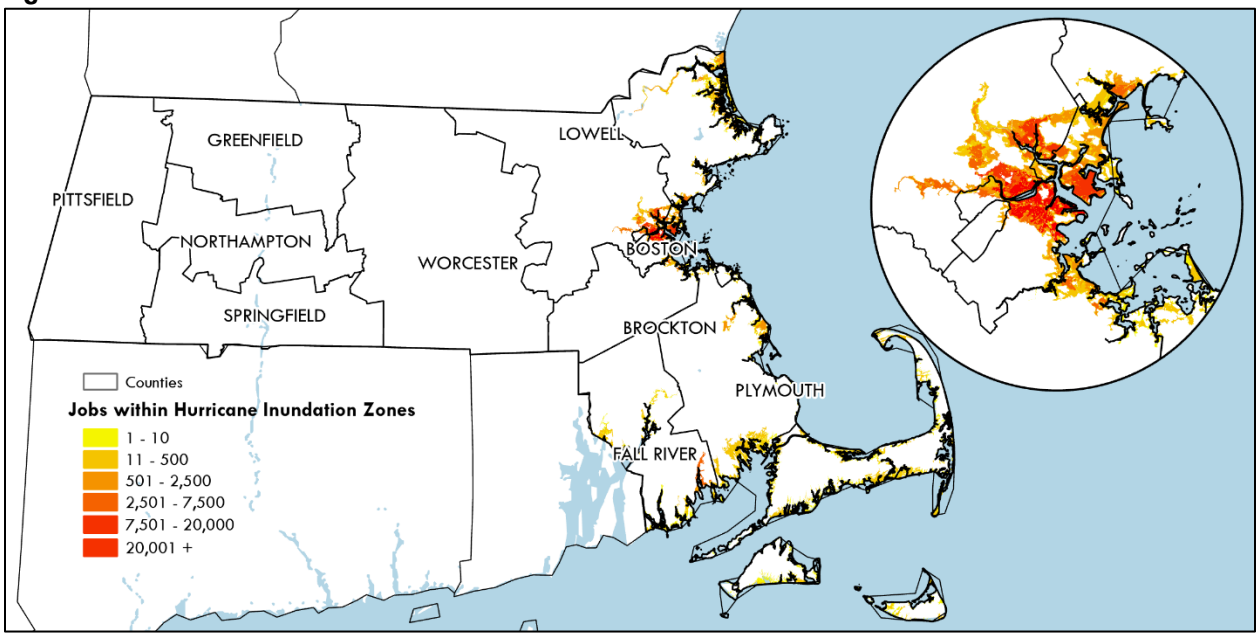
[8] Gori, A., Lin, N., Xi, D. *et al*. Tropical cyclone climatology change greatly exacerbates U.S. extreme rainfall–surge hazard. *Nat. Clim. Chang.* 12, 171–178 (2022). https://doi.org/10.1038/s41558-021-01272-7

Figure 22. Jobs Located in 100-Year Flood Zones



Source: FEMA National Flood Hazard Layer via MA GIS, U.S. Census Bureau 2020 LODES data on Total Jobs; UMDI analysis
Note: Counts of jobs in this table represent jobs in Census Blocks or parts of blocks that intersect or are fully contained within areas designated as 100 Year Flood Zones by FEMA and assumes an even distribution of jobs in those blocks. FEMA's current national flood hazard layer does not contain finalized flood data for Berkshire, Franklin or Hampshire counties; data from the previous flood map was used for Berkshire and Hampshire counties. Data for Franklin County was not available.

Figure 23. Jobs Located in Hurricane Inundation Zones



Source: U.S. Army Corps of Engineers Hurricane Surge Inundation Zones via MA GIS, U.S. Census Bureau 2020 LODES data on Total Jobs, Analysis by the Donahue Institute

There are also risks associated with rising temperatures. According to the 2022 National Oceanic and Atmospheric Administration National Centers for Environmental Information State Climate Summaries temperatures in Massachusetts have risen by 3.5 degrees Fahrenheit since the beginning of the 20th century and are predicted to continue to rise to historically unprecedented levels.

While the full effects of climate change are hard to predict at this time, it is certain that some industries will bear more of the burden than others. For example, the tourism industry will likely be affected as there are more than a dozen ski areas in the Commonwealth that will face challenges as precipitation is expected to shift from snow to rain with warmer winter temperatures. Agriculture will be impacted by changes to the growing season and increased risk of drought. Fisheries will be impacted as increasing temperatures change the habitats of ocean species. The health of residents may be impacted by climate change. For example, changes in temperature will likely increase the risk or incidence of acute respiratory diseases, such as Asthma, and increase the presence of ticks that carry Lyme disease and mosquitoes carrying West Nile Virus. The risks vary across the state, within communities, and from resident to resident. Vulnerability to climate change is a function of exposure, sensitivity, and adaptive capacity. The most vulnerable are often the young, old, and medically vulnerable, those who live in areas with higher risk of extreme events and those without the resources to adapt.

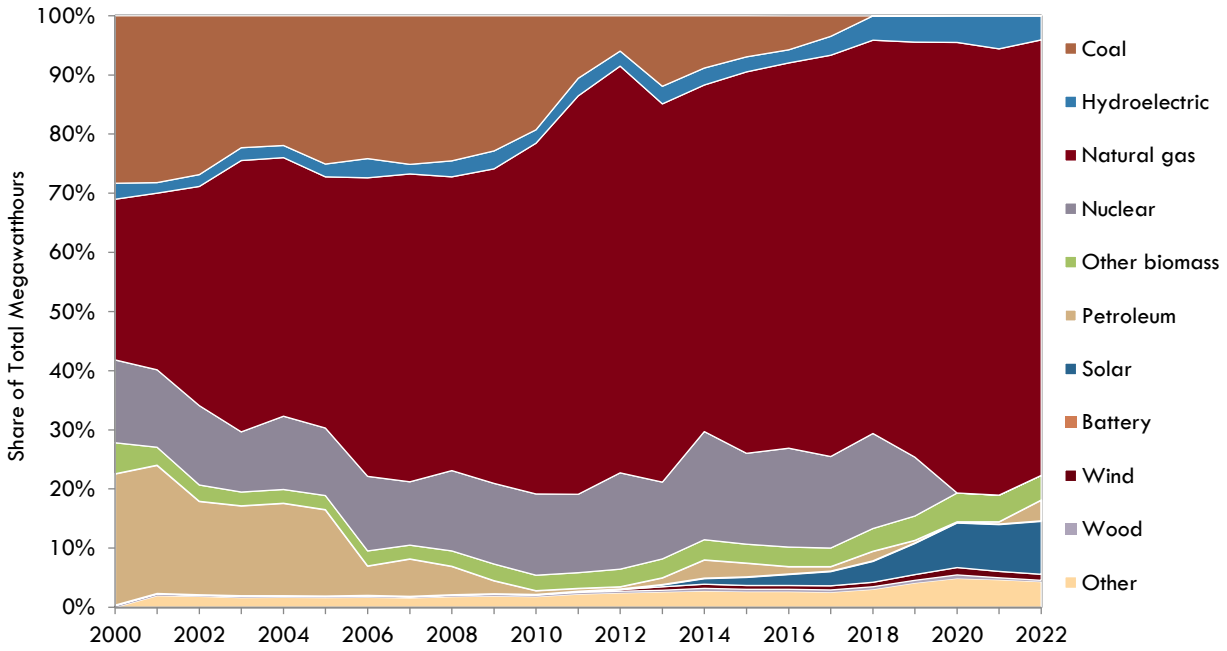
Changes to the environment, such as extreme weather events, do not respect political boundaries, therefore, policy makers have limited ability to mitigate the course of environmental change. However, local officials can prepare for natural disasters and plan for predicted changes in the environment, such as rising temperatures and sea-levels. To this end Massachusetts established the Municipal Vulnerability Preparedness grant program that supports city and towns through grants and technical assistance that fund and support local assessments of vulnerability to climate change and adaptation projects. The grants have funded a wide-variety of projects that support different stages of adaptation, from the development of local climate action plans to construction projects related to river restoration. Over 90 percent of municipalities in the state have enrolled in the program.

