

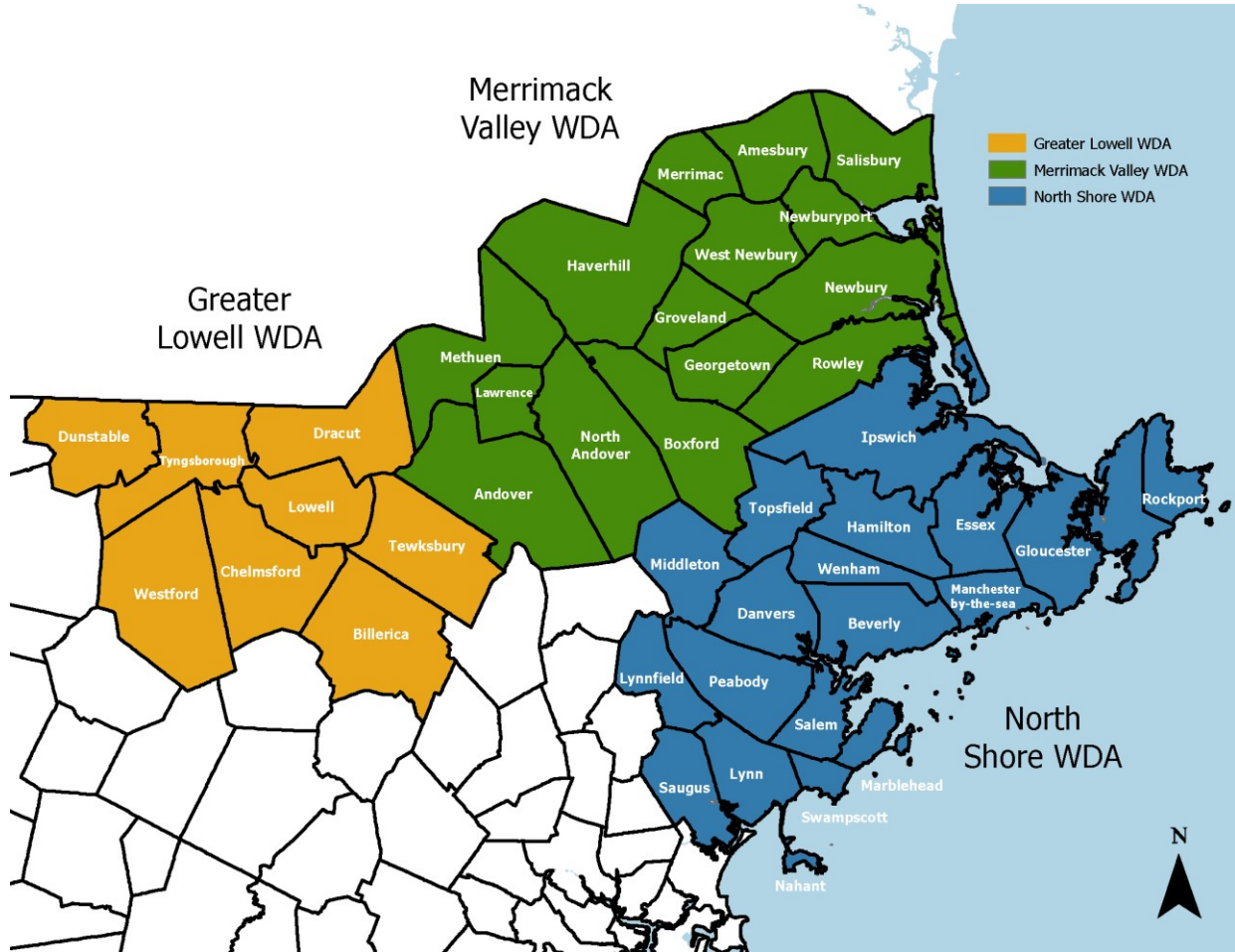
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Where are we now?

Regional Context

Northeast Massachusetts has a population of 1.1 million, which includes the 42 cities and towns that are served by Greater Lowell Workforce Board, Merrimack Valley Workforce Board, and the North Shore Workforce Board (Figure 2). The Greater Lowell area is made up of 8 communities, which includes the urban center of Lowell and its surrounding communities. The Merrimack Valley area consists of 15 cities and towns, including the larger cities of Haverhill and Lawrence, along the Merrimack River and the New Hampshire border. The North Shore area comprises 19 cities and towns, including the cities of Beverly, Gloucester, Peabody, and Salem and other shoreline communities. The combined Merrimack Valley and North Shore Workforce Boards comprise the entirety of Essex County while the Greater Lowell Workforce Board represents the northeastern corner of Middlesex County, the most populous county in Massachusetts.

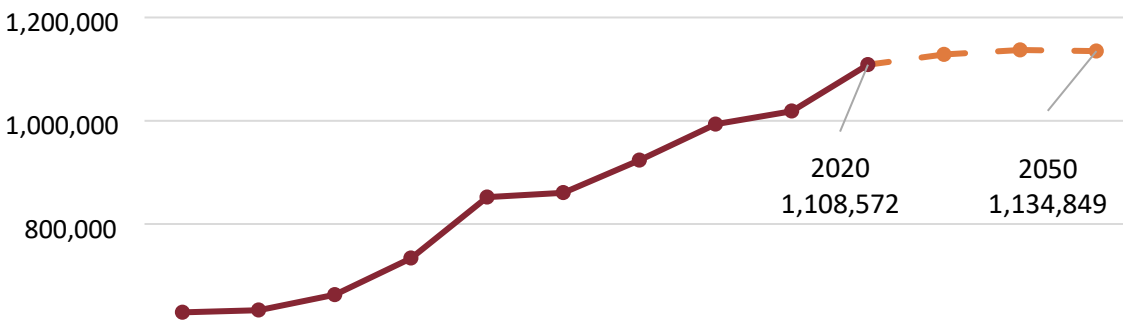
Figure 2: Map of Workforce Development Areas (WDA) in Northeast Massachusetts



CRITICAL TRENDS IN POPULATION AND REGIONAL DEMOGRAPHICS THAT IMPACT THE WORKFORCE

The Northeast Massachusetts population has grown steadily over the past decades but is projected to slow over the next few decades (Figure 3). From 2010 to 2020, the regional population grew by nine percent, adding around 90,000 people. Between 2020 and 2050, the region is projected to gain around 25,000 in population, which is a two percent growth rate, a slower pace than the region has been growing.

Figure 3: Northeast Massachusetts Population, 1930-2020 Decennial Census Counts, Projected to 2050





Source: Decennial Census data and UMDI v2024 Population Projections

The growth rate in Massachusetts overall is also projected to slow over the next few decades; between 2020 and 2050, the population in the state is expected to have little change with a projected decrease of less than one percent (Table 2). The population projections vary by region, however. In Greater Lowell, the population is projected to have a small one percent increase by 2030 followed by a small decrease of about two percent overall between 2020 and 2050. The North Shore follows a similar pattern but overall the population remains steady with only about a one percent increase projected by 2050. The greatest projected growth is in the Merrimack Valley, which is projected to grow by eight percent, adding around 30,000 people between 2020 and 2050 (Table 2).¹

Table 2: Northeast Population Projections to 2050 by Region

	2010	2020	2030	2040	2050
Greater Lowell	275,404	298,405	301,366	298,515	292,009
Merrimack Valley	333,748	370,065	382,828	394,593	400,092
North Shore	409,411	440,102	444,202	443,942	442,748
Northeast Massachusetts	1,018,563	1,108,572	1,128,396	1,137,050	1,134,849
Massachusetts	6,547,629	7,039,139	7,115,199	7,102,574	7,021,497

¹ UMDI's population estimates are based on trends in births, deaths, and in- and out-migration. V2024 population projections series uses a cohort-component model based on a combination of trends in fertility, mortality, and migration from 2010 through 2020 and decennial Census data from 2000, 2010, and 2020. The V2024 projections methodology may also be described as a "status-quo" projections model; it assumes that recent trends in the demographic components of population change, such as fertility, mortality, and migration by age, will persist in future periods. See methodology notes at the end of the report for how projections are calculated. More information also available here: <https://donahue.umass.edu/business-groups/economic-public-policy-research/massachusetts-population-estimatesprogram/population-projections>

Source: Decennial Census data and UMDI v2024 Population Projections

The population in Northeast Massachusetts is aging. Projections show that the share of the population that is age 65 and above will increase from the current 17 percent to 23 percent by 2040.² In that same period, the prime age working population, ages 25 to 54, is projected to grow by only four percent. Northeast Massachusetts is aging at a faster rate than the state.

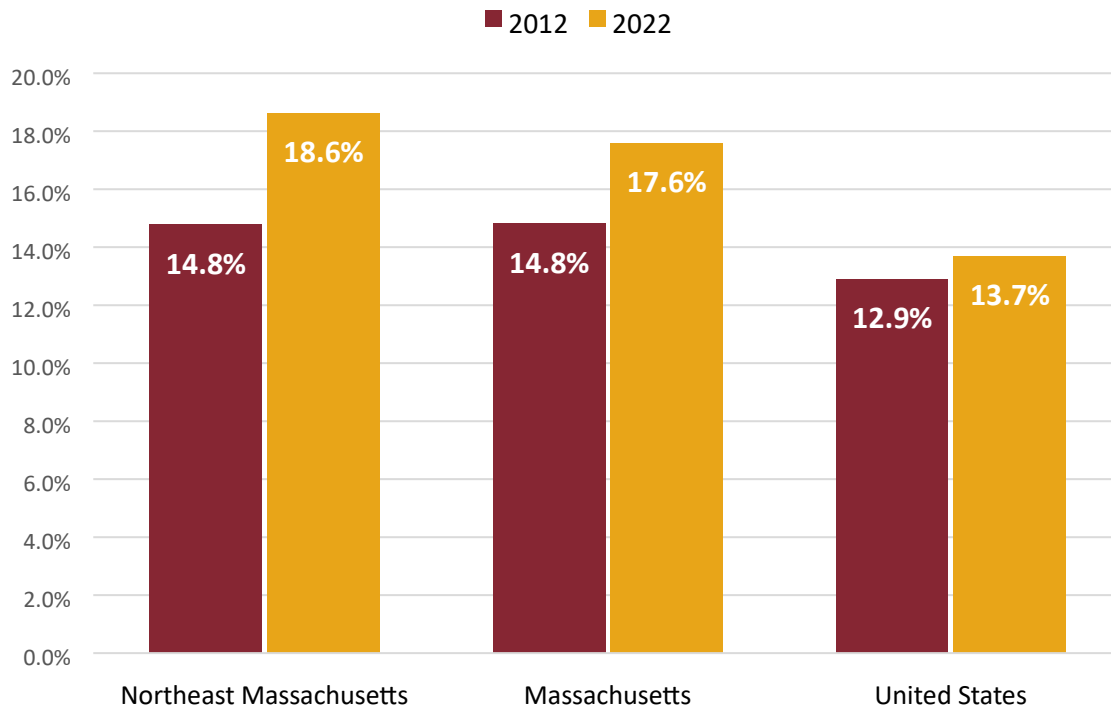
This shift in the age of the population will affect the workforce as more people retire and leave the workforce. In addition to creating job vacancies, retirements can also lead to a loss of institutional knowledge. However, there is opportunity in growing sectors of the population like the foreign-born population. Northeast Massachusetts's foreign-born population has increased over the past decade, and it has a slightly higher foreign-born population than the state at 18.6 percent (Figure 4). More than half of the foreign-born population in the region comes from the Americas, which is a greater share than in Massachusetts overall.³

The region is becoming more diverse in terms of race and ethnicity and there is an opportunity to engage more diverse populations in the labor force. From 2010 to 2020, the region had almost a 50 percent increase in the Hispanic or Latino population (Table 3).

