

**MASS**

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# **BENCHMARKS**

THE JOURNAL OF THE MASSACHUSETTS ECONOMY



## **CLIMATE RESILIENCE IN COASTAL MASSACHUSETTS: A SURVEY OF MUNICIPAL CHALLENGES, PLANS, AND NEEDS**

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MassBenchmarks provides timely information about the Massachusetts economy, including reports, commentary, and data about the state's regions and industry sectors that comprise them.

*Published by the UMass Amherst Donahue Institute in cooperation with the Federal Reserve Bank of Boston.*



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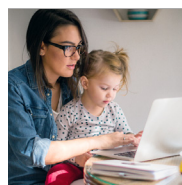


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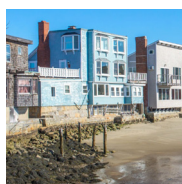


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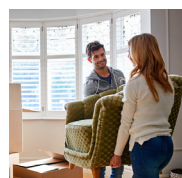


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## LETTER FROM THE CHANCELLOR



This issue of MassBenchmarks explores the multifaceted economic landscape of the Commonwealth and highlights several significant policy challenges facing our state. It reminds us that the greatest strength of our economy is the talent and innovative nature of the people who fuel it. It also considers threats to the Commonwealth's economy.

The issue opens with a rigorous assessment of the state economy, authored by Mark Melnik of the UMass Amherst Donahue Institute, who also serves as MassBenchmarks' Senior Managing Editor. This piece reviews the Commonwealth's recent economic performance in detail. Importantly, it describes current conditions as well as a number of warning signs that will need careful attention from our policymakers and business and labor leaders. The report highlights several demographic headwinds that are explored in greater detail elsewhere in this issue.

In the first feature article, the UMass Amherst Donahue Institute's Branner Stewart and Kazmiera Breest examine labor market conditions in Northern Worcester County and document labor shortages in key fields. This detailed work underscores the workforce development challenges facing the Commonwealth. It documents an urgent need to tap into the latent potential of our workforce through innovative outreach and engagement strategies designed to overcome the numerous barriers to workforce participation that they identify.

The second feature article sheds important light on the many ways in which climate change is affecting the Commonwealth's 351 cities and towns. In this important piece, UMass Amherst's Marta Vicarelli, Rob DeConto, and Darci Connor Maresca, leaders in the Northeast Center for Coastal Resilience, worked with an interdisciplinary team of scholars and partners from across the UMass system as well as their community partners, to document the pressing need for practical strategies to adapt to the rising tides and other threats to the resilience of our coastal communities. As the authors conclude, their research provides an important "baseline for a long-term, participatory, and interdisciplinary research initiative focused on coastal resilience."

Finally, in this issue's Endnotes, Doug Howgate, president of the Massachusetts Taxpayers Foundation, offers important insights into a series of demographic shifts that threaten the human capital that has made the Commonwealth a global leader in innovation based economic development. This is a fitting conclusion to this issue of MassBenchmarks and reminds us that we must address quality of life issues such as the rising cost-of-living and other challenges that impact our communities and threaten the long-term health of our economy.

A stylized, handwritten signature in black ink, appearing to read 'J. Reyes'.

Javier A. Reyes  
Chancellor of the University of  
Massachusetts Amherst





### Lower inflation and continued growth in GDP are positive signs for the Massachusetts economy, but jobs growth has stalled and slower GDP growth is expected

State must capitalize on this period of relative economic growth and focus on transportation, childcare, and housing to address inequality and foster greater economic opportunity



Growth in real gross domestic product (GDP) in Massachusetts and the U.S. has remained unexpectedly high in recent quarters and Massachusetts' relative payroll jobs performance continues to outpace its New England neighbors. The growth in both the state and U.S. comes despite high interest rates that are now appearing to have the desired effect to lower inflation. The Massachusetts unemployment rate is down to a record low level. Most major industry sectors in the state also experienced payroll jobs growth through the first three quarters of 2023, again showing that the economic improvements are broadly based.

Heading into the last part of 2023 and early 2024, however, the economy is forecast to start cooling. Spending by Massachusetts consumers on goods and motor vehicles is also trending downwards. Navigating the economic ramifications of the confrontations in Ukraine and in the Mideast, the potential for a future U.S. government shutdown, and an economic slowdown in China are among the headwinds the economy faces ahead.

#### GDP

Massachusetts had been expanding faster than the U.S. as a whole in real gross

state product (GDP) growth for about a year (mid-2022 through mid-2023). That changed in the third quarter of 2023, however, with Massachusetts GDP increasing at a 3.8 percent annualized rate, according to MassBenchmarks, while U.S. GDP increased at a 4.9 percent annualized rate, according to the U.S. Bureau of Economic Analysis (BEA). That said, growth for both the state and the country was extremely robust during the third quarter.

The strong performance in the third quarter came as a surprise, as the July MassBenchmarks release 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 projected 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. The high growth, however, is expected to slow substantially in the fourth quarter and into 2024 as recent, consumer-led growth cannot be sustained indefinitely. As such, 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 2024. U.S. GDP growth is projected to follow a similar trend, slowing significantly from the highs seen in the third quarter of 2023.

#### EMPLOYMENT

Payroll jobs growth through the first three quarters of 2023 pointed to a relatively strong Massachusetts economy—performance that was noteworthy given the efforts of the Federal Reserve to slow the economy. Payroll employment grew by 1.7 percent on an annualized basis in the third quarter in both Massachusetts and the U.S. However, it is unlikely that this pace can be maintained in the final quarter

of 2023, and in fact payroll jobs in the state actually declined by small margins in September and October. Unemployment rates in the state are at historic lows, 2.8 percent in October as compared to 3.9 percent for the U.S. At this point in the economic cycle, and despite the very recent monthly jobs losses, any remaining slack in the labor market has been largely soaked up, making it more challenging to fill additional jobs moving forward.

## POLICY CONSIDERATIONS

As Massachusetts heads into the last part of 2023 and into the coming new year, there is cautious optimism that the state's economy will continue to expand, but there are numerous concerns. On the positive side, consumers have kept businesses afloat, construction levels are high, inflation finally seems to be slowing, and federal fiscal stimulus on infrastructure and technology investments (e.g., the CHIPS and Science Act) have helped prolong the economic expansion. Nationally, we can expect increases in military expenditures over at least the short-term that could also prop up growth, especially in defense-industry-intensive states like Massachusetts. This is tempered, however, by looming risks including two successive months of employment declines in the state, high interest rates, hesitancy by businesses to invest, volatility in the stock market, a Congress that continues to delay passage of a national budget, and the geopolitical risks associated with the conflicts in Ukraine and the Middle East.

Despite uncertainties, from a policy standpoint there is much that can be done at the state level, now and in the longer-term, to address inequalities and better position the state for future growth. High costs are putting a squeeze on residents, notably on the lower and middle-income populations. Although there has been a welcome recent uptick in the state's working age population, Massachusetts has been experiencing a net-outflow of residents to other states since the pandemic began in 2020. Expensive housing and childcare, as well as a congested and unreliable transportation system, are factors that both limit access to economic opportunity and push some residents to leave for states with lower living costs.

With these challenges, the Board discussed policies to raise competitiveness, equality, and to do better in retaining and attracting young people to the state. Stimulus money set aside for childcare by the U.S. Congress is now running out, pushing parents to foot steep bills or contemplate leaving the labor force to care for young children. Massachusetts is addressing this issue, in part, through the recently expanded Child and Family Tax Credit. This and other policies like increasing the rental deduction, among others, will help compensate for the state's high costs of living. The Board is concerned, however, if the state will have sufficient revenue to cover tax cuts (noting that cuts are concurrent with the revenue-generating "Millionaire's Tax" implemented in 2023) while raising overall spending on childcare, housing, and transportation – critical pillars for

Massachusetts to undergird present and future competitiveness. In the face of federal budget cuts, it is becoming more of an imperative for the state to step in and support the areas that are fundamental to sustaining its people and growing the economy.

In conclusion, the Massachusetts economy has undergone a period of substantial growth in recent years, including both a recovery and an economic expansion following the pandemic. Economic growth in the state, along with the national economy, likely peaked during the third quarter of 2023, and slower growth is expected heading into 2024. In this environment, Massachusetts will need to continue to coordinate policies that address high costs and inequality to encourage the growth of its labor force and set the stage for future economic growth. This is likely to include a more active role for the state to support beneficial programs, including childcare, that are seeing reduced funding due to a wind down of federal stimulus spending.

This summary reflects the discussion of the members of the Editorial Board of MassBenchmarks at its Fall meeting on October 27, 2023, and it reflects the economic data available up to that date. It was prepared by Branner Stewart, Senior Research Manager at the UMass Donahue Institute, and was reviewed and edited by the members of the Editorial Board. While discussion among the Board members was spirited and individual Board members hold a wide variety of views on current economic conditions, this summary reflects the broad consensus of the Board regarding the current state of the Massachusetts economy.



# State of the State Economy

BY MARK MELNIK

Current indicators of the Massachusetts economy are strong, outpacing national growth trends especially in terms of payroll employment and gross domestic product, and the nation has been resilient thus far to a recession. Future growth at this pace, however, will be difficult to maintain; the Commonwealth's labor force is shrinking in the face of an aging population and heightened net out-migration, consumer spending is expected to decline, and high interest rates may weigh on GDP.



## Introduction

The Massachusetts economy stands at an interesting inflection point. With the COVID crisis mainly in the rearview, the state economy has outperformed expectations over the last couple of quarters, particularly in payroll jobs and gross domestic product. The state's unemployment rate hit a historic low in July of just 2.5 percent, a full percentage point below the U.S. average and since then has been 2.6 percent. Despite all of this, public discourse has shifted to significant concerns surrounding the state. An aging labor supply coupled with a recent increase in domestic outmigration have piqued concerns locally about the state competitiveness in maintaining an adequately sized

labor force. With a new administration developing a legislatively mandated economic development plan for the state, concerns about housing costs, education, immigration, tax policy, transportation, and workforce development abound in thinking about the economic present and future of Commonwealth.

## Jobs and Unemployment

Over the last couple of decades, 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 mix of industry in Massachusetts left the state less vulnerable

during that extended recession as job losses nationwide were particularly concentrated in construction, retail, and manufacturing, industries with a smaller footprint in the state than the country. Conversely, industrial strengths in Massachusetts, notably higher education, health care, life sciences, and high tech all proved to be more resilient during the Great Recession. The Commonwealth's mix of knowledge-based industries and well-educated workforce helped propel high levels of labor force participation and low levels of unemployment in the state during much of the recovery and expansion period between the Great Recession and the COVID crisis in 2020.

The economic downturn caused by the COVID-19 pandemic led to a rapid and dramatic increase in both

the state and national unemployment rate. The early outbreak of COVID in the northeastern part of the U.S., coupled with proactive social distancing policies in Massachusetts, resulted in the state having one of the highest unemployment rates in the nation in April 2020 (16.9% compared to 14.7% for the nation). Massachusetts lost over 680,000 jobs in April 2020, equating to approximately 18.2 percent of total jobs in the state (the 7th highest percentage in the nation). Since that point, the state has consistently added jobs month over month. As of March 2023, Massachusetts had more jobs than its February 2020 pre-pandemic peak.

Over the same period, the Massachusetts unemployment rate has dropped dramatically and is now at historic

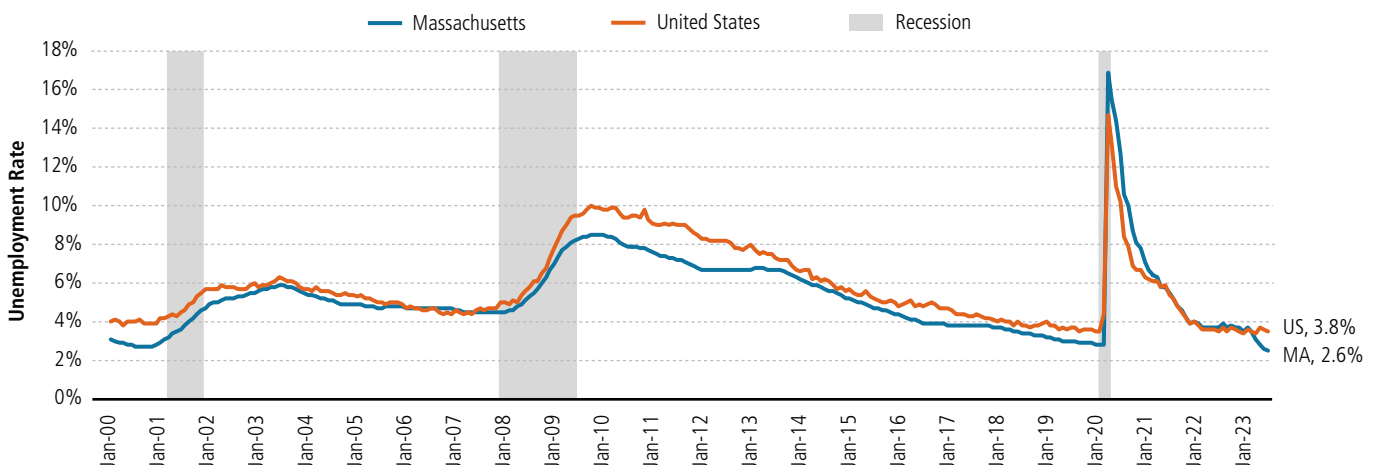
lows. The July unemployment rate for the Commonwealth stood at just 2.5 percent, down from 3.7 percent in July 2022 and a full percentage point below the U.S. The current Massachusetts unemployment rate is just under the historic low of 2.7 percent recorded at the end of the tech boom in the summer and fall 2000 and the lowest since these data were first collected in 1969. The U.S. unemployment rate, which was 3.8 percent in September, reached its low in January of 3.4 percent, the lowest level since the end of the 1960s.

The public health and the economic crises caused by COVID-19 disproportionately harmed historically marginalized groups. For example, the leisure and hospitality sector, which has a younger and less educated workforce, experienced the greatest loss of jobs and has been the slowest to recover. In contrast, highly-educated workers in knowledge-based industries were more likely to work from the home during the COVID-19 pandemic and less likely to lose their jobs. One clear way of demonstrating this issue is through looking at differences in unemployment by educational attainment in the state. As the Figure 2 on page 7 shows, there is a significant difference in unemployment between workers with and without a



**The Commonwealth's mix of knowledge-based industries and well-educated workforce helped propel high levels of labor force participation and low levels of unemployment in the state during much of the recovery and expansion period between the Great Recession and the COVID crisis in 2020.**

**Figure 1: Unemployment Rates in Massachusetts and the United States as of September 2023 (Seasonally Adjusted)**



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





**UNEMPLOYMENT DURING COVID**

Workers with college degree **10%**

Workers without college degree **25%**

four-year college degree and this difference widens during recent economic downturns.

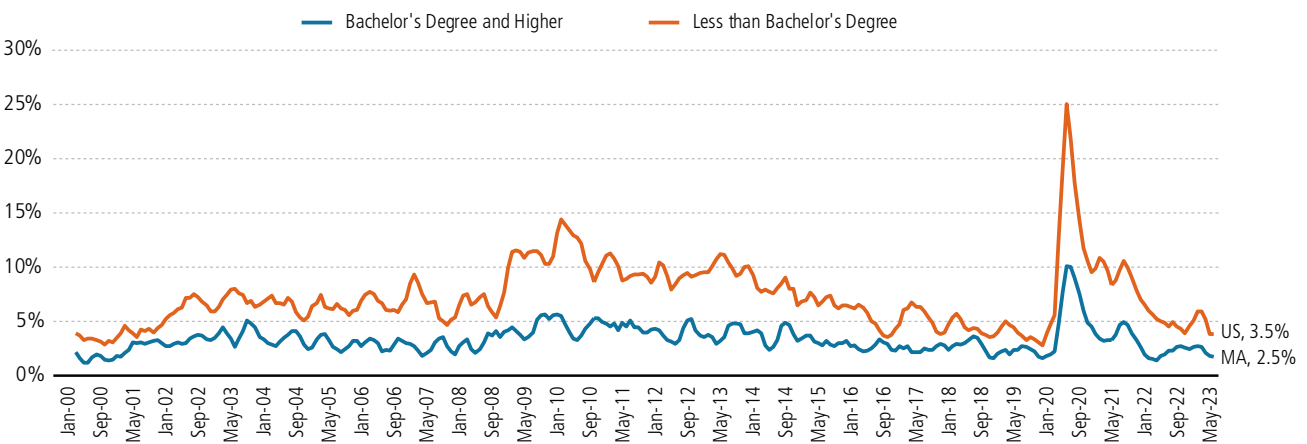
During the height of the COVID downturn, unemployment was 10 percent for workers with a college degree, but a whopping 25 percent for workers without a college degree. While the unemployment rate has dropped precipitously over the last two years for all demographic groups in the state, the unemployment rate for individuals without a four-year college degree is still higher than for individuals with a four-year college degree (3.5% and 2.5%, respectively). This speaks to skills mismatches in a tight labor market as well, as some of the most

robust job growth in the state has been concentrated in sectors typically requiring more advanced education and training.