There have been significant legislative efforts to address the environmental risks of climate change. In August 2022, legislation was passed and signed that, among other provisions focused on creating local clean energy economy and modernizing the grid, requires that all new vehicles in the state be zero-emission beginning in 2035. This builds on the March 2021 net-zero emissions law that set the goal of Massachusetts achieving net-zero emissions by 2050. In addition, the law sets interim emission targets and sets targets for six sectors: electricity, transportation, commercial and industrial buildings, residential buildings, industrial processes, and natural gas distribution. In October 2023, the States new Climate Chief, released a set of recommendations to outline how the Commonwealth will meet its goals related to climate change. Currently, Massachusetts consumes about 17 times more energy than it produces and relies on the regional grid to meet demand. However, Massachusetts uses less energy to produce a dollar of GDP than all but one other state, New York. Furthermore, according to the U.S. Energy Information Administration, Massachusetts used less energy per capita than all but four other states in 2020.

Over the past 20 years, Massachusetts has increasingly been reliant on natural gas for electric power generation, with the share of electric power from natural gas more than doubling from to 2001 to 2020; (Figure 24). The state receives the majority of its natural gas through pipelines that bring in natural gas

from sources in Appalachia and offshore Nova Scotia in Canada. In addition, natural gas arrives in the state through liquefied natural gas import terminals in Everett and offshore in Massachusetts Bay. The Commonwealth is generating less energy from coal, petroleum, and nuclear; the last nuclear power plant in the state closed in 2019. Solar energy has steadily increased. Electricity prices in Massachusetts are higher than in the nation as a whole. As of June 2023, Massachusetts consumers faced the fifth highest electricity prices in the nation.

Figure 24. Electric Power Generation by Primary Energy Source, 2000-2022



Source: U.S. Dept. of Energy, http://www.eia.doe.gov/; state electricity profiles.
Note: Other includes batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuels and misc. technologies. Pumped storage is omitted from the graph because it represents the storage of power generated elsewhere rather than newly generated power.

The state Capital Investment Plan (CIP)[9] for the five years of FY24 – FY28 plans to invest in decarbonization efforts through efforts toward promoting electric vehicles and making school buildings, housing, and public transportation more efficient. Additionally, the CIP funds the Municipal Vulnerability Preparedness grant program at $125 million, which will assist towns and cities as they manage the effects of extreme weather, heat, and other effects of climate change.

[9] *Five-Year Capital Investment Plan FY2024–FY2028*. (2023). Commonwealth of Massachusetts Executive Office for Administration and Finance. https://budget.digital.mass.gov/capital/fy24/static/1475dce8ff3a8e8167606105e8acb94f/fy24capitalplanma.pdf

Residents

Since 2010, Massachusetts has enjoyed a sustained period of population growth, driven largely by significant gains in the state's foreign-born population. That said, in recent months there has been a great deal of attention on modest year-over-year declines in the total Massachusetts population. Increases in domestic out migration over the last two years have alarmed economists and public policy makers alike. While Massachusetts has long had a significant churn of young adults moving into and out of the state around college-aged years, the combination of decreased immigration and increased retirement during the pandemic, coupled with increased domestic out migration has led to the Massachusetts labor force being smaller today than it was pre-pandemic. With the baby boomer generation increasingly reaching retirement ages in the coming years, the state's ability to attract and retain workers will be paramount in maintaining the economic strength and competitiveness that Massachusetts has enjoyed over the last couple of decades.

When seeking to understand state population trends, the primary sources of data come from the U.S. Census Bureau. The gold standard in demographic data in the U.S. continues to be the official decennial census enumeration. This is the official total population of an area as of April 1st of the enumeration year and these are the figures used, most notably, for determining congressional representations and political redistricting. The Census Bureau also annually estimates the total population for locations by estimating the various components of population change (natural change and migration) and applying them to the estimated population from the previous year. This estimate represents the total population of an area as of August 1st of the year in question. In addition, the Census Bureau fields an annual survey called the American Community Survey (ACS). The ACS captures detailed socioeconomic and demographic characteristics of the population, including information like educational attainment, household income, nativity status, and other variables. The combination of these three data sources provides a rich understanding of population patterns, especially as it relates to state population growth, decline, and migration.

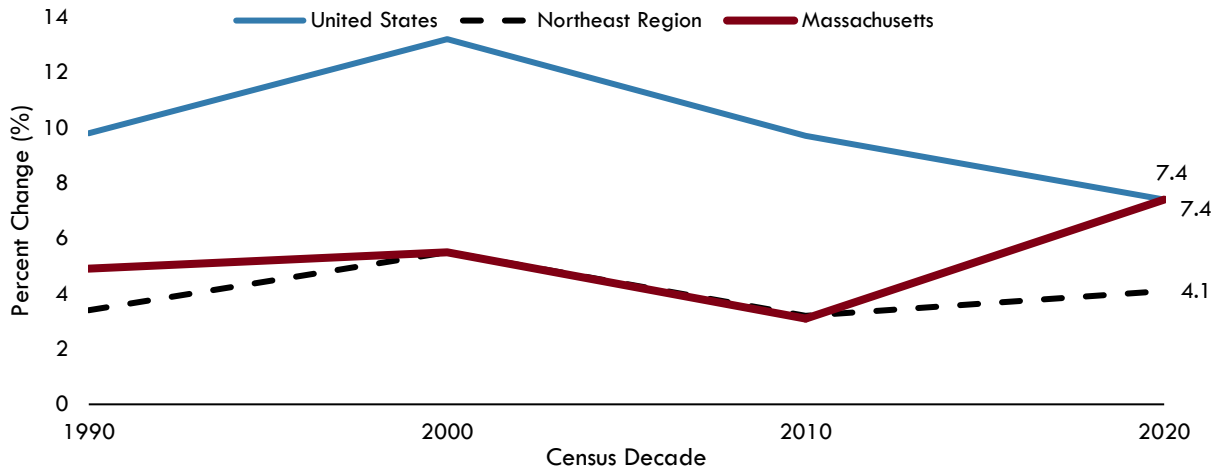
While New England has been a slow growth region for much of the last several decades, as higher numbers of people move to the southeast and western parts of the U.S., Massachusetts stands out as maintaining relatively strong population growth decade-to-decade among the New England states. Between the 2000 and 2010 census decennial enumerations, Massachusetts resident population grew at the same rate as the Northeast region.

