

4

Regional Profile

Demographics

Introduction

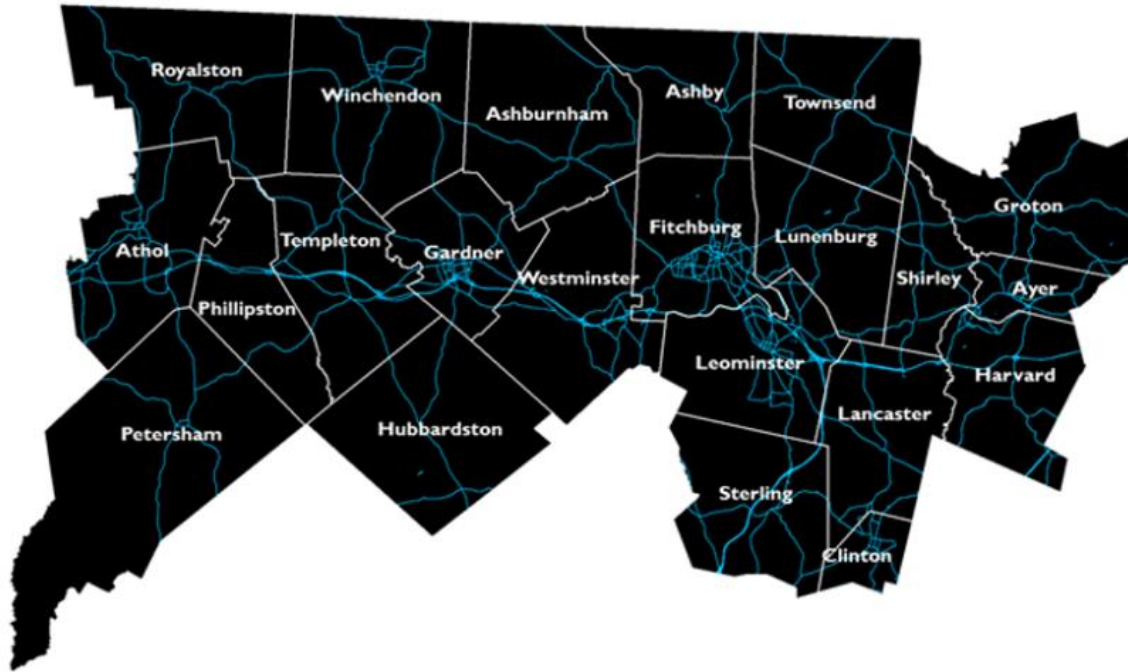
This following provides a profile of the Montachusett region through various sets of data, i.e., the U.S. Census and the American Community Surveys (ACS), as well as various MRPC reports developed in accordance with local studies and contracts.

Through the tables, charts and analyses presented, an understanding of the population that comprises the Montachusett region and its unique features and characteristics can be gained. The various data sets presented highlight the continued changing face of the region and help provide some background to the relationship that exists between the communities and their needs.

It should also be noted that between the last RTP completed in July of 2019 and this update, the Region, Commonwealth, the nation, and the world experienced an unprecedented situation in the form of the COVID19 pandemic. In an attempt to limit the spread and effectiveness of the virus, many policies, restrictions, and mandates were implemented by all levels of government. From mid-2020 to late 2022/early 2023, the most heavily impacted COVID years, these mandates had a significant effect on every business and employment sector and individual in the Region. These impacts may be reflected in some of the demographic data presented.

Background and History

Comprised of 22 communities located in north central Massachusetts, the region measures approximately 685 square miles in size. Of this area, approximately 654 square miles (or approximately 95%) is land.



The Montachusett Region's earliest settlements were founded as trading outposts. By the second half of the eighteenth century, most communities in the region were settled. Originally, local economies focused on agriculture but, since farming provided a poor return, manufacturing quickly became the dominant economic force in the region.

Montachusett communities harnessed streams and rivers for water-powered manufacturing originally allied with agricultural production. By the mid-nineteenth century, the production of lumber and wood products became the region's largest industry, and the City of Gardner was known internationally as a major center of chair manufacturing.

Growth in the region was accelerated by railroad connections enabling the easy transport of materials, goods and people. Communities with an industrial base prospered and expanded with the influx of migrants both foreign and US born. Smaller towns did not see the same widespread growth.

The 20th Century saw a period of economic decline caused by the migration of industries to southern states and the Great Depression. The smaller industrialized communities suffered severely and recovered slowly. Local economies, recognizing the instability of the region's industrial base, are undergoing a transition away from specialization in manufacturing industries. One successful foray has proven to be tourism with the creation of Johnny Appleseed theme marketing and the Johnny Appleseed Trail Association, Inc. (JATA) especially visible in Phillipston and Leominster.

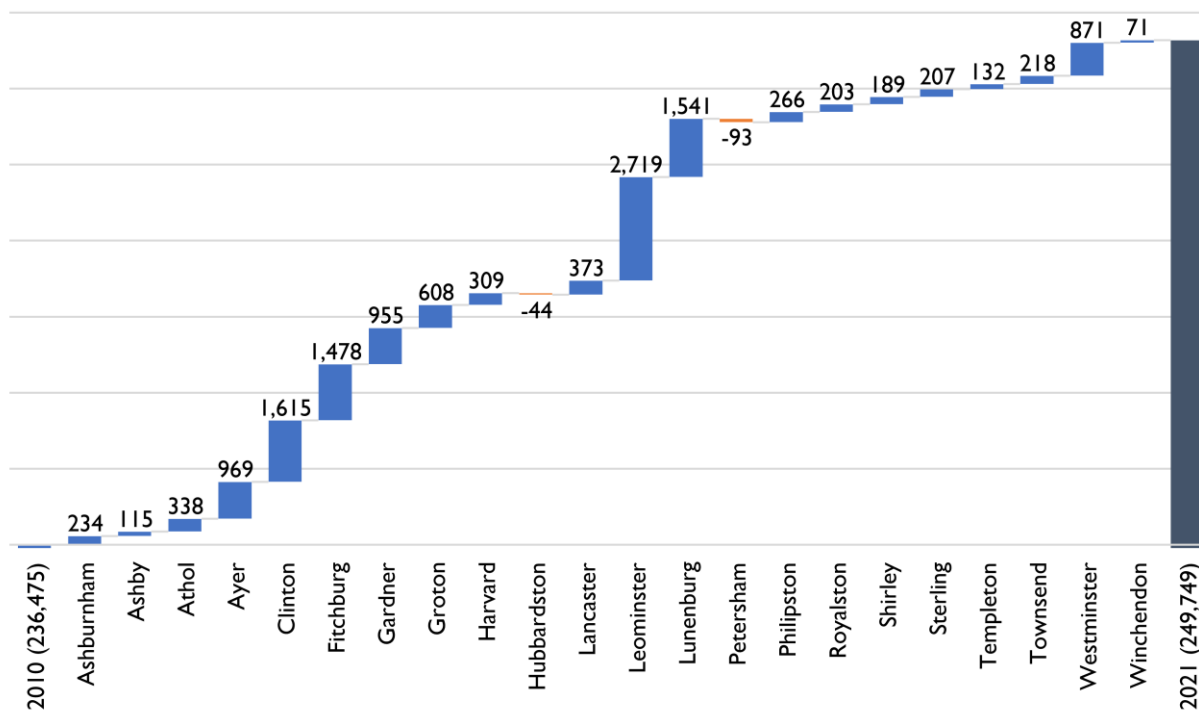
Regional Analysis

The following section identifies and highlights several key demographics for the Montachusett Region. From a review of this information, a series of regional trends and developments are identified. These trends, combined with input from the general public and local officials, will help to establish the future growth of the Montachusett Region. Again, it must be noted that the COVID pandemic years of 2020 to 2022 impacted a lot of the happenings in the Region and consequentially will have affected the trends and developments identified when compared to where the Region stood in 2019 at the development of the last RTP.

A. Population

The Montachusett Region witnessed a 5.6% increase in its population from 2010 to 2021, welcoming an estimated 13,274 new residents during this time (see Figure 4 -1). As of 2021, the Region boasts a population of 249,749 residents across its 22 communities.

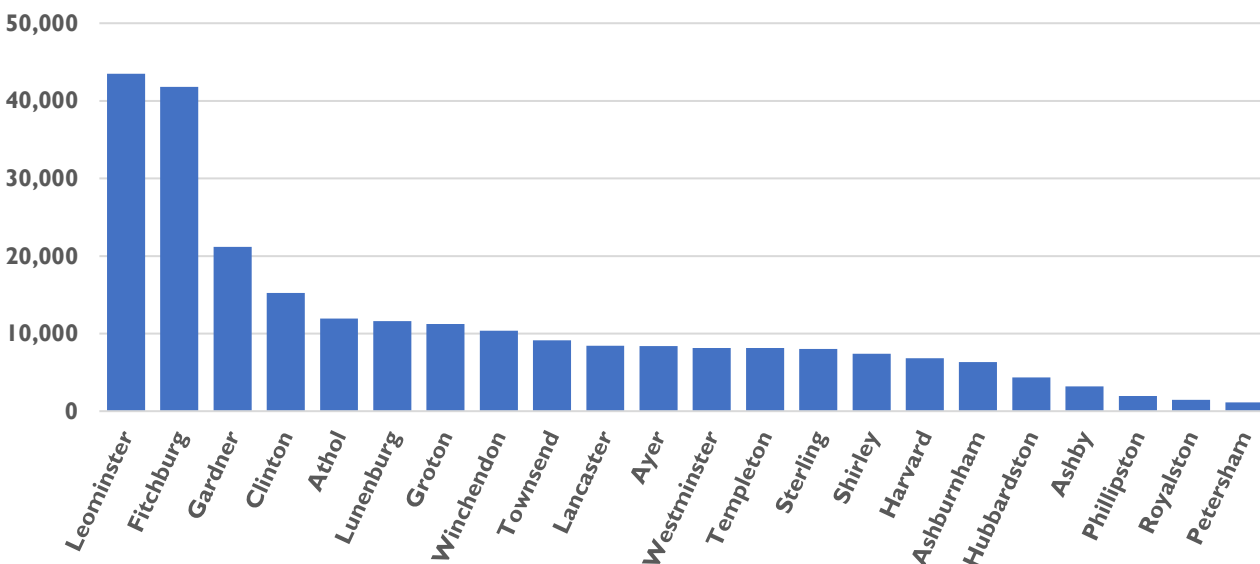
Figure 4.1-1: Population Change in the Montachusett Region (2010 to 2021)



Source: US Census, American Community Survey (2017-2021) 5-Year Estimates

Leominster saw the largest population increase in recent years with approximately 2,719 new residents (a 6.6% increase from 2010). The majority of communities saw more modest population increases, while two communities – Hubbardston and Petersham – experienced a slight decline in population (-1% and -7.5% respectively).

Figure 4.1-2: Population by Community

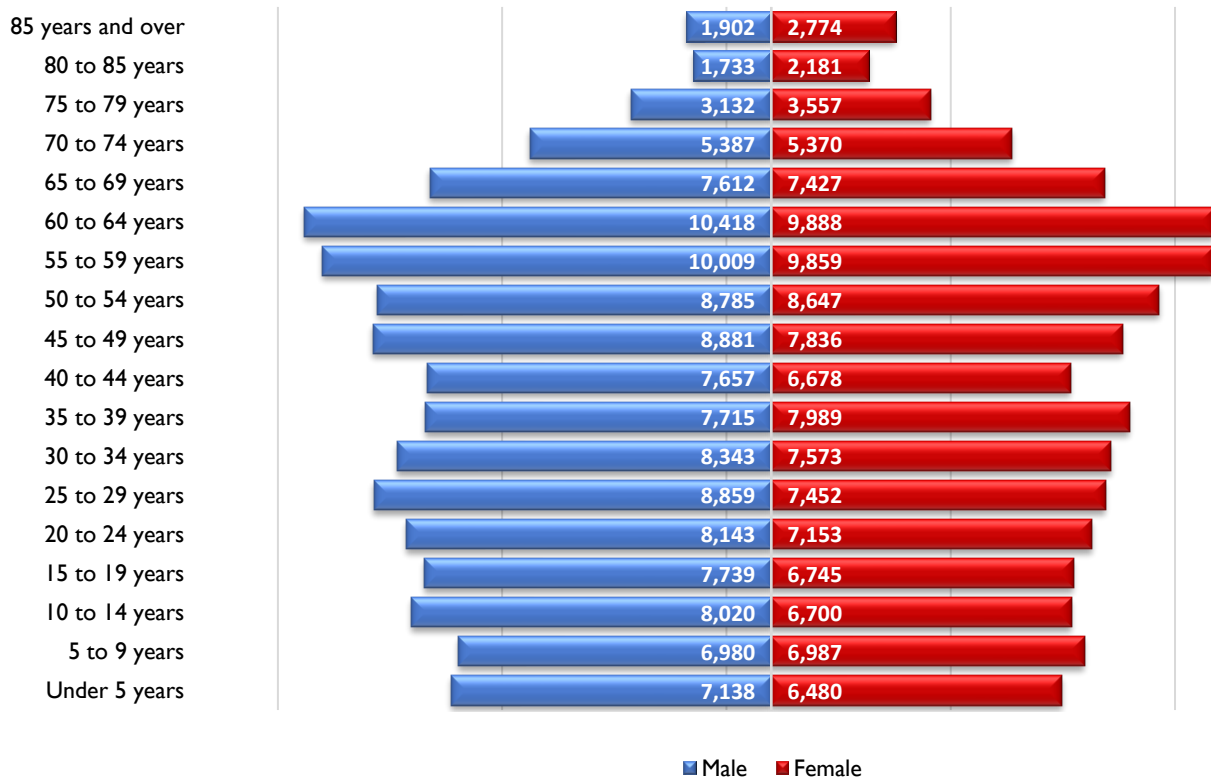


Source: American Community Survey (2017-2021) 5-Year Estimates

B. Age

The Montachusett Region is considerably older than the state or nation as a whole (see Figure 4 - 3), a trend that has been steadily rising in recent decades. In 2021, 19 of the Region's 22 communities had a higher median age than Massachusetts, up from just eight in 1990. According to the most recent data from the American Community Survey (ACS), slightly under one-quarter (22.7%) of Montachusett residents are between the ages of 45 and 59 years old.

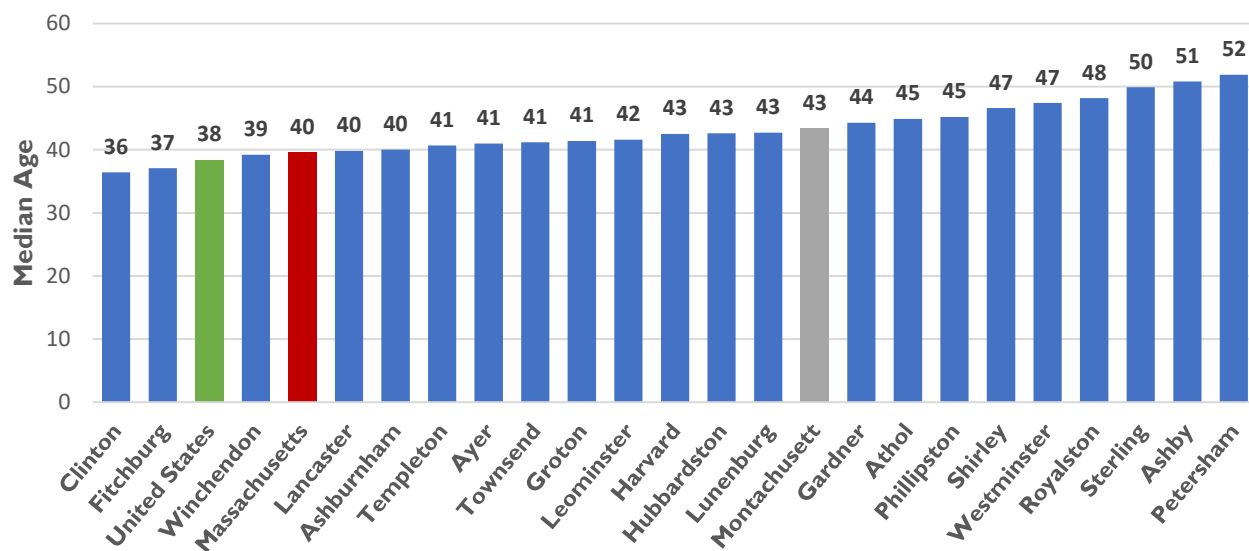
Figure 4.1-3: Age Distribution by Gender, Montachusett Region



Source: American Community Survey (2017-2021) 5-Year Estimates

The large proportion of residents nearing retirement age poses a number of planning challenges for the Region, including ensuring accessibility to health care services, public transportation, senior housing, as well as generational shifts in employment and succession in the workforce.

Figure 4.1-4: Median Age in Montachusett Communities Compared to Massachusetts and the US

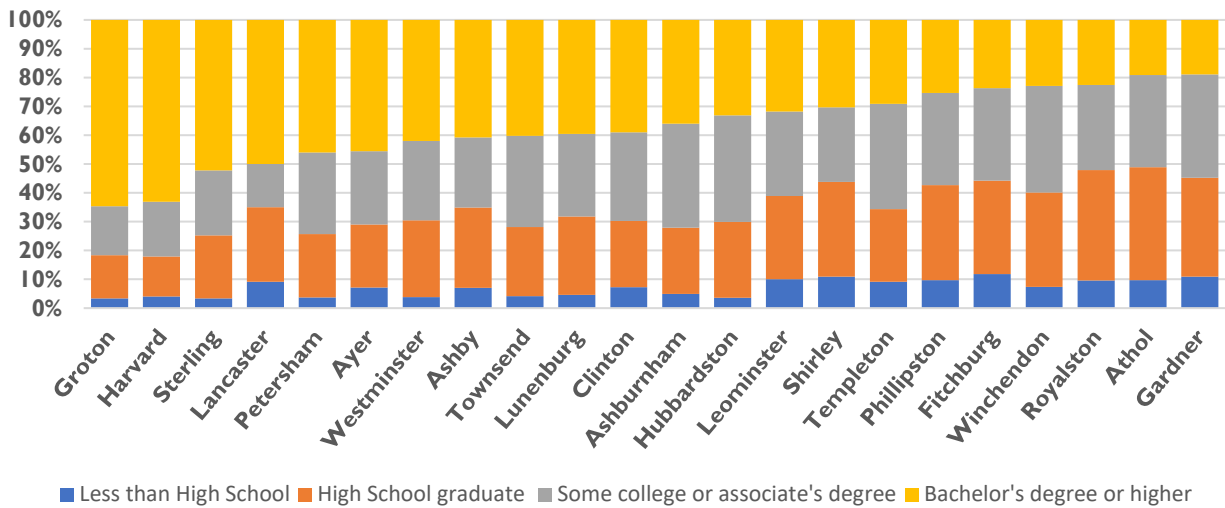


Source: American Community Survey (2017-2021) 5-Year Estimates

C. Educational Attainment

Montachusett communities range considerably in terms of highest level of educational attainment (see Figure 4.1-5).

Figure 4.1-5: Highest Level of Educational Attainment, Montachusett Region



Source: American Community Survey (2017-2021) 5-Year Estimates

Groton boasts the highest percentage of residents with a bachelor's degree or higher with 64.6% of residents holding a bachelor's or post-graduate degree (nearly 3.5 times that of Gardner).

In Table 4 - 1, we see flatlining levels of educational attainment across the board for those aged 25 to 34 years old. Graduation rates between 2000 and 2021 grew for both males and females for both high school and bachelor's degrees and higher. Most significantly, we witnessed a 25% increase in the proportion of women aged 25 to 34 years old with a bachelor's degree or higher.

Table 4-1.1: Highest Level of Educational Attainment (Aged 25 to 34 years)

| Highest Level of Educational Attainment | Male | | Female | |
|---|-------|-------|--------|-------|
| | 2000 | 2021 | 2000 | 2021 |
| High school degree or higher | 85.3% | 90.1% | 90.7% | 93.3% |
| Bachelor's degree or higher | 21.2% | 23.3% | 27.3% | 32.0% |

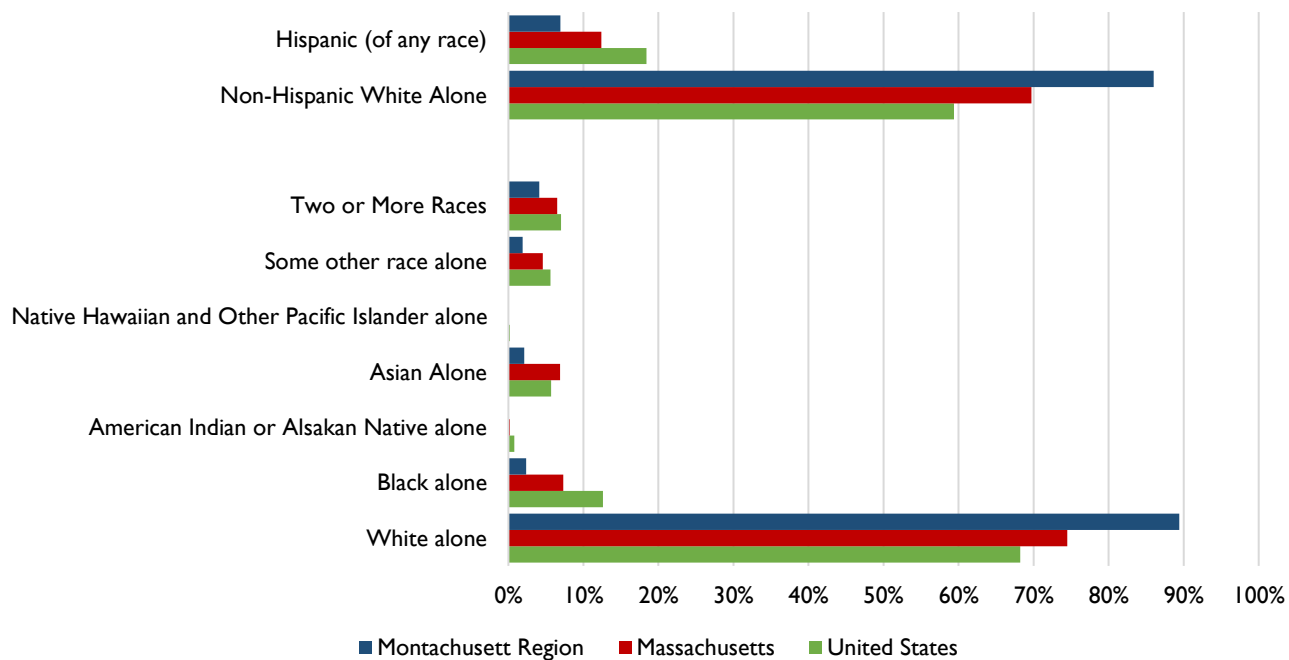
Source: US Census, American Community Survey (2017-2021) 5-Year Estimates

Still, educational attainment in the region remains lower than the state as a whole. In 2021, it was estimated that 92.1% of men and 94.4% of women aged 25 to 34 in Massachusetts received a high school degree or higher, while 46% and 55.8% received a bachelor's degree or higher. The trend toward having a more educated population is valuable as the economic sustainability of the region depends on ensuring a robust workforce that includes young professionals and careers to support their success.

D. Race

The Montachusett Region remains a predominantly white region but is trending toward increased diversity. The Region currently has a higher proportion of residents who identify as "white alone" when compared respectively to the state and nation as whole (see Figure 4.1-6).

Figure 4.1-6 Race in the Montachusett Region Compared to Massachusetts and the United States

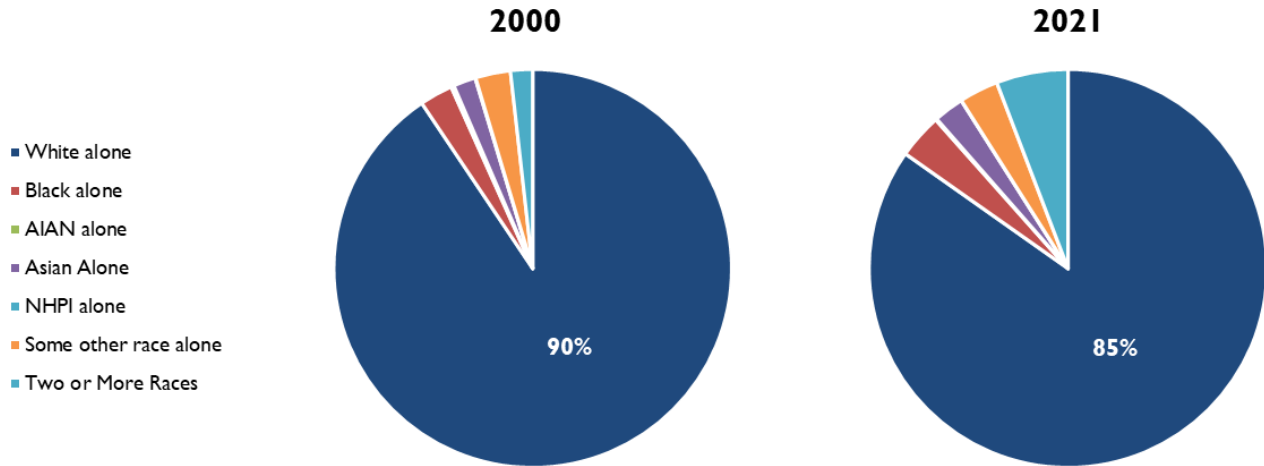


Source: American Community Survey (2017-2021) 5-Year Estimates

However, in the period between 2000 and 2021, we observed the following demographic changes as they pertain to race:

1. The number of Hispanic residents grew from 15,672 to 30,156 (+92.4%)
2. The number of residents who self-identified as Black or African American alone grew from 6,127 to 13,082 (+113.5%)
3. The number of Asian residents grew from 4,098 to 8,368 (+40.1%)
4. The number of residents who identified as two or more races increased from 4,127 to 14,575 (+65.4%)

Figure 4.1-7 Race in the Montachusett Region (2000 to 2021)



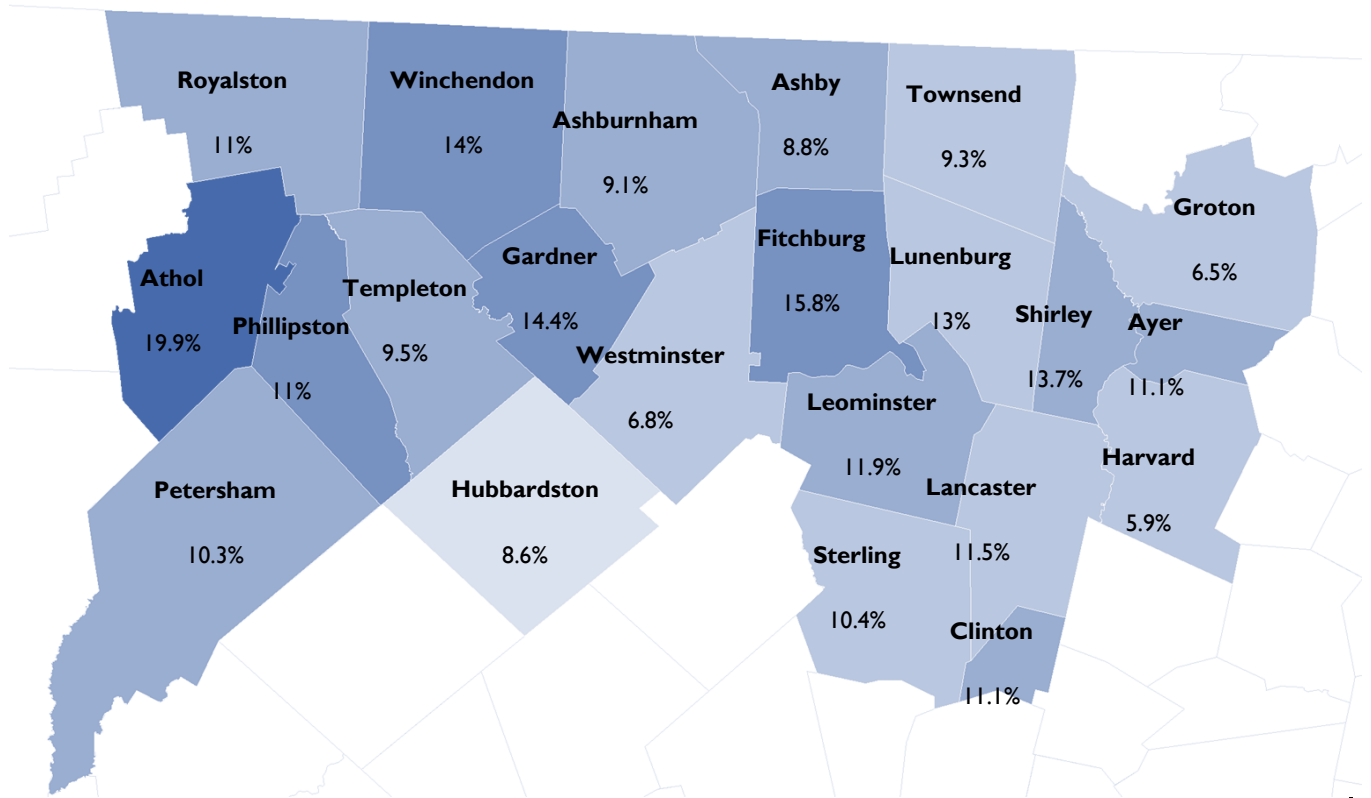
Source: US Census, American Community Survey (2017-2021) 5-Year Estimates

E. Disability

In Massachusetts, 11.6% of total individuals report having a disability (ACS 2021). A disability refers to difficulty hearing, vision, cognitive, ambulatory, self-care, and/or living independently.

Seven Montachusett communities have a higher proportion of residents managing a disability than the state as a whole (Figure 4 - 8), with Athol, Fitchburg, and Gardner topping the list. Among other important planning considerations, the comparatively high percentages of residents with disabilities, and a steadily aging population, emphasizes the importance of multimodal transportation access. Access to transportation services through the Montachusett Regional Transit Authority (MART) offers a vital lifeline for many to ensure equitable access to employment, education, as well as social and healthcare services.

Figure 4.1-8: Individuals with a Disability, Montachusett Region



Source: American Community Survey (2017-2021) 5-Year Estimates

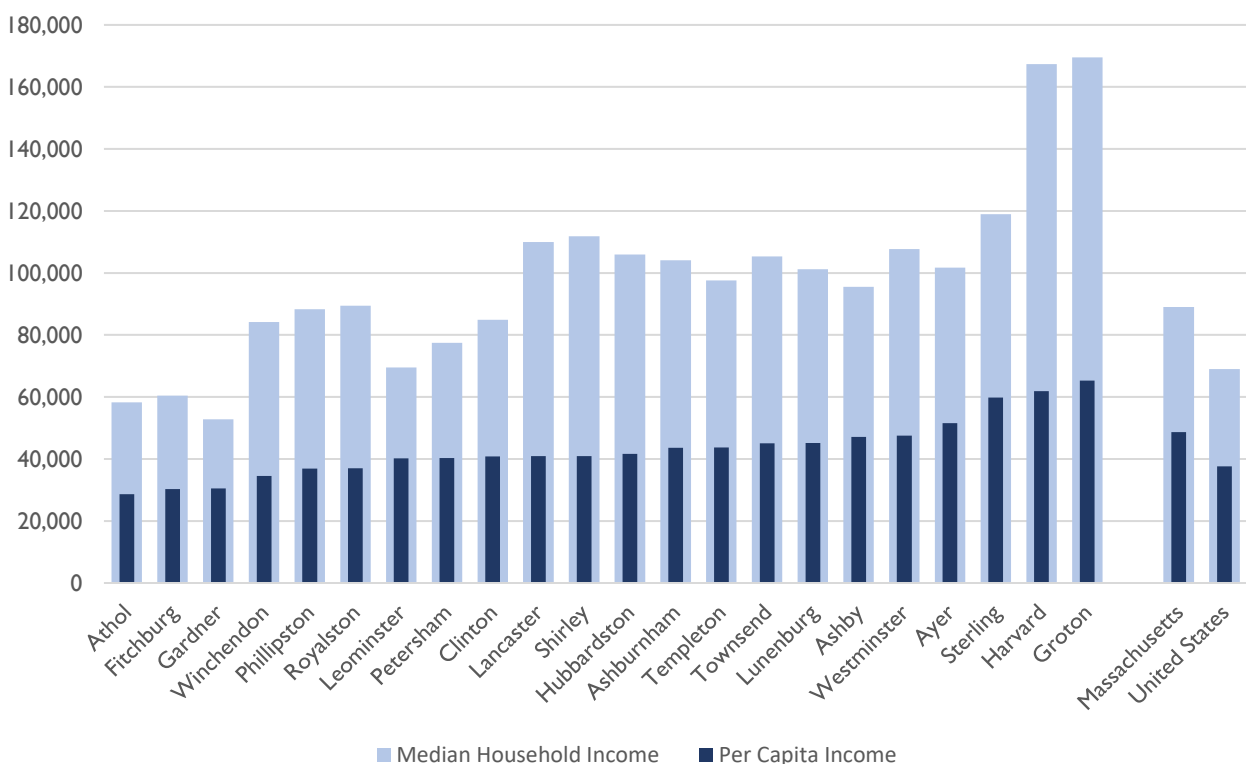
MART currently offers ADA Eligible Paratransit Service to transportation-disabled individuals. Service is provided by lift-equipped vans and is available in the areas that MART provides fixed route bus service. Under the ADA regulations, there are three categories of persons who are eligible for ADA Paratransit Service:

1. Is unable as a result of physical or mental impairment, to get on, ride, or get off an accessible vehicle on the public transit system: or
2. Needs the assistance of a wheelchair lift or other boarding assistance device and is able, with such assistance to get on, ride and get off an accessible vehicle, but such vehicle is not available on the route when the individual wants to travel; or
3. Has specific impairment-related condition including vision, hearing or impairments causing disorientation which prevents travel to or from a station or stop on the system.

F. Income

The ACS collects income and poverty data, and presents both across a range of different categories, including age, gender, race, family structure, occupation, etc. The ACS defines per capita income as the mean money income received in the past 12 months computed for every man, woman, and child in a geographic area. It is derived by dividing the total income of all people 15 years old and over in a geographic area by the total population in that area. (Note: income is not collected for people under 15 years old, even though those people are included in the denominator of per capita income. This measure is rounded to the nearest whole dollar.). In addition to per capita income, median household income is presented here in Figure 4 - 9 for each Montachusett community, as well as the state and nation.

Figure 4.1-9: Per Capita Income and Median Household Income



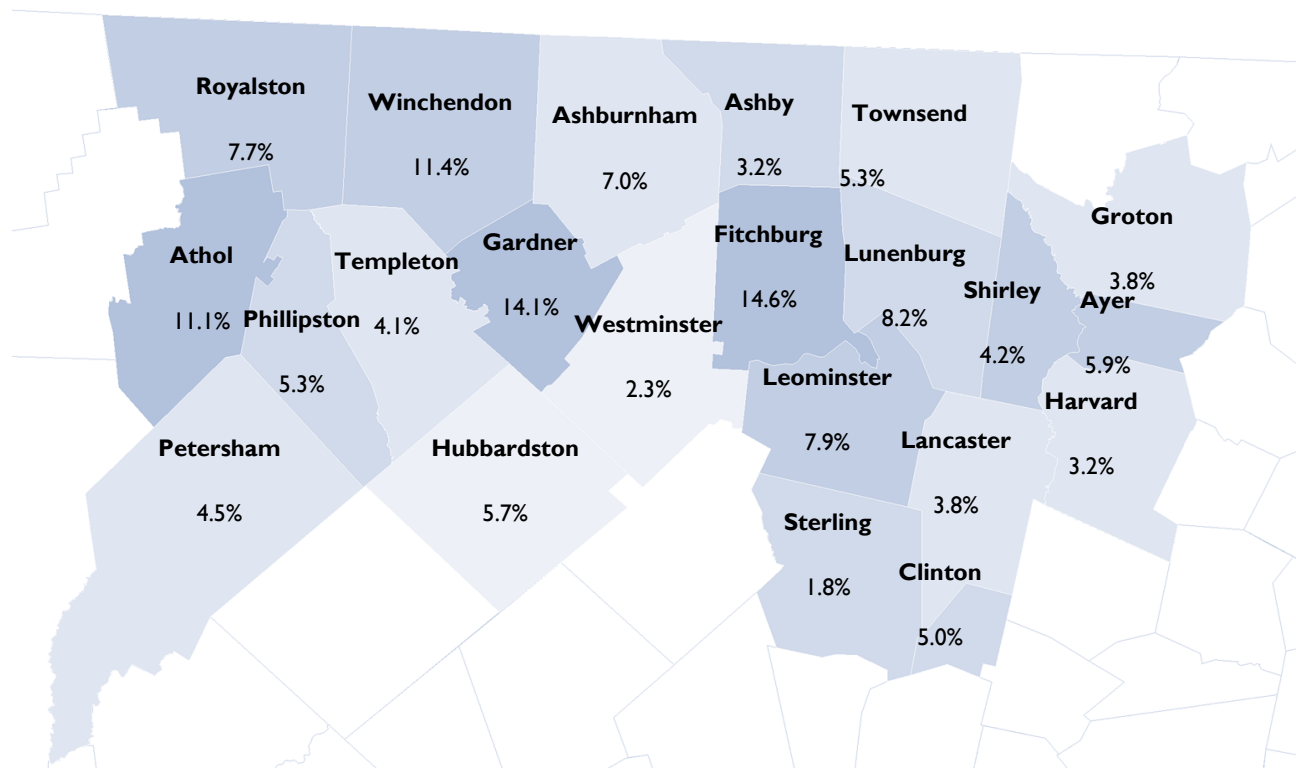
Source: American Community Survey (2017-2021) 5-Year Estimates

Eighteen (18) of the region's 22 communities have a lower per capita income than the state (\$48,617), while eight rank below the state when examining median household income (Figure 4 - 9).

G. Poverty

Poverty is calculated as a percentage of the population below the poverty threshold. The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, that family and every individual in it is considered to be in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps).

Figure 4.1-10: Individuals Living in Poverty, Montachusett Region



Source: American Community Survey (2017-2021) 5-Year Estimates

An estimated 9.9% of individuals are living in poverty within the Commonwealth of Massachusetts. Six Montachusett communities have a higher concentration of poverty than the state as a whole, with Fitchburg (14.6%) and Gardner (14.1%) also exceeding the national poverty rate of 11.3% (Figure 4 - 10).

Between 2020 and 2021, poverty rates in both the region and the state showed a marginal increase, while the nation demonstrated a nominal decrease (Table 4 - 2).

Table 4.1-2: Poverty Rates

| Area | 2020 | 2021 | 1-Year Change |
|---------------------|-------|-------|------------------|
| Montachusett Region | 5.9% | 6.4% | .5% |
| Massachusetts | 9.8% | 9.9% | 0.1% |
| United States | 12.8% | 12.6% | -0.2% |

Source: American Community Survey 5-Year Estimates

H. Title VI and Environmental Justice (EJ)

Transportation and social equity through Title VI and Environmental Justice (EJ) all play a key role in the quality of life in the region by shaping access to jobs, housing, services and recreational opportunities and is essential to addressing poverty, unemployment and other equal opportunity goals. It is based on the principle that all people have a right to be protected from harmful or burdensome investments/projects, to live in and enjoy a clean and healthful environment and ensure that these identified communities do not bear a disproportionate burden of obtrusive projects and also share in positive and beneficial investments.

Annually, during the development of the Transportation Improvement Program (TIP) and the Unified Planning Work Program (UPWP), an analysis is conducted on projects and work tasks to assess burdens and benefits on identified Title VI and EJ communities. For these analyses, the 2017-2021 American Community Survey 5-year estimates were utilized. For some of the data, census estimates were only available at the Census Tract level. This data dealt with Foreign Born, Disabilities and Non-English Spoken at Home. The remaining census data estimates were available at the Block Group level. The tables below list the ACS data sources as well as whether they were broken down to the Census Tract or

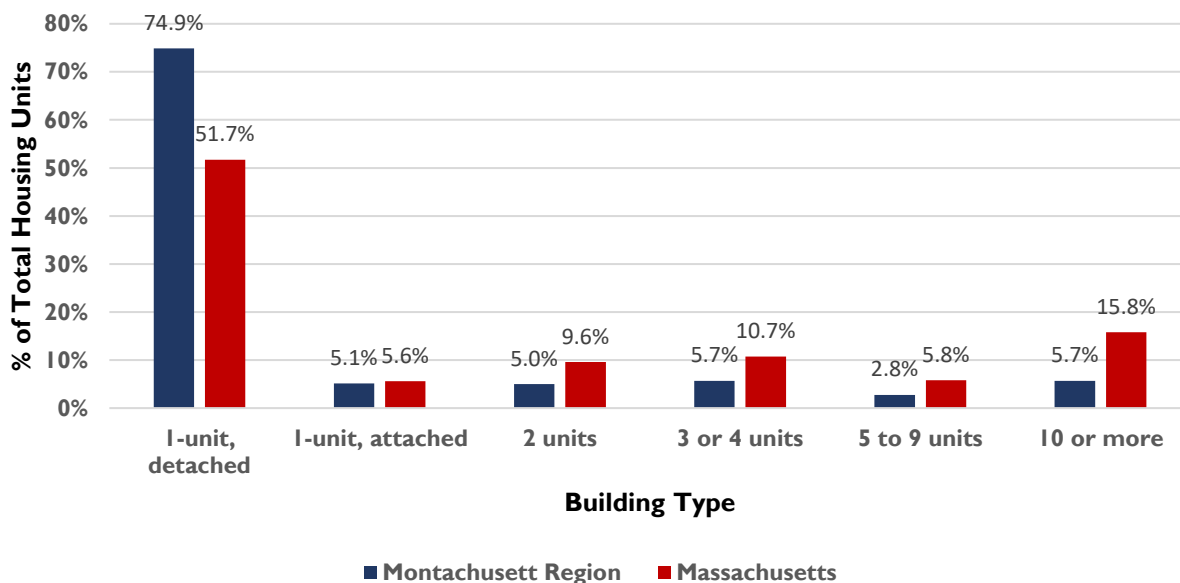
Block Group level. These tables, therefore, were used to determine Environmental Justice (EJ) and Title VI designated areas.

I. Housing Characteristics

To serve their aging populations as well as attract young professionals and working families, Montachusett communities will need to offer a variety of housing options. For many individuals, housing needs changes over a lifetime as household size and income decreases. Ensuring available housing near importance services (e.g. healthcare facilities, public transit, grocery stores) becomes more important as the ability and willingness to drive may decrease as well. Balancing the housing needs of seniors, students, and working families and individuals of all ages represents an ongoing challenge for each of our 22 communities.

Like the state as a whole – but to an even further degree – the majority of housing units in the Montachusett Region are single detached units (Figure 4.1 - 11).

Figure 4.1-11: Housing Units by Building Type

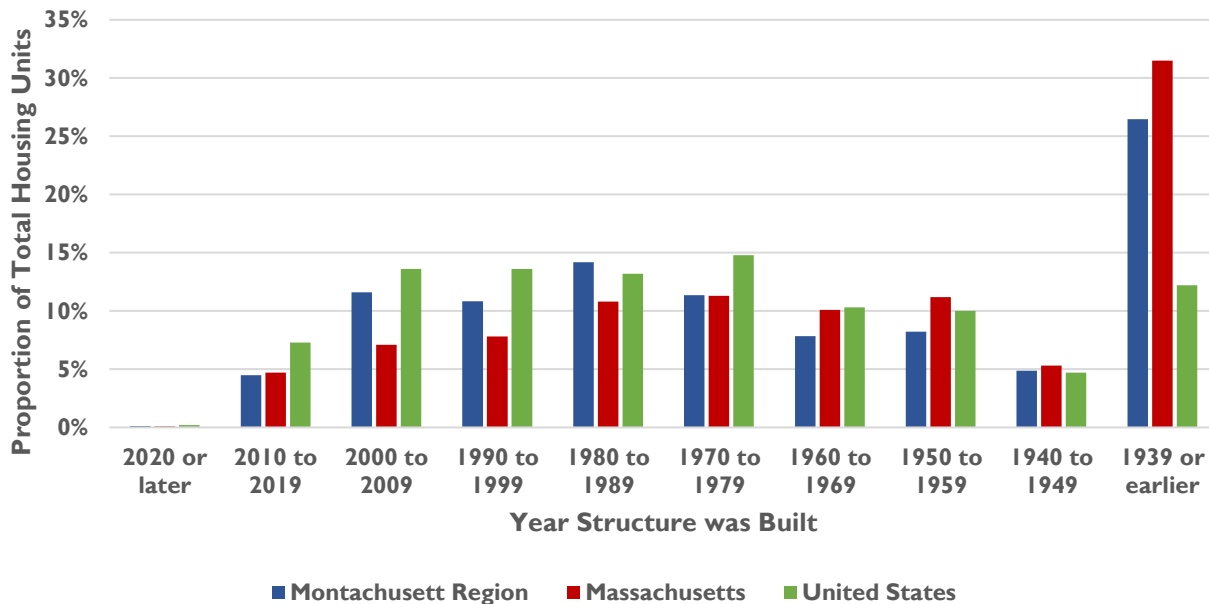


Source: American Community Survey (2017-2021) 5-Year Estimates

The ages of homes in the Montachusett Region are akin to much of New England, with nearly a third of all homes having been built prior to the second World War (Figure 4 - 12). All homes built prior to 1978 (when lead-based house paint was discontinued in the United States) are likely to contain some levels of

lead. Today, the Massachusetts Lead Law requires the removal or covering of lead paint hazards in homes built before 1978 where any children under six live, regardless of their blood lead level.

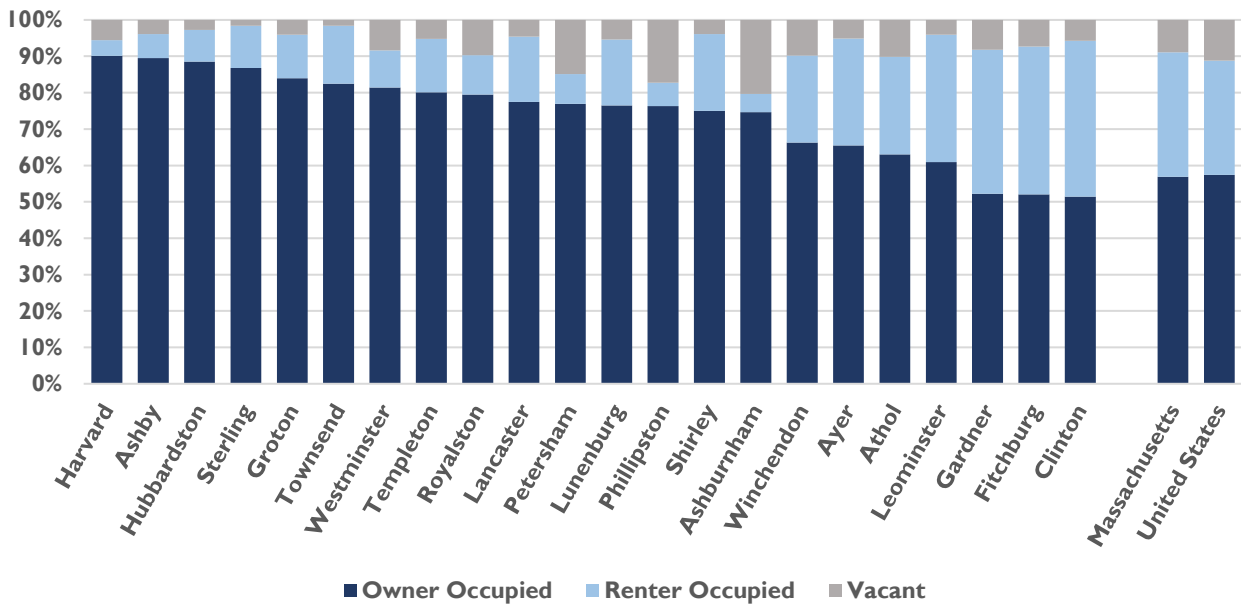
Figure 4.1-12: Proportion of Total Housing Units by Year Structure Was Built



Source: American Community Survey (2017-2021) 5-Year Estimates

Housing occupancy is highly variable between communities in the region (Figure 4 - 13), with homeowner occupancy ranging from as high as 90% in Harvard to as low as 51% in Clinton (compared to 57% in both the state and the nation).

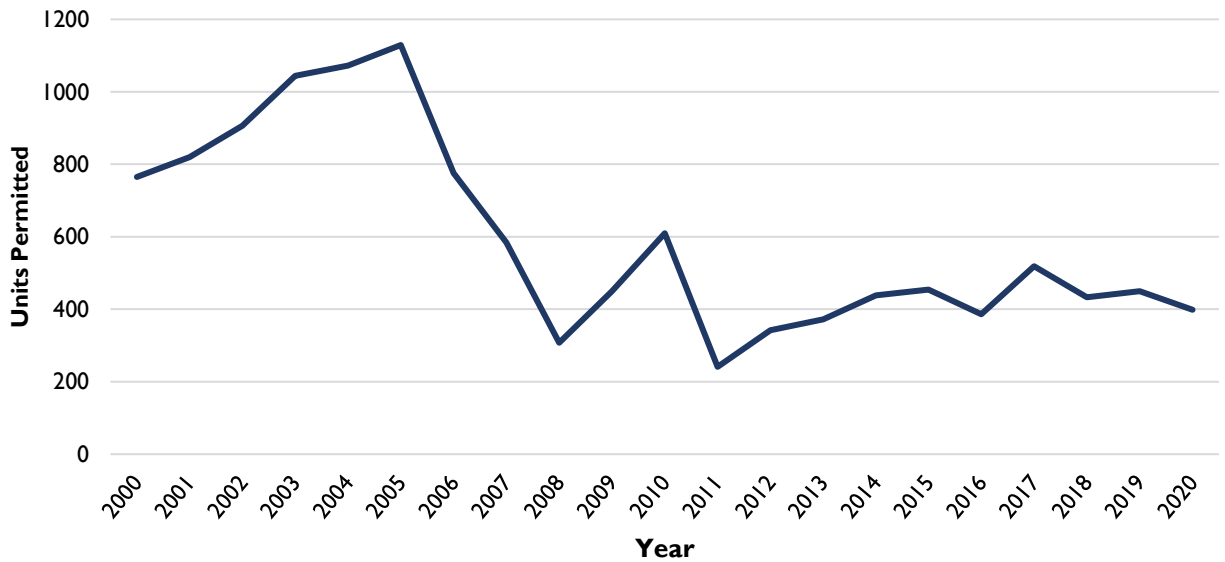
Figure 4.1-13: Housing Occupancy Status



Source: American Community Survey (2017-2021) 5-Year Estimates

In 2010, the region witnessed a spike in housing production which helped break the trend of declining construction which began in 2005 (Figure 4 - 14).

Figure 4.1-14: Number of Housing Units Permitted in the Montachusett Region (2000 to 2020)



Source: US Census Bureau – Annual Building Permit Survey

More than half of the building units permitted in 2010 were concentrated in the community of Lunenburg who supported the production of 308 units that year (of the total 610 in the entire region), including seven housing complexes with an estimated 186 total housing units.

It is generally accepted that a household can afford a home valued up to 30% of the household's annual income before becoming "cost burdened". Those households who pay a higher percentage of their income on housing may – according to the US Department of Housing and Urban Development – "have difficulty affording necessities such as food, clothing, transportation, and medical care". An estimated 16,082 owner-occupied households and 12,309 renter-occupied households are cost burdened throughout the Montachusett Region (Table 4 - 6).