**Industry Employment**

While the aggregate number of jobs in the state is above the pre-pandemic peak, there is quite a bit of variability from industry to industry in terms of jobs losses and recovery. First, job losses were most acutely felt in service sectors of the economy, especially in those industries relying on

**Figure 2: Unemployment Rates in Massachusetts by Education Level, as of September 2023 (Not Seasonally Adjusted)**



■ Source: U.S. Census Bureau, Current Population Survey; UMDI analysis ■ Note: rates are a 3-month rolling average

face-to-face customer interactions. Accommodation and food services, retail trade, arts, entertainment, and recreation, health care, and other services (which includes several personal care industries) were all disproportionately impacted by the COVID-induced economic downturn. Most of these industries are still below their pre-pandemic employment peaks, notably accommodation and food services which has nearly 26,000 fewer jobs today than it did in February 2020 (approximately 7.9% below its prep-pandemic peak). Conversely, the professional and technical services industry in the state grew dramatically in the post-pandemic period, adding nearly 45,000 jobs, an increase of 12.7 percent. Within this sector, the state

has seen particular gains in scientific research and development, as well as specialized design services.

## Workforce

Payroll jobs growth continues to be a strong point for the Massachusetts economy, especially when compared to the U.S. average. That said, the declining unemployment rate in the state is also due to reduced labor force size. There are several important demographic factors at play that should have the attention of public policy makers in the short and long term centered around the shifting age profile of the state and domestic outmigration.

Figure 3 on page 9 shows the growth in the size of the Massachusetts labor



**The professional and technical services industry in the state grew dramatically in the post-pandemic period, adding nearly 44,000 jobs**

**Table 1. Jobs Deficit in Massachusetts Relative to February 2020 Peak by 2-Digit NAICS Industry**

Industry	Massachusetts				U.S.
	Feb-20	Sept-23	Change (N)	Change (%)	Change (%)
Accommodation and food services	323,900	298,400	(25,500)	(7.9%)	(1.3%)
Retail trade	351,000	331,100	(19,900)	(5.7%)	0.2%
Manufacturing	242,800	236,400	(6,400)	(2.6%)	1.8%
Government	464,300	458,900	(5,400)	(1.2%)	(0.0%)
Management of companies and enterprises	73,500	70,700	(2,800)	(3.8%)	1.9%
Other services	142,000	139,700	(2,300)	(1.6%)	(0.9%)
Mining and logging	1,000	1,100	100	10.0%	(6.0%)
Arts, entertainment, and recreation	63,100	63,400	300	0.5%	0.1%
Real estate and rental and leasing	48,800	49,600	800	1.6%	3.1%
Information	95,600	96,600	1,000	1.0%	4.4%
Educational services	184,100	187,400	3,300	1.8%	3.7%
Finance and insurance	177,900	183,500	5,600	3.1%	3.3%
Administrative and waste services	184,700	192,000	7,300	4.0%	3.0%
Transportation, warehousing and utilities	105,300	113,000	7,700	7.3%	15.8%
Wholesale trade	123,100	132,200	9,100	7.4%	3.1%
Health care and social assistance	645,600	655,800	10,200	1.6%	4.2%
Construction	166,100	177,900	11,800	7.1%	5.3%
Professional and technical services	350,900	395,600	44,700	12.7%	12.9%
<b>Total nonfarm</b>	<b>3,743,700</b>	<b>3,783,300</b>	<b>39,600</b>	<b>1.06%</b>	<b>3.0%</b>

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



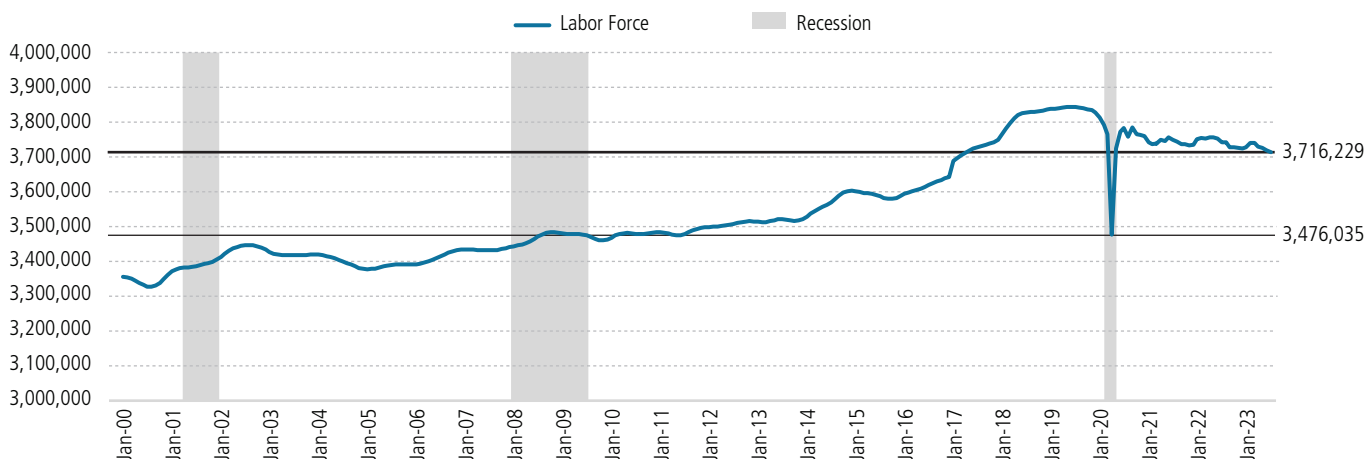
force from 2000 to today. As is evident in the figure, the labor force in the state (those people working or unemployed and looking for work) grew steadily between 2000 and the pandemic, with a slight slowdown starting in 2019.

The labor force shrunk dramatically with the onset of the pandemic and has struggled to reach its pre-pandemic peak. A modest uptick in the labor force at the start of the year proved to be short-lived. The seasonally adjusted Massachusetts labor force declined by nearly 13,000 between September 2022 and September 2023. More significantly, this represents part of a longer trend that began prior to the pandemic. Since reaching a peak of about 3.85 million in June 2019, the state's labor force has fallen to 3.7 million in September 2023, a net decline

of 130,000, and is roughly equal today to the size of the labor force in mid-2017.

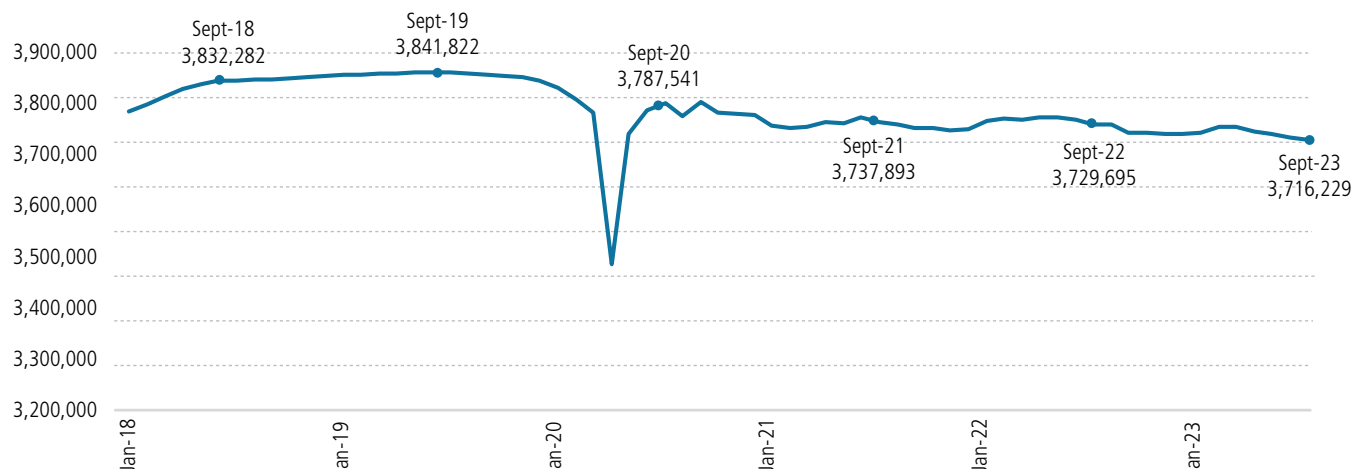
Related, the labor force participation rate in the state (those working or unemployed and looking for work divided by the working age population) dropped dramatically during the pandemic, as scores of workers, particularly women, dropped out of the labor market because of either the scarcity of jobs, family care responsibilities, or both. The labor force participation rate has increased steadily over the last three years but remains lower than its pre-pandemic rates. It is also worth noting that the labor force participation rate in Massachusetts tends to be higher than the U.S. overall. This is largely due to the state's well-educated labor force, the relatively high rates

**Figure 3: Massachusetts Labor Force, January 2000-September 2023 (Seasonally Adjusted)**



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

**Figure 4: Massachusetts Labor Force, January 2018-September 2023 (Seasonally Adjusted)**



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

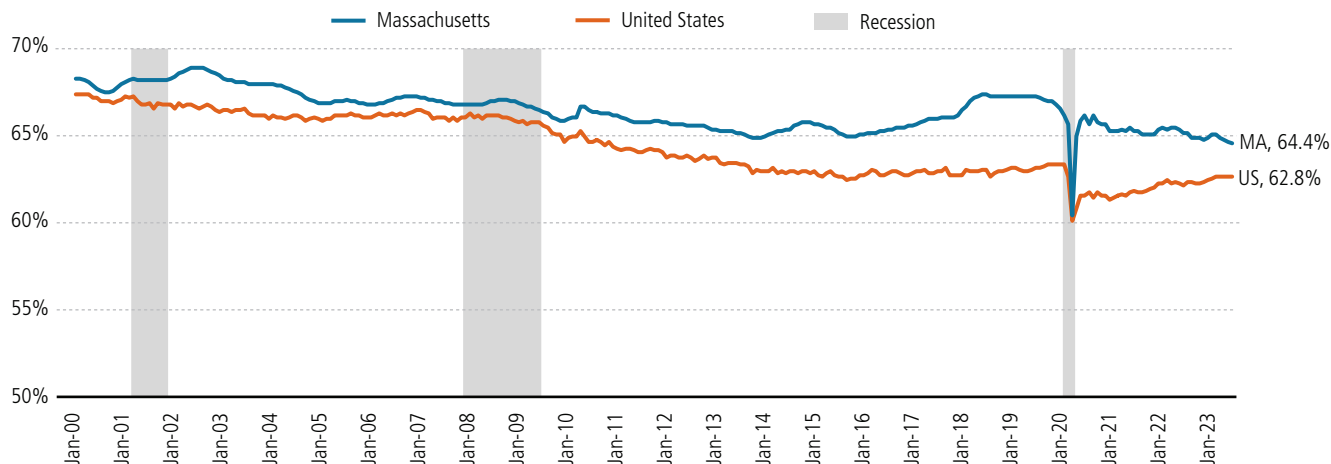
of female labor force participation, and the state's strengths in knowledge-based sectors. Well-educated workers in knowledge sectors tend to participate at higher rates and delay retirement more than less-educated workers in other sectors.

The percentage of retired working age adults increased both in the U.S. and Massachusetts over the last couple of years, though, the shift is more pronounced in the Commonwealth. While the initial increases were likely due to COVID-induced retirements, shifting age dynamics are also likely playing a factor in retirement rates in the state today. In 2019, just over 15 percent of working age adults in Massachusetts were retired. Today, it is near 18 percent.

Massachusetts is a relatively old state too. Today, Massachusetts has the 17th highest median age in the country, at 39.9 years of age (compared to 38.9 for the U.S.). Over 30 percent of the state today is 55 years of age or older, about a percentage point and a half above the U.S. average. While these are seemingly modest differences with the national averages, they do underscore some of the tight labor market conditions employers are experiencing around the state and what they may portend for the future.

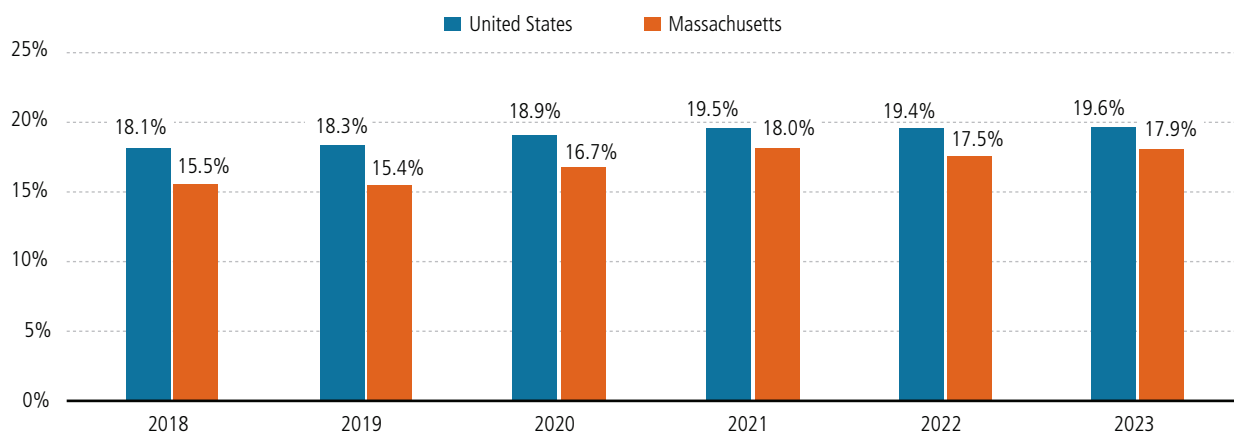
This issue will continue to be a critical one for the Commonwealth in the coming years as a higher and higher percentage of adults in the state will be outside of "prime

**Figure 5: Labor Force Participation Rates in Massachusetts and the United States, January 2000-September 2023 (Seasonally Adjusted)**



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

**Figure 6: Percent Retired of Working Age Population (16+) for United States and Massachusetts, 2018-2023 (Annual Averages)**



Source: U.S. Census Bureau, Current Population Survey; UMDI analysis



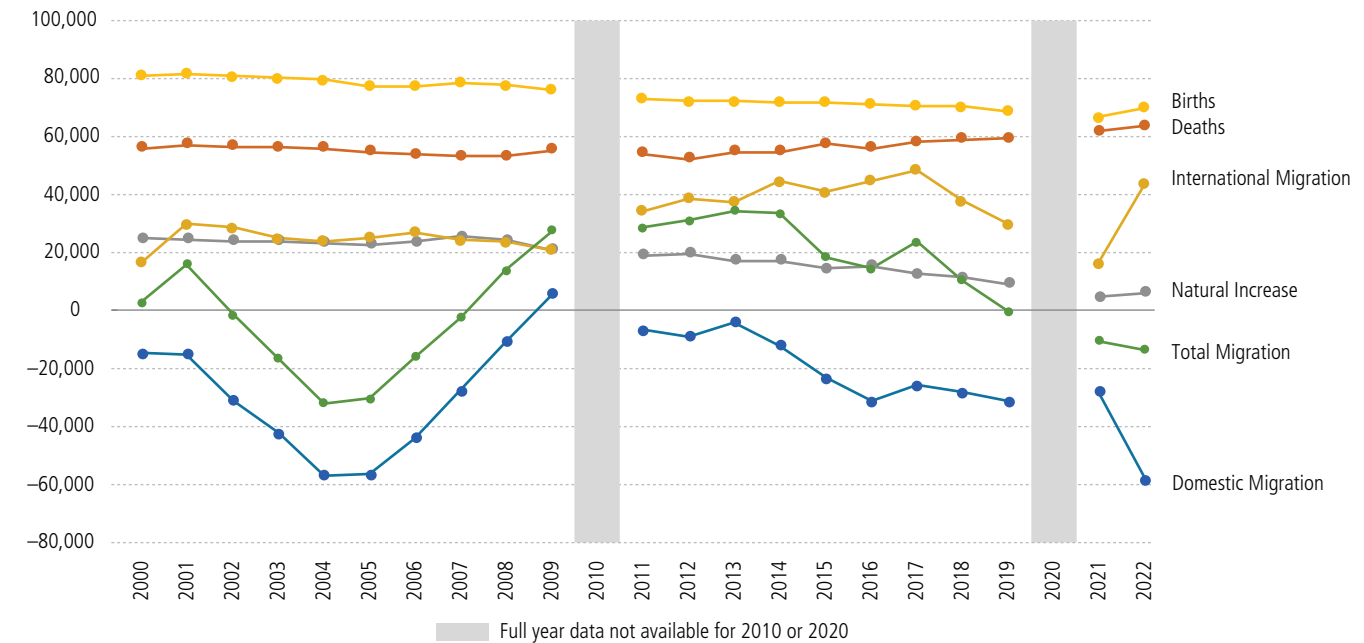
working age” groups. For example, in 2010 13.7 percent of Massachusetts was 65 years of age or older. Our most recent population projections at the Donahue Institute estimate that 21.9 percent of the state will be 65 or older by the year 2050. Assuming current patterns of the labor force participation by age, this will equate to a significant slowdown in labor force growth in the state, as well as a likely dramatic shift in the social service and health care needs of the resident population in the coming years.