From 2010-2020, Massachusetts experienced considerable resident population growth, placing it well above the average population change throughout the Northeast region (Figure 25).[10] Between the 2010 and 2020 Census, the Massachusetts population grew from approximately 6.5 million to 7.0 million residents. This marked a 7.4 percent increase in the state's population, in line with the U.S. overall growth

[10] The Northeast includes: Maine, New Hampshire, Vermont, Massachusetts, New York, Connecticut, Rhode Island, Pennsylvania, and New Jersey.

and making the Bay State the fastest growing state in the Northeast. In contrast, the average population growth in the Northeast was 4.1 percent.

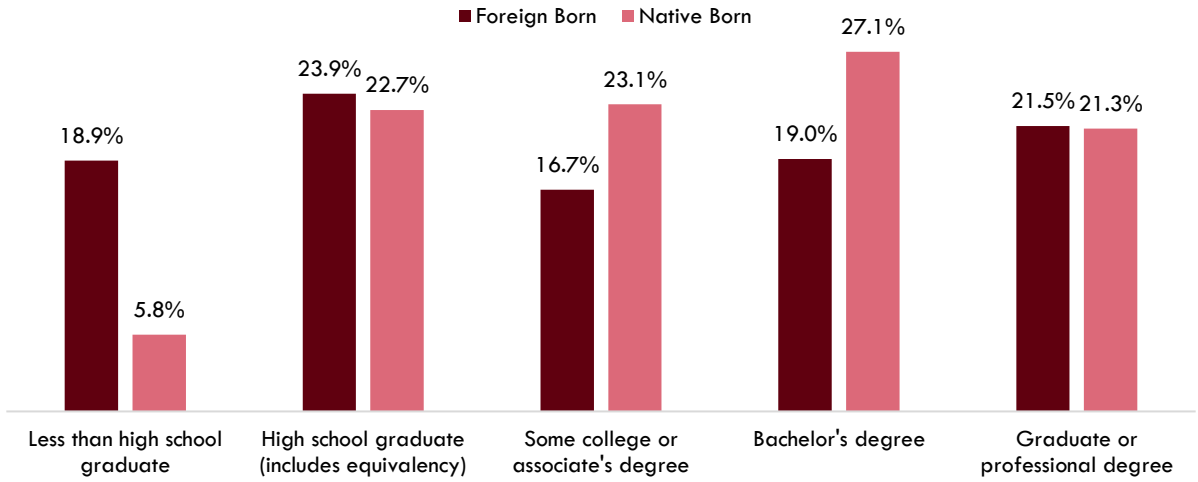
Figure 25. Change in Resident Population by Decade



Source: U.S. Census Bureau; UMDI analysis

As mentioned above, annual population estimates from the Census Bureau build on the enumerations generated by the decennial census. The Census Bureau compiles data on the various components of population change (i.e., birth, death, in-and-out migration) each year to estimate an annual population. These components of change offer insights on broad demographic patterns for location. For example, during the 2000s population growth in Massachusetts has largely been driven by significant gains in international migration. Massachusetts' combination of higher education institutions and knowledge-based industries appears to be an important factor in attracting and retaining foreign-born residents. The foreign-born in Massachusetts has a bimodal education distribution with a high concentration with less than a high school education (18.9% in 2022) and a significant concentration with college degree (41%). A similar proportion of immigrants in the state hold a graduate degree as native-born residents (21%) (Figure 26).

Figure 26. Educational Attainment of the Foreign Born in Massachusetts, 2022

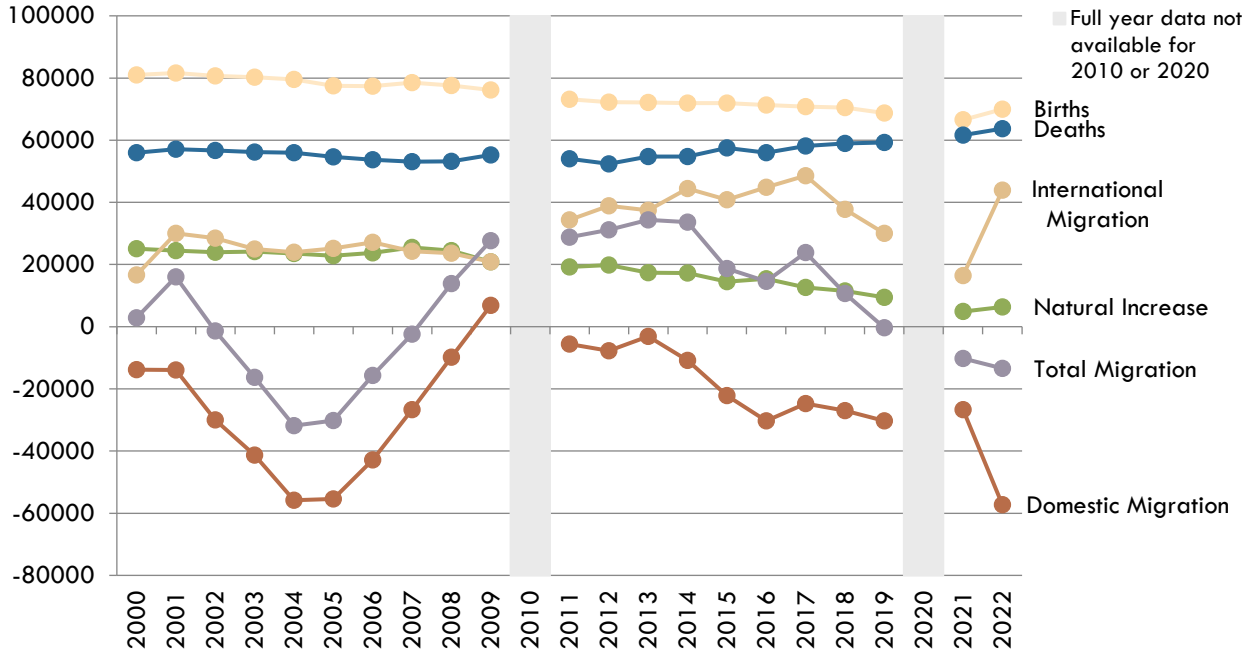


Source: U.S. Census Bureau, 2022 1-Year American Community Survey; UMDI analysis.