² UMDI v2022 Population Projections

³ U.S. Census Bureau, American Community Survey; UMDI analysis

Figure 4: Percent foreign-born, 2012-2022



Source: U.S. Census Bureau, American Community Survey; UMDI analysis

Table 3: Change in Race and Ethnicity, Northeast Massachusetts, 2010 to 2020

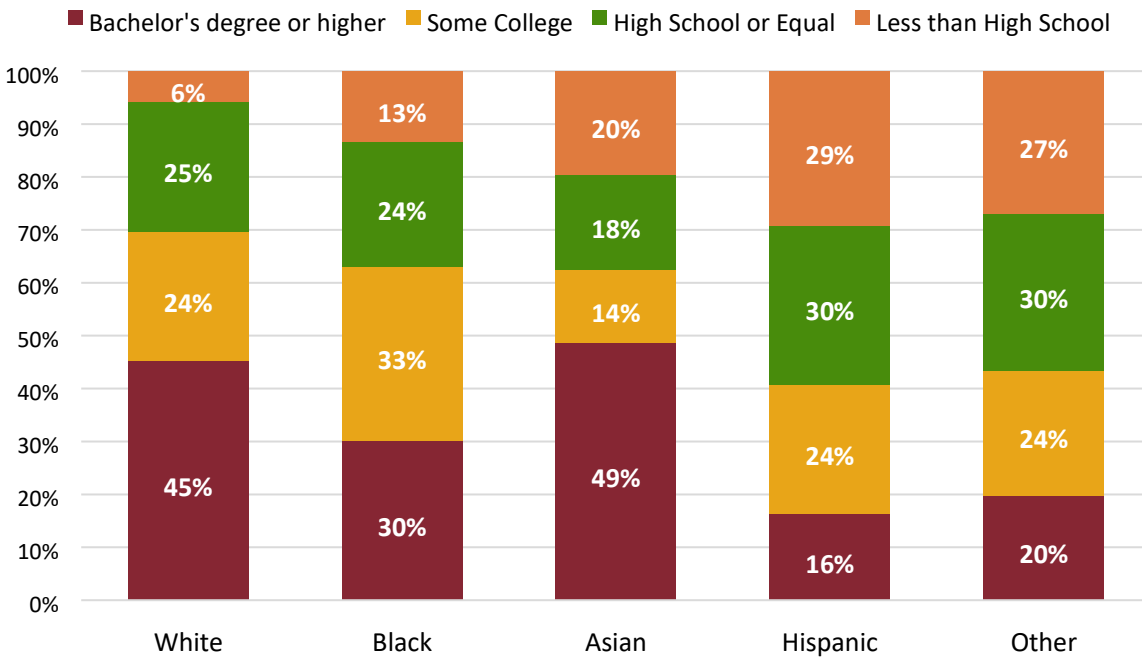
Race Or Ethnicity	2010	2020	% Change
Race			
White	824,874	756,945	-8.2%
Black	37,698	49,695	31.8%
Asian	55,140	73,011	32.4%
American Indian & Alaska Native	3,211	4,687	46.0%
Some Other Race and NHPI	71,904	126,677	76.2%
Two or More Races	25,736	97,219	277.8%
Ethnicity			
Hispanic or Latino	145,255	216,194	48.8%
Non-Hispanic or Latino	873,308	892,040	2.1%
Total Population	1,018,563	1,108,234	8.8%

Source: Source: US Census 2010 SF1 and 2020 PL94 Data, UMass Donahue Calculations

The Hispanic or Latino population has lower educational attainment than other populations, but there could be strategies implemented to bring them into the labor force and into growing industries and career pathways. In Northeast Massachusetts, only 16 percent of the Hispanic or Latino population has a bachelor’s degree or higher, compared to 45 percent of the white population (Figure 5). As this is a

growing sector of the population, workforce strategies focused on the Hispanic population could help increase labor supply while also providing quality jobs for this group.

Figure 5: Educational Attainment by Race, Northeast Massachusetts, 2022



Source: U.S. Census Bureau, American Community Survey 5YR 2018-2022

As of 2023, Northeast Massachusetts has around 665,000 jobs, which includes both full and part time jobs (Table 4). As the most populated of the three subregions, the North Shore region makes up the largest portion of these jobs at 41 percent (

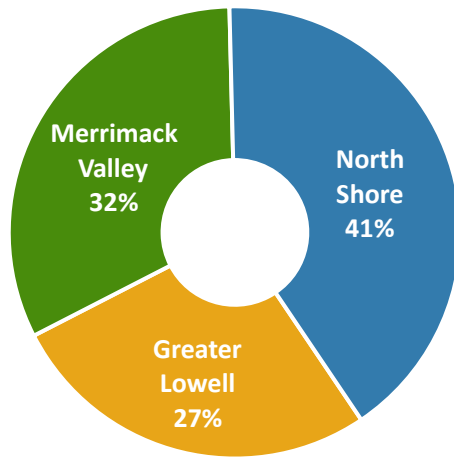
Figure 6). Merrimack Valley, the next largest subregion by population, makes up 32 percent and Greater Lowell makes up 27 percent of the jobs.

Table 4: Jobs by Subregion in Northeast Massachusetts

Geography	2013 Jobs	2023 Jobs	2033 Jobs (Projected)
Greater Lowell	159,020	178,937	205,730
Merrimack Valley	189,992	213,985	245,055
North Shore	235,717	272,419	314,285
Northeast Massachusetts	584,729	665,342	765,070
Massachusetts	4,382,137	5,075,356	5,893,158

Source: Lightcast, includes full and part time jobs

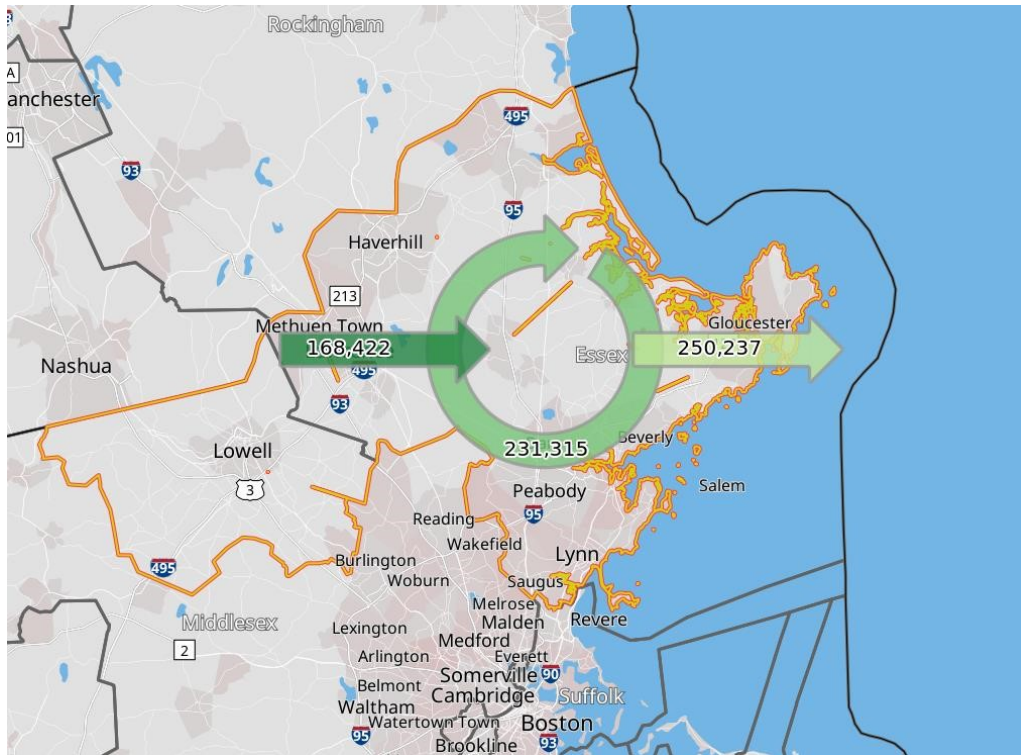
Figure 6: Share of Jobs by Subregion in Northeast Massachusetts, 2023



Source: Lightcast

In Northeast Massachusetts, more people commute out of the region for jobs than the number of people who commute into the region for jobs. Around 250,000 residents leave the region for work, 168,000 workers commute into the region for work, and 230,000 both live and work within the region (Figure 7). The Northeast Massachusetts location along several MBTA commuter rail lines has historically made much of the region popular for people working in the Boston-Cambridge urban core. These same people, if they were more aware about the job opportunities within Northeast Massachusetts, have the potential to add to the supply of labor for the region’s employers.

Figure 7: On the Map, Primary Jobs in Northeast Massachusetts, 2021



Source: U.S. Census, On the Map (for Primary Jobs in 2021)

Industry Demand Analysis (NAICS)

In the state’s recently released workforce plan, they identify four priority industries to focus on: advanced manufacturing, healthcare and human services, life sciences, and clean energy (or “climate tech”).⁴ All four of these industries were brought up in facilitated discussions with the regional planning team as increasingly important sectors for the Northeast Massachusetts region and can help frame the regional strategies.