Table 4.1-6: Cost Burden Severity by Community and Housing Occupancy

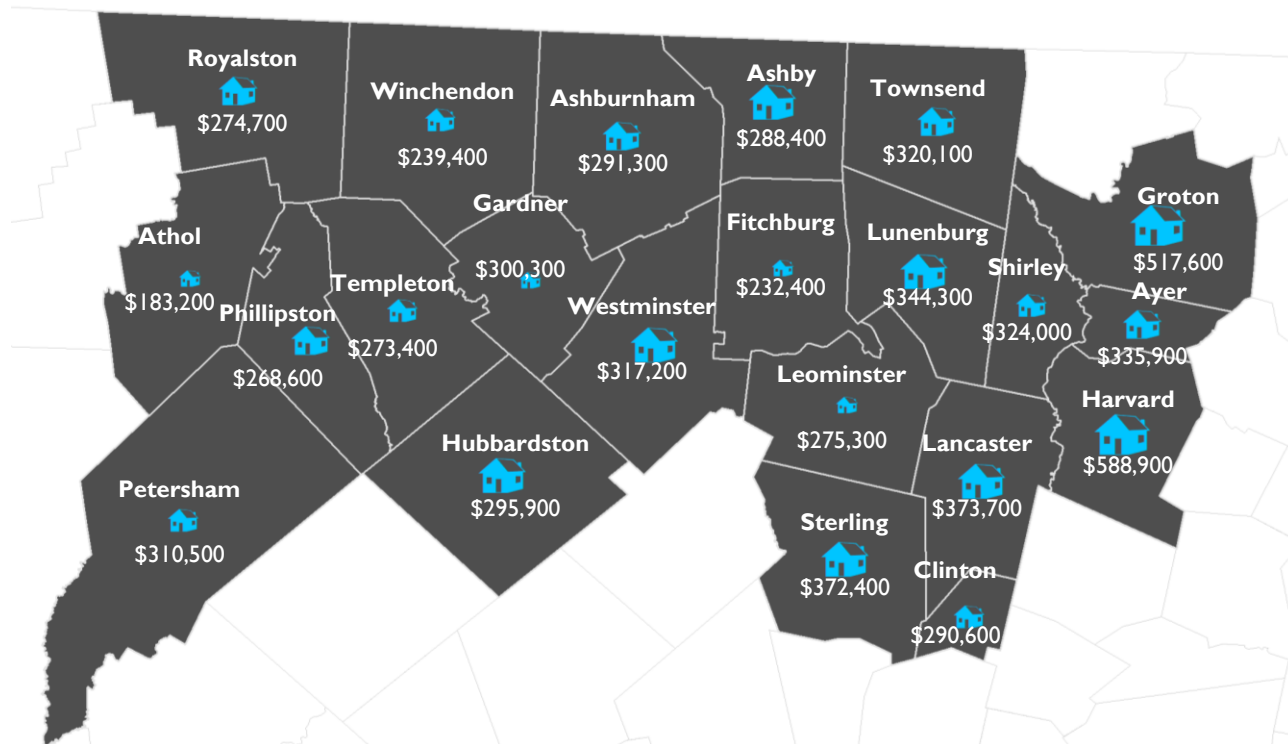
| Community | Number of owner-occupied households that are cost burdened | % of owner-occupied households that are cost burdened | Number of renter-occupied households that are cost burdened | % of renter-occupied households that are cost burdened |
|-------------|--|---|---|--|
| Ashburnham | 438 | 28.1 | 68 | 59.7 |
| Ashby | 266 | 28.2 | 10 | 13.5 |
| Athol | 845 | 34.5 | 788 | 58.8 |
| Ayer | 573 | 29.2 | 398 | 36.6 |
| Clinton | 833 | 31.0 | 992 | 34.4 |
| Fitchburg | 2,883 | 45.8 | 3,572 | 50.9 |
| Gardner | 1,498 | 43.1 | 1,642 | 45.8 |
| Groton | 587 | 21.8 | 206 | 52.7 |
| Harvard | 333 | 23.3 | 38 | 60.3 |
| Hubbardston | 244 | 20.3 | 49 | 47.6 |
| Lancaster | 524 | 29.7 | 232 | 54.8 |
| Leominster | 2,874 | 34.1 | 2,602 | 41.6 |
| Lunenburg | 896 | 33.5 | 350 | 47.3 |
| Petersham | 133 | 47.3 | 9 | 23.7 |
| Phillipston | 158 | 31.5 | 10 | 27.8 |
| Royalston | 120 | 33.2 | 30 | 65.2 |
| Shirley | 407 | 28.6 | 202 | 39.3 |
| Sterling | 582 | 35.7 | 131 | 39.3 |
| Templeton | 666 | 35.5 | 124 | 29.3 |
| Townsend | 712 | 32.0 | 196 | 39.2 |
| Westminster | 738 | 36.2 | 217 | 62.3 |
| Winchendon | 492 | 21.8 | 443 | 47.0 |

Source: American Community Survey (2017-2021) 5-Year Estimates

Almost twenty-eight percent (27.3%) of owner-occupied households are considered cost-burdened throughout Massachusetts; all but four communities in the Montachusett region exceed this figure. Although fewer total renters experience being cost burdened when compared to homeowners, their rate of burden is significantly higher. Specifically, 49.4% of renter-occupied households spend more than 30% of their income on living expenses across the state, while 8 of 22 Montachusett communities exceed this rate.

Another indicator of housing affordability is the median home value of the region. As a general trend, housing values are highest along the eastern edge of the Montachusett Region in those communities with greatest accessibility to Boston and major employment centers (Figure 4 - 15).

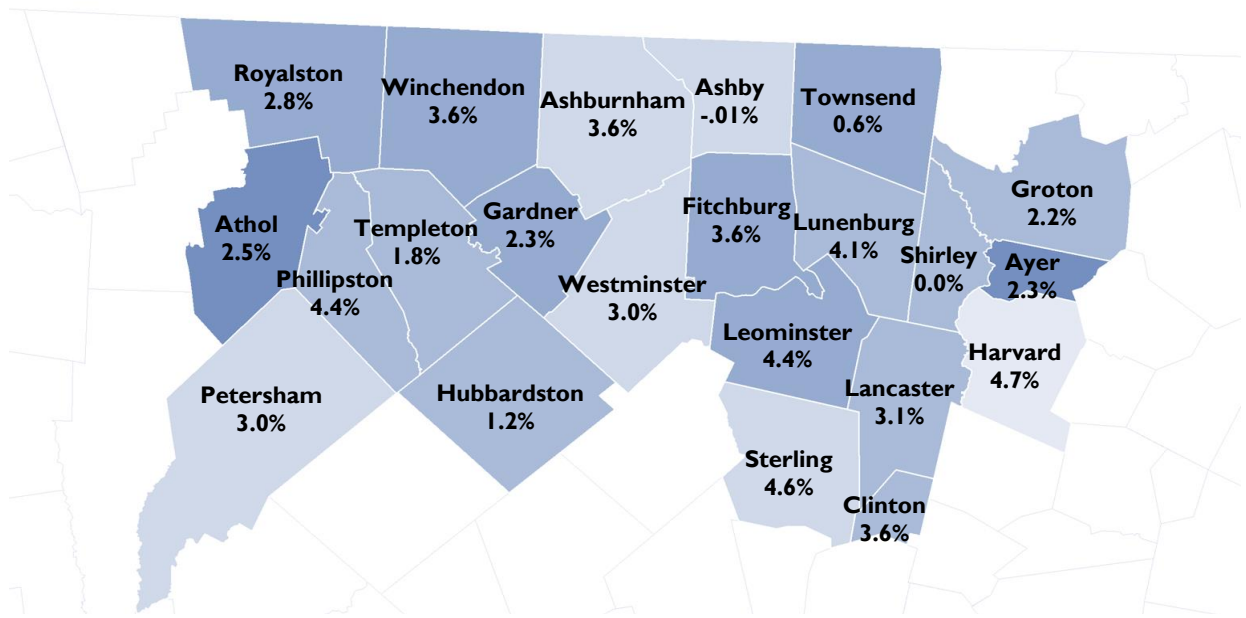
Figure 4.1-15: Median Household Value for Owner-Occupied Households



Source: American Community Survey (2017-2021) 5-Year Estimates

To project future household values, Zillow.com compiles the past six years of home sales data and forecasts ahead a single year (Figure 4 - 16). Housing values are projected to hold steady or slightly increase in every Montachusett community over the next year; in particular, Harvard (4.7%) and Sterling (4.6%) are expected to see moderate growth in their housing markets in the near future.

Figure 4.1-16: One-Year Household Value Projections



Source: Zillow Research 2023

J. Labor Force and Employment

Labor force and employment data were collected and compared across multiple sources, including American Community Survey estimates, ESRI's Business Analyst Online (BAO), and Massachusetts Office of Labor and Workforce Development. Overall, despite significant disruptions since before 2000, manufacturing remains the largest (NAICS 2-digit) employment sector in the region (15.7% of total employees) and integral to the economic health of many communities.

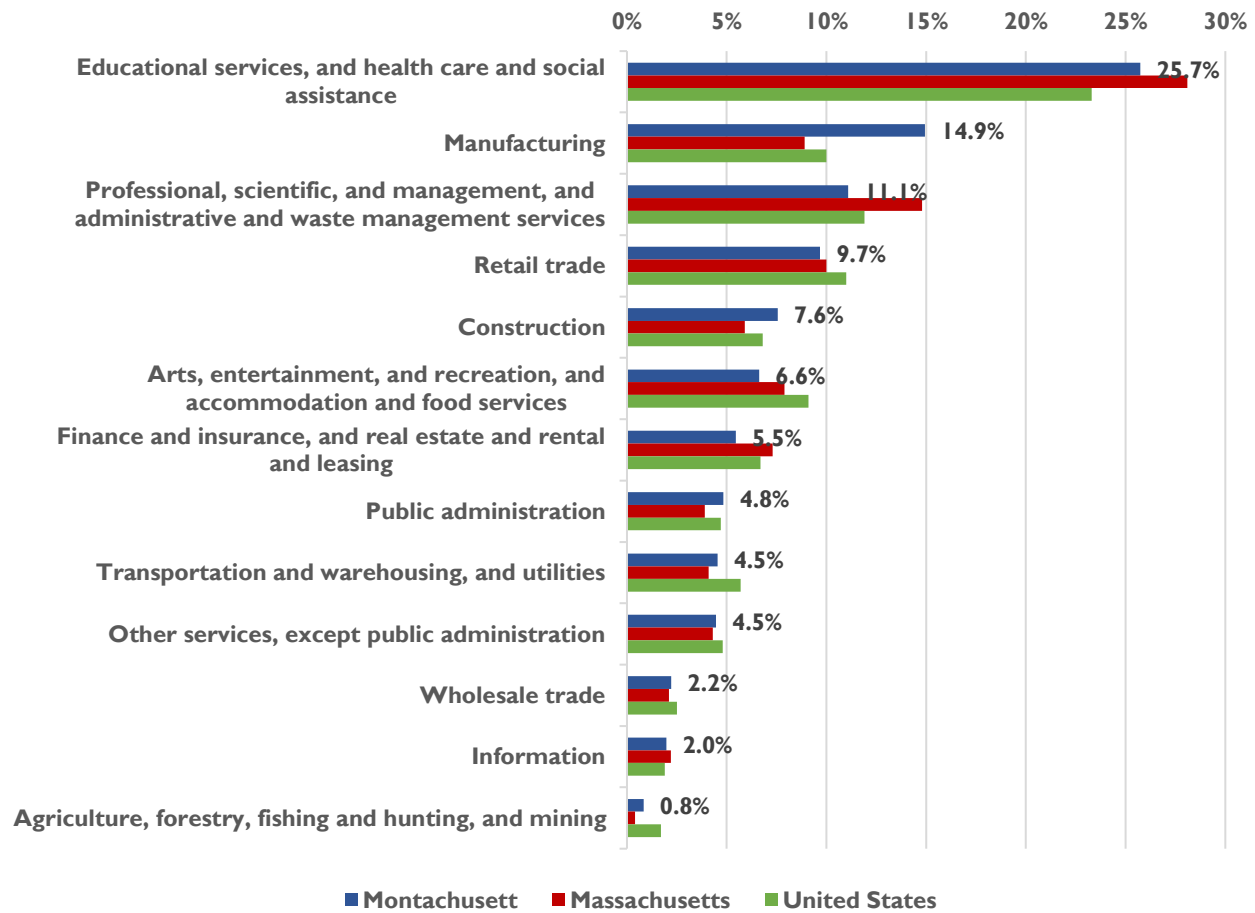
Table 4.1-7: Businesses and Employment by Industry (ESRI BAO 2022)

| Industry By NAICS Codes | Businesses | | Employees | |
|---|--------------|---------------|---------------|---------------|
| | Number | Percent | Number | Percent |
| Manufacturing | 404 | 4.8% | 14,699 | 15.7% |
| Health Care & Social Assistance | 692 | 8.2% | 14,047 | 15.0% |
| Retail Trade | 1,096 | 13.0% | 11,243 | 12.0% |
| Educational Services | 249 | 3.0% | 9,292 | 9.9% |
| Accommodation & Food Services | 516 | 6.1% | 8,256 | 8.8% |
| Other Services (except Public Administration) | 1,310 | 15.6% | 5,992 | 6.4% |
| Public Administration | 466 | 5.5% | 5,774 | 6.2% |
| Construction | 782 | 9.3% | 4,194 | 4.5% |
| Wholesale Trade | 322 | 3.8% | 3,929 | 4.2% |
| Professional, Scientific & Tech Services | 651 | 7.7% | 3,796 | 4.0% |
| Arts, Entertainment & Recreation | 161 | 1.9% | 2,588 | 2.8% |
| Administrative & Support & Waste Management & Remediation Services | 298 | 3.5% | 2,020 | 2.2% |
| Finance & Insurance | 257 | 3.1% | 1,980 | 2.1% |
| Real Estate, Rental & Leasing | 380 | 4.5% | 1,660 | 1.8% |
| Transportation & Warehousing | 169 | 2.0% | 1,612 | 1.7% |
| Information | 181 | 2.1% | 1,399 | 1.5% |
| Unclassified Establishments | 382 | 4.5% | 550 | 0.6% |
| Agriculture, Forestry, Fishing & Hunting | 65 | 0.8% | 322 | 0.3% |
| Management of Companies & Enterprises | 12 | 0.1% | 277 | 0.3% |
| Utilities | 21 | 0.2% | 172 | 0.2% |
| Mining | 7 | 0.1% | 71 | 0.1% |
| Total | 8,421 | 100.0% | 93,873 | 100.0% |

Source: ESRI Business Analyst Online (BAO) 2022

When aggregated (as is done for the American Community Survey estimates), educational services, and health care and social assistance together represent the largest employing industry in the Montachusett Region, as we see in the state and nation as a whole.

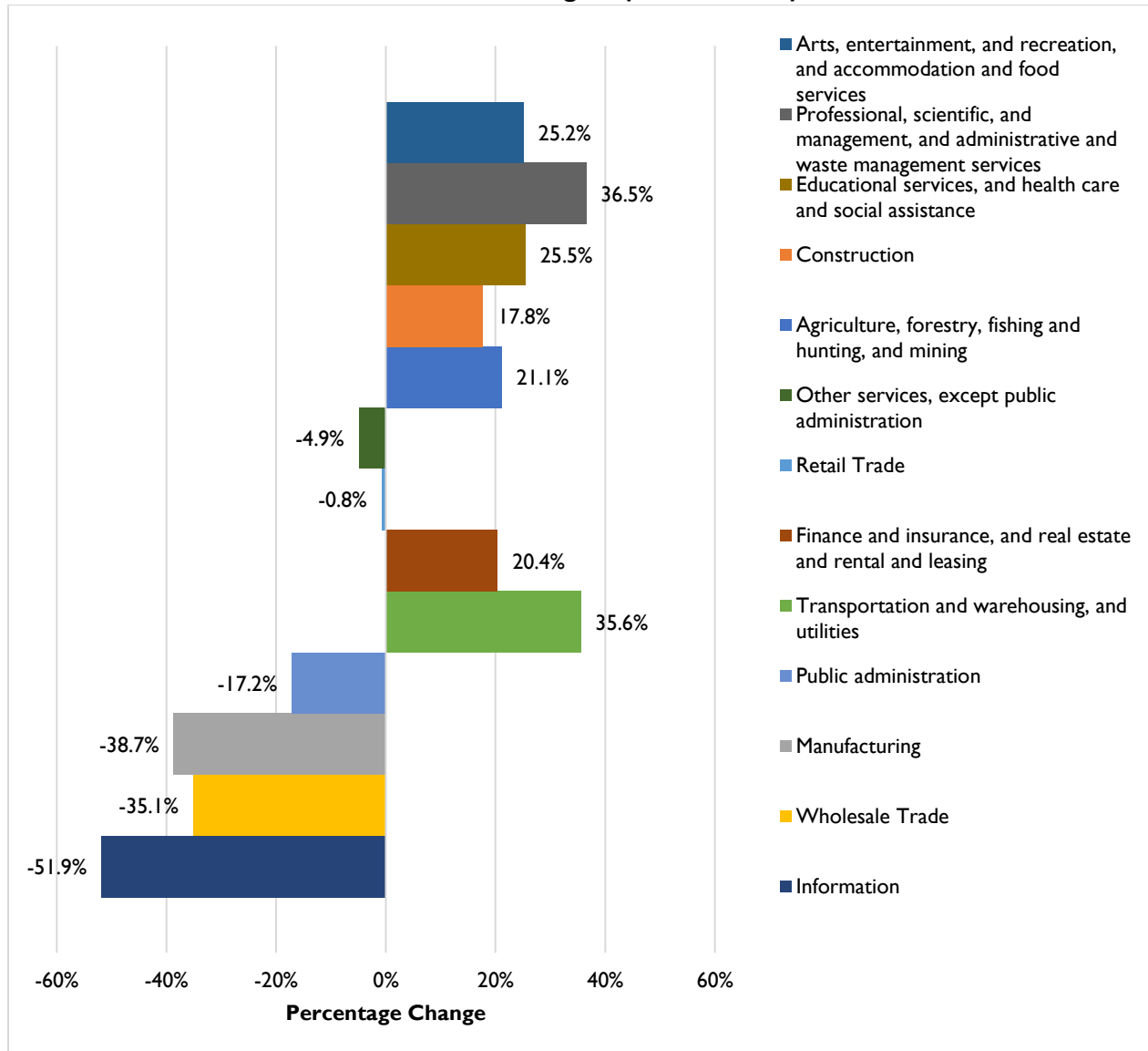
Figure 4.1-17: Employment by Industry



Source: American Community Survey (2017-2021) 5-Year Estimates

The level of manufacturing-based employment – despite declines in recent decades – continues to dwarf that of both the state and country. While efforts continue toward diversifying the regional economy into other growing sectors of the economy, including service sectors, the region’s comparative advantage of an experienced manufacturing workforce and legacy industrial space will ensure manufacturing is maintained as a cornerstone in the region’s economy.

Figure 4.1-18: Shift in Employment by Industry as a Share of the Regional Economy, Montachusett Region (2000 to 2021)



Source: US Census, American Community Survey (2017-2021) 5-Year Estimates

Between 2000 and 2021, the region witnessed some notable shifts in the total employment share by each industry. Arts, entertainment, and recreation, and accommodation and food services – although still modest in its total employment, with 9,054 jobs in 2021 – has increased its share of total employment in the region by 25.2% since 2000. Other industries which witness such a boost included professional, scientific, and management, and administrative and waste management services (36.5%); educational services, and health care and social assistance (25.5%); and construction (27.8%).

While two of the greatest declines in total employment share occurred in the information (-51.9%) and wholesale trade (-35.1%) sectors, together these sectors are responsible for less than 4% of jobs in the region in 2021. Manufacturing, on the other hand, accounts for an estimated 14.5% of the region's employment and is down from 23.7% in 2000 (and a net loss of 7,885 jobs during that time).

According to the Massachusetts Executive Office of Labor and Workforce Development, the fastest growing occupation in the Montachusett Region is Maids and Housekeeping Cleaners (see Table 4 - 8). Nurse practitioners are also going to be needed in higher supply to help continue to meet the care needs of the region's growing senior population.

Table 4.1-8: Fifteen (15) Fastest Growing Occupations in the Montachusett Region

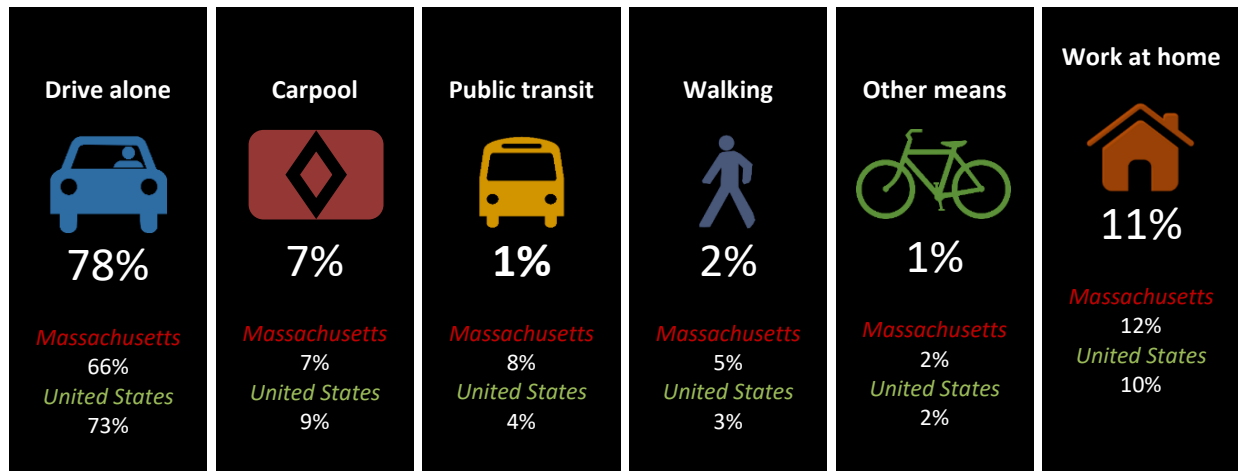
| Title | Employees 2020 | Projected Employees 2030 | Numeric Change | Percent Change | 2021 Mean Annual OES Wage |
|--|-------------------|--------------------------------|-------------------|-------------------|---------------------------------|
| Maids and Housekeeping Cleaners | 354 | 739 | 385 | 108.8% | \$34,622 |
| Cooks, Restaurant | 565 | 1,025 | 460 | 81.4% | \$30,609 |
| Fitness Trainers and Aerobics Instructors | 164 | 290 | 126 | 76.82% | \$58,227 |
| Nurse Practitioners | 128 | 220 | 92 | 71.87% | \$119,143 |
| Bartenders | 305 | 503 | 198 | 64.91% | \$36,720 |
| First-Line Supervisors of Housekeeping and Janitorial Worker | 108 | 175 | 67 | 62.03% | \$56,088 |
| Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop | 168 | 256 | 88 | 52.38% | \$31,292 |
| Waiters and Waitresses | 877 | 1,284 | 407 | 46.40% | \$35,943 |
| Industrial Machinery Mechanics | 237 | 340 | 103 | 43.45% | \$59,146 |
| Dishwashers | 200 | 286 | 86 | 43.00% | \$31,127 |
| Passenger Vehicle Drivers, Except Bus Drivers, Transit | 674 | 959 | 285 | 42.28% | *** |
| Chemists | 249 | 351 | 102 | 40.96% | \$107,177 |
| Coaches and Scouts | 101 | 142 | 41 | 40.59% | \$49,133 |
| Self-Enrichment Education Teachers | 165 | 231 | 66 | 40.00% | \$50,138 |
| First-Line Supervisors of Food Preparation and Serving Workers | 519 | 723 | 204 | 39.30% | \$43,633 |

Source: Massachusetts Executive Office of Labor and Workforce Development 2023

K. Travel Means & Times

This section provides commuting information for workers aged 16 or over. This data comes from the American Community Survey (ACS) from the US Census Bureau.

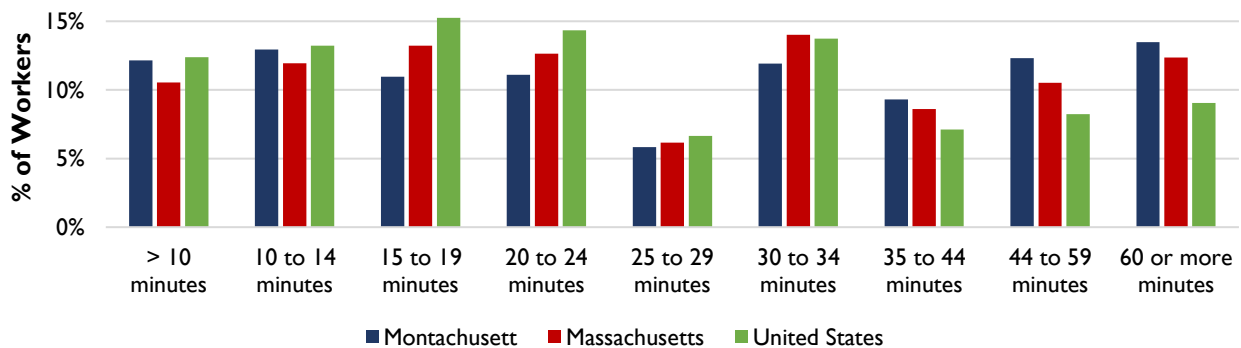
Figure 4.1-19: Means of Travel to Work, Montachusett Region



Source: American Community Survey (2017-2021) 5-Year Estimates

Montachusett Region commuters are more auto-reliant for than the state or nation, with 85% of workers either driving alone or carpooling to work (compared to 75% of workers in Massachusetts, and 82% of workers in the country). We also recognize Montachusett residents are significantly less reliant upon public transit and a few residents are able to walk to their place of employment.

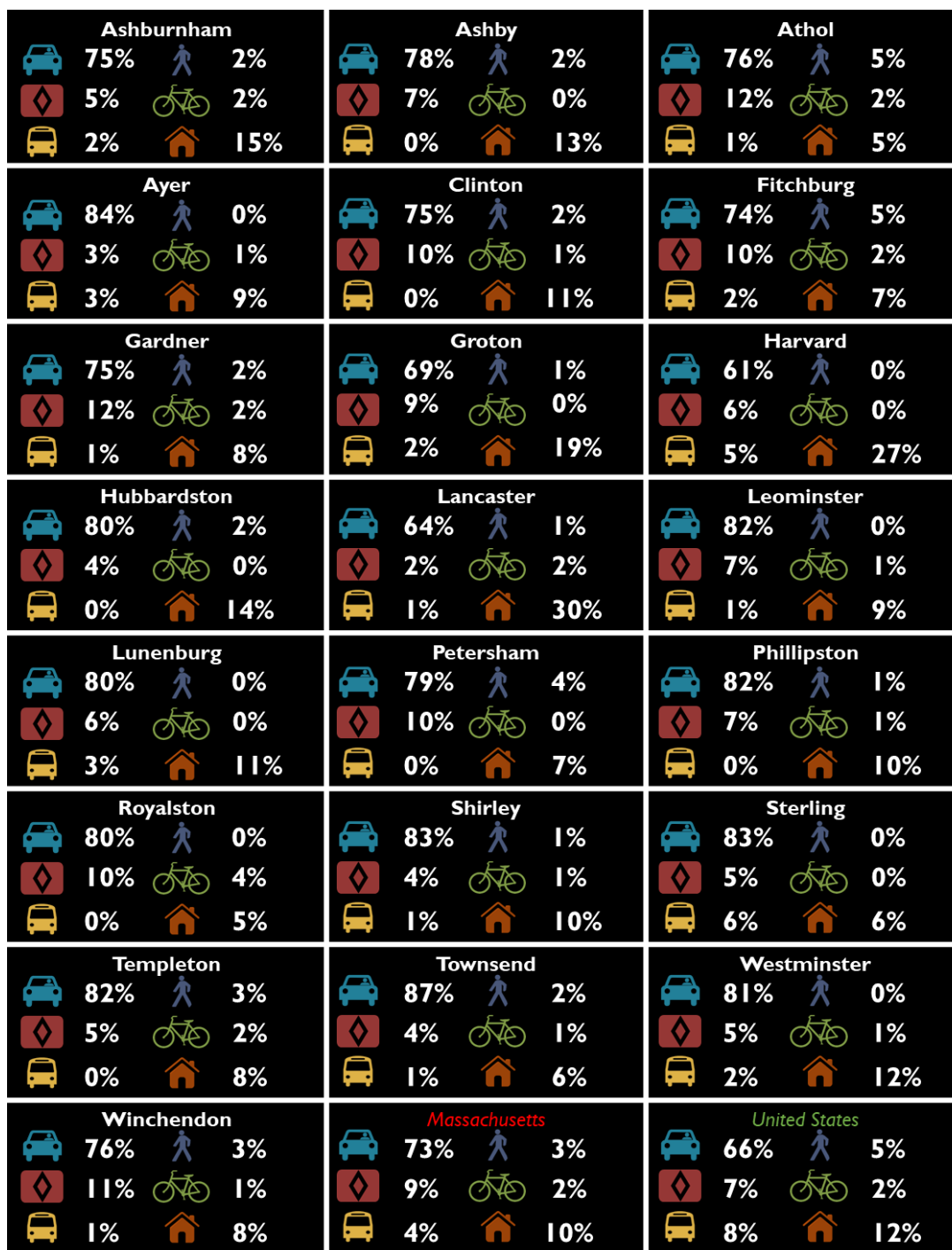
Figure 4.1-20: Travel Time to Work



Source: American Community Survey (2017-2021) 5-Year Estimates

Interestingly, a higher proportion of Montachusett residents have *both* less than a 10-minute and more than a 45-minute commute to their place of employment when compared to Massachusetts.

Figure 4.1-21: Means of Travel to Work by Community



Source: American Community Survey (2017-2021) 5-Year Estimates

Projections for the Montachusett Region

MassDOT worked in 2021 with the UMass Donahue Institute (UMDI), the Central Transportation Planning Staff (CTPS) of the Boston Region MPO, the Metropolitan Planning Commission (MAPC) and the state's other Regional Planning Agencies (RPAs), to again update and revise population, households, and employment projections for the Commonwealth's MPOs to use as part of their 2024 RTP. This was a repeat of efforts begun in 2017 that resulted in the development of projections for 2010 to 2040 for the 2020 RTPs. These projections were titled "Vintage 2018". Working with a Socioeconomic Projection Committee that included all of these individuals, UMDI compiled projections, in 10 year increments out to 2050, for the development of these RTP updates. These new projections are entitled "Vintage 2022" or V2022.

The complete methodology and development process can be found in detail at UMDI's website, [Massachusetts Population Estimates Program](#). A methodology report on V2022 entitled "Long-Term Population Projections for Massachusetts Municipalities and Regional Planning Areas" is also available that outlines the projections process. Within this report, UMDI makes an important statement regarding limitations of the projections:

It is important to note that modeled projections cannot and do not purport to predict the future, but rather may serve as points of reference for planners and researchers. Like all forecasts, the UMDI projections rely upon assumptions about future trends based on past and present trends which may or may not actually persist into the future. The V2022 series employs a status-quo model approach to predict future population change. It assumes that recently observed trends in the components of population change, including birth, death, and migration rates, will persist in future years. It is also a demographically-based model, assuming that population change is driven by births, deaths, and the persistence of historic migration rates into the future.

As suggested by the demographic-accounting framework, the V2022 projections are based on demographic components of change to the exclusion of other factors, such as housing or transportation development initiatives, large-scale institutional changes, cultural shifts, and public policy revisions. To the extent that geographically-specific birth, death, and migration trends from the last ten years reflect the development that occurred in that place over the past ten years, the V2022 projections should serve as reasonable reflections of future development should development continue at the same relative pace in that geography. Should a region's economic development outlook change dramatically, relative to other places in the state or the U.S., then the migration component in the model may no longer reflect the migration that may be anticipated in

future years. An important counterpoint to the very likely possibility of future changes in migration, however, is that the strongest predictor of future population in almost all places is the population residing there today.

Factors specific to the timing of this series may also greatly impact the accuracy of the V2022 projections. For one, the projections are based on trends unfolding during what may be described as an off-trend period. The COVID-19 pandemic drastically shifted short-term trends in births and deaths -- two of the main components used as direct inputs in the UMDI population projections method -- not only in Massachusetts but around the U.S. as a whole. Secondly, the pandemic altered typical migration and immigration patterns, with an already declining trend in immigration exacerbated by the global pandemic and with a shift in domestic migration out of urban and into more rural and seasonal areas. While population data from 2020 are incorporated into the launch populations in our projections models, it is still too early to tell whether 2020 residency choices will persist into future years as the “new normal” or whether they will revert to pre-pandemic tendencies, or, if something in-between, to what extent they will persist or rebound.

Another major consideration affecting our ability to produce accurate population projections in 2022 relates to the release schedule of detailed Census 2020 data. As of the date of this report, the only decennial Census data available for 2020 are the total combined male and female populations by race and ethnicity for two large age cohorts: under-18 and 18-plus years of age. While detailed count data by specific five-year and single-year age cohorts are usually available to researchers by this time in the Census cycle, due to both pandemic and methodological-related delays within the U.S. Census Bureau, the UMass Donahue Institute Economic and Public Policy Research 11 release of five-year age cohorts is now not anticipated until May of 2023.¹ The decennial Census counts published every 10 years by the U.S. Census Bureau are typically considered the “gold-standard” against which other estimates and rates may be evaluated or produced. In the V2022 estimates series, UMDI must instead rely on age distributions extrapolated from a Census 2010 base which, though reasonable, lack the precision of an actual recent count.

For all of these reasons, researchers should use caution when planning initiatives around the V2022 population projections, and be thoughtful about the data sources, methods, and assumptions that underpin the series. This methodology report represents UMDI’s efforts to provide transparency and clarity on the inputs, methods, and assumptions used in the series so that potential users may be well informed on the components used to generate the final V2022 results.

For a complete and detailed discussion and a review of the overall methodology, various components and data sources of the V2022 projections, please see the UMDI methodology guide linked above.

Based upon the work conducted by UMDI and MassDOT as outlined on the UMDI report, a series of projections were calculated for the Montachusett Region. These projections were provided as regional totals and then disaggregated to the 22 communities that comprise the region.

A. Population

The population of the Montachusett region is expected to shrink gradually from 2020 until 2050 (Refer to the following Figure 4.1 - 22). From 2020 to 2050, the expected population for the region is projected to shrink by -8.51% while the population of Massachusetts is projected to increase by 3.39%.

Figure 4.1-22: Population Projection

| TOWN | Census 2000 | Census 2010 | Census 2020 | Population 2030 | Population 2040 | Population 2050 |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Ashburnham | 5,546 | 6,081 | 6,315 | 6,195 | 5,931 | 5,582 |
| Ashby | 2,845 | 3,074 | 3,193 | 3,554 | 3,732 | 3,760 |
| Athol | 11,299 | 11,584 | 11,945 | 11,706 | 11,195 | 10,581 |
| Ayer | 7,287 | 7,427 | 8,479 | 9,128 | 9,424 | 9,353 |
| Clinton | 13,435 | 13,606 | 15,428 | 14,974 | 14,248 | 13,471 |
| Fitchburg | 39,102 | 40,318 | 41,946 | 41,614 | 41,193 | 40,305 |
| Gardner | 20,770 | 20,228 | 21,287 | 19,625 | 17,655 | 15,604 |
| Groton | 9,547 | 10,646 | 11,315 | 12,494 | 13,622 | 13,955 |
| Harvard | 5,981 | 6,520 | 6,851 | 6,964 | 7,144 | 6,945 |
| Hubbardston | 3,909 | 4,382 | 4,328 | 4,615 | 4,570 | 4,283 |
| Lancaster | 7,380 | 8,055 | 8,441 | 8,277 | 7,922 | 7,305 |
| Leominster | 41,303 | 40,759 | 43,782 | 41,404 | 38,098 | 34,581 |
| Lunenburg | 9,401 | 10,086 | 11,782 | 11,756 | 11,370 | 10,839 |
| Petersham | 1,180 | 1,234 | 1,194 | 1,108 | 963 | 839 |
| Phillipston | 1,621 | 1,682 | 1,726 | 1,674 | 1,540 | 1,346 |
| Royalston | 1,254 | 1,258 | 1,250 | 1,206 | 1,080 | 911 |
| Shirley | 6,373 | 7,211 | 7,431 | 8,476 | 9,258 | 9,803 |
| Sterling | 7,257 | 7,808 | 7,985 | 7,678 | 7,302 | 6,556 |
| Templeton | 6,799 | 8,013 | 8,149 | 8,926 | 9,511 | 9,915 |
| Townsend | 9,198 | 8,926 | 9,127 | 8,856 | 8,116 | 7,118 |
| Westminster | 6,907 | 7,277 | 8,213 | 7,932 | 7,541 | 7,019 |
| Winchendon | 9,611 | 10,300 | 10,364 | 10,285 | 9,824 | 9,135 |
| TOTAL | 228,005 | 236,475 | 250,531 | 248,447 | 241,239 | 229,206 |
| Statewide | 6,349,097 | 6,547,629 | 7,029,917 | 7,195,346 | 7,263,082 | 7,267,961 |

B. Households

Like population, the number of households in the region is expected to follow a negative trend through 2050. As shown in Figure 4.1-23 below, the region is projected to see a decrease from 96,886 in 2020 to 95,883 in 2050 (-1.09%). Statewide, projections show an increase in households from 2,749,225 in 2020 to 2,946,290 in 2050 (7.17%)

Figure 4.1-23: Household Projection

| TOWN | Census 2000 | Census 2010 | Census 2020 | Households 2030 | Households 2040 | Households 2050 |
|-------------|-------------|-------------|-------------|--------------------|--------------------|--------------------|
| Ashburnham | 1,929 | 2,148 | 2,330 | 2,267 | 2,273 | 2,195 |
| Ashby | 978 | 1,105 | 1,160 | 1,134 | 1,123 | 1,087 |
| Athol | 4,487 | 4,656 | 4,862 | 5,008 | 4,997 | 4,849 |
| Ayer | 2,982 | 3,118 | 3,591 | 3,973 | 3,971 | 3,864 |
| Clinton | 5,597 | 5,831 | 6,581 | 6,550 | 6,483 | 6,297 |
| Fitchburg | 14,943 | 15,165 | 16,143 | 16,904 | 16,804 | 16,231 |
| Gardner | 8,282 | 8,224 | 8,720 | 8,750 | 8,583 | 8,259 |
| Groton | 3,268 | 3,753 | 3,972 | 4,141 | 4,153 | 3,974 |
| Harvard | 1,809 | 1,893 | 2,108 | 2,756 | 2,826 | 2,729 |
| Hubbardston | 1,308 | 1,566 | 1,684 | 1,632 | 1,621 | 1,554 |
| Lancaster | 2,049 | 2,409 | 2,619 | 2,897 | 3,104 | 3,019 |
| Leominster | 16,491 | 16,767 | 17,873 | 18,189 | 18,102 | 17,520 |
| Lunenburg | 3,535 | 3,835 | 4,546 | 4,136 | 4,122 | 3,970 |
| Petersham | 438 | 493 | 479 | 553 | 550 | 530 |
| Phillipston | 580 | 633 | 674 | 673 | 679 | 655 |
| Royalston | 449 | 498 | 514 | 559 | 566 | 549 |
| Shirley | 2,067 | 2,264 | 2,486 | 2,841 | 2,893 | 2,810 |
| Sterling | 2,573 | 2,810 | 2,994 | 3,037 | 3,073 | 2,974 |
| Templeton | 2,411 | 2,882 | 3,039 | 2,985 | 2,940 | 2,830 |
| Townsend | 3,110 | 3,240 | 3,460 | 3,356 | 3,347 | 3,223 |
| Westminster | 2,529 | 2,716 | 3,079 | 2,920 | 2,965 | 2,843 |
| Winchendon | 3,447 | 3,810 | 3,972 | 4,054 | 4,020 | 3,871 |
| TOTAL | 85,262 | 89,816 | 96,886 | 99,315 | 99,195 | 95,833 |
| Statewide | 2,443,580 | 2,547,075 | 2,749,225 | 2,870,730 | 2,932,930 | 2,946,290 |

C. Employment

Employment growth in the region is expected to have peaked in 2020 at 83,885 persons, followed by a period of slow decrease -0.85% (-710 persons) in 2030 and an additional -2.41% (-2,006 persons) in 2040 and -3.67% (-2,980 persons) in 2050. This is opposite of a projected increase in employment statewide as growth in the ten-year periods of 2020 to 2030, 2030 to 2040 and 2040 to 2050 are projected at 2%, 1.1% and 1.2%, respectively.

Figure 4.1-24: Employment Projection

| MRPC Region | 2020 | 2030 | 2040 | 2050 | |
|-------------|-----------|-----------|-----------|-----------|--------|
| | 83,885 | 83,175 | 81,169 | 78,189 | |
| | Change | Change | Change | Change | Change |
| | 20-'30 | 30-40 | 40-'50 | 20-'50 | |
| | (710) | (2,006) | (2,980) | (5,696) | |
| Statewide | 2020 | 2030 | 2040 | 2050 | |
| | 3,633,367 | 3,704,952 | 3,744,092 | 3,788,585 | |
| | Change | Change | Change | Change | Change |
| | 20-'30 | 30-40 | 40-'50 | 20-'50 | |
| | 71,585 | 39,140 | 44,493 | 155,218 | |
| | 2020 | 2030 | 2040 | 2050 | |
| | 3,633,367 | 3,704,952 | 3,744,092 | 3,788,585 | |
| | Change | Change | Change | Change | Change |
| | 20-'30 | 30-40 | 40-'50 | 20-'50 | |
| | 2.0% | 1.1% | 1.2% | 4.3% | |

Trends

Through the development and analysis of the demographics and projections for the Montachusett region, the following trends were identified and noted. Following these trends, a series of recommendations are presented for the region.

- Current growth expected to stall and begin a steady period of decline in future projections.
- The population in the region is aging faster than in the state or nation. This trend is also reflected in the 2030, 2040 and 2050 projections where the overall growth in the population of the region is expected to slow and decline. This aging of a large proportion of the population poses a number of planning challenges for the Region, including accessibility to health care and elderly services, public transportation, senior housing. In addition, there will be generational shifts in employment sectors and the workforce.
- Educational attainment rates are increasing in the regions male and female populations. However, they still remain lower than state averages. Efforts are needed in the Region to retain this increasing educated population and subsequently help to address shifts in the employment sectors.

- Seven Montachusett communities have a higher proportion of residents with a disability than the state as a whole. Athol, Fitchburg, and Gardner top the list. Among other planning considerations, the high percentages of residents with disabilities, coupled with a steadily aging population, only help to emphasize the importance of multimodal and functional transportation network.
- Eighteen (18) of the region's 22 communities have a lower per capita income than the state (\$48,617), while eight rank below the state when examining median household income.
- An estimated 9.9% of individuals are living in poverty within the Commonwealth of Massachusetts. Six Montachusett communities have a higher concentration of poverty than the state as a whole, with Fitchburg (14.6%) and Gardner (14.1%) also exceeding the national poverty rate of 11.3%. Between 2020 and 2021, poverty rates showed a marginal uptick in the region, rising from 5.9% to 6.4%, still well below the state rate of nearly 10%. In order to reverse these trends, additional opportunities to create a more diverse employment sector is needed. Along with this, is the need for improved access to these jobs at a reasonable cost for those in the lower income strata.
- Based on an analysis of current and past transportation and highway projects versus identified Environmental Justice and Title VI populations, there does not appear to be an undo benefit or burden on these populations.
- Housing in the region trends toward single family homes. This along with a rising median home values can affectively price individuals out of the Montachusett Region. This can be especially harmful to younger, more highly educated individuals, which in turn can exasperate the aging population situation. In order to serve the regions changing population characteristics, i.e. aging, diversified, and low income, affordable housing units (either as single or multiple units) need to be an emphasis for the region's officials. Additionally, where appropriate direct tie ins to available transportation options should be a major factor for local officials in this area.

- Manufacturing continues to remain the largest employment sector in the region (nearly 16% of total employees) and integral to the economic health of many communities. The level of manufacturing-based employment, despite the decline in recent decades, continues to outstrip that of both the state and country. While efforts continue toward diversifying the regional economy into other growing sectors, including the service sectors, the region's comparative advantage of an experienced manufacturing workforce and industrial space will help keep manufacturing as a cornerstone in the region's economy.
- Montachusett Region commuters are more auto-reliant than in the state or the nation. Eighty-five percent (85%) of workers either drive alone or carpool to work as compared to 75% of workers in Massachusetts, and 82% of workers in the country. Montachusett residents are also significantly less reliant upon public transit. The longer commute times and distances of Montachusett individuals tend to put more emphasis on the traditional commuter roads in the region, i.e. Route 2, I-190, Route 117, Route 119, Route 140, Route 12, etc. The potential for increased public transit usage exists if expansion and costs can be implemented in a reasonable fashion. In addition, these segments of commuters are also likely to be impacted by technological changes in travel modes, i.e. autonomous vehicles, rideshare options and alternative energy vehicles. With a greater demand or usage of these technologies, critical support infrastructure is needed from long term parking areas for autonomous vehicles, to charging stations, to incentive programs.

Recommendations

The following is a series of recommendations based upon the identified trends related to the demographic profile of the Montachusett Region. It should not be viewed as a complete and finite list but rather a starting point for the continued review of the needs of the region.

1. The aging of the region's population requires that several issues be addressed:
 - a. Expanded transit options to vital services for elderly. Expansion to needed services such as medical and shopping should remain a priority. Additionally,

connections between communities should be examined and implemented where feasible.

- b. Upgrades, expansion and improvements to the pedestrian network in the core centers of communities and in and around identified service areas, i.e. medical facilities, shopping centers, etc. Safer sidewalks and pedestrian corridors will also serve other segments of the population beyond the elderly.
 - c. Safety improvements along the road and pedestrian/bicycle networks need to be expanded and prioritized to help deal with the aging population as well as assisting with other segments with their activities.
2. Identification and prioritization are needed for projects that assist the disabled community throughout the region. This would include better sidewalks, improved access to transit options, and eliminating gaps in the network that prevent or discourage usage (ex. incomplete or non-existing sidewalks on fixed route transit lines).
3. Expansion of employment opportunities are needed in order to retain and expand the regional workforce. As the educational level continues to rise in the region, without adequate employment options, the population will continue to age as younger individuals seek better paying jobs outside of the region. Network improvements are needed to assist and encourage employers to remain in the region. This would involve infrastructure improvements to support industries, multiple travel options to bring employees to and from work, and expansion of outreach efforts to all segments of the population. Continued emphasis on maintaining pavement conditions and reducing bridge deficiencies will allow for greater marketing by municipalities of available industrial and commercial areas.
4. Expansion of mode options for commuters needs to also be a priority for the region. This would also involve the region's trail/pedestrian/bicycle networks. These systems can be improved and expanded in order to provide additional walking and biking mode options.

5. Additional planning is needed to address future technological advances in transportation as they occur and become more and more feasible. This would include issues such as:
 - a. Autonomous vehicles. Where will they “park” when riders have reached their destinations? Is there a need for special lots or facilities? Are there potential congestion issues at the start and end of work shifts? Will “peak hours” increase because the autonomous vehicle may be making additional trips to desired locations (i.e., one trip in and one trip out in both the AM and PM (4 trips) as opposed to a driver that has one trip in and one trip out in the AM and PM (2 trips))?
 - b. Electric vehicles. Where should charging stations be located? How many facilities exist, and do they adequately serve the population now? Environmentally, are there any drawbacks associated with batteries, etc., that need to be addressed?
 - c. Ride share options. Can these systems be expanded to address the needs of the elderly, low income and disabled populations? Can the systems expand to the more rural communities to serve these areas without viable transit options?
6. The population is getting more and more diverse in terms of minority populations and language. Additional efforts are needed to draw these individuals into the transportation planning process to ensure adequate representation and service.

Infrastructure

Introduction

Within the transportation system, the infrastructure that makes up and serves the roadway network is critical to its effectiveness and efficiency. Poorly maintained bridges and pavement impact all aspects of movement, from commuting and recreation to freight and emergency services.

Bridges

Throughout the Montachusett region, many of its roads travel over numerous brooks, rivers and water bodies. Within the 22 communities of the Montachusett planning area, some 326 bridges are identified and rated by MassDOT as part of their inventory system. MassDOT regularly provides MRPC access to its bridge inventory which includes data such as the community where the bridge is located, the road name that the bridge is located on, the bridge identification number, functional classification of the road, year built, historical significance, rebuilt date (if applicable), AASHTO (American Association of State Highway and Transportation Officials) rating, and the deficiency status of each bridge, i.e. structurally deficient.

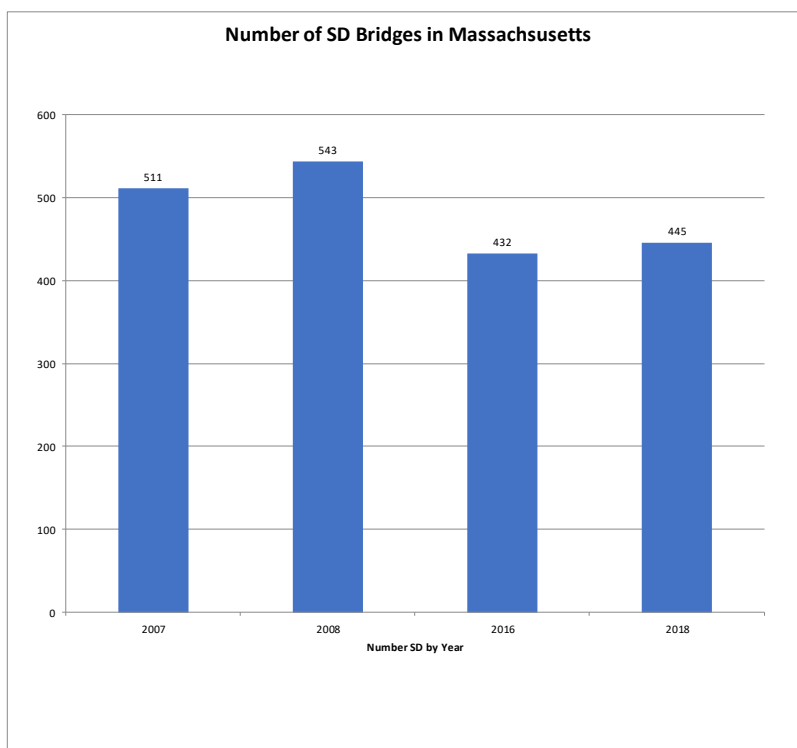
Structurally deficient bridges are a main concern in terms of repair priorities. A Structurally deficient bridge is not necessarily unsafe but is deteriorated to a point where it must be closely monitored and inspected or repaired. Structurally deficient bridges can result in bridge closings and weight restrictions which alter traffic patterns by forcing vehicles to find alternate routes frequently leading through residential streets. The result is increased congestion and pollution, potential loss of business, the potential for more accidents, and failure of the emergency response times and planning process.

A. Accelerated Bridge Program

The Accelerated Bridge Program (ABP) was initiated by the MassDOT in 2008 as an effort to reduce the number of bridges rated as structurally deficient. On February 1, 2007, there were 511 structurally deficient (SD) bridges statewide. This number increased to 543 by July 1, 2008 when the ABP Program was initiated. Without the program, the number of SD bridges was

expected to rise to 697 by October 1, 2016. The goal of the program was to reduce the number of SD bridges to fewer than 450 by October 1, 2016. That goal was reached with 432 ABP-eligible structurally deficient bridges as of October 1, 2016. The number of ABP-eligible structurally deficient bridges as of September 1, 2022 was 443.

