Boylston Hazard Mitigation Plan



Rocky Pond - Photo from Town of Boylston

Effective April 1, 2026 -March 31, 2031

Local Hazard Mitigation Team
Town of Boylston, Massachusetts
&
Central Massachusetts Regional Planning Commission
One Mercantile Street, Suite 520
Worcester, MA 01608

[Last updated 9/11/2026]

CENTRAL MASSACHUSETTS
Regional Planning Commission

Board of Selectmen

Date of Meeting: Monday, January 12th, 2026
Time: 6:30 PM – 9:30 PM
Members Present: Selectmen Chair Ridinger, Selectmen Filsinger and Selectmen Marzo, Town Administrator Steward and Administrative Assistant, Alison Kennedy
Members Not Present:

The meeting commenced at 6:30 PM.

Financial Warrants were signed in agreement.

Pledge of Allegiance was recited.

Approval of Meeting Minutes: 12/22/25 and 12/29/25

The Board of Selectmen reviewed and unanimously approved the meeting minutes from December 22, 2025, and December 29, 2025, with no edits suggested by any board members.

> Motion to approve the minutes from Monday, December 22, 2025, and Monday, December 29, 2025.
>
> Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Reports: Police Chief, Fire Chief and Highway Superintendent

Highway Superintendent Report

Highway Superintendent Mero reported on winter operations, including road maintenance, sign installations on Pine Hill Drive to address truck parking issues, tree debris cleanup, and equipment maintenance. He noted challenges with being short a mechanic but confirmed all equipment remains operational during storms. He also reported on pre-treating roads with liquid brine, with plans to expand coverage once a 5,000-gallon tank is delivered from the Department of Transportation.

Fire Chief Report

Fire Chief Flanagan presented the December 2025 call statistics, reporting 92 responses for the month, with a record-breaking 1,074 emergency calls for 2025. He highlighted that response times from station to scene are consistently under five minutes due to 24-hour staffing. Chief Flanagan also provided updates on the fire station building project, noting that site surveys have been completed with positive results, and that a meeting with Context Architecture is scheduled to begin the planning process.

Police Chief Report

Police Chief Annunziata reported that the department is over budget on overtime but expects to balance by year-end. He noted 2,096 calls in December and explained that the department has conducted interviews for two open patrol positions, with conditional offers extended. The Chief also mentioned that the Flock policy has been reviewed by Town Counsel, and that Officer Monaghan has submitted his resignation.

Scheduled Items

Discussion and Possible Vote on a Speed Limit Reduction on Scar Hill Road

The Board discussed reducing the speed limit on Scar Hill Road in response to resident concerns about safety. Residents cited blind corners, particularly near house numbers 19-25 and the intersection with Kendall Place, as well as increased traffic from delivery vehicles in an area with many children. The Board concluded that reducing the speed limit and adding advisory signage would improve safety.

> Motion to reduce the overall speed limit on Scar Hill Road to 30 miles per hour and to further put an advisory speed limit around the approaches to Kendall Place of 20 miles per hour.
>
> Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Discussion on Options for Conducting a Formal Traffic Study at the Linden Street and Mile Hill Road Intersection

The Board discussed ongoing safety concerns at the five-way intersection of Linden Street and Mile Hill Road following multiple accidents and near-misses. Residents described dangerous conditions, including drivers running stop signs, poor visibility at the intersection, and high speeds. After hearing residents' testimonies, the Board agreed to pursue both immediate actions and a comprehensive traffic study.

The Board determined they would place the following items on the next meeting agenda: reducing the speed limit at the intersection from 40 mph to 30 mph, adding additional signage, and installing stop signs at the bottom of Duffy Road. Selectman Marzo will explore funding options for a formal traffic study through the Planning Board, and Highway Superintendent Mero will investigate the possibility of solar-powered blinking stop signs.

Waste and Recycling Committee Recommendation

The Waste and Recycling Committee, after two years of research and over 20 meetings, presented their recommendation for implementing a town-wide voluntary waste collection program. The Committee recommended selecting Waste Management as the hauler based on their thorough proposal, cost savings, and proximity to town.

The Committee explained that a town contract with Waste Management could save residents $250-300 per household annually compared to current costs of approximately $800 per year with individual carriers. The program would provide weekly trash and recycling pickup with a fixed rate increase of 5% per year. Implementation challenges were discussed, including the billing process and startup funding requirements.

The Board determined that next steps would include:

- Identifying a town point person to oversee the program
- Determining whether billing would be handled in-house or outsourced
- Exploring funding options for startup costs
- Meeting with Waste Management representatives to clarify questions about implementation

Discussion on Establishing a Sick Bank for Non-Union Employees

Highway Superintendent Mero proposed establishing a sick bank for non-union town employees. Town Administrator Steward explained that such a program would be opt-in and would require employees to have accumulated a minimum amount of sick time before participating. A committee comprising the Treasurer/Collector, Town Administrator, and an employee representative would oversee the program.

The Board supported the proposal and directed Town Administrator Steward, Highway Superintendent Mero, and appropriate staff to develop detailed policies and procedures for Board review at a future meeting.

Action Items

Vote to Appoint Justin Burke as a Member of the Finance Committee

The Board interviewed Justin Burke, a new Boylston resident with a finance background who expressed interest in serving on the Finance Committee. Finance Committee Chairman Drobner noted that the appointment would help maintain a full committee for the upcoming budget season.

> Motion to appoint Justin Burke as a member of the Finance Committee.
>
> Moved by: Selectman Marzo Seconded by: Selectman Filsinger Vote: Unanimous approval

Vote to Appoint Michael May as a Member to the Affordable Housing Committee

This item was postponed to a future meeting as the candidate was not present.

Review and Vote to Approve the Highway Department Job Description for an Equipment Operator/Groundskeeper

The Board reviewed a job description for a new Equipment Operator/Groundskeeper position to be shared between the Highway Department and Parks and Recreation. The position would help with field maintenance, facility work, and highway operations. Several grammatical corrections to the job description were noted.

Town Administrator Steward explained that funding for this position would come from multiple sources: the Parks and Recreation revolving fund, the Highway Department budget, and the facilities budget, minimizing the impact on the tax rate.

> Motion to approve the job description for the Equipment Operator/Groundskeeper as amended.
>
> Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Financial Impact & Community Benefit: This position will leverage $14,000 from the Parks and Recreation revolving fund, $20,000 from the Highway Department budget, and $13,000 from the facilities line, resulting in a recurring expense. The position addresses the growing need for maintenance of public recreational spaces and facilities that were previously managed through volunteer work, while providing more consistent service to residents. The shared nature of the position maximizes resource utilization across departments.

Vote to Authorize the Town Administrator to Sign Tighe & Bond Letter Proposal for the FY26 Rural Development Fund Grant

The Board authorized Town Administrator Steward to sign a letter proposal for a Rural Development Fund grant to address phosphate issues in Newton Pond as part of the town's MS4 permitting requirements.

> Motion to authorize Town Administrator to sign Tighe & Bond letter proposal for the FY26 Rural Development Fund grant.
>
> Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Financial Impact & Community Benefit: The grant would provide $68,000 toward a $75,000 project from the Rural Development Fund, with the remaining $7,000 coming from the town's stormwater account. This one-time funding would support required environmental remediation of phosphate issues in Newton Pond, helping the town meet EPA standards and improve water quality for residents.

Vote to Approve the Hazard Mitigation Plan

The Board discussed and approved the town's Hazard Mitigation Plan, which has been conditionally approved by FEMA pending the Board's formal approval. The plan, which is updated every five years, identifies and addresses potential hazards in the community.

> Motion to approve the Hazard Mitigation Plan as written with changes to appropriate content as discussed, including the Select Board members.
>
> Moved by: Selectman Marzo Seconded by: Selectman Filsinger Vote: Unanimous approval

Vote to Accept a Donation with Gratitude of $450.00 from the Worcester Pistol and Rifle Range to the Police Department

The Board accepted a donation to the Police Department for supplies related to armory or firearms.

Motion to accept the donation with gratitude, $450 dollars from the Worcester Pistol and Rifle Range to the Police Department.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Vote to Accept the Donation of $325.00 with Gratitude, from Hillside Disc Golf Group to the Parks and Recreation Commission

The Board accepted a donation to the Parks and Recreation Commission.

Motion to accept the donation of $325 dollars with gratitude from the Hillside Disc Golf Group to the Parks and Recreation Commission.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Vote to Approve IRS 2026 Standard Mileage Rate of 72.5 cents per Mile Driven for Business Use

The Board approved the IRS standard mileage reimbursement rate for 2026.

Motion to approve the IRS 2026 standard mileage rate of 72.5 cents per mile.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Vote to Use the Three ImageCast ICP2 Voting Tabulators in All 2026 Elections

The Board approved the use of three specific voting tabulators for all 2026 elections.

Motion to use the 3 image cast ICP2 voting tabulators in all 2026 elections, serial numbers: VAL23100069-004, VAL23100072-004, VAL23250018-04.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval by roll call

Vote to Use the Five Poll Pads (Boylston 001, 002, 003, 004, 005), Purchased from and Maintained by LHS Associates, in all 2026 Elections

The Board approved the use of five poll pads for all 2026 elections.

Motion to use the 5 poll pads, Boylston 001, 002, 003, 004, 005 purchased from and maintained by LHS Associates in all 2026 elections.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval by roll call

Vote to Re-affirm Town Hall, 221 Main Street, as Boylston's Official Polling Location for Both Election Day and Early In-Person Voting

The Board reaffirmed Town Hall as the official polling location.

Motion to reaffirm Town Hall 221 Main Street as Boylston's official polling location for both election day and early in-person voting.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval by roll call

Vote to Re-affirm the Boylston Town House, 599 Main Street, as Boylston's Alternate Polling Location for Both Election Day and Early In-Person Voting

The Board reaffirmed the Boylston Town House as the alternate polling location.

Motion to reaffirm the Boylston Town House 599 Main Street as Boylston's alternate polling location for both election day and early in-person voting.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval by roll call

Vote to Re-affirm Boylston's Town Election Voting Hours as 12 Noon to 8 P.M.

The Board reaffirmed the town election voting hours.

Motion to reaffirm Boylston's Town election voting hours as 12 noon to 8 PM.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval by roll call

Vote to Confirm that Boylston is Opting OUT of Mail-In Voting for the May 11th Annual Town Election and Any Other Municipal Elections that May Be Held During the 2026 Calendar Year

The Board discussed whether to opt out of mail-in voting for municipal elections. Town Clerk Porter recommended opting out due to cost concerns, explaining that in past state election years, the town mailed approximately 1,900 ballot packages at significant expense but received few returns for municipal elections. After deliberation, the motion to opt out failed.

Motion to confirm that Boylston is opting out of mail-in voting for the May 11th annual town election and any other municipal elections that may be held during the 2026 calendar year.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Motion failed (1-2, with Selectmen Marzo and Chairman Ridinger opposed)

Vote to Appoint Poll Workers for 2026

This item was postponed to a future meeting to allow for a complete list of poll workers to be compiled.

Vote to Approve TERVA as the Architect for the Police Department Renovation Project

The Board approved TERVA as the architect for the police department renovation project, subject to Town Counsel review of the contract.

Motion to approve TERVA as the architect for the police department renovation projects subject to final review of Town Counsel and Town Administrator.

Moved by: Selectman Filsinger Seconded by: Selectman Marzo Vote: Unanimous approval

Vote to Authorize the Town Administrator to Be the Designated Voting Delegate at the Upcoming Massachusetts Municipal Association (MMA) Meeting on the Matters Presented to the Membership

The Board authorized Town Administrator Steward to serve as the town's voting delegate at the upcoming MMA meeting.

Motion to authorize Town Administrator to be the designated voting delegate at the upcoming Massachusetts Municipal Association meeting on the matters presented to the membership.

Moved by: Selectman Marzo Seconded by: Selectman Filsinger Vote: Unanimous approval

At 9:30 PM, Selectmen Marzo motioned to adjourn. Selectmen Filsinger seconded. Voted all in favor.