Northeast Massachusetts will be key in the growth of advanced manufacturing in the state. The region is already a hub for manufacturing and in particular, advanced manufacturing. The regional employment in manufacturing in Northeast Massachusetts is 1.45 times more concentrated than the national average.⁵ Advanced manufacturing was also the most frequently discussed industry in the facilitated discussions with the regional planning team. The concentrations of robotics, semiconductor machinery manufacturing, aerospace, pharmaceuticals, medical equipment, computers, aerospace, and a range of defense-related industries, including secondary and tertiary suppliers (e.g., in fabricated metals) make manufacturing a cornerstone of the Northeast Massachusetts economy. Many of the region’s existing

⁴ <https://www.mass.gov/doc/executive-summary-massachusetts-workforce-agenda-2024-2028/download>

⁵ Lightcast

workforce development strategies are for the advanced manufacturing workforce, and this can be strengthened as this sector continues to grow and evolve.

Regional planning members also noted the growing importance of advanced manufacturing in terms of federal funding and support like with the CHIPS and Science Act. In 2023, the Healey-Driscoll Administration announced that Massachusetts was awarded \$19.7 million in funding through the federal CHIPS and Science Act to establish the Northeast Microelectronics Coalition Hub (NEMC), a regional hub to advance the microelectronics needs of the U.S. Department of Defense.⁶ Regional workforce strategies can continue to build on strengths in advanced manufacturing to help support the growing sector in the state and capitalize on the opportunities from the increased federal funds.

Northeast Massachusetts has existing partnerships that support the regional advanced manufacturing industry. The three workforce boards, along with the Metro North Workforce Board, created the organization Northeast Advanced Manufacturing Consortium (NAMC) to focus on manufacturing for the northeast region. A regional planning team member discussed how this has been a great partnership and organization to develop this industry workforce. An initiative spearheaded by NAMC is the Advanced Manufacturing Training and Expansion Program (AMTEP), one of the largest workforce training programs outside of Boston. AMTEP is a special project funded by a grant from the GE Foundation and managed by the Essex County Community Foundation and Northshore MassHire. It runs in-person training programs at Lynn Vocational Tech, Gloucester High CTE, and Essex Tech in areas such as manual and CNC machining, welding, and electromechanical assembly. They also hold virtual education programs run by the North Shore Community College to help students learn the math skills necessary for modern advanced manufacturing practices. The extra funding from the GE Foundation allows AMTEP to run 8-10 training cycles per year, compared to 1-2 in other workforce areas which ultimately provides a greater scale in training. Participants in the facilitated discussion indicated that NAMC and AMTEP could also serve as a model for other industries (e.g., the nascent clean energy/climate tech industry) to have an organization focused on a specific industry or occupation in Northeast Massachusetts.

The clean energy (climate tech) sector is also a significant emerging opportunity for Northeast Massachusetts. Regional planning members discussed the growing importance of clean energy related fields. This includes the offshore wind terminal project in Salem that could create thousands of jobs, which includes jobs across many industries including advanced manufacturing and construction (e.g., electrical engineers, welders, pile drivers, turbine technicians, etc.). Additionally, climate tech is now a priority in Massachusetts economic development and is an explicit part of the Mass Leads Act, joining life sciences as a strategic long-term growth sector that will receive considerable state investments in coming years.

With the strong economic development focus on climate tech, supportive workforce programs are now being put in place, including a pre-apprenticeship program targeted to opportunities related to Salem Offshore Wind. With the help of a grant from the Massachusetts Clean Energy Center (MassCEC), the

⁶ <https://www.mass.gov/news/massachusetts-wins-proposal-to-host-northeast-microelectronics-hub-through-federal-chips-and-science-act>

MassHire North Shore Workforce Board’s Clean Energy and Offshore Wind Program and Training Initiative is working to raise awareness and meet the early stage demands of the Salem Wind Port and the Clean Energy and Offshore Wind sector as a whole. The program will build direct pathways to employment by establishing Clean Energy and Offshore Wind building trades pre-apprenticeship

program to help fill diversity gaps within the clean energy sector. The training is targeting residents of environmental justice communities throughout the North Shore and Merrimack Valley.

Healthcare is also an important sector in the region as it is the largest industry by number of jobs and has high demand, as seen in high levels of job postings and vacancies. The regional planning team discussed the huge demand for health care occupations and challenges filling those roles, which includes low wages in some of those most in-demand positions.

PAST AND CURRENT HIGH-LEVEL INDUSTRY TRENDS IMPACTING WORKFORCE NEEDS

The largest industry sector in Northeast Massachusetts by number of jobs is Health Care and Social Assistance, which is also the largest industry in the state, overall. The next largest industry sectors in the region are Retail Trade, Government, Manufacturing, and Professional, Scientific, and Technical Services. In the Greater Lowell subregion, the Professional, Scientific, and Technical Services sector is actually the largest industry by number of jobs but is closely followed by Health Care and Social Assistance (see Appendix A). Health Care and Social Assistance is the largest industry in both Merrimack Valley and North Shore. Other regional differences can be found in the tables in the Appendices.

Over the past decade, the region was participating in a state and national economic expansion, though interrupted by the pandemic. Growth has resumed as the state and region head into the middle parts of the 2020s. The industries that have added the most net new jobs in the region are Transportation and Warehousing; Real Estate and Rental and Leasing; Construction; Professional, Scientific, and Technical Services; Finance and Insurance; and Health Care and Social Assistance (Table 5). Transportation and Warehousing added over 16,000 net new jobs in the region, which is a growth rate of over 100 percent. This was in keeping with the trend across the state as Massachusetts added over 100,000 net new jobs in this industry in that same time period.⁷ The job increases in this industry can be attributed to new technological innovations over the past decade including increases in online shopping, which creates more demand for delivery services and distribution centers. There have also been increases in transportation jobs from ride services like Uber and Lyft as well as increases in jobs related to local delivery services such as grocery or food delivery.

Manufacturing lost a small number of jobs between 2013 and 2023, about a one percent loss, but remains one of the largest industries in the region, noting that manufacturing continuously introduces productivity enhancing approaches to production like automation that sometimes masks a strong, competitive industry despite lower gains (and even small losses) in the overall job numbers.

⁷ Lightcast

Over the next decade, the region is projected to add the most net new jobs in Health Care and Social Assistance, which is already the largest industry. This is followed by Government, which didn't have high growth over the previous decade, but is projected to add the most jobs in elementary and secondary schools and local government. There is also expected to be continued growth in Transportation and Warehousing; Real Estate and Rental and Leasing; Professional, Scientific, and Technical Services; and Finance and Insurance. Construction is still expected to grow and add jobs, but not by as much as it grew over the past decade.

Table 5: Historical and Projected Job Growth by Industry, Northeast Massachusetts, 2013 to 2033

NAICS	Description	2013 Jobs	2023 Jobs	2033 Jobs (Projected)	2013 - 2023 % Change	2023 - 2033 % Change (Projected)
62	Health Care and Social Assistance	82,974	91,185	106,442	10%	17%
44	Retail Trade	57,378	61,610	66,901	7%	9%
90	Government	61,744	61,600	71,207	(0%)	16%
31	Manufacturing	61,270	60,871	65,462	(1%)	8%
54	Professional, Scientific, and Technical Services	50,371	59,520	67,554	18%	13%
72	Accommodation and Food Services	39,428	41,454	46,840	5%	13%
23	Construction	30,792	40,108	45,489	30%	13%
81	Other Services (except Public Administration)	33,937	36,404	41,708	7%	15%
56	Administrative and Support and Waste Management and Remediation Services	31,347	35,766	40,632	14%	14%
53	Real Estate and Rental and Leasing	22,947	35,760	44,788	56%	25%
52	Finance and Insurance	24,648	32,964	40,418	34%	23%
48	Transportation and Warehousing	12,737	29,210	38,426	129%	32%
61	Educational Services	19,812	21,131	24,990	7%	18%
42	Wholesale Trade	17,130	18,562	20,775	8%	12%
71	Arts, Entertainment, and Recreation	14,804	16,293	17,875	10%	10%
51	Information	11,795	10,099	11,061	(14%)	10%

55	Management of Companies and Enterprises	7,827	7,741	8,549	(1%)	10%
11	Agriculture, Forestry, Fishing and Hunting	2,455	2,814	3,336	15%	19%
22	Utilities	1,056	2,018	2,339	91%	16%
21	Mining, Quarrying, and Oil and Gas Extraction	276	232	278	(16%)	20%
	Total:	584,729	665,342	765,070	14%	15%

Source: Lightcast

Note: Table is sorted by industries with the greatest number of jobs in 2023

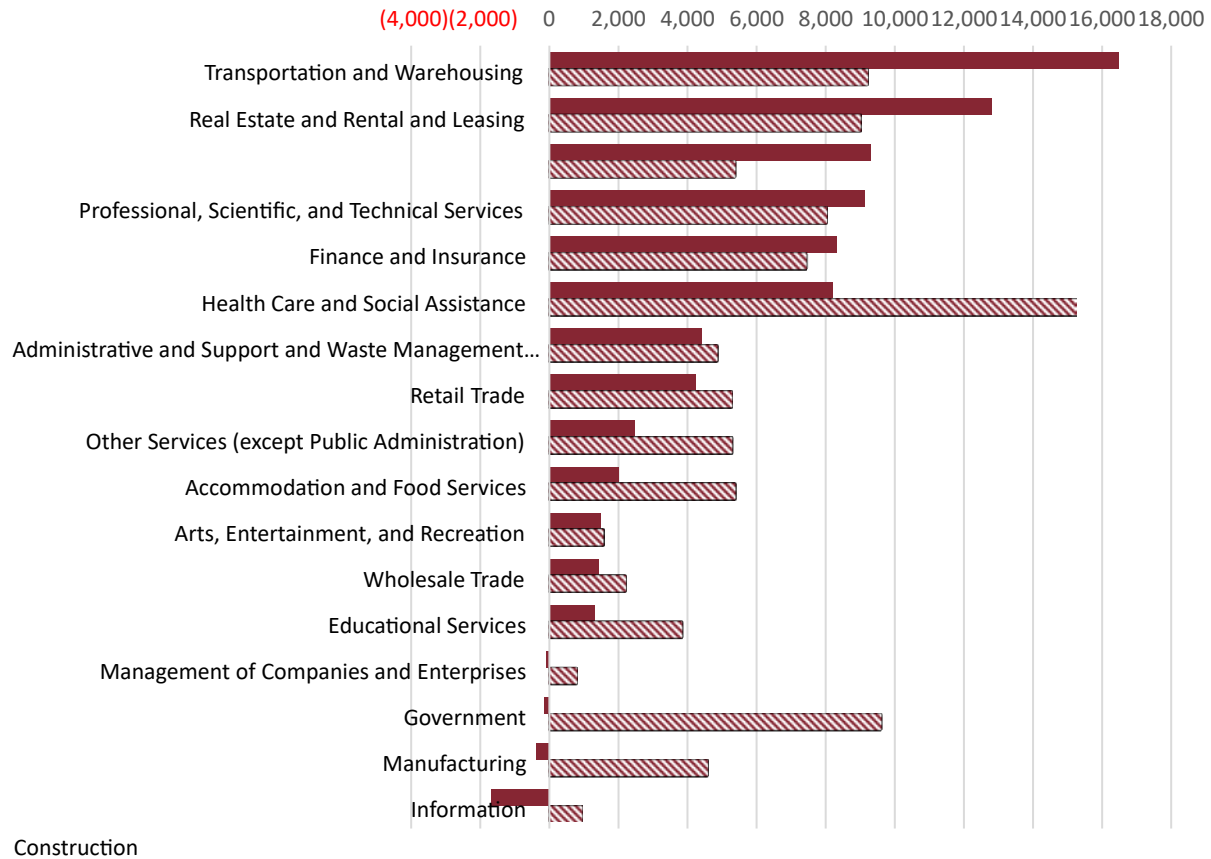
The top growing industry sectors based on both historic and projected growth include the following:

- Transportation and Warehousing
- Real Estate and Rental and Leasing
- Construction
- Professional, Scientific, and Technical Services
- Health Care and Social Assistance
- Finance and Insurance
- Government (including public schools)
- Manufacturing

This growth can also be seen in Figure 8.