Figure 4.2-1: Number of Structurally Deficient Bridges in Massachusetts



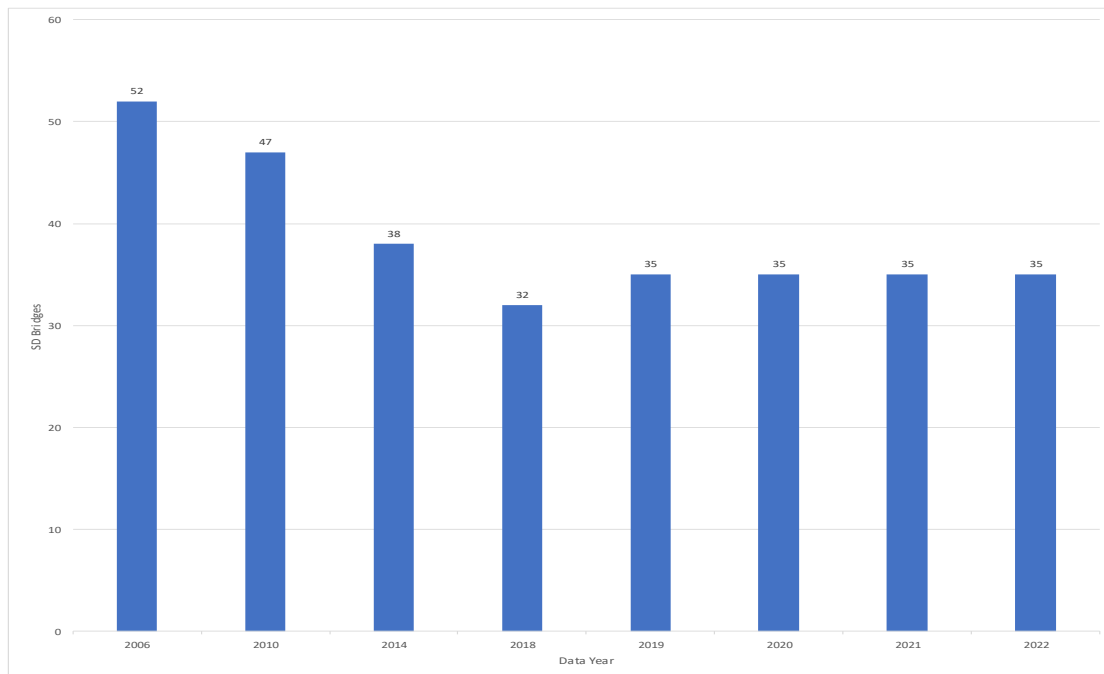
B. Montachusett Bridges – Current & Historical

The following table and graph provide a breakdown of the total bridge numbers regionwide as well as the number of SD bridges in each community from bridge inventories over the years.

Table 4.2-1: Structurally Deficient Bridge Changes

| Structurally Deficient Bridges Regionwide | | | | | | | |
|---|------|------|------|------|------|------|------|
| 2006 | 2010 | 2014 | 2018 | 2019 | 2020 | 2021 | 2022 |
| 52 | 47 | 38 | 32 | 35 | 35 | 35 | 35 |

Figure 4.2-2: Percent of Structurally Deficient Bridges in Region



Within the Montachusett Region, the 2022 bridge inventory lists 35 bridges as SD. This represents approximately 11% (35 of 326) of the Region's total bridges. Of particular note is that bridge inventories from 2006 and 2010 report structurally deficient bridges being around 15% of the total in the region. A major reason for the decrease in both number and percentage of SD bridges throughout the region in the following decade is due to major investments made from the Accelerated Bridge Funding Program. As this funding program has ended, recent inventories show a plateau trend in which the number and percentage of bridges rated as SD are leveling off, or even increasing.

In order to maintain an efficient movement of goods and people, a responsive and adequately funded bridge maintenance program is essential. It is important to discourage the previous trend of increasing percentage of bridges being rated as structurally deficient. These percentages will be monitored in future inventories to determine where current trends are heading.

Pavement

The *Pavement Management Program* at MRPC consists of surveying all federal aid eligible roadways in the region for the purpose of collecting, maintaining and evaluating pavement condition data for use in this transportation plan and project decision making.

There are approximately 667 miles of federal aid eligible roads in the Montachusett region, of which 222 miles are National Highway System (NHS) roads, and 445 miles are Surface Transportation Block Grant (STBG) roads. NHS roadways represent all Interstate roadways such as I-190, and I-495 along with a systematic network of principal arterials such as Route 2 and parts of Routes 12, 140 and 2A; NHS roads are regularly surveyed by MassDOT. STBG roadways, which include all other numbered routes as well as all urban arterials, urban collectors and rural arterials, are surveyed mostly by the MRPC, MassDOT also regularly collects data on all numbered routes.

A. The Roadway System

Of the approximately 2,124 miles of roads in the Montachusett region, approximately 445 miles are Surface Transportation Block Grant (STBG) eligible roadways and 222 miles are National Highway System (NHS) eligible roadways. This represents 31% of the region's road miles. The remaining 1457 miles (69%) are state and local aid eligible roads.

These roadways are defined as follows:

National Highway System (NHS) – all interstate roadways and a systematic network of principal arterials spanning the state. In addition, roads connecting the NHS roadways to military bases

(known as the Strategic Highway Network) are also considered part of the NHS network. NHS passenger and freight terminals are connected by roadways called NHS connectors.

Surface Transportation Block Grant (STBG) – comprised of any functionally classified roadway not part of the NHS network. STBG funded roadways include all urban arterials, urban collectors and rural arterials. According to previous funding legislation, rural collectors are STBG eligible, but have a limitation on the STBG funding amount.

State and Local Aid – includes Chapter 90 and other non-Federal Aid categories. Roadways that fall under this category are comprised of roads functionally classified as local roads.

The following table provides a breakdown of roads by community by their aid eligibility, NHS, STBG or State Aid/Local.

Table 4.2-2: Regional Centerline Miles

| Community | NHS | STP | Total Fed-Aid | State and Local | Total |
|------------------|------------|------------|----------------------|------------------------|--------------|
| Ashburnham | 9.60 | 10.70 | 20.30 | 77.30 | 97.60 |
| Ashby | 6.69 | 7.52 | 14.21 | 50.04 | 64.25 |
| Athol | 13.10 | 19.31 | 32.41 | 82.41 | 114.82 |
| Ayer | 6.96 | 9.75 | 16.71 | 36.82 | 53.53 |
| Clinton | 4.96 | 13.11 | 18.07 | 35.16 | 53.23 |
| Fitchburg | 18.45 | 47.13 | 65.58 | 137.01 | 202.59 |
| Gardner | 10.89 | 30.72 | 41.61 | 75.53 | 117.14 |
| Groton | 13.15 | 20.84 | 33.99 | 80.29 | 114.28 |
| Harvard | 13.70 | 5.22 | 18.92 | 60.98 | 79.90 |
| Hubbardston | 8.18 | 13.13 | 21.31 | 64.32 | 85.63 |
| Lancaster | 14.29 | 17.15 | 31.44 | 43.61 | 75.05 |
| Leominster | 19.28 | 42.64 | 61.92 | 121.12 | 183.04 |
| Lunenburg | 10.26 | 23.59 | 33.85 | 58.41 | 92.26 |
| Petersham | 12.55 | 7.07 | 19.62 | 59.63 | 79.25 |
| Phillipston | 2.97 | 8.23 | 11.20 | 41.94 | 53.14 |
| Royalston | 0.00 | 20.99 | 20.99 | 52.35 | 73.34 |
| Shirley | 3.56 | 16.38 | 19.94 | 31.82 | 51.76 |
| Sterling | 14.92 | 28.81 | 43.73 | 62.73 | 106.46 |
| Templeton | 5.68 | 35.15 | 40.83 | 63.97 | 104.80 |
| Townsend | 9.03 | 16.32 | 25.35 | 68.91 | 94.26 |
| Westminster | 13.65 | 29.53 | 43.18 | 67.19 | 110.37 |
| Winchendon | 10.44 | 21.23 | 31.67 | 85.99 | 117.66 |
| | 222.31 | 444.52 | 666.83 | 1457.53 | 2124.36 |

B. Regional Pavement Conditions

The structural conditions of the majority of the Federal Aid eligible roads are determined by MassDOT and MRPC pavement surveys. The condition is expressed by assigning either a Pavement Serviceability Index (PSI) number from 0 to 5 or a Pavement Condition Index number from 0 – 100 (PCI) to segments along the roadway. PSI (MassDOT method) and PCI (MRPC method) is an overall rating of the pavements condition. Conditions are rated as Excellent, Good, Fair and Poor. The following table shows a general correlation between PSI and PCI,

condition, repair strategies, and associated cost. This average cost has been determined from consultation with MassDOT and other Regional Planning Agencies throughout the State.

Table 4.2-3: Pavement Condition – Cost Breakdown

| PSI | PCI | Condition | Associated Repair | Repair Cost Per. Sq. Yard |
|------------|----------|-----------|----------------------------------|---------------------------|
| 0 - 2.29 | 0 - 64 | Poor | Reconstruction | \$45 |
| 2.3 - 2.79 | 65 - 84 | Fair | Rehabilitation (Mill/Overlay) | \$18 |
| 2.8 - 3.49 | 85 - 94 | Good | Preventative Maintenance | \$8.50 |
| 3.5 - 5 | 95 - 100 | Excellent | Routine Maintenance | \$0.75 |

Utilizing this information, a general condition of the Montachusett Region’s federal aid eligible roadway network can be developed. The following lists pavement condition on federal aid eligible roads by town in the region. These federal aid miles are further broken down by local and state jurisdiction. Please note that due to the time frame between data collection and report preparation, conditions of the roadways may change. Additionally, mileage listed in the following charts may not reflect mileage listed on the “Total Fed-Aid Miles” column of the Centerline Miles table as a small percentage of roads not eligible for federal aid are included. Therefore, this information should be viewed in general terms regarding needs and condition.

Table 4.2-4: 2022 Regionwide Conditions

| 2022 REGIONWIDE | Condition | State | | | Local | | | Combined | | | |
|-----------------|-----------|--------|-----------|--------------|--------|-----------|---------------|--------------------------|--------|-----------|---------------|
| | | Miles | Sq. Yards | Cost | Miles | Sq. Yards | Cost | Repair Category | Miles | Sq. Yards | Total |
| | Excellent | 87.48 | 1231774 | \$923,830 | 137.16 | 1931232 | \$1,448,424 | Routine Maintenance | 224.65 | 3163006 | \$2,372,254 |
| | Good | 92.32 | 1299862 | \$11,048,830 | 94.41 | 1329253 | \$11,298,654 | Preventative Maintenance | 186.73 | 2629116 | \$22,347,484 |
| | Fair | 50.92 | 716941 | \$12,904,936 | 81.22 | 1143605 | \$20,584,898 | Rehabilitation | 132.14 | 1860546 | \$33,489,834 |
| | Poor | 11.13 | 156711 | \$7,052,015 | 156.53 | 2203943 | \$99,177,455 | Reconstruction | 167.66 | 2360655 | \$106,229,469 |
| | Total | 241.85 | | \$31,929,611 | 469.32 | | \$132,509,432 | Total | 711.17 | | \$164,439,042 |

In comparing current regionwide network conditions to those from 2017, it would appear that the overall condition of federal aid eligible roads has shifted over the years. ‘Improve System Preservation and Maintenance of All Modes’ is a Goal originally stated in the 2016 RTP and still identified in this 2024 update. To monitor progress of that Goal, a Performance Measure was set to ‘Increase the percent of categorized “good” to “excellent” federal aid eligible roadway miles within the region over a 10-year period’. The 2022 condition change charts below would indicate that this performance measure is currently being met. These conditions will continue to be monitored and reported on, on an annual basis.

It should be noted that the mileage of state jurisdiction roads has increased significantly since 2017. The reason for this is that divided highways have been accounted for in only one direction in earlier surveys in this analysis but will now be considering both ways. For example, Route 2 is a divided highway in the Montachusett region. Previous surveys only reflected condition data on one direction of the highway, current practice is to count both east and west directions. It is also normal to have a small difference in surveyed roads year to year due to the surveys available from either MRPC or MassDOT each year.

Table 4.2-5: 2022 and 2017 Regionwide Percentage Comparisons

| 2022 | Condition | State | | Local | | Combined | |
|------|-----------|--------|-----|--------|-----|----------|-----|
| | | Miles | % | Miles | % | Miles | % |
| | Excellent | 87.48 | 36% | 137.16 | 29% | 224.65 | 32% |
| | Good | 92.32 | 38% | 94.41 | 20% | 186.73 | 26% |
| | Fair | 50.92 | 21% | 81.22 | 17% | 132.14 | 19% |
| | Poor | 11.13 | 5% | 156.53 | 33% | 167.66 | 24% |
| | Total | 241.85 | | 469.32 | | 711.17 | |

| 2017 | Condition | State | | Local | | Combined | |
|------|-----------|--------|-----|--------|-----|----------|-----|
| | | Miles | % | Miles | % | Miles | % |
| | Excellent | 80.24 | 42% | 75.06 | 16% | 155.30 | 23% |
| | Good | 52.72 | 27% | 93.84 | 19% | 146.56 | 22% |
| | Fair | 32.36 | 17% | 155.03 | 32% | 187.39 | 28% |
| | Poor | 27.11 | 14% | 158.84 | 33% | 185.95 | 28% |
| | Total | 192.43 | | 482.77 | | 675.20 | |

Table 4.2-6: 2017 - 2022 Condition Percentage Change

| % Change 2017 - 2022 | Condition | State | Local | Combined |
|-------------------------|-----------|----------|----------|----------|
| | | % Change | % Change | % Change |
| | Excellent | -6% | 14% | 9% |
| | Good | 11% | 1% | 5% |
| | Fair | 4% | -15% | -9% |
| | Poor | -9% | 0% | -4% |

As with the condition of bridges, the regionwide pavement conditions are in danger of deteriorating. It is important to continue to monitor these conditions and consider trends in the decision-making process. For a map data base of all pavement conditions in the Montachusett region, visit the pavement conditions database on MRPC's MRMapper.

(<https://mrmapper.mrpc.org/>)

Trends

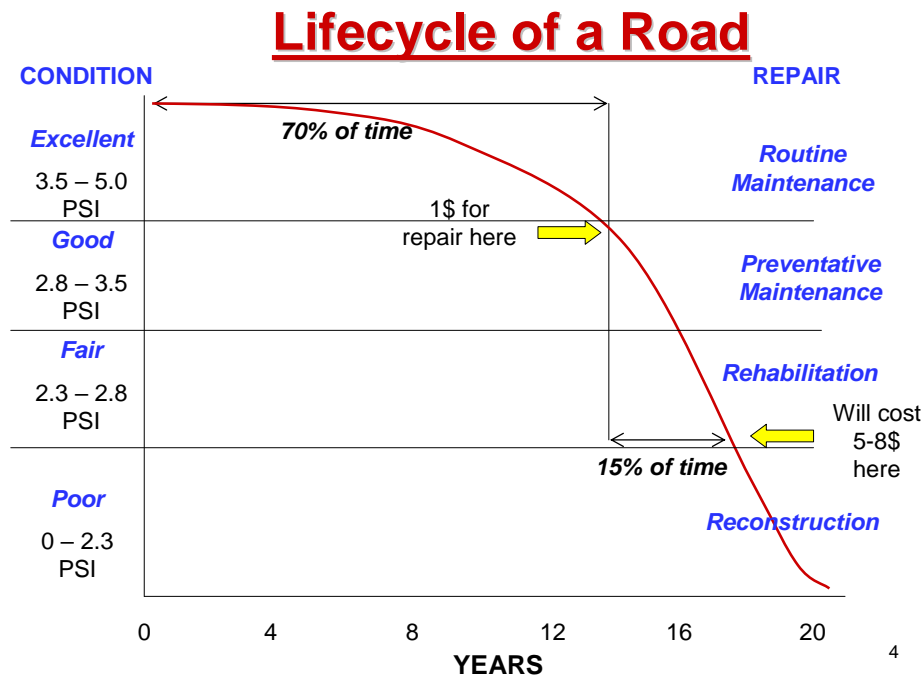
Analysis of roads and bridges in the Montachusett region demonstrate a network that is relatively stable, however, in danger of deterioration if proper investments are not maintained. It is important to prioritize maintenance and repair of this existing infrastructure to be able to maximize public funds and allow additional investments for improvements and expansion.

Recommendations

The transportation system in the Montachusett region largely consists of roads and bridges. Maintaining these assets are a challenge, however, we must understand the importance of a properly functioning and safe roadway system. Maintaining a state of good repair should be a main priority and in our best interest in order to stretch our investments to the greatest benefits. Ultimately, it is recommended that investments are guided by proven asset management practices and the proper amount of investment is made to ensure these assets do not deteriorate.

The figure below displays the concept of pavement lifecycle cost. A pavements lifecycle is the time between reconstruction periods. Lifecycle cost is the total cost spent on maintenance and repairs for a particular pavement section during its lifecycle. One of the main focuses of pavement management is to keep lifecycle cost low to stretch the dollar in what is commonly an ever-decreasing maintenance budget.

Figure 4.2-3: Lifecycle of a Road



Due to the rising cost of improvements and the declining funds for preserving existing infrastructure, it is challenging to make improvements to the pavement network. Building a historical and measurable database of conditions in the Montachusett region allows for a snapshot of overall conditions which will allow us to determine how the network changes over time. Maintaining historical databases of bridge and pavement data paired with applying proven methods of asset management is recommended. Conditions should be closely monitored due to the threat of a deteriorating network.

Safety

Introduction

The MRPC has an ongoing commitment to the goal of improving roadway safety in the Montachusett Region (Region) for all transportation modes. The MRPC has and will continue to work with MassDOT and MRPC Member Communities to improve roadway safety. The following content provides a snapshot of the existing safety conditions and information for improving safety in the Region.

2023 Massachusetts Strategic Highway Safety Plan

The MRPC continues to work cooperatively and in coordination with MassDOT for the implementation of the most recent Massachusetts Strategic Highway Safety Plan (Plan) (2023 Plan completed: 12/22). The Plan seeks to improve safety on all public roads in Massachusetts (state). The Plan provides a framework for how the state will work to make its roadways safer for all roadway users. The Vision Zero, Safe System Approach, Equity: Equitable Distribution of Resources, and Collaboration Efforts of the Plan are briefly described below.

VISION ZERO

The state's top priority on all public roadways (from residential streets to interstate highways disregarding jurisdiction and functional classification) is ensuring the safety of all roadway users whether a roadway user is driving an automobile, pickup truck, large truck, motorcycle, riding as a passenger, walking, bicycling, on a wheelchair, or using any other mobility device. One life lost or seriously diminished on the states' roadways is one too many. The state is committed to the goal of zero roadway fatalities and serious injuries.

SAFE SYSTEM APPROACH

To achieve Vision Zero, the state has adopted a Safe System Approach (SSA) that addresses and mitigates the risks inherent on roadways. The SSA is endorsed by the U.S. Department of Transportation as a framework for addressing roadway safety in a holistic manner. The SSA is a

system that works by anticipating human mistakes and keeps the kinetic energy of a crash on the human body at a tolerable level. A successful SSA identifies and mitigates risks on the roadway system to prevent crashes rather than waiting for crashes to occur followed by taking action afterward. The SSA approach requires responsibility for crash risk identification and mitigation across all agencies and communities. This includes those responsible for planning, programming, designing, constructing, maintaining, and utilizing (road users). Not to be forgotten are those who create, enforce, and adjudicate roadway system laws.

EQUITY: THE EQUITABLE DISTRIBUTION OF RESOURCES

The state has incorporated equity into every actionable effort that flows from the Plan. In this context, equity means the distribution of all roadway resources to all people in a just and impartial way. The actions to be taken will address the disproportionate harm that vulnerable populations and people of color often suffer on the state's roadways. An action plan will be undertaken to understand why the existing disparities exist through analysis of roadway fatality and serious injury crash data including all possible factors and the best practices to mitigate them.

COLLABORATION

The state is developing partnerships for every actionable effort that will flow from the Plan. Partnerships include supporting communities and other public entities to address safety locally and regionally, especially since most of the state's roadways (approximately 80%) are under local jurisdiction. Many communities have already taken steps to improve safety that the state will augment and learn from. The Plan seeks partnerships with philanthropic and private entities. It is important to realize that no single entity can achieve the Vision Zero goal alone.

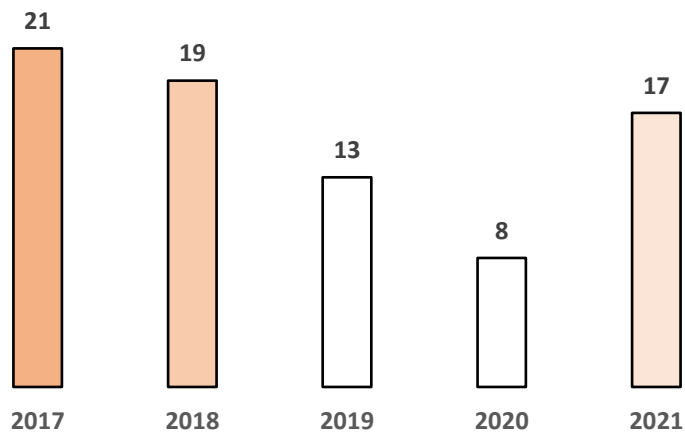
**This link provides access to the Plan
[2023 Plan Download](#)**

Impact of COVID on Fatalities and Serious Injuries

Reducing the number of Fatalities and Serious Injuries is the top priority in the Region. Since the COVID pandemic began, fatal crashes have increased dramatically in the Region, so it is urgent

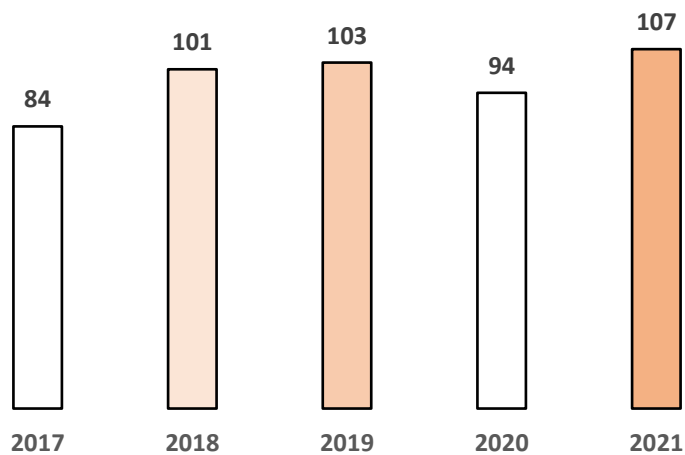
to expedite coordinated action to prevent fatal crashes. Serious Injuries have increased as well but not as dramatically as Fatalities.

Figure 4.2-1: Region Total Fatalities*



Year 2021 total Fatalities more than doubled the year 2020 total Fatalities (17 to 8, a 113% increase) after declining an average of four (4) Fatalities year to year from years 2017-2020 for the highest total since year 2018. Fortunately, year 2021 total Fatalities are not a new high for the Region as over the past 16 years, Fatalities occurred 30 times in year 2006, 17 times in year 2012, 23 times in year 2013, 21 times in year 2017, and 19 times in year 2018.

Figure 4.3-2: Region Total Serious Injuries*



After a small decline in total Serious Injuries from years 2019-2020 (103-94, an 8.7% decrease), total Serious Injuries increased moderately in year 2021 from 94-107 (a 13.8% increase). This is the highest Serious Injuries total since year 2016 when 110 Serious Injuries occurred.

*Source for all crash data in this chapter: MassDOT. **NOTE:** Crash data is regularly updated by MassDOT which may/will increase or decrease Fatality data, Serious Injury data, and all crash cluster data.

Safety Needs

Total Fatalities Trend by 5-Year Rolling Average

The figure *Region Total Fatalities 5-Year Rolling Averages* (**Figure 4.3-3**) below graphically represents the number of roadway crash Fatalities that occurred in the Region from 2012-2021 (the last year of each 5-year period). The number of Fatalities is provided as an annual average based on a five-year rolling average (i.e., years 08-12, 09-13, etc.).



Figure 4.3-3: Region Total Fatalities 5-Year Rolling Averages

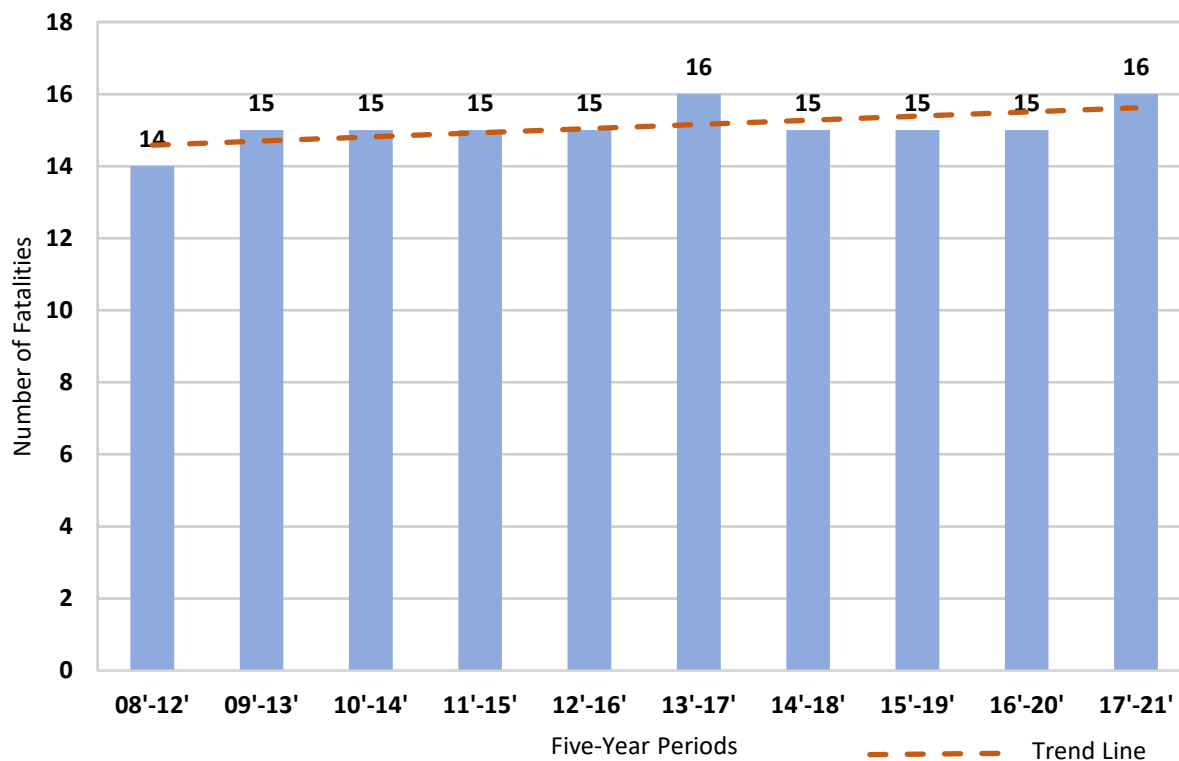


Figure 4.3-3 shows that the number of Fatalities that occurred remained consistent at 15 Fatalities over the years of 09-13 to 12-16 with the 08-12 period being an exception with 14 Fatalities. The 13-17 period saw an increase of one (1) Fatality to 16 Fatalities, but the number of Fatalities receded to 15 Fatalities for the years 14-18 to 16-20. The number of Fatalities returned to 16 for the 17-21 period which includes the impact of the COVID pandemic year of 2021, but also year 2020 which experienced the lowest number of Fatalities (8) of any year since 2014. Fortunately, this is not a new high for the Fatality 5-year rolling average analysis for the Region, but it does equal the previous high of the 13-17 period.

This resulted in Fatalities trending upward since 2012 as depicted by the Trend Line in **Figure 4.3-3**. To begin to reverse the upward trend in Fatalities in the Region to meet the Vision Zero goal, Safe System Approach projects need to be considered for development on the roadways where the Fatalities occur. The MRPC will contact Member Communities concerning the historic locations of Fatalities for further study and potential project development.

Total Serious Injuries Trend by 5-Year Rolling Average

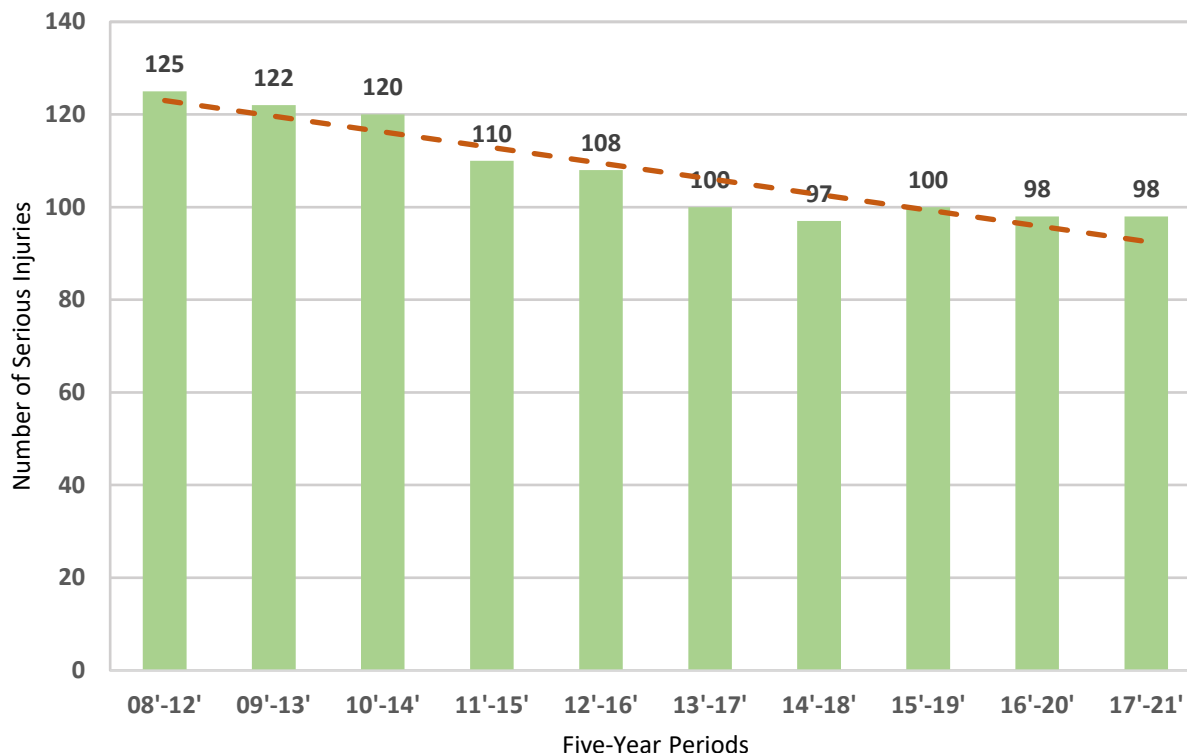
The figure *Region Total Serious Injuries 5-Year Rolling Averages* (**Figure 4.3-4**) below graphically represents the number of roadway crash Serious Injuries that occurred in the Region from 2012-2021 (the last year of each 5-year period). The number of Serious Injuries is provided as an annual average based on a five-year rolling average.



Figure 4.3-4 shows that the number of Serious Injuries decreased 21.6% for a decrease of 27 Serious Injuries from 125 to 98 from the 08-12 period to the 17-21 period. The most significant decrease in the number of Serious Injuries occurred from 08-12 period to 13-17 period which saw a decrease of 22.4% for a decrease of 28 Serious Injuries from 125 to 97. The number of Serious Injuries rose during the 15-19 period to 100 followed by a minor decrease of two (2) Serious Injuries during the 16-20 period. The number of Serious Injuries for the 17-21 period equaled the 16-20 period total of 98 which includes the impact of the COVID pandemic year of

2021. Fortunately, this is not a new high for the Serious Injury 5-year rolling average analysis for the Region.

Figure 4.3-4: Region Total Serious Injuries 5-Year Rolling Averages



This resulted in Serious Injuries trending downward since 2012 as depicted by the Trend Line in **Figure 4.3-4**. To continue the downward trend of Serious Injuries from 17-21 total of 98 in the Region to meet the Vision Zero goal, Safe System Approach projects need to be considered for development on the roadways where the Serious Injuries occur. MRPC will contact Member Communities concerning the historic locations of Serious Injuries for further study and potential project development.

All Mode High Crash Intersections (HCIs) At-Risk Road Segments for Crash Type Speeding (*At-Risk Rd Segs*)

HCIs include all crashes involving all types of motorized vehicles and people that are:

- Walking / on bicycles / using public transportation / or using any other mobility means such as wheelchairs.

HCI prioritize Fatal crashes and Serious Injury crashes over crashes that result in property damage only. Please see the [HSIP Project Selection Criteria](#) for more information.

- **Table 4.3-1** below shows that for the 3-year period of 2017-2019, a total of 106 HCIs occurred in Member Communities.
- The HCIs are unevenly distributed among 15 Member Communities.
- 71.7% (76 of 106) of the HCIs occurred in the three Member Communities of Fitchburg, Gardner, and Leominster.

Table 4.3-1: HCIs Per Member Communities

| COMMUNITIES | # of HCIs Per Community |
|-------------------------|-------------------------|
| ASHBY | 1 |
| ATHOL | 3 |
| AYER | 1 |
| CLINTON | 3 |
| FITCHBURG | 29 |
| GARDNER | 11 |
| GROTON | 3 |
| HARVARD | 1 |
| LANCASTER | 3 |
| LEOMINSTER | 34 |
| LEOMINSTER & FITCHBURG* | 2 |
| LUNENBURG | 3 |
| STERLING | 3 |
| TOWNSEND | 3 |
| WESTMINSTER | 3 |
| WINCHENDON | 3 |
| REGION TOTAL: | 106 |

*HCIs occurred at City Lines

♦ **All 106 HCIs need safety improvements. However, projects cannot be completed for all of them at the same time. In light of this, the MRPC recommends that Member Communities select at least one to submit as a safety improvement project. Please see the Appendix for the full All Mode HCIs Table.**

❖ **Please contact the MRPC for further information on the full All Mode HCIs Table.**

Table 4.3-2 below list the:

- Top 10 HCIs in the Region that may also about ***At-Risk Rd Segs.***
- HCIs that are listed in the state's [Top 200 High Crash Locations Report](#) .
- HCIs that are NEAR Top 200 HCLs that may also about ***At-Risk Rd Segs.***
- HCIs that overlap Bike and Pedestrian High Crash Locations that may also about ***At-Risk Rd Segs.***

NOTE: 48 HCLs abut 40 *At-Risk Rd Segs*.

NOTE: All Ped and Bike HCLs in the Region are included in **Table 4.3-2**.

◆ **Table 4.3-2 is NOT A PRIORITIZED LIST of HCLs.** Each of the 106 HCLs in the full HCLs table is a priority for safety improvement.

Table 4.3-2: Top 10 Region HCLs / HCLs that are also (or near) Top 200 HCLs / Ped HCLs / Bike HCLs and Abut At-Risk Rd Segs in Member Communities

| COMMUNITIES | HCLs 2017 - 2019 | State Top 200 HCLs^ | Overlap Bike HCLs^^ | Overlap Ped HCLs^^ | Abut At-Risk Rd Segs* |
|-------------|--|---------------------|---------------------|--------------------|-----------------------|
| FITCHBURG | 1. WATER ST (SR 12) at WANOOSNOC RD | • | | | • |
| LEOMINSTER | 2. NORTH MAIN ST (SR 12) at LINDELL AVE | • | | | • |
| | 3. MAIN ST (SR 13) at HAMILTON ST | • | • | | • |
| LANCASTER | 4. LOWER BOLTON RD (SR 110) at BOLTON RD | • | | | • |
| LEOMINSTER | 5. HAWS ST at RT 2 EXIT 100 ON/OFF RAMP | | | | • |
| FITCHBURG | 6. LUNENBURG ST (SR 2A) at BOUTELLE ST | | | | |
| | 7. SOUTH ST at WANOOSNOC RD | | | | • |
| LEOMINSTER | 8. NORTH MAIN ST (SR 12) at NELSON ST | | | | • |
| FITCHBURG | 9. MAIN ST (SR 2A) at NORTH ST | | | • | • |
| | 10. BEMIS RD at AIRPORT RD | | | | |
| LEOMINSTER | MAIN ST (SR 13) at RAILROAD ST | | •** | | • |
| FITCHBURG | MAIN ST at CUSHING ST | | | • | • |
| LEOMINSTER | MONUMENT SQ (SR 12) at MECHANIC ST | | | • | • |
| FITCHBURG | MAIN ST at BOULDER DR | | | • | • |
| LEOMINSTER | MAIN ST (SR 13) at RIVER ST | •** | • | | • |
| FITCHBURG | MAIN ST at WATER ST | | | • | • |
| | WATER ST (SR 12) at MARKET BASKET DRW | | | • | |
| ATHOL | MAIN ST (SR 2A) at EXCHANGE ST | | • | | • |
| FITCHBURG | WATER ST (SR 12) at LAUREL ST (SR 2A) | | | • | • |
| GARDNER | MAIN ST (SR 68) at WILLOW ST | | | • | |
| FITCHBURG | WATER ST (SR 12) at WANOOSNOC RD | •** | | | • |

^HCLs that are included in the state's Top 200 High Crash Locations Report

^^Bike and Ped HCLs are included in the state's Top 200 High Crash Locations Report

*Identified Locations from the At-Risk Road Segments for Speeding

**Any HCLs located near a State Top 200 HCL or a Bike HCL

For *At-Risk Rd Segs* and to achieve the Safe Systems Approach and the Equity efforts of the Plan, road segments that are susceptible to Fatal crashes and Serious Injury crashes related to speeding were identified by MassDOT using the following risk factors:

- Roadway Risk Factors: The occurrence of Fatal crashes and Serious Injury crashes that exceeded the speed limit; Average Annual Daily Traffic (AADT); degree of road

curvature; posted speed limit; presence of a sidewalk on at least one side of the road; divided or undivided road; stability of road shoulder; and other factors.

- Societal Risk Factors: Proportion of younger drivers in a community; vulnerable and people of color populations within a community; and other demographic and socioeconomic characteristics.

NOTE: Not all Risk Factors need to occur on a road segment for that road segment to become an **At-Risk Rd Seg**. For example, road curvature does not need to exist on a road segment, but if it does exist, then it becomes a Risk Factor.

- **Table 4.3-3** below shows that for the 5-year period of 2013-2017, a total of 160 **At-Risk Rd Segs** were identified in Member Communities.
- **At-Risk Rd Segs** are unevenly distributed among 19 Member Communities.
- 57% (91 of 160) of the **At-Risk Rd Segs** occurred in five Member Communities: Clinton; Fitchburg; Groton; Lancaster; Leominster.

Table 4.3-3: At-Risk Rd Segs Per Member Communities

| COMMUNITIES | # of At-Risk Rd Segs Per Community |
|-------------------|------------------------------------|
| ASHBURNHAM | 3 |
| ASHBY | 2 |
| ATHOL | 7 |
| AYER | 8 |
| CLINTON | 10 |
| FITCHBURG | 31 |
| GARDNER | 9 |
| GROTON | 13 |
| HARVARD | 3 |
| LANCASTER | 11 |
| LEOMINSTER | 26 |
| LUNENBURG | 5 |
| PETERSHAM | 2 |
| SHIRLEY | 4 |
| STERLING | 3 |
| TEMPLETON | 2 |
| TOWNSEND | 9 |
| WESTMINSTER | 7 |
| WINCHENDON | 5 |
| REGION TOTAL: | 160 |

♦ **All 160 At-Risk Rd Segs need safety improvements. However, projects cannot be completed for all of them at the same time. In light of this, the MRPC recommends that**

Member Communities select at least one to submit as a safety improvement project.
Please see the Appendix for the full *At-Risk Rd Segs* Table.

❖ Please contact the MRPC for further information on the full *At-Risk Rd Segs* Table.

Tables 4.3-4A and 4.3-4B below list the 40 *At-Risk Rd Segs* that also abut at least one HCI.

Intersection crashes were not included in this analysis. Intersections are covered in the *All Mode HCIs* analysis above.

Table 4.3-4A: At-Risk Rd Segs that Abut HCIs in Member Communities

| COMMUNITIES | At-Risk Rd Segs | Abut All Mode HCI* |
|-------------|-----------------------|--------------------|
| ATHOL | MAIN STREET | • |
| | SOUTH MAIN STREET | • |
| CLINTON | HIGH STREET | • |
| | WATER STREET | • |
| FITCHBURG | ELECTRIC AVENUE | • |
| | JOHN FITCH HIGHWAY | • |
| | LAUREL STREET | • |
| | MAIN STREET | • |
| | MOUNT ELAM ROAD | • |
| | NORTH STREET | • |
| | OLD SOUTH STREET | • |
| | PEARL STREET | • |
| | PRINCETON ROAD | • |
| | RIVER STREET | • |
| | SOUTH STREET | • |
| | WANOOSNOC ROAD | • |
| | WATER STREET | • |
| | WESTMINSTER STREET | • |
| GARDNER | TIMPANY BOULEVARD | • |
| GROTON | BROADMEADOW ROAD | • |
| | LONGLEY ROAD | • |
| | LOWELL ROAD | • |
| LANCASTER | CENTER BRIDGE ROAD | • |
| | HIGH STREET EXTENSION | • |
| | LOWER BOLTON ROAD | • |
| | MAIN STREET | • |

*Abuts at least 1 HCI

Table 4.3-4B: At-Risk Rd Segs that Abut All Mode HCIs in Member Communities

| COMMUNITIES | At-Risk Rd Segs | Abut All Mode HCI* |
|-------------|-------------------|--------------------|
| LEOMINSTER | HAMILTON STREET | • |
| | HARVARD STREET | • |
| | HAWS STREET | • |
| | LITCHFIELD STREET | • |
| | MAIN STREET | • |
| | MECHANIC STREET | • |
| | MONUMENT SQUARE | • |
| | NORTH MAIN STREET | • |
| | RIVER STREET | • |
| | TOLMAN AVENUE | • |
| TOWNSEND | SOUTH STREET | • |
| WESTMINSTER | EAST MAIN STREET | • |
| WINCHENDON | FRONT STREET | • |
| | SCHOOL STREET | • |

* Abuts at least 1 HCI

Future Analysis:

Other Crash Types that May Occur on At-Risk Road Segments Segments with Excessive Fatal and/or Serious Injury crashes

The following list of Crash Types are susceptible to Fatal crashes and Serious Injury crashes on road segments. MassDOT has developed Risk Factors for the highlighted Crash Types. The MRPC will be conducting an analysis of these Crash Types in the near future. Risk Factors for **At-Grade Rail Crossing; Intersection; and Safety of Persons Working on Roadway (Work Zone)** Crash Types are under development by MassDOT.

At-Grade Rail Crossing: It is a crash in which the **ROADWAY JUNCTION TYPE** field in the crash report is reported to be a **RAILWAY GRADE CROSSING**.

Bicycle/Bicyclist: It is a crash in which the **PERSON TYPE** field in the crash report is reported to be **NON-MOTORIST** and the **NON-MOTORIST TYPE** field in the crash report is reported to be **CYCLIST**.

Distracted Driver: It is a crash in which the **DRIVER DISTRACTED TYPE** field in the crash report is reported to be **MANUALLY OPERATING AN ELECTRONIC DEVICE; TALKING ON HANDS-FREE ELECTRONIC DEVICE; TALKING ON HAND-HELD ELECTRONIC DEVICE; OTHER ACTIVITY; ELECTRONIC DEVICE; OTHER ACTIVITY (SEARCHING, EATING,**

PERSONAL HYGIENE, ETC.); PASSENGER; or EXTERNAL DISTRACTION (OUTSIDE THE VEHICLE).

Impaired Driving: It is a crash in which one or more drivers is reported as being suspected of using alcohol. On the crash report **ALCOHOL SUSPECTED FIELD** equals **YES**.

Intersection: It is a crash in which the **ROADWAY JUNCTION TYPE** field in the crash report is reported to be either a **T** intersection; **Y** intersection; **4-WAY** intersection; **5-POINT OR MORE** intersection; or **TRAFFIC CIRCLE**.

Lane Departure: It is a crash in which the **VEHICLE SEQUENCE OF EVENTS** field in the crash report is reports as a collision with a **CURB; TREE; UTILITY POLE; LIGHT POLE; GUARDRAIL; SIGN POST; FENCE; MAIL BOX; BRIDGE** (or any other roadside object); **RAN OFF THE ROAD RIGHT; RAN OFF THE ROAD LEFT; CROSS MEDIAN/CENTERLINE**.

Large Truck Involved: It is a crash in which the **VEHICLE CONFIGURATION CODE** field in the crash report is reported to be **BUS (SEATS FOR 16 OR MORE, INCLUDING DRIVER); BUS (SEATS FOR 9-15 PEOPLE, INCLUDING DRIVER); SINGLE-UNIT TRUCK (2-AXLE, 6-TIRES); SINGLE-UNIT TRUCK (3-OR-MORE AXLES); TRUCK/TRAILER; TRUCK TRACTOR (BOBTAIL); TRACTOR/SEMI-TRAILER; TRACTOR/DOUBLES; TRACTOR/TRIPLES; UNKNOWN HEAVY TRUCK, CANNOT CLASSIFY**.

Motorcycle/Motorcyclist: It is a crash in which the **VEHICLE CONFIGURATION CODE** field in the crash report is reported to be **MOTORCYCLE**.

Occupant Protection: It is a crash in which the **PROTECTIVE SYSTEM USE** field in the crash report is reported to be **NO**.

Older Driver: It is a crash in which the **AGE OF DRIVER – OLDEST KNOWN** field in the crash report is reported to be between the ages of **65 AND 110**.

Pedestrian: It is a crash in which the **PERSON TYPE FIELD** in the crash report is reported to be **NON-MOTORIST** and the **NON-MOTORIST TYPE** field in the crash report is reported to be **PEDESTRIAN**.

Safety of Persons Working on Roadways (Work Zone): It is a crash in which the **WORK ZONE RELATED FLAG** in the crash report is reported as **YES**.

Speeding: It is a crash in which the **DRIVER CONTRIBUTING CIRCUMSTANCE** field in the crash report is reported to be **EXCEEDED AUTHORIZED SPEED LIMIT**.

Young Driver: It is a crash in which the **AGE OF DRIVER – YOUNGEST KNOWN** field in the crash report is reported to be between the ages of **15 AND 20**.

Segments with Excessive Fatal and/or Serious Injury Crashes: Have been identified by MassDOT. The Top 5% and Next 10% segments will be considered for safety improvement projects. The MRPC will be conducting an analysis of these segments in the near future.

Safety Recommendations and Action Items

Action Items

- To improve safety at **HCLs**; Bike HCLs; Ped HCLs; and **At-Risk Rd Segs**, or any combination thereof, safety improvement projects need to be considered for development based on the strategies and actions found in the Plan.
- Safety project development includes the requirement of conducting a Road Safety Audit (RSA) that will provide safety improvements alternatives before the design is initiated.
- Member Communities may choose to contact the MRPC for the **HCLs**; Bike HCLs; Ped HCLs; and **At-Risk Rd Segs** that may exist within their community.
- MRPC will contact Member Communities concerning the **HCLs**; Bike HCLs; Ped HCLs; and **At-Risk Rd Segs** for further study and potential project development.
- **HCLs**; Bike HCLs; Ped HCLs; and **At-Risk Rd Segs** data is updated by MassDOT which may add locations or subtract existing locations.
- The MRPC maintains regional **HCLs**; Bike HCLs; Ped HCLs; and **At-Risk Rd Segs Tables**.
- The MRPC will be conducting an analysis of the Crash Types that are susceptible to Fatal crashes and Serious Injury crashes on road segments in the near future.

Future Safety Improvement Projects

Table 4.3-5 below lists the top **HCI** from the full **All Mode HCIs Table** for each Member Community listed in **Table 4.3-1** above. Please see the Appendix for the full **All Mode HCIs Table**. All 106 locations in the table need safety improvements. However, projects cannot be

completed for all of them at the same time. In light of this, the MRPC recommends that Member Communities select at least one to submit as a safety improvement project.

Table 4.3-5: Top HCIs in Member Communities

| COMMUNITIES | Top HCI in each Community 2017 - 2019 | Crash Count | 1) Fatal &/or Serious Injury | 2) Minor &/or Possible Injury | 1 & 2 Total | PDO | EPDO | Region Top 5% | Region Top 100 | State Top 200 HCI | ** |
|--------------------------|--|-------------|------------------------------|-------------------------------|-------------|-----|------|---------------|----------------|-------------------|-----|
| ASHBY | GREENVILLE RD (SR 31) at TURNPIKE RD | 17 | 2 | 5 | 7 | 10 | 157 | Yes | | | |
| ATHOL | TEMPLETON RD (SR 2A) at ORCHARD ST | 14 | 0 | 4 | 4 | 10 | 94 | | Yes | | |
| AYER | GROTON HARVARD RD at CENTRAL AVE | 13 | 0 | 5 | 5 | 8 | 113 | Yes | | | |
| CLINTON | MAIN ST (SR 68) at BROOK ST | 10 | 0 | 4 | 4 | 6 | 90 | | Yes | | |
| | STERLING ST (SR 62) at GREELEY ST | 10 | 0 | 4 | 4 | 6 | 90 | | Yes | | |
| FITCHBURG | WATER ST (SR 12) at WANOOSNOC RD | 50 | 1 | 13 | 14 | 36 | 330 | Yes | | Yes | Yes |
| GARDNER | TIMPANY BLVD (SR 68) at CONANT ST | 19 | 0 | 6 | 6 | 13 | 139 | Yes | | | |
| GROTON | MAIN ST (SR 119) at LOWELL RD (SR 40) | 19 | 0 | 3 | 3 | 16 | 79 | | Yes | | |
| HARVARD | JACKSON RD at GIVRY ST | 9 | 0 | 6 | 6 | 3 | 129 | Yes | | | |
| LANCASTER | LOWER BOLTON RD (SR 110) at BOLTON RD | 28 | 1 | 10 | 11 | 17 | 248 | Yes | | Yes | Yes |
| LEOMINSTER | NORTH MAIN ST (SR 12) at LINDELL AVE | 47 | 3 | 9 | 12 | 35 | 287 | Yes | | Yes | Yes |
| LEOMINSTER* & FITCHBURG* | NORTH MAIN ST (SR 12) at BATTLES ST* | 23 | 0 | 7 | 7 | 16 | 163 | Yes | | | |
| | NORTH MAIN ST (SR 12) at ERDMAN WAY* | 22 | 0 | 5 | 5 | 17 | 122 | Yes | | | |
| LUNENBURG | CHASE RD (SR 13) at MASSACHUSETTS AVE (SR 2A) | 9 | 0 | 5 | 5 | 4 | 109 | Yes | | | |
| STERLING | PRINCETON RD (62) at REDEMPTION ROCK TRAIL (140) | 13 | 0 | 4 | 4 | 9 | 93 | | Yes | | |
| TOWNSEND | MAIN ST (SR 119) at SOUTH ST | 16 | 0 | 4 | 4 | 12 | 96 | | Yes | | |
| WESTMINSTER | E MAIN ST (2A) at RAMP-RTS 2 EB/140 SB TO RTS 2A/140 | 20 | 1 | 3 | 4 | 16 | 100 | Yes | | | |
| WINCHENDON | SPRING ST (SR 12) at GARDNER RD (SR 140) | 10 | 0 | 4 | 4 | 6 | 90 | | Yes | | |

*these 2 HCIs occurred at the City Line **Abuts At-Risk Rd Seg

Tables 4.3-6A and 4.3-6B below list one **At-Risk Rd Seg** from the full **At-Risk Rd Segs Table** for each Member Community listed in **Table 4.3-3** above. Please see the Appendix for the full **At-Risk Rd Segs Table**. All 160 locations in the table need safety improvements. However, projects cannot be completed for all of them at the same time. In light of this, the MRPC recommends that Member Communities select at least one to submit as a safety improvement project.