Another issue impacting labor force size in Massachusetts are the shifting dynamics in international and domestic migration. While Massachusetts has experienced net population losses through domestic outmigration (i.e., people moving from Massachusetts to another state) over the last 20 years, these losses were always counterbalanced by significant gains in international migrants. That said, 2022 showed a dramatic increase in the state’s domestic outmigration rate, essentially doubling from the typical outmigration seen in the state over the last several years. Conversely, in both 2020 and 2021 international migration, which had slowed somewhat during the early part of the Trump administration, shifted dramatically due to pandemic related restrictions, only to finally return to a more typical rate for the state in 2022. On balance, though, we had fewer immigrants entering the Massachusetts labor markets during the pandemic years and when immigration returned to normal, domestic outmigration picked up speed at the same time.



The percentage of retired working age adults increased both in the U.S. and Massachusetts over the last couple of years, though, the shift is more pronounced in the Commonwealth.

■ Figure 7: Massachusetts Estimated Components of Population Change, 2000-2022



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

Domestic outmigration in the state is largely driven by the exodus of young adults 25-34 years of age. This age cohort accounted for 43 percent of the outmigration in 2021. It is unclear how much the most recent outmigration data indicates a “new normal” or is simply an artifact of temporary COVID-driven patterns. That said, this issue brings into focus different “push factors” for young adults in the state, most notably housing costs. The Endnote in this edition explores recent migration data in more detail.

## Leading and Current Index: Massachusetts v. the U.S.

Overall, the state and national economy continue to perform better than expected, with surprising resilience in the labor market. In the third quarter of 2023, Massachusetts real gross domestic product (GDP) increased at a 4.0 percent annualized rate as estimated by MassBenchmarks, while U.S. GDP increased at a 2.4 percent rate according to the U.S. Bureau of Economic Analysis (BEA). In the first

quarter of 2023, Massachusetts GDP grew at a 2.5 percent annualized rate as compared to a 2.0 percent rate for the U.S., according to the BEA. It is unlikely this pace of growth can continue during the third and fourth quarters. There is little slack left in the labor market to support strong employment growth, consumer spending in real terms seems to be leveling off as households exhaust excess savings from the COVID fiscal stimulus, and the Federal Reserve raised interest rates in their July rate-setting meeting with a possibility of a further rate increase later this year.

■ Figure 8: Growth in Real Gross Domestic Product, Massachusetts and the United States



■ Source: US data through 2023 Q2 and MA data through 2023 Q1 from U.S. Bureau of Economic Analysis. 2023 Q2 MA estimate, Q3 and Q4 MA projections from MassBenchmarks calculations by Dr. Alan Clayton-Matthews. U.S. projections for 2023 Q3 and Q4 from Wall Street Journal. Note: average annual growth is calculated by averaging the four quarters of annual growth rates for the calendar year.



The condition of the Massachusetts economy looks good heading into the latter part of 2023. Current indicators are solid and have defied the expectations of a recession for several quarters now.

Although a recession is not anticipated in the second half of this year, all indications are that growth can be expected to slow. The Massachusetts and U.S. economies have been growing in sync with each other, with slightly higher growth in Massachusetts in the first half of this year reflected in marginally higher payroll employment growth and higher wage and salary income growth. In the second quarter, Massachusetts payroll employment grew at a 2.2 percent annualized rate versus 1.9 percent for the U.S. In the first quarter, state and national employment grew 2.9 percent and 2.5 percent, respectively. Since the second quarter of 2022, wage and salary income is estimated to have grown 6.2 percent in Massachusetts versus 5.6 percent for the U.S.

The outlook for the remainder of 2023 calls for slower growth in both Massachusetts and the U.S. The MassBenchmarks Leading Economic Index expects third quarter growth of 0.7 percent for Massachusetts, while the Wall Street Survey of economists in July projects growth of 0.6 percent for the U.S. The pace of job growth can be

expected to slow as well, and there are some indications that employer demand for workers may be softening. Payroll employment in June in Massachusetts declined moderately—by 4,500—which could reflect the difficulty employers are having finding workers, or that demand for workers has peaked.

## Conclusion

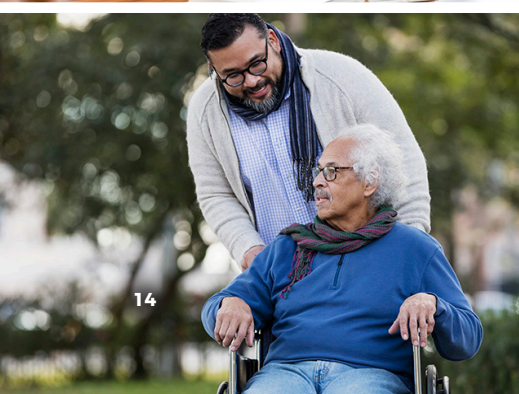
The condition of the Massachusetts economy looks good heading into the latter part of 2023. Current indicators are solid and have defied the expectations of a recession for several quarters now. That said, it is unlikely for the economy to continue growing at the rate seen early in 2023, as higher interest rates, tight labor market conditions, and reduced consumer spending will all constrain GDP growth in the coming months. From a policy perspective, the most important issue facing the state in the coming years is attracting and retaining workers and finding ways to maximize labor force participation among the workers who are here. While the state has incredible assets in terms

of human capital and industry mix, public policy needs to focus on making Massachusetts a competitive place to do business and starting a career, including housing, transportation, childcare, and energy. The demographic headwinds facing the state require proactive thinking in these areas to ensure the state maintains its dynamic economic edge in the coming years.



**Mark Melnik** is the Director of the UMass Donahue Institute Economic & Public Policy Research Group and Senior Managing Editor of this journal.





# Worker Shortages and the North Central Massachusetts Region

## Engaging Hidden and Future Workers to Grow the Local Economy

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BRANNER STEWART & KAZMIERA BREEST

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Similar to the state, North Central Massachusetts is facing a future of labor shortages, exacerbated by a wave of retirements and the pandemic. A recent study demonstrates how the region can develop and attract workers to meet the impending needs of its diverse employer base, focusing on methods to bring two identified groups, "hidden workers" and "future workers", into the labor force. Through coordinated efforts between employers, workers, and key workforce and economic development stakeholders, the work posits multi-pronged solutions to address barriers and help people realize success in the North Central job market.

### The Imperative for More People to Enter the Workforce

After growing for decades, the diminishing labor supply has become a significant concern for businesses, economic development leaders, and workforce practitioners in recent years. Baby boomers (aged 59–77), formerly the backbone of the U.S. workforce, are now rapidly approaching retirement or cutting back hours. However, the remaining (and future) cohorts (e.g., Generation X, millennials, and Generation Z) are not projected to be sufficiently large enough to take their place. In Massachusetts, this is compounded by a decline in international migration and a stubborn pattern of domestic out-migration (though a recovery may now be in its early stages). Following the economic downturn brought on by the COVID-19 pandemic and a slow return of people to the labor force, a more pressing interest in labor supply issues and how to address them has emerged. For aging, slower growth regions of the state, including North Central Massachusetts—the focus area of a recent study by the UMass Donahue Institute (UMDI)—the need to think proactively about labor shortages in the region and the strategies and practices needed to help grow the regional workforce has become an imperative.

As of May 2023, the labor force participation rate (LFPR) in Massachusetts was 64.7 percent, well below the pre-pandemic rate of over 67 percent.<sup>1</sup> Though this change may appear small, the gap is significant, underscoring the worker shortage that the state's employers are now facing. Job postings remain unfilled across many industries at a time of very high demand for both goods and services, while those who are marginally attached to the workforce are struggling to secure employment,

a phenomenon that carried through the pandemic and has been worsening for decades.<sup>2</sup>

In response to the need to find workers, the North Central Massachusetts Chamber of Commerce, headquartered in Fitchburg, worked with UMDI to better understand the problem and develop strategies and practices to increase the size of the available workforce in the North Central region. For context, and to better direct recommendations, a detailed analysis of labor force trends and of the unique barriers people face in entering the workforce was conducted. To support the study, the UMDI team completed an extensive review of programs and initiatives taking place in other parts of Massachusetts as well as around the United States to encourage people to enter the workforce or to enable them to participate more fully. UMDI also carried out more than a dozen interviews with local stakeholders and employers in the region with a main theme in mind: How can North Central Massachusetts encourage labor force participation and better meet the jobs needs of its employers both now and into the future?

In its research, UMDI identified two pools of workers that offer potential to increase the region's labor supply: "hidden workers" and "future workers." Hidden workers often offer or can learn the skills that local employers need, but, for a variety of reasons, they are either not in the labor market or are not fully participating. Future workers, on the other hand, are not yet in the labor force—due to their young age, not currently living in the region, technology, or other factors—but should be

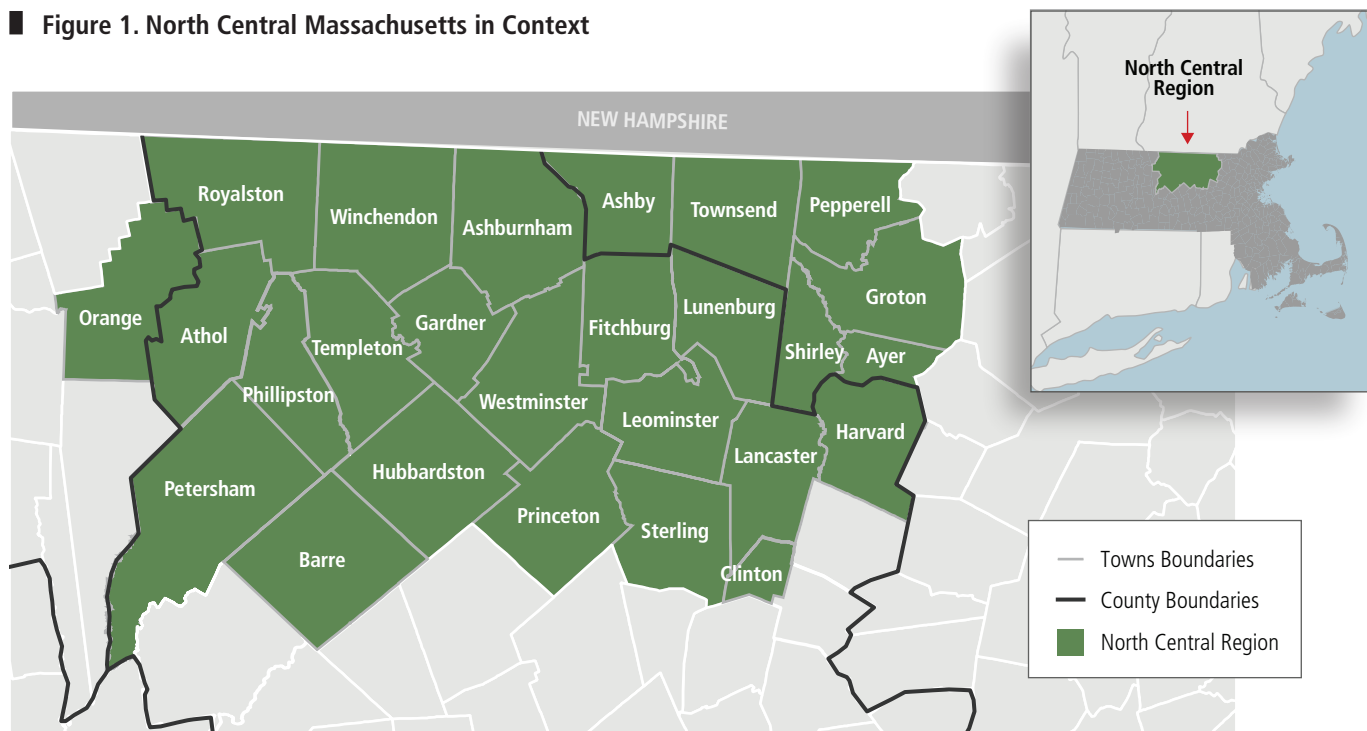
considered in plans for the growth of the labor force. This article describes the labor force participation trends in North Central Massachusetts, characterizes the types of potential workers who can enter or expand their engagement in the labor force, highlights the primary barriers preventing them from entering the workforce, and recommends strategies and potential initiatives for overcoming these barriers at the regional level.

## North Central Massachusetts, a Region Facing Labor Force Shrinkage

North Central Massachusetts encompasses 26 towns and cities, from Franklin County in the west, represented by the town of Orange, and stretching 50 miles east to Middlesex County, including the towns of Ayer, Groton, and the former Fort Devens. Beginning at the New Hampshire border in the north, the region extends south toward central Worcester County in the towns of Princeton, Sterling, and Clinton.

Comprising an area of over 800 square miles, the North Central region has large amounts of relatively affordable land for development compared with the Greater Boston region, as well as the economic infrastructure to support business growth. The area is a distribution and manufacturing hub for the state with sites such as Devens accommodating large-scale expansions in such industries as biopharmaceuticals, medical devices, and paper and food manufacturing.

■ Figure 1. North Central Massachusetts in Context



■ Source: North Central Massachusetts Chamber of Commerce; UMDI.

Note: The "North Central Region" is defined as the service area for the North Central Massachusetts Chamber of Commerce.

The current labor market in the North Central region is driven by long-term demographic trends, most notably those related to the aging population. Massachusetts has a younger median age than all other New England states, at 40 years, though it is older than the national average of 38 years, and the North Central region is older than the state overall, with an average age of 44 years.<sup>3</sup>

The North Central region has a slower growing population (only 5.1% growth between 2010 and 2020) than Massachusetts (7.4% over the same period), and that population is also aging (24% of the labor force was over 55 in 2020). With fewer people entering the workforce, large groups leaving, and labor force participation rates declining, the size of the workforce is expected to decrease in the coming years. The pandemic exacerbated this crisis by driving many people out of the labor force, either by retiring early, becoming full-time caregivers for their families, or entering emerging job markets such as the gig economy, which may offer flexibility that traditional employment cannot. The net result of these

demographic and behavioral changes is that employers increasingly face challenges to fulfill their work needs.

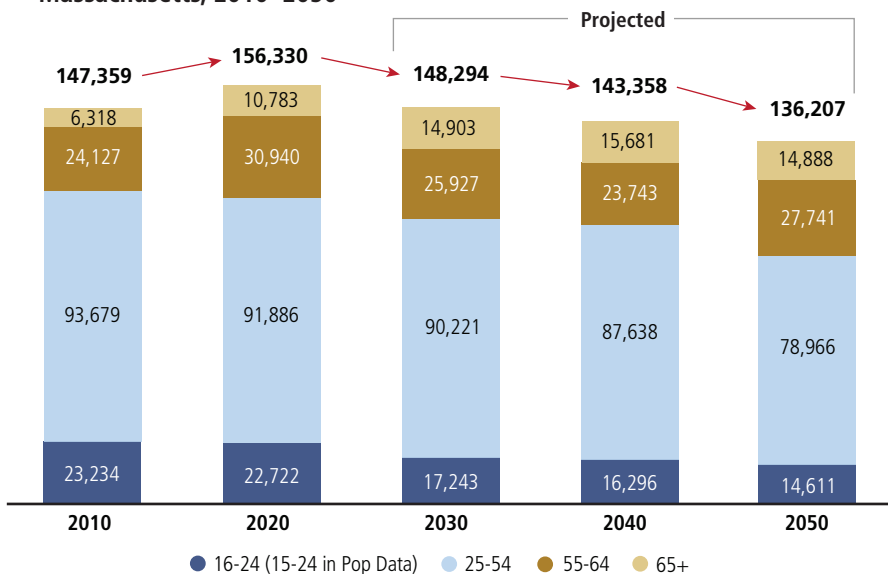
Assuming that current LFPRs by age cohort (i.e., the share of people by age group who are working or looking for a job) remain constant, population projections predict a downward trend in the size of the North Central Massachusetts labor force, declining from 156,000 today to 136,000 by 2050. Based on projections developed by UMDI and on U.S. Census data, Figure 1 shows the change in the North Central region's labor force from 2010 to 2020 and the projected change through 2050. Between 2010 and 2020, the growth of the labor force can be mostly attributed to the 55-plus segment of the workforce. Moving beyond 2020, the labor force size for all groups, except for 65-plus, are expected to decrease. This dynamic may alter slightly in the latter years of the projection period due to the labor force participation patterns of millennials. With all other factors remaining equal, the North Central region faces labor force decline in years to come, and many employers will increasingly depend on older workers.

## Hidden Workers and Future Workers: Finding and Incentivizing People to Become More Engaged in the Labor Force

To address the shrinking of its labor force, North Central Massachusetts, like many other parts of the United States, must tap into potential labor pools that match employer needs. Labor force participation can vary based on demographic characteristics such as age, race, gender, and educational attainment since these characteristics often present certain barriers to entering the labor force. Some groups, many of which represent historically marginalized populations, have particularly low labor force participation. By addressing these barriers, workers can be incentivized to engage more fully in the labor force. For the purpose of creating strategies to incentivize and engage the workforce, workers can be categorized into two potential labor pools based on their involvement with the current workforce. Hidden workers and future workers offer a means to arrest the decline and introduce greater economic opportunity in the region. It is important to note that North Central Massachusetts is not demographically homogeneous, and different groups will respond in distinct ways to labor force initiatives, even if they face similar barriers to fully participating in the labor market.