These gains in international migration have offset typical losses in domestic outmigration (i.e. people moving from Massachusetts to another state). The decline in natural population increases (i.e. the difference between births and deaths) is notable as well. Massachusetts has an extremely well-educated population, with high labor force participation from women. This often equates to later family formation and smaller household sizes. Couple this with an aging population and a global pandemic reducing birth rates and increasing death rates, the natural increase in Massachusetts has declined precipitously over the last several years.

While Massachusetts showed steady growth between the 2010 and 2020 Census, the onset of the global COVID pandemic appears to have spurred some unique and new population patterns in the state. For example, while Massachusetts has experienced net population losses through domestic outmigration over the last 20 years, 2022 showed a dramatic increase in the state's domestic outmigration rate, essentially doubling from the typically outmigration seen in the state over the last several years (Figure 27). Conversely, in both 2020 and 2021 international migration, which had slowed somewhat during the early part of the Trump administration, slowed dramatically due to pandemic related restrictions, only to finally return to a more typical rate for the state in 2022.

Figure 27. Massachusetts Estimated Components of Population Change, 2000-2022



UMass Donahue Institute. Source Data: ST-2000-7; CO-EST2010-ALLDATA; and NST-EST2022-ALLDATA, U.S. Census Bureau Population Division.

The U.S. Census Bureau Population Estimates Program provides a view of the changes in domestic migration and population changes within the Northeast states from 2019-2022. During this period, Massachusetts experienced an out of state migration rate that doubled from -0.4 percent to -0.8 percent. The United States experienced a 0.6 percent increase in population between 2020-2022, and in contrast Massachusetts' population declined by -0.7 percent placing the Commonwealth below the national average of population growth.

The outmigration rate in Massachusetts between 2020-2022 occurred at a much sharper migration rate than other states in the Northeast region, who have experienced net increases in domestic migration. The one state in the Northeast that experienced a higher rate of out-migration than Massachusetts is New York, which experienced an outmigration rate of -1.5 percent in 2022 compared to -0.9 percent in 2019.

To examine migration patterns by state and by county, the Internal Revenue Service (IRS) U.S. Population Migration dataset was used. This annual dataset presents migration patterns based on year-to-year address changes reported in individual income tax returns filed with the IRS. From 2019-2020, the IRS U.S. Population Migration data has shown that domestic outmigration in Massachusetts is highest among counties in Greater Boston. Prior to 2020, the highest rate of domestic out-migration occurred in the western half of Massachusetts, within Franklin and Berkshire Counties.

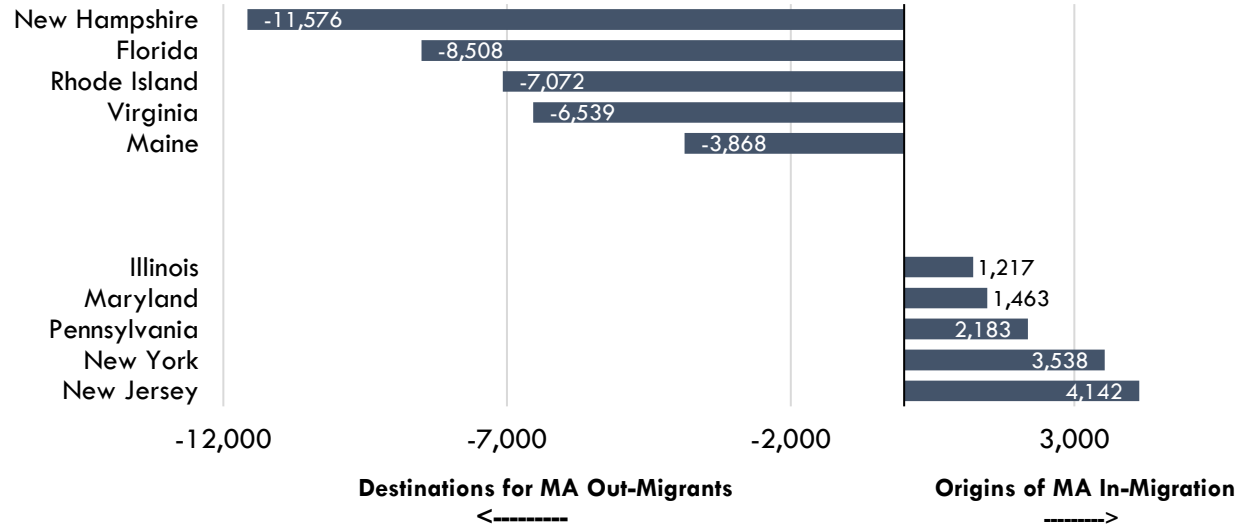
Massachusetts has experienced a dramatic divergence in migration trends in recent years from what it was pre-pandemic. The 2020-2021 IRS population migration data shows that this trend flipped, with Suffolk

and Middlesex counties experiencing the highest rate of out-migration in the state. However, domestic migration rates have not flipped in all counties. The island counties of Dukes and Nantucket, as well as Barnstable County have all experienced positive domestic migration rates over the past decade through 2021, particularly during 2020 when the global pandemic began. With the continued analysis of future migration datasets, we will be better able to understand where these trends will normalize and if, in the years to come, Massachusetts migration will return to pre-pandemic trends.

Using microdata from the 2021 U.S. Census Bureau's American Community Survey, net migration to Massachusetts is most concentrated throughout the 18–24 year-old age group. This group includes the large number of young adults who migrate into Massachusetts for their college education. Within this age group, the majority moved from New Hampshire to Massachusetts, followed by a sizable number of migrants from Florida. This is notable because overall New Hampshire and Florida are the top destinations for Massachusetts out migrants. From 2020-2021 over 11,500 individuals moved from Massachusetts to New Hampshire and another 8,500 moved to Florida, followed by Rhode Island, Virginia, and Maine (Figure 28). Most migrants aged 65 and older migrated to Florida, which is a popular destination state for retirees.

In contrast, most out-migrants to New Hampshire were aged 25-44, prime age workers potentially moving with their young children. Some of these workers may hold jobs located in Massachusetts and thus still pay payroll taxes in the Commonwealth. According to OnTheMap data from the U.S. Census Bureau, 75,000 workers (22%) who live in the three border counties of Southern New Hampshire[11] hold Massachusetts jobs.