Vote: Approved unanimously by roll call (Bill: Yes, David: Yes, Seth: Yes)

Respectfully submitted,

Alison Kennedy, Assistant to the Board of Selectmen

Meeting Materials On File in The Board of Selectmen's Office

Agenda
Sign In Sheet
Mile Hill Road/Linden Street Resident Concerns
Waste and Recycling Committee Recommendation
- References
- Technical proposals

DRAFT Meeting Minutes – 12/22/25 & 12/29/25
Department Head Reports
Boylston Hazard Mitigation Plan

ACKNOWLEDGEMENTS

This Acknowledgements section helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))"*

This Hazard Mitigation Plan (HMP) update was funded by the Federal Emergency Management Agency (FEMA) via the Massachusetts Emergency Management Agency (MEMA). This report was prepared for the community of Boylston by the Central Massachusetts Regional Planning Commission (CMRPC).

The Boylston Select Board extends its thanks to participants in the Local Hazard Mitigation Team for their time and hard work in participating in this timely project. Core Team members include:

Paul Dell'Aquilla, Town Administration, Town Planner

April Steward, Town Administration, Town Administrator

Stephen Mero, Highway Department, Superintendent

Joe Flanagan, Fire Department, Fire Chief

Joe McGrath, Conservation Commission, Commission Member

Dennis Goguen, Council on Aging, Chairperson

Teresa Prunier, Boylston Water Department, Commissioner

Mark Barakian, Boylston Light Department, Manager

Carol Costello, Boylston-Berlin Regional School District, Superintendent

Paula Davidson, Department of Conservation and Recreation, Regional Engineer

Bernadette DeBlander, Department of Conservation and Recreation, Regional Planner

In addition, thanks are extended to the staff of the Central Massachusetts Regional Planning Commission for process facilitation and preparation of this document.

Will Talbot, Assistant Resiliency Planner

Marc Granato, Emergency Preparedness Planner

Sarah Plutnicki, Assistant Resiliency Planner

Greer Jarvis, Assistant Resiliency Planner

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Benjamin Spencer, Resiliency Intern (former)

Matthew Franz, GISP, Director, GIS

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Trish Settles, AICP, Deputy Executive Director, Regional Collaboration and Community Planning

Thanks are also due to the Massachusetts Emergency Management Agency (MEMA) for guidance and feedback regarding this plan.

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1.0 INTRODUCTION

1.1 DISASTER MITIGATION PLAN

Congress enacted the Disaster Mitigation Act of 2000 (DMA 2000) on October 10, 2000. Also known as the Stafford Act Amendments, this bill was signed into law by President Clinton on October 30, 2000, creating Public Law 106-390. The law established a national program for pre- disaster mitigation and streamlined the federal administration of disaster relief. Specific rules on the implementation of DMA 2000 were published in the Federal Register in February 2002 and required that all communities must have a Hazard Mitigation Plan in place in order to qualify for future federal disaster mitigation grants following a Presidential Disaster Declaration. Hazard Mitigation Plans emphasize measures that can be taken to reduce or prevent future disaster damage caused by natural hazards. In the context of natural hazard planning, Pre-Disaster Mitigation refers to any action that permanently reduces or eliminates long-term risks to human life and property.

1.2 PLAN PURPOSE

Section 1.2 helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*

This plan identifies the natural hazards facing the Town of Boylston, assesses the vulnerabilities of the Town's critical facilities, infrastructure, residents, and businesses to these hazards, and presents recommendations to mitigate the adverse effects of these hazards.

New England weather is renowned for its mercurial and dramatic nature. Late summer hurricanes, major winter blizzards, and summer droughts are all experienced in Central Massachusetts. These natural hazards occur frequently enough to be familiar scenes to residents of Boylston. The negative effects of these natural hazards on the built environment can lead these events to be classified as natural disasters. As climate change continues to progress, the severity and frequency of natural hazard risk will increase.

This planning effort has drawn on the knowledge of local municipal officials and residents. The recommendations presented in the following report are intended to be realistic and practical steps for mitigating natural hazards and preparing Boylston as best as possible for the effects of climate change. Implementation of these actions will translate into savings – fewer lives lost, less property destroyed, and less disruption to essential services and ecological systems.

1.3 PLANNING PROCESS

Section 1.3 helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1));*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

This Plan is funded through a Fiscal Year 2023 Pre-Disaster Mitigation grant to the Town of Boylston from the Federal Emergency Management Agency (FEMA) through the Massachusetts Emergency Management Agency (MEMA).

The planning process in Boylston was composed of two distinct but related phases:

1. data collection and technical review, and
2. public input and planning.

The identification of natural hazards impacting the Town of Boylston was accomplished through a review of available information from various sources. These sources included federal and state reports and datasets, existing plans, and in some cases engineering documents. An assessment of risks and vulnerabilities was performed primarily using geographic information systems (GIS) to identify the infrastructure (critical facilities, public buildings, roads, neighborhoods, etc.) at the highest risk of being damaged by hazards, particularly flooding. Local knowledge as imparted by Town officials, staff, emergency management volunteers, and others was a critical element of this phase.

The second phase of the planning process was focused on outreach, public participation and input, and planning. This phase was critical to fostering awareness of the process among a wide range of local officials, coordinating updates to different plan elements in ways that included important stakeholders, and providing opportunities for public comment and input from a representative base of residents and other stakeholders, including community lifelines, in Boylston. Through community engagement, CMRPC was better able to gauge community priorities for mitigation and understand local resources as well as existing policies and procedures. With information from this phase of the planning process in hand, the local planning team was able to develop an informed list of mitigation strategies for the Town.

The Boylston Hazard Mitigation Planning team, consisting of local and MassDCR staff, included:

Paul Dell'Aquila, Town Administration, Town Planner

April Steward, Town Administration, Town Administrator

Stephen Mero, Highway Department, Superintendent

Joe Flanagan, Fire Department, Fire Chief

Joe McGrath, Conservation Commission, Commission Member

Dennis Goguen, Council on Aging, Chairperson

Teresa Prunier, Boylston Water Department, Commissioner

Mark Barakian, Boylston Light Department, Manager

Carol Costello, Boylston-Berlin Regional School District, Superintendent

Paula Davidson, Department of Conservation and Recreation, Regional Engineer

Bernadette DeBlander, Department of Conservation and Recreation, Regional Planner

To discuss hazard areas, critical infrastructure and other assets, and plan priorities and strategies, the Hazard Mitigation Planning team met six times on November 16th, 2023, January 18th, 2024, February 15th, 2024, March 28th, 2024, April 25th, 2024, and May 30th, 2024. Between meetings and during development of the draft and final plans, information and comments were shared among the local team and CMRPC. On January 23rd, 2024, the Hazard Mitigation Planning team launched a public survey to gauge resident, worker, visitor, and business owner concerns about and experiences with natural hazards in Town. The survey was distributed on the Town's website and social media pages and flyers for and paper copies of the survey were distributed around Town. A total of 62 responses were collected. Survey responses were discussed by the local planning team at its March 28th, 2024 meeting and helped inform the development and prioritization of the plan's mitigation strategies. Representatives from the surrounding communities of West Boylston, Berlin, Shrewsbury, Sterling, Clinton, Worcester and Northborough were invited to comment on the draft plan during the public comment period in an effort gather input from surrounding communities who might have shared interests or concerns. As planning activities progressed, a public presentation was made by CMRPC and the local planning team on September 9, 2024 at a Boylston Select Board meeting to provide a summary of key aspects of the draft Plan report then being finalized. The presentation was televised on the local cable access channel, and the opportunity for public comment was emphasized during this presentation. Materials and notes from this presentation and the public comment period are included in the appendices D and E respectively. A full draft plan was provided to the Town for distribution and made available online at CMRPC's website for public comment for two weeks starting on September 20, 2024. In addition, the final draft Plan was distributed to officials in all neighboring communities for review and input regarding shared hazards. Information on the invasive species issues at Rocky Pond was provided during the public the public comment period.

The final draft plan was submitted to MEMA for review on January 27th 2025, and was then relayed to FEMA for federal review. After receipt of FEMA's notice of approval pending adoption on November 13th, 2025, the plan was formally adopted by vote of the Board at the January 12th 2026 meeting of the Select Board. The town of Boylston received final approval of the plan from FEMA on April 1st, 2026.

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region 1 Mitigation Division has approved the *Boylston Hazard Mitigation Plan*

effective **April 1, 2026** through **March 31, 2031** in accordance with the planning requirements of the Robert T. Stafford Relief and Emergency Assistance Act (Stafford Act), as amended; the National Flood Insurance Act of 1968, as amended; the National Dam Safety Program Act, as amended; and Title 44 Code of Federal Regulations (CFR) Part 201.

In addition, CMRPC, which is the State-designated Regional Planning Agency (RPA) for Boylston, works with all agencies that regulate development in its region; these agencies that CMRPC works with include both the municipal entities listed above and state agencies such as the Department of Conservation and Recreation (MassDCR) and the Department of Transportation (MassDOT). The regular collaboration between CMRPC and these municipal entities and state agencies ensured that the operational policies of and any mitigation strategies or hazards identified by these entities and agencies were incorporated in this Boylston Hazard Mitigation Plan. The engagement of a diverse array of representatives, stakeholders, community lifelines, and organizations during the planning process promoted the creation of mitigation strategies for local recovery and resilience efforts in town. This hazard mitigation planning process included stakeholders from a broad range of sectors both inside and outside of local government. The inclusion of these stakeholders in the planning process is a critical step towards ensuring equitable, effective, and comprehensive risk reduction outcomes.

The following community lifelines were sent the full draft plan during the public comment period for their review and input. FEMA defines community lifelines as "the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.[1]"

Safety and Security Lifelines:

- Local Planning Team
- Town Government - Boylston
- Town Government - West Boylston
- Town Government - Berlin
- Town Government - Shrewsbury
- Town Government - Worcester
- Town Government - Sterling
- Town Government - Clinton
- Town Government - Northborough
- Boylston Fire Department
- Boylston Police Department

Food, Water, and Shelter Lifelines:

- Massachusetts Water Resources Authority
- Boylston Council on Aging
- Berlin-Boylston Regional School District

1 FEMA, "Local Mitigation Planning Policy Guide," FEMA.gov, Federal Emergency Management Agency, April 19, 2022, page 17, https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf.

- DCR - Water Supply Protection
- Boylston Food Pantry
- Bigelow Nurseries

Health and Medical Lifelines:

- UMass Medical - Worcester
- UMass Medical - Clinton
- St. Vincents Hospital
- Boylston Board of Health
- Boylston Public Health Department
- Greater Boroughs Partnership for Health

Energy Lifelines:

- Boylston Municipal Light Department
- Eversource Energy – Natural Gas

Communications Lifelines:

- Wachusett Regional Dispatch Center
- Verizon
- Charter

Transportation Lifelines:

- Boylston Highway Department
- NRT (School Bus Company)
- WRTA

Hazardous Materials Lifelines:

- Frito-Lay Inc
- Luvak Inc.
- Mass Highway Depot
- Verizon Garage
- Verizon Switching Station
- The Haven Country Club
- Cyprian Keyes Golf Club
- Bigelow Nurseries
- Boylston DPW Garage
- Tower Hill Botanic Gardens

Water Systems Lifelines:

- Boylston Water District

2.0 Community Profile and Development Trends

2.1 Regional and Community Profile

The Central Massachusetts Regional Planning Commission (CMPRC) region occupies roughly 1,000 square miles in the southern two-thirds of Worcester County, Massachusetts. The City of Worcester, which is the second-largest city in Massachusetts and New England with a population of 206,518 according to the 2020 United States Census, is relatively in the central part of the region. Nearly 588,141 people live in the CMRPC Region, of whom 4,849 reside in Boylston.[2]

The CMRPC region is bordered to the west by the Central Massachusetts uplands, to the south by Rhode Island and Connecticut, to the east by the Boston metropolitan area, and to the north by the Montachusett region in northern Worcester County. The forty-community region has been divided for planning purposes into six sub-regions, as determined by shared characteristics and roadway corridors. Boylston is located in the northeast sub-region consisting of 5 towns located to the east and northeast of Worcester, including: Berlin, Boylston itself, Northborough, Shrewsbury, and Westborough.