Figure 3 on page 18 shows examples of the different types of hidden and future workers, all of which may have varying experiences with labor force participation and entering the workforce or more fully engaging in it. These groups can face similar barriers to entering the labor force as well as barriers unique to their own circumstances.

■ **Figure 2. Historic and Projected Labor Force Growth in North Central Massachusetts, 2010–2050**



■ Note. LFPR by year multiplied by projected population 2020–2050; LFPR for 2020 is applied to 2020–2050 population; 2010 LFPR is applied only to 2010 population. Source: ACS 2010 PUMs and 2020 5YR (<https://www.census.gov/programs-surveys/acs/microdata/access.html>), UMDI V2020 Population Projections (<https://donahue.umass.edu/business-groups/economic-public-policy-research/massachusetts-population-estimates-program/population-projections>).



## HIDDEN WORKERS

The term “hidden workers” refers to workers who are left out of the workforce, either as applicants who are screened out of consideration or those who have no choice but to remain out of the workforce (entirely or partially). The experiences of this diverse group of workers and the reasons why they are not participating more fully in the labor force can be organized into three broad categories:

### MISSING HOURS

People who **are working** one or more part-time jobs but are willing and able to work full-time. The Bureau of Labor Statistics often includes these persons under the heading “part-time for economic reasons.” These people have the ability to work more but cannot find a full-time job that fits their schedule or one that fits their lifestyle.

### MISSING FROM WORK

This category includes workers who have been **unemployed** for a long time but may have an interest in returning to the labor force and **seeking employment**. Sometimes referred to as “discouraged workers,” these individuals have been unable to find work for such a long time that they have given up searching, falling out of the labor force. This may also include people near retirement age or already retired who left the workforce early of their own volition and may be interested in some sort of return to the workforce, likely part-time.

### MISSING FROM THE WORKFORCE

This group includes those who are **not working** and **not seeking employment** due to other responsibilities or limitations but are willing and able to work under the right circumstances. This might include a stay-at-home parent for whom childcare is economically unattainable, or a person with a disability who is unable to find work that is sufficiently accessible and has since stopped their search.

## FUTURE WORKERS

The term “future workers” refers to those workers who are not currently in the labor force due to age, location, technology, and other factors, but will be in the future. These future workers comprise three primary groups:

### YOUNG PEOPLE

This group includes people in the 0–14 age cohort, including children who are not yet eligible to work due to age, as well as young people over the age of 14 who are currently in education or training but plan to enter the workforce at some point. These people are already in north central Massachusetts; thus, there is a clear opportunity to both educate them and encourage them to remain within the region.

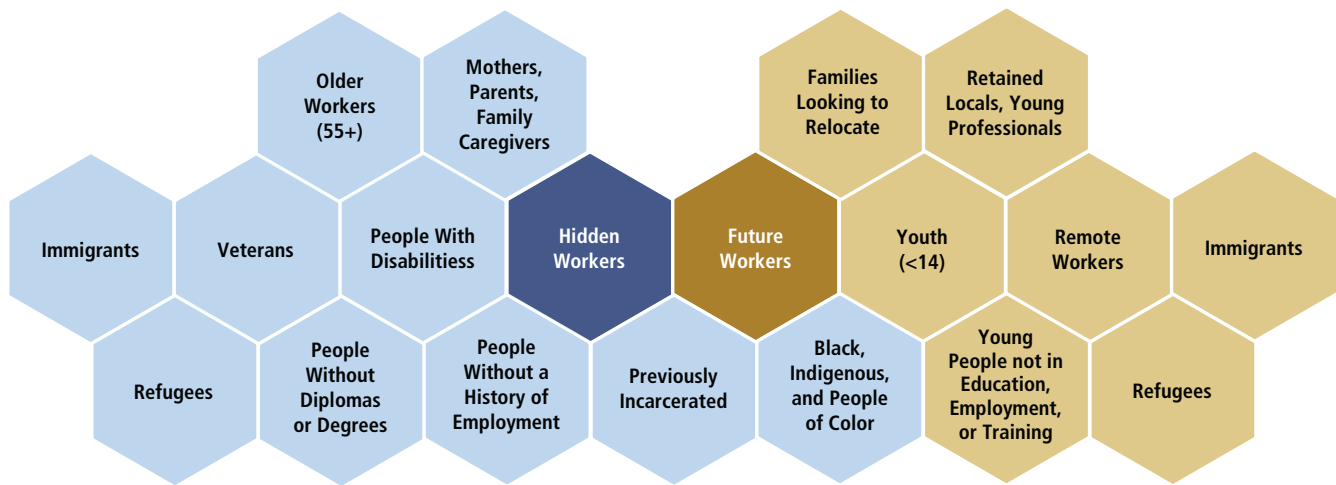
### FUTURE RESIDENTS

This group includes those who can be attracted to the region, both people from out of state as well as in-state populations, such as those who live in the urban core and are looking for more affordable housing. This group includes young families and immigrants who may choose to move to the region for lower costs, economic opportunities, quality of life, or other amenities.

### THE FUTURE OF WORK

This group includes the population of remote workers who are becoming increasingly accessible to employers in the North Central Region given technological innovations and improved communications tools. While remote work greatly expands the reach of regional employers to draw in labor, changes in prevailing work practices (e.g., greater flexibility in scheduling) also represent innovations that would allow more people who may be sitting on the sidelines to enter the North Central region workforce.

■ Figure 3. Types of Hidden and Future Workers



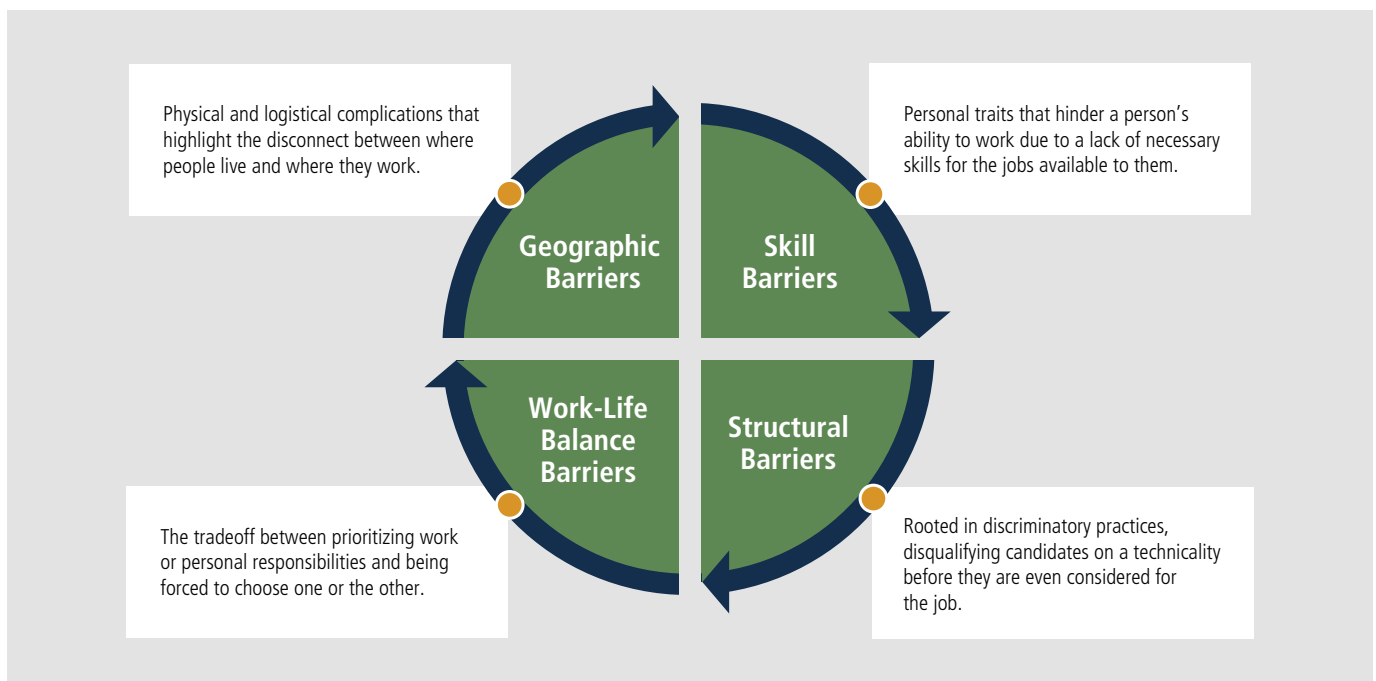
### Prospective Workers Face Several Barriers to Entering the Labor Force

A range of issues that complicate labor force participation were categorized into four main types of barriers:

geographic, structural, skill, and work-life balance. Some of these barriers, like transportation (within the “geographic barriers” category), physically hinder people from accessing employment. Other barriers are technical, like turning away people without certain backgrounds, or based on individual

capabilities, such as requiring certain degrees even if a person has the accumulated experience to fulfill job duties. One of the most challenging barriers relates to the difficult choices that prospective workers must make between a job and their home responsibilities.

■ Figure 4. Barriers to Entry





One of the most challenging barriers relates to the difficult choices that prospective workers must make between a job and their home responsibilities.

## BARRIERS TO ENTRY

**Geographic barriers** are rooted in a lack of affordable housing adjacent to jobs or a lack of transportation from where affordable housing is available to jobs. The Massachusetts housing market is experiencing plummeting inventories and rising prices both in the owner and renter markets. This heightens the challenges for prospective workers as well as newly employed workers to secure housing that is both affordable and near their job. Since Massachusetts is a small state, a slightly longer commute is a practical tradeoff for more affordable housing, but affordability issues are growing in most places, and commutes remain particularly dependent on access to a car, especially outside the Metro Boston region.

**Skill barriers** are perhaps the most common challenges for someone seeking gainful employment since skillsets may not match job requirements. Earlier in their career, workers may not receive the on-the-job training they need to advance, and financing other training options may not be in their budget. Workers may find that the skills they once used are no longer compatible with

the industries in the area. Furthermore, younger people and students may not have knowledge of or be on educational paths that will lead them to productive careers with regional employers.

**Structural barriers** represent forces outside a worker's ability to do a job which prevent them from gaining employment. Discrimination, which can be racist, sexist, and/or ableist<sup>4</sup> in nature, is a long-standing barrier to employment, whereby a potential employee may be denied hiring for prejudiced reasons. A structural barrier can also entail a restriction on certain types of workers for practical reasons; for example, a person with a criminal history of driving under the influence may be perceived as a high employment risk as a commercial driver or raise the employer's insurance premiums. These restrictions may begin as practical considerations, but they can easily become overly strict, even as evidence emerges that a certain type of worker is fully compatible with certain jobs. Overly aggressive applicant filters can also comprise a structural barrier (e.g., strict degree requirements) because they may filter out workers who can do the job but do not have the exact

package of credentials needed to reach the interview process.

**Work-life balance** represents the fourth barrier, whereby available jobs do not accommodate a person's lifestyle. A person may avoid geographic, skill, and structural barriers, get a job offer, and then discover that some quality of the job is incompatible with their life. They may find that their new employer is more inflexible with scheduling than they thought, making it hard for them to take time to care for their family or to find time to work a second job. They may be offered pay below what is required or that is too high for the worker to continue qualifying for certain social assistance benefits such as rental assistance or childcare vouchers. Problems of work-life balance may be the most complex set of issues that workers and employers face. Particularly in the wake of the pandemic, there is evidence that workers are re-evaluating their priorities. This can make it very hard for employers to retain employees and for workers to find jobs that adequately conform to their other obligations.



## A Collaborative Approach to Drawing People Into the North Central Massachusetts Workforce

Though the barriers to entry in the North Central region's labor force are many, they are far from insurmountable, and there are numerous potential solutions to draw more people to jobs with regional employers. Some of these solutions focus on the specific needs of hidden workers, and many could yield small but impactful changes. To maximize benefits, UMDI identified steps that the North Central Massachusetts Chamber of Commerce and regional leaders can take to offer solutions that reach the widest range of people. In doing so, we have made some important assumptions about workers' needs.

Most workers' needs cannot be summed up by one barrier to entry or addressed by a single solution; rather, workers' needs should be approached

holistically. Many workers who leave the workforce do so because they have needs and responsibilities that are not being met or fulfilled. Needs related to childcare, reliable transportation, and even getting enough sleep all impact a person's ability to get to and do good work. Many in the workforce are also enrolled in education of some form, and creating career pathways for their growth requires a level of flexibility in the workplace that employers must recognize and offer. The Chamber should openly and continually recognize these facets of work-life balance and share these challenges, as well as methods for solving them, with its members.

Addressing these needs requires wraparound services<sup>5</sup> for workers, whereby obstacles in the process of navigating career pathways can be identified and adjusted for at a personal level between employers and employees. The Chamber could introduce to local stakeholders a multi-pronged, coordinated approach, including such

initiatives and interventions as adjusting public transit schedules and adding more frequency, extending bus routes to better connect employers and workers, creating learning roles for nontraditional and lifelong learners, establishing clear career ladders and promotion schedules, hiring and promoting racially diverse leaders who reflect the region's changing demographics, conforming shift times to employee schedules, creating jobs with innovative roles and responsibilities, and incorporating morale boosters such as taking "pulse" surveys to monitor worker satisfaction.

Offering the range and types of support needed to expand the labor force requires the involvement and coordination of businesses, government, workforce agencies, and economic development organizations. Indeed, no business or organization can handle all the efforts single-handedly. Institutions and other entities in North Central Massachusetts are already taking steps toward offering wraparound services for hidden workers.

Many in the workforce are also enrolled in education of some form, and creating career pathways for their growth requires a level of flexibility in the workplace that employers must recognize and offer.





Making work easier involves addressing the obstacles current and future workers face regarding skill development, discriminatory hiring, and transportation and life responsibility barriers, preventing people from working at all or advancing in their careers.

- Mount Wachusett Community College offers flexible programming and childcare support for enrolled parents and an additional program for local veterans transitioning from service to college, the workforce, and civilian life.
- The Commonwealth Corporation offers an adult re-entry program for justice-involved individuals from incarceration to the workplace.
- Employers in the area are beginning to look beyond perfectly aligned resumes to find candidates and are offering more flexibility in shift scheduling, hours of operation, and job responsibilities.
- Montachusett Regional Technical School and other tech schools in the area are filling skill gaps with post-graduate training.

To effectively address a problem (and future problems) of this size, employers, educators, stakeholders, and community organizations need to work in tandem to develop multi-purpose solutions that make working more convenient and rewarding while also supporting business growth. Avenues for tackling these major barriers involve collaboration with local employers to discuss **geographic barriers**, with local employers and educational institutions to discuss **skill barriers**, with local employers and workforce development experts to reduce **structural barriers**, and with community stakeholders to

increase the supply of childcare providers to support **work-life balance**. For a full list of short-, medium-, and long-term solutions to address the four types of barriers identified in this article, see the full report.<sup>6</sup>

## Conclusion: Make It Easier to Work

In short, to get workers into the labor force, going to work must be easier. This involves tackling problems that arise outside the employee's job description and targeting the logistics of how workers do work. Making work easier involves addressing the obstacles current and future workers face regarding skill development, discriminatory hiring, and transportation and life responsibility barriers, preventing people from working at all or advancing in their careers. These obstacles differ depending on the individual, and it has become abundantly clear that workers do not have homogeneous needs. To increase labor force participation in North Central Massachusetts, the Chamber of Commerce can act as a coordinator between employers, key stakeholders, and workers in developing wraparound services in the region. Once they have a detailed understanding of their employees' needs, businesses in the area should convene and, together, strategize how to make it easier to work in the region. By collaborating to offer wraparound services needed by workers, businesses and organizations would

be better able to develop, attract, and retain labor in the region and at less of a resource burden than addressing those needs on a company-by-company basis. As a high-visibility convener and liaison, the Chamber of Commerce is in a unique position to establish the business, education, and institutional connections necessary to better meet worker needs and bring additional people into the North Central Massachusetts labor force.