Figure 28: Net Migration to Massachusetts, 2020-2021



Source: U.S. Census Bureau, American Community Survey Microdata, 1-Year Estimates 2021.

[11] Cheshire, Hillsborough, and Rockingham counties, New Hampshire. Data is from 2020 from the OnTheMap tool by the U.S. Census: https://onthemap.ces.census.gov/

The age group experiencing the largest number of out migration is 25-44 year olds. Within this group, New Hampshire was the state most former Massachusetts residents moved to, followed by Rhode Island, Florida, Virginia, and Maine in turn. This group contains post graduate professionals, many of whom are at a point in their life where personal priorities include focusing on home ownership and starting families. It's likely that this group finds the cost of living, particularly with housing costs, challenging, and in this move to states where the cost of living is lower. The state that sent the most migrants into Massachusetts was New Jersey, which sent roughly 4,000 new Massachusetts residents, followed by New York, Pennsylvania, Maryland, and Illinois in turn.

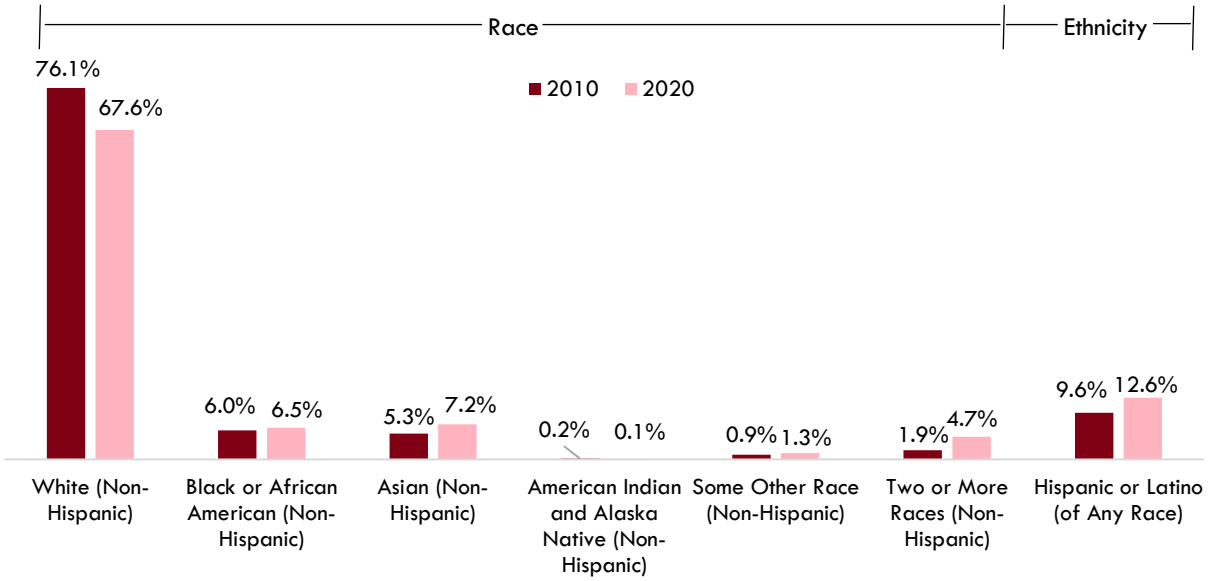
Higher paid and more educated residents were more likely to move out of state in 2021. This likely reflects the fact that long distance moves require significant resources. Looking at the net migration patterns out of Massachusetts from 2020-2021, data from the U.S. Census Bureau, American Community Survey Microdata (2021) helps clarify who within the state is moving out. Net migration out of state was highest within occupations with higher wages across both high school diploma and college degree educational brackets.

Looking at the out-migration trend from 2020-2021 raises understandable concern over the dramatic increase in the rate of former residents moving out of the state. It is important to note that the COVID crisis upended residential patterns and migration trends. At this point, it is unclear which of these patterns are short-term reactions to the pandemic and which ones may be more durable over the term. With that, state migration trends should be analyzed cautiously as the years following the pandemic are likely not representative of an average year of out migration.

The question that remains is where out migration trends will normalize. We have already seen some trends from the Internal Revenue Service, U.S. Population Migration Data (2020-2021) that indicate certain areas within the state have already returned to their similar pre-pandemic migration trends, such as we see happening on the Cape in Barnstable County. Over the next few years, it will be important to continue tracking out migration trends to see where residential patterns normalize.

As with the nation, Massachusetts is becoming more racially and ethnically diverse. The share of the population that identifies as non-Hispanic, white decreased from 76 percent to 68 percent from 2010 to 2020, while the shares that identify as Black non-Hispanic, Asian non-Hispanic, and Hispanic increased to 6.5 percent, 7.2 percent, and 12.6 percent respectively. The share that identifies as two or more races (non-Hispanic) more than doubled to 4.7 percent (Figure 29). The state's population is older than the nation as a whole—the median age is 39.9 compared to 38.8 for the nation. The Commonwealth has the lowest median age in New England and, due to the presence of higher education institutions.

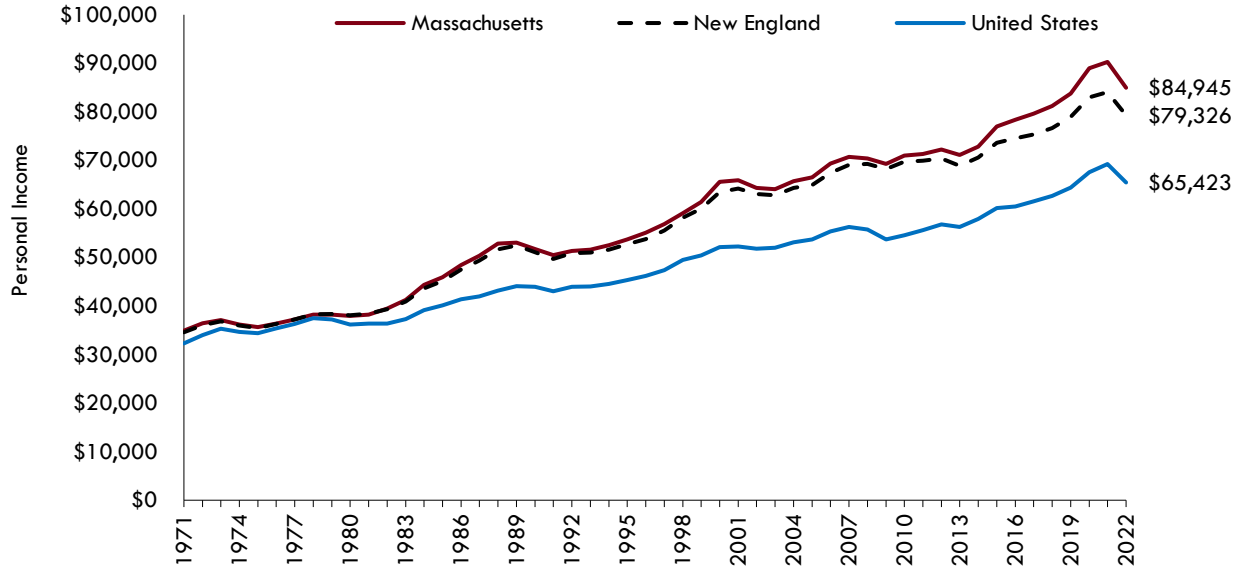
Figure 29. Share of Total Massachusetts Population by Race and Ethnicity in 2010 and 2020