Figure 8: Net New Jobs by Industry Sector in Northeast Massachusetts, 2013 to 2033

■ 2013 - 2023 ▨ 2023 - 2033 (Projected)



Source: Lightcast

TOP THREE INDUSTRIES THAT ARE MOST IMPORTANT TO THE NORTHEAST MASSACHUSETTS REGION'S ECONOMIC SUCCESS

Based on the industry data and qualitative data from the facilitated discussions with the regional planning team, the top three industries that are most important to the region's economic success are the following:

1. Advanced Manufacturing
2. Health Care
3. Professional, Scientific, and Technical Services

Other important industries include:

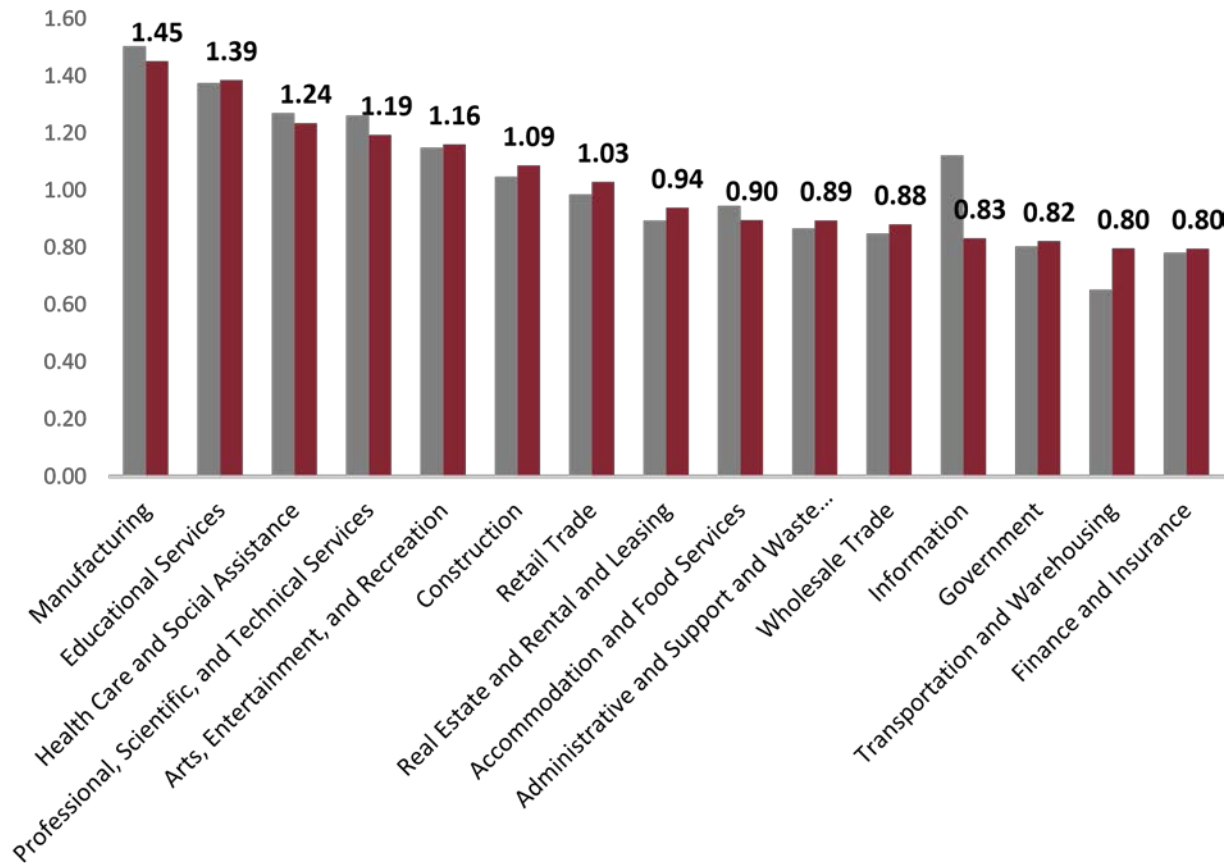
4. Clean Energy or Climate Tech
5. Education
6. Construction

Even though transportation and real estate sectors are adding the most jobs (Figure 8), there are other factors to consider in workforce planning such as the regional competitiveness, the earning potential, and skill or education level. Analyzing the employment concentrations, or “location quotients”, of industries can give more insight into the competitiveness and regional advantages.

Manufacturing has the highest employment concentration in Northeast Massachusetts with 1.45x average national employment (Figure 9). There are eight industry sectors with employment concentration above one, meaning it is above the national average. Educational Services, Health Care and Social Assistance, and Professional, Scientific, and Technical Services also have high employment concentrations in the region.

Figure 9: Employment Concentration by NAICS Industry Sector, Northeast Massachusetts

■ 2013 Employment Concentration ■ 2023 Employment Concentration

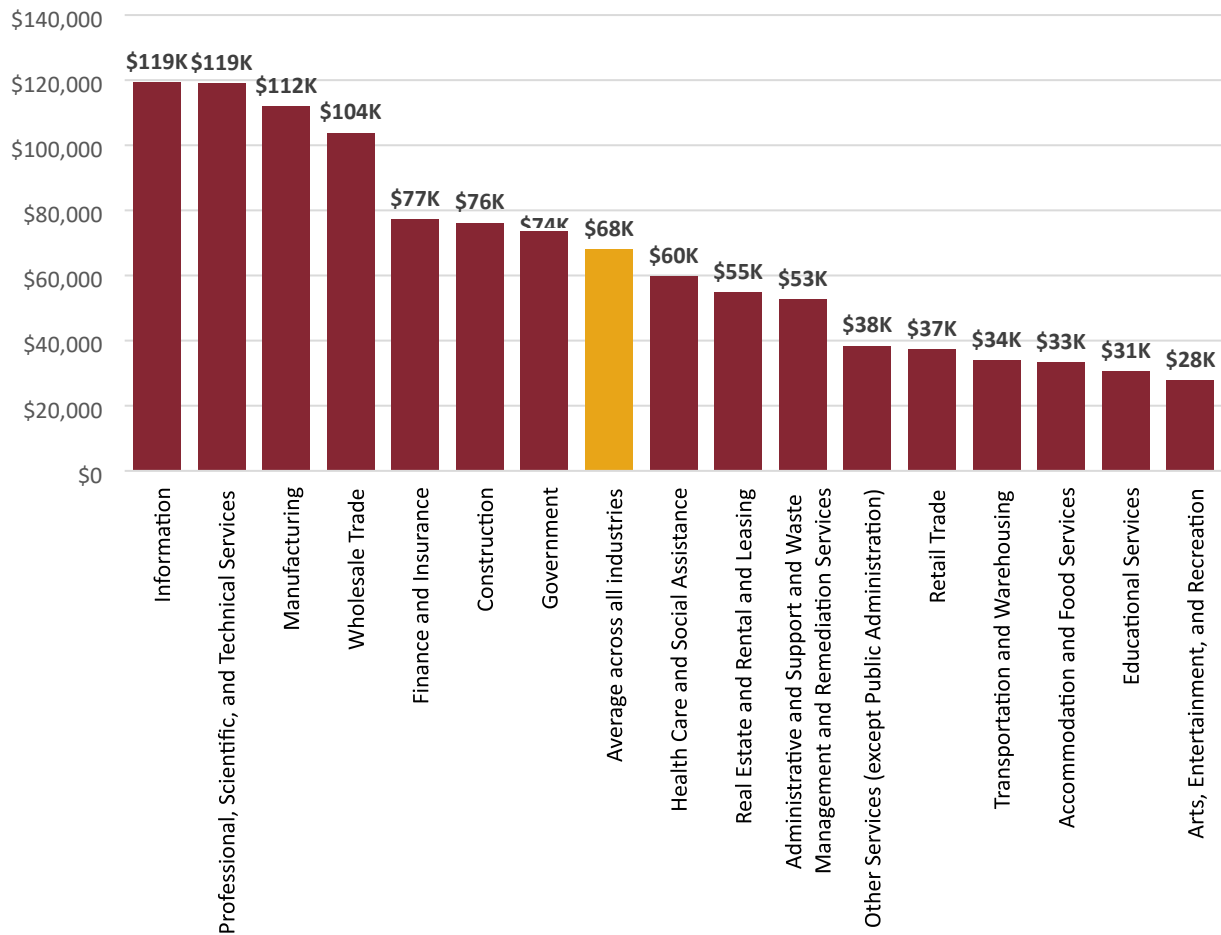


Source: Lightcast

Many of these industries with high employment concentrations also have high wages and earnings in the region. Professional, scientific, and technical services and manufacturing both have higher wages of over \$100,000 (Figure 10). Construction, which also has an employment concentration above the national average, has higher wages of around \$76,000.

The region's largest industry, health care and social assistance, has lower wages and earnings than the average across all industries, but it remains one of the most in-demand industries in the region. The low wages in this industry were an area of concern among the regional planning participants. Similarly, Educational Services has low wages but is the second largest industry sector in the region.