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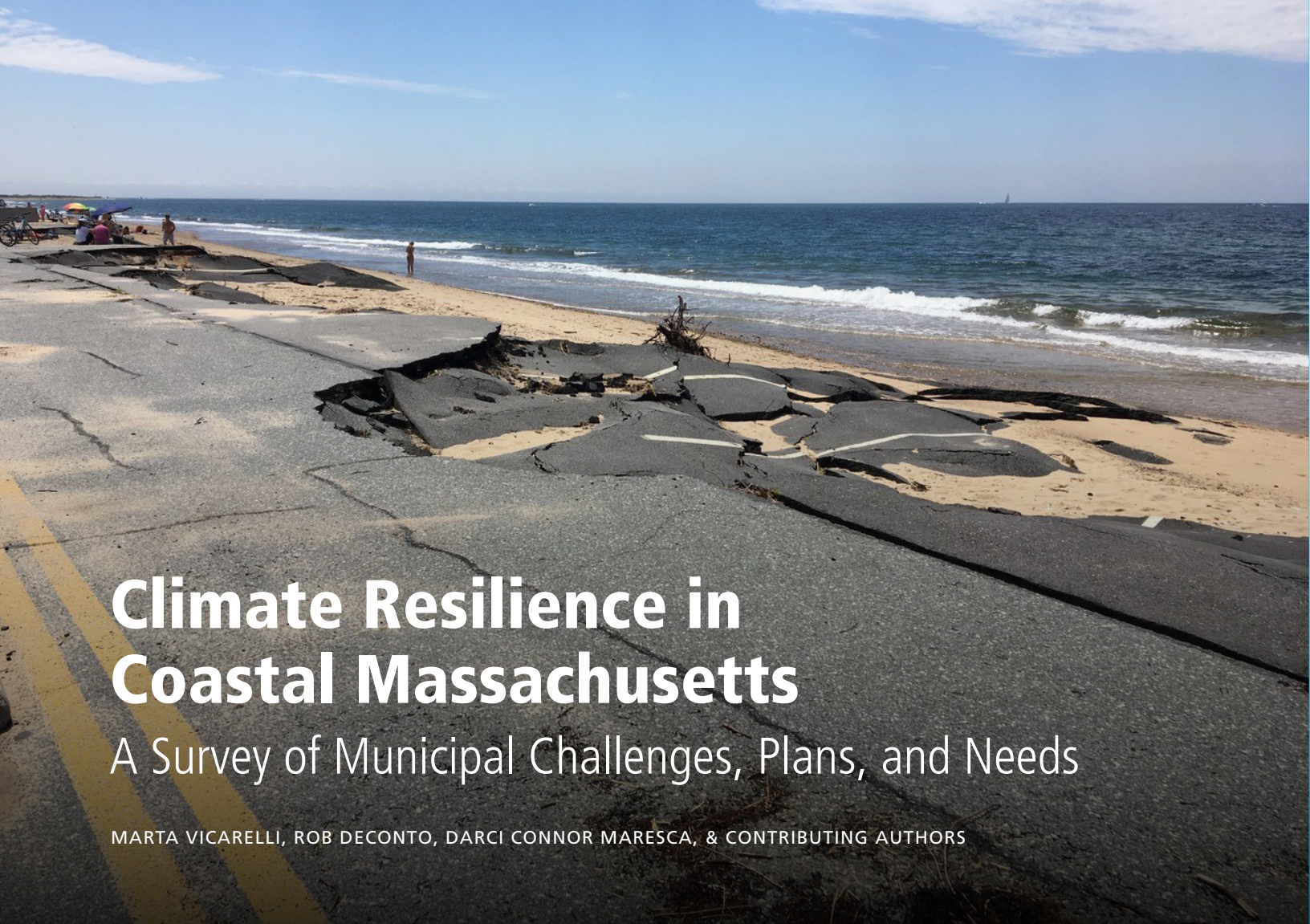


**Kazmiera Breest** is a research analyst in the Economic and Public Policy Group at the University of Massachusetts Donahue Institute.

## Endnotes

- 1) Massachusetts Executive Office of Labor and Workforce Development (<https://lmi.dua.eol.mass.gov/lmi/LaborForceAndUnemployment>).
- 2) <https://www.hbs.edu/managing-the-future-of-work/Documents/research/hiddenworkers09032021.pdf>
- 3) ACS 5-Year Estimates 2021, Table S0101 (<https://data.census.gov/table?q=S0101&tid=ACST5Y2021.S0101>).
- 4) Discrimination or prejudice against people with disabilities or who are perceived to be disabled.
- 5) Wraparound services refer to programs that support multiple facets of a person's life in pursuit of work, such as addressing transportation barriers, closing the skills gap, rewriting structural norms, and accommodating work-life balance.
- 6) <https://donahue.umass.edu/our-publications/worker-shortages-and-the-north-central-massachusetts-region>





# Climate Resilience in Coastal Massachusetts

## A Survey of Municipal Challenges, Plans, and Needs

MARTA VICARELLI, ROB DECONTO, DARCI CONNOR MARESCA, & CONTRIBUTING AUTHORS

The Northeast Center for Coastal Resilience—a partnership across the University of Massachusetts system with more than 60 collaborating faculty and researchers and more than 50 regional partners—conducted a survey of Massachusetts municipalities and planning agencies focusing on coastal resilience. The report produced from the survey results provides a comprehensive outlook of the climate-change hazards and impacts experienced in coastal and inland areas, the resilience strategies adopted, and the barriers encountered.

### Introduction and Overview

New England is experiencing a combination of rapid atmospheric warming<sup>1,2</sup> increasing frequency of extreme precipitation and wind events<sup>3,4,5</sup> and accelerating sea-level rise (SLR).<sup>6,7</sup> These phenomena are creating compounded climate impacts with increasing stresses on natural, built, and socioeconomic systems in coastal New England.<sup>8</sup>

There is uncertainty about society's level of preparedness and resilience planning in response to these changes. The findings of this survey-based study provide a comprehensive outlook and a data baseline for climate resilience in Massachusetts,

with emphasis on the Blue Economy, from the perspective of municipalities and regional planners. The Blue Economy is defined here as inclusive and resilient coastal communities supported by thriving maritime (or oceanic) economic sectors that value and integrate biodiversity and ecosystem services for coastal and ocean health.

The survey gathered information on the climate-change hazards and impacts experienced in coastal and non-coastal (i.e., inland) municipalities; the resilience strategies adopted to address these challenges; the barriers encountered during the design and implementation of resilience strategies; and



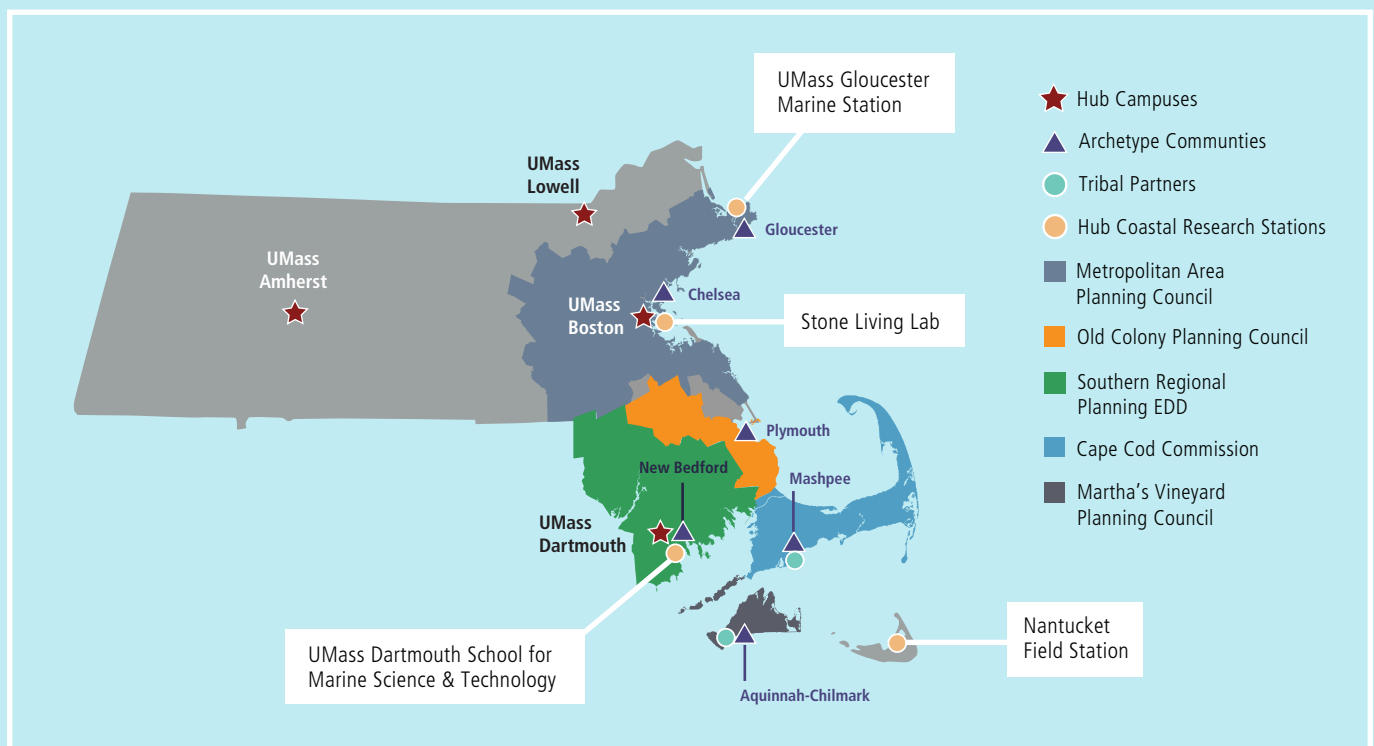
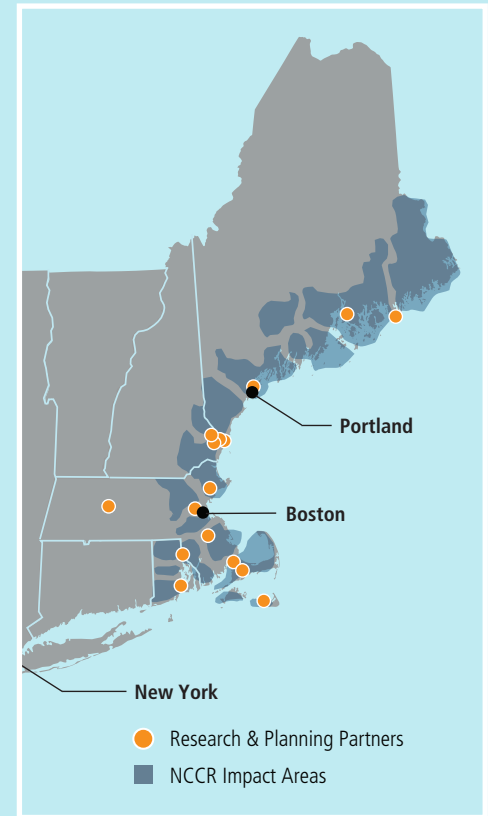
# THE NORTHEAST CENTER FOR COASTAL RESILIENCE (NCCR):

## Advancing actionable coastal science and sustainability, informing policy and local decision making, and supporting blue economic development.

Coastal New England and Massachusetts have long served as living laboratories for ocean exploration, innovation, blue economic development, and ecological stewardship, but the unprecedented pace of climate warming and sea-level rise in the Northeast, combined with increasing demands on coastal spaces and ocean resources, have begun pushing the limits of regional coastal sustainability. NCCR was founded by the UMass Amherst School of Earth & Sustainability in collaboration with UMass Boston, UMass Lowell, and UMass Dartmouth. It includes more than 60 collaborating faculty across the University of Massachusetts system and more than 50 regional partners to address the most pressing enviro-socioeconomic issues along the coastline of the northeastern United States.

Guided by participatory input from tribal collaborators, regional municipalities, policymakers, and other regional partners from Rhode Island to Maine, NCCR's research aims to understand the key interactions among the socioeconomic, built, and natural underpinnings of New England coastal systems at community and regional scales. Leveraging a network of four UMass coastal research facilities, each situated in a very different biophysical and socioeconomic setting on the North Shore of Massachusetts and in Boston Harbor, Buzzards Bay, and Nantucket, NCCR is ideally situated to study the evolving interplay of environmental stressors and socioeconomic systems unique to a range of environs representative of coastal New England.

NCCR's goal is to produce actionable science and data-informed pathways for decision making that foster thriving, sustainable, equitable, and just coastal communities while adaptively planning for a resilient and environmentally sound coast in the long term.



the data needs of Massachusetts communities and planning agencies to aid future implementation of resilience strategies. This study is part of the regional engagement activities of the Northeast Center for Coastal Resilience (NCCR), a recently launched knowledge hub involving campuses of the University of Massachusetts system. The survey results will be used to align the hub's mission, research activities, and deliverables with the actual needs of regional municipalities, planning agencies, decision makers, and practitioners. The resilience indicators collected in this baseline study will be monitored and reevaluated in subsequent studies and shared with decision makers.

## Methodology

The Massachusetts Municipal Association (MMA) facilitated the organization of focus groups during the survey design and helped disseminate the survey to all Massachusetts municipalities. Numerous planning agencies contributed to the dissemination of the survey to municipalities within their region, including the Cape Cod Commission (CCC), the Martha's Vineyard Commission (MVC), the Metropolitan Area Planning Council (MAPC), the Merrimack Valley Planning Commission (MVPC), the Montachusett Regional Planning Commission (MRPC), the Northern Middlesex Council of Governments (NMCG), and the Old Colony Planning Council (OCPC).

Distributed online to the municipal leaders in all of Massachusetts' 351 municipalities, the survey received 141 responses from 111 municipalities (Table 1). All Massachusetts counties and planning regions were represented in the survey

sample. Coastal municipalities were identified based on their categorization by the Massachusetts Office of Coastal Zone Management.<sup>9</sup> The survey included 40 (51%) of the 78 coastal municipalities of Massachusetts.

The survey responses were likely not from a random sample of Massachusetts municipalities. Larger and wealthier municipalities, often associated with more urban areas, are more likely to have resources (including staff members) dedicated to climate-change issues, and for this reason, they are more likely to respond. In our sample, the percentage of survey respondents from cities<sup>10</sup> (as opposed to towns) and of municipalities that are not in rural areas<sup>11</sup> are slightly higher compared with Massachusetts as a whole (Table 1). Average municipal per capita income and average population size are also slightly higher in our sample than Massachusetts averages. Despite these limitations, the survey results provide insights into climate impacts experienced by Massachusetts municipalities and their resilience strategies and needs. Actual impacts may be somewhat underestimated because municipalities represented in our sample are, on average, wealthier than the Massachusetts average and therefore have more resources to mitigate vulnerability to climate-change impacts.

## Hazards

Almost all responding Massachusetts municipalities (99%) reported experiencing impacts from climate hazards. The perceived intensity and spatial distribution of climate impacts differed across the municipalities in our sample (Figure 1):

**Table 1. Characteristics of Municipalities**

Characteristic	Massachusetts		Sample in this Study	
	Count	Percent of Total	Count	Percent of Total
Total number of municipalities	351	—	111	—
Number of cities	39	11%	21	19%
Number of towns	312	89%	91	81%
Coastal municipality *	78	22%	40	36%
Inland municipality	273	78%	71	64%
Not rural **	191	54%	75	67%
Rural Level 1	104	30%	24	21%
Rural Level 2	56	16%	13	12%
Average municipal per capita income ***	\$43,071		\$49,531	
Average municipal population size ****	19,637		21,549	

■ Note.

\* Coastal municipalities are identified based on the categorization by the Massachusetts Office of Coastal Zone Management: <https://www.mass.gov/files/documents/2016/11/nt/czm-regions.pdf>

\*\* The definition of rurality is provided by the Massachusetts government: <https://www.mass.gov/service-details/state-office-of-rural-health-rural-definition>

\*\*\* Per capita income in 2020 dollars—U.S. Census: <https://data.census.gov/cedsci/table?q=B19301&g=0400000U525.060000&tid=ACSDT5Y2019.B19301&hidePreview=true>

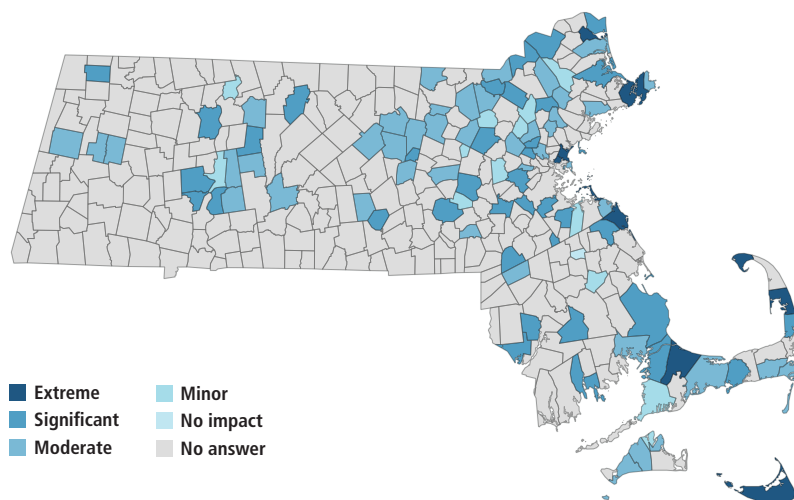
\*\*\*\* 2019 U.S. Census: <https://donahue.umass.edu/business-groups/economic-public-policy-research/massachusetts-population-estimates-program/population-estimates-by-massachusetts-geography/by-city-and-town>



19% of respondents from coastal municipalities described the current observed impacts as extreme. No inland municipalities reported extreme impacts. The majority of respondents from coastal municipalities (39%) described observed climate-change impacts as significant.

The majority of respondents from coastal municipalities reported being strongly affected by severe storms and high-wind events (73%), storm surges (69%), sea-level rise (58%), flooding (54%), higher tides (53%), and ocean acidification (53%; Figure 2). Respondents indicated being mildly affected by heat waves (67%), droughts (53%), and warming oceans (46%; Figure 2). When municipalities were not already experiencing a specific climate-related hazard, they often anticipated being affected in the future. Forty-nine percent of respondents predicted that wildfires would become a hazard for their communities in the future. Respondents also anticipated impacts on their communities in relation to marine heat waves (43%), de-oxygenated waters (31%), and increased water temperatures (24%).