Source: 2010 Source Data: Census 2010 Summary File 1; 2020 Source Data: Census 2020 PL-91-171; UMDI analysis

Massachusetts' residents earn some of the highest incomes in the nation. Real per capita income has consistently exceeded incomes in the New England and the U.S. and in 2022, Massachusetts had the second highest real per capita personal income in the nation, excluding the District of Columbia. Connecticut had the highest, though the BEA estimates a less than $30 gap between the two. In 2022, the Commonwealth's real per capita income was nearly $85,000 compared to approximately $79,000 in New England and just over $65,000 in the U.S. (Figure 30). High inflation in 2021-2022 eroded some purchasing power for consumers nationwide, and so inflation adjusted incomes in 2022 were lower than in 2020 or 2021. The relatively high-income levels reflect the high level of education and the concentration of high-wage industries such as health care, professional services, and finance and insurance. The poverty rate is lower in Massachusetts than in the nation at 9.9 percent compared to 12.6 percent according to the 2021 Five-Year American Community Survey. However, in several cities the poverty rate exceeds the state average: for example, in the Gateway cities of Holyoke, Springfield, and Worcester poverty rates were 26.5 percent, 26.3 percent and 19.3 percent, respectively. Boston is also above the state average with a rate of 17.6 percent. Higher rates of poverty in these Gateway Cities and Boston are particularly concerning because Gateway Cities are home to a large share of the state's communities of color and immigrant communities. The concentration of poverty in these cities raises concerns about equity and quality of life.

Figure 30. Real Per Capita Personal Income in Massachusetts, the United States, and New England, 1971-2022 (in $2022)



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

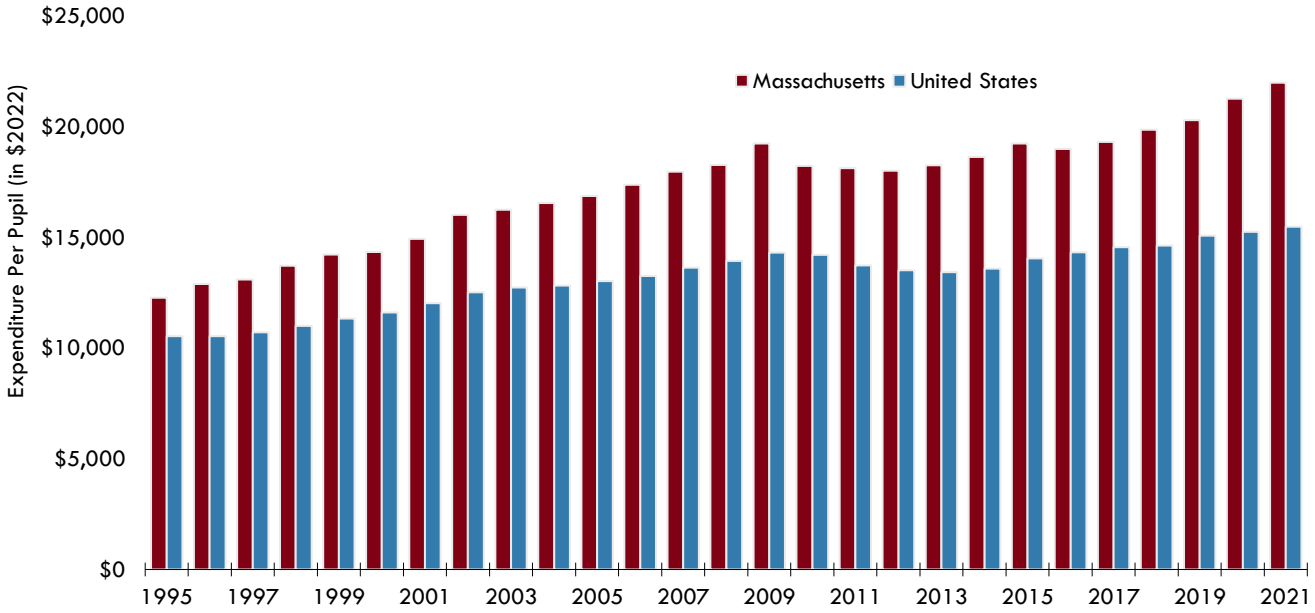
The presence of a skilled and well-educated population is an important resource for the Commonwealth. At the primary and secondary level, the state invests more than the national average in its public schools (Figure 31). Furthermore, students in Massachusetts' K-12 public schools consistently outperform their peers in the U.S. on national assessments. The state has the most well-educated population in the country, with over 46 percent of all residents 25 years of age or older earning a bachelor's degree or more. However, educational attainment varies significantly across racial groups: Black and Hispanic residents are less likely to have a bachelor's degree than the state average, at 32 percent and 23 percent respectively. Fifty percent of white residents and 64 percent of Asian residents hold a bachelor's degree or higher. That said, across all racial groups, educational attainment rates are higher than the national average (Figure 32). For adults without a high school diploma and/or low English proficiency, the state has recently increased investment in adult basic education and English for speaker of other languages services through its Department of Elementary and Secondary Education. For adults with a high school diploma but no college degree (associates or bachelor's), the state included in the FY 24 budget a program called MassReconnect which offers free tuition at Massachusetts's 15 public community colleges.[12] Implementation of this program started in Fall 2023, and the effects of which will start being seen in the coming years as the first cohorts of students complete their degrees.