Figure 10: Current Wages, Salaries, & Proprietor Earnings by Industry Sector, Northeast Massachusetts, 2023



Source: Lightcast

Based on the high earning potential, high employment concentration of manufacturing, and the existing advanced manufacturing ecosystem, advanced manufacturing is a priority industry for the region. Advanced manufacturing is also related to the clean energy sector and can help support this industry as well. Both advanced manufacturing and clean energy are priorities for Massachusetts.

Health care is also a priority industry as it is the largest industry in the region, has a high employment concentration and continues to have high demand from job postings. The earning potential in this sector is lower than the average across all industries. The wages in the industry vary considerably depending on occupation, but workforce strategies can aim to make these jobs higher quality, higher paying jobs to meet the demand in the region.

Professional, scientific, and technical services is a priority industry as it has one of the highest industry earnings in the region and has a high employment concentration. The industry includes many of the activities like engineering, research & development, and computer systems design that are crucial to the Northeast Massachusetts innovation economy. This industry has also been growing and is projected to

continue to grow in the region. Initiatives like the “Lowell Innovation Network Corridor” centered on UMass Lowell’s East Campus and now supported by an expansion of Cambridge’s Draper Labs will further drive professional, scientific, and technical services in Northeast Massachusetts. Workforce initiatives supporting the growth and competitiveness of this industry can help workers enter an expansive field of high-paying careers.

In addition to clean energy/climate tech, some other priority industries that were discussed for the region include education and construction. There was some concern among a labor shortage for teachers and vacancies in these positions. There is also high projected growth for jobs in elementary and secondary schools and a skilled and specialized workforce will be needed to meet this demand. Construction is another area where there are labor shortages and high demand. The demand for construction will also continue with the build out of climate tech projects in the region, such as the offshore wind terminal in Salem. These workforce needs should be considered in the overall workforce planning for the region, however, the top three industries for the region to focus on are advanced manufacturing, health care, and professional, scientific, and technical services.

MOST SIGNIFICANT WORKFORCE DEVELOPMENT CHALLENGES IDENTIFIED BY BUSINESS AND INDUSTRY PARTNERS FROM THOSE INDUSTRIES

The workforce development challenges identified in the top three industries (advanced manufacturing, health care, and professional, scientific, and technical services) are related to labor supply issues and the barriers to increasing the labor supply. The regional planning team identified labor shortages as a challenge across all industries. One regional planning member said, “Every single industry is desperate to hire people. I do not believe I’ve seen any company saying, ‘I’m fully staffed, and I don’t need any help finding people.’” While there are shortages across all industries, the regional planning team would like to focus on quality jobs that can best support the Northeast Massachusetts economy. Additionally, there are some workforce development challenges more specific to certain industries. For example, many of the regional planning members discussed the low wages in the health care industry and the challenges in training and recruiting for those positions. Some of the biggest challenges identified in the region’s labor supply include the following:

- Lack of awareness of careers among high school students and other potential new workers
- Barriers for the immigrant or foreign-born population
- High cost of living or other financial barriers
- Aging workforce and increasing retirements
- Lack of capacity or funding for existing programs that address these issues
- Short-term funding mechanisms that mitigate continuity and the effectiveness of workforce training
- Low wages, specifically in several high-demand occupations in the health care industry

Lack of awareness of careers among high school students and other potential new workers

One of the regional planning members described comprehensive high schools as “the biggest population that you can grab” for future workforce pipelines. However, many high school students are unaware of the career opportunities in critical industries, especially those that do not require a college degree, such as many of the positions available in advanced manufacturing. MassHire has many existing programs with

both technical and comprehensive high schools in the region, however, it is difficult to reach every student. One member said, “In general we find that most school staff are not aware of post high school options and that they are not being shared within the schools unless MassHire is sharing it.” They also noted that many schools are still focused on sharing information for attending college and do not have as much information about the career opportunities available for students who are not going to college.

Other planning members also discussed the issue with high schools still focusing on college and not educating students on the good career opportunities available without a degree. This can be an issue for industries like advanced manufacturing where students can be trained to enter a career without a college degree, but they may not be aware of those opportunities. A planning member said, “there is no systemic connection to MassHire for young adults completing high school but are not going to college.” Another planning member said, “There is a real high need to inform people about what manufacturing is and what it looks like.”

The Northeast Advanced Manufacturing Consortium (NAMC) has existing programs with technical high schools and is looking at bringing additional programs to the comprehensive high schools to reach more students. The career and technical high schools have limited capacity, however, and NAMC is looking at ways to broaden opportunities to enter the advanced manufacturing workforce. This includes a potential pre-apprenticeship program over the summer at the technical high schools where students have access to the teachers and equipment. This can increase awareness of the career opportunities for students not going to college. NAMC is also planning to put a counselor focused on manufacturing careers in Salem High School, Peabody High School, and Reading High School. The counselors will also talk to students in elementary and middle schools as well as parents to increase awareness of these careers at earlier ages. Increasing these types of programs for advanced manufacturing as well as the other priority industries (e.g., in climate tech/clean energy) can help source new workers for employers while also getting students hired out of school.

In a similar vein, and with the help of a grant from the Massachusetts Clean Energy Center (MassCEC), the MassHire North Shore Workforce Board’s Clean Energy and Offshore Wind Program and Training Initiative is working to raise awareness and meet the early stage demands of the Salem Wind Port and the Clean Energy and Offshore Wind sector as a whole. The program will build direct pathways to employment by establishing Clean Energy and Offshore Wind building trades pre-apprenticeship program to help fill diversity gaps within the clean energy sector. The training is targeting residents of environmental justice communities throughout the North Shore and Merrimack Valley. A planning team member said some employers might complain about people wanting to work, but the issue is not that they do not wish to work, but they do not know what the jobs are. They also said that while MassHire does a lot of work on increasing awareness of jobs, they cannot reach every student. A regional planning team member said,

“I think we need to do that on a much larger scale than we're able to do with our current workforce within MassHire so educating the school personnel to be able to do that as well and educating employers that you know, we can't really complain that we aren't getting skilled workers if we aren't going out to young people and sharing that information at a much earlier stage.”

Another planning team member talked about how manufacturing employers have become more engaged now with high schools because of their high demand for workers. They also noted that these employers are paying higher salaries now because they are competing for workers. Manufacturing employers and industry partners like NAMC have done a lot of work trying to increase their labor supply; however, they still say increasing awareness of the career opportunities is one of the most important strategies for them. This includes marketing initiatives outside of schools such as billboards or PSA announcements.

Other industries can also follow some of these strategies and programs that the manufacturing industry is implementing. Health care, for example, is also in high demand of workers, including those in lower level positions like home health aides, which does not require a formal degree. These occupations can still lead to higher paying jobs in health care through a career pathway. The regional planning team wants to generally increase awareness to high school students about the various career pathways that are available to them. Programs aimed at the high school population can help source workers for these critical industries.

Barriers for the immigrant or foreign-born population

The immigrant or foreign-born population can be another source of new workers for critical industries, however, there are barriers in getting them into the workforce. One of those barriers is language and education as much of this population is likely to not speak English well or not have formal education credentials in the United States (although they may have credentials from their country of origin).

A couple of regional planning members mentioned issues around work status and authorization as additional barriers in getting this group of workers in the workforce. In addition to getting official work status, another regional planning member noted the cost of working and figuring out how to work can be more complicated with factors like transportation. They might need financial support during training, especially if they cannot work and earn money while in training.

The regional planning members also talked about a few ideas that employers could do to help engage foreign-born workers. They could be more flexible in the educational requirements for jobs and think of ways to create pathways for individuals to earn credentials after they start working. They said, “The goal is to try to get them in the door, and then to kind of move them up.” In this strategy, the employers would take on more responsibility for the workforce training. Again, this can also be helpful because it can be difficult for individuals to receive training if it means they cannot work while in training. Lowering the educational requirements on job postings could be a helpful strategy not just for the foreign-born population, but for anyone with less than a bachelor’s degree educational attainment.

Similarly, another workforce planning member said that English speaking should not be a requirement for employment or for training programs, encouraging employers or program leaders to think differently in how to fill jobs. This includes being more accommodating to workers who speak other languages. Initiatives such as dual language training, technical courses offered in Spanish, and wrap-around support (e.g., case managers, jobs placement specialists, resume assistance, etc.) are gaining traction, facilitating immigrants' integration into the workforce.

High cost of living or other financial barriers

The high cost of living in Northeast Massachusetts can also be a challenge for workers, especially for those in lower wage positions. The regional planning team expressed concern about workers being able to afford housing in the area along with the cost of other factors like transportation and childcare.

Several regional planning members brought up concerns about outmigration and people, particularly younger people, leaving the region to live in more affordable areas like New Hampshire or states in the Southeast. The members discussed strategies to address this like providing financial support during training, however, the workers still need to make living wages when they leave training. A few regional planning members discussed the need for employers to pay higher wages. One planning member said,

“I think that businesses can play a bigger role in ensuring that they're providing and offering quality jobs, whether it's pay, or benefits, or the workforce environment that they are bringing people into. I think that plays a key role in keeping people interested in wanting to grow in an industry and a career path.”

The financial barriers that come along with workforce training prevent some people from either participating in or completing training. Even if training is free, there is a cost for transportation and potentially for childcare. There is also a loss of income if you cannot earn money while going to training. MassHire recently had a program that provided stipends to help people participate in training, but that grant is not currently funded. Other planning board members talked about issues getting people to complete trainings once they get started. Some drop out of training programs because they have to work “survival jobs” for themselves and often to support their families.

Transportation is another barrier to training that can be limited by finances. Many lower income workers or students do not have their own car and there are limited public transportation options in Northeast Massachusetts. One planning board member also talked about transportation affecting students getting internships. If students can't get to their internships or jobs reliably or efficiently, they might not be able to take or sustain them. Implementing workforce programs like internships or apprenticeships also need to consider these other factors that prevent people from joining or completing them.

Aging workforce and increasing retirements

One reason for the existing labor shortages is increasing retirements among the older workers. Retirements will only increase as workers continue to get older. Several regional planning board members discussed the concern over the aging workforce, the “silver tsunami”, as well as the outmigration of the younger population.

In addition to losing workers, members are concerned about the loss of knowledge and experience especially in industries with specialized practices that ar. There were several workforce ideas discussed surrounding how to continue to engage the 65+ population. This could include getting retired or soon-to-be retired workers to help with training or even having part-time jobs training new workers.

Another idea was to try to engage retired workers to take part-time jobs that are in demand such as transportation jobs. One planning member mentioned that there is a need for drivers at places like senior centers or social service agencies that need to transport individuals for certain services. Older or retired

workers might be inclined to take on a part-time job like this and that would help re-engage them in the labor force.