**Figure 1. Coastal and Inland Municipalities: How would you describe the current observed impacts of climate change on your municipality? (n = 108)**



#### FROM THE SURVEY

“[Our city] remains highly dependent on the health of the ocean in ways both large and small. The reality of sea level rise becomes more ominous all the time.... There is a need for truly comprehensive planning for this community that has a rare combination of both blessings and challenges.”

— Municipal official from a coastal city





Impacts

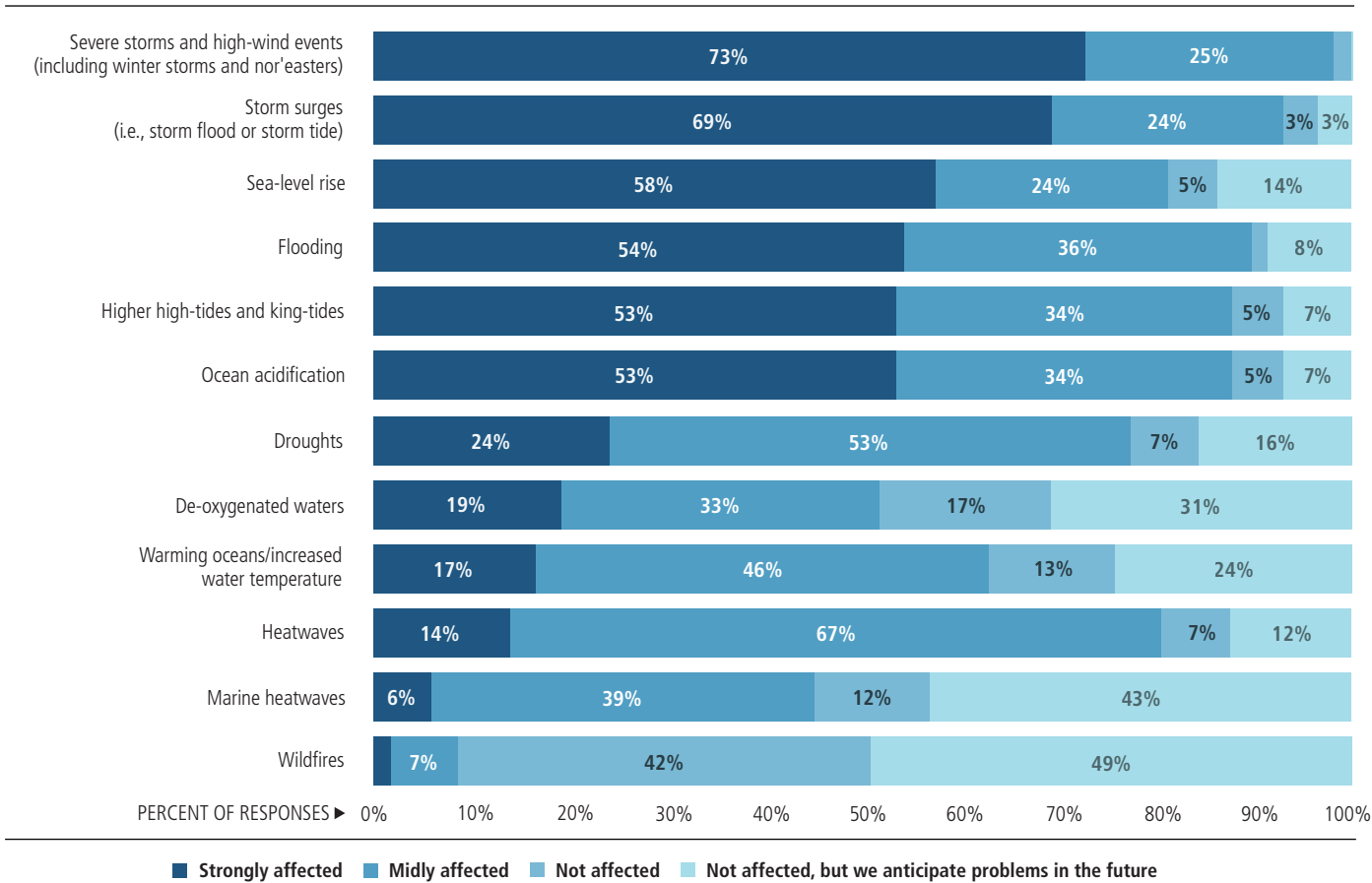
Municipalities reported a wide array of climate impacts, both observed and anticipated. Based on the survey results, environmental, infrastructural, and economic impacts present an increasing severity gradient from inland areas to coastal communities.

The most frequently reported strong environmental impacts included wastewater management concerns (42%), water habitat degradation (38%), the introduction of invasive species (35%), and harmful algal blooms (31%). The most frequently predicted future environmental impacts included species die-

offs (45%), animal and fish out-migrations (42%), and heat-related illnesses (37%).

Negative impacts on coastal infrastructure (e.g., shoreline retreat and impacts to ports and other coastal infrastructure) and on the Blue Economy (e.g., commercial fisheries) seemed to have noticeable economic ramifications in inland municipalities as well. This suggests a strong economic interdependence between coastal and inland municipalities. In coastal municipalities, the infrastructural impacts most frequently reported as strong included beach loss and shoreline property impacts (48%), damage to dams and/or sea walls (46%), damage to private properties (42%), and disconnected

Figure 2. Coastal Municipalities: Hazards Experienced (n = 59)



FROM THE SURVEY

"[Our city] is a coastal community significantly impacted by climate change and sea level rise. We experience flooding from the ocean, flooding of the back shore and inundation along the [local] river. We also have many creek brooks and low lying areas that flood with heavy precipitation events."

— Municipal official from a coastal city

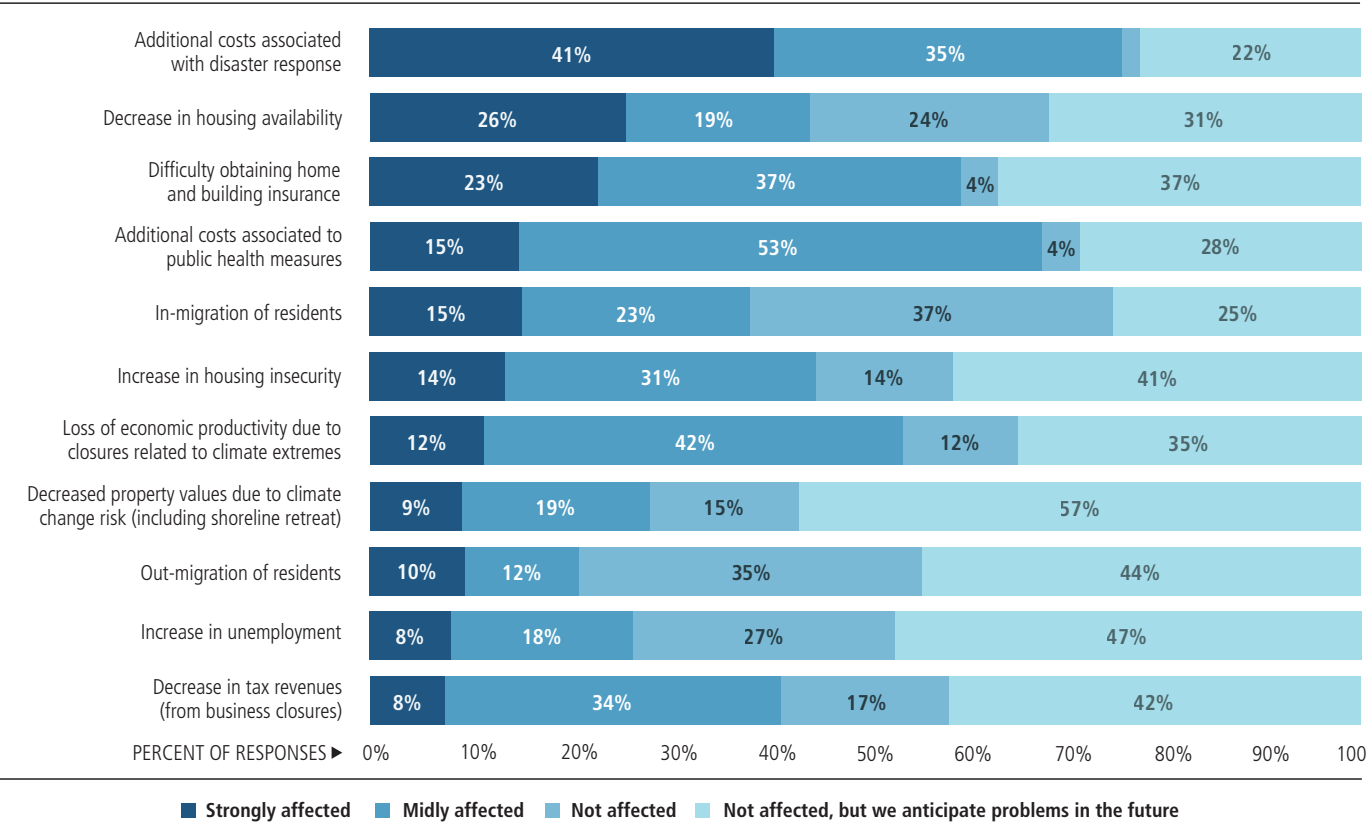
(e.g., inaccessible, inundated) roads (38%). About half of coastal municipalities predicted infrastructural impacts on water-supply systems. More than 35% of coastal municipalities anticipated damages to historic sites.

Increasing costs of disaster response and public health measures were the most frequently reported economic impacts experienced by Massachusetts coastal municipalities (41%; Figure 3). Population migration related to climate change emerged as a source of concern for both coastal and inland municipalities. More than 20% of coastal municipalities reported being strongly affected by a decrease in housing availability and difficulty obtaining home and business insurance. The most frequently

predicted economic impacts in coastal municipalities were decreased property values (57%), increased unemployment (47%), out-migration of residents (44%), decreased tax revenues (42%), and increased housing insecurity (41%). Meanwhile, respondents in inland municipalities were more likely to anticipate future economic impacts from the in-migration of residents.

The Blue Economy appears already severely impacted by climate change. In coastal municipalities, the most frequently reported strong impacts are associated with the following industries: commercial fisheries (including permitting issues related to species migration; 30%); tourism (20%); real estate and rental leasing (16%); and agricultural

**Figure 3. Coastal Municipalities: Please indicate how strongly your municipality is affected by the following economic impacts. (n = 54)**



**FROM THE SURVEY**

"In recent years we have seen a number of ocean-front homes being washed away by increased northeast storms. The shoreline continues to erode as a result of these intense storms."

— Municipal official from a coastal city

activities (15%; Figure 4). In addition, moderate to strong impacts were frequently reported for impacts to commercial fisheries (71%); construction (61%); administrative, support, waste, and remediation services (60%); and tourism (58%; Figure 4).

Equity

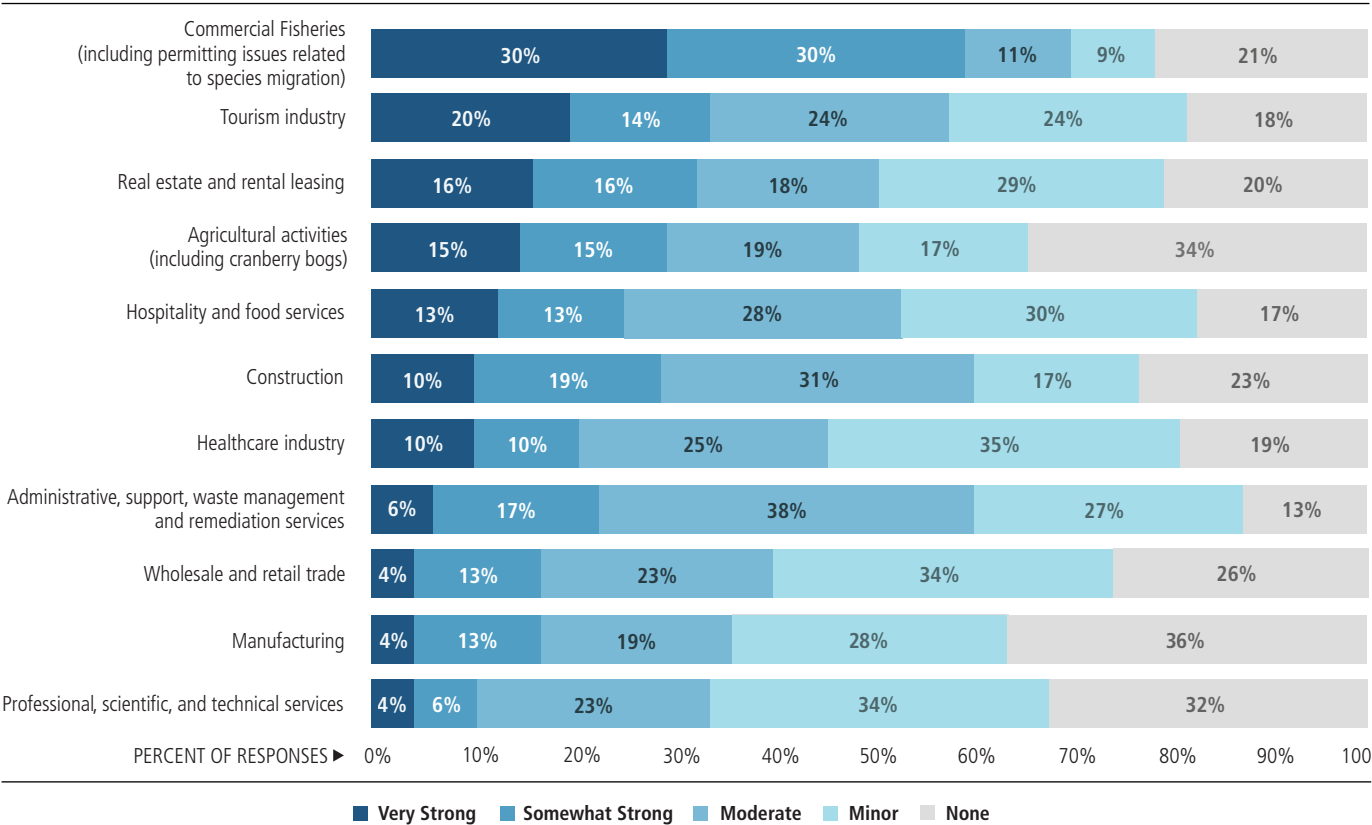
Some populations are more vulnerable to climate hazards because of greater exposure (due to geographic location), preexisting health conditions, age, or other socioeconomic factors. The survey investigated the equity and social-justice dimensions of vulnerability to climate change in municipal settings.

More than 75% of respondents identified elderly residents, people with disabilities, and low-income residents as groups vulnerable to climate change. These groups are also more likely to be the focus of targeted municipal resilience programs (Figure 5).

About 30% of respondents identified veterans; Black, Indigenous, and other People of Color (BIPOC); and immigrants as vulnerable groups. Fewer than 20% of municipalities reported dedicating resources to these populations to increase their resilience capacity.

Equitable resilience and adaptation planning requires reliable data to monitor climate impacts on vulnerable groups. Unfortunately, less than 30% of municipalities appear to have access to reliable socioeconomic indicators (e.g., employment

Figure 4. Coastal Municipalities: To your knowledge, how strong are the negative impacts of climate change on the following industries in your municipality. (n = 50)



FROM THE SURVEY

“There have been several red tides and cases where extremely high coastal waters caused sewage to flow into the coastal waters, thus impacting both the shellfish industry, fishing industry and safe use of our coastal waters for swimming, kayaking, boating, etc.”

— Municipal official from a coastal city



statistics, food-security metrics, health statistics, and housing and security indicators), and in less than 10% of cases, the data available are disaggregated by race and ethnicity.

Resilience Strategies

The survey examined the resilience strategies already adopted by municipalities and the strategies they hope to adopt in the future. A large majority of respondents (89% of all municipalities) indicated that climate adaptation and resilience planning are priorities in the planning documents of their respective municipalities. Eighty percent of all municipalities reported having completed a vulnerability/risk assessment.