Massachusetts has a humid continental climate, with maritime influences increasing from northwest to southeast. According to the National Oceanic and Atmospheric Association's National Weather Service, between 2000 and 2024, the Worcester, MA area saw monthly mean temperatures ranging from 15.1 degrees Fahrenheit in January to 74.7 degrees Fahrenheit in July.[3] According to this same source, between 2003 and 2023, average annual precipitation in the Worcester, MA area has been relatively high at 51.43 inches,[4] and, between 1999-2000 and 2023-2024, average annual snowfall has been 70.7 inches.[5] Approximately 30 miles from the Atlantic coast, Boylston and its neighboring communities are subject to a variety of types of severe storms, including hurricanes, nor'easters, thunderstorms, and blizzards.

The Town of Boylston, Massachusetts was incorporated in 1786. Boylston is a small suburban middle to upper income community, and it shares the water's edge of the Wachusett reservoir with West Boylston, Clinton, and Sterling MA. Interstate 290 cuts through a small portion of the southeast corner of town, while MA Routes 140 and 70 run through town, intersecting near Spruce Pond. Boylston is home to the Berlin-Boylston

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[2] "P1: Race," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table?q=boylston%20town%20Massachusetts.

[3] These Worcester area temperature estimates are based on data recorded at a weather station at Worcester Regional Airport. "Monthly Mean Avg Temperature for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed September 11, 2024, https://www.weather.gov/wrh/Climate?wfo=box.

[4] These Worcester area precipitation estimates are based on data recorded at a weather station at Worcester Regional Airport. The calculation of this average does not incorporate data from the year 2021, as precipitation data for January 2021 is missing for this station.
"Monthly Total Precipitation for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed September 11, 2024, https://www.weather.gov/wrh/Climate?wfo=box.

[5] These Worcester area snowfall estimates are based on data recorded at a weather station at Worcester Regional Airport. "Monthly Total Snowfall for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed September 11, 2024, https://www.weather.gov/wrh/Climate?wfo=box.

School District, a local library, a historical society, New England Botanic Garden at Tower Hill, and two golf courses. Its employment base is healthy: as of May 2024, 2,877 Boylston residents were employed[6], and, as of 2022, 1,692 people were employed in Boylston.[7] Boylston is bordered by Clinton to the north, West Boylston to the west, Shrewsbury to the south, and Berlin and Northborough to the east.

Boylston has a total area of 19.7 square miles and a population of 4,849.[8] According to the Central Massachusetts Regional Planning Commission's (CMRPC) Long Range Transportation Plan, Boylston's population is projected to continue growing slowly.[9] The Town of Boylston is expected to grow approximately 4.8% between 2020 and 2050, reaching 5,093 residents. The number of residents in town increased by over 1/3rd from 1,700 to 2,774 between 1950 to 1970; The Town's population has grown slowly but steadily each decade between 1970 and 2020, except for between 1980 and 1990, when it only grew by around 1.3%.[10] According to the 2020 US Census, 87.3% of Boylston's population identifies as white, 5.0% of the Town's population identifies as Asian, 0.6% of the Town's population identifies as Black or African American, 0.2% of the Town's population identifies as American Indian or Alaska Native, 1.5% of the Town's population identifies as some other race, and 5.2% of the town's population identifies as belonging to two or more races.[11] According to the 2020 Census, about 2.9% of Boylston's residents identified as Latino or Hispanic. According to the 2020 US Census, 21.3% of the Town's population is under 18 years old, while 19.8% of the population is 65 years and over.[12]

The median age in town, according to the 2020 US Census, is 46.3 years old, which is comparatively higher than the State's median age at 39.9.[13] At $133,292, median household annual income in Boylston (according to 2022 American Community Survey 5-year estimates) is significantly higher than the State at $96,505 and Worcester County at $88,524.[14] The poverty rate in town (according to 2022 ACS 5-year estimates) is

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[6] Massachusetts Department of Economic Research, "Municipal Employment Data: Boylston - 2010," lmi.dua.eol.mass.gov, March 2024, https://lmi.dua.eol.mass.gov/lmi/MunicipalEmploymentData/LmiTown?A=000269.

[7] "Work Area Profile Analysis: Workers: Employed in Boylston town (Worcester, MA)," Onthemap.ces.census.gov, United States Census Bureau, accessed July 22, 2024, https://onthemap.ces.census.gov/.

[8] "P1: Race," Data.Census.gov

[9] Central Massachusetts Metropolitan Planning Organization. "2050 Connections: 2024 Long Range Transportation Plan for the Central Massachusetts Metropolitan Planning Organization," Cmrpc.org, Central Massachusetts Regional Planning Commission, July 19, 2023, page III-5, https://cmrpc.org/wp-content/uploads/2024/05/2050-Connections-Endorsed-Document.pdf.

[10] "Boylston," Cmrpc.org, Central Massachusetts Regional Planning Commission, accessed June 21, 2024, https://cmrpc.org/data-center/community-snapshots/boylston/.

[11] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table?q=dp1%20boylston%20town%20ma.

[12] Ibid

[13] Ibid

[14] "S1903: Median Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars)," Data.Census.gov, United States Census Bureau, accessed June 21, 2024,

8.0%, nearly 2 percentage points below the State's and Worcester County's rates of, respectively, 9.9% and 10.0%.[15] With a median value of owner-occupied housing units at $498,000 according to 2022 ACS 5-year estimates, housing costs in Town are slightly higher compared to the State and to Worcester County, whose comparable numbers are $483,900 and $363,200, respectively.[16] According to 2022 ACS 5-year estimates, 89.8% of occupied homes are single-family homes (detached or attached), and 10.2% are multi-unit structures.[17] With a 4.3% vacancy rate according to the 2020 US Census, the vacancy rate in Boylston is relatively lower than the comparable rates in the State and Worcester County, which are 8.3% and 5.7%, respectively.[18] Most homes in town are relatively new, with only 12.4% of them being built before 1940 according to 2022 ACS 5-year estimates.[19]

https://data.census.gov/table/ACSST5Y2022.S1903?q=ACS%20Massachusetts%20s1903&g=050XX00US25027_060XX00US2502746820.

[15] "S1701: Poverty Status in the Past 12 Months," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table/ACSST5Y2022.S1701?q=ACS%20Massachusetts%20s1701&g=050XX00US25027_060XX00US2502746820.

[16] "DP04: Selected Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table/ACSDP5Y2022.DP04?q=ACS%20Massachusetts%20dp04&g=050XX00US25027_060XX00US2502746820.

[17] "S2504: Physical Housing Characteristics for Occupied Housing Units," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table/ACSST5Y2022.S2504?q=ACS%20Massachusetts%20s2504&g=050XX00US25027_060XX00US2502746820.

[18] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov.

[19] "S2504: Physical Housing Characteristics for Occupied Housing Units," Data.Census.gov.

2.2 Development Trends

Section 2.2 helps meet the following FEMA local mitigation plan requirements:

- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3)); and*
- E1. "Was the plan revised to reflect changes in development?" (Requirement 44 CFR § 201.6(d)(3))

Table 1: Town of Boylston Development Projects between 2018 - 2024

Name	Status	Year	Housing Units	Commercial SQ Feet	Project Type
1 & 2 family	complete	2018-2024	129	NA	Single & 2 Family Homes
Avery Way	complete	2019	3	n/a	3-lot Subdivision
245 Mile Hill	complete	2019	2	n/a	2-lot Subdivision
Woodland Drive	complete	2020	2	n/a	2-lot Subdivision – "Lucas Lane"
2 Rindle Road	complete	2020	66	n/a	Multi-family project – "Brookside"
100 Pine Hill Drive (FedEx)	complete	2021	n/a	367,000	Warehouse/distribution
Morgan Circle	complete	2021	30	n/a	Senior Residential Development – "Lillymere"
156 Shrewsbury Street (Rand Whitney)	complete	2023	n/a	307,000	Warehouse/distribution

160 Shrewsbury Street (Rand Whitney)	complete	2023	n/a	380,925	Warehouse/distribution
80 Pine Hill Drive	complete	2023	n/a	429,000	Warehouse/distribution
100 Shrewsbury Street	complete	2024	63	n/a	40B/LIP project – "Trailside"
90 Shrewsbury Street	complete	2024	n/a	5,400	Commercial Building

Table 2: Town of Boylston Potential Future Development

Name	Status	Year	Housing Units	Commercial SQ Feet	Project Type
8 Gulf Street SRD	Under Construction	2023	20*	n/a	Senior Residential Development – "Burkhardt Farm"
22 Diamond Hill Avenue	Under construction	2023	2*	n/a	2-lot Subdivision – "WKS"
500 Main Street	Approved; awaiting construction	2021	2*	n/a	2-lot Subdivision – "Hawks Perch"
Barnard Hill - Phase IV	Approved; awaiting construction	2024	13	n/a	Subdivision
313 Main Street (Pond View)	In process (permit renewal)	2024	n/a	106,000	Warehouse/distribution

The Town of Boylston is a bedroom residential community on the border of an urban core that

desires to maintain its more rural character. These features of the Town's character contribute to ongoing development and redevelopment patterns throughout the Town. There are a few commercial and industrial development projects that are currently underway in town. There is a 15.5-acre warehouse/distribution center project for 94,000 sq ft of industrial space at 313 Main Street that is in the permitting approval process. In addition, three warehouse/distribution facilities were recently built in town as of the writing of this plan at 156 Shrewsbury Street (Rand Whitney), 160 Shrewsbury Street (Rand Whitney) and 80 Pine Hill Drive. All subdivisions and new developments in town are rigorously reviewed by the Planning Board, Fire Department, Police Department, as well as any other applicable departments, boards, and committees, to ensure that new construction complies with bylaws and ensures emergency vehicle access.

There are also numerous residential construction projects that have been recently completed or are under construction in town. Barnard Hill is a neighborhood subdivision that is planning on constructing 13 additional single family detached dwellings. Currently under construction is a 20-unit senior resident development at 8 Gulf Street. There are also many single-family dwellings being constructed across town. A 40/B LIP Project located at 100 Shrewsbury Street has also been built as well, and it provides 63 units of housing to low-income families.

Recent development in Boylston has minimally increased the Town's overall vulnerability to natural hazards, as 4 of the 79 properties which have been developed since 2018 have buildings in locally identified hazard areas and/or the FEMA 100-year and/or 500-year flood zones. 1 of these properties have buildings located in locally identified flooding hazard areas and 3 of these properties has a building located in the 100-year and/or 500-year flood zones.