Table 4.3-6A: At-Risk Rd Segs in Member Communities

| COMMUNITIES | At-Risk Rd Segs | Abuts All Mode HCI* |
|-------------|-----------------|---------------------|
| ASHBURNHAM | MAIN STREET | |
| ASHBY | MAIN STREET | |
| ATHOL | MAIN STREET | Yes |
| AYER | MAIN STREET | |
| CLINTON | MAIN STREET | |
| FITCHBURG | MAIN STREET | Yes |
| GARDNER | MAIN STREET | |
| GROTON | MAIN STREET | |

*Abuts at least 1 HCI

Table 4.3-6B: At-Risk Rd Segs in Member Communities

| COMMUNITIES | At-Risk Rd Segs | Abuts All Mode HCI* |
|-------------|-------------------|------------------------|
| HARVARD | AYER ROAD | |
| LANCASTER | MAIN STREET | Yes |
| LEOMINSTER | MAIN STREET | Yes |
| LUNENBURG | MASSACHUSETTS AVE | |
| PETERSHAM | BARRE ROAD | |
| SHIRLEY | LANCASTER ROAD | |
| STERLING | MAIN STREET | |
| TEMPLETON | PATRIOTS ROAD | |
| TOWNSEND | MAIN STREET | |
| WESTMINSTER | EAST MAIN STREET | Yes |
| WINCHENDON | FRONT STREET | Yes |

*Abuts at least 1 HCI

4.4 Bicycle & Pedestrian

Introduction

Increasing concern for air quality, energy conservation, rising fuel costs, and the health benefits of getting outdoors is generating continued interest in multi-modal transportation in the Montachusett Region and throughout the state. The MRPC has been working toward a more sustainable transportation system by educating and promoting transportation mode choice throughout the region. This section will review existing and proposed Bicycle and Pedestrian transportation alternatives while focusing on the importance of mode shift.

Existing Infrastructure

A. Bikeways

Bikeways are special routes and/or facilities established to facilitate the movement of bicycles as an energy efficient transportation and/or recreational mode of travel. Bikeability is a measure of how well an area encourages biking for everyday trip purposes.

In 2019 MassDOT updated the “[Massachusetts Bicycle Transportation Plan](#)”. This plan consists of an overview, a roadmap which includes the vision, goals and principles, as well as initiatives and an action plan. As a part of this update development, MassDOT also developed the “Municipal Resource Guide for Bikeability” to go along with the updated Bike Plan. This plan is meant to assist communities in enhancing community bikeability and includes additional resources.

The Vision, Goals and Principles identified in the updated Bike Plan include –

Vision – Biking in Massachusetts will be a safe, comfortable, and convenient option for everyday travel.

- Goal 1 – Create high-comfort connected bike networks for people of all ages and abilities.
- Goal 2 – Increase the convenience and attractiveness of everyday biking.
 - Principle 1 – Treat all people the same regardless of travel mode
 - Principle 2 – Address gaps and barriers known to discourage everyday biking
 - Principle 3 – Lead by example and partner with municipalities to advance everyday biking

MassDOT developed a Capital Investment Plan (CIP) to manage funding that works towards this vision. This plan includes projects such as small-scale maintenance projects to large-scale multimodal modernization projects. All projects are scored based on their anticipated benefits in order to determine investment priorities. Additional programs include Complete Streets Funding Program, the Chapter 90 Program, the Multi-Use Pathways Program and the MassTrails Funding Program.

1. Bikeway Projects in the Montachusett Region

- **Mass Central Rail Trail (MCRT)**– (Clinton/Sterling) The Montachusett Region considers the completion of this statewide trail a transportation priority as it is a vital link for regional and statewide trail connections. An estimated 53 miles of this trail are already open and, when complete, it will total around 104 miles of trail (<https://www.masscentralrailtrail.org/>).

- Sterling - The Sterling spur runs between Gates Road at Washacum Street in Sterling center, with parking at both trailheads. This trail section is constructed on the right-of-way of the previous Fitchburg & Worcester Railroad, which ran from Sterling Junction through Sterling Center to Pratt's Junction.



Wachusett Greenways, in partnership with Sterling and seven more regional towns and the Commonwealth, constructed and maintains the central portion of the statewide MCRT. The MCRT runs along a 30 mile route through Sterling, West Boylston, Holden, Rutland, Oakham and Barre following the old Mass Central Railroad alignment with other connecting lands. Twenty miles of the trail are complete and construction continues to fill in the gaps.

The Town of Sterling and Wachusett Greenways are collaborating to plan extension of the MCRT spur north from Washacum Street to Chocksett Road. MasDOT's construction of a roundabout at Route 12 and Chocksett Road, a second roundabout at I-190 Exit 6, with lane reductions, and additional pedestrian and bicycling accommodations offers the potential for safe extension of the route further north. The general direction of the Sterling Spur of the MCRT offers the potential to connect to the recently constructed Twin Cities Rail Trail in Fitchburg/Leominster.

- Clinton - The Clinton/Berlin areas are important components of the MCRT. Wachusett Greenways anticipates constructing the MCRT from West Boylston to Route 110, leading to a Clinton connection. The route from the West Boylston, Thomas Street trail entrance, bridges along the Route 140 Beaman Street causeway, then follows old Pleasant Street to the Bean Road, Sterling and Prescott Street, West Boylston line. Wachusett Greenways has identified trail route options from there to

Route 110 at Chase Hill Road, Sterling on DCR land and town roads. Wachusett Greenways is currently constructing the old Pleasant Street, West Boylston section.

The Town of Clinton recently purchased the segment of trail that includes the 1,000-foot tunnel in 2020. The Clinton Greenway Conservation Trust is currently working with the town of Clinton on the design phase for the remediation of the tunnel and the design of the trail from the tunnel to the Berlin town line.



When this design phase is completed, bid documents will be ready for the remediation of the tunnel and the trail will move on to the build phase. The Montachusett Region is in support of using Transportation funds to complete this work.

The DCR Wachusett Reservoir section of the MCRT in Clinton is already open and in use. It runs from gate 39 at South Meadow Road to Gate 43 at the base of Grove Street. This is the only trail along the Wachusett Reservoir where bikes are allowed. To connect the Clinton owned section of the trail to the DCR section of the trail, a crossing at Route 70 and the Nashua River will need to be designed and completed. This project will part of the next design phase for the Clinton section.

A connection to the west also needs to be designed and built to connect Clinton to the Sterling section of the trail. There are a few options to join these sections. One option is “rail with trail” as the rail bed between Clinton and West Boylston is still active. Another option may be to develop a trail along Route 110. An exact path has yet to be determined.

The MCRT could be the longest rail trail in the northeast and at Northampton it is going to connect directly with a North/South trail to New Haven, CT making for a totally

sustainable tourism experience for families. Boston to Northampton on the MCRT and then south to New Haven on the Farmington Canal Greenway and then take passenger rail back to Boston.

- **Nashua River Rail Trail** – (Ayer/Groton) This popular trail is a former railroad right of way that travels 11 miles through the towns of Ayer, Groton, Pepperell and Dunstable. Managed by the Department of Conservation and Recreation, the trail was officially opened to the public on October 25, 2002. The trail is an active transportation corridor to the Ayer Commuter Rail Station as well as a popular destination for recreation. Unfortunately, the condition of the trial surface has deteriorated over the years and it is in dire need of repairs.



- **North Central Pathway** – (Gardner/Winchendon) This recreational trail connects the communities of Gardner and Winchendon. The trail was broken down into phases to ease the development process.



- Phase 1 – Dedicated paved trail from Park Street past Crystal Lake to Mount Wachusett Community College (MWCC)
- Phase 2 – Using existing roads from MWCC, Kelton & Stone Streets to Route 140. This portion of the trail exists only as an on-street connection with signage. Once Phase 6 is completed, this phase will no longer be needed.
- Dunn Park Spur – Existing roads from MWCC to Dunn Park with dedicated connector at the Middle School
- Phase 3 – 3.2 miles paved from Route 140 to Old Gardner Road in Winchendon
- Phase 4 – Downtown Winchendon to Glenn Allen Street
- Phase 5 – \$1.7 Million-dollar project that consists of 2.1 miles starting at North Ashburnham Road to Glennallen Street (Rt. 202).

- Phase 6 – A \$8.3 Million-dollar bridge over Route 140 that is currently in the design process. It is listed on the Draft 2024-2028 TIP for year FY2027.
- Phase 7 – Proposed along the old rail bed from Park Street to the bridge at Route 140 (Phase 6).

When completed, this trail will provide the region with a link to many other recreational sites and activities including Dunn Pond, Gardner High School Athletic Facilities, Mount Wachusett Community College, Gardner Municipal Golf Course, the Gardner Veterans Rink, Clark YMCA, Grout Park and many more.

○ **Twin Cities Rail Trail**

After over 20 years of planning, phase 1 of this 4.5-mile rail was completed in the summer of 2022. When all phases are completed, the trail will connect downtown Fitchburg to downtown Leominster via the former CSX railroad bed that parallels Route 12. Due to the complex nature of the trail design, the project was broken up into three phases.



- Phase 1 – Construction of this phase began during FY2020 and is the main portion of the trail connecting the area of First Street in Fitchburg south to Carter Park in Leominster. This portion of the trail has two major bridges and many road crossings.
- Phase 2 – Scheduled for FY2024, this phase will consist of a bridge over the Nashua River and existing railroad tracks over to the Intermodal station in Fitchburg. This phase of the trail is extremely important as it will connect trail users directly to the commuter rail as well as MART transit services.
- Phase 3 – This phase will continue the trail through Carter Park to Mechanic Street in Leominster. At the time of this write up, the City of Leominster is in negotiations with CSX to purchase the rail line through Carter Park. It is expected that this will be completed by 2024. If timing allows, this phase may be combined with Phase II to

shorten the time frame for project completion and reduce the project's administrative costs.

This trail provides a much-needed multi-modal connection from one city center to the other by providing many different populations, including environmental justice neighborhoods, access to recreation, shopping, medical centers as well as to transit options. Future connections south to Sterling and the Mass Central Rail Trail are a possibility for trail expansion.

Ashburnham Rail Trail – (Ashburnham) The Town of Ashburnham and Ashburnham Rail Trail (ART) Inc., a private not for profit, are working together toward their goal of a safe, non-motorized route between Ashburnham Center and South Ashburnham. This relatively flat, shared use path will benefit residents and visitors by providing a safe route along a very busy 2.5-mile section of Route 101 where sidewalks and bike lanes are currently unavailable due to geographic constraints.

Ashburnham is working toward two major aspects of this project:

1. Turnpike Road intersection looking west - Completion of the engineering and design of the 2.5-mile section of the Rail Trail, which will provide users convenient access to the many existing businesses and service of Ashburnham Center, as well as providing excellent opportunity for future growth in this area. Along the route, the Rail Trail would offer access to the Post Office, municipal soccer fields, J.R. Briggs Elementary School, and the William J. Bresnahan Community Center. The Town has purchased the abandoned railroad bed and both the Town and volunteers maintain and improve the trail. A multi-use path is included in the Reconstruction of Rte. 101S MassDOT TIP currently scheduled for completion in FY25. The path will allow safe pedestrian and bike access between Turnpike Road and the Bresnahan Community Center.

2. Bridge over Whitney Pond - At the South Ashburnham termination of the current Rail Trail, the goal is to connect the Ashburnham Rail Trail to the North Central Pathway of Greater Gardner and Winchendon via the abandoned Cheshire Branch of the former Boston & Maine Railroad. With this connection, Ashburnham would be a major entryway to a tri-state network of rail trails.

Progress on the 2.5-mile section of the trail has been difficult, slow, and will be expensive. However, the project is vital to Ashburnham's future economic development. To date, the Town has acquired ownership and/or rights to most segments that comprise the Rail Trail. In 2007 and with support of Ashburnham residents at Town Meeting, a 25% Design Plan was completed for the Rail Trail and an application for an Abbreviated Notice of Resource Area Delineation was submitted to the Ashburnham Conservation Commission. In 2022, MassDOT expressed an interest in linking the Rail Trail segment from downtown Ashburnham and Turnpike Rd. to the Rte. 101S TIP multi-use path. The Town must complete 100% of the design plan between Williams and Turnpike Rd., which includes a bridge before possibly receiving state funding to complete the project segment.

Challenges that lie ahead for completion of the Rail Trail include:

- Parking and access point delineations
- Clearing, grading and surface preparation
- Whitney Pond Bridge reconstruction after Whitney Pond Dam removal is completed.
- Bridge construction at the washed-out gulley behind the soccer fields
- Municipal, State and Federal permitting
- Applying for and receiving state and federal grant funding

The financial constraints have left Ashburnham and ART, Inc. with few options of moving forward with these expensive and major projects. Funding and grant money are limited for such a short but vital section of rail trail. That is why the Cheshire Line is such an important piece of the plan.

With greater awareness of the incredible asset they have in Ashburnham, the Town and ART, Inc. hope to keep their dream of a Tri-State Rail Trail alive.

- **Squannacook River Rail Trail – (Townsend/Groton)**

The construction of the Squannacook River Rail Trail has been broken down into four phases.

- Phase 1- Townsend center to Old Meetinghouse Road (Complete)
- Phase 2 - Old Meetinghouse Road to Townsend Harbor (Complete)
- Phase 3 - From the Bertozzi Wildlife Management Area in West Groton to the northern Crosswinds Drive crossing in West Groton (Complete)
- Phase 4 - From the northern Crosswinds Drive crossing to Townsend Harbor (behind the Harbor Village Mall). (Completion estimated for March 2024)

When completed, the Squannacook River Rail Trail will be 3.7 miles long. This multi-use recreational trail will parallel the scenic Squannacook River and will connect the town centers of Townsend Harbor and Townsend Center, two historical districts, two shopping centers, the North Middlesex Regional High School, and several major open space/conservation areas (notably Townsend State Forest and the Squannacook River and Ash Swamp Wildlife Management Areas). In Townsend, this trail closely parallels the bicycle and pedestrian unfriendly Route 119, providing a long-desired safe alternative to that state highway for non-motorized travel. The surface is/will be stone dust, with a 10-foot width. The rail bed is owned by the MBTA, and was leased in March 2015 by the non-profit Squannacook Greenways, Inc. Squannacook Greenways was the first non-profit in the state of Massachusetts to sign a lease to construct a rail trail with the MBTA. They were also the recipient of two MassTrails grants, funds from Groton's Community Preservation Act as well as private foundation money to continue efforts in project development. More information can be found at sqgw.org and <http://squannacookgreenways.org/>.

- **Nashoba Regional Greenway (NRG)** - (Ayer, Devens, Harvard) The Nashoba region of Massachusetts is located between and around routes 128 and 495 in the vicinity of the Fitchburg commuter rail line. This greenway aims to connect shared-use trails and greenways, notably the Nashua River Rail Trail, the Bruce Freeman Rail Trail, the Assabet River Rail Trail, the Minuteman Bikeway, and the Mass Central Rail Trail. Currently, however, there are no designated safe/appropriate routes to connect these resources to mass transit, community centers, or regional attractions. The Nashoba Regional Greenways (NRG) coalition is a group of town officials and volunteers from fifteen communities who are working together to fill that gap using the existing road and trail network. They envision a network of quiet and safe routes, designated by signage, suitable for bicycles, pedestrians, strollers alike.

B. Pedestrians

Like the roadway projects in the region, pedestrian facilities in the Montachusett Region are also limited due to a lack of funding. During these tough economic times, communities tend to focus their monies elsewhere. Local communities have expressed interest and support of improved pedestrian ways, often in connection with potential bikeways, but they lack adequate funding for the design and construction of these facilities.

As mentioned in the bicycle section above, in addition to the Massachusetts Bicycle Transportation Plan, the state of Massachusetts also created the [Massachusetts Pedestrian Transportation Plan](#) in 2019.

The Vision, Goals and Principles identified in the updated Pedestrian Plan include:

Vision – All people in Massachusetts will have a safe, comfortable, and convenient option to walk for short trips.

- Goal 1 – Eliminate pedestrian fatalities and serious injuries
- Goal 2 – Increase the percentage of short trips made by walking

Principles

1. Value people walking and their travel needs, especially the most vulnerable – children, elderly, people with disabilities – to ensure they can walk safely.
2. Prioritize improvements for people walking by proactively addressing gaps and barriers that discourage walking and are known to increase the likelihood of crashes.
3. Lead the Commonwealth in meeting the pedestrian plan goals by supporting local municipalities and other agencies to increase everyday walking.

In 2020, the MRPC developed a Regional Bike and Pedestrian Plan. The MRPC incorporated data from the statewide Bike and Pedestrian Plans into this document as well as the information and recommendations that were included within this 2024 Regional Transportation Plan.

C. Sidewalks

The majority of the communities in the Montachusett Region are rural in nature with small downtown areas. The areas typically contain sidewalks within the major activity centers. The urban communities have a more extensive infrastructure within the central business districts that facilitates pedestrian circulation. Efforts have been made to improve pedestrian access by means of sidewalk improvements, crosswalk delineation, and construction of handicapped ramps, improved lighting, and connections to municipal parking lots. Designated fixed route bus stops are also common along the sidewalks providing a connection between different modes of travel. MRPC conducted a sidewalk and bike lane inventory in 2020 which can be seen on the MrMapper site on the MRPC webpage - <https://mrmapper.mrpc.org/>.

D. Trails

Using Unified Planning Work Program (UPWP) funds, the MRPC was able to conduct a region wide trail inventory starting in 2005 and finishing in 2011. Through public outreach, local meetings and data collection, the MRPC was able to gather trail data for each of their 22 communities plus Devens. This data was broken down into three categories:

- Existing Formal – Trails that are open to the public.
- Existing Informal – Trails that exist but are not open to the public. These trails are likely on private or environmentally sensitive land.
- Potential – These are trails that are not currently in existence but that have potential for development in the future.

In 2012, the trail inventory data was updated through community outreach and field investigation. A Montachusett Regional Trail Guide was then created with the updated trail data in 2014. This guide includes all of the Existing Formal Trails along with local cultural and historical points of interest. The first guide consisted of 10,000 printed copies that were distributed throughout the region. These guides were so popular that they were all dispersed in just over a few years.

In 2019, the MRPC, with the help of the Montachusett Regional Trails Coalition (MRTC), updated existing trail data once again and published an updated Montachusett Regional Trail Guide. At the time of this document, the MRPC currently has approximately 665.5 miles of existing formal trails throughout the region. This total does not include the town of Groton, which owns its own trail inventory using an open-source application made by a third-party vendor. The third-party vendor has multiple legal requirements that must be met in order to use the data stored on its site. Because the application is open-source, anyone can submit or edit the data. Therefore, the data may not be reliable. In previous iterations of the Trail Inventory, the MRPC included Groton's trail data. However, once the hinderances of using the trail data stored on this application were recognized, it was decided that it would be in everyone's best interest to remove Groton's trail data from the MRPC's Trail Inventory.

Resources & Funding

MassDOT developed the Capital Improvement Plan (CIP) which will allow the state to develop and implement the Commonwealth's transportation investment strategy. This plan includes a magnitude of projects and project types – from small-scale maintenance projects to large-scale

multimodal modernization projects. All projects listed in the CIP are subject to the MassDOT Healthy Transportation Policy Directive which requires the incorporation of walking, bicycling, and transit in all projects.

Funding sources for multi-modal projects include:

- Complete Streets
- Chapter 90
- Shared Use Path Program
- Safe Routes to School
- MassTrails Grants
- Shared Streets and Spaces

A. Working with the Montachusett Regional Trail Coalition

The MRPC is partnered with the Montachusett Regional Trail Coalition (MRTC) in support of their mission “To advance local and regional connectivity, community commitment, and enthusiasm for trails in the Montachusett Region.” This mission was re-established during a strategic planning process that was made possible in part by a grant from the Community Foundation of North Central Massachusetts. During this process, a vision statement, guiding principles and goals were also established-

Vision Statement

MRTC envisions:

- fostering trail connections in and around the Montachusett region;
- serving as a centralized resource for regional trail planning;
- helping our communities see trails as essential infrastructure.

Guiding Principles

MRTC advances the development of diverse, high-quality shared-use trails and greenways that are sustainable and accessible:

- Collaboration - Seek participation of diverse stakeholders who represent the communities we serve.
- Connectivity - Advocate for trail linkages within and between communities to bring people and places together in the region.
- Accessibility - Provide trail experiences for people of all abilities and ages.
- Sustainable Development - Commit to developing trails that protect the environment and meet user needs through best management practices.
- Economic Vitality - Support the local economy by putting North Central Massachusetts on the map as a recreational and tourist destination.
- Healthy Lifestyles - Encourage the health, fitness, and well-being of residents by providing multimodal trail opportunities.
- Awareness & Education - Work to make trails a part of the community fabric, connect people with the natural world, and provide outdoor learning experiences for people of all ages.

Goals

- Goal 1 – Identify, secure, and appropriately utilize the human and financial resources necessary to carry out the work of the strategic plan.
- Goal 2 – Develop and implement a marketing plan that targets the proper audiences, strengthens brand awareness, and supports MRTC’s mission.
- Goal 3 – Promote trail connectivity and usage throughout the region by identifying and acting upon opportunities for outreach, education, and advocacy.

The MRTC has been instrumental in gaining public involvement, education, and working with MRPC to identify trail gaps and priorities. Some of the significant trail projects that have been identified include:

1. Connecting the Twin Cities Rail Trail from its terminus in Leominster south to Sterling where it would connect to the Sterling Spur and the Mass Central Rail Trail.
2. Connecting the North Central Pathway in Winchendon to the Ashburnham Rail Trail to the south

3. A Gardner to Athol connection that has yet to be determined

Since COVID 19, the MRTC has been struggling to get up and running again. It is the hope that the group can regain momentum and continue their mission.

B. Sidewalk Inventory & Pedestrian/Bicycle Connections for MART Bus Routes (2018)

This study focused on the Cities of Fitchburg, Gardner and Leominster, in particular, the major fixed bus routes within these communities. The goal was to find and prioritize areas where there are gaps in accessing the bus routes. The study area was defined by the areas within ¼ mile of the bus routes.

As part of the process, a sidewalk inventory was conducted within this study area, and trail data was also included to show transportation alternatives. Data was gathered regarding special populations and points of interest were noted. All of these data sets were mapped and assisted in the prioritization of key areas.

Priority areas for each community included:

- Fitchburg State University (Fitchburg) – This area was listed as one of the top bus routes (Route 4), is located in both of the top five specialty population block groups, and incorporates a major continuing education facility in the area. John Fitch Highway is also a major roadway in the City of Fitchburg (12,000-20,000 avg. vehicles per day). There is also recreational trails nearby at Coolidge Park and Fitchburg State University's athletic fields.
- Leominster Hospital (Leominster) – This area incorporates both elderly and disabled populations, is located on one of the top bus routes (Route 2) and travel routes (North Main Street (Rt. 12) - average of 15,000-30,000 vehicles per day), includes a major medical facility and shopping plazas as well as low income and/or elderly housing facilities.

- Johnny Appleseed Plaza (Leominster) – This is a large area that mostly encompasses Central Street (Route 12) along bus route 9 in the area of Johnny Appleseed Plaza and Willard Street, which connects over to the Walmart shopping area. This section includes both top populations of elderly and individuals with disabilities, low income and/or elderly housing facilities, shopping plazas, and a possible trail connection on the east side of the plaza.
- Parker Pond (Gardner) – This area is located in both of the top five specialty population block groups and is located in between two major routes, Route 68 and 101. The smaller side streets to the east of Parker Pond do not currently have sidewalks. The bus route connects the two routes via Foss Road and Robillard Street. Connections from the smaller side streets near Parker Pond to the bus route and major roadways would be ideal.
- Timpany Plaza (Gardner)– The area just north of Timpany Plaza is listed as having both disabled and elderly populations and is one of the top 5 block groups for elderly residents. It is located within walking distance to the bus route along both Timpany Boulevard and Pearson Boulevard. Both of these locations have many points of interest such as shopping and restaurants and recreational fields/playgrounds.
- Gardner Plaza Shopping Center (Gardner) – The Gardner Plaza is located just off of Route 2 to the north. There are shops and restaurants located here as well as along Pearson Boulevard. There are also two nursing homes and an elementary school located within close proximity. The main focus area is east of Elm Street which is just north of the plaza.

C. Mobility and Access (2022)

This study, similar to the Sidewalk Inventory & Pedestrian/Bicycle Connections for MART Bus Routes mentioned above, examined existing transportation infrastructure that covers vehicular

and non-vehicular mobility needs. The goal of the study was to identify key locations where accessibility should be improved in order to create more transportation options for a variety of ages and populations, specifically Environmental Justice and Title VI populations. Previous studies were examined to assist with identifying these key areas and also to prioritize them by most impactful need.

MRPC staff reviewed existing reports regarding accessibility. Studies that included data gathering for specific types of infrastructure such as trails, sidewalks, bike lanes, pavement condition, etc., were used to assist with the analysis. The main focus was around major destinations such as shopping areas, medical facilities and major employers. MRPC then broke down the data collection into two parts – mobility access for motorists and mobility access for non-motorist. Transit was used for both data sets and was also highlighted in previous reports regarding access to the transit bus lines. The main goal is to identify which areas have the greatest need for improvements in order to create a more user-friendly environment for both transportation modes.

Based upon the data collected and the analysis conducted, the following priority areas were identified. These are the top five priority areas based on the data analysis categories listed above. Each category (vehicular and non-vehicular) has its own set of priority areas and sometimes these areas overlap.

1. Gardner Center- This area has the highest number of analysis criteria with a total of 21 (11–Non-Vehicular & 10 –Vehicular) which makes it the top priority area for both categories. The analysis for this location was based on the following: located within two different vulnerable populations, the MART bus route is located nearby but not directly adjacent to the point(s) of interest (POI), poor pavement conditions adjacent to the POI, located adjacent to both vehicular and non-vehicular top crash clusters, sidewalks nearby but not adjacent to the POI, and no bike infrastructure, commuter rail stop, park & ride, or trails within the priority area.

2. Leominster Center - This location has 18 total points with 9 being a vehicular focus and 9 as non-vehicular. There are 3 vulnerable populations located within this area, which is the highest number of these types of populations within the entire analysis. There are no park & ride facilities, commuter rail stops, trails or bike infrastructure in this area. Poor pavement conditions and both motor vehicle and bike/pedestrian crash clusters adjacent to the points of interest, and sidewalks are present nearby, but connections could be made adjacent to the points of interest.
3. Athol Center - This location also has 18 total points (10 non-vehicular points and 8 vehicular points) in the analysis. The Athol Center is located within two different vulnerable populations, the MART bus route is located nearby but not directly adjacent to the point(s) of interest (POI), poor pavement conditions adjacent to the POI, located adjacent to non-vehicular top crash clusters, trails are located nearby but not adjacent to the POI, and no bike infrastructure, commuter rail stop, or park & ride within the priority area.
4. Fitchburg Center - This location has 17 total points for the analysis (7 for vehicular and 10 for non-vehicular). It is located in 2 top vulnerable populations, there are no park & ride facilities, the MART bus routes, sidewalks, bike infrastructure, and poor pavement conditions are located nearby but not adjacent to the points of interest, there are non-vehicular crash clusters adjacent to the points of interest and vehicular crash clusters nearby.
5. Leominster High School - This location has a total of 15 points for the analysis (8 vehicular and 7 non-vehicular). It is located in 2 vulnerable population groups and there are no commuter rail stops or park and ride facilities in the area. The MART transit bus routes are located nearby but are not adjacent to the points of interest, there are poor pavement conditions throughout the area which also extend adjacent to the points of interest, there are zero vehicular and non-vehicular crash clusters located in the area, there are sidewalks throughout the area and some that are adjacent to the points of interest but bike infrastructure and trails are nonexistent.

Trends

The desire for more multi modal transportation options within the Montachusett Region has increased significantly over the past few years. More people are seeing the value in having these types of transportation options and are also advocating for the development of new, safer, bicycle and pedestrian facilities throughout the region. Programs such as Complete Streets and Safe Routes to School are gaining support from our communities -

- Complete Streets – 19 out of 22 communities have approved policies, one is registered, and 15 have received funding for multi modal projects
- Safe Routes to School – 18 out of 22 communities are partners with the program.

Montachusett Region Communities Participation in Safe Routes to School & Complete Streets

| Community | Safe Routes to School | | Complete Streets | | |
|-------------|-----------------------|----------------------|------------------|----------------------------|---------------------------|
| | Participant | Infrastructure Funds | Tier 1 Policy | Tier 2 Prioritization Plan | Tier 3 Construction Funds |
| Ashburnham | X | | 2019 | 2019 | 2020 |
| Ashby | X | | | | |
| Athol | X | | 2019 | 2019 | 2020 |
| Ayer | X | | 2016 | 2017 | 2019 |
| Clinton | X | | 2016 | 2017 | 2017 & 2020 |
| Fitchburg | X | 2016-2017 | 2016 | 2017 | 2018 & 2020 |
| Gardner | X | 2022 | 2016 | 2017 | 2018 & 2023 |
| Groton | | | 2016 | 2017 | 2018 & 2022 |
| Harvard | X | | 2017 | 2018 | 2019 |
| Hubbardston | X | | 2017 | 2017 | 2018 |
| Lancaster | | | 2016 | 2017 | 2018 & 2022 |
| Leominster | X | 2022 | 2016 | 2017 | 2018 |
| Lunenburg | X | | 2017 | 2018 | 2020 |
| Petersham | X | | | | |
| Phillipston | | | 2018 | | |
| Royalston | X | | Registered | | |
| Shirley | X | | 2016 | 2018 | 2020 & 2023 |
| Sterling | X | | 2020 | 2021 | 2022 |
| Templeton | | | 2017 | | |
| Townsend | X | | 2017 | 2018 | |
| Westminster | X | | 2022 | 2022 | |
| Winchendon | X | | 2016 | 2017 | 2022 |

The State is also contributing financially to trail projects through the MassTrails Grant program. This program provides grants to support recreational trail and shared use pathway projects across the Commonwealth. These grants are reviewed and recommended by the Massachusetts Recreational Trails Advisory Board and the Commonwealth's Inter-Agency Trails Team. There are two funding sources for the grant –

1. Recreational Trails Program (RTP) – these grants are federally funded through the Federal Highway Administration (FHWA), administered at the State level, and provide funding for the development and maintenance of recreational trail projects, both motorized and non-motorized.
2. Commonwealth Trails Grants – “These grants are supported by the State’s annual Capital Investment Plan (CIP) and aim to help communities design, create and maintain off-road shared-use pathway connections between where Massachusetts residents live, learn, work, shop and recreate, especially by building out the longer distance regional networks of multi-use pathways across the state and filling in critical gaps in existing networks, or overcoming current barriers to connectivity.”

(www.mass.gov/guides/masstrails-grants)

In 2022, seven communities within the Montachusett Region received MassTrails funding – Athol, Clinton, Gardner, Groton, Lunenburg, Sterling and Templeton.

Other notable funding sources are the Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Transportation Alternatives Program (TAP). CMAQ provides federal funding for states to support projects and programs intended to improve air quality and reduce traffic congestion. Example projects include – traffic flow improvements, public transit services and facilities, bicycle and pedestrian facilities and programs, rideshare activities, etc. The Twin Cities Rail Trail phase 2 and the North Central Pathway bridge project are currently scheduled in the FY2024-2028 Transportation Improvement Plan. The BIL continues the Transportation Alternatives set-aside from the Surface Transportation Block Grant (STBG) program. Eligible uses of the set-aside funds include all projects and activities that were previously eligible under

the Transportation Alternatives Program under the Moving Ahead for Progress in the 21st Century Act (MAP-21). This encompasses a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity. (<https://www.mass.gov/doc/stip-ffy-2023-2027-appendix-funding-category/download>)

Recommendations

As these multi modal trail and bikeway projects continue to be studied and developed, funding is always a major component. Increasing the existing funding programs and available dollar amounts are always critical to further these regionally significant projects. Additionally, continuing the study and planning of trail related developments in order to identify priority trails and trail connections are also key for alternate modes of transportation.

Economic Vitality

Introduction

The MRPC has an ongoing commitment to the goal of improving economic vitality in the Montachusett Region (Region) by focusing on improving the transportation infrastructure that services the diverse economic drivers within the Region. The MRPC has and will continue to work with MassDOT, MRPC Member Communities, and Devens to improve the transportation infrastructure. The following content provides a snapshot of the existing transportation infrastructure critical to the economic vitality of the Region that should be the focus of future improvement and recommendations for improving the infrastructure.

Economic Vitality Needs

Critical Rural Freight Corridors (CRFCs) & Critical Urban Freight Corridors (CUFCs)

One of the ten federal requirements from the current [2017 Ma Freight Plan](#) (see below for more) was to develop two freight corridor listings:

- **CRFCs:** Are public roads not in an urbanized area which provide access and connection to the *Primary Highway Freight System* (PHFS) and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities.
- **CUFCs:** Are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

Purpose and Implications of CUFCs and CRFCs Regional Freight Corridors (RegionFCs*)

*RegionFCs: MRPC highways that facilitate regional freight traffic for the Region

Massachusetts highways that facilitate inbound and outbound freight traffic in Massachusetts include:

- Five major Interstate corridors: Interstates 84, 90, 91, 93, and 95;
- Seven auxiliary corridors: Interstates 190, 290, 291, 391, 295, 395, and 495;

- Seven major non-Interstate corridors include US-3, US-6, MA-2, MA-3, MA-24, MA-128, and MA-146

Of the above Highways, the following are RegionFCs:

- I-190 and MA-2: The two RegionFCs form an interchange in Leominster at Exit 19 and Exit 101 respectively

The following highways provide freight truck access and egress for the RegionFCs from outside the Region:

- I-495 to MA-2 via Exit 78 in Littleton (MA-2 Exit 113)
- I-495 to MA-2 via the following Routes and Exits (south to north):
 - Route 62 via Exit 67; Route 117 via Exit 70; Route 111 via Exit 75; Route 2A/110 via Exit 79; Route 119 via Exit 80
- I-290 to I-190 via Exit 22 in Worcester
- I-91 to MA-2 via Exit 46 in Greenfield
- I-91 to Route 202 to MA-2 via Exit 14

RegionFCs, CRFCs and CUFCs & National Highway Freight Network (NHFN) National Highway Freight Program (NHFP) Funding

The FHWA defines the NHFN for the purpose of prioritizing through routes critical to interstate commerce:

- The RegionFCs are included in the NHFN
- The Region CRFCs and CUFCs (listed below) provide connectivity to the NHFN for manufacturers and consumers in the Region
- The Montachusett MPO used its own analysis and discretion to designate their mileage allotment to develop Region CRFCs and CUFCs to address the greatest regional freight needs
- The CRFC and CUFC designations increase NHFN in Massachusetts allowing expanded use of NHFP formula funds and, if renewed, the FASTLANE Grant Program funds for eligible projects that support identified national goals (23 U.S.C. 167(b), 23 U.S.C. 117(a)(2))

- MassDOT directs funds toward projects that will improve system performance and the efficient movement of freight on the NHF^N in Massachusetts
- By programming these projects using a mix of NHF^P and other funds, MassDOT will advance projects on the roadway segments deemed most critical to freight needs by the MPOs
- Additionally, each project is screened to make sure it meets at least one statutory requirement before NHF^P funds are applied
- After the development of the STIP and CIP, the project list is updated annually

The following four CUFCs and three CRFCs received MPO endorsement in 2017. The two Route 2 CRFCs also serve as part of the Route 2 RegionFC:

- **Jackson Road (CUFC)** in Harvard/Devens connects Route 2 (Exit 106) to the developing industrial and freight centers at Devens and indirect access to the railroad freight terminal as well as destinations in Ayer.
- **Barnum Road (CUFC)** in Ayer/Devens provides indirect access via Jackson Road to the developing industrial and freight centers at Devens and direct access to the railroad freight terminal as well as destinations in Ayer.
- **Lunenburg/Fort Pond Road (Route 70) (CUFC)** in Lancaster/Lunenburg allows access from Route 2 (Exit 103) to mining facilities at P.J. Keating, a manufacturer of construction earth products and installer of hot mix asphalt, and its mines and truck terminals.
- **Route 111 (CRFC)** from Route 2 (Exit 109) through the Town of Harvard is a connection between two PHFS - Route 2 and I-495 (Exit 75) in the Town of Boxborough.
- Two **Route 2 CRFCs** (also serve as part of the Route 2 RegionFC): One in Phillipston / Templeton, and one in Harvard. Route 2 is the main east-west corridor in the Region. It is parallel to significant freight and commuter rail infrastructure as well as connecting the regional industrial centers of Devens, Leominster, Fitchburg, and Gardner. Exits 82, 79, and 109 connect the two Route 2 CRFCs to destinations north and south of Route 2. Route 2 connects to interstates I-495 to the east, I-190 within the Region and to the south, and I-91 to the west.

Figure 4.5-1: Narrow Rd & Dangerous S-shaped Horizontal Curve at Rt 31 RR Bridge



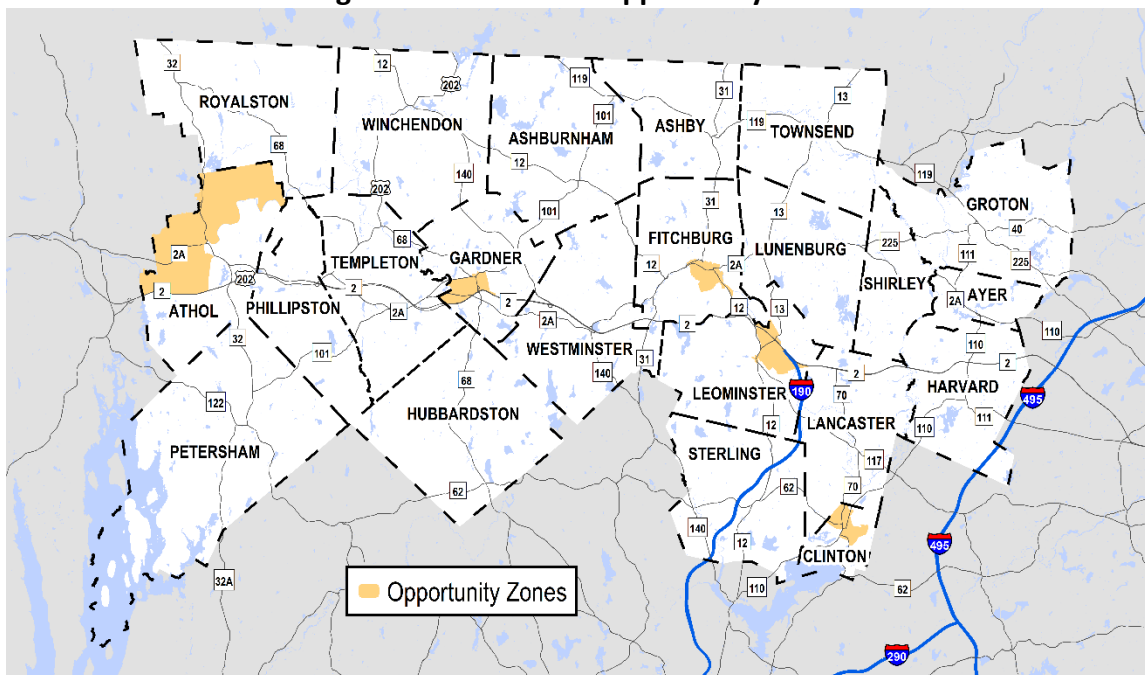
- **Princeton Road (Route 31) (CUFC)** in Fitchburg allows direct access to Wachusett Station and an industrial park and other numerous industrial facilities north of Route 2 (Exit 95). South of Route 2 it provides access to New England Renewable Power, a biomass power plant.

Federal Opportunity Zone Program

2021 Montachusett Region Comprehensive Economic Development Strategy (MRCEDS)

MRCEDS (see below for more) provides a description of the federal *Opportunity Zone* program and the *Opportunity Zones* that are within the Region. Opportunity Zones are census tracts generally composed of economically distressed areas. Ten census tracts were approved within five communities in the Region. The Opportunity Zones are distributed evenly (two each) among the following communities – Athol, Clinton, Fitchburg, Gardner, and Leominster (**Figure 4.5-2**).

Figure 4.5-2 - Federal Opportunity Zones



The *Athol Route 2 Interchange Study* evaluated the feasibility of a new interchange on Route 2 at South Athol Road where Athol continues to seek the initiation of an interchange project. The proposed interchange project falls within the **Athol Opportunity Zone** that includes Route 2 as does much of the study area examined the interchange study.

Road Network Constraints

The MRPC road network constraints are a land use conflict that impacts, or potentially impacts, economic vitality. The constraints include:

- Congested roads and bottlenecks, include at-grade railroad crossings.
 - Economic vitality is hindered by the same congested roads and bottlenecks that affect all traffic in the Region. Please refer to the *Systems Preservation* section of this document for a more detailed description of the congested roads and bottleneck constraints.
 - Railroad at-grade crossings also present a potential congested road and bottleneck problem in several municipalities throughout the Region.
- Roadway safety, including safety at at-grade railroad crossings.

- Economic vitality is hindered by the same High Crash Intersections and At-Risk Road Segments that affect all traffic in the Region. Please refer to the Safety Needs section of this document for a more detailed description of the safety constraints.
- Railroad at-grade crossings also present a potential safety problem in several municipalities throughout the Region.

Montachusett Region Trail Coalition (MRTC)

The MRPC will continue to work with the MRTC to improve the transportation infrastructure that services the regional recreational destinations. Refer to the *Bike & Pedestrian* section of this document for a more detailed description of the transportation infrastructure constraints of the regional recreational destinations.

Future Improvement Projects and Activities

- Continue to seek to improve freight truck access on the RegionFCs, CUFCs, and CRFCs
- Continue to seek to improve external and internal freight truck access for the 10 Opportunity Zones
- Continue to seek an interchange project on Route 2 at South Athol Road in Athol
- Continue to seek to improve congested roads and bottleneck locations
- Continue to seek to safety improvement at High Crash Intersections and on At-Risk Road Segments
- Continue to seek to improve external and internal access to the regional recreational destinations

Current and Future Guidance Plans

Four of the following plans provided guidance for the completion of this Economic Vitality chapter while two will provide guidance to improve economic vitality in the Region after the plans are completed.

2017 Ma Freight Plan & DRAFT 2023 Ma Freight Plan

The draft of the 2023 Ma Freight Plan (23MFP) that builds on the 2017 Ma Freight Plan (17MFP) was released for public comment that will end on June 29, 2023. The draft 23MFP will then be submitted to the Federal Highway Administration for final review and approval. The draft 23MFP is available at [DRAFT 23MFP](#). The [17MFP](#) remains in effect until the 23MFP becomes approved.

The MRPC will continue to work with MassDOT, MRPC Member Communities, and Devens to apply the 17MFP improvement strategies to the Region until the draft 23MFP is approved. The 17MFP (endorsed April, 2018) follows a “scenario-based analysis” model which recognizes that many plausible futures exist. The 17MFP identifies drivers of change in the world and the range of ways in which they could progress and combines these into multiple plausible futures and presents strategies which will allow Massachusetts to thrive across the widest range of outcomes. The 17MFP is a companion plan to the **Ma State Rail Plan** discussed below.

17MFP & DRAFT 23MFP Improvement Strategies

The draft 23MFP presents several draft improvement strategies and several that will possibly be carried over from the 17MFP. The strategies are located in chapter seven of the 23MFP.

- Improvement Strategies that may be **CARRIED OVER** from the 17MFP will include:
 - improve the condition of freight network assets
 - Improve truck parking
 - Improve congestion and bottlenecks, including last-mile access
 - Upgrade railroad freight lines to the 286K standard
 - Strategies to address deliveries and curbside demand in urban districts and town centers
 - Policies to reduce greenhouse gas emissions from transportation
 - Coordinate with states in the region on freight planning
 - Freight related workforce development
- **Draft** Improvement Strategies to the 23MFP will include:
 - Improve safety on roadways and at highway-rail grade crossings

- Other improvements to highway-rail grade crossings
- Better integrate freight planning into MassDOT activities
- Alternative fuels/zero-emission freight vehicles
- Real-time and new data sources
- Improve and preserve freight connections to and from Boston’s freight facilities

Freight Study (under development) – Ayer, Lancaster, Lunenburg, Shirley

This study is under development with a preferred completion date of October, 2024. The study will identify the major truck routes that provide heavy truck access to destinations within these communities and address their concerns with heavy truck traffic. There are currently several large commercial operations, as well as a number of planned developments, that generate/will generate heavy truck traffic and safety concerns for these communities. The planned developments include the Capital Commerce Center and Unified Global Packaging in Lancaster and the recently completed Industrial Development in Lunenburg that is unoccupied at this time. The freight study will also provide potential solutions/improvement alternatives to mitigate current and future heavy truck conditions and needs.

2018 Ma State Rail Plan (MSRP)

The MRPC will seek to apply the MSRP ([Ma State Rail Plan](#)) recommendations to the Region. The purpose of the MSRP is to guide the future of the rail system and rail services in Massachusetts. The Goals of the MSRP are:

1. Maintain existing rail system in a state-of-good-repair, expand accessibility, and preserve railroad rights-of-way
2. Support economic growth throughout Massachusetts and enable the State to compete in the changing global economy
3. Improve the safety and security of the rail system
4. Provide a rail system that is environmentally and financially responsible
5. Improve intermodal connectivity for both passenger and freight rail facilities by stronger coordination between rail system users to promote system use and efficiency

6. Maximize the return on public dollars towards rail investment by maximizing the use of existing rights-of-way

2021 MRCEDS

The MRPC will seek to apply the 2021 MRCEDS roadway infrastructure recommendations to the Region. The Economic Development Administration (EDA) administers the *Comprehensive Economic Development Strategy* (CEDS) program. The CEDS program was established as an economic development planning tool to assist communities, regions, and states to advance economic development activities, programs, and projects. Through CEDS, a qualifying economic development organization works to identify a region's flexibility to adapt to the everchanging global economy, persistent economic distresses and learn to utilize a region's assets to maximize economic opportunity that fosters growth and job creation and retention for the residents of a region.

Athol Route 2 Interchange Study

The purpose of this study is to assist Athol in evaluating the feasibility of a new Interchange project on Route 2 at South Athol Road where Athol is seeking to initiate an Interchange project. The study evaluates the potential effects of converting the existing grade separated roads into an interchange on the existing transportation system and on the surrounding environment as well as providing ramp alternatives.

The Interchange project was first identified in the Montachusett 2016 RTP and then again in the 2020 RTP. Since these roads are already grade separated, only ramps would be needed to connect them to create the Interchange. The proposed Interchange project is based on the following comments received from the Town:

- The proposed Interchange project falls within the **Athol Opportunity Zone** (see above)
- Freight movement in Athol is limited due to railroad bridge height restrictions that results in heavy trucks using side streets and driving through residential areas
- The North Quabbin Commons commercial development on Templeton Road (Route 2A) has the potential of producing traffic backups on Route 2 at Exit 77

- The Interchange would **reduce greenhouse gas emissions** as it would improve heavy truck access and egress to Route 2 for South Athol Road
- The Interchange would promote economic growth in Athol primarily along the South Athol Road Corridor
- Heavy truck traffic on smaller local roads would cease thus creating a safer roadway environment in neighborhoods, extending the pavement life of neighborhood roads, and healthier neighborhoods through **decreased greenhouse gas emissions**
- The Interchange would improve South Athol Road access and egress to essential community and regional services that includes the following:
 - Athol Fire Department
 - Athol Hospital
 - MA State Police Barracks in Athol
 - Athol High School
- The Interchange would reduce school bus pick-up and drop-off travel times

Trends

The MRPC recognizes that the transportation network plays an important role in the economic growth of the Region. Many sectors of the economy depend heavily on safe and efficient movement of goods and services by truck and rail.

The Economic Vitality Needs section above reveals two existing issues that continue to facilitate an increasing trend that hinders growth in economic vitality in the Region:

- Aging railroad bridges, most of which were constructed approximately 100 years ago, are narrow and many have bridge height restrictions. Also, the bridge alignment geometry of many railroad bridges is not aligned with the geometry of the intersecting road creating dangerous S-shaped horizontal curves with poor sight distance
- Many of the Route 2 interchanges, including the ramps, do not have the capacity to meet traffic volume demand. One new interchange in Athol has been proposed

Devens is an [EPA Smartway Affiliate Partner \(press release here\)](#) that has connected numerous businesses directly to active rail lines by installing rail spurs. This helps to improve economic efficiencies and avoid unnecessary truck trips through the Region. The companies that have been connected to active rail lines by installing rail spurs are:

- New England Sheets
- 66 Saratoga (three spurs installed)
- US Gypsum
- Devens Recycling

Potential rail spurs:

- P&G/Gillette/Sonoco

Existing rail spurs:

- Southern Container (previous name)
- Armed Forces and Army National Guard
- PanAm/Guilford Intermodal Facility

Many types of organizations can become a [Smartway Affiliate Partner](#). Devens also operates the [Devens Eco-Efficiency Center](#) that supports businesses in improving operational efficiencies.

Devens enforces the state's [Anti-Idling Law](#) and requires shore and auxiliary power technologies for freight operations. To enforce anti-idling laws, Devens has two requirements:

- It is included as a condition of approval in any development that requires compliance so that it can be enforced locally
- Projects are required to post signage at all loading docks to inform drivers

Devens partners with the State Police (contracted as the Devens Police Force) to assist with enforcement.

To reduce the potential for idling, Devens requires projects with loading docks to:

- Install shore power systems as part of their development so that refrigeration trailers can plug in and not have to rely on the diesel cab engine for power while at the loading dock

- Install auxiliary power units to keep the truck cabs conditioned during cold and hot weather
- Businesses must include these components in their operations and maintenance manuals for the property to raise maximum awareness of these requirements

On a cyclical basis, MassDOT solicits new candidate projects for funding under the [Industrial Rail Access Program \(IRAP\)](#). The IRAP accepts applications from freight rail-supported businesses across the state for projects to expand or improve rail or freight access that will support economic opportunity, safety, and job growth. IRAP is a competitive state-funded public/private partnership program that provides financial assistance to eligible applicants to invest in industry-based rail infrastructure access improvement projects. Applicants must match public funds with private funds, with private funds paying at least 40 percent of a project's total cost. Applicants may match more than the required minimum. MassDOT manages IRAP and typically solicits new candidate projects in the spring of each year.

Below is a listing of previously funded projects by funding round in the Region

- Arrowhead Environmental Partners , Ayer (2023)
- Leominster Packaging & Warehousing, Inc., Leominster (2021)
- United Material Management, Leominster (2020)
- Pan Am Southern, LLC., Ayer (2018, 2020)
- Pan Am Intermodal Yard Improvements, Ayer (IRAP IV)
- Catania Spagna Track Expansion, Ayer (IRAP III)
- Ardent Mills Loop Track Restoration, Ayer (IRAP II)

Economic Vitality Recommendations and Action Items

Future & Ongoing Economic Vitality Projects and Action Items to Improve Safety & Reduce Greenhouse Gas Emissions in the Region

- Improve the narrow road and/or dangerous S-shaped horizontal curves and the height restrictions of the aging railroad bridges

- Improve Route 2 interchanges to meet current design standards and future traffic volume demand
- Encourage organizations in the Region to become EPA Smartway Affiliate Partners to improve freight sustainability
- Encourage organizations in the Region to apply for IRAP funded projects to expand or improve rail or freight access to support economic growth and safety
- Continue to seek to improve freight truck access on the RegionFCs, CUFCs, and CRFCs
- Continue to seek to improve external and internal freight truck access for the 10 Opportunity Zones
- Continue to seek a new interchange on Route 2 at South Athol Road in Athol
- Continue to seek to improve congested roads and bottleneck locations
- Continue to seek to safety improvement at High Crash Intersections and on At-Risk Road Segments
- Continue to seek to improve external and internal access to the regional recreational destinations
- MRPC will continue conducting freight corridor analyses

Congestion

Introduction

Congestion occurs at intersections and along road segments throughout the region which adversely impacts commuter travel, the efficient movement of goods and air quality. The following areas of congestion were identified through local knowledge, public input from surveys, MRPC studies, identified bottlenecks and various technical data sources.