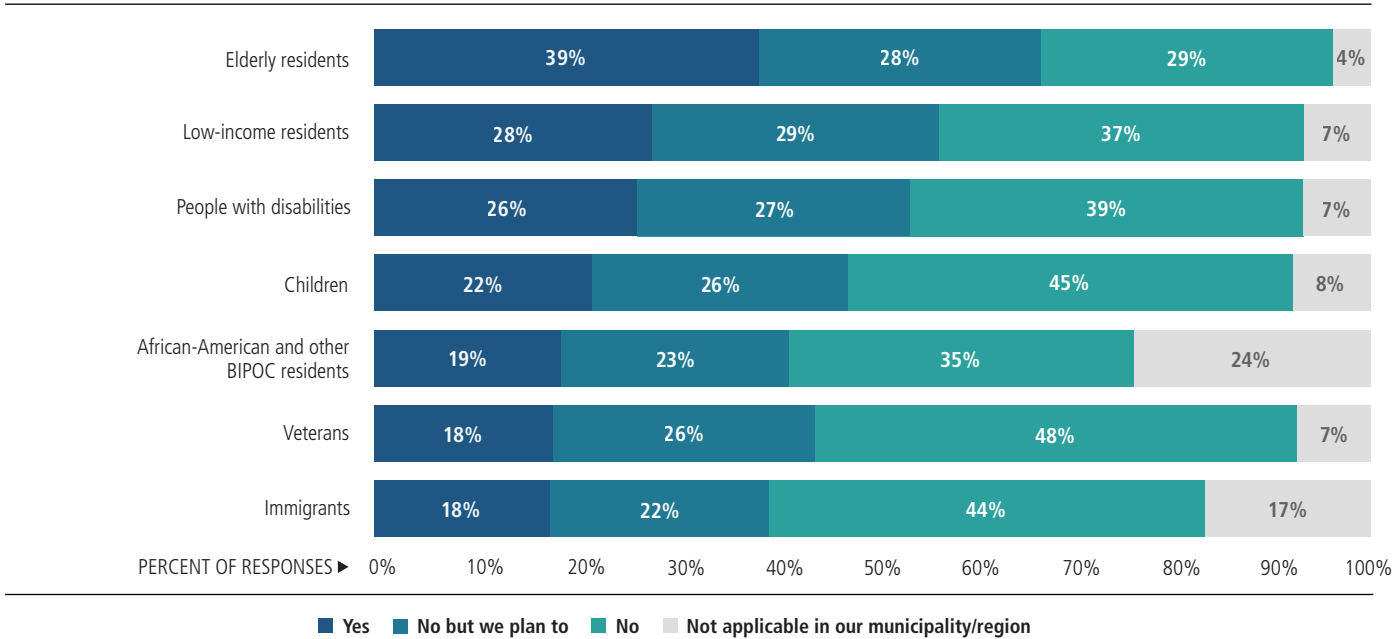
Compared with inland municipalities, coastal municipalities seem to be more likely to have already adopted and be interested in the future adoption of a vast array of engineering and nature-based resilience strategies. The most frequently adopted engineered (gray) infrastructural strategies in coastal communities are tidal barriers, levees, revetments, and other

flood walls (65%); wet flood-proofing (61%); improvement or expansion of stormwater drainage systems (55%); and improvement or expansion of wastewater systems (41%; Figure 6). Priorities for the future adoption of gray infrastructure to increase coastal resilience include interventions to increase the resilience of telecommunication networks (74%), weatherization and retrofitting of buildings (66%), improvement or expansion of stormwater drainage systems (59%), and increasing the resilience of power stations (61%).

The Fifth Session of the United Nations Environment Assembly (UNEA-5)<sup>12</sup> resolution formally adopted the definition of nature-based solutions (NBS) as

*actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits.*

■ Figure 5. Coastal Municipalities: Has your municipality dedicated resources (i.e., assessed needs, developing plans or programs) to increase the climate resilience capacity of any of the following populations? (n = 106)



**FROM THE SURVEY**

“Our Planning Department is currently trying to make changes but it’s slow, turns quite legal, and they hesitate.... Fear is preventing us from doing anything. Fear of an exodus of residents. Fear of lawsuits.”

— Municipal official from a coastal city



NBS are emerging as important vulnerability reduction strategies in response to climate change. The Biden–Harris Administration released a Nature-Based Solutions Roadmap outlining recommendations for scaling-up NBS to address climate change, nature loss, and inequality in the United States.<sup>13</sup> In our survey, the majority of respondents in coastal municipalities reported that they had already adopted land conservation practices (81%), nature-based erosion-control measures (72%), nature-based flooding prevention (67%), and nature-based stormwater management (64%; Figure 7). Coastal municipalities also expressed interest in adopting more NBS in the future. Nature-based priority areas include adoption of green roofs (73%), urban forests (58%), nature-based cooling strategies (54%), and restorative agricultural practices (49%).

## Financing Strategies

States and municipalities throughout the United States have started exploring possible COVID-19 economic recovery pathways. The expression "green recovery" has emerged to describe policies that push for low-carbon economic growth, prioritizing renewable energy, energy efficiency, green transport, climate resilience, and other environmentally beneficial projects. At the time of the survey, several Massachusetts municipalities were using or planning to use state and federal COVID-19 recovery funds to finance sustainable policies and programs. The top three programs and strategies most frequently reported focus on climate mitigation, including electric vehicle charging infrastructure

(47%), expansion of renewable energy capacity within the municipality (40%), and energy efficiency programs (36%).

## Barriers

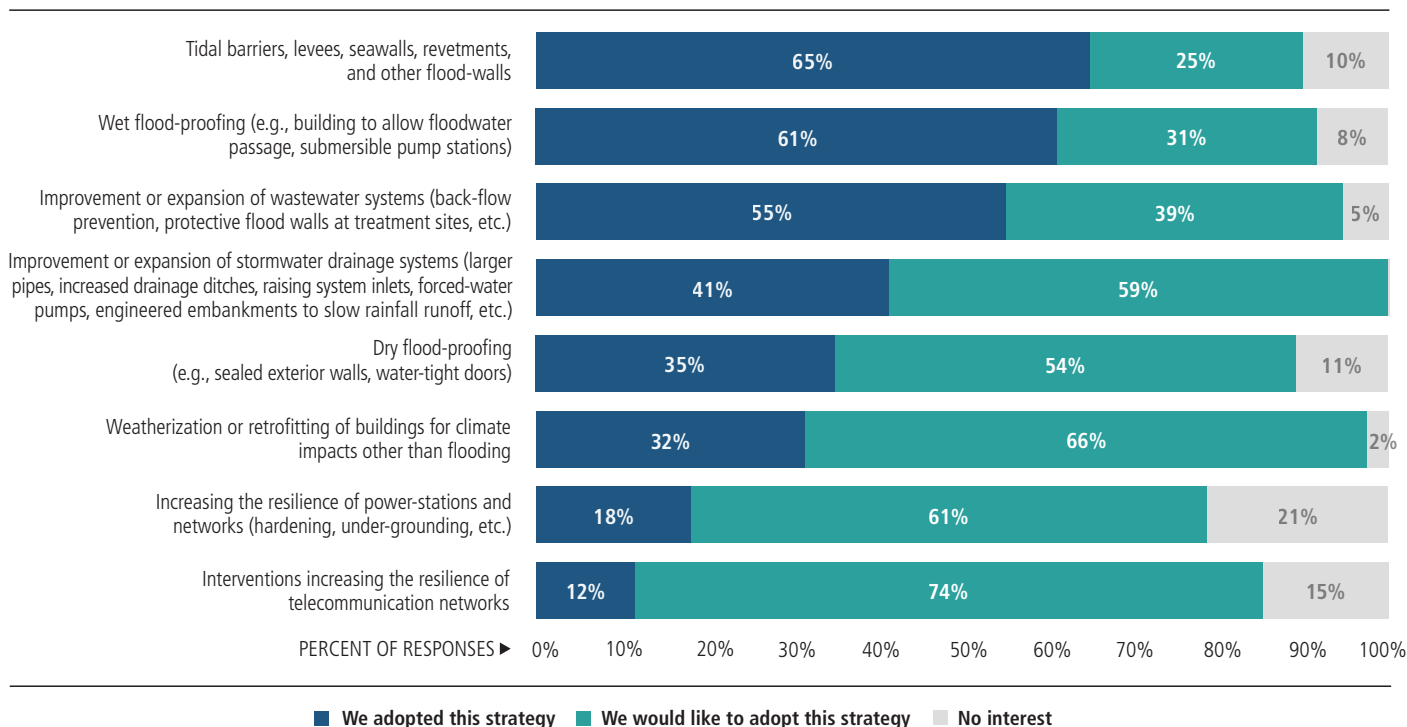
The implementation of resilience recovery strategies appears to be hindered by a range of barriers, including possible constraints on municipal resources, coordination and governance failures, and difficulties accessing data. The most frequently reported implementation barrier to climate-change resilience plans was limited staffing capacity, especially in smaller municipalities (92% of respondents from towns and 85% from cities; Figure 8).

Barriers related to municipal resources were also frequently reported, including lack of a centralized way to identify funding opportunities (51%), lack of regulatory authority to support enforcement of strategies (47%), lack of expertise (43%), and lack of grant-writing capacity (40%).

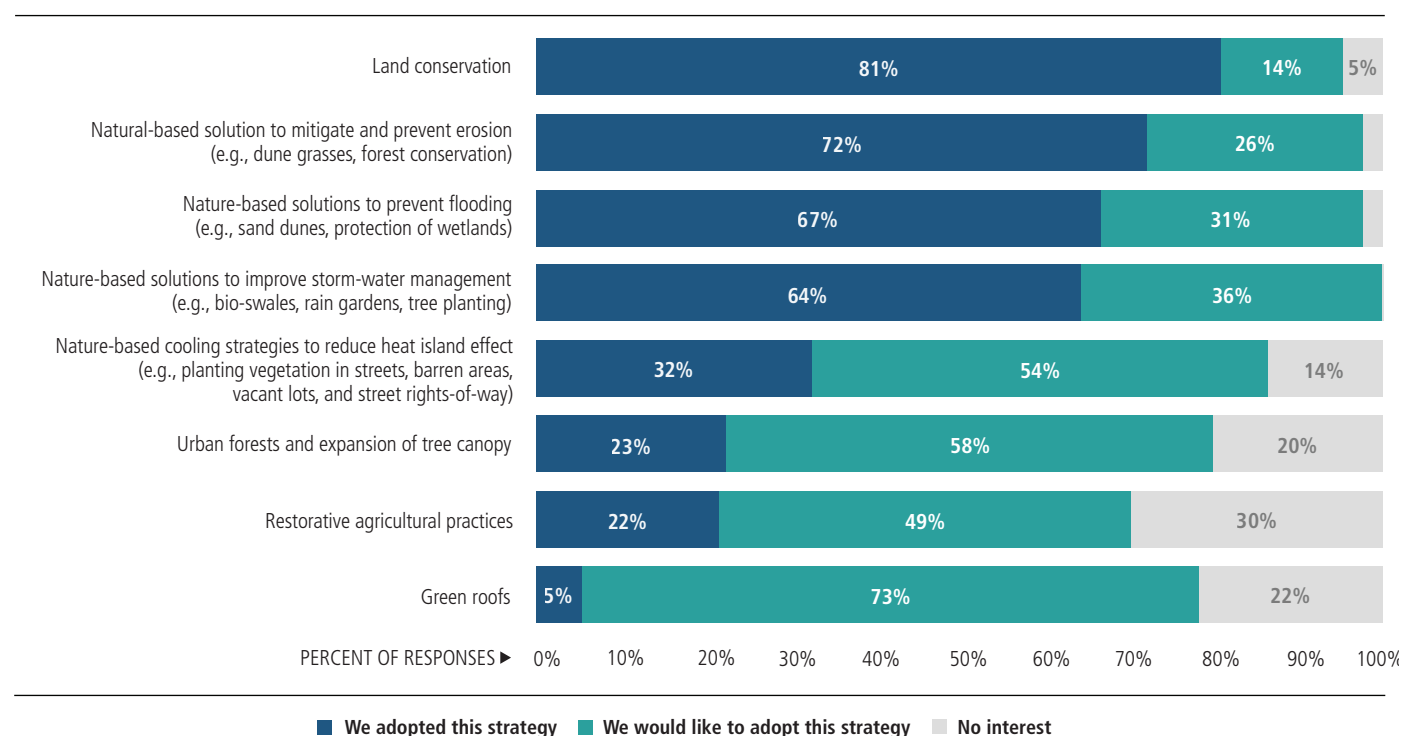
The need for more regional cooperation and intra-municipal coordination was highlighted by municipal survey respondents as well as regional planners interviewed during the survey-project development. Insufficient metrics and tools for monitoring progress emerged as an additional constraint. Planning agencies that participated in our focus groups confirmed the trends observed in the municipal data. They also provided insights into challenges related to permitting costs necessary to implement resilience strategies.

In addition to needing to overcome the resource and governance barriers highlighted earlier, Massachusetts municipalities reported an urgent need for easily accessible and usable data to facilitate and

**Figure 6. Coastal Municipalities: Please indicate which of the following engineered (gray) infrastructure strategies your municipality has adopted, or would like to adopt. (n = 44)**

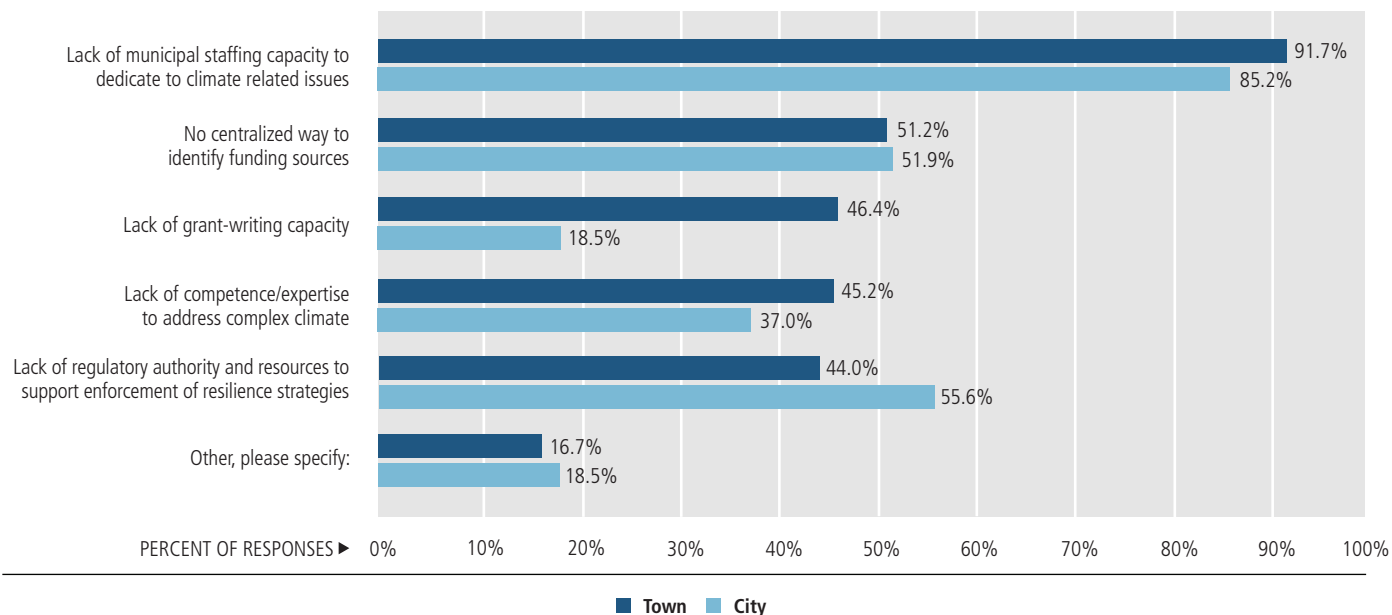


**Figure 7. Coastal Municipalities: Please indicate which of the following green infrastructure and nature-based solutions your municipality or planning region has adopted or would like to adopt. (n = 43)**





**Figure 8. Municipal Resources by Towns and Cities: Please indicate which of the following barriers complicate, slow, or prevent the implementation of climate change resilience plans in your municipality. (Please check all that apply) (n-Total = 111; n-Towns = 84; n-Cities = 27)**



accelerate the implementation of climate-resilience strategies. Economic evaluations of climate-change impacts (89%) and local CO2 emissions data (59%) are the two types of data most frequently requested, but they are not easily accessible. These data are crucial both in climate-adaptation planning and in monitoring climate-mitigation progress (i.e., actions that reduce emissions of greenhouse gases). The resources most frequently selected by municipalities (especially by cities) as most helpful in climate adaptation include expert assistance, tools, and metrics for monitoring impacts of climate change at the local level.

## Looking Ahead

Impacts on coastal landforms, ecosystems, social systems and infrastructure are accelerating in New England, as is the need for coastal municipalities and regional planning bodies to design and implement inclusive resilience strategies that reflect the concerns and aspirations of diverse communities. A key question has emerged: How can just and participatory adaptive planning efforts be developed and enabled at scales appropriate to serve a wide range of coastal communities under varying levels of environmental stress with a deeply uncertain future?

The \$1 trillion Infrastructure Investment and Jobs Act (IIJA; 2021), which includes a significant component targeting climate resilience, and emerging state resources for resilient infrastructure and green economic development are increasing the immediate need for data-informed decision making with long-term consequences. Increasingly, communities will be forced to decide

on adaptation strategies. In some cases, actions chosen now will determine what options are available in the future through “lock in” and path dependency. If a poor first action is taken, future opportunities may be lost, or worse yet, maladaptation may occur.

To support New England communities, there is a need for multi-institutional regional collaborations between academic, private, governmental, and local stakeholders. These collaborations and participatory science will best position decision makers and stakeholders to understand key interactions between the socioeconomic, built, and natural underpinnings of New England coastal systems at both community and regional scales, and the evolving combination of environmental stressors unique to each.

This study’s results comprise a baseline for a long-term, participatory, and interdisciplinary research initiative focused on coastal resilience. Relying on a strong impact-monitoring approach, this NCCR collaborative will create new knowledge with decision-support tools at scales needed to promptly inform the critical near-term decisions necessary to support thriving, sustainable, and equitable coastal communities in an uncertain future.