If a development is formally approved by the appropriate boards and departments, due consideration should be given to the protection of natural resources and newly constructed residences. If resilience measures are implemented in construction, new development can decrease the Town's vulnerability to natural hazards or prevent an increase in the Town's vulnerability to natural hazards. The clearing of brush and trees lessens the chance of wildfires near new development, buried powerlines can reduce risk of power loss from storm events, and the usage of flood control measures such as drainage structures, rain gardens, swales and berms can reduce flood hazard risks in an area. However, new development built without the inclusion of hazard mitigation and resiliency in mind can increase the Town's vulnerability to natural hazards; Building within the floodplain or close to the wildland interface, removing native plants, and draining wetlands can all greatly exacerbate natural hazard risks to life and property. Standardizing the incorporation of resilience measures in new development will be especially important in Boylston as climate change leads to increased natural hazard risk in town and new residential developments and/or warehouse/distribution facilities continue to be built in town. . According to the Executive Office of Housing and Livable Communities, this would mean taking into account hazards more intentionally at the local and state level when considering housing or community investments and creating new initiatives that invest in adaptive measures. In addition, the state and municipalities must consider seriously the option of relocation or retreat from the areas of highest vulnerability.[20]

An increase in storm runoff in localized areas of town caused by new development is possible, and proper drainage infrastructure is necessary to mitigate disruption to surrounding properties, wetlands, streams, and aquifers caused by development-induced runoff. During the modern

[20] HOUSING ADVISORY COUNCIL, "A HOME FOR EVERYONE: A Comprehensive Housing Plan for Massachusetts 2025 – 2029," Mass.gov, Executive Office of Housing and Livable Communities, 2025, https://www.mass.gov/doc/a-home-for-everyone/download.

construction process, erosion control measures should be installed to prevent the sedimentation of surface water resources, stormwater drainage facilities should be installed to mimic undeveloped conditions and cleanse contaminants, trees should be trimmed back from structures and power lines, utility lines should be installed underground, roads should be built wide enough to allow emergency vehicles to enter, modern building codes should be followed, and setbacks from wetlands are required. The town should do everything possible to ensure that developers are following these guidelines as required by the state building codes and strictly enforce the existing codes to ensure developments are resilient to hazards and do not adversely affect the built and natural environment.

The Town, including various responsible boards and commissions, should ensure that new development processes take potential and known hazards into account and ensure that the mitigation of hazards occurs when needed. Boylston utilizes various methods to ensure that new development conforms with current Massachusetts General Laws as well as the Town's Bylaws. The Planning Board, Conservation Commission, and Zoning Board of Appeals (ZBA) in town consider water resource and open space preservation in decision making and, in the case of the ZBA, when hearing and deciding on appeals. This consideration includes specific evaluation criteria that are relevant to natural hazards – including requirements for preventing and mitigating flooding and stormwater impacts. The Town's Bylaws are amended and updated on an as needed basis to adapt to the needs of and the shifting forces that affect the Town.

New development in Boylston needs to be in line with the state building code. Boylston currently has adopted the Base Code for the state.[21]

As the population of Boylston continues to grow and additional development occurs, officials should seek to further integrate hazard mitigation practices into the Town's planning and development processes. In 2022, the Town of Boylston updated its Master Plan; this planning process gave the Town an opportunity to identify threats and prioritize strategies to address them. Climate change, according to current predictions, will lead to an increase in extreme storm events, including more rain in shorter amounts of time. Planning for the future impacts of climate change is imperative to protecting the citizens of Boylston.

[21] "Massachusetts Building Energy Code Adoption by Municipality," Mass.gov, Massachusetts Department of Energy Resources, May 28, 2024, https://www.mass.gov/doc/building-energy-code-adoption-by-municipality/download.

3.0 Critical Facilities and Vulnerable Populations

A critical facility is defined as a building, structure, or location which:

- is vital to hazard response efforts,
- currently helps protect the community from hazards, and/or
- would create a secondary disaster if a hazard were to impact it.

3.1 Critical Facilities Within Boylston

The Critical Facilities List for the Town of Boylston has been created through the utilization of several online sources, several planning documents, and the knowledge and expertise of the local HMP planning team in town.

Planning documents and online resources which inform this plan include:

- Boylston's Comprehensive Emergency Management Plan (CEMP),
- MassGIS data on dams,
- Massachusetts Department of Early Education and Care data on childcare facilities,
- Massachusetts Historical Commission data on historic sites,
- Employment data from the Massachusetts Department of Economic Research and the Massachusetts Department of Education, and
- Critical infrastructure mapping undertaken by CMRPC under contract with the Central Region Homeland Security Advisory Council, which is charged by the Executive Office of Public Safety and Security to administer and coordinate the State Homeland Security Grant for central Massachusetts.

Boylston's Local Hazard Mitigation Planning Team has broken up this list of facilities into four categories:

- Emergency response facilities needed in the event of a disaster,
- Non-emergency response facilities that have been identified by the local HMP planning team (these facilities are not required in an emergency response event, but are considered essential for the everyday operation of Boylston),
- Dams, and
- Facilities that serve vulnerable populations and/or which the Town wishes to protect in the event of a disaster.

Critical infrastructure and facilities are mapped in Appendix A.

3.2 Category 1 – Emergency Response Facilities

The Town has identified emergency response facilities and services as the highest priority facilities and services to protect in instances of natural and man-made hazards.

Table 3: Emergency Response Facilities in Boylston

Type	Name	Address	Details	Has Emergency Generator?
Emergency Operations Center/Police Station	Boylston Police Dept./EOC (dispatch) 215 Main Street	215 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
Fire Station	Fire Headquarters	599 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
Communications Facilities	Boylston Municipal Building	221 Main Street (Cell Tower)	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Emergency Operations Antennae	215 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Emergency Operations Antennae	599 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Emergency Operations Antennae	1001 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cell Tower	Cross Street	This facility is located within a locally identified lightning strike hazard area.	No
	Cell Tower	10 Church Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Cell Tower	215 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	SBA Communications Tower	215 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
Communications Facilities (cont.)	Verizon Transmission / Switching Station	480 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Verizon Service Garage	170 Shrewsbury Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No

DPW Facilities	DPW Headquarters	385 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
Emergency Shelters	Boylston Elementary School	200 Sewall Street	This shelter has been identified by the local hazard mitigation planning Team as vulnerable to extreme temperatures and rooftop snow loads.	No
	Town Hall/ Municipal Building	221 Main Street	The local hazard mitigation planning team noted that the town hall could be used for an emergency shelter; however, it currently lacks a generator.	No
	Townhouse	599 Main St	This facility was identified in the Town's CEMP as a designated shelter.	Yes
	Tahanto Middle School	1001 Main St	The local hazard mitigation planning team noted that this facility could be used as a potential shelter location, but would need to be upgraded to fill that role.	No
Primary Evacuation Routes	I-290	N/A	The local hazard mitigation planning team noted that this route would be susceptible to flooding, and snow events.	N/A
	MA-70	N/A	The local hazard mitigation planning team noted that this route would be susceptible to flooding, and snow events.	N/A
	MA-140	N/A	The local hazard mitigation planning team noted that this route would be susceptible to flooding, and snow events.	N/A
	Central Street	N/A	This route is a locally identified evacuation route which has been identified by the local HMP planning team in town as being an important access route to and from I-290.	N/A
	Paul X Tivnan Drive	N/A	The local hazard mitigation planning team noted that this route would be susceptible to snow events.	N/A

	School Street	N/A	The local hazard mitigation planning team noted that this route would be susceptible to snow events.	N/A
	French Drive	N/A	The local hazard mitigation planning team noted that this route would be susceptible to snow events.	N/A

3.3 Category 2 – Non-Emergency Response Facilities

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Boylston.

Table 4: Non-Emergency Response Facilities in Boylston

Type	Name	Address	Details	Has Emergency Generator?
Water Supply	Boylston Water District Office	16 Paul X. Tivnan Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Water Well	MA-70 & MA-140	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Water Pump	310 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Water Pump	Adams Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Water Tower	221 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Water Tower	Stiles Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Booster Station	Pleasant Street	This facility is located within a locally identified lightning strike hazard area.	No
	Pump House/ Well	Scar Hill Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No

	Dry Hydrant	Boulder Way	This route has been noted as vulnerable by CMRPC's GIS analysis because it is located in a high slope (15% and above) area.	No
	Fire Cistern	Duffy Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Fire Cistern	87 Mile Hill Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Fire Cistern	Longley Hill Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Fire Cistern	Central Street at Redwood Circle	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
Town Facilities	Boylston Public Library	695 Main Street	The local hazard mitigation planning team noted that this structure was built of unreinforced masonry and is susceptible to earthquake hazards.	No
	Boylston Historical Museum	3 Central Street	The local hazard mitigation planning team noted that this structure was built of unreinforced masonry and is susceptible to earthquake hazards.	No
	Boylston Council of Aging	599 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Boylston Municipal Facility	221 Main Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
Utilities	Municipal Light Department	16 Paul X. Tivnan Drive	There are no noteworthy concerns regarding natural hazard impacts on this facility.	Yes
	Nuria Energy	328 Shrewsbury Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Yatco Energy	270 Shrewsbury Street	There are no noteworthy concerns regarding natural	No

			hazard impacts on this facility.	
	Electrical Substation	196 Temple Street, West Boylston	This substation is shared with West Boylston.	No
	National Grid Transmission line/ High Tension Corridor		This transmission line / corridor passes through the southwest corner of town.	N/A
Natural Resources and Natural Resource Protection Organizations	Department of Conservation and Recreation Response Garage	33 Sterling Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Department of Conservation and Recreation Maintenance Garage	77 Lancaster Street, West Boylston	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Department of Conservation and Recreation Maintenance Garage	500 Wilson Street, Clinton	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Department of Conservation and Recreation Offices	180 Beaman Street, West Boylston	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	Department of Fish and Wildlife	Route 140, West Boylston	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No
	New England Botanic Garden at Tower Hill	Tower Hill Road	There are no noteworthy concerns regarding natural hazard impacts on this facility.	No

3.4 Category 3 – Dams[22]

The third category of critical infrastructure sites in this plan is a listing of dams located in and around Boylston:

[22] "MassGIS Data: Dams," Mass.gov, Massachusetts Bureau of Geographic Information, February 2012, https://www.mass.gov/info-details/massgis-data-dams.

Table 5: Dams Located In and Around Boylston

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA01231	Rocky Pond Dam	Private	Office of Dam Safety	Low Hazard	This dam has been identified as being host to several aquatic invasive species.
MA02596	Mt. Pleasant Pond Dam	Private	Office of Dam Safety	Significant Hazard	This dam is owned by the Haven Country Club.
MA03342	Spruce Pond Dam	Private	Office of Dam Safety	Low Hazard	This dam has been noted as vulnerable by CMRPC's GIS analysis because it is located within FEMA flood zone X, also known as the 0.2% annual chance flood hazard zone.
MA01630	Sheperd Knapp Dam	Private	Office of Dam Safety	N/A	There are no noteworthy concerns regarding natural hazard impacts on this facility.
MA00682	Newton Pond Dam	Town of Shrewsbury	Office of Dam Safety	Significant Hazard	This dam has been identified by the Local Hazard Mitigation Planning Team as a dam of concern as there needs to be greater coordination between the Town of Shrewsbury and Boylston when the water levels are altered by Shrewsbury. The dam itself is is located in nearby Shrewsbury but affects downstream in Boylston. Newton Pond itself was noted as having phosphorus issues by Boylston's HMP Planning Team.
MA03263	Wachusett Reservoir South Dike	State - DCR	Office of Dam Safety	High Hazard	This dam has been identified by the Local Hazard Mitigation Planning Team as a dam of concern; it is located in Clinton but would affect the Town of Boylston should it break or burst.
N/A	Mill Road Dam	Private	Unknown	N/A	This dam has been identified by the Local Hazard Mitigation Planning Team, as the breakwater at this dam has a beaver problem, with beavers damming up the site. The site of this dam used to be a hydroelectric plant. This dam has not been identified by the Massachusetts Office of Dam Safety, and it is located beneath Mill Road in Boylston.
MA01511	Fish Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this facility.

For additional information on dams and the dam failure hazard in Boylston, also see Chapter 4.

3.5 Category 4 – Facilities/Populations to Protect

The fourth category of critical infrastructure sites in this plan is facilities that serve vulnerable populations and/or which the Town wishes to protect in the event of a disaster.