Congested Corridors

Congestion in the following corridors/locations tends to create the greatest impacts to traffic flow in the region. Inadequate geometrics, right-of-way issues and improper signal timings and/or phases result in poor vehicle flows and, in many cases, unsafe conditions. Concerns will range from local intersections and corridors to congestion on regionally important highways such as Route 2.

- Route 2, Harvard, Lancaster, Leominster, Fitchburg, Westminster, and Gardner –

This highway serves as the second major east-west connector for the Commonwealth and has a significant effect on development well beyond the Region. Improvements and maintenance are vital along the entire stretch of Route 2 to maintain its usefulness and move commuters. Regular resurfacing and maintenance costs are significant in terms of dollars and are usually well beyond the limited federal funds allocated to the Region. There is still a need for an increased investment to maintain Route 2, along with all roadways in the region, in an acceptable condition. The possibility of the section of Route 2 between I-495 and I-190 being incorporated into the interstate system due to its natural connection between these two major routes has been discussed. Designation of this type, i.e. interstate highway, would make this segment eligible for Interstate Maintenance funds. Connections to nearly all major routes in the region exist on Route 2, as does the interchange of Route 2 and I-190. Recent improvements to the pavement striping in this location seem to have reduced confusion and congestion, although further study is needed.

- Route 12, Fitchburg and Leominster

This main corridor through the cities of Fitchburg and Leominster may be the most congested in the region. Many improvement projects have been completed in recent years to address congestion issues. Most recently are geometric and signal improvements around Routes 12, 2 and Hamilton Street in Leominster. Adequate access to Route 2 often dominates local concerns. The City of Fitchburg continues to maintain the need for improved access between Route 2 and its downtown as a major force in the communities' economic development; this would also serve as a congestion mitigation measure for traffic on surrounding streets and intersections leading into the city from the highway. This concern is echoed by the North Central Massachusetts Chamber of Commerce as one of the major needs for the area as well as the city. A major project scheduled in 2024 will rebuild the two bridges carrying Water Street (Route 12) in Fitchburg, one over the Nashua River, another over Boulder Drive and the Boston and Maine Railroad. This project will greatly improve access to downtown Fitchburg by improving safety and traffic flow.

- Route 13 Leominster

Although many improvements have been made in the last 20 years this corridor still remains among the regions most congested. Several recommendations were proposed to address congestion as well as safety issues associated with heavy traffic volumes and the poor geometrics of the Route 13/Haws Street/Route 2 interchange. In 2008 the Route 13 Bridge over the North Nashua River was rehabilitated and pedestrian safety improvements were made. In 2010 MassDOT introduced design plans for Route 13 in Leominster between Prospect and Haws Streets, the most congested area of Route 13, which involves a new signal at Route 13 and Mead, as well as signal equipment upgrades and coordination of existing signals. These improvements will be completed in 2023 and are projected to further improve traffic flow in this corridor.

- South Street/Merriam Avenue, Fitchburg and Leominster

This corridor serves as one of two major connecting roads between Fitchburg and Leominster in addition to providing direct access to Route 2. Volumes along this corridor are mainly affected by a traffic signal at the Route 2 westbound ramp/Twin City Mall entrance crossing as well as by the Merriam Avenue Bridge over Route 2. Road widths are limited by the bridge and abutting land uses to two travel lanes; one northbound and one southbound. In 2018 MRPC completed the Merriam Avenue – South Street Corridor Bottleneck Study which profiled this area and made recommendations to improve congestion.

- Route 117, Lancaster and Leominster

This state route is a major commuter road that provides access to I-190 at the Leominster/Lancaster line and I-495 in Bolton located east of Lancaster. Most of the congestion along this corridor occurs during AM and PM peak hours. Also causing significant delays is an at-grade freight railroad crossing east of Route 70 in Lancaster which frequently stalls traffic for long periods of time as trains pass through. Within the past 20 years there has been major commercial development on both sides of Route 117 on the Leominster/Lancaster line. These commercial developments have been complemented by various improvements to the roadway including the addition of turning lanes and stop lights allowing easier access to both I-190 and the commercial access roads. MRPC conducted the “Route 117 Corridor Profile” (2014) through the town of Lancaster which suggested major improvements to the intersections of Route 117/Lunenburg Road and Route 117/Main Street. A significant project funded through the 2022 TIP will improve traffic flow and safety through the addition of geometric and signal upgrades.

- Downtown Gardner

Route 101 (Central Street/Parker Street) runs east-west through this corridor while Route 68 (Main Street/Parker Street) runs north-south. The layout of this intersection can be

confusing to drivers and is a high crash location in the region. Furthermore, traffic routinely backs up through downtown during peak hours. While many variations of geometrics have been tried over the years Right of Way issues make it difficult to make an ideal improvement. Long term efforts may need to involve complete reconstruction and reconfiguration of this intersection.



**Figure 4.6-1 - Main Street
(Route 68)/Central Street
(Route 101) in Gardner Looking
North.**

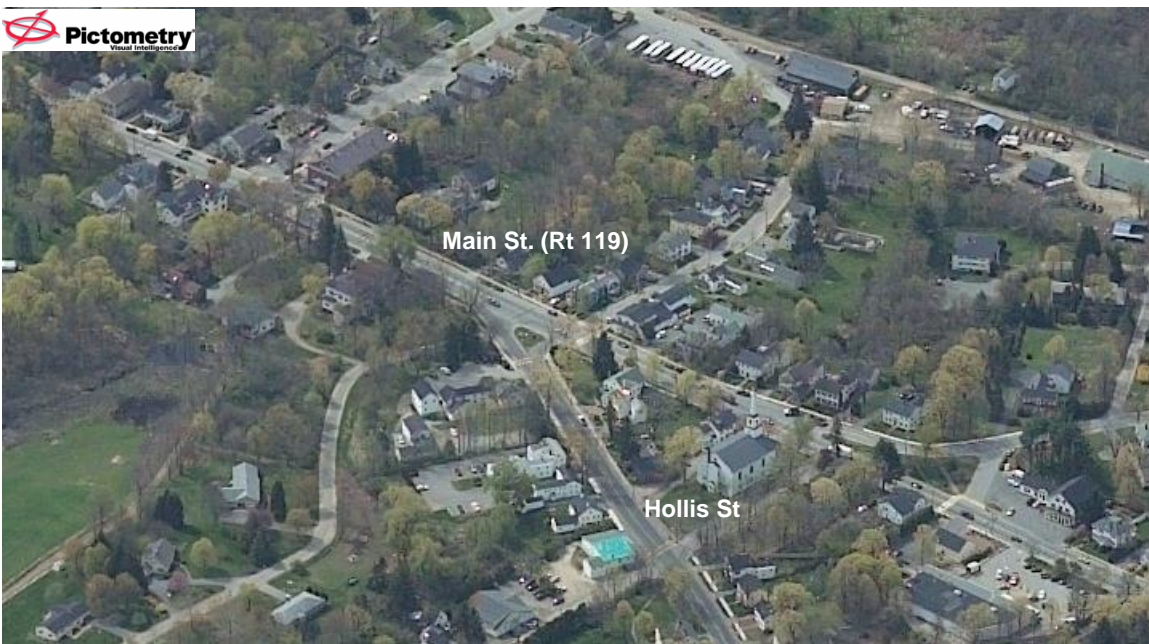
- Route 119, Townsend and Groton

This road has become a major commuting route for the northern portion of the Region. Route 119 runs southeast from New Hampshire to I-495 in Littleton to Route 2 at the Concord Rotary. Peak hour flows are heaviest eastbound in the AM and reversed in the PM reflecting its use as a commuting road to the I-495/Boston area. The route runs through the town centers of Townsend and Groton and as such greatly impacts local travel patterns.

Figure 4.6-2 – Route 119 in Townsend Looking North



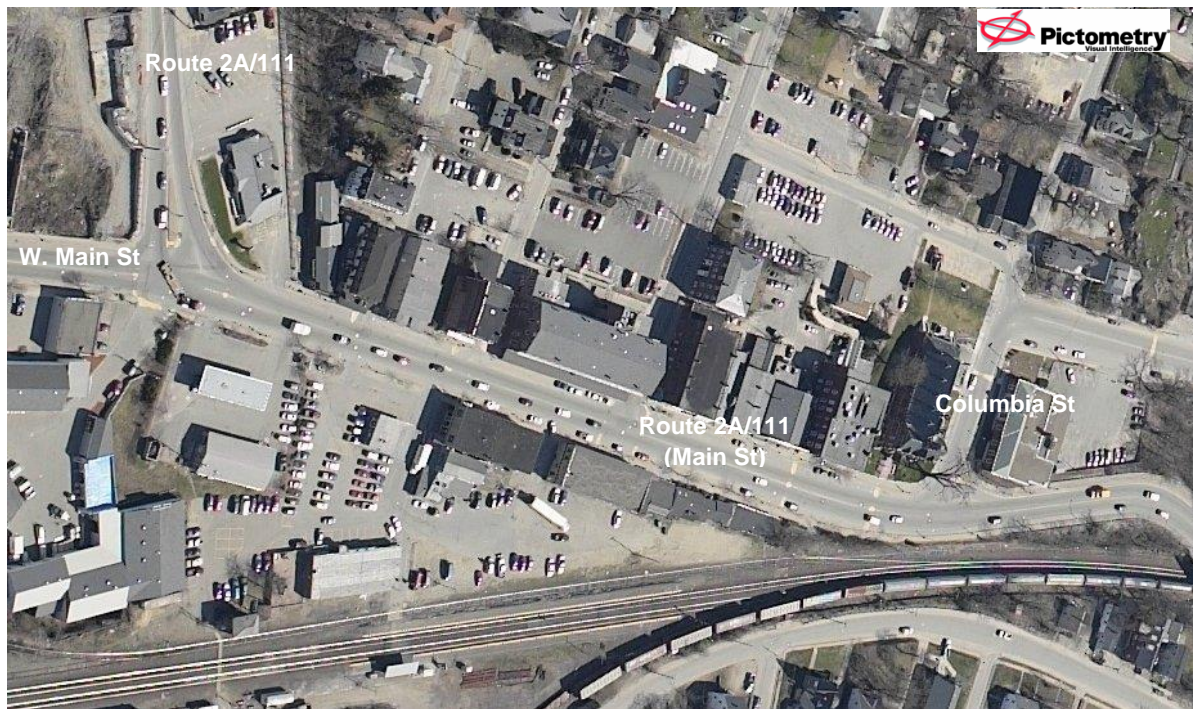
Figure 4.6-3 – Route 119 in Groton Looking South



- Route 2A, Ayer

From Park Street (Routes 2A/111) to the Littleton town line, includes Main Street, East Main Street, and Littleton Road. Peak hour traffic suffers from slow travel speeds along the Main Street segment through the downtown area due to side street traffic, on-street parking, an MBTA Commuter Rail stop downtown and narrow lanes. A notable intersection in this corridor is Park Street (Routes 2A/111) and Main Street. Park Street traffic looking to continue onto Route 2A east/111 south must stop and wait for a gap in traffic on East Main Street/Main Street which results in long peak hour delays from this approach. A project currently under design will rehabilitate this corridor by making geometric and signal improvements that will increase traffic flow and safety. This project (#609227 – Roadway rehabilitation on Route 2A/111, Park Street and Main Street) is the highest ranked project of all eligible TIP projects and is listed in the appendix of the 2024-2028 TIP.

**Figure 4.6-4 - Main Street (Routes 2A/111) in Ayer from Park Street to Columbia Street
Looking North**



Transportation Studies with Congestion Elements

Member communities regularly request various types of transportation studies which the MRPC conducts through the Unified Planning Work Program (UPWP). Many of these studies involve examining congestion issues along a roadway or corridor. One of the most useful data sets pertaining to congestion issues is travel time. Travel time data is collected using a GPS Device and TravTime 2.0™, a software program which measures travel time and delays on a roadway. Since MRPC has acquired TravTime software, it has regularly been included in analysis in transportation studies done throughout the region. Numerous travel time runs are taken through the study area. From this, an average travel time can be computed during the peak hour through a particular road or corridor. This data is compared to free flow travel time to

depict a travel time index rating. The free-flow travel time is the amount of time in seconds it takes to travel a particular corridor at the posted speed limit without any delay. The travel time index (TTI) is a ratio between the average peak hour travel time and free-flow travel time. For example, a TTI value of 1.30 indicates that the average travel time at peak hour takes 30 percent longer than free flow travel time. The table below shows the different congestion levels of the TTI of an arterial roadway.

Table 4.6-5 - Travel Time Index (TTI) Levels of Congestion

| Functional Class | No/Low Congestion | Moderate Congestion | High Congestion | Severe Congestion |
|------------------|-------------------|---------------------|-----------------|-------------------|
| Arterials | < 1.5 | 1.5 - 2.0 | 2.0 - 2.6 | > 2.6 |

*Source: Federal Highway Administration

Three recent studies which included travel time analysis have been completed in recent years. Below are descriptions of each of these study areas and results from our Travel Time analysis.

A. Downtown Fitchburg Bottleneck Profile (2012)

The *Downtown Fitchburg Bottleneck Profile* was an effort to highlight various issues causing one of the most significant bottlenecks in the Montachusett Region – Downtown Fitchburg. Throughout the program year various data was collected and analyzed to draw attention to issues leading to traffic delays in the area.

Study Area

The study area encompasses the downtown area from Moran Square at the intersection of Main (Rte. 2A), Lunenburg (Rte. 2A) and Summer Streets in the east extending west to the area known as the “Upper Common” at the intersection of Main, River (Rte. 31) and Mechanic (Rte. 31) Streets. Traffic along the roadways of Main Street and Boulder Drive, including the intersections with other side streets were considered for this report.

Travel Time

| | Run 1 | Run 2 | Run 3 | Run 4 | Run 5 | Average Time | Travel Time Index (TTI) |
|-----------------------------|---|-------|-------|-------|---|--------------|-------------------------|
| Eastbound (Minutes) | 3.73 | 3.63 | 3.73 | 3.85 | 3.45 | 3.08 | 1.40 |
| Westbound (Minutes) | 5.7 | 5.83 | 4.35 | 3.95 | 6.03 | 5.17 | 2.18 |
| Posted Speed Limit = 25 MPH | Corridor Distance (Miles) = 0.99 WB / 0.92 EB | | | | Free Flow Travel Time (Minutes) = 2.38 WB / 2.21 EB | | |

From the travel time results it is clear that traveling westbound on Main Street during peak hour entails dealing with a high level of congestion. A major inhibitor of traffic flow through downtown was the lack of a system of properly operating and coordinated network of traffic signals.

Figure 4.6-6 - Main Street in Fitchburg Looking North



B. Route 117 Corridor Profile (2014)

The Town of Lancaster requested the Montachusett Regional Planning Commission (MRPC) to conduct a study of Route 117 through the community in the spring of 2013. In its efforts the MRPC in turn has engaged town officials to form an informal Steering Committee to assist, offer guidance and provide local knowledge that would contribute to a Corridor Profile along the road. The goal was to assess the conditions and problems that may exist along Route 117 and offer recommendations and avenues to make improvements where necessary. After much data collection, analysis, site visits and public engagement the MRPC completed the **Route 117 Lancaster Corridor Profile** in 2014. As part of the report, multiple Travel Time runs were taken during the measured peak hour times through the entire 4.7 miles of Route 117 in Lancaster.

Travel Time

| | Run 1 | Run 2 | Run 3 | Average Time | Travel Time Index (TTI) |
|-----------------------------|---------------------------------------|-------|-------|--|-------------------------|
| Eastbound (Minutes) | 8.68 | 8.33 | 8.93 | 8.65 | 1.15 |
| Westbound (Minutes) | 8.3 | 8.47 | 11.95 | 9.57 | 1.28 |
| Posted Speed Limit = 40 MPH | Corridor Distance (Miles) = 5.0 Miles | | | Free Flow Travel Time (Minutes) = 7.5 WB / 7.5 EB | |

Although congestion did not pose a great issue through the corridor as a whole, the junction of Route 117 and Route 70 and its two major intersections were identified as having long delays for the Route 70 approaches. Improvement alternatives were presented to the town and a project at this location is listed in year 2021 of the 2020-2024 Transportation Improvement Program.

Figure 4.6-7 - Lancaster Route 117/70 looking North



C. Merriam Avenue – South Street Corridor Bottleneck Study (2018)

The Merriam Avenue - South Street Bottleneck study stems from a goal set in the 2016 RTP of the to “reduce congestion and improve mobility”. One performance measure set under this goal was to “identify one (1) bottleneck location and conduct a study every 2 years in order to develop and/or implement corrective measures”. This section of Merriam Avenue and South Street in the cities of Leominster and Fitchburg has long been considered one of the regions congested corridors and is considered a traffic “bottleneck”. The Federal Highway Administration’s (FHWA) definition of a traffic bottleneck is "a localized section of highway that

experiences reduced speeds and inherent delays due to a recurring operational influence or a nonrecurring impacting event." This study profiles existing conditions and identifies factors adding to the congestion of the Merriam Avenue - South Street corridor.

Study Area

The study area extends from the south at the intersection of Merriam Avenue and Lindell Avenue in Leominster, to the north at the intersection of South Street and Wanoosnoc road in Fitchburg. The Merriam Avenue - South Street corridor serves as one of two major connecting roads between the cities of Fitchburg and Leominster in addition to providing direct access to Route 2. Contained within this corridor are the following primary locations, listed from south to north, which are the main catalysts for congestion and are highlighted in this study.

- Intersection of Merriam Ave./ Route 2 East ramp
- Merriam Ave. bridge over Route 2
- Signalized Intersection of Merriam Ave./ South St./ Whalon St./ Twin City Plaza
- Signalized Intersection of South St./ Wanoosnoc Rd.

Figure 4.6-8 - Leominster/Fitchburg, Merriam Ave/South Street Corridor



Travel Time

| Functional Class | No/Low Congestion | Moderate Congestion | High Congestion | Severe Congestion |
|------------------|-------------------|---------------------|-----------------|-------------------|
| Arterials | < 1.5 | 1.5 - 2.0 | 2.0 - 2.6 | > 2.6 |



Southbound Traffic through the study area measures no or low congestion (TTI of 1.34). Northbound traffic experienced high congestion (TTI of 2.51). The study also considered delay caused by the intersections along the corridor and physical challenges along the road such as the road being limited to two lanes over the route 2 bridge. A number of improvement alternatives were presented in the study.

D. Sterling – Route 140 at 62 Intersection Analysis (2020)

Route 140 at Route 62 in Sterling is a significant source of localized congestion along this semi-rural stretch of roads. Safety is also an issue, as this skewed intersection has a large, open area of pavement which offers many possible conflict points. This analysis compared possible improvements and discussed the benefits of a roundabout versus a signalized intersection. Ultimately, a TIP project was approved in 2022 which will see the construction of a roundabout which help mitigate both congestion and safety concerns. This project (#612612 - Intersection Improvements at Route 140 and Route 62) is listed in federal fiscal year 2028 in the 2024 – 2028 TIP.

E. Fitchburg – Route 12 and 31 Intersection analysis (2021)

This analysis focused on the busy intersection of Routes 12 (Ashburnham and River Street) and 31 (Westminster Street) in Fitchburg, which had experienced a high crash rate over the three-year period of 2017 to 2019. This three-way intersection has an ill-positioned stop sign on Route 31 (Westminster Street), which has contributed to the high number of crashes. According to the MassDOT crash database, there were approximately 49 recorded crashes at this location in this time period, of which 28 were reported as rear-end crashes.

Figure 4.6-9 – Route 31 at Route 12, Fitchburg



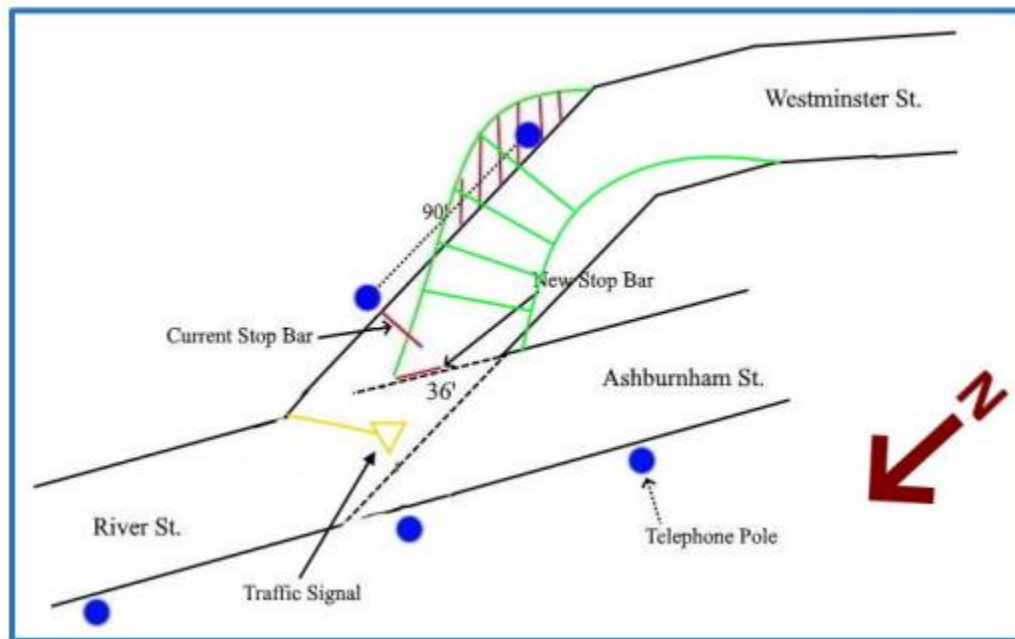
The analysis analyzed traffic and safety data and considered multiple improvement alternatives. Data indicated that this location met three traffic signal warrants based on:

- Peak hour volumes
- 4-hour volumes
- 8-hour volumes

Ultimately this resulted in two recommendation designs. One designed as a short-term solution and another as a long-term solution. The short-term design recommendation is the bump out to correct the geometric difficulties of the intersection while the long-term recommendation includes the addition of a signal to the bump out. This way, the bump out will improve the intersection in the meantime until the signal is approved and funded, which should occur around the same time the data analysis shows the intersection will fail, in approximately 10+

years. The bump out design in which utility poles are relocated was chosen to give extra room for the turn.

Figure 4.6-10 – Route 31 at Route 12 Recommendation, Fitchburg



F. Townsend – Main Street (Route 119) at Canal Street/West Elm Street Intersection Analysis (2021)

The MRPC received an official request from the Town of Townsend to conduct a traffic analysis of the Main Street (Route 119) at Canal Street / West Elm Street intersection.

The Town’s official request letter stated the following:

- *Vehicles turning onto / or off of / or crossing over, Route 119 encounter dangerous circumstances due to the layout of the Intersection;*
- *This is a light commercial district and improvements to both vehicular and pedestrian traffic as a result of a study would well serve the citizens;*

This Study considered the following existing conditions of the intersection: the offset geometric alignment (or layout); pedestrian and bike facilities; signage; pavement markings; land use; traffic congestion; safety; environmental constraints, and pavement condition. This Study also provided improvement alternatives for consideration by the Town.

Figure 4.6-11 – Main Street (Route 119) at Canal and Elm Streets, Townsend



The recommendation was that the existing offset geometry, pavement condition, pavement markings condition, signage condition, inadequate pedestrian and bike facilities, and the potential future traffic growth of the Intersection during the PM peak hour should be the priorities for improving the Intersection if the Town so chooses. The MRPC recommends that the Town consider Complete Street Concept solutions to address these priorities for the Intersection.

Covid-19 Pandemic Impact on Traffic

Past RTPs have typically looked at traffic volumes at continuous count stations in the region. Since the July 2019 endorsement of the 2020 RTP (Working Towards the Future), a significant and unforeseeable occurrence took place in the Covid-19 pandemic. The shutdowns halted the economy and commenced a new age of remote school and work. Traffic significantly decreased in March of 2020, and when it began to recover, traffic patterns changed. Although the declared emergency is officially over, its effects remain in both historical volumes and existing trends. It is widely accepted that the proliferation of virtual participation in work and society will prove to have a lasting impact, however, what that impact will reflect on traffic in 2050 is difficult to project.

Continuous Count Stations in Region

The following tables list average daily traffic volumes from MassDOT continuous count stations on major routes (Route 2 and I-190) in the Montachusett region going back to 2001. From these tables the following patterns can be seen.

- Pre-pandemic counts had recuperated to pre-recession (pre-2008) levels after a period of decline throughout the region in the mid 2000's.
- Steady growth had been occurring throughout the region since 2015.
- After a significant decline in volumes in 2020, traffic in the region has slowly begun to recover to pre-pandemic levels.

Tables 4.6-1, Continuous Count Stations

| Route 2 Littleton East of Harvard Town Line | | | Route 2 Lancaster West of Route 70 | | | Route 2 Westminster East of Route 140 | | |
|--|--------|--------|--|--------|--------|--|--------|--------|
| Year | Volume | Growth | Year | Volume | Growth | Year | Volume | Growth |
| 2022 | 47,254 | 2% | 2022 | 57,663 | 0% | 2022 | 46,372 | -2% |
| 2021 | 46,418 | 12% | 2021 | 57,765 | 8% | 2021 | 47,074 | 16% |
| 2020 | 40,933 | -35% | 2020 | 53,249 | -18% | 2020 | 39,355 | -24% |
| 2019 | 55,214 | 1% | 2019 | 62,646 | 5% | 2019 | 48,922 | -6% |
| 2018 | 54,452 | 2% | 2018 | 59,761 | 4% | 2018 | 52,062 | 2% |
| 2017 | 53,473 | 0% | 2017 | 57,154 | 3% | 2017 | 51,279 | 1% |
| 2016 | 53,207 | 2% | 2016 | 55,471 | 2% | 2016 | 50,872 | 4% |
| 2015 | 52,262 | 9% | 2015 | 54,277 | 6% | 2015 | 48,912 | 15% |
| 2014 | 47,432 | 2% | 2014 | 51,454 | 1% | 2014 | 41,401 | 2% |
| 2013 | 46,642 | 2% | 2013 | 50,847 | 1% | 2013 | 40,614 | 2% |
| 2012 | 45,692 | 0% | 2012 | 50,113 | 1% | 2012 | 39,880 | -6% |
| 2011 | 45,569 | -3% | 2011 | 49,476 | -3% | 2011 | 42,088 | -2% |
| 2010 | 47,100 | -3% | 2010 | 51,104 | 1% | 2010 | 43,000 | 1% |
| 2009 | 48,540 | -1% | 2009 | 50,435 | 5% | 2009 | 42,770 | -1% |
| 2008 | 48,803 | 0% | 2008 | 47,806 | 1% | 2008 | 42,999 | 3% |
| 2007 | 48,800 | 8% | 2007 | 47,186 | -1% | 2007 | 41,887 | -1% |
| 2006 | 45,112 | -2% | 2006 | 47,800 | 6% | 2006 | 42,172 | -2% |
| 2005 | 46,229 | -1% | 2005 | 45,104 | -3% | 2005 | 42,991 | -1% |
| 2004 | 46,900 | -7% | 2004 | 46,433 | 2% | 2004 | 43,257 | 3% |
| 2003 | 50,022 | -1% | 2003 | 45,454 | 0% | 2003 | 42,168 | -1% |
| 2002 | 50,603 | 1% | 2002 | 45,457 | | 2002 | 42,663 | 4% |
| 2001 | 50,000 | | Growth since 2002: 21% | | | 2001 | 40,923 | |
| Growth since 2001: -6% | | | Growth since 2019: -9% | | | Growth since 2001: 12% | | |
| Growth since 2019: -17% | | | | | | Growth since 2019: -5% | | |

| Route 2 Athol East of Orange TL | | | I-190 Leominster North of Route 117 | | | I-190 Sterling North of Route 12 | | |
|------------------------------------|--------|--------|---|--------|--------|--|--------|--------|
| Year | Volume | Growth | Year | Volume | Growth | Year | Volume | Growth |
| 2022 | 10,124 | 2% | 2022 | 51,334 | 2% | 2022 | 38,496 | 1% |
| 2021 | 9,945 | -6% | 2021 | 50,406 | 12% | 2021 | 37,947 | 7% |
| 2020 | 10,537 | -35% | 2020 | 44,568 | -18% | 2020 | 35,433 | -11% |
| 2019 | 14,264 | -5% | 2019 | 52,442 | 1% | 2019 | 39,403 | 1% |
| 2018 | 14,910 | 14% | 2018 | 51,923 | -1% | 2018 | 39,013 | 1% |
| 2017 | 12,749 | 0% | 2017 | 52,354 | 3% | 2017 | 38,807 | 2% |
| 2016 | 12,699 | 9% | 2016 | 50,736 | 6% | 2016 | 38,121 | 0% |
| 2015 | 11,514 | 5% | 2015 | 47,892 | 7% | 2015 | 37,931 | 4% |
| 2014 | 10,965 | 3% | 2014 | 45,395 | 2% | 2014 | 36,505 | 6% |
| 2013 | 10,615 | -2% | 2013 | 44,399 | 0% | 2013 | 34,322 | -1% |
| 2012 | 10,826 | -5% | 2012 | 44,239 | 1% | 2012 | 34,819 | 8% |
| 2011 | 11,385 | 1% | 2011 | 43,774 | -1% | 2011 | 32,080 | 3% |
| 2010 | 11,274 | -30% | 2010 | 44,293 | 1% | 2010 | 31,131 | -12% |
| 2009 | 14,711 | 27% | 2009 | 43,792 | 3% | 2009 | 34,735 | 7% |
| 2008 | 10,740 | -2% | 2008 | 42,272 | 7% | 2008 | 32,180 | -1% |
| 2007 | 11,003 | -2% | 2007 | 39,149 | -6% | 2007 | 32,612 | -2% |
| 2006 | 11,202 | 0% | 2006 | 41,503 | 1% | 2006 | 33,168 | 2% |
| 2005 | 11,180 | 0% | 2005 | 41,154 | 0% | 2005 | 32,646 | -9% |
| 2004 | 11,127 | 1% | 2004 | 41,168 | 4% | 2004 | 35,700 | 22% |
| 2003 | 10,967 | 2% | 2003 | 39,579 | 0% | 2003 | 28,000 | 0% |
| 2002 | 10,800 | 4% | 2002 | 39,700 | 8% | 2002 | 28,000 | 10% |
| 2001 | 10,415 | | 2001 | 36,548 | | 2001 | 25,100 | |
| Growth since 2001: | | -3% | Growth since 2001: | | 29% | Growth since 2019: | | 35% |
| Growth since 2019: | | -41% | Growth since 2019: | | -2% | Growth since 2019: | | -2% |

| I-190 Sterling North of Route 140 | | | I-190 Sterling South of Route 140 | | | 12 Sterling North of I-190 | | |
|---|--------|--------|---|--------|--------|-------------------------------|--------|--------|
| Year | Volume | Growth | Year | Volume | Growth | Year | Volume | Growth |
| 2022 | 33,247 | 2% | 2022 | 34,775 | 0% | 2022 | 8,946 | 1% |
| 2021 | 32,527 | 9% | 2021 | 34,765 | 15% | 2021 | 8,872 | 8% |
| 2020 | 29,568 | -28% | 2020 | 29,614 | -26% | 2020 | 8,200 | -17% |
| 2019 | 37,748 | 1% | 2019 | 37,233 | -7% | 2019 | 9,557 | 4% |
| 2018 | 37,374 | 5% | 2018 | 39,961 | 6% | 2018 | 9,193 | 1% |
| 2017 | 35,588 | 2% | 2017 | 37,689 | 18% | 2017 | 9,107 | 4% |
| 2016 | 34,959 | 2% | 2016 | 30,844 | 0% | 2016 | 8,709 | 1% |
| 2015 | 34,322 | 7% | 2015 | 30,691 | -8% | 2015 | 8,629 | -1% |
| 2014 | 31,828 | 4% | 2014 | 33,143 | 2% | 2014 | 8,712 | -14% |
| 2013 | 30,586 | -1% | 2013 | 32,625 | -1% | 2013 | 9,946 | 12% |
| 2012 | 30,764 | 0% | 2012 | 33,058 | 1% | 2012 | 8,763 | -17% |
| 2011 | 30,802 | 3% | 2011 | 32,629 | -1% | 2011 | 10,284 | 21% |
| 2010 | 30,003 | -3% | 2010 | 33,026 | 2% | 2010 | 8,137 | -3% |
| 2009 | 31,050 | -15% | 2009 | 32,483 | 3% | 2009 | 8,375 | -2% |
| 2008 | 35,782 | 17% | 2008 | 31,398 | -1% | 2008 | 8,501 | 1% |
| 2007 | 29,524 | 0% | 2007 | 31,653 | 6% | 2007 | 8,385 | 0% |
| 2006 | 29,537 | 1% | 2006 | 29,722 | 6% | 2006 | 8,379 | -3% |
| 2005 | 29,290 | 0% | 2005 | 27,919 | -23% | 2005 | 8,625 | -4% |
| 2004 | 29,300 | 4% | 2004 | 34,300 | 0% | 2004 | 9,003 | 0% |
| 2003 | 28,078 | 4% | 2003 | 34,200 | 11% | 2003 | 8,969 | 4% |
| 2002 | 26,965 | 1% | 2002 | 30,600 | 23% | 2002 | 8,647 | -1% |
| 2001 | 26,800 | | 2001 | 23,500 | | 2001 | 8,693 | |
| Growth since 2001: 19% | | | Growth since 2001: 32% | | | Growth since 2001: 3% | | |
| Growth since 2019: -14% | | | Growth since 2019: -7% | | | Growth since 2019: -7% | | |

| 202 North of Templeton Town- Line | | |
|---|--------|--------|
| Year | Volume | Growth |
| 2022 | 4,716 | 0% |
| 2021 | 4,721 | 11% |
| 2020 | 4,215 | -21% |
| 2019 | 5,109 | 0% |
| 2018 | 5,130 | 1% |
| 2017 | 5,073 | 1% |
| 2016 | 5,013 | 6% |
| 2015 | 4,720 | |
| Growth since 2015: | | 0% |
| Growth since 2019: | | -8% |

The official end of the Covid-19 Emergency on May 11, 2023 will set a new benchmark. Future analysis will specify if traffic volumes continue to increase, or plateau, likely due to holdover effects the pandemic has had on travel habits.

Progress

The table 4-28 below shows projects with congestion benefits which are scheduled through the 2024-2028 Transportation Improvement Program. As mentioned, some of the most congested roadways have been or will be addressed in the near future.

Table 4.6-2 - 2024-2028 TIP Projects with Congestion Benefits

| City/Town | Project | Year | Cost |
|------------|---|-------------|--------------|
| Fitchburg | FITCHBURG- BRIDGE REPLACEMENT AND RELATED WORK, F-04-017, WATER STREET (STATE 2A) OVER BOULDER DRIVE AND PANAM RAILROAD & F-04-018, WATER STREET (ROUTE 12) OVER NORTH NASHUA RIVER | 2024 | \$18,836,028 |
| Leominster | LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022 | 2024 - 2025 | \$21,444,970 |
| Sterling | STERLING - INTERSECTION IMPROVEMENTS AT ROUTE 140 AND ROUTE 62 | 2028 | \$3,616,300 |
| Ayer | AYER - ROADWAY REHABILITATION ON ROUTE 2A/111 (PARK STREET AND MAIN STREET | APPENDIX | \$4,800,000 |
| Winchendon | WINCHENDON - INTERSECTION IMPROVEMENTS AT BLAIR SQUARE: FRONT STREET, CENTRAL STREET, AND SRING STREET AND ROUTES 12 AND 202 | APPENDIX | \$3,129,916 |

Trends

Pre-pandemic counts throughout the region showed a period of increased traffic. The proliferation of remote work and social activities during the pandemic have undoubtedly changed future trends in travel. Still, congestion remains throughout the region, especially in areas highlighted in this section. Along with increased traffic comes heavier and more frequent periods of congestion. Many of the highlighted areas in this section have shown congestion for many years, especially during rush hour. It is important to mitigate congestion issues that exist, while continuing to monitor changes in our network.

Recommendations

It is important to prepare for increased traffic and congestion throughout the region. Investments must be well thought out and balanced with other needs such as investments in maintenance and expansion. The following recommendations are made to help prevent the spread of congestion in the region.

- Continue to monitor trends throughout the region.
- Continue to monitor emerging technologies such as autonomous vehicles and ride hailing services and the impact made on congestion throughout the region.

- Continue to profile areas of heavy congestion and make recommendations for improvements.

Transit

Introduction

Transit continues to be a major transportation factor in the in the Montachusett region. From fixed route buses to commuter rail, shuttles and on demand services, many individuals rely on the regional transit system for access to services such as jobs, grocery stores, medical facilities, schools, social services, and recreation. Expansion and continued improvements to the transit system will continue to be a major factor in the overall goal of reducing the number of single occupant vehicles (SOV) on the road network, and in the reduction of greenhouse gases (GHG).

Since the completion and endorsement of the 2020 Montachusett RTP (July 2019), the region, Commonwealth, nation and the world suffered under the constraints and consequences of the global Corona Virus pandemic. From early 2020 to late 2022, various federal, state and local mandates limited the ability for numerous services, businesses and activities to operate as usual. The resulting effect to the transit system was a significant impact, i.e., reduction, to ridership and revenue. Because of this, an effected review and comparison of trends in fixed route, paratransit and commuter rail services from 2019 to 2023 cannot be developed and analyzed with any degree of certainty. The best that can be accomplished is to identify the impacts and then monitor the gradual return to pre-pandemic normalcy. In the following sections, a review of pre-pandemic figures from the 2020 RTP will be presented along with statistics that illustrate the pandemic impacts to the various transit systems.

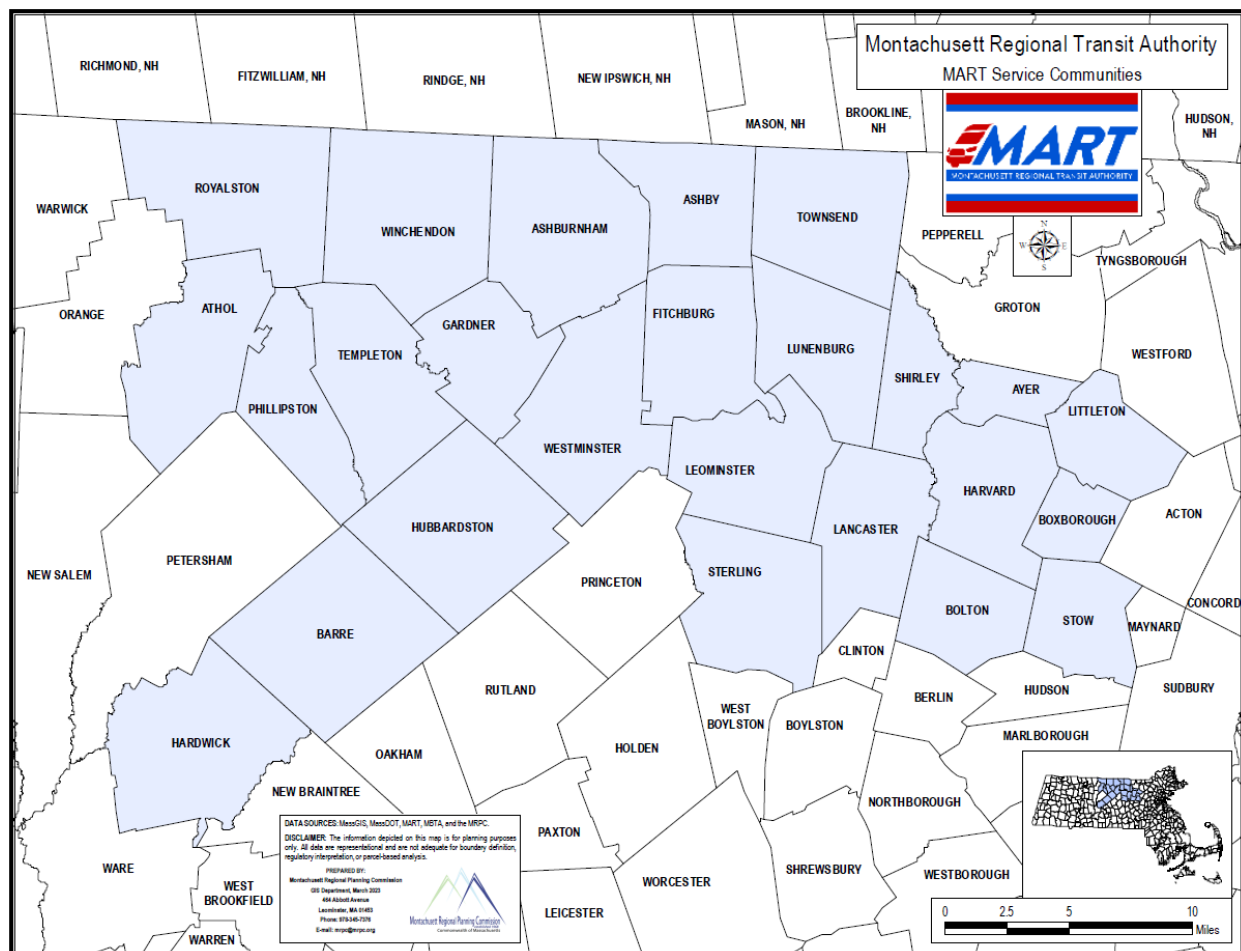
Transit System Overview

A. RTA Jurisdiction

Within the region, the Montachusett Regional Transit Authority (MART) is the major provider of services. As has been the case since the authority was started in 1978, fixed route services are mainly concentrated within the urban cities of Fitchburg, Leominster, Gardner and to a lesser degree – Westminster, Lunenburg and Lancaster. Over the past ten years, service has expanded slowly into neighboring rural communities. The expansion has been driven both by requests by

local communities, as well as the need for services to integrate with redesigned fixed routes and schedules. The communities served by MART have grown steadily over the years. Since 2019, MART has added three additional communities to its service area: Barre, Phillipston, and Townsend. MART now serves 25 total communities. In the MRPC region are the 19 communities of Ashburnham, Ashby, Athol, Ayer, Fitchburg, Gardner, Harvard, Hubbardston, Lancaster, Leominster, Lunenburg, Phillipston, Royalston, Shirley, Sterling, Templeton, Townsend, Winchendon, and Westminster. Outside of the Montachusett region, MART serves the 6 communities of Barre, Bolton, Boxborough, Hardwick, Littleton, and Stow.

Figure 4.7-1 MART Jurisdiction



Fixed route bus, paratransit and subscription services are operated by a private management company, currently, Management of Transportation Services, Inc. MART's brokerage

transportation is operated by a variety of private vendors throughout Massachusetts. The Massachusetts Bay Transportation Authority (MBTA) is responsible for commuter rail services from Fitchburg to Boston. MART has also worked with communities to develop micro transit services to support expanded business opportunities and a growing number of regional attractions in its service area. Over the past three years, MART has endeavored to accomplish many of the goals that were set established in the 2020 RTP, albeit within the numerous and unprecedented challenges presented by the pandemic, some of which are still presenting limitations on the ability to provide expanded services, primarily workforce expansion and funding limitations.

Pre-Pandemic Transit

A. Fixed Route System

1. Fitchburg/Leominster and Gardner

Local fixed route bus services operate along set routes and follows a set schedule Monday through Saturday. Twelve (12) routes are available in Fitchburg, Leominster and Gardner. There is also a supplemental route to Lunenburg in the afternoon. Buses also run more frequently (15 minutes) to and from Fitchburg State University during the campus school year on weekdays. Bus services are not offered on Sundays and holidays. Regional frequencies vary depending on the route.

Table 4.7-1: Fixed Routes Yearly Ridership

| Fixed Routes | 2015 | 2016 | 2017 | 2018 | Percent Change 2015 to 2018 |
|-----------------------------|---------|---------|---------|---------|--------------------------------|
| Leominster/Fitchburg | 605,952 | 591,374 | 496,005 | 470,744 | -22.31% |
| Gardner | 57,193 | 58,852 | 47,548 | 45,848 | -19.84% |

Source: Montachusett Regional Transit Authority – 2020 RTP

MART’s fixed-route bus ridership decreased over the 4-year period from FY 2015 to FY 2018. The biggest single decline was from 2016 to 2017 with at 16% drop in Leominster/Fitchburg ridership and a 19% drop in Gardner ridership. Ridership data from 2018 indicates the decline

leveled off between FY 2017 and FY 2018, with a 5.09% drop in Leominster/Fitchburg ridership and a 3.58% drop in Gardner ridership.

2. Regional Services

In 2019, MART had a number of regional fixed route bus and shuttle services that spanned a wide geographic area. Most of the services were new and did not cover the 4 years of the 2020 RTP. The Link Bus service is available along Route 2/2A between Greenfield and Gardner, stopping in Gardner, Templeton, Phillipston, and Athol. The Athol Link connected to Route 32 and was operated by the Franklin Regional Transit Authority (FRTA). MART also operated the Winchendon Link which traveled along state Routes 68 & 202 from Gardner through Baldwinville (a section of Templeton) to Winchendon Center.

Table 4.7-2: Link Yearly Ridership

| Link Route | 2015 | 2016 | 2017 | 2018 | Percent Change 2015 to 2018 |
|----------------------|--------|--------|--------|--------|--------------------------------|
| Athol Link | 31,238 | 19,559 | 13,883 | 10,694 | ** |
| Athol-Orange Shuttle | N/A | 10,318 | 18,124 | 22,043 | ** |
| Winchendon Link | 5,760 | 6,022 | 5,388 | 5,158 | -10.45% |

Source: Montachusett Regional Transit Authority – 2020 RTP

The drop in ridership on the Athol/Orange link between 2015 and 2016 was due to a change in services. In FY16 the Athol-Orange Fixed Route Shuttle was initiated, i.e. November 2015. This service replaced an old Dial-A-Ride service and instituted a local fixed route service between Athol and Orange. Therefore, the ridership was not actually lost, but just diverted to a different route. Combining Athol Link ridership with the Athol-Orange Shuttle ridership shows an increase of almost 5%. The Winchendon Link continued to ups and downs; peaking in FY16 at 6,022 riders and bottoming out at 5,158 in FY18.

The Intercity Bus Route travels within Gardner, through Westminster, then to Fitchburg and Leominster. This route runs from Labor Day up to Memorial Day.

Table 4.7-3: Intercity Yearly Ridership

| Intercity Routes | 2015 | 2016 | 2017 | 2018 | Percent Change 2015 to 2018 |
|--------------------------|--------|--------|---------|-------|--------------------------------|
| Intercity Bus | 18,409 | 16,690 | 10,383* | 7,608 | -58.67% [!] |
| Wachusett Shuttle | N/A | N/A | 2,284 | 4,284 | ** |

Source: Montachusett Regional Transit Authority – 2020 RTP

* This figure includes the Commuter Bus runs through May, and excludes the riders diverted to the new Wachusett Shuttle.
[!] 58% decrease includes the Wachusett Shuttle riders.

The Wachusett Shuttle began service on September 30, 2016 (FY 2017) and had an 87.57% increase in ridership due to the opening of Wachusett Station. This route diverted some of the riders from the Intercity Bus who rode to access the downtown Fitchburg Commuter Rail Station. This shuttle has a shorter route with more runs with direct access between Gardner City Hall and Wachusett Station.

In FY2017 MART, through a public-private partnership with the Devens Enterprise Commission, launched a new regional shuttle to provide the commuters from Fitchburg and Leominster with access to jobs in Devens, and with stops in the local communities of Shirley and Ayer (the Commuter Rail Stations) in order to provide the last mile connection. This service began slowly but was able to achieve a measurable ridership in only ten weeks. It continued to grow into 2018 with a peak ridership of 508 in the month of March 2018.

In June 2018, in collaboration with the towns of Littleton and Westford, MART launched the Littleton-Westford Commuter Rail Shuttle, which provided last mile access from the Littleton/495 MBTA Commuter Rail Station to the many business and technology companies along Route 110 in Littleton and Westford. The first month of ridership had 250 riders for only 4 hours of service a day, Monday through Friday.

Table 4.7-4: Other Regional Shuttle Yearly Ridership

| Intercity Routes | 2015 | 2016 | 2017 | 2018 | Percent Change 2015 to 2018 |
|------------------------------------|------|------|------|------------------|--------------------------------|
| Devens Regional | -- | -- | 416* | 4,701 | ** |
| Littleton-Westford Commuter | -- | -- | -- | 250 [†] | ** |

Source: Montachusett Regional Transit Authority – 2020 RTP

* Started as a pilot in late April 2017. Launched at full-time route in October 2017.

[†] Launched on June 4, 2018. Only 1 month of ridership.

At the time of the 2020 RTP, ridership on fixed routes (excluding the Wachusett Shuttle) continued to decrease. The change from FY2017 to FY2018 seemed to show the decrease was slowing, from an overall decrease of -21.96% between FY2016 and FY2017 to -12.04% between FY2017 and FY2018.

B. Paratransit

MART's complementary paratransit service in 2019 included origin to destination transportation for citizens with disabilities who were eligible under the criteria of the Americans with Disabilities Act (ADA). In other communities in the region, twenty-one (21) member Councils on Aging (COA) provided service for seniors and the disabled; Royalston did not have MART affiliated COA transportation available. Prices and times of operation varied per community.

Table 4.7-5: Paratransit Yearly Ridership (not including COA)

| Communities | 2015 | 2016 | 2017 | 2018 | Percent Change 2015-2018 |
|------------------------------|---------|---------------------|---------|---------|-----------------------------|
| Leominster/Fitchburg | 93,655 | 74,095 | 68,606 | 71,565 | -23.59% |
| Gardner | 18,707 | 15,341 [†] | 16,367 | 18,837 | 0.69% |
| Athol | 51,081 | 17,760 [‡] | 1,485 | 1,470 | ** |
| Dial-A-MART Services* | 155,958 | 158,758 | 155,627 | 146,166 | -6.28% |

Source: Montachusett Regional Transit Authority – 2020 RTP

* Includes traditional Dial-A-MART for social service agencies such as GVNA & 7 Hills, as well as HST services such as MassHealth rides and routes for DDS. DDS routes account for 65% of the rides.

[†] Westminster ADA new service added.

[‡] Athol services changed from full scale Dial-A-Ride to breakout into Athol ADA, Athol COA & Athol Fixed Route shuttle beginning in November 2015. This number reflects 4 months of full Dial-A-Ride and 8 months of Athol ADA only. About 40% of the ridership was diverted to the fixed route shuttle in the first year. FY17 reflects a full year of Athol ADA Only. Athol COA

ridership is about 10% of the original Dial-A-Ride (~5100 rides per year). The percentage change from FY 2017 to FY 2018 is a decrease of 1.01%.