Lack of capacity in training programs

In general, MassHire has designed and implemented numerous programs to address the workforce development challenges facing Northeast Massachusetts. However, they deal with issues of capacity and have sufficient staff and resources to increase their impact.

One common recommendation by multiple regional planning members was the need for extended grant periods. They noted that often the grant time periods are too short, or they stop and start, and make it difficult for the program to operate effectively. One planning member said, “We need to urge longer term grants that allow us to have some opportunity to really have an impact without worrying about the budget period, the state, when that's coming out, when it's not coming out, and just know we have this time to do this sort of work.”

Another planning member confirmed this need for longer term, multiyear grants saying it's important “that the state look at that because the starting and the stopping, and then the pausing waiting six months for a grant to get executed between the ending and the start. It's way too long a time and it's disruptive.” An example of this is with internship and apprenticeship programs for high school students. With the grant “stop and start” issues, they can't recruit for internships until they know they have grant funding, and by the time they know, it's too late in the school year to recruit students. They need more consistency and time to plan these programs in order for them to be effective.

A regional planning member also mentioned that there are “stop and start” grant issues with adult education programs as well. It makes it difficult to know when there are programs available and often the timeline is uncertain of when programs will be offered. The regional planning team wants more consistency in funding, so the programs are as reliable as K-12 education.

Another planning member gave an example of a successful workforce program, AMTEP (Advanced Manufacturing Training and Expansion Program), that has long-term funding. It has been funded by the GE Foundation over the past several years, allowing for continuity and reliability in planning. According to this member, the program recruits, trains, and employs 125 individuals a year in advanced manufacturing and 85 percent are immediately employed upon completion of a five-month certificate and they see a 25 percent wage increase from before the five months certificate to after the five-month certificate. This is just one example of where a consistently funded training program can have a stronger impact on and help increase the scale of training capacity.

In addition to having consistently funded programs, there are successful workforce training programs that could be implemented on a larger scale with more resources and capacity. For example, the programs discussed in educating high school students about career opportunities could be expanded. One planning member said, “I think we need to do that on a much larger scale than we're able to do with our current workforce within MassHire so educating the school personnel to be able to do that as well and educating employers.”

The technical high schools have had many successful workforce training programs. A planning member talked about CTI training programs at the technical schools in the region where students are often hired in

advanced manufacturing careers before graduating and there are still not enough graduates to meet the high demand. However, they also noted that many of these technical schools have waiting lists for the programs. These are successful training programs with direct placement into jobs, however, the technical school programs do not have enough capacity to train enough students to meet the employer demand.

Low wages in health care

The regional planning team members generally agreed that health care jobs are in very high demand in Northeast Massachusetts, but many of the occupations have low wages which makes them harder to fill. There is also an increasing need for health care workers as the population gets older and requires more health care services. Members specifically noted the high demand for home health aides, which is one of the lowest paid jobs in the health care industry. One member also discussed Certified Nursing Assistants (CNA) and medical assistants, which are important, but low paying jobs for the industry. This member said they should be making \$50 an hour for the work they are doing. The team overall agrees that these workers are underpaid and want to find ways to increase pay for these jobs that are essential to the health care industry.

In addition to lower wages, a regional planning member brought up that the nature of the health care industry might deter potential workers from entering this field, especially after the pandemic. The burnout in the industry led to more retirements and it can be emotionally and physically demanding work. Another planning member mentioned that the high cost of earning a bachelor's in nursing (BSN) degree could deter people from becoming Registered Nurses (RN). Even though RNs make more money than CNAs or home health aides, the pay might not be enough for the cost of the degree and again the potentially demanding nature of the work. Some existing programs can help with tuition reimbursement or other costs with the degree, but given the high demand for nursing positions, there is a need for more programs to increase the supply of nurses.

The low pay was also discussed specifically for behavioral health jobs as well. One member talked about a high demand for mental health counselors at hospitals in Northeast Massachusetts, but the jobs do not pay well enough to attract workers. Another member suggested investing in behavioral health occupations that do not pay well but are needed. Another member suggested specifically investing in positions like "career navigators" within health organizations that can help workers stay in their positions and receive training to move up in the organization.

Another planning member mentioned that childcare workers are paid minimum wage, which is surprising given the high cost of childcare. The low pay of these jobs can deter people from this line of work, which can constrain the childcare capacity even further.

Occupational Demand Analysis (SOC)

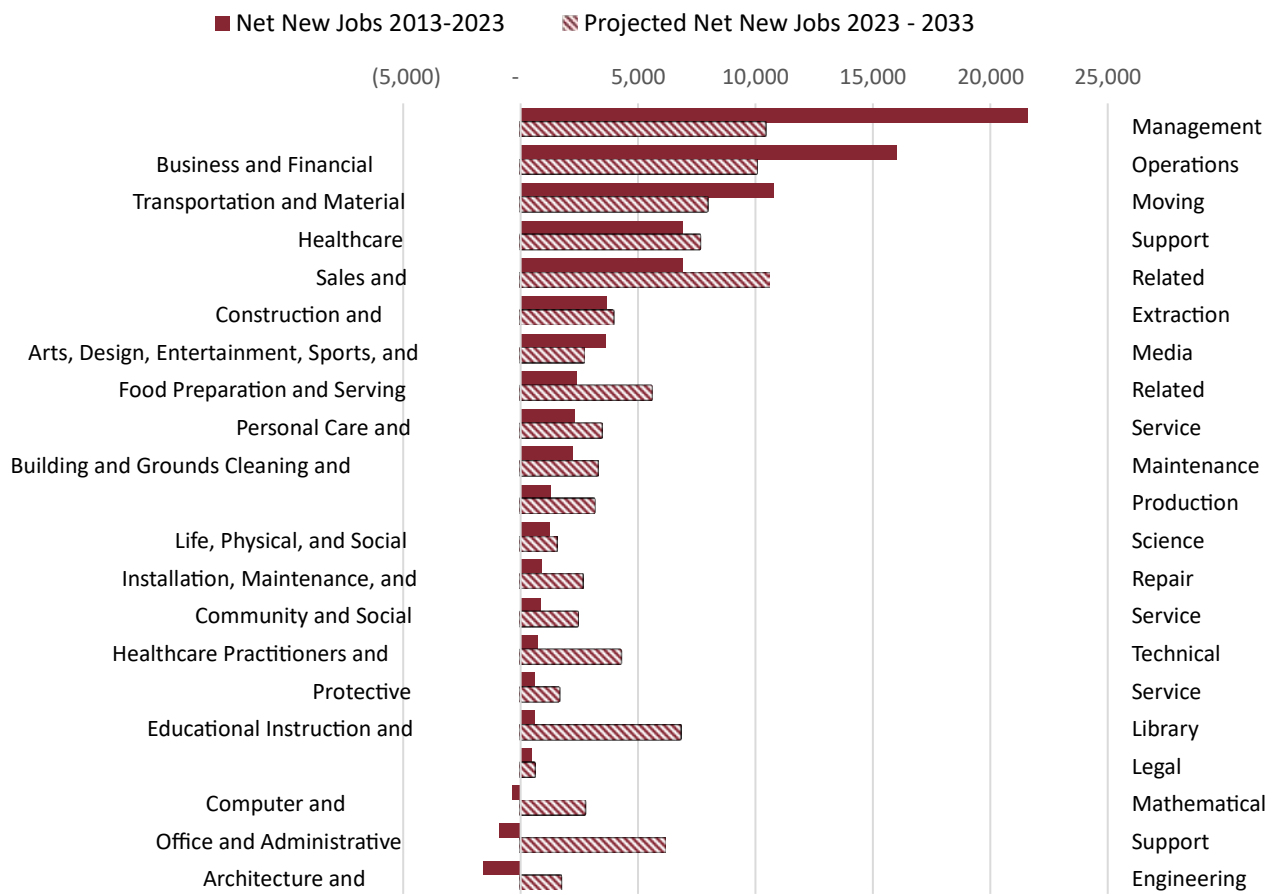
As Northeast Massachusetts continues to rebuild itself and expand in a post-COVID world, a major set of outstanding questions concerns the type of jobs that will be in demand, as well as the forms of work most beneficial to the broader economy and the region's underlying competitiveness. This section of the report

assesses the types of jobs, based on standardized occupational definitions, which will be in demand in coming years.

CRITICAL TRENDS IN OCCUPATIONAL EMPLOYMENT HISTORY IN THE REGION

The occupation groups in Northeast Massachusetts that have added the most net new jobs over the past decade are Management, Business and Financial Operations, Transportation and Material Moving, Healthcare Support, Sales and Related, and Construction (Table 6). The occupation groups that are projected to add the most new jobs in the region over the next decade are those same groups as well as Educational Instruction and Library and Office and Administrative Support (Table 6 and Figure 11). Tables for each of the three sub-regions that comprise Northeast Massachusetts are included in the Appendix.

Figure 11: Net New Jobs by Occupation Groups, Northeast Massachusetts, 2013 to 2033