Table 6: Facilities and Populations to Protect in Boylston

Type	Name	Address	Details
Special Needs Population/Apartment Complexes/Assisted Living/ Housing Authority	Sunbank Senior Living	Heritage Lane	There are no noteworthy concerns regarding natural hazard impacts on this senior housing facility.
	Morgan Circle		This site is a 55+ development.
	Compass Point		This site is a 55+ development.
	Cheryl's Way		This site is a 55+ development.
Schools/Daycares[23]	Tahanto Regional Middle School	1001 Main Street	This school has a flat roof and is prone to snow load hazards.
	Boylston Elementary School	200 Sewall Street	This school has a flat roof and is prone to snow load hazards. The town has recently put money towards mitigating this.
	Tiny Explorers Daycare/ Early Childhood School	75 MAIN ST	There are no noteworthy concerns regarding natural hazard impacts on this daycare / school.
Faith Institutions	St. Mary of the Hills	630 Cross Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.
	First Congregational Church	10 Church Street	There are no noteworthy concerns regarding natural hazard impacts on this facility.
Historic Buildings/Sites[24]	According to the Massachusetts Cultural Resources Information System (MACRIS) online database accessed in August 2024, there are 2 Areas, 63 Buildings, 1 Burial Grounds, 1 Objects, and 4 Structures listed for Boylston. 1 of these historic areas, 3 of these buildings, and 1 of these structures lie within regulated or locally identified flood areas within town. The following historic sites were identified by the Boylston HMP Core Team as critical facilities or infrastructure: The Wachusett Reservoir and the John Bartholomew Gough House.		

[23] "Licensed Child Care Search," Childcare.Mass.gov, Massachusetts Department of Early Education and Care, accessed June 21, 2024, https://childcare.mass.gov/findchildcare.

[24] "Search Results," Mhc-macris.net, Massachusetts Historical Commission, accessed June 21, 2024, https://mhc-macris.net/queryresults.

Employment Centers

Based on data obtained from the Massachusetts Executive Office of Labor and Workforce Development (EOLWD),[25] the largest employers in Boylston are listed in the following table:

Table 7: Employment Centers in Boylston

Company name	Address	Number of Employees	NAICS Code
Landscaping Etc Inc	Shrewsbury St	100-249	2389
Mt Pleasant Country Club	Central St	100-249	5615
Berlin-Boylston School Dist	Main St	50-99	6111
Cyprian Keyes Golf Club	E Temple St	50-99	8134
Haven Country Club	Cross St	50-99	7139
Tower Hill Botanic Garden	French Dr	50-99	7121
Boylston Fire Dept	Main St	20-49	9221
Boylston Town Admin	Main St # 2	20-49	9211
Butler-Dearden Paper Svc Inc	Shrewsbury St	20-49	4241
Entravision Communications	Cross St	20-49	5161
Honematic Machine Corp	Shrewsbury St	20-49	3327
Loomis Armored US	Shrewsbury St	20-49	5616
Phillips Precision	Shrewsbury St	20-49	3327
Red River Hospital	8th St	20-49	6222
Summer Widlife	Linden St	20-49	7121
B B W B Travel Basketball Inc	Heywood St	10-19	7112
Boylston Police Dept	Main St	10-19	9221
Dunkin'	Shrewsbury St / Rt 140	10-19	7225
Fountain Services Inc	Shrewsbury St	10-19	4251
Frontline Network Systems Inc	Shrewsbury St	10-19	4236
G & L Plumbing Inc	Shrewsbury St # 4	10-19	5629
Haven Country Club Maintenance	Central St	10-19	8134

Environmental Justice and Vulnerable Populations

The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice (EJ) Policy sets the state's definition for Environmental Justice areas. The policy states that EJ populations are groups within the larger populace that EEA has determined to be most at risk of being unaware of or unable to participate in environmental decision-making, to be most at risk of being unable to gain access to state environmental resources, or to be especially vulnerable. The policy also states that EJ areas are defined as U.S. Census Bureau census block groups (which are often the size of neighborhoods) that meet one or more of the following criteria:

- The annual median household income is not more than 65% of the statewide annual median household income (according to American Community Survey 2020 5-year estimate data);

[25] "Largest 100 Employers in Boylston," Lmi.dua.eol.mass.gov, Massachusetts Department of Economic Research, accessed June 21, 2024, https://lmi.dua.eol.mass.gov/LMI/LargestEmployersArea/LEAResult?A=05&GA=000503.

- Minorities comprise 40% or more of the population (according to 2020 US Census data);
- 25% or more of households lack English language proficiency (according to American Community Survey 2020 5-year estimate data); or
- Minorities comprise 25% or more of the population and the annual median household income of the municipality in which the block group is located does not exceed 150% of the statewide annual median household income (according to 2020 US Census data and 2020 5-year estimate American Community Survey data, respectively).

According to the EEA, there are no Environmental Justice populations in Boylston.[26] Although there are no EJ populations in town, it is still important for the Town to consider EJ populations and other vulnerable community members in the hazard mitigation planning process. In Boylston, according to the 2020 US Census, 22.8% of the population is under the age of 18 and 19.1% of the population is 65 years and over.[27] According to 2022 ACS 5-year estimate data, approximately 8.7% of the population in town speaks a language other than English at home.[28] Approximately 8.7% of the population in Boylston has a disability according to this same data.[29] This 2022 ACS 5-year estimate data also shows that people without health insurance account for about 0.9% of Boylston's population[30] and about 8.0% of the town's population is living in poverty.[31]

Outreach to vulnerable community members was a vital part of the public outreach strategy for the Boylston Hazard Mitigation Plan. Paper HMP surveys were available at the town hall, library, and senior center, and CMRPC staff conducted a presentation at a hybrid Select Board meeting in town during the planning process; these measures allowed residents who lack access to reliable Internet service and/or who have difficulty using the Internet to have a chance to complete the survey as well as hear about the planning process. The public presentation for the draft plan was televised on local cable access TV.

[26] "Massachusetts 2020 Environmental Justice Populations," Mass-eoeea.maps.arcgis.com, Massachusetts Executive Office of Energy and Environmental Affairs, November 12, 2022, https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212.

[27] "DP1: Profile of General Population and Housing Characteristics," Data.Census.gov.

[28] "S1601: Language Spoken at Home," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table?q=s1601%20boylston%20town.

[29] "S1810: Disability Characteristics," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table?q=s1810%20boylston%20town.

[30] "S2701: Selected Characteristics of Health Insurance Coverage in the United States," Data.Census.gov, United States Census Bureau, accessed June 21, 2024, https://data.census.gov/table?q=s2701%20boylston%20town.

[31] "S1701: Poverty Status in the Past 12 Months," Data.Census.gov.

4.0 HAZARD PROFILES, RISK ASSESSMENT, AND VULNERABILITIES

Sections 4.0-4.13 help meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3));*
- B1. "Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events?" (Requirement 44 CFR § 201.6(c)(2)(i);
- *B2. "Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods?" (Requirement 44 CFR § 201.6(c)(2)(ii));*
- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3));*
- *C2. "Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?" (Requirement 44 CFR § 201.6(c)(3)(ii));*
- *C4. "Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?" (Requirement 44 CFR § 201.6(c)(3)(ii)); and*
- *E1. "Was the plan revised to reflect changes in development?" (Requirement 44 CFR § 201.6(d)(3))*

The following section of this plan includes a summary of natural hazards that have affected or could affect Boylston in the future. Natural hazards are weather-related, climate-related, or other environmental processes which threaten people's lives as well as property and/or other valuable assets to human society. By examining historical data on natural hazard occurrences, as well as future projections on how climate change will interact with natural hazards, it is possible to approximate the future risk of natural hazards.

Historical documents relating to natural hazard occurrences, discussions with local officials and emergency management personnel, available hazard mapping and databases, and weather-related databases were used to develop the following list of the most significant identified natural hazards which affect Boylston:

- Flooding
- Severe Snowstorms / Ice Storms/ Nor'easters
- Hurricanes
- Severe Thunderstorms / Wind / Tornadoes
- Wildfires
- Earthquakes

- Dam Failure
- Drought
- Extreme Temperatures
- Invasive Species
- Other Hazards

4.1 State-wide Overview of Hazards

4.1.1 Massachusetts State Hazard Mitigation and Climate Adaptation Planning

The state of Massachusetts under Governor Healy's administration has updated the 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) pursuant to Executive Order 569. The 2023 ResilientMass Plan updates and expands upon the previous SHMCAP and outlines how the state of Massachusetts must prepare strategies to prevent, respond to, and mitigate natural hazards.[32] This plan incorporates climate change adaptation into a state-level hazard mitigation plan. The plan is also the document which makes Massachusetts eligible for federal disaster recovery and hazard mitigation funding. The plan is effective under FEMA from September 12, 2023 to September 13, 2028. The Massachusetts SHMCAP is a useful model for incorporating considerations relating to the effects of climate change into the natural hazard mitigation planning process. This plan will be referenced in this plan as the ResilientMass Plan or the SHMCAP interchangeably.

4.1.2 Climate Change Interactions

As part of the SHMCAP planning process, the state of Massachusetts performed a statewide analysis which detailed the effects of climate change on the cities and towns of Massachusetts. This analysis was included in the 2022 Climate Change Assessment, which detailed the impacts of climate change on the Central Region of Massachusetts (which includes 55 cities and towns) along with the other regions of the state. This report refocuses climate change impact assessment away from the specific hazards and towards how the most urgent of those hazards would affect the Region in the following sectors: Human, Infrastructure, Natural Environment, Governance, and Economy. The hazards identified as having the most urgent impacts for Central Massachusetts are **Extremes in Temperature and Precipitation**, with wide fluctuations in both precipitation extremes (including both flooding and droughts) as well as extremes in temperatures (both in extremely hot days becoming more prevalent, as well as extreme lows in temperature) being anticipated to having the greatest future risk to the Central Region across these sectors.

The State plan, while being comprehensive, places different priorities on the impacts of climate change and natural hazards than this Boylston municipal plan. These different priorities are based more on the specificities of local conditions in Boylston rather than any

[32] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs, accessed June 10, 2024, https://www.mass.gov/info-details/2023-resilientmass-plan.

contradictions with the State's analysis, and this local hazard mitigation planning effort was informed by the state planning process.

The following descriptions provide an overview of climate change impacts on the five sectors identified in the 2022 Climate Change Assessment.

- **Human Impacts**: The assessment identified a **Reduction in Food Safety and Security** and **Health and Cognitive Effects** from extreme heat as the most urgent human sector climate change impacts for the Central Region. The reduction in food safety and security is likely to occur at all levels of production and distribution because of both extreme heat and extreme cold causing spoilage, power outages, and extremes in precipitation creating a more unpredictable environment for the growth of produce. According to multiple studies, reductions in crop yields across the state and within the Region are anticipated to occur; research has shown that key commodity crop yields in the Central Region could decline by 12 percent by 2030.[33] These impacts to the regional food supply chain are expected to be similar to impacts on state and national crop yields and food distribution patterns. While our food supply networks are currently anticipated to be able to withstand these shocks, the increases in food prices which these shocks will cause will correspondingly lead to an increase in food insecurity within the Central Region.

The impacts of extreme temperatures are also projected to have a significant impact on health and cognition within the Central Region, particularly in our more urbanized areas. Currently, three annual premature deaths are attributed to extreme temperature in the Region, but approximately 35 additional premature deaths per year are expected in the Region as a result of climate change by the end of the century,[34] assuming that no new mitigation measures are taken to reduce the threat of temperature extremes. The negative impacts of extreme heat on people's physical and cognitive health can cause declines in learning outcomes, declines in workplace productivity, and increases in the usage of and strain upon emergency rooms dealing with heat related illnesses and injuries.

Additional Human Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: Increases in Mental Health Stressors; Increases in Vector Borne Disease Incidence and Bacterial Infections; Damage to Cultural Resources; Health Effects from Aeroallergens and Mold; Emergency Service Response Delays and Evacuation Disruptions; Health Effects of Extreme Storms and Power Outages; and Health Effects from Degraded Air Quality.

- **Infrastructure Impacts**: The assessment identified the **Loss of Urban Tree Cover** and **Damage to Electric Transmission and Distribution Infrastructure** as the most urgent infrastructure sector

[33] Estimates derived from application of data from the following two sources:
USEPA, "Multi-Model Framework for Quantitative Sectoral Impacts Analysis: A Technical Report for the Fourth National Climate Assessment," U.S. Environmental Protection Agency, 2017, EPA 430-R-17-001; Robert H. Beach et al., "Climate change impacts on US agriculture and forestry: benefits of global climate stabilization," *Environmental Research Letters* 10, no. 9 (2015). doi:10.1088/1748-9326/10/9/095004.