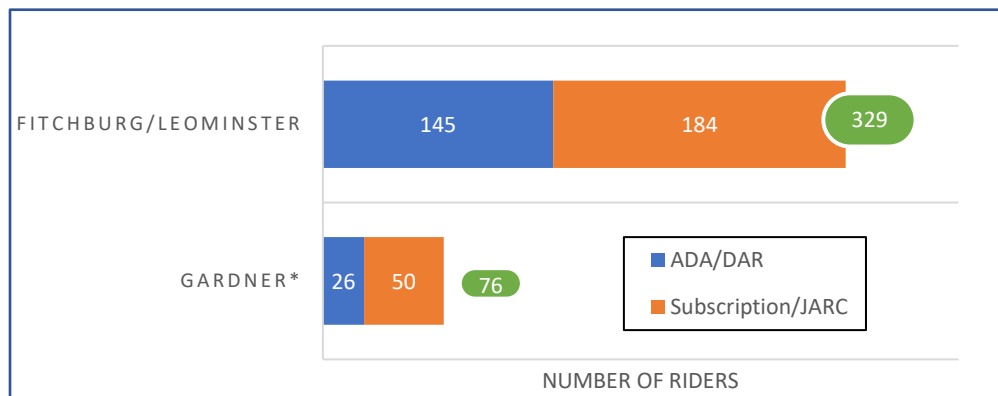
Table 4.7-6 COA Yearly Ridership

| Communities | 2015 | 2016 | 2017 | 2018 | Percent Change 2015-2018 |
|-----------------|---------|---------|---------|---------|-----------------------------|
| All COA Service | 116,756 | 117,084 | 111,100 | 107,830 | -7.65% |

Source: Montachusett Regional Transit Authority – 2020 RTP

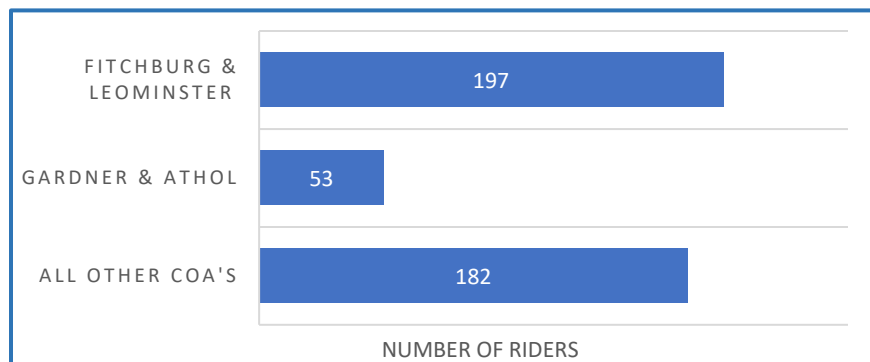
During 2015, paratransit and COA ridership peaked, but then they experienced a gradual decline. The following charts (Figures 4-56 and 4-57) highlight the average daily paratransit (not including contracted social service agency rides) and COA ridership across different services and communities at the time of the 2020 RTP.

Figure 4.7-2: Paratransit Average Daily Ridership (2018)



Source: Montachusett Regional Transit Authority – 2020 RTP

Figure 4.7-3: Council on Aging Average Daily Ridership (2018)



Source: Montachusett Regional Transit Authority – 2020 RTP

C. Dial-A-MART

Dial-A-MART service is transportation that serves the needs of either human service agencies or targeted populations (elderly, individuals with disabilities, and/or low-income individuals) through eligible agency sponsored trips. Service is provided on a negotiated cost basis with the agencies. MART utilizes the Dial-A-Mart Services to allow its operating company to act as a private vendor to the Brokerage Services Division of MART. This allows for cost savings to the brokerage program and increased revenue to support paratransit operations.

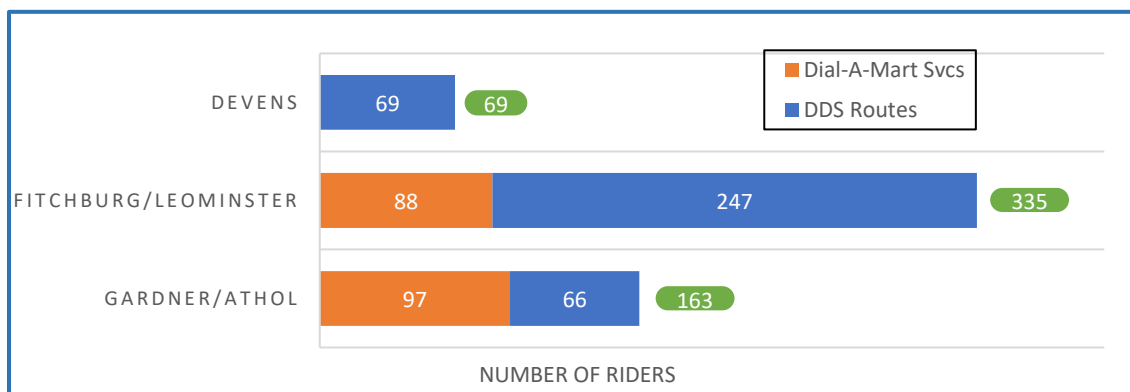
Figure 4.7-4 highlights average daily ridership figures for the Dial-A-Mart services and the Department of Developmental Services (DDS) routes brokered by MART from 2015 to 2018. Overall, the average daily ridership decreased by approximately 2%. However, ridership fluctuated each year, as can be seen in Table 4.7-7.

Table 4.7-7: Dial-A-MART Yearly Ridership

| Communities | 2015 | 2016 | 2017 | 2018 | Percent Change 2015 to 2018 |
|------------------------------|---------|---------|---------|---------|--------------------------------|
| Dial-A-MART Services* | 155,958 | 158,758 | 155,627 | 146,166 | -6.28% |

Source: Montachusett Regional Transit Authority – 2020 RTP

Figure 4.7-4: Average Daily Ridership for Sponsored Paratransit Services (2018)



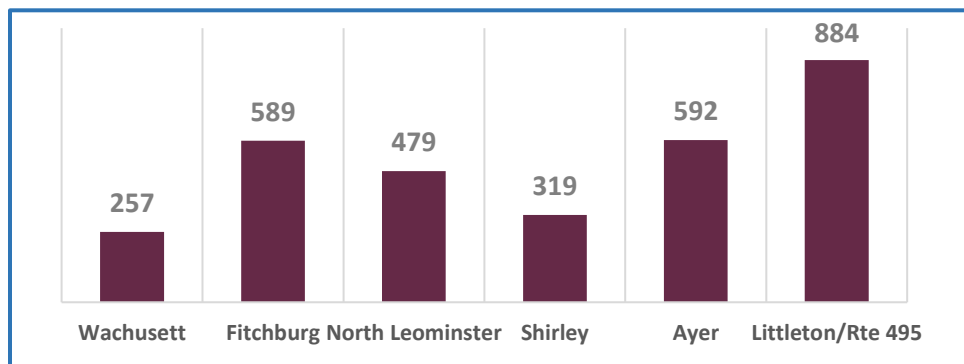
Source: Montachusett Regional Transit Authority

D. Commuter Rail Stations

Commuter rail service is managed by the Massachusetts Bay Transportation Authority (MBTA). In September 2016, MBTA extended service 4.5 miles of the Fitchburg Line with the opening of the Wachusett Station in Fitchburg. MART provided a transit shuttle from Gardner to Wachusett Station. The Fitchburg Line thus operates from Wachusett to Boston, with stops in Fitchburg, Leominster, Shirley, Ayer and Littleton within the MART service area. In 2019, the MBTA audit reported that of the various north-side commuter rail lines, the Fitchburg line had experienced the largest real increase and percentage increase for riders. Since 2012, two inbound trains and two outbound trains were added to increase service on this line.

At that time, daily ridership for the commuter line, shown in Figure 4.7-5, had a large number of riders boarding and alighting at the Littleton stop. The Littleton stop parking facilities added parking for an additional 50 vehicles at the time of the 2020 RTP. It still remained at capacity daily, with some drivers often parking illegally.

Figure 4.7-5: Commuter Rail Average Daily Ridership



Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff - 2020 RTP

Table 4.7-8: Commuter Rail Lot Parking Spaces – Current (2023)

| Community | Commuter Rail Station | Current No. of Parking Spaces | | Percent usage | Planned Parking Spaces | Estimated Year of Completion |
|------------|-------------------------|-------------------------------|---------|---------------|------------------------|------------------------------|
| | | | In use* | | | |
| Fitchburg | Wachusett Station | 360 | 127 | 35.28% | 360 | Completed |
| | Main Street | 425 | 311 | 73.18% | 425 | Completed |
| Leominster | North Leominster | 360 | 133 | 36.94% | 360 | Completed |
| Shirley | Front Street | 65 | 120 | 184.6% | 65 | N/A |
| Ayer | Main Street/Park Street | 65 | 65 | 100% | 200 | Completed |
| Littleton | Foster Street | 250 | 255 | 102% | 250 | Completed |
| Total | | 1,530 | | | 1,665 | |

Source: Montachusett Regional Transit Authority – 2020 RTP
 Parking lot usage was counted on Thursday July 11, 2019 by the MRPC.

Table 4.7-9 displays the percentage changes in ridership from 2012 to 2018. Due to Wachusett station's introduction in 2016, data to calculate a percentage change for boarding/alighting at Wachusett Station, as well as some percentages for the Fitchburg stop was not available. Most notable is the inbound change for the Littleton stop which saw an increase of 135.6% boarding and a 700% increase in alighting. Other notable changes included a 50% increase of outbound boarders at the North Leominster stop, a 38% decrease in the same measure at the Shirley stop, and in 71.6% increase in outbound alighting at the Littleton station.

The changes in daily ridership are shown in Figure 4-7.6. At the time, the trend seemed to indicate that ridership was holding steady, with a large increase at the Littleton station.

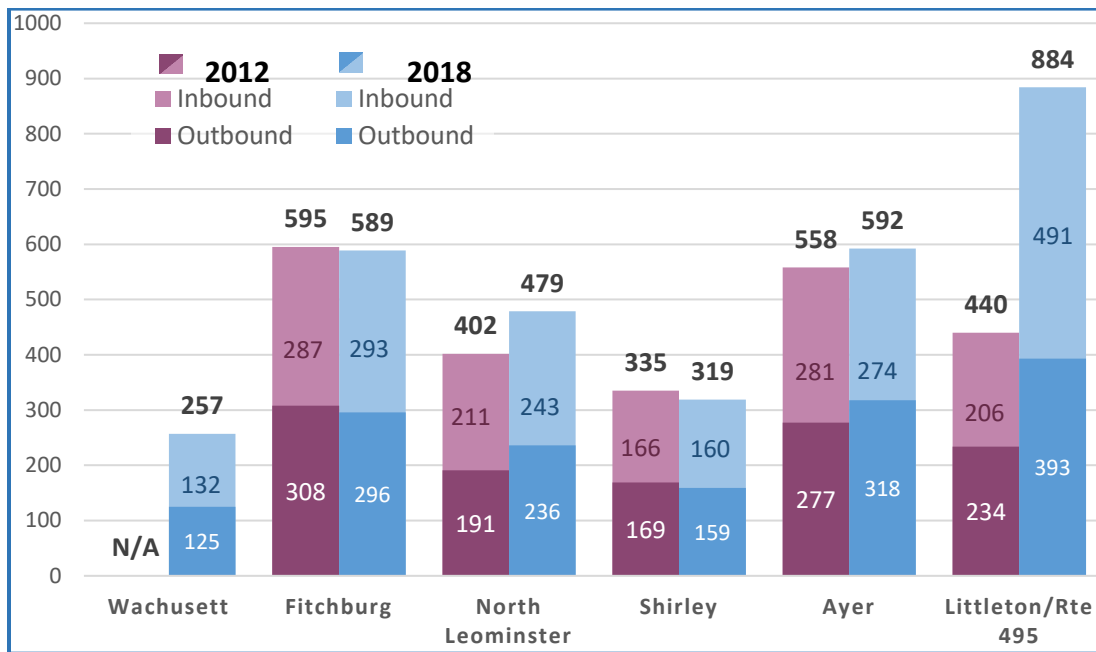
Table 4.7-9: Percentage Change in Commuter Ridership from 2012 to 2018

| | Inbound | | Outbound | |
|-------------------|----------|-----------|----------|-----------|
| | Boarding | Alighting | Boarding | Alighting |
| Wachusett | n/a | n/a | n/a | n/a |
| Fitchburg | n/a | n/a | n/a | -3.9% |
| North Leominster | 11.8% | n/a* | 50% | 23.3% |
| Shirley | -4.5% | 8.3% | -38% | -3.2% |
| Ayer | -2.0% | -6.3% | -9% | 18.2% |
| Littleton/Rte 495 | 135.6% | 700.0% | -22% | 71.6% |

Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff – 2020 RTP

*Data collected by the MBTA and the CTPS did not record any alighting at the North Leominster stop during their study in 2012, and therefore a percent change cannot be calculated.

Figure 4.7-6: Commuter Rail Daily Ridership, 2012 vs 2018



Source: Massachusetts Bay Transit Authority and Central Transportation Planning Staff – 2020 RTP

Pandemic and Post Pandemic Transit

A. Fixed Route System

1. Fitchburg/Leominster and Gardner

In 2019, the trend of decreased ridership along the fixed route system in Fitchburg, Leominster and Gardner continues as documented in the last RTP. Beginning in 2020 with the onset of the COVID pandemic and all of its associated restrictions on the public and transit agencies, the decrease in ridership (and its associated revenues) took a major decline. From 2020 to 2022, ridership fell in Fitchburg/Leominster and Gardner, 56.6 % and 28.14%, respectively. In Fitchburg/Leominster, this represented a more than 50% decrease in total ridership per year.

Table 4.7-10: Fixed Routes Yearly Ridership

| Fixed Routes | 2019 | 2020 | 2021 | 2022 | Avg Ridership Per FY 2015 to 2019 Pre-Pandemic Years Yearly Ridership | Avg Ridership Per FY 2020 to 2022 Peak Pandemic Years Yearly Ridership | 2023 (7 Months) |
|--------------------------------|---------------|---------------|---------------|---------------|---|--|-----------------|
| Leominster/Fitchburg | 436,204 | 346,478 | 181,837 | 221,250 | 520,056 | 249,855 | 144,497 |
| <i>Avg Ridership Per Month</i> | <i>36,350</i> | <i>28,873</i> | <i>15,153</i> | <i>18,438</i> | <i>43,338</i> | <i>20,821</i> | <i>20,642</i> |
| Gardner | 48,642 | 48,030 | 31,046 | 37,481 | 51,617 | 38,852 | 28,788 |
| <i>Avg Ridership Per Month</i> | <i>4,054</i> | <i>4,003</i> | <i>2,587</i> | <i>3,123</i> | <i>4,301</i> | <i>3,238</i> | <i>4,113</i> |

Source: Montachusett Regional Transit Authority

Table 4.7-11: Fixed Routes Yearly Ridership

| Fixed Routes | Percent Change Non-Pandemic Years (2015-2019) | Percent Change Pandemic Years (2020-2022) | Percent Change 2015 to 2022 |
|-----------------------------|---|---|-----------------------------|
| Leominster/Fitchburg | -38.91% | -56.60% | -173.88% |
| Gardner | -17.58% | -28.14% | -52.59% |

Source: Montachusett Regional Transit Authority

In the first seven months of 2023, ridership figures are showing an improved situation for both the Fitchburg/Leominster and Gardner systems. Average monthly ridership is currently equaling or exceeding monthly figures from the pandemic years of 2020 to 2022. This trend will hopefully continue as we move further away from the pandemic crisis.

2. Regional Services

Ridership on the Link System also saw ridership decreases during the peak pandemic years of 2020 to 2022. Although in most instances a ridership decline was already underway from 2018 to 2019, once the crisis hit, the decline doubled from the 2018 to 2019 levels. The Winchendon Link system alone saw a 41.39% decline cutting ridership almost in half from 2019 levels.

Table 4.7-12: Link Yearly Ridership

| Link Route | 2019 | 2020 | 2021 | 2022 | Percent Change 2018 to 2019 | Percent Change 2020 to 2022 |
|----------------------|--------|--------|--------|--------|-----------------------------|-----------------------------|
| Athol Link | 10,011 | 11,890 | 10,681 | 10,565 | -6.82% | -12.54% |
| Athol-Orange Shuttle | 22,758 | 21,306 | 17,756 | 20,585 | 3.14% | -3.50% |
| Winchendon Link | 4,285 | 3,539 | 2,122 | 2,503 | -20.37% | -41.39% |

Source: Montachusett Regional Transit Authority

The Intercity Bus ridership drop while on a decline heading into 2019, once the pandemic appeared, ridership dropped over 90% from 2019 to 2020. Overall, ridership dropped an incredible 804.90% during peak pandemic years.

The Wachusett Shuttle that provided access to Wachusett Station and the Fitchburg Commuter Rail Line saw ridership decrease 52.77% as commuters altered their regular work routine from travel east into the Boston Metro area to a work from home stance.

Table 4-.7-13: Intercity Yearly Ridership

| Intercity Routes | 2019 | 2020 | 2021 | 2022 | Percent Change 2019 to 2020 | Percent Change 2020 to 2022 |
|-------------------|-------|-------|-------|-------|-----------------------------|-----------------------------|
| Intercity Bus | 5,839 | 4,244 | 266 | 469 | -37.58% | -804.90% |
| Wachusett Shuttle | 3,360 | 3,946 | 1,618 | 2,583 | 14.85% | -52.77% |

Source: Montachusett Regional Transit Authority

The trend of double-digit percentage drops in ridership continues when looking at the shuttle services implemented by MART. The Devens Regional shuttle lost over half of its yearly ridership from 2019 to 2022. The Littleton-Westford Commuter shuttle while stable from 2019 to 2020, by 2021 the service was discontinued altogether. Resumption has not been planned as of this RTP.

Table 4.7-14: Other Regional Shuttle Yearly Ridership

| Intercity Routes | 2019 | 2020 | 2021 | 2022 | Percent Change 2019 to 2020 | Percent Change 2020 to 2022 |
|--|-------------|-------------|-------------|-------------|--|--|
| Devens Regional | 3,989 | 2,239 | 1,533 | 1,468 | -78.16% | -52.52% |
| Littleton-Westford Commuter | 2,452 | 2,420 | 0 | 0 | -1.32% | N/A |

Source: Montachusett Regional Transit Authority

B. Paratransit

The use of paratransit services also saw changes based on COVID restrictions put in place. Ridership was decreasing from 2018 to 2019, those decreases accelerated from 2020 to 2022. However, with the exception of Athol, paratransit ridership has grown from the peak pandemic year of 2021 to 2022. Paratransit service lends itself to a more health secure option that can be attractive to users, especially the more COVID vulnerable individuals.

Table 4.7-15: Paratransit Yearly Ridership (not including COA)

| Communities | 2019 | 2020 | 2021 | 2022 | Percent Change 2019 to 2020 | Percent Change 2020 to 2022 |
|-----------------------------|-------------|-------------|-------------|-------------|--|--|
| Leominster/Fitchburg | 70,991 | 53,832 | 48,169 | 71,722 | -31.88% | 24.94% |
| Gardner | 25,398 | 21,431 | 15,532 | 18,614 | -18.51% | -15.13% |
| Athol | 1,314 | 1,154 | 558 | 291 | -13.86% | -296.56% |
| Dial-A-MART Services | 138,093 | 92,308 | 24,353 | 63,261 | -49.60% | -45.92% |

Source: Montachusett Regional Transit Authority

C. Dial-A-MART

Dial-A-MART services while remaining relatively consistent were showing a slight yearly decline heading into 2019. Ridership then dropped severely beginning in 2020 until it hit a low in 2021 approximately 80% below 2019 levels. However, in 2022, ridership levels were beginning to recover from the COVID lows as it grew over 61% from 2021.

Table 4.7-16: Dial-A-MART Yearly Ridership

| Communities | 2019 | 2020 | 2021 | 2022 | Percent Change 2019 to 2020 | Percent Change 2020 to 2022 |
|----------------------|---------|--------|--------|--------|--------------------------------|--------------------------------|
| Dial-A-MART Services | 138,093 | 92,308 | 24,353 | 63,261 | -49.60% | -45.92% |

Source: Montachusett Regional Transit Authority

D. Commuter Rail Stations**Table 4.7-17: Commuter Rail Lot Parking Spaces – Current and Future Potential**

| Community | Commuter Rail Station | Current No. of Parking Spaces | In use* | Percent usage | Potential/Planned Parking Spaces | Estimated Year of Completion |
|------------|-------------------------|-------------------------------|---------|---------------|----------------------------------|------------------------------|
| Fitchburg | Wachusett Station | 360 | 127 | 35.28% | 360 | Completed |
| | Main Street | 425 | 311 | 73.18% | 425 | Completed |
| Leominster | North Leominster | 360 | 133 | 36.94% | 360 | Completed |
| Shirley | Front Street | 65 | 120 | 184.60% | 65 | N/A |
| Ayer | Main Street/Park Street | 65 | 65 | 100% | 200 | Completed |
| Littleton | Foster Street | 250 | 255 | 102% | 250 | Completed |
| Total | | 1,530 | | | 1,665 | |

Source: Montachusett Regional Transit Authority

*Parking lot use counted on Thursday July 11, 2019 by MRPC

E. Other Current Transit Capital Improvements

MART has purchased and deployed a fleet of minibuses (Arbocs) which were purchased and deployed to significantly reduce:

- Fleet acquisition costs
- Operational costs
- Maintenance costs

The minibuses will be used to:

- Operate fixed routes with ridership that does not warrant a large-frame bus

- Establish feeder routes between unserved and under-served areas of the fixed route communities and the current fixed routes; and
- Develop shuttle routes between rural communities and the fixed route communities for access to fixed route services.

MART has purchased and is utilizing recently acquired GPS-based transit technologies:

- Genfare Fare Collection System
 - Provides Multiple Purchase Options
 - Mobile devices
 - Internet
 - On-vehicle
 - Ticket Vending Machines
 - Provides Internal Data Collection and Trend Analysis
 - Ridership
 - Boarding location
 - Payment methodology
- Passio Go! System
 - Provides passengers w/ estimated arrival time at stops.
 - Provides transit staff w/ operational vehicle tracking.
 - Automated Passenger Counters
 - Provides transit staff w/ On-Time Performance capabilities for analyzing and improving fixed route and paratransit system performance.

F. Other Current Transit Operational Improvements

The Athol Shuttle route and schedule was modified in December 2022, increasing the service area and improving the route timing. Ridership has increased by 6% through June 2023.

The Advisory Board of the Transit Authority recently voted to approve several key fare policy changes:

- Full fares were reduced from \$1.25 to \$1.00

- School age students ride free
- No cost transfers for inter-city regional routes

MART has also recently launched two new micro transit services:

- Sterling, Lancaster, and Lunenburg service (funded by MassDevelopment Taxi/Livery grant)
- Bolton, Boxboro, Littleton and Stow service (funded by MAPC Community Connections grant)

Measures Implemented During Pandemic

In response to the pandemic, MART and other RTAs implemented a number of measures to combat spread and to provide a safe transit experience for riders and employees. Many of these particular measures have remained in place in place as part of the overall transit system.

Table 4.7-18: Pandemic Measures Implemented by MART

| Pandemic Measure | Date Implemented | End Date | Results/Action | Continued |
|---|-------------------------|-----------------|--|--------------------|
| Driver Safety Partitions in Rollingstock | 3/1/2020 | N/A | Allowed Drivers to Continue Work Throughout Pandemic | To Remain in Place |
| Vehicle Enhancement - Static Disinfectant | 3/1/2020 | N/A | Extra Cleaning Allowed Drivers and Ridership to be More Comfortable | To Remain in Place |
| Personnel Segregation – Implemented Alternating Schedules, Work from Home Policy and Separation of Personnel into Different Facilities to Adhere to Distance Guidelines | 2/20/2020 | 5/15/2022 | Provided a Safer Work Environment. Policies were Discontinued with Reduction of COVID Threat | Discontinued |
| Garages Disinfection - Handrails and Elevators | 3/1/2020 | 5/15/2022 | Cleaning Allowed for Comfort and Safety of Employees and Ridership | Discontinued |
| Wearing of Masks and Gloves | 3/1/2020 | 3/15/2023 | Lifted when Federal Mandate Discontinued | Discontinued |
| Rolling Stock Reconfigured to Include Medical MERV Rated Filters | 5/1/2020 | N/A | Improved Driver and Ridership Conform and Security | To Remain in Place |

Improvements Made Since 2019

MART has been striving to accomplish many of the goals that were established in the 2020 RTP. The following have been implemented or are scheduled to be implemented by the time of the next scheduled RTP in 2028.

Table 4.7-19: Improvements Implemented by MART Since 2019

| RTA Projects/Programs | FY | Reason | Est Cost |
|--|-----------|---|-----------------------|
| Vehicle Exhaust Detection System (Co/No) for Facilities | 2021 | Safety Feature at 840 North Main & 1427R Water St. to detect and alarm when fumes reach safety limits | \$90,000 |
| Gardner Bay Flooring | 2021 | Stripped and recoated failing slab for entire bus-bay | \$428,000 |
| Employee Parking Lot Reconfiguration | 2021 | Demolished, regraded, and paved new lot | \$246,000 |
| 840 North Main St Office Renovation - (Phase 1 & 2) | 2021-2023 | Completed total conversion of 1st floor space into office space for 46 staff. Modern office setting and prototype for future renovations. | \$900,000 |
| 1427R Water Street Facility - Fire Panel | 2022 | Replaced fire panels past useful life, with a 4100ES system | \$62,00 |
| 1427R Water Street Facility - VR Lift | 2022 | Replaced aging Parallelogram lift with new Vertical Rise lift | \$112,000 |
| Service Contracts - Multiple | 2022-2026 | Service contracts with trades for preventative maintenance. Part of initiative to better support, maintain and extract value out of existing systems. Cost is per/year. | \$130,000 |
| New Farebox System | 2022 | Allows RTA to better understand the relationship of ridership vs. revenue | \$1,500,000 |
| New APC - Passenger Counter System) | 2022 | Increases knowledge through data acquisition to improve transportation needs of the ridership | \$565,000 |
| New Security Camera System | 2022 | Improves over all safety of employees and ridership | \$200,000 |
| Thermal Compliant Vehicle Data/Functional Devices | 2022 | Improves data gathering capacity located in vehicles. | \$50,000 |
| Rolling Stock Consortium - Procurement Vans/Cutaways | 2022 | Group of RTA's that procure smaller rollingstock as a unified group. | Multi million-dollars |
| LBE Grant Award - EV/Solar Study for Water St. Facility for DOT-FHWA CFI Grant | 2023 | Award of \$75,000 to conduct concept and preliminary work for DOT-FHWA's CFI Grant with goal of acquiring funding for construction. | \$75,000 |

Table 4.7-19: Improvements Implemented by MART Since 2019 (cont.)

| RTA Projects/Programs | FY | Reason | Est Cost |
|----------------------------------|------|--|-----------|
| Ayer - Depot Square Project | 2023 | Completed Depot Square Project to finalizing MART's commitment to the Town of Ayer. | \$540,000 |
| Athol Depot - Facade Restoration | 2023 | Completed historical restoration of the Athol Depot. Included masonry, doors, windows, and hardware. | \$580,000 |

Human Service Transportation Brokerage Improvements

MART responded to a Request for Proposals issued by the Executive Office of Health and Human Services for Human Service Transportation (HST) Brokerage Services in June of 2020 and was subsequently awarded two of the three newly defined regions for brokerage services to commence on July 1, 2021. MART now manages more than eighty-two percent (82%) of the HST brokerage for the Commonwealth of Massachusetts.

To enhance the management of the brokerage services, MART developed and deployed additional technologies and reporting systems including:

- **Technologies**
 - MassHealth Member Trip Booking Portal
 - Facility Trip Booking Portal
 - Call Center w/ Integrated Voice Response (IVR)
 - Real-time notifications to customers for vehicle arrivals
 - Web portals for Complaint and Service reporting
 - GPS vehicle tracking
 - Vendor Contract Management and Credentialing Portal
 - Integration w/ Lyft
- **Reporting Dashboards**
 - Trip volume reporting (by agency, trip type, region, etc.)
 - Distribution by Company, driver, vehicle type, etc.
 - On-time performance

- Expenditure reporting (by agency, trip type, region, city/town/etc.)
 - Total cost of trips
 - Average cost per trip
- Call Center Metrics
 - Call Volume
 - Answered vs. Abandoned Calls
 - Call Duration
 - Available agents (by hour, region, agency, etc.)
- Complaints
 - Complainant Information
 - Transportation Provider Information
 - Complaints by category
 - Time to resolve and notification to consumer
 - By Agency, region, date, etc.

The significant enhancement to the technologies used to manage the brokerage operations, as well as the enhanced and upgraded dashboard reporting has substantially improved the customer experience and the abilities of MART and the HST office to manage the expanding needs and growth of the HST brokerage.

For FY23, MART provided nearly 5.8 million trips with a budget of \$235 million. The trips continue to increase post-COVID and MART is continuing to increase the pool of transportation providers providing services. The new integration with Lyft will greatly improve the increasingly frequent need to provide same day / next day trips, as well as non-emergent hospital trips and releases.

Trends

As indicated in the review of the ridership figures during the pandemic years of 2020 to 2022, clearly show and illustrate the negative impacts being felt by MART as well as other RTAs across the nation. Ridership and its corresponding revenue figures have placed a major strain and

burden on the transit system from fixed routes to commuter rail. Figures also indicate that trends are beginning to turn around and rebound from the lowest points of the pandemic.

Filling service gaps, meeting service needs, and increasing accessibility to residents continues to be a priority for MART. MART will continue to review its various transit routes and options as well as its facilities and rolling stock.

Transit Challenges

1. MART and its operating companies are still experiencing significant financial and operational impacts resulting from increased costs related to supply chain shortages, as well as a challenging workforce and labor participation environment.
2. Capital projects continue to be negatively impacted, due to significantly higher costs, contractor responsiveness and supply chain product availability.
3. All MART commuter rail garage facilities continue to generate substantially less parking fare revenue than the pre-pandemic period.
4. Although ridership continues to recover, both fixed route and paratransit ridership are still below pre-pandemic levels.

Recommendations

In order to provide increased mobility for Montachusett area residents that do not own automobiles or that choose to be less dependent on a personal vehicle, MART will need to continue to refine and implement public transit programs designed to increase ridership. To accomplish this, it will be necessary to examine the routes and schedules in order to determine the most efficient and effective services. Overcoming the negative effects of the COVID pandemic will be a continued long-range effort for the transit authority. MART remains open to expanding services wherever possible to fill service gaps, meet unmet regional needs and increase accessibility to health facilities and social services.

Where it becomes apparent that certain services are needed, MART should continue to work with those institutions to examine requests, organizational involvement, and ways to help

defray the cost of the additional services. Continued participation of local industries, businesses, major shopping centers and schools in developing appropriate schedules, routes and promotional programs is an important part of this ongoing planning and implementation of services.

Special service provided to the elderly and the disabled will need to be closely monitored to insure continuation of appropriate levels of service. The continuation of brokerage programs with the Department of Public Health, Department of Developmental Services, MassHealth, Department of Mental Health, MRC, and MCB is of major importance and should remain a focal issue.

In addition to increased and improved routing and scheduling, it will be necessary for MART to maintain and improve the operating condition of its vehicle fleet. The present vehicle fleet is constantly being replaced with new lift equipped ADA compliant equipment. The Montachusett TIP process should continue to be utilized to upgrade and replace buses and vans for the MART fleet, as well as continue to upgrade maintenance facilities. Opportunities in the Bipartisan Infrastructure Law (BIL) provide an opportunity to replace existing vehicles with electric, net zero and energy efficient vehicles. Additionally, the supporting infrastructure needed to supply these new technologies should also remain a major goal for MART.

It is recommended that MART collaborate with municipalities to lift the age requirement on the Council on Aging public transportation vehicles in order to provide service to a larger portion of the community. The Council on Aging van services could be expanded to operate on weekends and nights so that those who utilize the service have more scheduling opportunities.

It is recommended that MART continue to increase its social media presence to better promote services and information to the community. MART should continue to collaborate with local municipalities to promote available public transit options on the municipalities' websites and social media pages. It is also recommended that MART continue to disseminate information through traditional media like local newspapers, local access television, and radio while still improving its social media presence. Within the last RTP, it was recommended that MART hold

periodic training sessions in order to teach users on how to read and follow bus schedules. The pandemic obviously derailed this initiative. Training videos were developed and placed on the web as part of their outreach efforts. However, in person outreach meetings should return as an effort for the Transit Authority.

Most of the above actions are designed to improve efficiency and lower overall demand on the highway system. There remain several key and identifiable avenues by which the MART system can be both properly maintained and improved. They are:

Table 4.7-20: Recommended Programs/Projects

| RTA Projects Recommendations | Expected FY | Reason for Recommendation | Est Cost |
|--|-------------|--|-------------|
| Ridership Demographics Study | 2023-2026 | A large project involving MART and its Operating company to understand where the ridership is, where they want to go etc. in order to maximize mobility. | N/A |
| ITC Roof, Concourse & Stair Tower, Main Street - Fitchburg | 2023-2024 | 3 Projects to modernize and rehabilitate the aging Intermodal Transportation Center (ITC) | \$1,250,000 |
| Rebranding Campaign | 2023-2025 | Standardization of agency image (Logo/Colors) across its portfolio of buildings and fleet vehicles | \$400,000 |
| Elevator Modernization | 2023-2024 | Upgrade original elevator components following an assessment. Project will have two phases and cover all 7 elevators/lifts across MART the portfolio. | \$500,000 |
| Hydrogen Fueling Station - FTA's Lo-No & Bus-Bus Facility Grant Submission | 2024-2025 | Infrastructure for Hydrogen Fueling station to make-ready the Water St. Facility for Hydrogen Fuel Cell (HFC) Zero Emission fleet vehicles | \$5,000,000 |
| ITC Parking Garage - Structural Repairs, Main Street - Fitchburg | 2024-2025 | Address original design flaws to ensure structural integrity and safety and to prolong the facility's life expectancy. | \$950,000 |
| Fuel Station Upgrades - Systemwide | 2024-2025 | Final fuel station upgrades so that the system will last through the final rollover of the combustion fleet vehicles as the fossil fuels are phased out for ZEV (Hydrogen & EV). | \$235,000 |
| North Main St. Parking Expansion - Leominster | 2025 | Additional parking at the new 840 North Main St. Facility in Leominster | \$480,000 |

Table 4.7-20: Recommended Programs/Projects (cont.)

| RTA Projects Recommendations | Expected FY | Reason for Recommendation | Est Cost |
|--|--------------------|---|-----------------|
| HVAC Replacement 1427R Water Street - Fitchburg | 2025 | Replace underperforming HVAC system at Administrative offices. | \$400,000 |
| EV Vehicle Charing Infrastructure - DOT-FHWA CFI Grant Submission | 2025-2026 | Infrastructure upgrades for Electric Vehicle Charging Stations, Solar Canopy, Battery Backup, and Utility hookup in order to make-ready the Water St. Facility for Electric Vehicle (EV) Zero Emission fleet vehicles | \$8,000,000 |
| ITC Atrium, Main Street - Fitchburg | 2026+ | Repurpose for public/governmental use the underutilized North Pod Atrium at the Intermodal Transportation Center | \$680,000 |
| ITC 2nd Floor 100 & 150 Main Street - Fitchburg | 2026+ | Refurbish existing open office space, improve layout, floor plan, and space use at the Intermodal Transportation Center. | \$900,000 |
| ITC New Garage Lighting & Protection Main Street - Fitchburg | 2026+ | New garage lighting with anti-bird features at the Intermodal Transportation Center | \$200,000 |
| ITC Asphalt Sealing & Restriping, Main Street - Fitchburg | 2026+ | Topcoat/resealing and striping of asphalt + concrete sealant at the Intermodal Transportation Center | \$320,000 |
| Wachusett Station, Fitchburg Commuter Rail Asphalt Resealing + Concrete Sealing & Striping | 2026+ | Topcoat/resealing and striping asphalt + concrete sealant at the Wachusett Rail Station | \$380,000 |
| NL Asphalt + Concrete Sealing & Restriping | 2026+ | Topcoat/resealing and striping asphalt + concrete sealant | \$280,000 |
| Mechanic/Bay Side Update with New Equipment -Gardner Facility | 2026+ | Update Mechanic Space, Floors, Painting, Wash Bay Epoxy, plus 2 new Post Lifts | \$1,100,000 |
| 840 North Main St. Facility 2nd Floor Office Renovation - Leominster | 2026+ | 2nd Floor Office Build Out and Refurbishment of Space for Better Utilization; to include Rehab of Bathrooms. An Assessment to determine a better layout to be conducted. Existing layout from a prior car dealership. | \$900,000 |

Table 4.7-20: Recommended Programs/Projects (cont.)

| RTA Projects Recommendations | Expected FY | Reason for Recommendation | Est Cost |
|--|--------------------|--|-----------------|
| ITC Generator Replacement, Main Street - Fitchburg | 2026+ | Replace generator that supports 150 Main Street facility. Old generator installed in 2005 at the Intermodal Transportation Center. | \$120,000 |
| 840 North Main St. Facility Generator Replacement - Leominster | 2026+ | Replace generator that supports 150 Main Street facility. Old generator installed in 2005. | \$120,000 |

Other Future Transit Improvements Planned

The following transit improvements are currently in process or will be getting underway during FY24:

- The Gardner fixed routes are being assessed for:
 - Service area improvements
 - Improvements to the route schedules for commuter and local businesses
- Assessing and analyzing Fitchburg / Leominster fixed routes to enhance routing and schedules.
- Purchasing a facility within Devens to establish a satellite operations center to improve the ability to develop fixed route services to Devens, as well as to provide services in the eastern portion of our service area.
- Launching transit dashboards for improved access to information

Environment

Introduction

Environment and climate change are important areas of consideration for transportation planning. The Montachusett region needs to help protect and minimize negative impacts to its many areas of environmental value and its air, water, soil and wildlife. Along with environmental protection, the Montachusett region hopes to reduce greenhouse gas emissions which contribute to global climate change. This section will discuss the current and future activities the Montachusett region is undertaking to protect its environment and reduce greenhouse gas emissions.

“The best climate science for Massachusetts continues to stress three findings: temperatures have gone up over the years and will continue to increase; there could be both fewer rainy days and more intense rainstorms; and sea levels will rise and combine with more powerful coastal storms.”

– 2022 Massachusetts Climate Change Assessment

Impact

In response to building concerns on the effect of global climate change and the development of Massachusetts Green DOT initiatives, the MRPC has looked at ways climate change will impact the Montachusett region. In particular, staff has focused on potential flooding by identifying flood prone areas and the effects that it will have on each community in relation to major transportation infrastructure. Transportation infrastructures such as roadways, bridges, rail lines etc. are essential for the economic wellbeing of our region. More than half the country’s population now lives along the nation’s coasts, and one third lives in the highly populated coastal areas of the Northeast. The area between Boston and Philadelphia is one of the most populous areas of the country. The Montachusett region, being a part of this larger corridor, not only has infrastructure which carries regional significance but national as well.

Regional Significance

“Massachusetts’ current climate, and the threat of future climate change, is the result of two key dimensions of weather: temperature and precipitation. Changes in global temperatures over time also contribute to a third key dimension of climate change, sea level rise.” Even though there are no coastal areas in the Montachusett region it is important to note other effects climate change may have on inland areas. “While climate projections find that there may be fewer days that are rainy or snowy, on those days when it does rain or snow, there can be more moisture. The greater intensity and duration of rainfall on rainy days can lead to flooding, stress on built infrastructure, natural ecosystems and consequent impacts on human health” (**2022 Massachusetts Climate Change Assessment** - <https://www.mass.gov/info-details/massachusetts-climate-change-assessment#read-the-report->). Since flooding is a major concern to transportation infrastructure in the region, it is important to identify and recognize areas which are vulnerable to such events.

The flood zone maps at the end of this section show Federal Emergency Management Agency (FEMA) 100-year flood zones in the Montachusett region. A 100 year flood is “calculated to be the level of [flood](#) water expected to be equaled or exceeded every 100 years on average. The 100-year flood is more accurately referred to as the 1% annual exceedance probability flood, since it is a flood that has a 1% chance of being equaled or exceeded in any single year.” (United States Geological Survey “100 Year Flood – It’s all about Chance” <https://pubs.er.usgs.gov/publication/gip106>)

The map **FEMA 100-Year Flood Zones, MA DOT Bridges, and DCR Dams** at the end of this section shows all dams in the region and bridges that structurally deficient. According to the Massachusetts Highway Project Development and Design Guidebook, a *structurally deficient* bridge is defined as “a bridge structure that has a defect requiring corrective action.”

(**Massachusetts Highway Design Handbook** - <https://www.mass.gov/lists/design-guides-and-manuals>)

Dams are shown by their Hazard Codes, a system that categorizes dams according to the degree of adverse incremental consequences of a failure or mis-operation of a dam. The hazard

potential classification does not reflect in any way on the current condition of the dam (e.g., safety, structural integrity, flood routing capacity), rather the potential hazards downstream that would be realized by a failure. Three classification levels are *Low, Significant, and High*. According to the Massachusetts Office of Dam Safety a...

High Hazard Potential dam refers to dams located where failure will likely cause loss of life and serious damage to home(s), industrial or commercial facilities, important public utilities, main highway(s) or railroad(s).

Significant Hazard Potential dam refers to dams located where failure may cause loss of life and damage home(s), industrial or commercial facilities, secondary highway(s) or railroad(s) or cause interruption of use or service of relatively important facilities.

Low Hazard Potential dam refers to dams located where failure may cause minimal property damage to others. Loss of life is not expected.

The map ***TIP Projects and 100 Year Flood Zones*** at the end of the section overlays all projects currently listed in the “Target Section” of the Transportation Improvement Program (TIP) for the years 2024 through 2028 that are within the above-mentioned FEMA 100-year flood zones. The TIP is an annual prioritized listing of transportation and transit projects in the region proposed for implementation during the five-future federal fiscal years. Target section projects are prioritized and listed by the Montachusett MPO after consideration of several different criteria including effects on the environment and climate.

Table 4.8-1: High Hazard Dams in the Montachusett Region

| HIGH HAZARD DAMS IN THE MONTACHUSETT REGION | | | | |
|--|------------------|------------------|-----------------------------|----------------|
| Dam Name | City/Town | Ownership | Regulating Authority | ID Code |
| Lower Naukeag Lake Dam | Ashburnham | Municipality | Office of Dam Safety | MA00002 |
| Upper Naukeag Lake Dam | Ashburnham | Municipality | Office of Dam Safety | MA00003 |
| Winnekeag Lake Dam | Ashburnham | Private | Office of Dam Safety | MA00007 |
| Lake Wampanoag Dam | Ashburnham | Private | Office of Dam Safety | MA00010 |
| Ashby Reservoir Dam | Ashby | Municipality | Office of Dam Safety | MA00334 |
| Whites Mill Pond Dam | Winchendon | Private | Office of Dam Safety | MA00630 |
| Lake Monomonac Dam | Winchendon | Municipality | Office of Dam Safety | MA00631 |
| Whitney Pond Dam | Winchendon | Municipality | Office of Dam Safety | MA00633 |
| Crocker Pond Dam | Westminster | Private | Office of Dam Safety | MA00638 |
| Westminster Reservoir Dam | Westminster | Private | Office of Dam Safety | MA00639 |
| Wyman Pond Compensating Reservoir Dam | Westminster | Municipality | Office of Dam Safety | MA00641 |
| Hickory Hills Lake Dam | Lunenburg | Private | Office of Dam Safety | MA00851 |
| Fall Brook Reservoir Dam and Dike | Leominster | Municipality | Office of Dam Safety | MA00869 |
| Notown Reservoir Dam | Leominster | Municipality | Office of Dam Safety | MA00870 |
| Scott Reservoir Dam | Fitchburg | Municipality | Office of Dam Safety | MA00871 |
| Lovell Reservoir Dam | Fitchburg | Municipality | Office of Dam Safety | MA00872 |
| Wrights Reservoir Dam | Gardner | Municipality | Office of Dam Safety | MA00117 |
| Cowee Pond Dam | Gardner | Municipality | Office of Dam Safety | MA00118 |
| Perley Brook Reservoir Dam | Gardner | Municipality | Office of Dam Safety | MA00119 |
| Lake Shirley Dam | Lunenburg | Municipality | Office of Dam Safety | MA00455 |
| Lost Lake Dam | Groton | Municipality | Office of Dam Safety | MA00808 |
| Greenes Pond Dam | Fitchburg | Municipality | Office of Dam Safety | MA00875 |
| Overlook Reservoir Dam | Fitchburg | Municipality | Office of Dam Safety | MA00876 |
| Snows Mill Pond Dam | Fitchburg | Private | Office of Dam Safety | MA00878 |
| McTaggarts Pond Dam | Fitchburg | Municipality | Office of Dam Safety | MA00879 |
| Rockwell Pond Dam | Leominster | Municipality | Office of Dam Safety | MA00882 |
| Pierce Pond Dam | Leominster | Private | Office of Dam Safety | MA00883 |
| Wachusett Reservoir Dam | Clinton | State | Office of Dam Safety | MA00886 |
| Cresticon Upper Dam | Athol | Private | FERC Jurisdiction | MA00932 |
| Crescent Street Dam | Athol | Private | Office of Dam Safety | MA00934 |
| Birch Hill Dam | Royalston | Federal Agency | Army Corps of Engineers | MA00963 |
| Tully Lake Dam | Royalston | Federal Agency | Army Corps of Engineers | MA00970 |
| Bickford Pond Dike | Hubbardston | Municipality | Office of Dam Safety | MA01022 |
| Wachusett Reservoir North Dike | Clinton | State | Office of Dam Safety | MA01294 |
| Lovell Reservoir Dike | Fitchburg | Municipality | Office of Dam Safety | MA01334 |
| Lake Samoset Dam | Leominster | Private | Office of Dam Safety | MA00866 |
| Notown Reservoir Dike | Leominster | Municipality | Office of Dam Safety | MA01240 |
| Overlook Reservoir Dike | Fitchburg | Municipality | Office of Dam Safety | MA01236 |
| Falulah Reservoir Dam | Fitchburg | Municipality | Office of Dam Safety | MA02312 |
| Red Dam | Winchendon | Municipality | Office of Dam Safety | MA02345 |
| Damon Pond Dam | Ashby | State | Office of Dam Safety | MA02518 |

Table 4.8-2: Structurally Deficient Bridges in the Montachusett Region

| Community | Roadway | Bridge Over | Owner | Year Built | Year Rebuilt |
|---|--------------------|--------------------------|-------|------------|--------------|
| Hubbardston | HWY WILLIAMSVILL | WATER BURNSHIRT RIVER | MUN | 1939 | |
| Winchendon | US202 MAPLE ST | WATER N BR MILLERS RIVER | DOT | 1937 | |
| Fitchburg | HWY CIRCLE ST | WATER N NASHUA RIVER | MUN | 1937 | |
| Royalston | HWY WINCHNDON RD | WATER PRIEST BROOK | MUN | 1937 | |
| Templeton | HWY MAIN ST | WATER OTTER RIVER | MUN | 1938 | |
| Shirley | HWY LONGLEY RD | WATER MULPUS BROOK | MUN | 1968 | |
| Townsend | HWY W MEADOW RD | WATER LOCKE BROOK | MUN | 1917 | 1985 |
| Fitchburg | ST 12 WATER ST | WATER N NASHUA RIVER | DOT | 1937 | 1961 |
| Fitchburg | ST 2 A/LNENBRG ST | WATER BAKER BROOK | DOT | 1954 | |
| Fitchburg | ST 31 WESTMNSTR RD | WATER PHILLIPS BROOK | DOT | 1947 | |
| Ayer | ST 2 A/FTCHBRG RD | WATER NASHUA RIVER | DOT | 1975 | |
| Royalston | HWY N FITZWLM RD | WATER LAWRENCE BROOK | MUN | 1959 | |
| Hubbardston | ST 62 OLD BSTN TPK | WATER W BR WARE RIVER | MUN | 1950 | |
| Townsend | ST119 MAIN ST | WATER PEARL HILL BROOK | DOT | 1907 | 1931 |
| Westminster | ST 12 ASHBURNHM ST | WATER PHILLIPS BROOK | DOT | 1926 | |
| Ashby | ST119 STATE RD | WATER S BR SOUHEGAN RIV | DOT | 1962 | |
| Athol | ST 2 A/S MAIN ST | WATER WEST BROOK | DOT | 1930 | |
| Petersham | ST101 POPPLE CAMP | WATER E BR SWIFT RIVER | MUN | 1929 | |
| Winchendon | US202 RIVER ST | WATER MILLERS RIVER | DOT | 1932 | |
| Scheduled for construction in 2024-2028 TIP | | | | | |
| Currently under construction | | | | | |

Table 4.8-3: TIP Projects within 100-Year Flood Zones

| Project Number | Description | FFY | Cost |
|-----------------------|--|-------------|--------------|
| 609244 | ASHBURNHAM- ROADWAY REHABILITATION ON ROUTE 101 SOUTH | 2025 | \$9,240,930 |
| 604499 | LEOMINSTER- RECONSTRUCTION/ REHABILITATION ON ROUTE 12 (CENTRAL STREET), INCLUDING REHABILITATION OF L-08-022 | 2024 - 2025 | \$13,814,345 |
| 606640 | AYER- RESURFACING & RELATED WORK ON ROUTE 2A (FITCHBURG ROAD & PARK STREET) | Appendix | \$2,400,000 |
| 608424 | TEMPLETON- RECONSTRUCTION OF ROUTE 68, FROM KING PHILLIP TRAIL (ROUTE 202) NORTH TO THE PHILLIPSTON TOWN LINE (2.65 MILES) | 2026 | \$6,790,886 |
| 607432 | WESTMINSTER- REHABILITATION & BOX WIDENING ON ROUTE 140, FROM PATRICIA ROAD TO THE PRINCETON T.L. | 2023 | \$6,375,205 |
| 608879 | WINCHENDON- RESURFACING & RELATED WORK ON MAPLE STREET (ROUTE 202), FROM VINE STREET TO GLENALLEN STREET (1.36 MILES) | Appendix | \$1,680,444 |
| 609213 | HARVARD- RESURFACING AND BOX WIDENING ON AYER ROAD, FROM ROUTE 2 TO THE AYER TOWN LINE | 2026 - 2027 | \$11,353,264 |
| 612242 | FITCHBURG- RECONSTRUCTION OF JOHN FITCH HIGHWAY | 2028 | \$9,174,115 |

Tracking Progress

The below tables are of the number of structurally deficient bridges within 100-year flood zones in the region as well as in the region as a whole. Of particular note is that during the 2013 version of this report there were 27 structurally deficient bridges in 100-year flood zones in the region. In 2016 there were only 19, a decrease of 8. This nearly 30% decrease is due to major investments in bridge infrastructure throughout the Commonwealth from the Accelerated Bridge Funding Program. In 2022, the latest data available, there are currently 19 such bridges in 100-year flood zones in the Montachusett region. It is important to continue to invest in our current infrastructure, not only to ensure the safety of its users, but to prevent the need for expensive emergency type investments which ultimately syphon funding from other needs. The possibility of an uptick in number of structurally deficient bridges in the region should be seen as a warning sign that current investments in bridge infrastructure are not enough. It should also be noted that four structurally deficient bridges in 100-year flood zones are scheduled for or under repair within the next five years, however, as those bridges are fixed others are sure to deteriorate to the point where they are structurally deficient.

| Structurally Deficient Bridges in 100 Year Flood Zones | | | | | |
|--|------|------|------|------|------|
| 2013 | 2016 | 2019 | 2020 | 2021 | 2022 |
| 27 | 19 | 20 | 20 | 20 | 19 |

| Structurally Deficient Bridges Regionwide | | | | | | | |
|---|------|------|------|------|------|------|------|
| 2006 | 2010 | 2014 | 2018 | 2019 | 2020 | 2021 | 2022 |
| 52 | 47 | 38 | 32 | 35 | 35 | 35 | 35 |

Vulnerable Roadways

One of the biggest impacts climate change will have on transportation infrastructure in the Montachusett region will be more frequent and intense flooding events on roadways, causing damage and hindering access for system users. Nearly 3% of roads in the region exist within the 100-year flood zones. Although they are not the only infrastructure at risk, identifying these locations is important when prioritizing improvements to be funded. The following table is a community-by-community breakdown of where these roads are located and corresponds to the individual community maps at the end of this section. These maps will be referenced when evaluating projects on the TIP.