Source: Lightcast

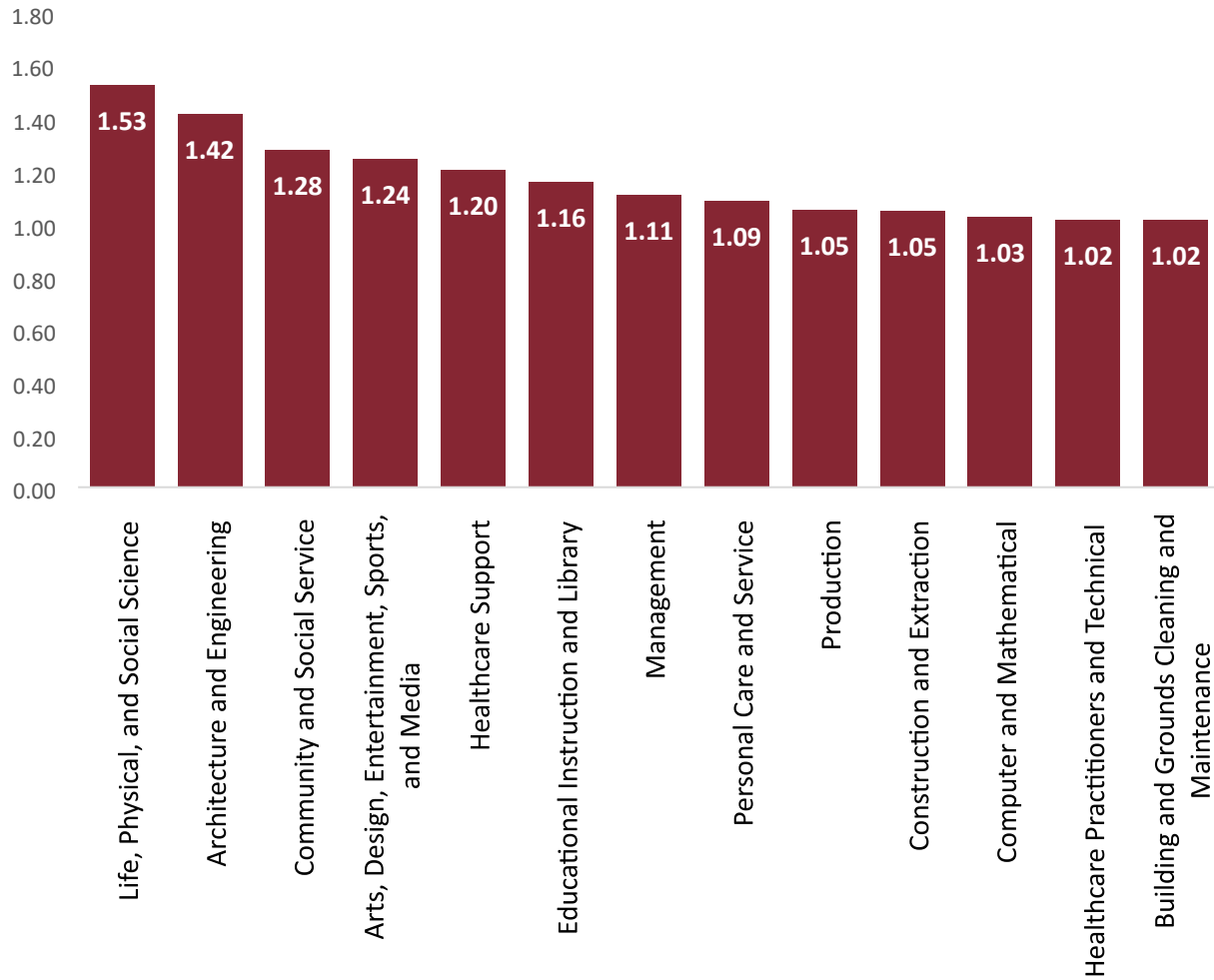
Table 6: Historical and Projected Job Growth by Occupation, Northeast Massachusetts, 2013 to 2023

SOC (2-digit)	Occupation Group	2013 Jobs	2023 Jobs	2033 Jobs (Projected)	2013 - 2023 % Change	2023 - 2033 % Change (Projected)
41	Sales and Related	67,966	74,868	85,432	10%	14%
11	Management	44,616	66,193	76,565	48%	16%
43	Office and Administrative Support	61,632	60,716	66,856	(1%)	10%
13	Business and Financial Operations	36,326	52,361	62,372	44%	19%
53	Transportation and Material Moving	32,388	43,180	51,100	33%	18%
35	Food Preparation and Serving Related	38,642	41,022	46,592	6%	14%
25	Educational Instruction and Library	35,884	36,493	43,284	2%	19%
29	Healthcare Practitioners and Technical	32,366	33,082	37,347	2%	13%
51	Production	30,765	32,037	35,184	4%	10%
31	Healthcare Support	24,496	31,400	39,024	28%	24%
47	Construction and Extraction	26,729	30,411	34,345	14%	13%
27	Arts, Design, Entertainment, Sports, and Media	21,999	25,620	28,331	16%	11%
39	Personal Care and Service	21,881	24,182	27,638	11%	14%
37	Building and Grounds Cleaning and Maintenance	21,148	23,364	26,665	10%	14%
15	Computer and Mathematical	19,095	18,712	21,453	(2%)	15%
49	Installation, Maintenance, and Repair	17,088	18,006	20,643	5%	15%
17	Architecture and Engineering	14,550	12,967	14,709	(11%)	13%
21	Community and Social Service	11,931	12,788	15,233	7%	19%
33	Protective Service	9,355	9,977	11,626	7%	17%
19	Life, Physical, and Social Science	7,881	9,143	10,699	16%	17%
23	Legal	4,823	5,299	5,919	10%	12%
45	Farming, Fishing, and Forestry	1,654	1,981	2,261	20%	14%
	Total	584,729	665,342	765,070	14%	15%

Source: Lightcast

The occupation groups with the highest employment concentrations in the region are Life, Physical, and Social Science and Architecture and Engineering (Figure 12). Other occupation groups with employment concentrations above the national average (above 1) that are relevant to the priority industry sectors include Healthcare Support, Educational Instruction and Library, Production, Construction and Extraction.

Figure :
12 Occupation Groups with Employment Concentrations Above National Average in Northeast Massachusetts 2023

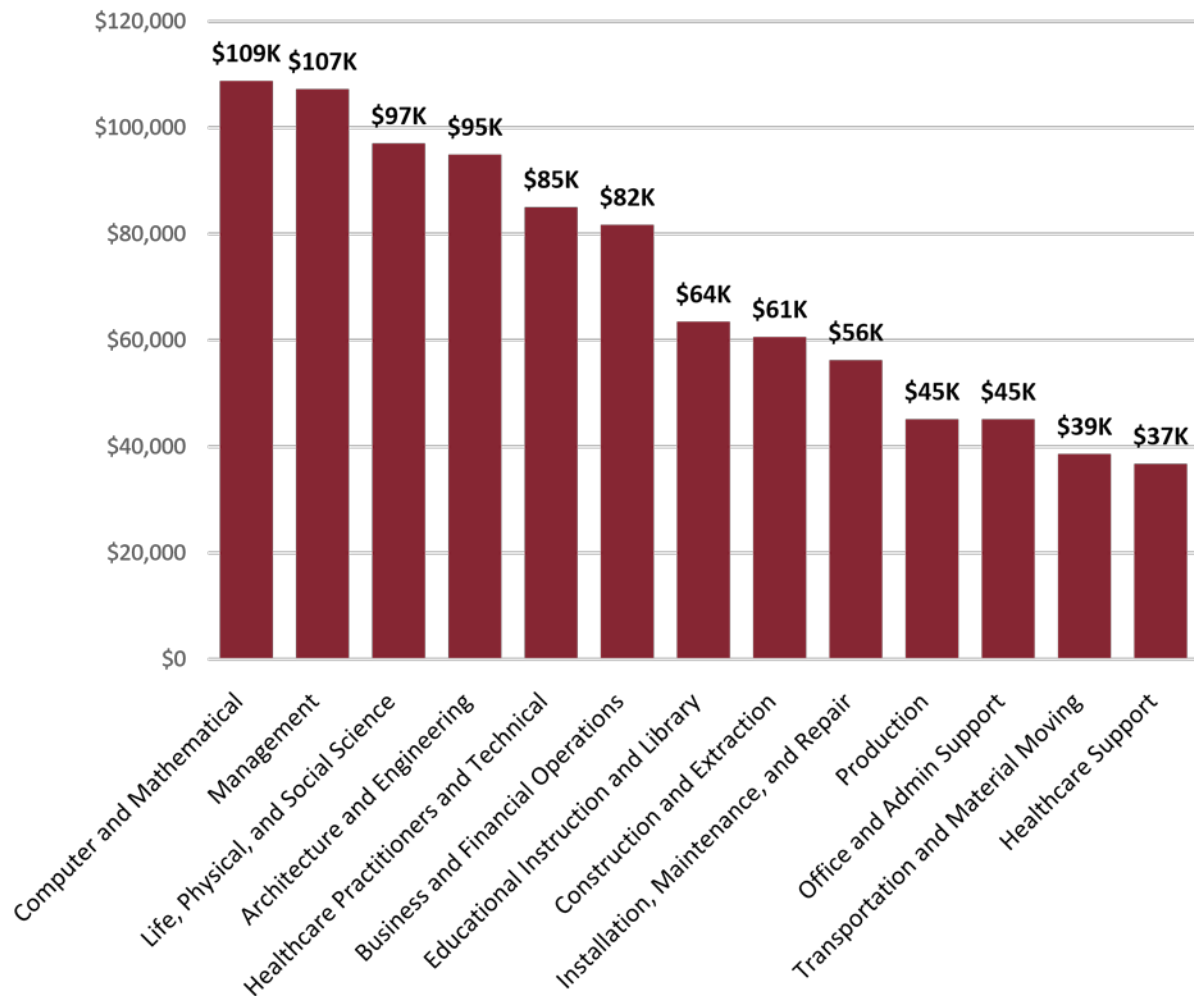


Source: Lightcast

The two occupation groups with the highest employment concentrations also have some of the highest wages: Life, Physical, and Social Science and Architecture and Engineering (Figure 13). Some of the other occupation groups relevant to the key industry sectors have lower wages like Healthcare Support and Production.

Figure :