[34] Estimates derived from application of David Mills et al., "Climate change impacts on extreme temperature mortality in select metropolitan areas in the United States.," *Climatic Change* 131 (2014): 83-95. https://doi.org/10.1007/s10584-014-1154-8.

climate change impacts for the Central Region. Urban Trees face a broad range of climate impacts and stressors, including increasing extreme weather activity, increasing threats from invasive pests and diseases, and reduced water and soil quality; All of these impacts and stressors correspond to an increased rate of tree mortality and therefore increased urban forest management costs for municipalities. Central Massachusetts has both urban and suburban centers where projected temperature increases make urban tree coverage particularly valuable at reducing the Heat Island Effect. A prime example of a community which could benefit from increased tree coverage is the City of Worcester, which is the state's second most populous city. 75 percent of the City's area falls within state-designated environmental justice block groups, but the City has relatively low canopy coverage and is at disproportionate risk for urban tree loss.[35]

Across the Central Region, damage to electric transmission and distribution infrastructure is projected to cost orders of magnitude more in the coming decades, with additional annual costs projected to grow to $6 million by 2030; $12 million by 2050; $19 million by 2070; and $28 million by 2090.[36] These costs are anticipated to be caused by the need for repair activities in response to climate-related damages and failures, and they take into account a wide range of climate stressors beyond extremes in temperature and precipitation.

Additional Infrastructure Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Damage to Roads and Loss of Road Service; Reduction in Clean Water Supply; Increased Risk of Dam Overtopping or Failure; Loss of Energy Production and Resources; Damage to Inland Buildings; and Damages to Rails and Loss of Rail/Transit Service.**

- **Natural Environment Impacts**: The assessment identified **Freshwater Ecosystem Degradation** and **Forest Health Degradation** as the most urgent natural environment sector climate change impacts in the Central Region. Increased nutrient load and harmful algal bloom growth in freshwater ecosystems from increased precipitation runoff as well as increased concentrations of contaminants in these ecosystems under drought conditions are both exacerbated by climate extremes. In addition, shifts in habitat caused by increased average air and water temperatures especially threaten the cold-water habitats and fisheries of the Central Region.

  The effect of climate change on the Region's forests is harder to predict, but the potential for significant forest ecosystem loss in the Region caused by climate change cannot be understated. Statewide, a third of tree species are classified by the U.S. Forest Service as having low capacity for adapting to projected climate change, and an increased frequency of extreme events poses

[35] "2022 Massachusetts Climate Change Assessment," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, December 2022, https://www.mass.gov/doc/2022-massachusetts-climate-change-assessment-december-2022-volume-iii-regional-reports/download, pages RS36-RS37.
[36] Estimates derived from application of Charles Fant et al., "Climate change impacts and costs to U.S. electricity transmission and distribution infrastructure," Energy, 195 (2020). https://doi.org/10.1016/j.energy.2020.116899.

an additional threat to forests in the Central Region.[37]

Additional Natural Environment Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Shifting Distribution of Native and Invasive Species and Soil Erosion.**

- **Governance Impacts**: As is true for other parts of the state, the assessment identified **Increase in Costs of Responding to Climate Migration**; an **Increase in Demand for State and Municipal Government Services**; and a **Reduction in State and Municipal Revenues** caused by climate change as the most urgent governance sector climate change impacts in the Central Region. Climate Migration, whether forced or voluntary, is already being felt by Massachusetts communities; it has been identified by the state as an impact which causes major consequences and will be the most difficult climate change impact to adapt to in the Central Region. Urban centers, particularly in and around Worcester, as well as towns serviced by state and regional transit services, are likely to become receiving zones for climate migration based on the relative assessment of climate hazards nationwide. The new influx of population caused by climate migration is expected to increase demand for government services. The need to increase government expenditures to maintain the current level of service for the existing population in addition to climate migrants and refugees is expected to be a significant stressor for local governments. Increased needs for MassHealth, food security support, and emergency services are expected in the Central Region due to population growth caused by climate migration in addition to other climate change impacts.

  Many climate change impacts are expected to be concentrated in low-income areas. Existing inequalities in the Region may become exacerbated if steps are not taken to prepare for these impacts, as an influx of climate migrants and refugees may increase demand for and place strain on public services.

  An increase in natural hazard impacts due to climate change is expected to increase disruptions to State and municipal revenue generation in the Region; these disruptions may include property tax and sales tax losses caused by interruptions to business and the economy.

  Additional Governance Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **an Increased Need for State and Municipal Policy Review and Adaptation Coordination and Damage to Inland State and Municipal Buildings.**

- **Economic Impacts**: The assessment identified a **Reduced Ability to Work** and a **Decrease in Agricultural Productivity** caused by climate change as the most urgent economic sector climate change impacts in the Central Region. Both of these impacts relate to an increase in dangerous

[37] Estimates derived from application of US Forest Service Tree Atlas for Massachusetts.
Northern Research Station Landscape Change Research Group: Iverson, Peters, Prasad, Matthews. "Massachusetts - Climate Change Atlas Tree Species: Current and Potential Future Habitat, Capability, and Migration," Fs.usda.gov, United States Department of Agriculture Forest Service, September 2022, https://www.fs.usda.gov/nrs/atlas/combined/resources/summaries/states/Massachusetts.pdf; "Climate Change Atlas," Fs.usda.gov, United States Department of Agriculture Forest Service, accessed June 10, 2024, https://www.fs.usda.gov/nrs/atlas/combined/resources/summaries/states.

temperature extremes causing to a decrease in workers' abilities to work; these impacts also relate to other natural hazards affecting workers' abilities to get to the job safely and increases in illnesses among workers caused by primary or secondary effects of natural hazards and climate change. Workers in the Region in high-risk industries (those exposed to outdoor conditions) are projected to lose 31 hours of work per worker per year by 2050 and 128 hours of work per worker per year by 2090; these projected losses in work hours by the end of the century are the highest in the Commonwealth.[38]

While the agricultural sector is a small part in the Central Region's economy, the impacts to this sector of the economy through climate change-induced lower crop yields have the potential to severely disrupt the local economy and regional food systems. Key commodity crop yields in the Central Region could decline by 12 percent by 2030 and by 14 percent by 2070; these declines in key commodity crop yields carry potentially disproportionate impacts on the local economies that rely on agricultural production and the individual farm workers and employers who work in this sector.[39]

Additionally, though not identified as the one of the most urgent economic sector climate change impacts in the Central Region in the state's assessment, the expected **Reduction in Availability of Affordably Priced Housing** has become a more prevalent issue since the assessment was released. As affordable properties are typically situated in more hazard-prone areas, climate change-induced natural hazard impacts may lead to a decrease in the supply of affordable housing over time. Also, as increases in demand for housing continue in the Region due to a disproportionate economic impact on working families from climate change-induced natural hazard, the overall resiliency of the Region to shocks will also decrease.

Additional Economic Sector impacts identified in the 2022 Massachusetts Climate Change Assessment include: **Damage to Tourist Attractions and Recreation Amenities and Economic Losses from Commercial Structure Damage and Business Interruptions.**

During the local Hazard Mitigation Planning process, the local HMP planning team in Boylston noted that their chief concerns related to the natural hazard impacts of climate change are extremes in precipitation in the form of rain or snow; these concerns are in concurrence with the state assessment.

4.1.3 Previous Federally Declared Disasters and Massachusetts State of Emergency Declarations in Worcester County

From 2018 to the present, the following Federally Declared Disasters and Massachusetts State of Emergency Declarations have occurred in Worcester County:

[38] Estimates derived from application of Matthew Neidell et al., "Temperature and work: Time allocated to work under varying climate and labor market conditions," *PloS One*, 16, no. 8 (2021), https://doi.org/10.1371/journal.pone.0254224.

[39] Estimates derived from application of USEPA (2017) and Beach et al. (2015)

Table 8: Previous Federally Declared Disasters and Massachusetts State of Emergency Declarations in Worcester County[40]

Disaster Declaration	Disaster Type	Incident Period	Declaration Date
Massachusetts Severe Storms and Flooding (DR-4780-MA)	Flooding	September 11, 2023 - September 13, 2023	May 15, 2024
Massachusetts Hurricane Lee (EM-3599-MA)	Hurricane	September 15, 2023 - September 17, 2023	September 15, 2023
Shelter Capacity Crisis	Not a Natural Hazard	August 8, 2023 - Present	August 8, 2023
Massachusetts Covid-19 Pandemic (DR-4496-MA)	Pandemic	January 20, 2020 - May 11, 2023	March 27, 2020
Massachusetts Severe Winter Storm and Snowstorm (DR-4379-MA)	Snow	March 13, 2018 - March 14, 2018	July 19, 2018

All of the disaster occurrences described in the above table were both Federal Disaster Declarations and Massachusetts State of Emergency Declarations with the exception of the Shelter Capacity Crisis, which is a Massachusetts State of Emergency Declaration but not a Federal Disaster Declaration, and the March 13th-14th, 2018 Severe Winter Storm and Snowstorm, which was a Federal Disaster Declaration but not a Massachusetts State of Emergency Declaration.

The majority of these disaster occurrences directly relate to the natural hazard concerns of towns within Worcester County; flooding from rain events and other extremes in precipitation (such as snowfall events) are the chief concerns of residents and local hazard mitigation planners alike in the Region.

[40] "Disaster Declarations for States and Counties," FEMA.gov, Federal Emergency Management Agency, accessed September 16, 2024, https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties; "State of Emergency Information," Mass.gov, Massachusetts Emergency Management Agency, accessed December 12, 2024, https://www.mass.gov/info-details/state-of-emergency-information.

4.2 Natural Hazard Identification and Analysis

This section of the plan examines the hazards in the Massachusetts SHMCAP which are identified as likely to affect Boylston. This analysis is organized into the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, Exposure, Potential Climate Change Effects, Vulnerability, and Mitigation Strategies. A description of each of these sections of the analysis and the risk assessment summary table which includes each hazard identified are provided below.

4.2.1 Hazard Description

The natural hazards identified for Boylston are:

- Flooding,
- Severe Snowstorms / Ice Storms / Nor'easters,
- Hurricanes,
- Severe Thunderstorms / Wind / Tornadoes,
- Wildfire,
- Earthquakes,
- Dam Failure,
- Drought,
- Extreme Temperatures, and
- Invasive Species.

Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms all may cause wind-related damage.

4.2.2 Location

Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion of the planning area, such as a floodplain or area that is susceptible to wildfires. Location classifications (large, medium, or small) are based on the area that would potentially be affected by the hazard, on the following scale:

Table 9: Percentage of Town Impacted by Natural Hazard

Land Area Affected by Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

4.2.3 Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement system. Other descriptions of extent include water depth, wind speed, and duration.

4.2.4 Previous Occurrences

Previous hazard events that have occurred are described in this section. Depending on the nature of the hazard, events listed may have occurred on a local, state-wide, or regional level.

4.2.5 Probability of Future Events

The likelihood of future events occurring in the planning area for each natural hazard was classified according to the following scale:

Table 10: Frequency of Occurrence and Annual Probability of Given Natural Hazard

Frequency of Occurrence	Probability of Future Events
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

4.2.6 Impact

Impact refers to the effect that a hazard may have on people and property in a planning area, based on the assessment of the extent and the severity of the hazard. Impacts are classified according to the following scale:

Table 11: Impacts, Magnitude of Multiple Impacts of Given Natural Hazard

Impacts	Magnitude of Multiple Impacts
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption to quality of life. Temporary shutdown of facilities.

4.2.7 Exposure

Certain features of a community's infrastructure, society, and environment may face more of, or may be disproportionately impacted by, natural hazards; these features therefore can be described as experiencing increased exposure to natural hazards. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3.