Table 4.8-4: Road Mileage in Flood Zones

| | Total Road Mileage | Mileage in Flood Zone | Percent in Flood Zone |
|-----------------------|-------------------------------|----------------------------------|----------------------------------|
| Ashburnham | 125.07 | 3.17 | 2.54% |
| Ashby | 70.12 | 1.25 | 1.79% |
| Athol | 144.57 | 2.28 | 1.58% |
| Ayer | 70.49 | 4.14 | 5.87% |
| Clinton | 69.26 | 1.36 | 1.96% |
| Fitchburg | 240.74 | 8.86 | 3.68% |
| Gardner | 148.43 | 2.29 | 1.55% |
| Groton | 149.50 | 3.13 | 2.09% |
| Harvard | 151.76 | 2.06 | 1.36% |
| Hubbardston | 113.54 | 4.30 | 3.79% |
| Lancaster | 150.22 | 4.98 | 3.32% |
| Leominster | 243.70 | 7.00 | 2.87% |
| Lunenburg | 123.48 | 1.84 | 1.49% |
| Petersham | 111.93 | 2.26 | 2.02% |
| Phillipston | 66.89 | 1.58 | 2.37% |
| Royalston | 81.17 | 4.05 | 4.99% |
| Shirley | 78.58 | 2.22 | 2.83% |
| Sterling | 144.23 | 1.90 | 1.32% |
| Templeton | 137.90 | 5.58 | 4.05% |
| Townsend | 109.51 | 3.11 | 2.84% |
| Westminster | 150.81 | 3.14 | 2.09% |
| Winchendon | 152.76 | 13.93 | 9.12% |
| Regional Total | 2834.65 | 84.47 | 2.98% |

Culverts

It is estimated that half of all culvert in the commonwealth are inadequate to handle large flood events. While there is high quality data available on bridges, dams and roads in the region, culverts lack a reliable centralized inventory database to analyze. Nonetheless, these structures are an integral part of a well operating transportation system. Many of these culverts are municipally owned and maintained. MassDER surveys indicate challenges faced by municipalities include a lack of in-house expertise with design of culverts; inability to identify

which culverts are most vulnerable to washouts; difficulty with the permitting process; and lack of funds for engineering, design and construction.

“In 2017, DER launched the Culvert Replacement Municipal Assistance Grant Program to help municipalities replace culverts with better design crossings. To date DER has provided incentive funding totaling over \$2.5 million to 36

municipalities. Three projects have been constructed and 12 projects are almost shovel-ready” (MassDER). Considering the anticipated increase in flood events due to development and climate change, it is important to maintain momentum on improving the network of culverts in the region.

“The Massachusetts Department of Ecological Restoration (MassDER) estimates that more than half of the 25,000 culverts and small bridges in Massachusetts restrict streamflow, create barriers to fish, and pose a risk to the public due to their vulnerability due to storm events. “

– MassDER

Development of EV Infrastructure within the Montachusett Region

Over the last decade, there has been improved access to and availability of electric vehicles (EV’s). This trend is expected to continue as government incentives and requirements, along with lower manufacturing costs, increase demand for these vehicles. Along with the proliferation on EV’s in the region, there have been an increase in number and demand for EV charging stations. The existence of these stations in the region will have an impact on EV usage as the incentives to such technology become greater with easier access to charging stations. The increase in this infrastructure within the region are being monitored annually. Currently, there are forty-two (42) EV charging stations in the region, an increase from thirty-three (33) EV charging stations documented in 2021. These stations are listed in the table below and included in the map “***Alternative Fueling Stations***”.

Table 4.8-5: EV Charging Stations in the Montachusett Region

| City | Station Name | Street Address |
|--------------|--|---|
| Leominster | NATIONAL GRID CHILIS LEOMNSTR | 42 Orchard Hill Park Dr |
| Lancaster | Ron Bouchard's Nissan | 490 Old Union Turnpike |
| Sterling | Kitchen Associates | 76 Leominster Rd |
| Athol | Athol Public Library | 568 Main St |
| Lancaster | NATIONAL GRID LANCASTER | Thayer Memorial Dr |
| Leominster | The Mall at Whitney Field - Tesla Supercharger | 100 Commercial Road |
| Leominster | RONBOCHARGE SHOP 02 | 500 Old Union Turnpike |
| Fitchburg | CONLONFA CONLON FA 1 | Conlon Fine Arts Center (Rear) 367 North Street |
| Ayer | TOWN OF AYER 0 PARK ST EV 1 | 1C Park St |
| Gardner | MT WACHUSETT CC MWCC STA 3 | 444 Green St |
| Fitchburg | EV CHARGING MS1 | 144 Main St |
| Leominster | EV CHARGING NS1 | 36 Nashua St |
| Devens | DEVENS DEVENS #2 | 33 Andrews Parkway |
| Leominster | MCKENZIE ENG STATION 1 | 305 Whitney St |
| Templeton | TEMPLETON LIGHT EV 1 | 79 Bridge St |
| Winchendon | MFS FRONT 1 | 664 Spring St |
| Leominster | RONBOCHARGE SHOP 01 | 500 Old Union Turnpike |
| Gardner | MT WACHUSETT CC MWCC STA 2 | 444 Green St |
| Gardner | MT WACHUSETT CC MWCC STA 1 | 444 Green St |
| Fitchburg | EV CHARGING MS2 | 144 Main St |
| Leominster | EV CHARGING NS2 | 36 Nashua St |
| Winchendon | MFS FRONT 3 | 664 Spring St |
| Winchendon | MFS FRONT 2 | 664 Spring St |
| Lancaster | PERKINS MANOR | Perkins Dr |
| Lancaster | PERKINS HERMANN BLDG | Pinfeather Ln |
| Baldwinville | Templeton Light | 86 Bridge St |
| Sterling | SMLD NORTHGATE 3-2 | 3000 Meadows Drive |
| Sterling | SMLD NORTHGATE 3-1 | 3000 Meadows Drive |
| Athol | TOWN OF ATHOL STATION 1 | 100 Main St |
| Athol | TOWN OF ATHOL STATION 2 | 100 Main St |
| Leominster | GERONIMO STATION1 | Twin City Marketplace (Hannaford) |
| Harvard | HILDRETH SCHOOL STATION1 | 27A Mass Ave |
| Groton | LAWRENCE AC. GRAY BUILDING 1 | 26 Powderhouse Rd |
| Groton | LAWRENCE AC. LA SOUTH | 14 Main St |
| Gardner | ENERGICA ROBS DYNO SERV | 45 Fredette Street |
| Sterling | SMLD LIBRARY | 14 Houghton Rd |
| Sterling | SMLD TOWN HALL | 1 PARK ST |
| Sterling | SMLD DUNKIN DONUTS | 50 Leominster Rd |
| Groton | Groton - Groton Senior Center | 117 West Main Street |
| Groton | Groton - Church Common | 2 Lowell Road |
| Groton | Groton - Country Club | 94 Lovers Lane |
| Groton | Groton - Prescott School Community Center | 145 Main Street |

National Electric Vehicle Infrastructure (NEVI) Program Deployment Plan

In September of 2022, the Federal Highway Administration (FHWA) approved the Massachusetts NEVI Deployment Plan, which is required to access funding through the NEVI formula program. The Deployment Plan is the framework for Massachusetts to expand its EV

highway fast charging network. The Massachusetts NEVI Deployment Plan can be located at https://www.fhwa.dot.gov/environment/nevi/ev_deployment_plans/ma_nevi_plan.pdf

Massachusetts Vehicle Census

The Massachusetts Vehicle Census was made available to the public in July of 2023 and is the first state level dataset in the nation that joins vehicle-level odometer readings with vehicle attribute and registration transaction histories. This powerful resource allows policymakers, researchers, and other stakeholders to understand state and local trends in vehicle usage and ownership. The following data derives from the Massachusetts Vehicle Census and will be compared over time in future years.

- 3% of vehicles in the Montachusett region are either zero-emission or hybrid, compared to 4.4% of vehicles statewide.
- It is estimated that zero-emission or hybrid account for 3.6% of daily vehicle miles driven in the region, compared with 4.8% statewide.

Massachusetts Climate Change Assessment

The Massachusetts Climate Change Assessment (Climate Assessment) evaluates the impacts of climate change to the Commonwealth, including human health and safety, natural resources, and public and private assets. The Climate Assessment serves to directly inform the 2023 update to the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP).

Many of the same climate change related impacts mentioned in this section were highlighted in the Climate Assessment. Urgent impacts in the infrastructure sector were identified and are listed below.

- **Damage to Inland Buildings** from heavy rainfall and overwhelmed drainage systems.
- **Damage to Electric Transmission and Utility Distribution Infrastructure** associated with heat stress and extreme events.

- **Damage to Rails and Loss of Rail/Transit Service**, including flooding and track buckling during high heat events.

Regional findings indicated unique impacts of concern by region. For Montachusett communities the following impacts of concern were identified.

- Decrease in Agricultural Productivity
- Health Effects of Extreme Storms and Power Outages
- Reduction in Food Safety and Security
- Loss of Urban Tree Cover

Trends

Climate change impacts such as global warming is expected to increase the frequency of precipitation and severity of weather events. It is important to anticipate the impact of such factors on transportation infrastructure.

Recommendations

- Encourage the development of more projects which qualify for Congestion Mitigation and Air Quality (CMAQ) funds.
- Maintain the prevalence of environmental factors when reviewing and prioritizing transportation projects.
- Continue to monitor and assess vulnerable infrastructures.
- Continue to promote opportunities for infrastructure upgrades through our local, state and federal partners.

The importance of the environment in the Montachusett region goes beyond just the moral responsibility to protect our planet. Natural resources and attractions which exist in the region could also have economic benefits as well. Both the protection of our environment and the

efficient connectivity of people to these assets should play a prominent role in transportation decision making now and in the future. Environmental Performance Measures set in this plan will help ensure progress continues to be made.

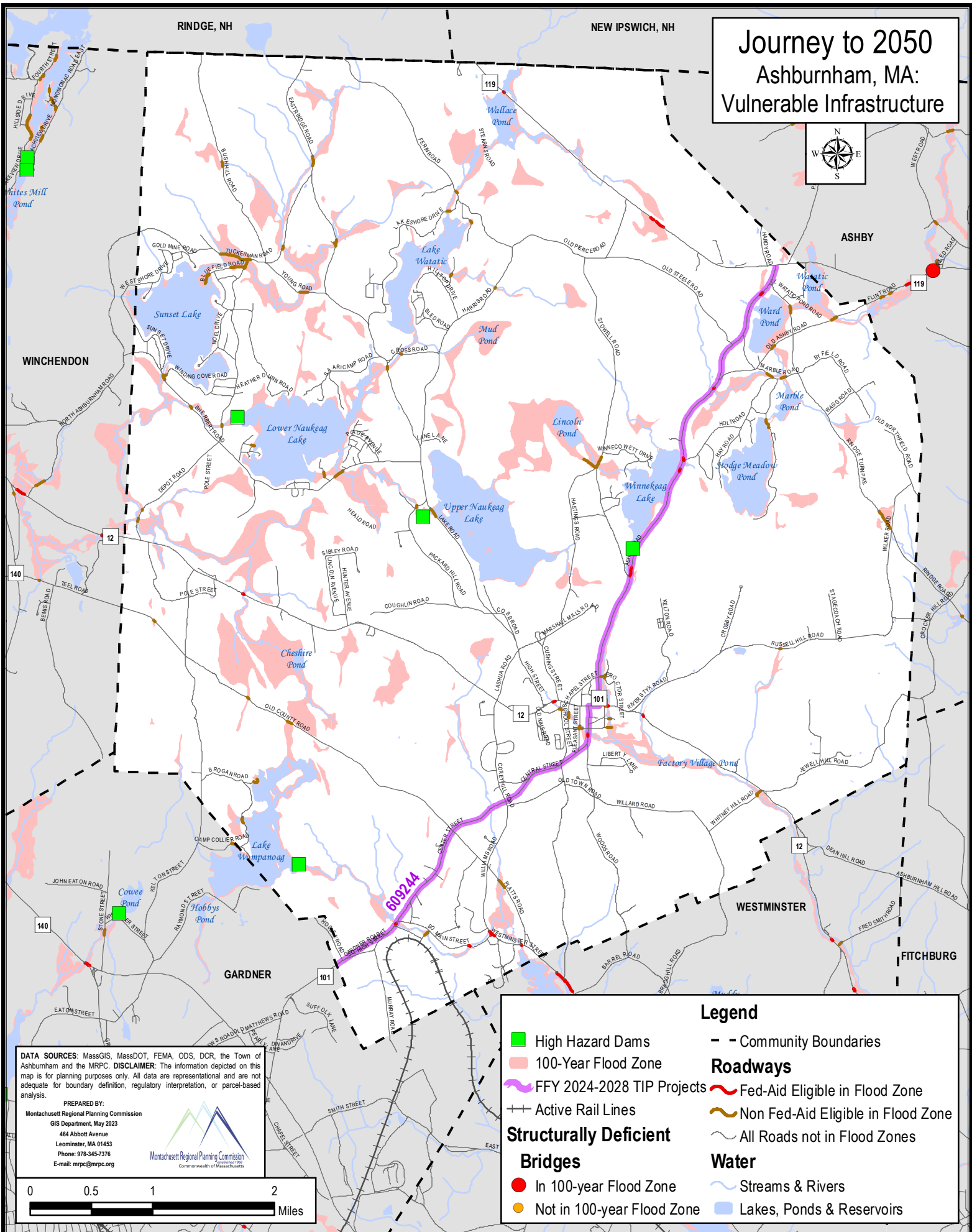
RINDGE, NH

NEW IPSWICH, NH

Journey to 2050

Ashburnham, MA:

Vulnerable Infrastructure



DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Ashburnham and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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0 0.5 1 2
 Miles

Legend

High Hazard Dams

100-Year Flood Zone

FFY 2024-2028 TIP Projects

Active Rail Lines

Structurally Deficient

Bridges

In 100-year Flood Zone

Not in 100-year Flood Zone

Community Boundaries

Roadways

Fed-Aid Eligible in Flood Zone

Non Fed-Aid Eligible in Flood Zone

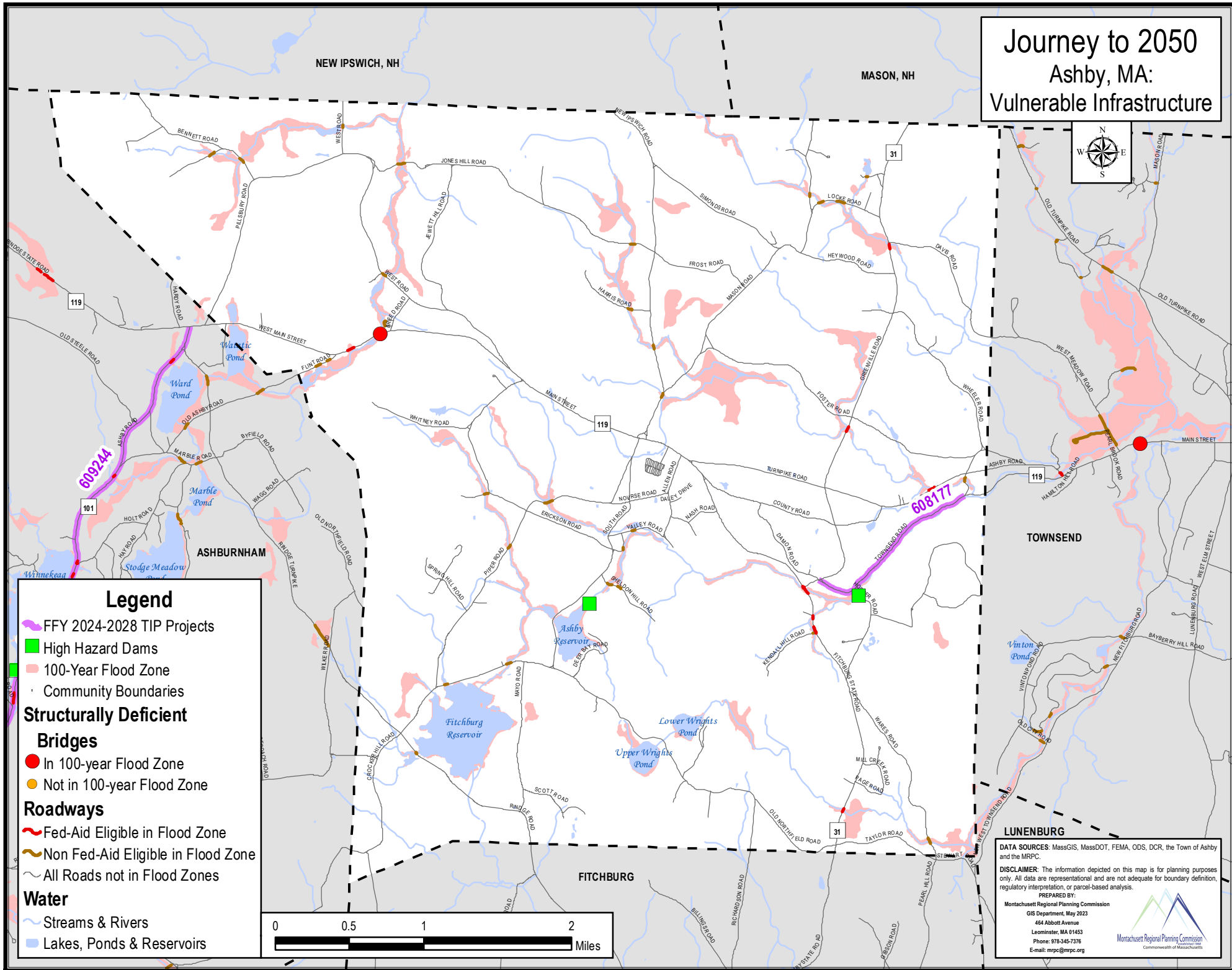
All Roads not in Flood Zones

Water

Streams & Rivers

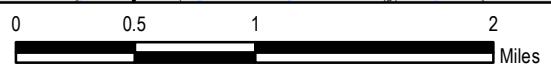
Lakes, Ponds & Reservoirs

Journey to 2050 Ashby, MA: Vulnerable Infrastructure



Legend

- FFY 2024-2028 TIP Projects
- High Hazard Dams
- 100-Year Flood Zone
- Community Boundaries
- Structurally Deficient Bridges**
- In 100-year Flood Zone
- Not in 100-year Flood Zone
- Roadways**
- ~ Fed-Aid Eligible in Flood Zone
- ~ Non Fed-Aid Eligible in Flood Zone
- ~ All Roads not in Flood Zones
- Water**
- ~ Streams & Rivers
- Lakes, Ponds & Reservoirs



DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Ashby and the MRPC.

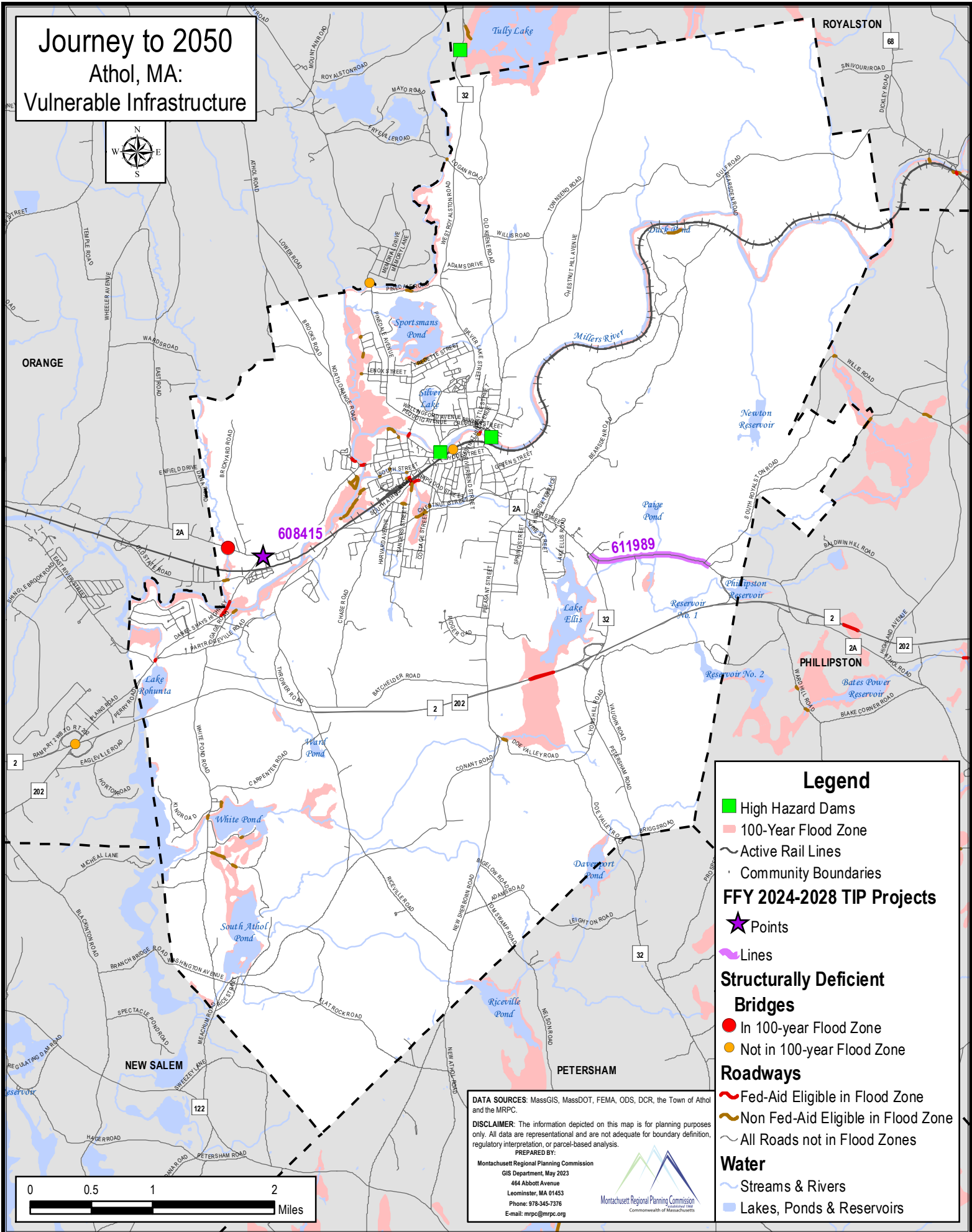
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Journey to 2050

Athol, MA:

Vulnerable Infrastructure



Legend

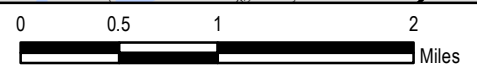
- High Hazard Dams
- 100-Year Flood Zone
- ~ Active Rail Lines
- Community Boundaries
- FFY 2024-2028 TIP Projects**
- ★ Points
- Lines
- Structurally Deficient Bridges**
- In 100-year Flood Zone
- Not in 100-year Flood Zone
- Roadways**
- ~ Fed-Aid Eligible in Flood Zone
- ~ Non Fed-Aid Eligible in Flood Zone
- ~ All Roads not in Flood Zones
- Water**
- Streams & Rivers
- Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Athol and the MRPC.

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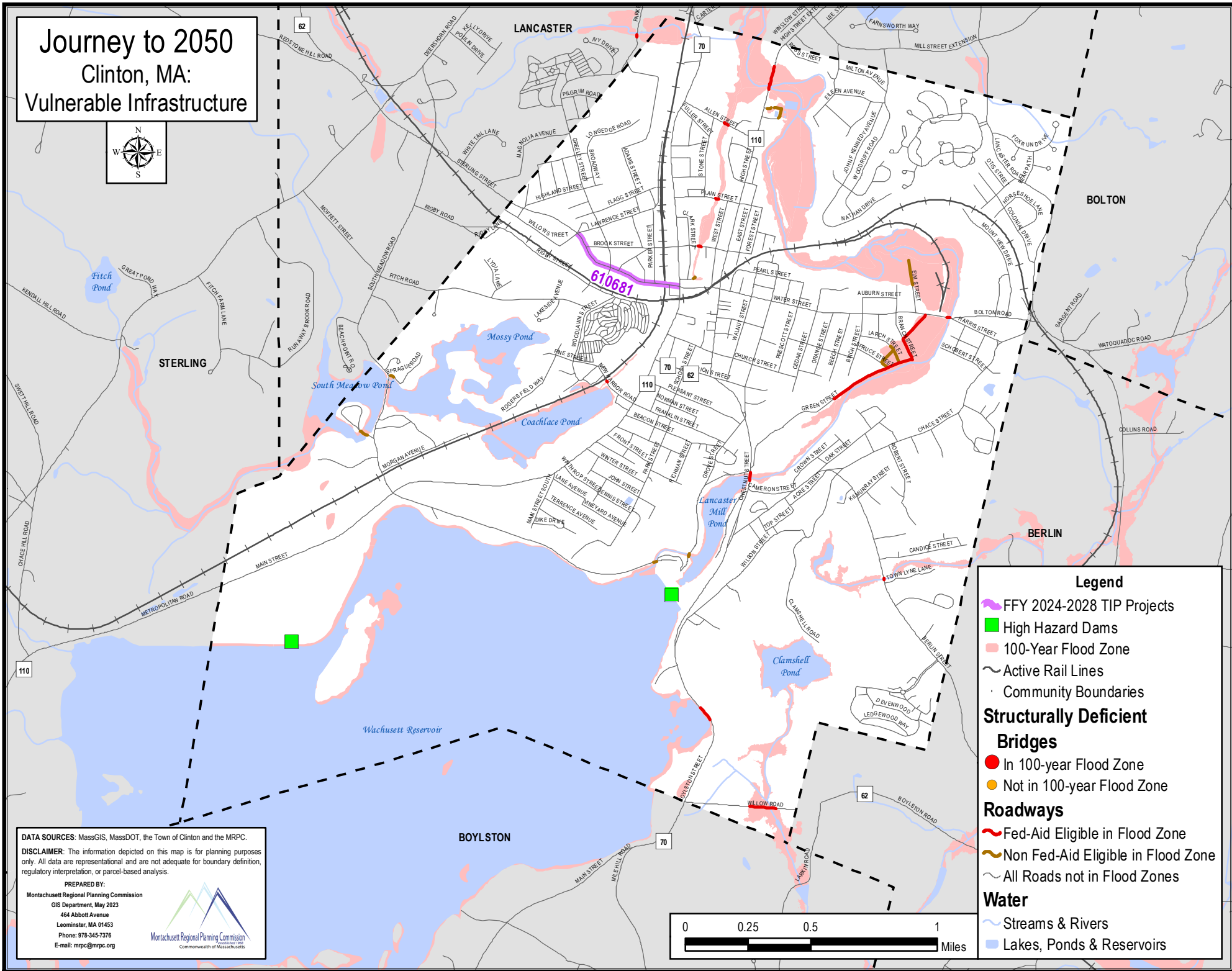




Journey to 2050

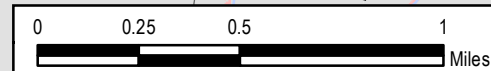
Clinton, MA:

Vulnerable Infrastructure



DATA SOURCES: MassGIS, MassDOT, the Town of Clinton and the MRPC.
DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

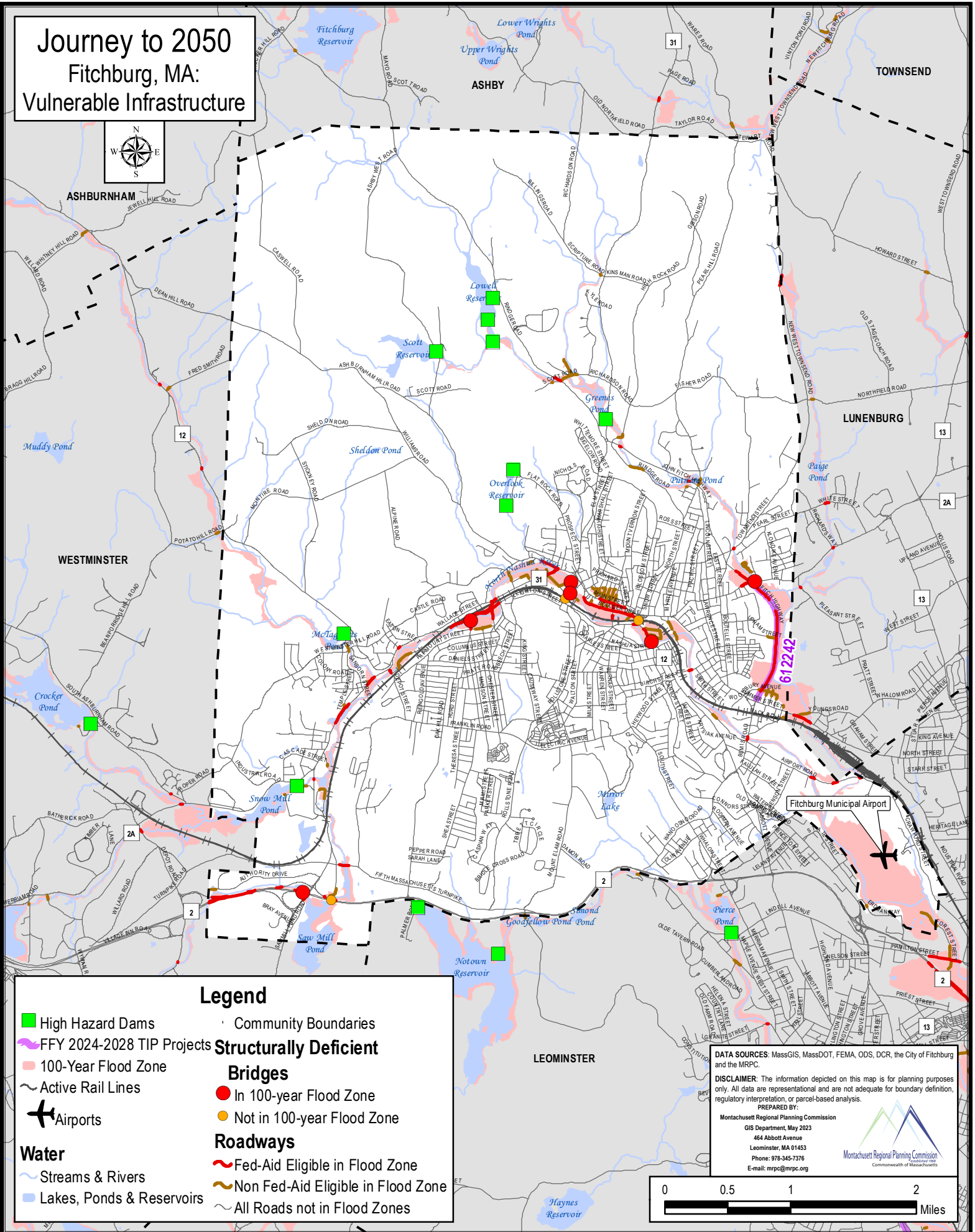
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Journey to 2050

Fitchburg, MA:

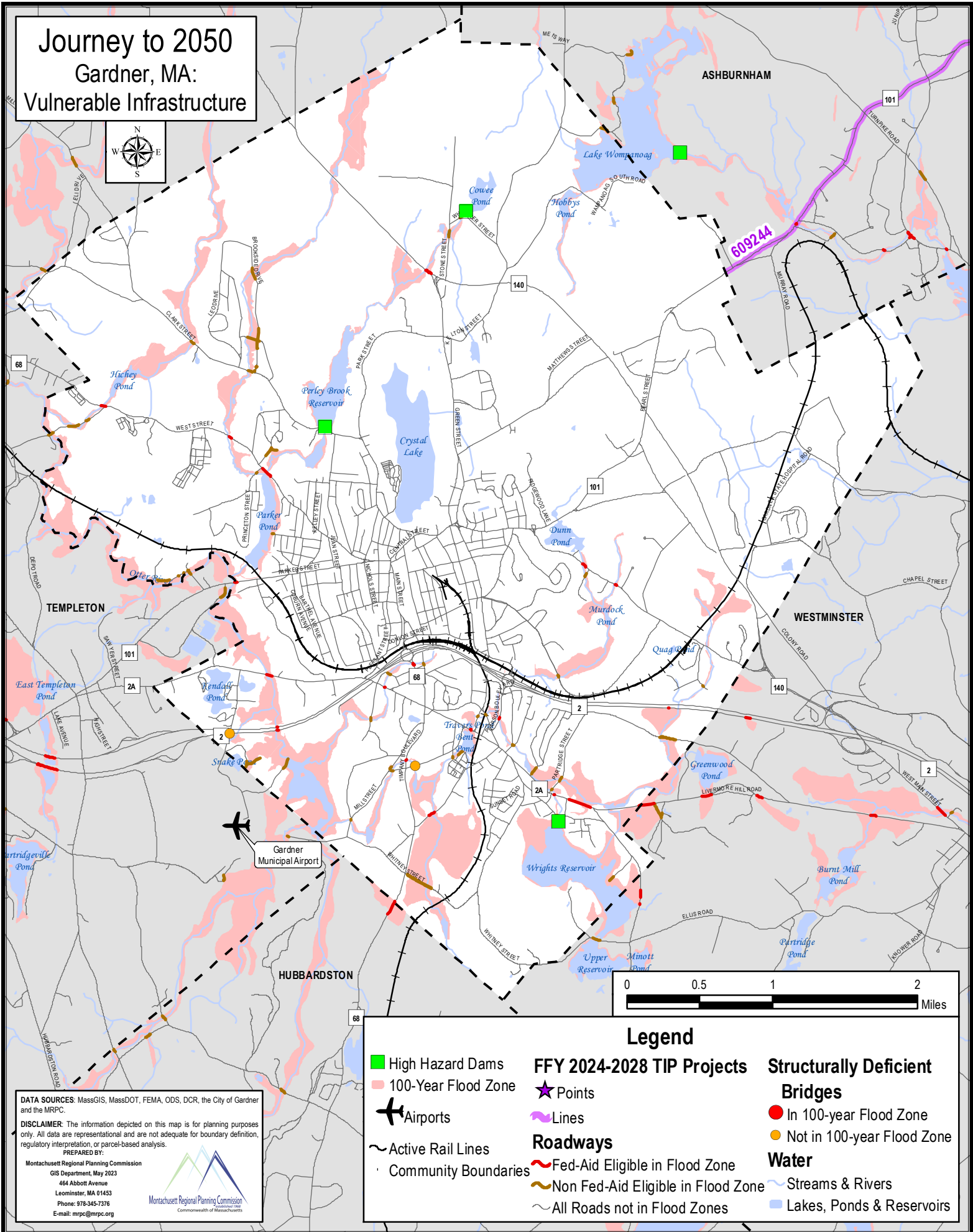
Vulnerable Infrastructure



Journey to 2050

Gardner, MA:

Vulnerable Infrastructure



Journey to 2050

Groton, MA:

Vulnerable Infrastructure



High Hazard Dams

FFY 2024-2028 TIP Projects

100-Year Flood Zone

Active Rail Lines

Community Boundaries

Water

 Streams & Rivers

Lakes, Ponds & Reservoirs

Structurally Deficient Bridges

In 100-year Flood Zone

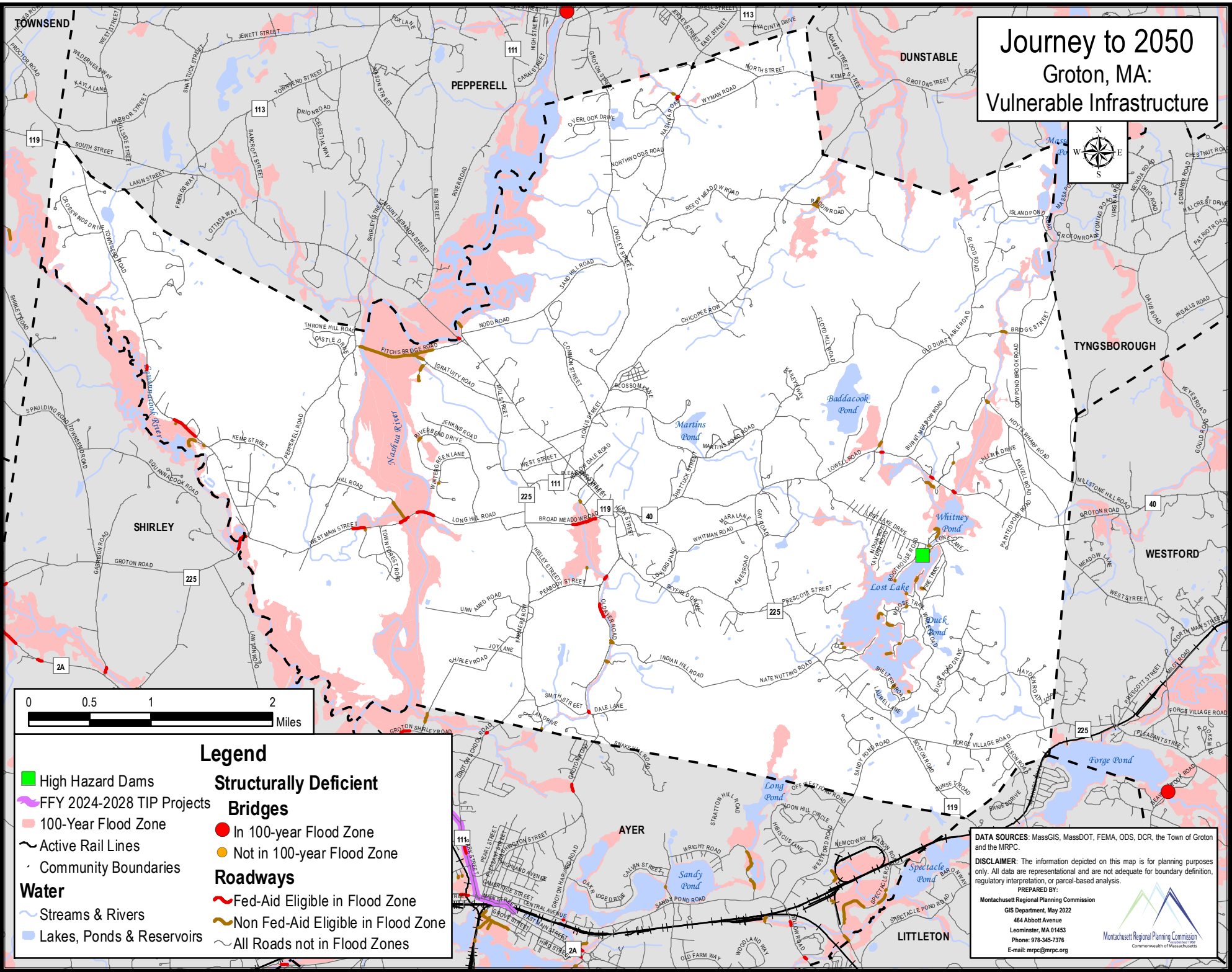
Not in 100-year Flood Zone

Roadways

Fed-Aid Eligible in Flood Zone

Non Fed-Aid Eligible in Flood Zone

All Roads not in Flood Zones



DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Groton and the MRPC.

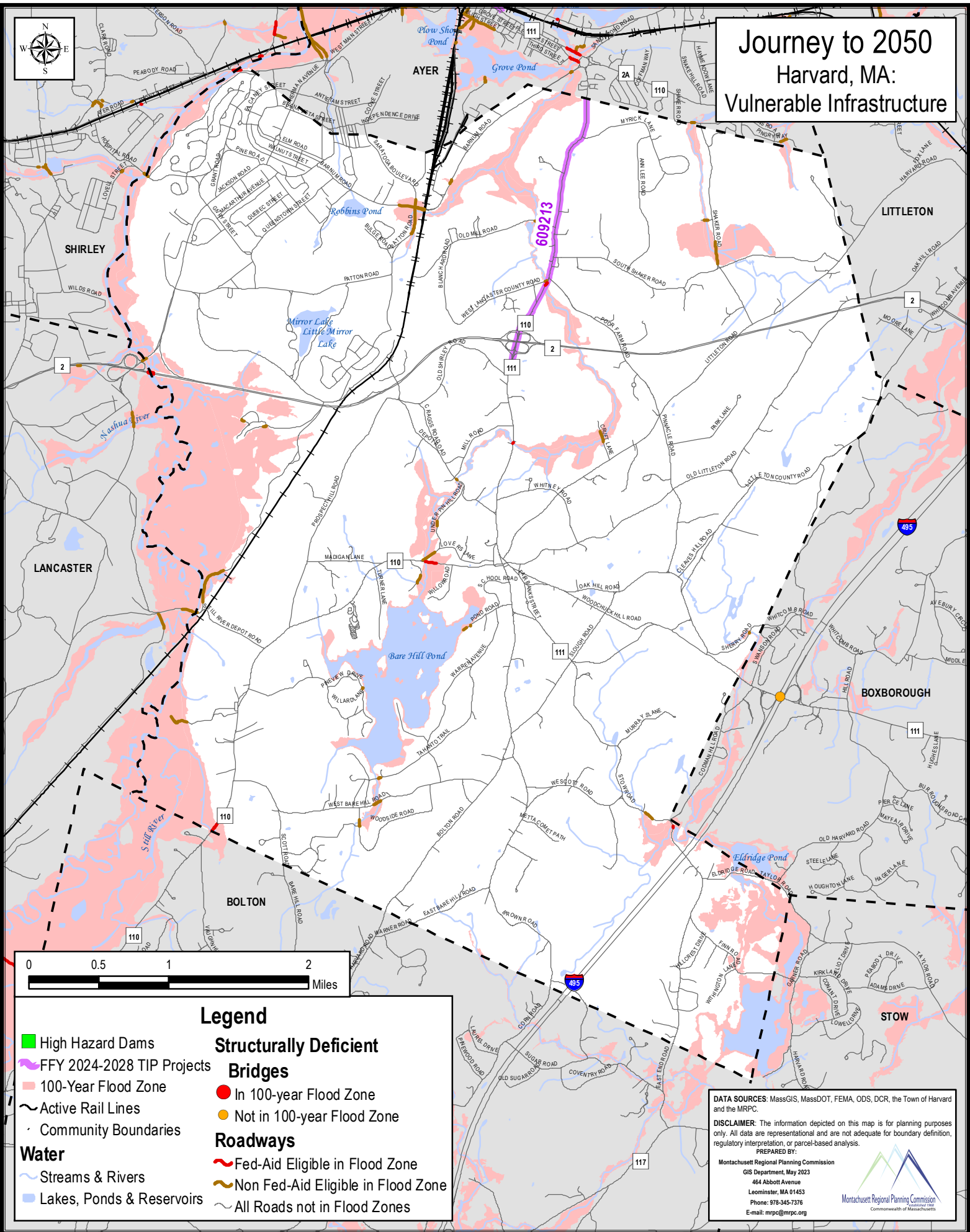
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Journey to 2050

Harvard, MA:

Vulnerable Infrastructure



Journey to 2050

Hubbardston, MA:

Vulnerable Infrastructure



Legend

- High Hazard Dams
- 100-Year Flood Zone



- Active Rail Lines
- Community Boundaries

Structurally Deficient Bridges

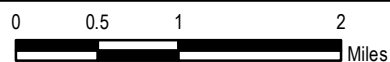
- In 100-year Flood Zone
- Not in 100-year Flood Zone

Roadways

- Fed-Aid Eligible in Flood Zone
- Non Fed-Aid Eligible in Flood Zone
- All Roads not in Flood Zones

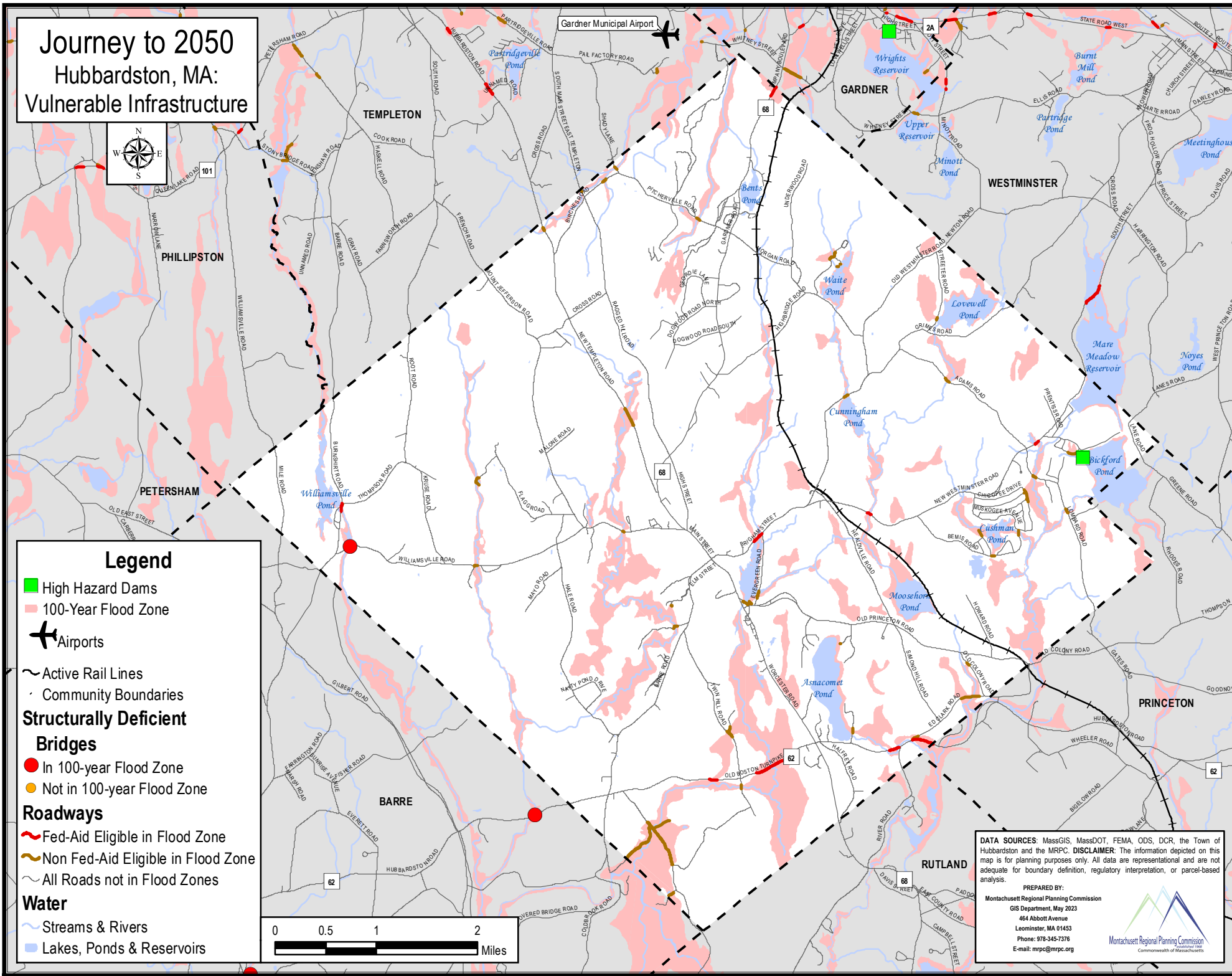
Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs



DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Hubbardston and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representative and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

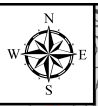
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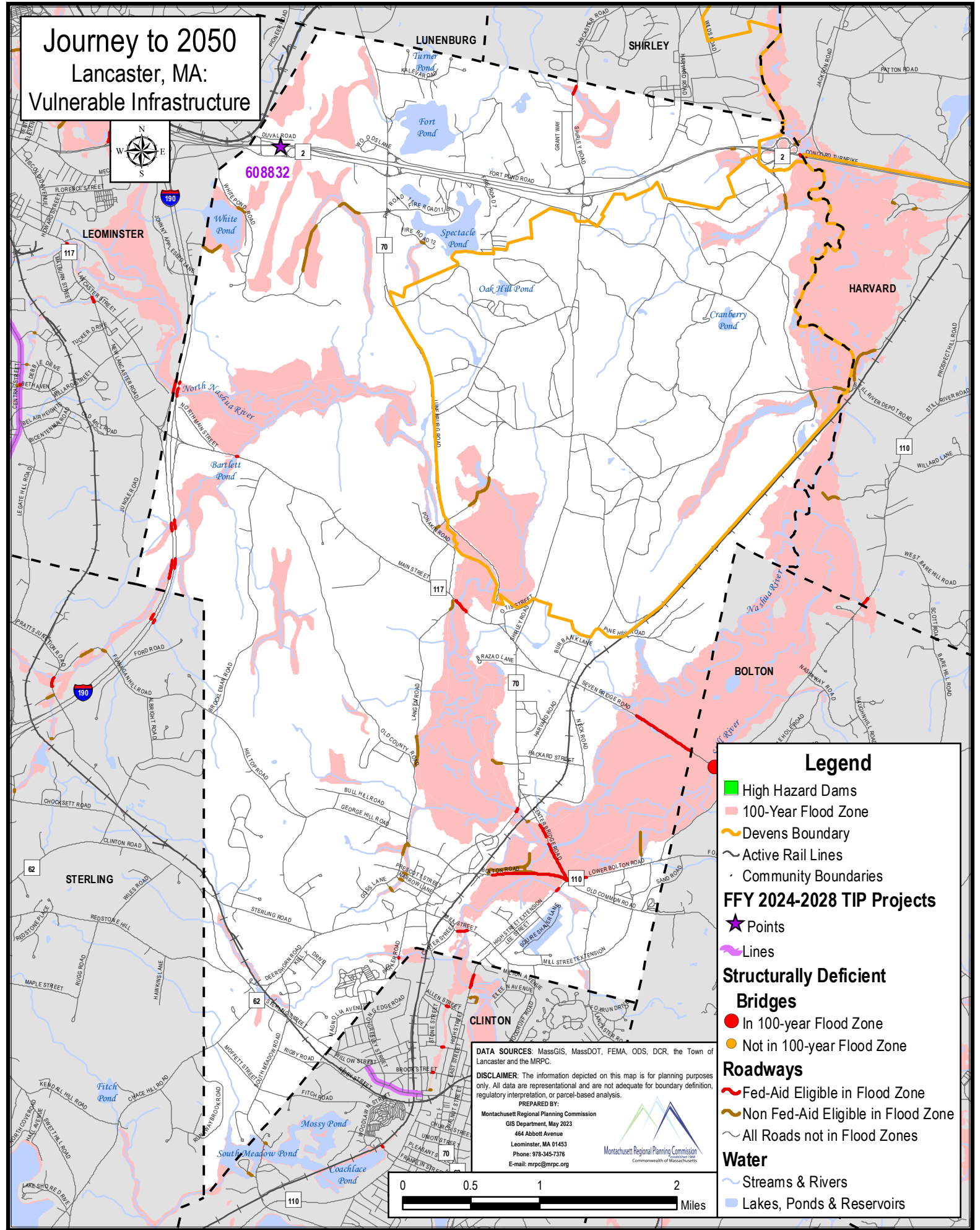
Journey to 2050

Lancaster, MA:

Vulnerable Infrastructure



608832



Legend

- High Hazard Dams
- 100-Year Flood Zone
- Devens Boundary
- Active Rail Lines
- Community Boundaries
- ★ Points
- Lines
- Structurally Deficient Bridges**
 - In 100-year Flood Zone
 - Not in 100-year Flood Zone
- Roadways**
 - Fed-Aid Eligible in Flood Zone
 - Non Fed-Aid Eligible in Flood Zone
 - All Roads not in Flood Zones
- Water**
 - Streams & Rivers
 - Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Lancaster and the MRPC.