The well-educated population supports and is a product of the concentration of elite public and private colleges and universities in the state. Educational services is the third largest industry in Massachusetts in terms of jobs. Nearly half a million students are enrolled in higher education in the state. The number of international students has rebounded from pandemic-era lows of 66,000 in the 2020/2021 academic

[12] https://www.mass.edu/osfa/programs/massreconnect.asp

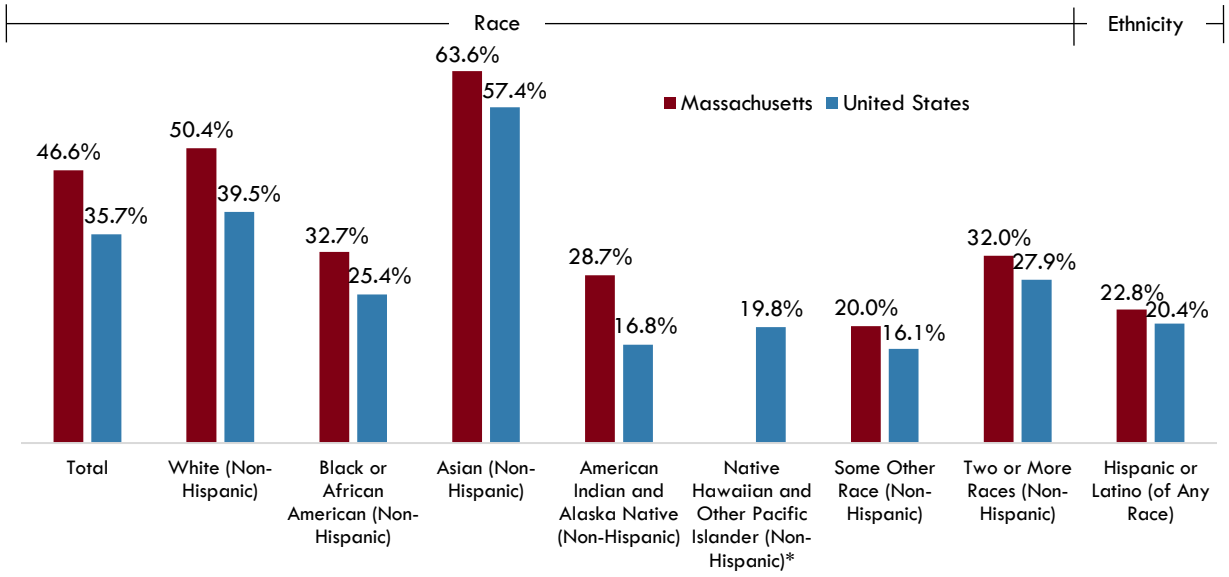
year to 71,000 in the 2021/2022 academic year. This is close to the record, nearly 74,000 in the 2019/2020 academic year.

Figure 31: Per Pupil Expenditure in Public Elementary and Secondary Schools (in $2022)



Source: U.S. Census Bureau, Public Elementary–Secondary Education Finance Data.

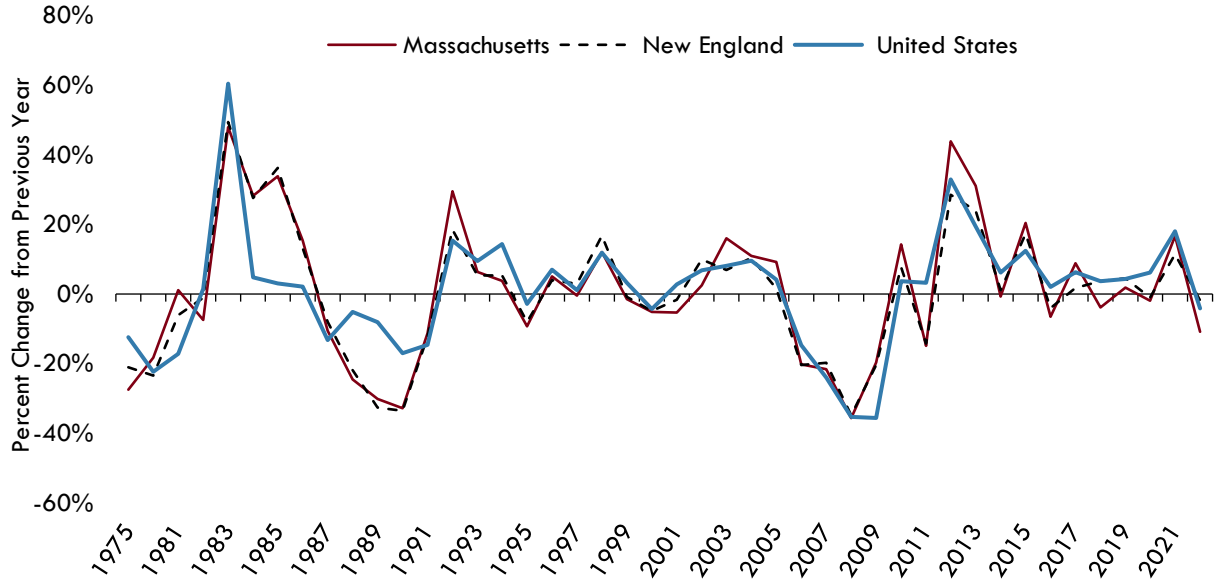
Figure 32. Persons in Massachusetts and the United States 25 Years and Older with a Bachelor's Degree or Higher by Race and Ethnicity in 2022



Source: U.S. Census Bureau, 2022 1-Year American Community Survey; UMDI analysis.
*Note: The estimate for Native Hawaiian and Other Pacific Islander (Non-Hispanic) in Massachusetts cannot be displayed because there were an insufficient number of sample cases in the selected geographic area.

While residents enjoy higher incomes than most other states, the cost of housing in Massachusetts is a burden for many, especially for Black and Hispanic households. Housing costs remain high across the Commonwealth, driven in part by population and economic growth and inadequate housing production over the last couple of decades. The sales price of existing homes continued to increase, but at a slower rate, and higher interest rates have further increased the cost of owning a home. In 2022, median home prices increased to $575,000 from $530,000 in 2021, an 8.5 percent increase. Prices have remained well above the national median, which according to the National Association of Realtors was at $366,900 in December 2021. Construction is not keeping up with demand. Preliminary data shows that nationally, the number of building permits decreased 4.1 percent from 2021 to 2022, but in Massachusetts the decline was greater, permits decreased 10.9 percent over the same period (Figure 33).