**To learn more please visit:**

<https://www.umass.edu/ses/research/northeast-center-coastal-resilience/ma-resilience-report>



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- 9) Massachusetts Office of Coastal Zone Management: <https://www.mass.gov/files/documents/2016/11/nt/czm-regions.pdf>
- 10) Municipalities in the state of Massachusetts are classified as either towns or cities. Under state law, the classification is based on their form of government. Towns have an open town-meeting or representative town-meeting form of government. Cities adopt a mayor-council or council-manager form. Based on these classifications, there are 294 towns and 57 cities in Massachusetts. There are 14 communities that have applied for and been granted city forms of government, though they wish to be known as “The Town of.” For a list of cities and towns, see the Massachusetts Secretary of State’s website: <https://www.sec.state.ma.us/cis/cisctlist/ctlistalph.htm>
- For more information, including an updated number of cities and towns, see: <https://www.sec.state.ma.us/cis/cisctlist/ctlistidx.htm>
- 11) We refer to the definition of rurality provided by the Massachusetts government: <https://www.mass.gov/service-details/state-office-of-rural-health-rural-definition>
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## ENDNOTES

# Post-Pandemic Demographics and Destiny in Massachusetts

BY DOUG HOWGATE

In late 2022, the Massachusetts Taxpayers Foundation began a series of reports on the impact of demographic and labor trends on the state's economy, highlighting the threat of domestic out-migration to long-term economic competitiveness. With changing demographic patterns and increased out-migration, the state's focus should be on lowering living costs and improving the quality of life to make Massachusetts an attractive place to settle and stay.

In late 2022, the Massachusetts Taxpayers Foundation began releasing a series of visual reports on the effects of demographic and labor trends on the Massachusetts economy. As with any work in this area, the goal is not to speak definitively as to what the Commonwealth's future has in store, but instead to identify emerging opportunities and challenges and connect those trends to public policy choices. One theme that has quickly emerged centers on the serious threat that domestic out-migration poses to long-term economic competitiveness and to equitable economic opportunities for residents and those doing business in Massachusetts.

#### TAKING A STEP BACK: MIGRATION AND MASSACHUSETTS PRIOR TO 2020

The importance of domestic and international migration trends to Massachusetts is not new. An aging population and a declining birth rate have meant that, for years, the Commonwealth has relied on the movement of people into Massachusetts to grow its labor force. However, even before the onset of COVID-19, more

Massachusetts residents were moving to other states than moving in, and it was international migration that buoyed the state's workforce. (Figure 1).

In the years leading up to the pandemic, there was an alarming drop in international migration to Massachusetts, which has long served to offset domestic out-migration. A combination of federal policy decisions and larger economic and geopolitical factors resulted in a 40 percent drop in international migration to the state between 2017 and 2019. This steep decline, in addition to long-term domestic out-migration trends, meant that by 2019, net migration was effectively zero, trending negative as soon as the pandemic began.<sup>1</sup>

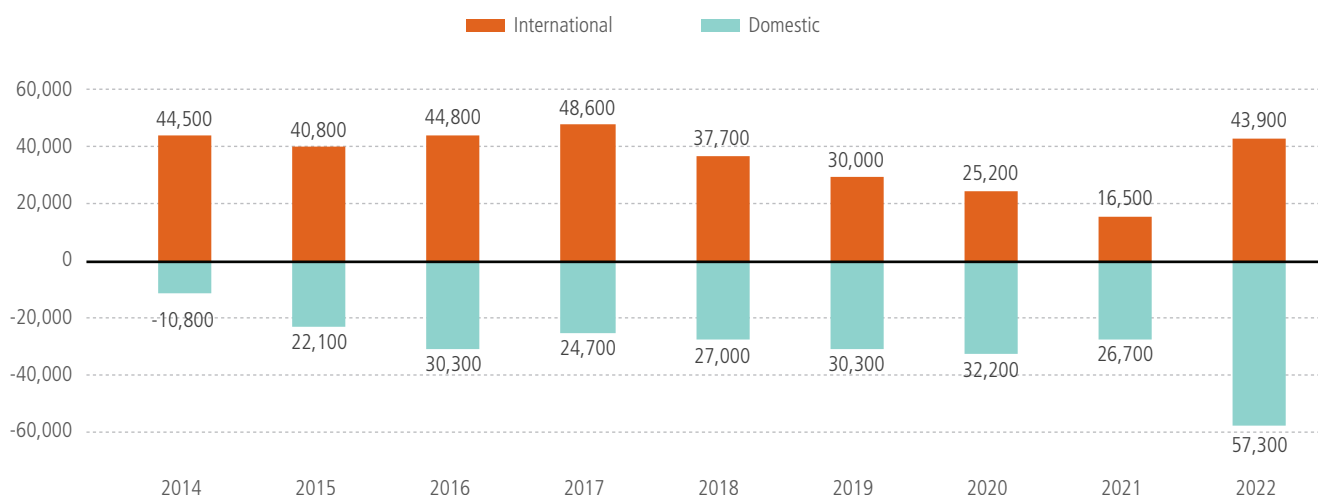
#### A CHANGED LANDSCAPE: THE PANDEMIC AND MIGRATION TRENDS

In the spring of 2020, fundamental elements of how individuals, families, and businesses make location decisions changed overnight. Suddenly, working from home offered many employees a chance to rethink the connection between where they live and where they work, especially those in high-wage industries linked closely with

the Massachusetts economy. In the Commonwealth, this means that areas like the Berkshires as well as the Cape and Islands have seen population growth for the first time in decades. But while certain areas of the state have opportunities to attract new residents, Massachusetts as a whole faces challenges in responding to new migration realities. Metro Boston is a high-cost region, with rental, housing, and childcare prices among the highest in the United States. Combine these high prices with Boston's notoriety as the city with the fourth-worst traffic congestion in the world,<sup>2</sup> and the areas of Massachusetts that saw the largest growth over the last 20 years now look much less attractive both for workers with limited resources and for those with greater flexibility to work from home.

It is still too early to draw any permanent conclusions from pandemic-era data, but there are clear indications that the Commonwealth needs to rethink its strategies for keeping people in the state, and investment in housing is a good place to start. Massachusetts had the lowest rental vacancy rate in the United States in 2022,<sup>3</sup> and in Boston, the problem is particularly acute, with the city's rental costs and rate of growth

■ Figure 1. Net International and Domestic Migration



■ Source: U.S. Census Bureau, Population Estimates Program

in rental costs ranking near the top nationally.

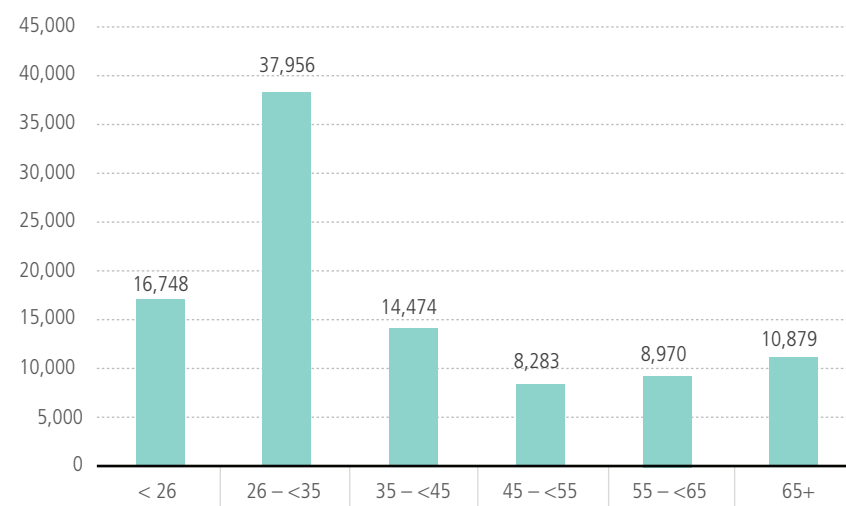
Given these factors, it is not surprising that Massachusetts is losing younger residents. In 2020, according to IRS data, individuals aged 26–35 years represented the age group with the highest prevalence of out-migration—a cohort that is critical to the state’s current and future economic growth (Figure 2).<sup>4</sup>

As Massachusetts loses residents, some unlikely neighbors are seeing gains in domestic migration. Between April 2020 and July 2022, Massachusetts lost more than 100,000 net residents through domestic out-migration, while Maine and Vermont gained more than 30,000 from other states. This represents a complete shift from the demographic trends affecting New England in the decade before the pandemic, when the rate of population growth in Massachusetts more than doubled that of its neighbors to the north.

### PUTTING IT IN PERSPECTIVE: HISTORIC MIGRATION IN MASSACHUSETTS

Negative outflows in domestic migration are not new for Massachusetts, and the state economy has recovered from

**Figure 2. Total Tax Returns From Residents Who Left**

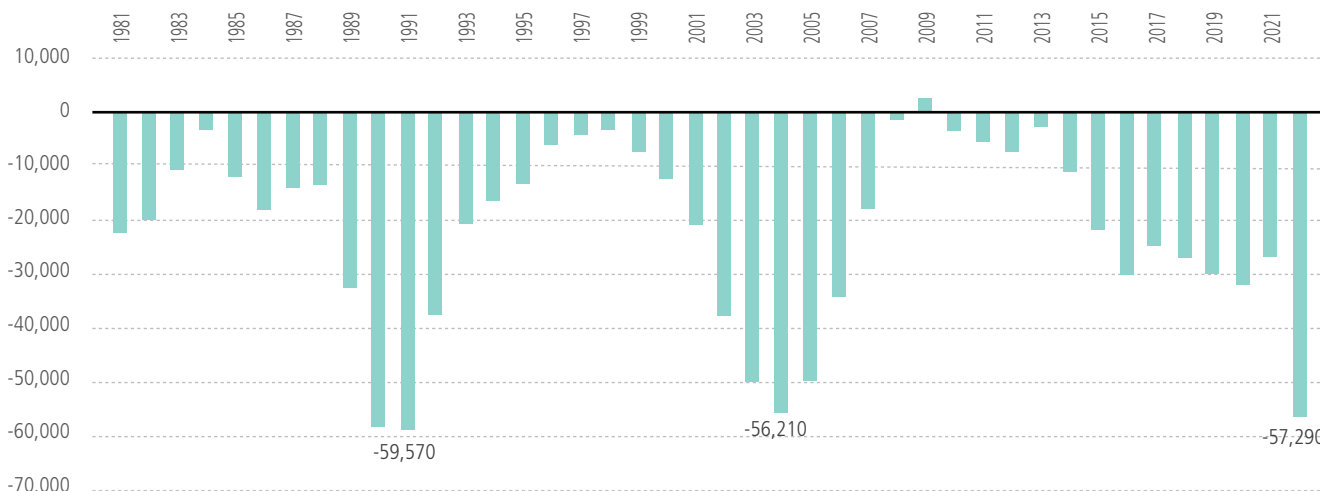


■ Source: Internal Revenue Service, Individual Income Tax Returns: Gross Migration for Selected Income Items by State, Size of Adjusted Gross Income, and Age of Taxpayer [1], Calendar Years 2020-2021

previous dips. In 2022, Massachusetts’ net out-migration figure was just over 57,000, but similar figures were reached, or even exceeded, in the 1990s and early 2000s (Figure 3). The fact that the Commonwealth has been here before means that recovery is possible, but it is also important to assess what is different this time around as the state leverages lessons learned from the past.

The last time domestic out-migration in Massachusetts exceeded the current figure was in 1991. In July of that year, the state’s unemployment rate was over 9 percent as a national recession hit the Commonwealth especially hard. Out-migration was partly driven by residents leaving the state to look for jobs. The same was true in 2003 and 2004, when out-migration again spiked

**Figure 3. Domestic Out-Migration, 1981–2022**



■ Source: U.S. Census Bureau, Population Estimates Program





in Massachusetts just as the state's unemployment rate reached its highest levels since the prior downturn. In the past, out-migration trends have worsened due to a weakening state economy.

That is not the situation we are currently in. The state has an unemployment rate of less than 3 percent, and the number of open jobs is double that of available workers.<sup>5</sup> People are not leaving Massachusetts due to a lack of work opportunities. Instead, it appears that the combination of high costs and lower barriers to relocation has put Massachusetts at a competitive disadvantage for attracting and retaining residents.

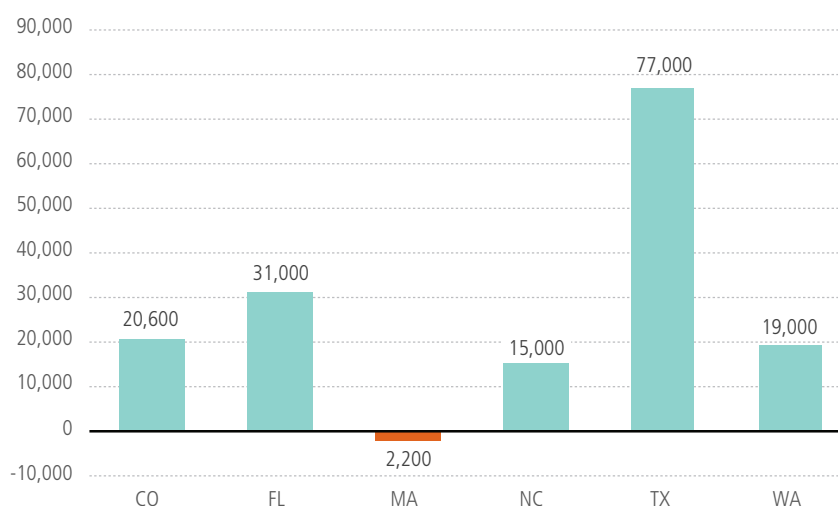
### THE IMPACT ON INNOVATION: LOOKING AT SECTOR SHIFTS IN EMPLOYMENT

Losing residents—and workforce—to other states has clearly had a negative effect on Massachusetts' ability to grow its economy. The potential impacts are even more concerning if future worker shifts are more pronounced in sectors that have historically been economic strengths of the Commonwealth. Once again, the data are preliminary, but initial indications show that, as

Massachusetts loses population to other states, it also falls behind in job growth in areas of long-term economic strength. For example, Massachusetts is near the top of national rankings in computer and mathematical jobs per 1,000. However, since the start of the pandemic, Massachusetts has lost about 2,000 jobs in computer systems design, while six competitor states have gained 160,000 (Figure 4).<sup>6</sup>

Job data and migration data are not the same, as someone working remotely for a Massachusetts company is typically still counted as a Massachusetts job, even if the person has migrated out of the state. However, this means that troubling job numbers, such as those in the computer sector, may in fact understate the economic impact of slowed job growth in Massachusetts, as some component of Massachusetts jobs

**Figure 4. Change in Computer Tech Employment, March 2020–March 2023**



Source: U.S. Bureau of Labor Statistics, State and Area Employment, Hours, and Earnings

may reflect remote workers who have permanently relocated to other states.

Pandemic-era data have indicated that white-collar jobs are more likely to allow flexibility for working remotely. This gives employees less incentive to locate near their place of employment and potentially increases incentives for employers to seek workers in lower cost locations. This is a bad combination for a high-cost state with a disproportionate share of white-collar workers.

### PUTTING IT TOGETHER: WHAT'S NEXT FOR MASSACHUSETTS MIGRATION

Ebbs and flows of domestic migration are not a new challenge for Massachusetts, and it is still too early to know which aspects of the pandemic's demographic disruption are permanent and which are temporary blips. However, the data we do have indicate that major aspects of how people live and make location choices have changed. They also show that Massachusetts entered March 2020 facing some concerning demographic trends with an aging population, declining birth rate, and domestic out-migration—trends that have accelerated post-pandemic. This combination is a real threat to the state's economic future.

Three factors emerge as central to the Commonwealth's efforts to retain and attract residents:

1. How expensive is it to live in Massachusetts?
2. What relative benefits does Massachusetts residency provide compared with other states?
3. How easy is it to relocate from Massachusetts without major life disruption?

There is little Massachusetts can do about the third question since a large share of the state's workers have work-location flexibility they never

considered prior to the pandemic. Thus, the answer to the first two questions will likely govern the effects of migration moving forward. To that end, the Commonwealth must focus public policy efforts on lowering the cost of living and enhancing the quality of life for families to make the Commonwealth the most attractive place it can be for people to settle and stay.



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### Endnotes

- 1) U.S. Census Bureau, National Population Totals and Components of Change, 2020–2022 (<https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-total.html>); Moody's Analytics (<https://www.economy.com/databuffet/preview/start>).
- 2) INRIX 2022 Global Traffic Scorecard (<https://inrix.com/scorecard>).
- 3) Redfin, Rental Market Tracker, March 2023 (<https://www.redfin.com/news/redfin-rental-report-february-2023>).
- 4) IRS, Gross Migration for Selected Income Items by State, Size of Adjusted Gross Income, and Age of Taxpayer, Calendar Years 2020–2021 (<https://www.irs.gov/pub/irs-soi/2021inmigall.xlsx>).
- 5) U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (<https://data.bls.gov/PDQWeb/jt>) and Local Area Unemployment Statistics (<https://data.bls.gov/PDQWeb/la>).
- 6) U.S. Bureau of Labor Statistics, State and Area Employment, Hours, and Earnings (<https://data.bls.gov/PDQWeb/sm>).



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