4.2.8 Potential Climate Change Effects

Each natural hazard is influenced by one or more of the climate change interactions listed in Section 4.1.2 Climate Change Interactions. Climate change interactions can modify the location, extent, and/or probability of future events depending on the hazard. The hazard risk assessment table in section 4.2.11 of this plan lists climate change interactions as described by the 2023 ResilientMass Plan.

4.2.9 Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 through 5 as follows:

1 – Highest risk

2 – High risk

3 – Medium risk

4 – Low risk

5 – Lowest risk

This ranking is qualitative and is based, in part, on the local HMP planning team's knowledge of past experiences with each hazard. The size and impacts of a natural hazard can be

unpredictable; However, many of the mitigation strategies currently in place and many of those proposed for implementation in Boylston can be applied to expected natural hazards, regardless of their unpredictability.

4.2.10 Mitigation Strategies

Based on meetings with the local planning team, a selection of mitigation strategies that address the specific hazard is included at the end of each hazard analysis section.

4.2.11 Risk Assessment

Table 12: Hazard Risk Assessment for Each Natural Hazard in Boylston

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Potential Climate Change Effects	Hazard Risk Index Rating
Flooding	Small	Moderate	Minor	Increase extent; increase probability	3
Severe Snowstorms / Ice Storms / Nor'easters	Large	Very High	Minor	Increase extent	2
Hurricanes	Large	Low	Minor	Increase extent; increase probability	4
Severe Thunderstorms / Wind	Small	Moderate	Minor for severe thunderstorms; Limited for severe wind	Unclear	2
Tornadoes	Small	Very Low	Limited	Unclear	4
Wildfire	Medium	Moderate	Limited	Increase extent; increase probability	3
Earthquakes	Large	Very Low	Minor	None	5
Dam Failure	Small	Very Low	Limited	Indirect effects related to flooding	4
Drought	Large	Low	Minor	Increase extent; increase probability	4
Extreme Temperatures	Large	Moderate	Minor	Increase in average temperature; increase in probability of extreme heat	3
Invasive Species	Large	Very High	Critical	Increase in range and severity of invasive species	2

Source: based on Massachusetts Resilient Mass Plan 2023;[41] modified to reflect conditions in Boylston.

[41] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

4.2.12 Natural Hazard Impacts from Changes in Future Conditions

The following table summarizes how changes in future conditions, including changes in population, changes in land use and development, and climate change could potentially change natural hazard impacts on people and vulnerable community assets in Boylston.

Table 14: Natural Hazard Impacts from Changes in Future Conditions

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Flooding	There are no anticipated impacts from changes in population on the impacts of flooding in Boylston.	If commercial and industrial development continues to be built in town and/or the pace of residential development in town increases from its currently low level, the Town will face increased flooding risk (and therefore increased risk from hurricanes and severe thunderstorms) if these developments are built near the 100-year, 500-year, and locally identified flooding hazard areas and/or have large amounts of impervious surface.	The Town may no longer be able to safely develop in areas of town that experience frequent flooding, so the Town may need to change its zoning bylaw to emphasize stormwater resilience. New areas of town may be subject to severe and/or frequent flooding. Dams in town may face more pressure from flooding.
Severe Snowstorms / Ice Storms / Nor'easters	Tahanto Regional Middle School and Boylston Elementary have been identified as vulnerable to winter storms and snow load by CMRPC's GIS analysis; if more people from vulnerable populations frequent these critical infrastructure sites in the case that the Town continues to grow, the Town would be at higher risk in the case of winter snow and ice storms occurring.	If developments with flat roofs are built in town in the future, the Town will face increased snow and ice load risk.	An increase in wintertime rains may lead to more frequent occurrences of hazardous roadway conditions. Snow and ice storms will become less frequent but will become more severe when they occur; this may lead to a need for more sheltering infrastructure in town.

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Hurricanes	There are no anticipated impacts from changes in population on the impacts of hurricanes in Boylston.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from hurricanes.	More intense hurricanes may lead to the need to increase stormwater resilience measures in the Town's zoning bylaw and the need for more sheltering infrastructure in town.
Severe Thunderstorms / Wind	There are no anticipated impacts from changes in population on the impacts of severe thunderstorms/wind in Boylston.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from severe thunderstorms and wind.	More intense severe thunderstorm and wind events may lead to the need to increase stormwater resilience measures in the Town's zoning bylaw and the need for more sheltering infrastructure in town.
Tornadoes	There are no anticipated impacts from changes in population on the impacts of tornadoes in Boylston.	If most developments in town continue to not be built to Zone 1 Design Wind Speed Codes, the Town will continue to face increased risk from tornadoes.	More research needs to be conducted on the anticipated climate change impacts of tornadoes in Boylston, but some studies indicate that the number of days with tornadoes will decrease but the number of tornadoes on these days will increase.[42]

[42] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-56.

Type of Hazard	Impacts from Changes in Population	Impacts from Changes in Land Use and Development	Impacts from Climate Change
Wildfire	There are no anticipated impacts from changes in population on the impacts of wildfire in Boylston.	If commercial and industrial development continues to be built in town and/or the pace of residential development in town increases from its currently low level, the Town will face increased wildfire risk if these developments are built near the densely forested areas of the wildland-urban interface.	The Town may no longer be able to safely develop near densely forested areas in the wildland-urban interface. The Town may have less access to water to fight wildfires due to the increased prevalence of drought. Wildfire-related air quality risks may become more prevalent in town.
Earthquakes	The Boylston Public Library and the Boylston Historical Museum have been identified as vulnerable to earthquakes by CMRPC's GIS analysis; if more adults and young people frequent these sites the Town would be at higher risk in the case of earthquakes occurring.	If many developments in town continue to not be built to the Massachusetts State Building Code's seismic standards, the Town may continue to face increased risk from earthquakes.	There are no anticipated climate change impacts on earthquakes in Northborough.
Dam Failure	There are no anticipated impacts from changes in population on the impacts of dam failure in Boylston.	If new developments in town are built in the potential inundation zones of dams, the Town will face increased risks from potential dam failure.	Dams in town may face more pressure from flooding, and therefore will face a higher risk of overtopping.

Drought	There are no anticipated impacts from changes in population on the impacts of drought in Boylston.	If commercial and industrial development is built in and/or the pace of residential development in town increases from its currently low level in areas of town not served by the public reservoir-fed water system, the Town will face increased risk from wells drying out during drought.	Land in Boylston may become harder or impossible to farm due to more frequent and severe drought. The Town may see an increase in population, with people from parts of the country facing more severe drought impacts moving to the northeast.
Type of Hazard	**Impacts from Changes in Population**	**Impacts from Changes in Land Use and Development**	**Impacts from Climate Change**
Extreme Temperatures	If the Town's population ages, the Town will face increased risk from extreme temperatures, as older adults are more vulnerable to extremely hot and cold conditions.	If the Town does not sufficiently prioritize artificial and/or passive/natural heating and cooling measures, both inside and outside, as the Town's development pattern changes in the future, the Town will face increased risk from extreme temperatures.	Growing seasons, ecosystem types, and migratory patterns in Boylston will shift, and farmers and wildlife may be forced to adapt. More intense extreme heat events will lead to a need for more sheltering infrastructure in town, and residents and businesses in town may need to alter work patterns due to more frequent and severe extreme heat events. Boylston may see an increase in population, with people from parts of the country facing more severe extreme heat impacts moving to the northeast.
Invasive Species	There are no anticipated impacts from changes in population on the impacts of invasive species in Boylston.	If the Town does not sufficiently prioritize the control of invasive species when new developments and changes in land use encroach on wild areas, the Town will face increased risk from invasive species.	Changing climatic conditions, including warming temperatures, may assist invasive species in outcompeting native species in town. Invasive species may take advantage of climatic shocks and disturbances and may be more easily able to damage agricultural crops. Invasive vegetation species may be more easily able to build up as fuel that can increase the Town's wildfire risk.

Boylston has grown steadily in population in recent decades. The Town has a high population of older adults between 50 and 69 years old, with the Town's largest five-year age cohort being adults between 65 and 69 years old. The Town's largest five-year age cohort

of people under 40 years old is adults between 35-39 years old. [43] If many older adults continue to live in town after they retire, the Town's number of retirement-age residents facing increased vulnerability to natural hazard impacts will rise. If a greater number of families with school-aged children choose to live in town in the future, the Town's number of young residents facing increased vulnerability to natural hazards will rise. If the proportion of new construction built in vulnerable areas in town remains the same, the Town's vulnerability to natural hazards will slightly increase over time if the population continues to increase.

[43] "Boylston," Cmrpc.org

4.3 FLOODING

The local HMP planning team identified flooding as one of the most prevalent natural hazards in Boylston. Flooding is generally caused by hurricanes, nor'easters, severe rainstorms, and thunderstorms. Global climate change has the potential to exacerbate the hazards which cause flooding over time by leading to more severe and frequent storm and rainfall events. There are several different types of flood hazards – from stormwater inundation and poor drainage infrastructure to riverine flooding and storm surges to dam failures. Riverine and stormwater flooding both occur in Boylston, though stormwater flooding is more common. Riverine flooding occurs when the surge of water comes from the top of streams, ponds, and rivers. Stormwater flooding occurs when the amount of precipitation in a storm is greater than the volume that the stormwater management system can handle.

LOCATION

Flooding and flood-prone areas in Boylston are closely associated with the 1% (or 100-year) flood areas identified by FEMA. According to a GIS analysis performed by CMRPC, there are 241 parcels in Boylston that are susceptible to 1% (100-year) floods, with 123 of them containing structures. See below for a discussion of previous flood occurrences in town and their locations. Building footprints that overlap with flood zones may be impacted by flooding, especially if residents and building owners do not act to mitigate their personal flood risk. Despite Boylston having numerous localized flooding problems, most of Boylston is upland and built away from rivers and ponds. Boylston's affected area from this hazard, or its location, is considered "small" (less than 10% of the Town). Map 2 in Appendix A illustrates the FEMA FIRM 1% flood zones in town as well as locally identified flooding areas.

The 2023 Worcester County Flood Insurance Study from FEMA lists the following flooding sources which impact Boylston:

- Cold Harbor Brook (flood zone AE)
- Sewall Brook (flood zone AE)[44]

FEMA Flood zones

FEMA creates and manages Flood Insurance Rate Maps (FIRMs) that identify local Special Flood Hazard Areas (SFHAs). These SFHAs are locations that will be inundated by a flood event with a 1% or greater chance of occurring in any year. These areas are also referred to as the base flood, or 100-year / 1% flood zone. These areas are considered at high risk of flooding and have around a 1 in 4 chance of flooding during a 30-year mortgage.

FEMA FIRMs also identify areas with a "moderate" flood risk, defined as locations outside of the 100-year / 1% flood zone that will be inundated by a flood event with between a 1% and a .2% chance of occurring in any year.

[44] Federal Emergency Management Agency, "Flood Insurance Study: Worcester County, Massachusetts (All Jurisdictions)," Map1.msc.fema.gov., FEMA Flood Map Service Center, accessed August 21, 2024, https://map1.msc.fema.gov/mipdata/25027CV001C.pdf?LOC=2cdcfcb8d29a9ba73c75a69614806808.