Figure 33. Housing Units Authorized by Building Permit, Percent Change from Previous Year, 1975-2022

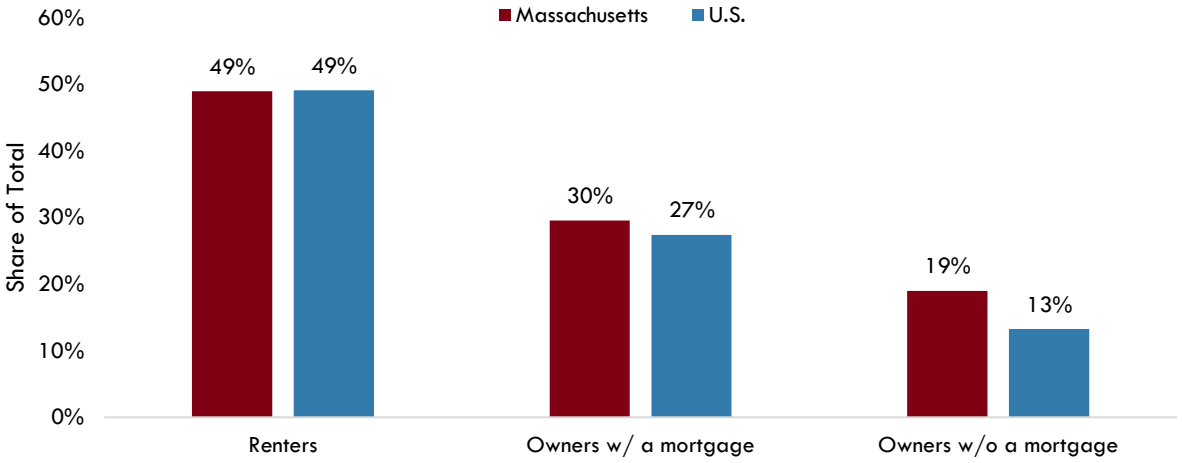


Source: U.S. Census Bureau Building Permits Survey; UMDI analysis
Note: Reported data plus data imputed for non-reporters & partial reporters.

The increase in sale prices and the low supply of homes for sale has translated into high rental costs as well. In addition, low vacancy rates have contributed to higher costs; rental vacancy rates in the state were at 3.3 percent in 2021 compared to 5.7 percent nationally. Mirroring rates in the U.S., nearly half of renters are cost burdened, meaning they spend over 30 percent of their income on housing costs, and nearly a quarter (23%) of Massachusetts renters are severely cost burdened, meaning they spend 50 percent or more of their income on housing (Figure 34). In contrast, 30 percent of owners with a mortgage are cost burdened and 10 percent are severely cost burdened. The rates of cost burden are highest among low-income residents, as well as Black and Hispanic households. It is important to note that rates of housing cost burden depend on both the income of residents and housing costs. For example, in the Boston Metro Area 46 percent of renters were cost burdened in 2021, compared to 50 percent in Springfield Metro Area, where rents are relatively lower than the Boston Metro Area, but out-of-reach for many lower income families. Due to a history of discriminatory housing policies, rates of homeownership vary by race

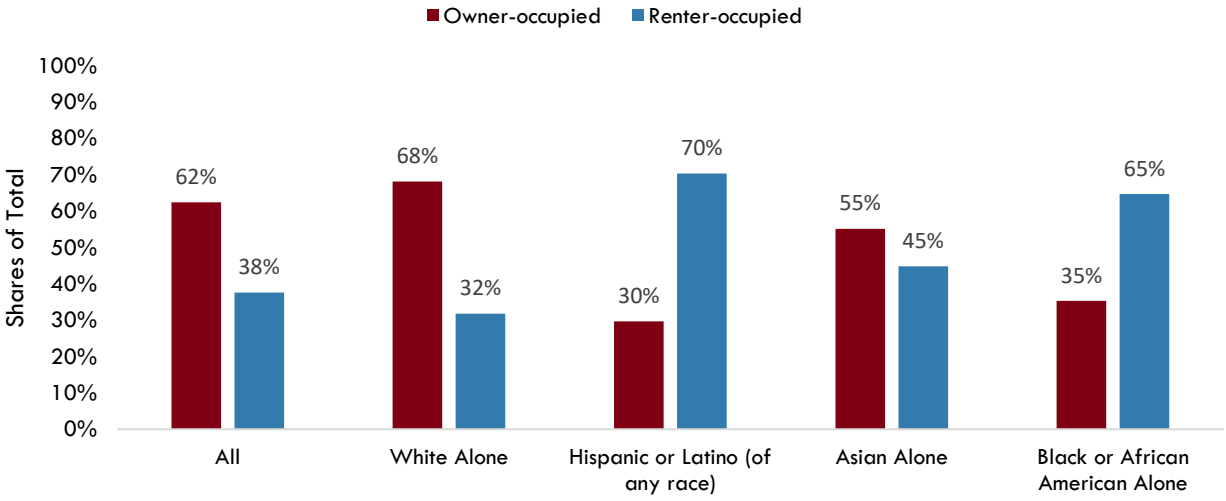
and ethnicity. Among the most detrimental federal policies that originated in the 1930's was "redlining," which meant that racial and ethnic identity were a primary factor in the determination of loan risk, leading to the racist assignment of lower ratings to communities of color than neighboring and similar white communities. This system kept people of color from buying their own homes, one of the most important forms of intergenerational wealth. The harmful impact of this system is still felt today in the disproportionate rate that people of color rent, where they live, and their substantially lower levels of wealth than their white peers.

Figure 34. Housing-Cost-Burdened Households by Housing Tenure in Massachusetts and the United States (Spending 30 Percent or More of Income on Housing Costs)



Source: ACS 2017-2021 5-Year Estimates, Table DP04, A through I.

Figure 35. Housing Tenure in Massachusetts in 2021 by Race and Ethnicity



Source: ACS 2017-2021 5-Year Estimates, Table B25003, A through I.

Overall, 62 percent of households in Massachusetts are owner-occupied and 38 percent are renter occupied. The majority of white and Asian households own their homes and Black and Latino households

are more likely to rent (Figure 35). The disparity in homeownership rates matters because homeownership is a fundamental mechanism for building wealth in the U.S. and homeowners are far less likely to experience severe housing cost burden.

With the goal of increasing housing production, particularly near transit hubs, the Commonwealth has passed legislation to amend the state Zoning Act. Known as the "Housing Choice" Act, it included several provisions to remove zoning-related barriers to production. The Act changed voting standards for local city councils or town meetings to adopt or change zoning ordinances and bylaws from two-thirds to a simple majority. Among other measures, the Act also requires "by right", multi-family zoning in "MBTA" communities, 176 communities that are served by the Massachusetts Bay Transportation Authority.

As part of the Commonwealth's FY24 – FY28 Capital Investment Plan, significant funding is allocated to the new HousingWorks program which aims to provide affordable housing funding to projects across the state. The Affordable Housing Trust Fund and the Housing Stabilization Fund are also slated to receive robust funding, and the effort to reinvest in Massachusetts public housing will receive $120 million. Overall, funding toward housing programs has increased 21percent (inflation-adjusted) in this 5-year capital plan compared to the FY23 – FY27 CIP, which was released last year.[13]

[13] *Five-Year Capital Investment Plan FY2024–FY2028*. (2023). Commonwealth of Massachusetts Executive Office for Administration and Finance. https://budget.digital.mass.gov/capital/fy24/static/1475dce8ff3a8e8167606105e8acb94f/fy24capitalplanma.pdf