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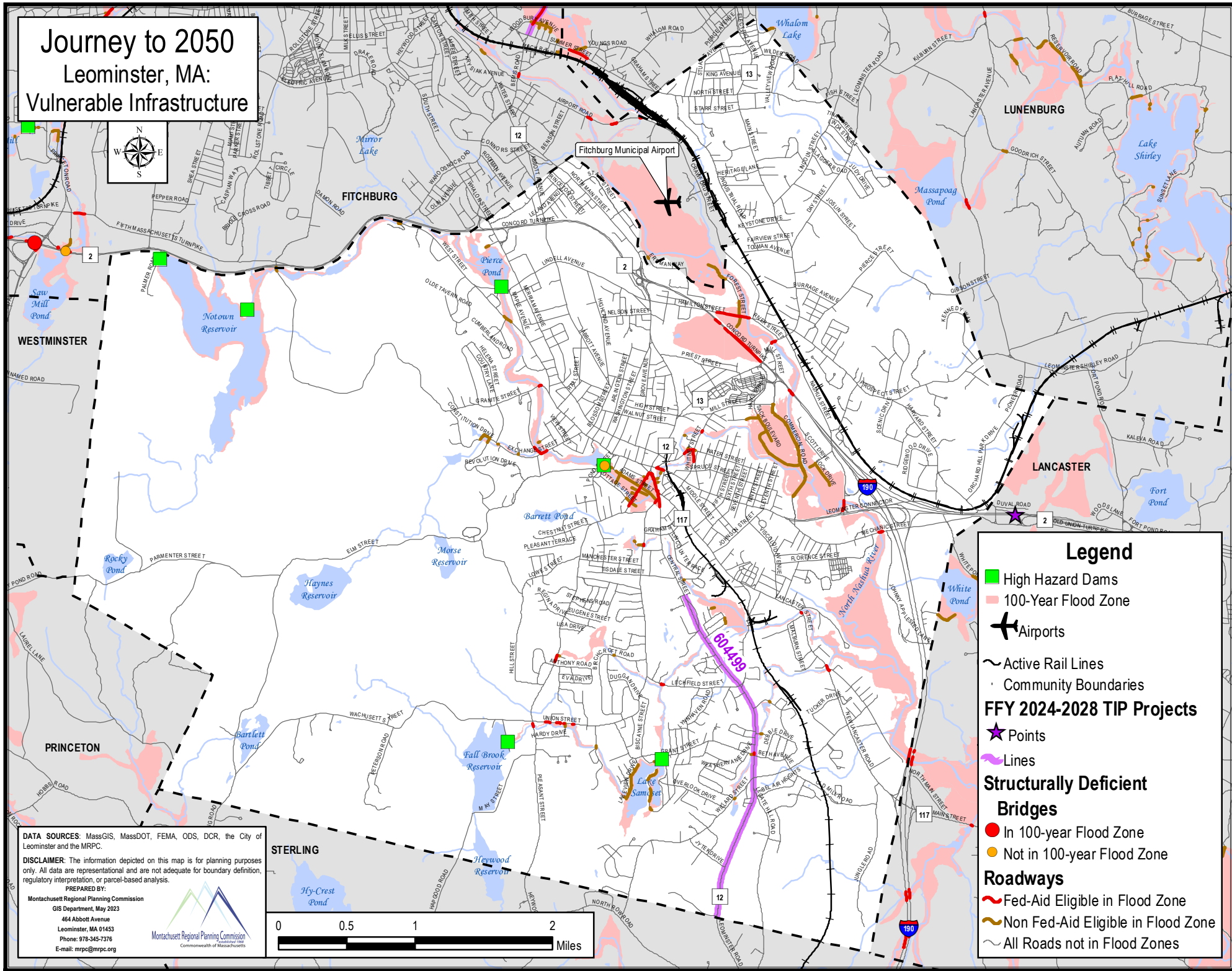
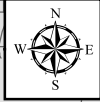
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Journey to 2050

Leominster, MA:

Vulnerable Infrastructure



DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the City of Leominster and the MRPC.

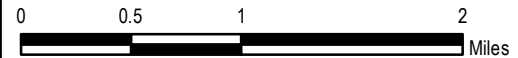
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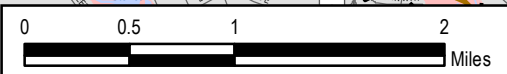
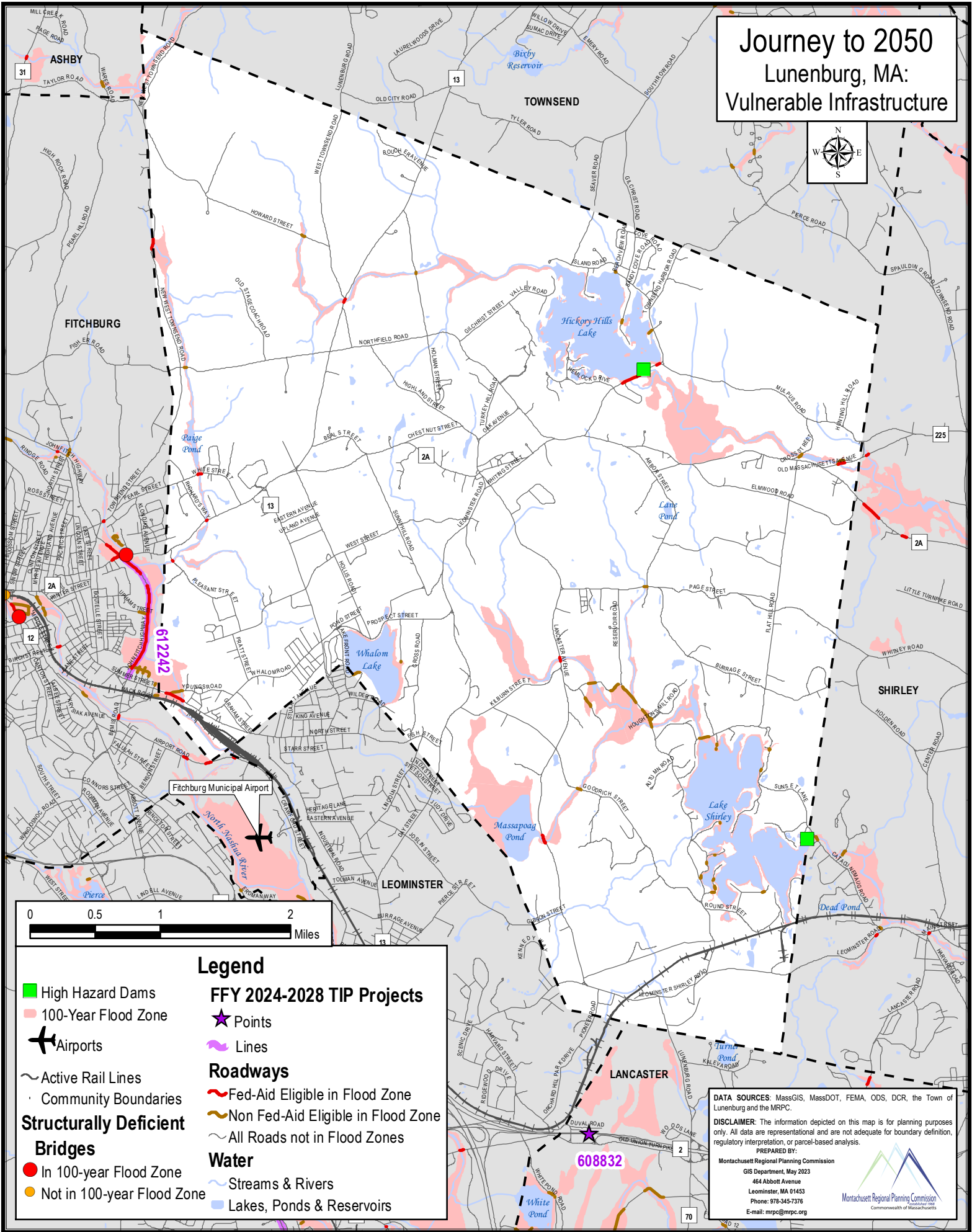
STERLING



Legend

- High Hazard Dams
- 100-Year Flood Zone
- Airports
- Active Rail Lines
- Community Boundaries
- FFY 2024-2028 TIP Projects**
- ★ Points
- Lines
- Structurally Deficient Bridges**
- In 100-year Flood Zone
- Not in 100-year Flood Zone
- Roadways**
- Fed-Aid Eligible in Flood Zone
- Non Fed-Aid Eligible in Flood Zone
- All Roads not in Flood Zones

Journey to 2050 Lunenburg, MA: Vulnerable Infrastructure



■ High Hazard Dams

■ 100-Year Flood Zone

Airports

Active Rail Lines

Community Boundaries

Structurally Deficient Bridges

● In 100-year Flood Zone

● Not in 100-year Flood Zone

FFY 2024-2028 TIP Projects

★ Points

— Lines

Roadways

— Fed-Aid Eligible in Flood Zone

— Non Fed-Aid Eligible in Flood Zone

— All Roads not in Flood Zones

Water

— Streams & Rivers

— Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Lunenburg and the MRPC.

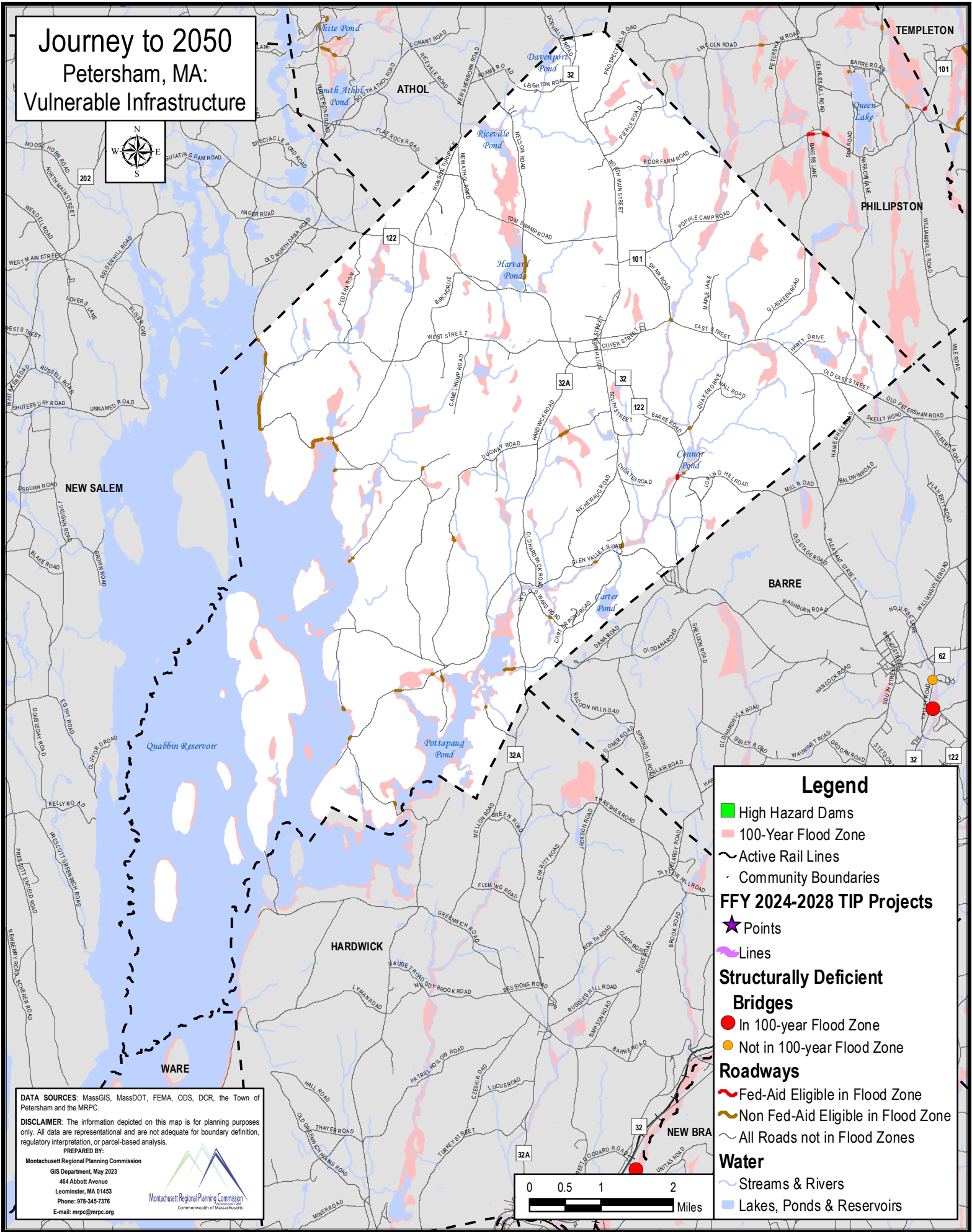
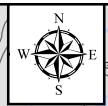
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Journey to 2050

Petersham, MA:

Vulnerable Infrastructure




Legend

- High Hazard Dams
- 100-Year Flood Zone
- Active Rail Lines
- Community Boundaries
- FFY 2024-2028 TIP Projects
- Points
- Lines
- Structurally Deficient Bridges
- In 100-year Flood Zone
- Not in 100-year Flood Zone
- Roadways
- Fed-Aid Eligible in Flood Zone
- Non Fed-Aid Eligible in Flood Zone
- All Roads not in Flood Zones
- Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Petersham and the MRPC.

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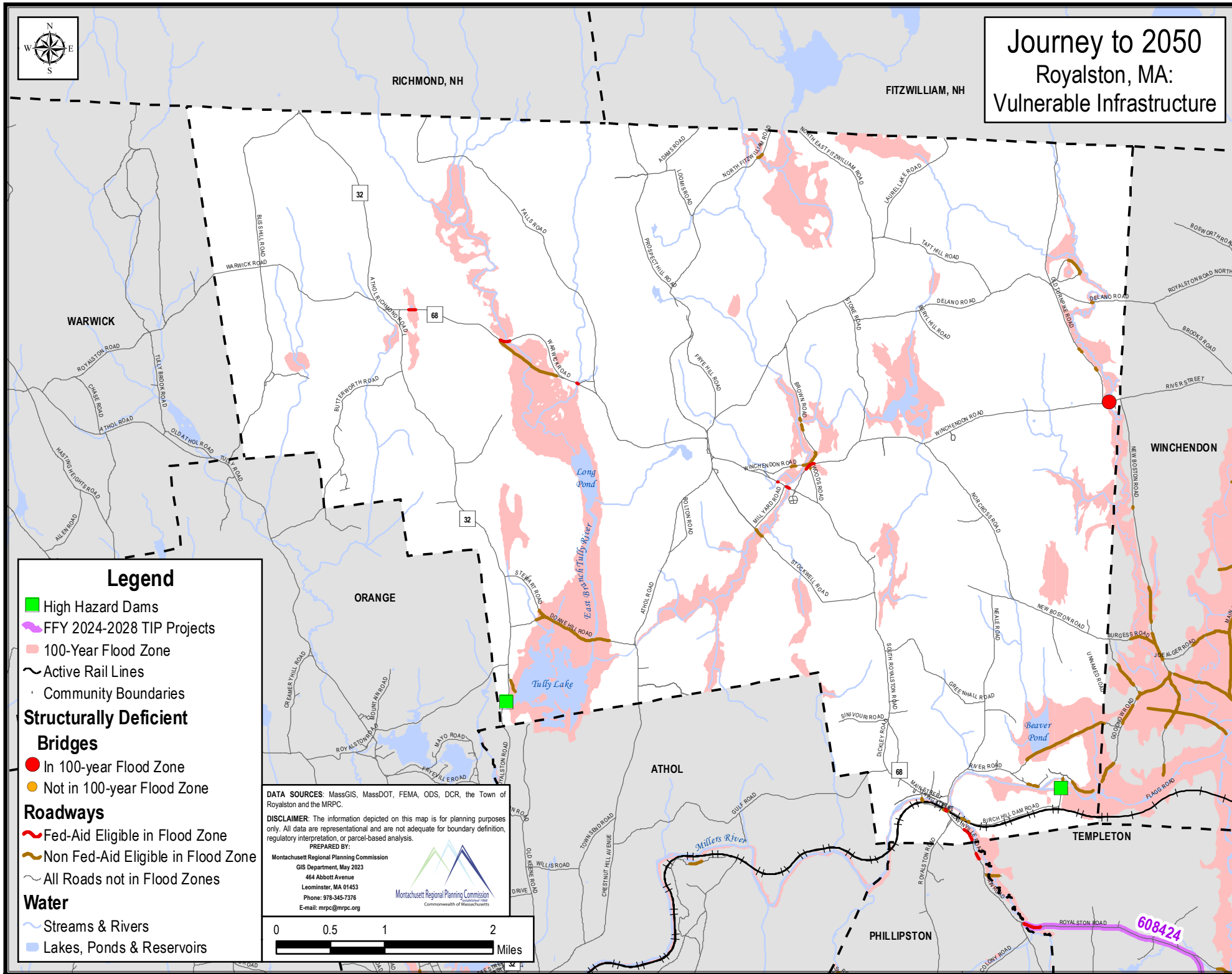





Journey to 2050

Royalston, MA:

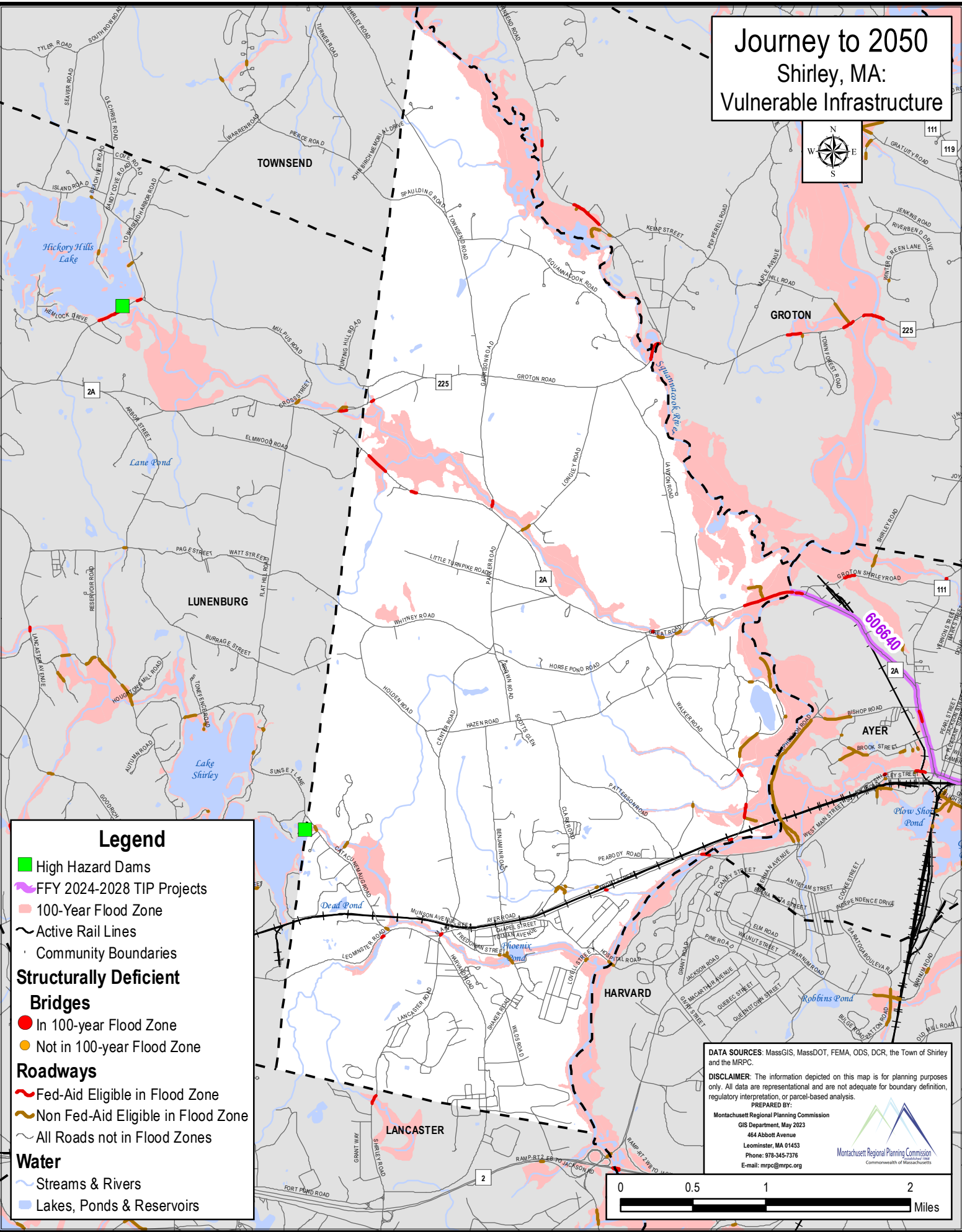
Vulnerable Infrastructure



Journey to 2050

Shirley, MA:

Vulnerable Infrastructure



Legend

- High Hazard Dams
- FFY 2024-2028 TIP Projects
- 100-Year Flood Zone
- Active Rail Lines
- Community Boundaries

Structurally Deficient Bridges

- In 100-year Flood Zone
- Not in 100-year Flood Zone

Roadways

- Fed-Aid Eligible in Flood Zone
- Non Fed-Aid Eligible in Flood Zone
- All Roads not in Flood Zones

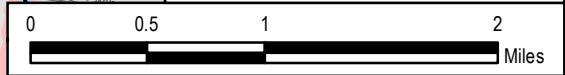
Water

- Streams & Rivers
- Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Shirley and the MRPC.

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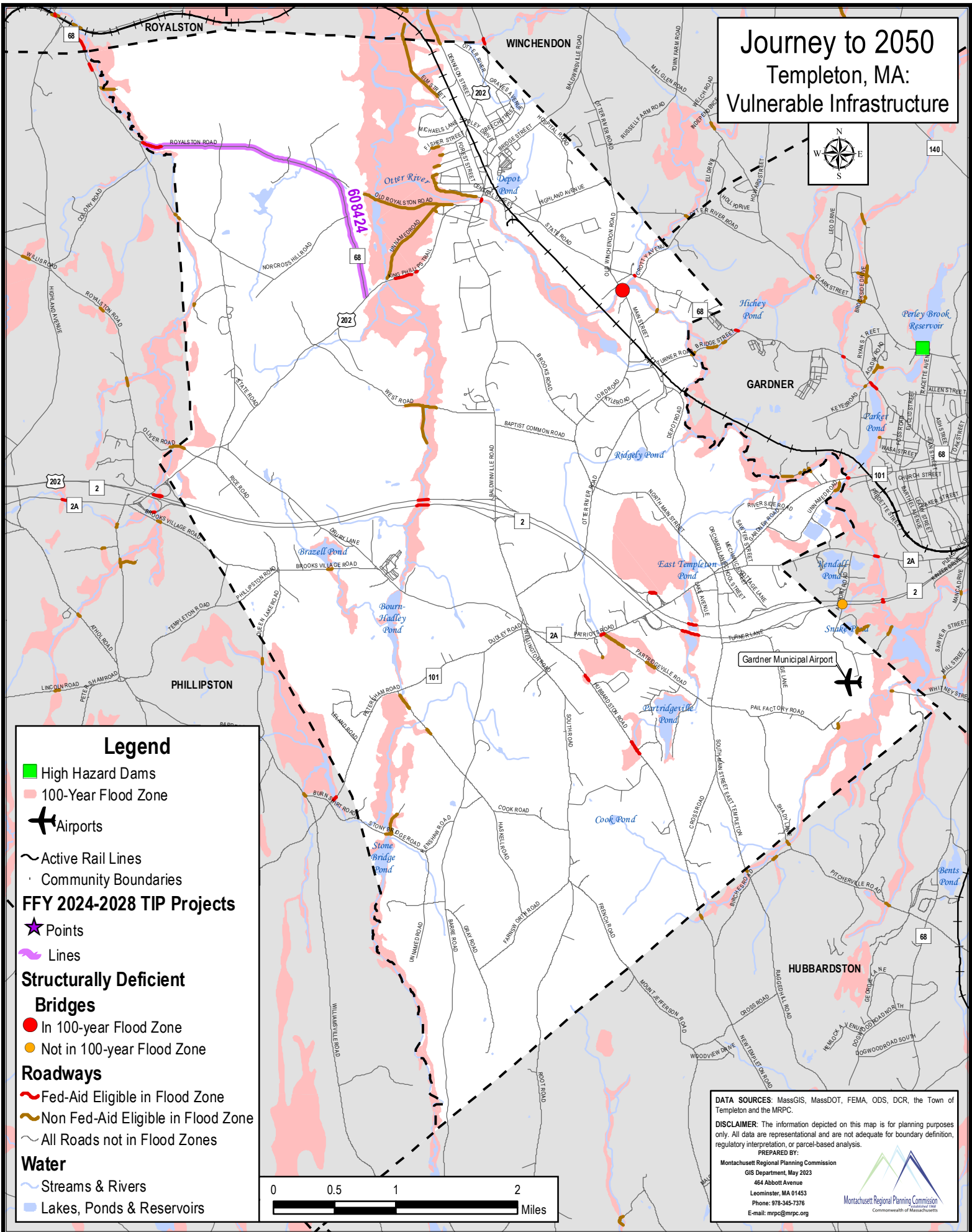
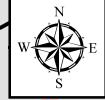
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Journey to 2050

Templeton, MA:

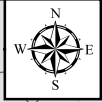
Vulnerable Infrastructure



Journey to 2050

Townsend, MA:

Vulnerable Infrastructure




Legend

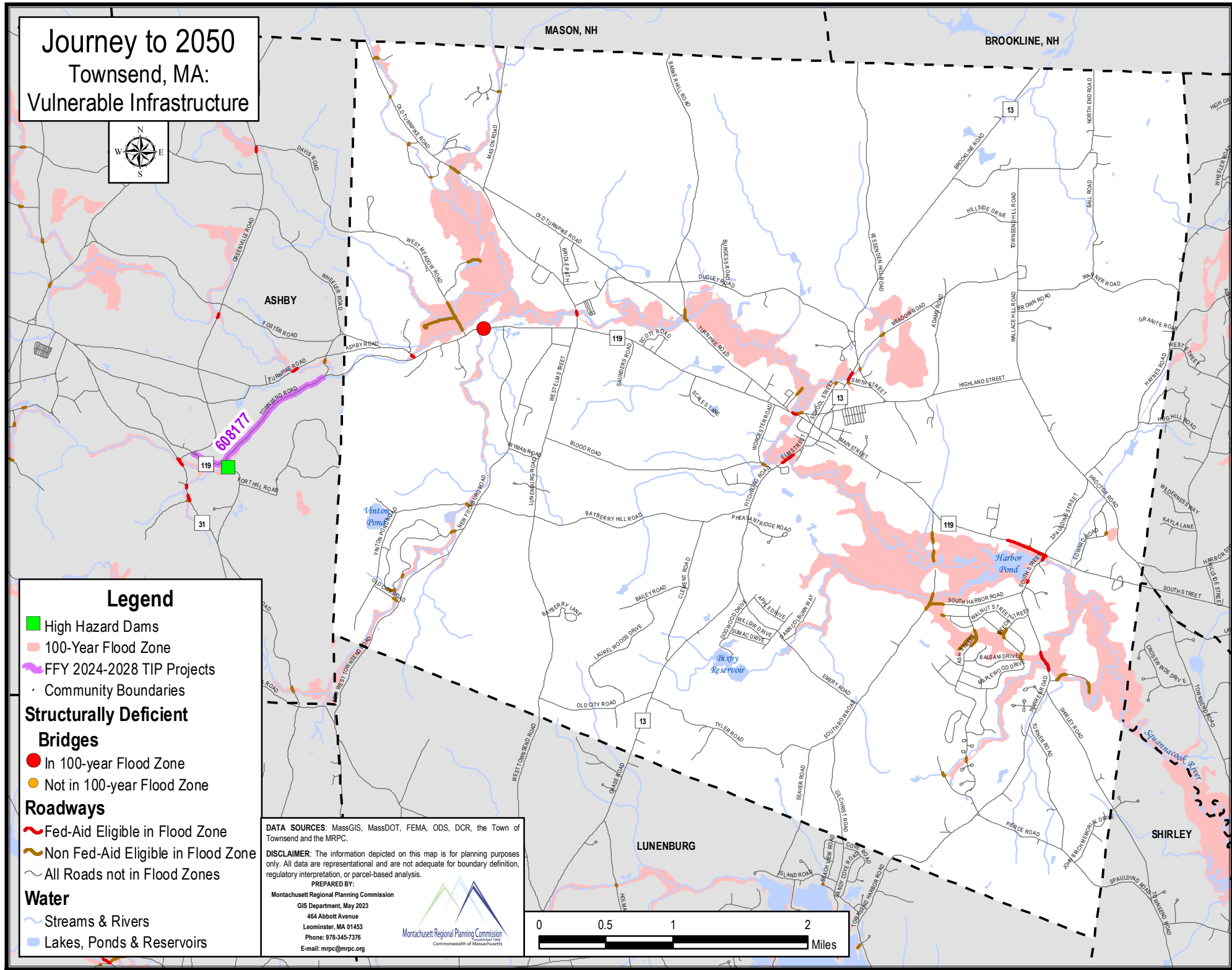
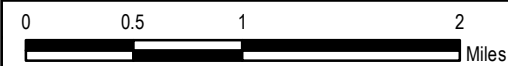
- High Hazard Dams
- 100-Year Flood Zone
- FFY 2024-2028 TIP Projects
- Community Boundaries
- Structurally Deficient Bridges**
 - In 100-year Flood Zone
 - Not in 100-year Flood Zone
- Roadways**
 - ~ Fed-Aid Eligible in Flood Zone
 - ~ Non Fed-Aid Eligible in Flood Zone
 - ~ All Roads not in Flood Zones
- Water**
 - ~ Streams & Rivers
 - Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Townsend and the MRPC.

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 Montachusett Regional Planning Commission
 Commonwealth of Massachusetts



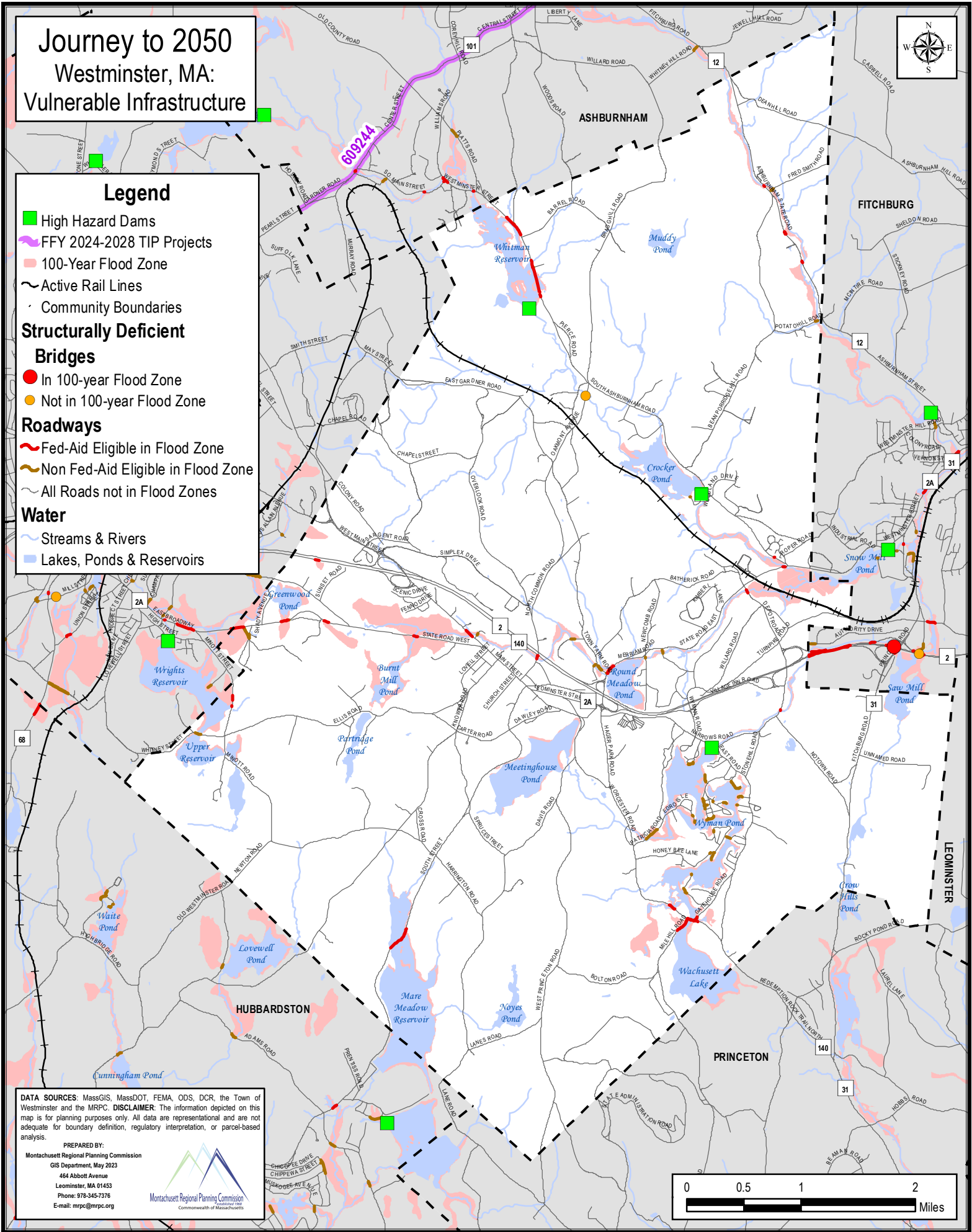
Journey to 2050

Westminster, MA:

Vulnerable Infrastructure

Legend

- High Hazard Dams
- ~ FFY 2024-2028 TIP Projects
- 100-Year Flood Zone
- ~ Active Rail Lines
- Community Boundaries
- Structurally Deficient Bridges**
 - In 100-year Flood Zone
 - Not in 100-year Flood Zone
- Roadways**
 - ~ Fed-Aid Eligible in Flood Zone
 - ~ Non Fed-Aid Eligible in Flood Zone
 - ~ All Roads not in Flood Zones
- Water**
 - ~ Streams & Rivers
 - Lakes, Ponds & Reservoirs



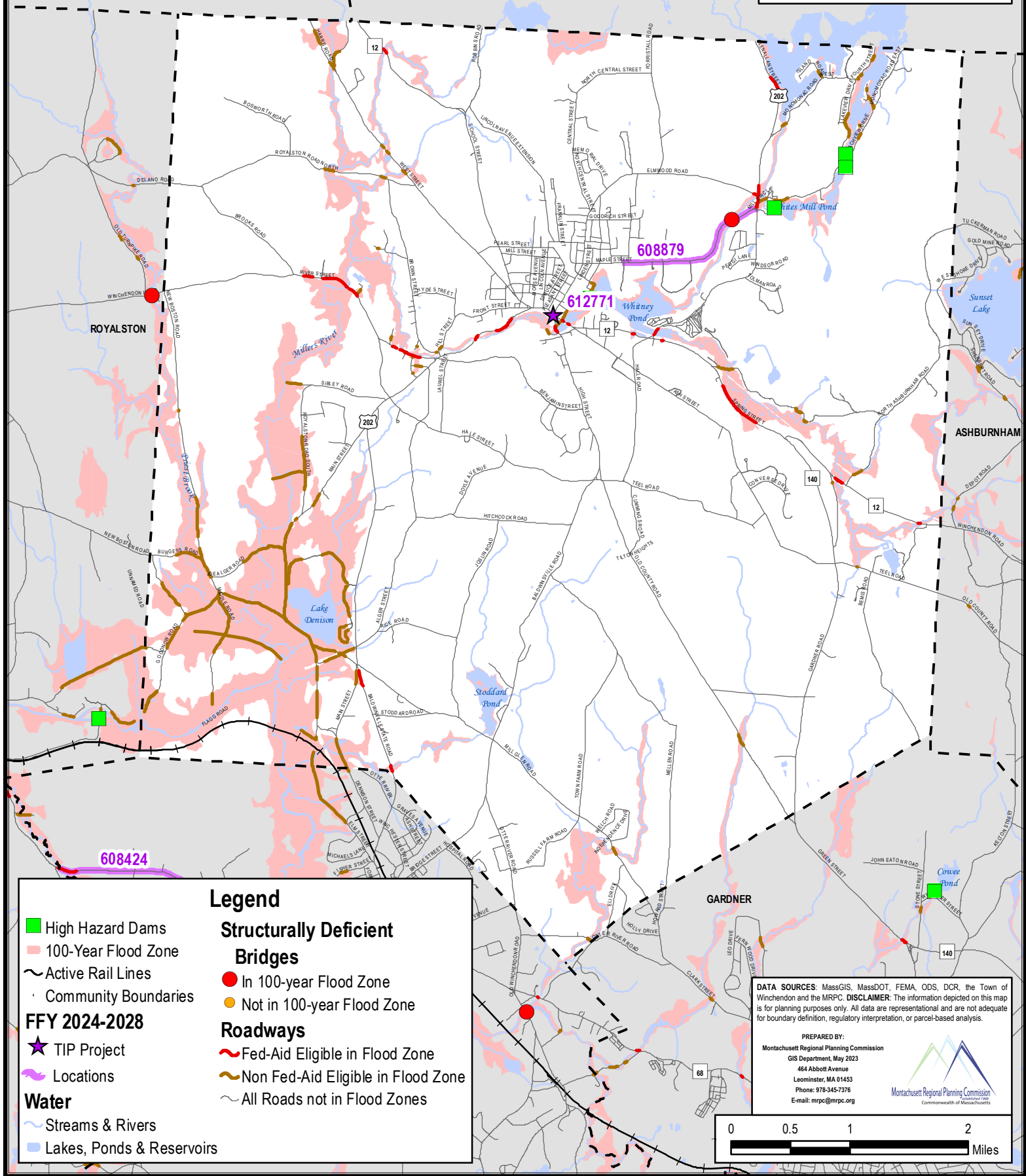
DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Westminster and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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Journey to 2050 Winchendon, MA: Vulnerable Infrastructure



High Hazard Dams

100-Year Flood Zone

Active Rail Lines

Community Boundaries

FFY 2024-2028

TIP Project

Locations

Water

Streams & Rivers

Lakes, Ponds & Reservoirs

Legend

Structurally Deficient Bridges

In 100-year Flood Zone

Not in 100-year Flood Zone

Roadways

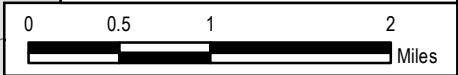
Fed-Aid Eligible in Flood Zone

Non Fed-Aid Eligible in Flood Zone

All Roads not in Flood Zones

DATA SOURCES: MassGIS, MassDOT, FEMA, ODS, DCR, the Town of Winchendon and the MRPC. **DISCLAIMER:** The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

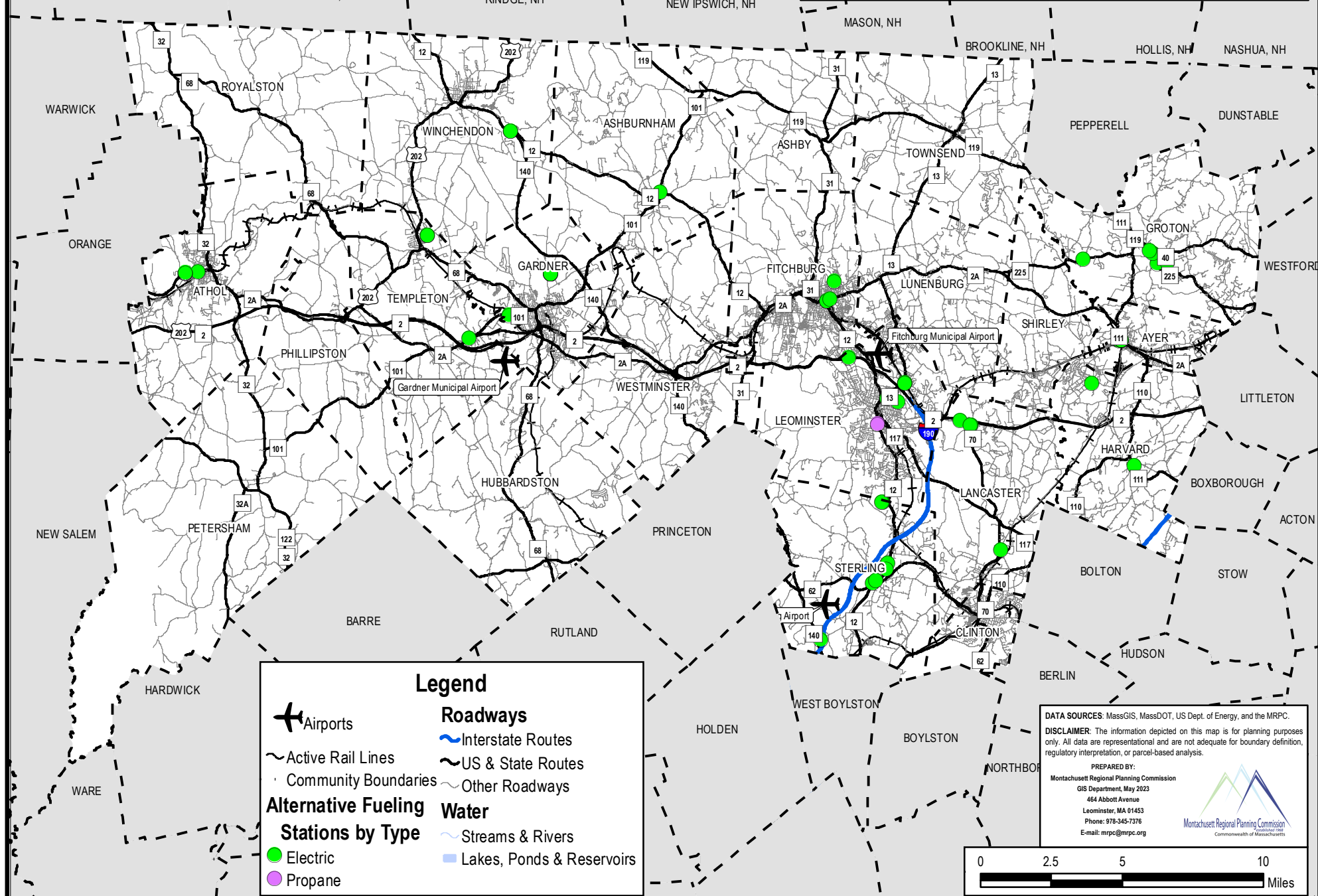
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Journey to 2050

Montachusett Regional Planning Commission: Alternative Fueling Stations (as of May 25th, 2023)



Airports

Active Rail Lines

Community Boundaries

Alternative Fueling Stations by Type

Electric

Propane

Legend

Roadways

Interstate Routes

US & State Routes

Other Roadways

Water

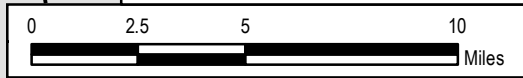

Streams & Rivers

Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, US Dept. of Energy, and the MRPC.

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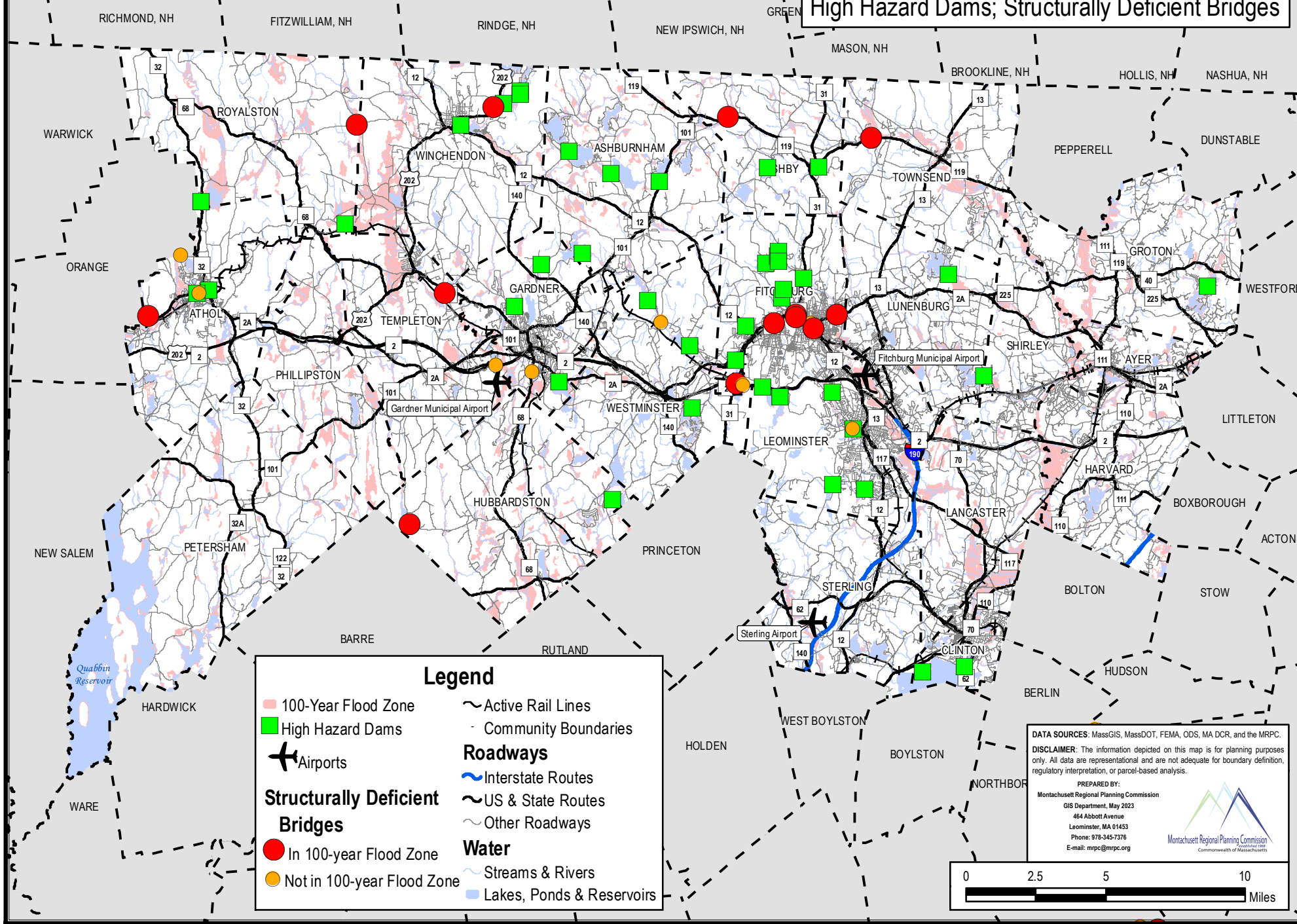
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Journey to 2050

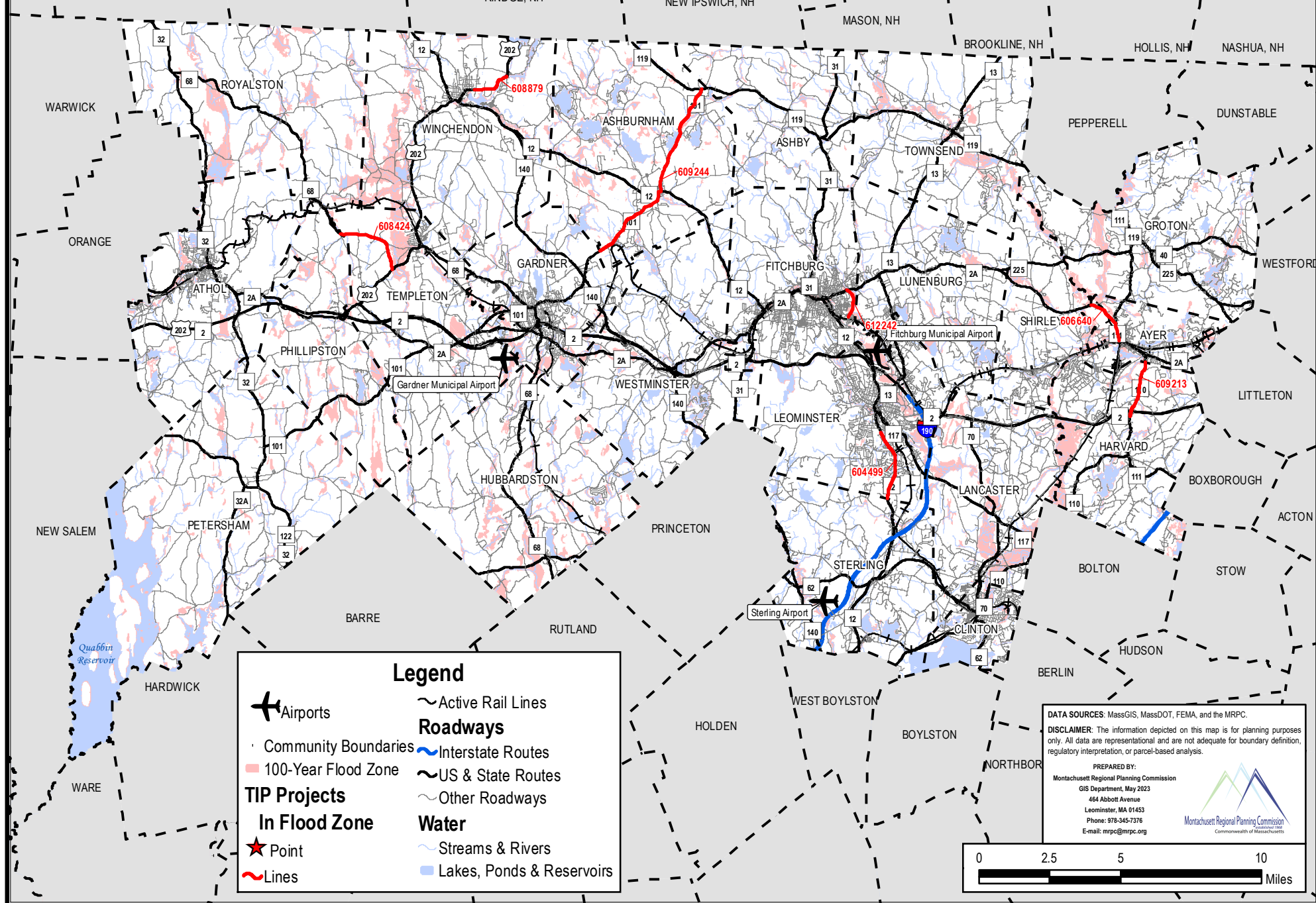
Montachusett Regional Planning Commission: High Hazard Dams; Structurally Deficient Bridges





Journey to 2050

Montachusett Regional Planning Commission: FFY 2024-2028 TIP Projects in 100-Year Flood Zones



Airports

Community Boundaries

TIP Projects In Flood Zone

Point

Lines

Active Rail Lines

Roadways

Interstate Routes

US & State Routes

Other Roadways

Water

Streams & Rivers

Lakes, Ponds & Reservoirs

DATA SOURCES: MassGIS, MassDOT, FEMA, and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

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