13 Median Annual Earnings by Occupation Group, Northeast Massachusetts, 2023



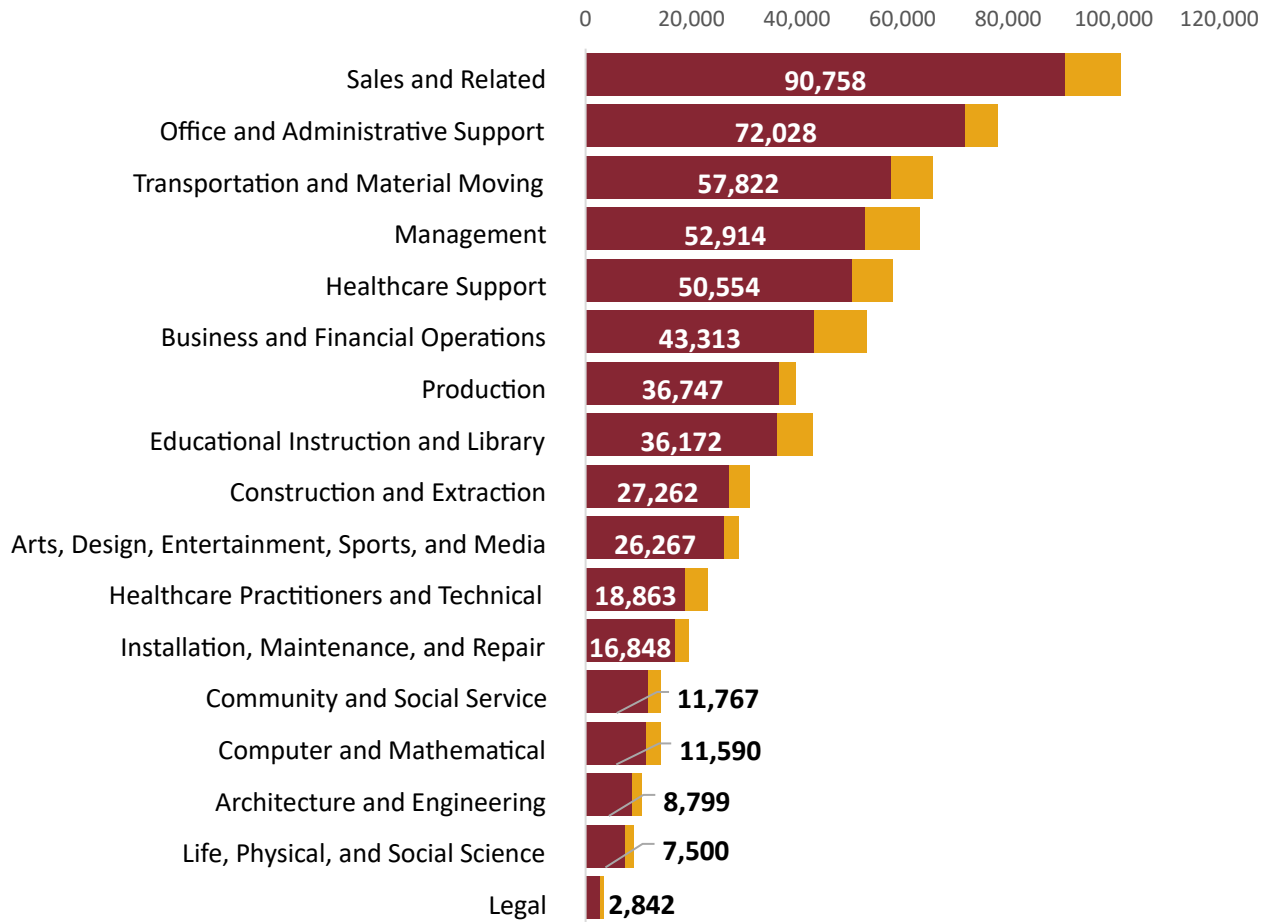
Source: Lightcast

Across all occupation groups, there will be high demand from replacement jobs, which are the jobs that become available as people retire or leave an occupation permanently (Figure 14). As seen in the demographic part of this analysis, shown earlier, Northeast Massachusetts like the rest of the state is becoming older. As people age out of their jobs in larger numbers, identifying, finding, and developing the skills for the workers that will replace them is and will continue to be an imperative for Northeast Massachusetts. Encouraging older workers to stay on their jobs, even with reduced hours and to remain available to contribute to training for younger, less experienced workers are ways to keep older people involved and assist in the transformative transition towards a new cohort of workers.

14 Projected Replacement Jobs, Northeast Massachusetts, 2023 to 2033

■ Projected Replacement Jobs (2023 - 2033) ■ Net new jobs (2023 - 2033)

Figure :



Source: Lightcast

THE TOP OCCUPATIONS OR OCCUPATIONAL GROUPS IN WHICH THE REGION IS FACING THE MOST SIGNIFICANT EMPLOYEE SHORTAGES

According to the state's regional occupational list, the occupations that are priority and in "5-star" demand in **all three** workforce regions include the following:

- Carpenters
- Electricians
- General and Operations Managers
- Industrial Machinery Mechanics
- Nurse Practitioners
- Plumbers, Pipefitters, and Steamfitters
- Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel • Software Developers

The construction and trade occupations like carpenter, electrician, and plumber are priority because of their relevance to the emerging climate tech/clean energy industry – a long-term growth priority for the Commonwealth of Massachusetts. General and operations manager is also a priority for the clean energy sector but is also aligned with advanced manufacturing and life sciences.

Industrial machinery mechanics, software developers, general and operations managers, and sales representatives of services are all priority occupations for the advanced manufacturing sector – a sector as pointed out earlier in the report that has both a legacy and a particular concentration of jobs in Northeast Massachusetts. All four of these occupations are also aligned with life sciences, an additional strength for the region as well an identified strategic priority for Massachusetts. Nurse practitioner is a priority occupation within the region’s large and extensive health care industry.

There is some variation among the regions within Northeast Massachusetts, but these are the occupations that are priorities for the state and have 5-star demand in all three of the workforce regions.

The qualitative findings from the three facilitated discussions carried out for this study further reinforced many of the trends seen in the quantitative data. Health care was one of the major areas that the regional planning team members said is experiencing labor shortages.

One planning member said that they could fill an entire job fair with home healthcare companies looking to hire home health aides. Other members confirmed they are seeing high demand for home health aides, but the wages are low, which makes it difficult to fill those vacancies. Home health aide is not indicated in the state’s occupation list as a priority occupation despite the high number of vacancies and demand for this position. The occupation list does indicate Registered Nurse (RN) and Licensed Practical and Licensed Vocational Nurse (LPN) as 4-star demand and priority occupations for the health care industry. These are higher wage nursing positions, but there is demand for nursing positions at all levels. A career pathway in nursing can help move workers up in this career, however, to reach the level of LPN, RN, or even Nurse Practitioner (NP).

Similarly, planning members discussed the shortages in behavioral health positions and the challenges filling these positions that often have low wages. The state has substance abuse, behavioral disorder, and mental health counselor as a 5-star demand, priority occupation for the North Shore and a 4-star demand, priority occupation for Merrimack Valley. Child, family, and school social worker, and healthcare social worker are also both 3-star demand, priority occupations for North Shore and Merrimack Valley. Mental health and substance abuse social worker is a 3-star demand, priority occupation for Greater Lowell and Merrimack Valley. There is high demand for various counselor and social worker occupations across the region, but the low wages make the positions difficult to fill. The region recently received a behavioral health care hub grant, which several regional team planning members mentioned as a way to help grow this workforce.

Another planning team added that there is also a demand for independent physicians. In general, there is high demand for a spectrum of jobs across the health care industry, including behavioral health. However, the non-competitive wage jobs within this industry frequently make vacancies challenging to fill.

A couple of planning team members also talked about shortages and demand for teachers in the region. One member cited an example of a local school where there was a third-grade class with no teacher, and it took several months to fill the position and teachers had to take turns teaching the class. The state's occupation data does show various teaching occupations for elementary and secondary schools as having high demand, including 3-,4-, and 5-star demand. However, these are not priority occupations in terms of the state's four priority industry sectors. Still, these are crucial positions that remain in high demand across Northeast Massachusetts.

OCCUPATIONS OFFERING A "CAREER PATHWAY" FOR WORKERS TO MOVE TO HIGHER SKILLS AND WAGES, ESPECIALLY WORKERS STARTING AT ENTRY-LEVEL

The regional planning team discussed the idea of career pathways and how they can be applied to most occupations where workers can move up to become supervisors or managers. However, they want to focus on career pathways that lead to good, quality jobs. The workforce boards already have mapped out some career pathways for their critical occupation needs.

The specific occupations that were discussed in terms of career pathways were health care occupations, including nursing occupations and behavioral health occupations, manufacturing occupations, transportation occupations, and IT and computer-related occupations like software developers.

Health care occupations

There is high demand for nursing occupations from home health aides up to nurse practitioners. The regional planning team discussed the high demand for the lower level, low wage positions like home health aides and nursing assistants. These roles are challenging to fill and to keep workers in because of the low wages and difficult work. The planning team wants to develop strategies to make these jobs more attractive, but it mostly comes down to what the employers will pay for those jobs. Additionally, the regional planning team felt that even at the higher-level nursing positions like Registered Nurse (RN), the wages can be too low for the type of work and for the high cost of living in the area.

Still, nursing occupations have clearly defined career pathway where the lower-level positions like home health aides can learn new skills and earn certifications and move up to positions like Certified Nursing Assistant and Licensed Practical Nurse (LPN), and eventually move up to even higher positions like RN.

The region has existing programs and a healthcare hub grant that funds the nursing pathway programs. These pathways help workers go to a CNA up to an LPN and then beyond. These pathways are clearly defined and have some funding, however, there is still a challenge in recruiting for the entry level positions to get enough workers to enter the pathway.

For behavioral health jobs, there is also a career pathway to move workers up to higher-level, higher wage positions. One regional planning team member discussed how there is potential high paying jobs in behavioral health, but it takes time and money to earn those higher degrees to get to that point:

“There is a career pathway around mental health in the mental health industry that you can move up through leading to a bachelor's or master's degree in social work, which pays really well once you get up to that point. But it's a long journey to make it up there. So, you know, they're

critical. We need to be paying attention to them. We need to be supporting people in them, but we need to be helping them move up a career pathway within it. And we, I think we need to be making noise about why is the salary so low.”

Another planning team member recommended that for both healthcare and behavioral healthcare occupations, organizations should invest in positions like “career navigators” to help people stay in the organizations and help show them how they can receive training and move up.

Manufacturing occupations

As a priority industry in the region, advanced manufacturing also has opportunities for career pathways in the occupations within this industry.

A regional planning team member mentioned how UMass Lowell and MIT are working collaboratively on curriculum for a middle occupation between technician and engineer, which is called the “Technologists”. They said there is a high need for this type of occupation and this curriculum will be taught at the community colleges. This new occupation will provide a chance for technicians, which is a lower paying job, to advance to a higher paying job and is a pathway to continue to advance up to engineer.

The regional planning team also discussed the first line supervisor group leader position in manufacturing. This is another job that is an opportunity for lower-level workers to upskill to make higher wages in a supervisory position. They also said there is a high need for this position in manufacturing.

Computer occupations

For IT and computer related jobs like software developers, a regional planning team member said, “Any computer related job inherently builds in our certifications where employees go back and get recertified or get certified in new programs. And so automatically, that's like a built-in career pathway. So, they're constantly improving their skills and homing in on the new skills that are ever changing.”

They also said that the challenge with these jobs can be getting the entry level workers into this pathway. There are entry level positions that only require some computer training and do not require a college degree. Once they have entered the career pathway, they can continue to build their skills and get certifications to move up in these positions. The high-level computer occupations like software developers are high paying jobs and have potential for upward mobility. However, having a clearly defined pathway and strategies to recruit the entry level workers for the pathway are needed.

Workforce Supply

Northeast Massachusetts is populous with over a million people and is a sub-region of the much larger Boston Combined Statistical Area (CSA) which is one of the largest in the country with a population of over eight million. With that, Northeast Massachusetts is a component of a large and diverse labor shed with numerous educational assets. However, even with these advantages, employers in Northeast