The 2023 Worcester County FIS also notes that within Worcester County, severe flooding generally occurs as a result of hurricanes or melting snows and spring rains, with more localized flooding also being caused by summer thunderstorms. Heavy thunderstorms can result in rapid runoff and flooding in the downstream portions of small streams in the county. Flood elevations in the county can also be raised by ice jams or by the accumulation of uprooted trees and other debris at bridges.[45]

As of September 2022, the Town of Boylston has no repetitive loss structures as defined by FEMA's NFIP. As defined by the NFIP, a repetitive loss property is any property which the NFIP has paid out two or more flood claims of $1,000 or more for in any given 10-year period since 1978. For more information on repetitive loss properties, see https://www.fema.gov/repetitive-flood-claims-grant-program-fact-sheet. The Town of Boylston has 1 NFIP policy holder in town, and the NFIP insures up to $350,000.00 of property in the Town. NFIP has paid out 5 claims in total to policy holders in Boylston.[46]

EXTENT

The average annual precipitation for the closest weather station to Boylston (which is located at the Worcester Regional Airport) has been 53.64 inches for the period from 2017 to 2023.[47] Water levels in Boylston's rivers, streams, and wetlands rise and fall seasonally and rise during high rainfall events. High water levels in town are typical in spring due to snowmelt and ground thaw; This is the period when flood hazards are normally expected. Low water levels occur in summer due to high evaporation and plant uptake (transpiration). Monthly precipitation levels in town are highly variable, but for the period between 2017 and 2024, Boylston received on average the most precipitation in the months of July, September, October, and December; July was also uncharacteristically rainy in 2021 and 2023, in a deviation from expected norms. At any time, heavy rainfall may create conditions that raise water levels in rivers and streams above bank full stage; this results in overflow which floods adjacent lands.

More severe flooding occurrences in town will lead to more impactful changes in the levels and quality of groundwater. The United States Geological Survey National Groundwater Conditions web application measures groundwater levels by monthly percentiles as compared to historic levels at each particular site.[48] In Massachusetts, the quality of drinking water, including from groundwater sources, is assessed by measuring maximum containment levels (MMCLs) from a number of inorganic and organic chemical, radionuclide, and biological contaminants.[49]

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[45] Ibid.

[46] Community Overview: Boylston, Town of," NFIP Community Information System, accessed July 2, 2024.

[47] The calculation of this average does not incorporate data from the year 2021, as precipitation data for January 2021 is missing for this station.
"Monthly Total Precipitation for Worcester Area, MA (ThreadEx)," Weather.gov, National Oceanic and Atmospheric Association National Weather Service, accessed October 30, 2024, https://www.weather.gov/wrh/Climate?wfo=box.

[48] Lee Stanish, "Introducing the National Groundwater Conditions web application," Waterdata.usgs.gov, United States Geological Survey, accessed April 7, 2025, https://waterdata.usgs.gov/blog/groundwater-levels-app/.

[49] "Drinking Water Standards and Guidelines," Mass.gov, the Massachusetts Department of Environmental Protection,

Based on past records and the knowledge and experience of members of the Boylston Hazard Mitigation Planning Team as well as town residents, the extent of the impact of localized flooding would be "minor" in town.

Previous Occurrences

In addition to experiencing flooding in the floodplains mapped by FEMA as 1% and .2% annual chance flood zones, Boylston periodically experiences minor flooding at isolated locations due to drainage problems or problem culverts. Town staff have reported that flooding events are becoming more frequent in recent years. The following specific flooding locations (mapped in Appendix A) were identified by the Boylston Hazard Mitigation Planning Team:

- Longly Hill Subdivision
- Central Street
- West Temple Street

Most of the flood hazard areas listed here were identified due to known past occurrences in the respective areas. There are other areas with no record of previous flood incidents that could be affected in the future by heavy rain and runoff. Additionally, some areas in town have experienced erosion and stormwater drainage failures. It is important to note that many of these areas are near or along evacuation routes and cause concern in cases of evacuation from affected parts of town.

In the past 10 years, there have been a number of flooding events that have occurred in and around Boylston;[50] major events near and/or in town described as part of the National Oceanic and Atmospheric Administration (NOAA)'s National Centers for Environmental Information (NCEI) database are listed below:

- 7/01/2013 – Flash Flood: A series of shortwaves moved along a stationary boundary to the west of Southern New England, igniting showers and thunderstorms. An atmosphere characterized by low CAPE and decent deep layer shear resulted in showers and thunderstorms producing heavy rain and rotating thunderstorms. One of these storms produced a microburst in Agawam.
- 7/27/2014 – Flash Flood: An upper level disturbance moving out of the Great Lakes initiated showers and thunderstorms over New York and New England. Enough instability was present in the region for some of these storms to become severe, producing strong to damaging winds and at least one funnel cloud.

accessed April 7, 2025, https://www.mass.gov/guides/drinking-water-standards-and-guidelines.

[50] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2024, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Flash+Flood&eventType=%28Z%29+Flood&eventType=%28C%29+Heavy+Rain&beginDate_mm=11&beginDate_dd=01&beginDate_yyyy=2000&endDate_mm=11&endDate_dd=30&endDate_yyyy=2023&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

- 08/15/2015 – Flood: A weak cold front moving through southern New England brought showers and thunderstorms to the region. These storms produced hail and damaging winds as well as some poor drainage street flooding.
- 7/22/2016 – Flood: A cold front moved through southern New England and when coupled with the existing heat and humidity, resulted in showers and thunderstorms developing over much of the area late in the day and continuing into the evening and overnight hours. Minor street flooding occurred on Route 135 in Westborough.
- 10/21/2016 – Flash Flood: Low pressure tracking toward southern New England tapped into a plume of tropical moisture and produced torrential rainfall over parts of central and northeast Massachusetts in the matter of a few hours. This resulted in prolific urban flash flooding in the greater Worcester area and significant urban flooding in greater Boston. The highest single rainfall total from this event was within the City of Worcester, where a Skywarn Spotter reported 5.24 inches of rainfall.
- 06/27/2017 – Flood: A disturbance at mid-levels in the atmosphere moved from the Great Lakes across New England during the afternoon and evening. This along with daytime heating through partly sunny skies allowed afternoon and evening thunderstorms to develop.
- 10/24/2017 – Flood: Low pressure moved north through the Great Lakes. This swung a cold front slowly east into Southern New England on October 25. The front stalled over the region during the 25th before moving off to the east on the 26th. Strong low level winds brought a flow of tropical moisture ahead of the front. The strong winds aloft were brought to the surface in damaging wind gusts, with speeds reaching 45 to 55 mph. The tropical moisture was converted to heavy downpours, with storm rainfall totals ranging from 2 inches to 6 1/2 inches. This brought widespread urban and poor drainage flooding. State Route 9 at Saybrook Road in Shrewsbury was flooded.
- 7/17/2018 – Flash Flood: A cold front moved east from the Great Lakes, crossing Massachusetts during the night of the 17th. The thunderstorms brought strong wind gusts and wind damage during the afternoon and evening. Thunderstorms also brought downpours in Western, Central, and Northeast Massachusetts. Two to four inches of rain fell from Westfield through Worcester to Boston.
- 08/11/2018 – Flood: A cold front stalled over Southern New England on the 11th. Low pressure from the Midwest then moved slowly east along the front. The weather system drew upon warm and very humid air to create showers with local downpours, resulting in rainfall amounts of two to five inches in Northern Massachusetts on August 11th and 12th. An exceptionally powerful downpour left 8.15 inches in the city of Lynn.
- 8/23/2020 – Flash Flood: Diurnally driven thunderstorms brought wind damage, hail, and some flooding to mainly western and central Massachusetts.

- 9/11/2023 – Flash Flood: A deamplifying mid-level shortwave with dewpoints in the 70s and decent instability brought scattered thunderstorms and widespread flash flooding to Massachusetts and Rhode Island. There were many streets closed, many cars stranded in flood waters, and several houses with flooded basements or first floors.

Probability of Future Events

In addition, minor flooding related to changes in groundwater was identified as affecting the Town, as basement flooding has been experienced by town residents who responded to the survey. The 2023 ResilientMass Plan describes how flooding resulting from changes in groundwater can impact communities in Massachusetts.[51]

Based upon previous data, there is a "moderate" probability (a 10% to 40% chance) of localized flooding occurring in Boylston in the next year. This represents a slight increase as compared to the last HMP update in town due to increased precipitation driven by climate change.

Impact

The Town faces a minor impact from flooding, with less than 10% of properties in the affected area of town likely to be damaged or destroyed by a 1% annual chance flooding event. Based on the HAZUS analysis described below, a .2% annual chance flood event in Boylston is unlikely to destroy any buildings, but such a .2% annual chance flood event could displace residents and come at a significant economic cost.

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. The HAZUS software was used to model potential damage to the community from a .2% annual chance flood event, assuming a 1 square mile data resolution.

Table 13: HAZUS Potential Damages to Boylston from .2% Annual Chance Flood Event

.2% Annual Chance Flood Event	
Building Characteristics	
Estimated total number of buildings in Boylston	1,202
Estimated total building replacement value (2024 $)	$ 762,074,000.00
Building Damages	
# of buildings sustaining minor damage (1-10%)	1

[51] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

# of buildings sustaining moderate damage (11-40%)	0
# of buildings sustaining severe damage (41-50%)	0
# of buildings destroyed	0
Population Needs	
# of households displaced	27
# of people seeking public shelter	19
Value of Damages	
Total property damage (buildings and content)	$3,340,000.00
Total losses due to business interruption	$ 3,020,000.00
Total Economic loss	**$ 6,360,000.00**

Though there are no recorded instances of a flood event of this size in Boylston, this model shows a reasonable "worst case scenario" that would help planners and emergency personnel evaluate the impacts of flooding that might be more likely in the future as the region experiences a period of more intense and frequent storms. For more information on the HAZUS-MH software, go to http://www.fema.gov/hazus-software.

EXPOSURE

Certain features of Boylston's infrastructure, society, and environment may face more flooding, or may be disproportionately impacted by it, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Low-lying areas, including but not limited to the FEMA 1% and .2% annual chance flood zones;
- Specific locations with undersized or outdated storm water infrastructure that cannot handle sudden surges in precipitation;
- Residents who may have trouble evacuating from their residences due to age, health concerns, or lack of a vehicle;

- Flood-prone municipal buildings and critical infrastructure that are subject to flooding and potential contamination from flood waters;
- Septic systems, especially in flood prone areas or locations with high water tables;
- Aquatic ecosystems, which may suffer from erosion, eutrophication, or sedimentation due to stormwater;
- The municipal financial burden of infrastructure maintenance and upgrades needed to address flooding;
- Highway department staff, who sometimes must unclog storm drains during extreme weather events. Due to limited staffing, highway department employees often have to go out alone, making safety a concern; and
- Sides of roadways, which may be eroded due to excessive rainfall. Lack of funding to make road repairs may compound this issue.

Potential Climate Change Effects

According to the 2023 State Hazard Mitigation and Climate Adaptation Plan, climate change effects coupled with changes in development and population density can increase the risk of flooding from precipitation. As noted earlier in this plan, the Central Region is most likely to be impacted by extremes in precipitation in the following ways:

- Climate change is projected to increase the variability of precipitation events in any given year, including the potential for extreme precipitation events. Instances of inland flooding, river overflows, and pressure on dams may result; and
- Projected changes in precipitation patterns in all seasons, as well as higher frequency of extreme weather (including hurricanes and nor'easters), will change patterns of river flow and increase the frequency and severity of inland riverine flooding.

According to the 2023 ResilientMass Plan, climate change is predicted to affect groundwater levels; Sea level rise, extreme temperature events, and changes in precipitation patterns will all affect groundwater conditions and may increase the risk in town of minor basement flooding.[52]

In summary, climate change is likely to increase the extent and probability of future flood events in Boylston, which will make it more likely for multiple storms in a short duration to cause cumulative damage; These impacts can affect land use and development by causing people to no longer be able to develop in parts of town that flood frequently and causing the Town's government to zone for increased stormwater resilience.

Vulnerability

Based on this analysis and the assessment of the Boylston Local HMP Planning Team, Boylston faces a hazard index rating of "3 – medium risk" from flooding. The Town's stormwater infrastructure is aging and undersized, and there has recently been an increase in the number of localized flooding events around this faulty infrastructure; localized flooding events have

[52] Ibid.

occurred downhill of the Longly Hill subdivision where this subdivision meets Styles Road as well as at multiple locations along Central Street. Also, a notable washout has occurred at West Temple Street. The Town's location along the Wachusett Reservoir is also makes it susceptible to potential flood impacts; this susceptibility will be discussed further in the dam failure section of this plan.

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to flooding through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to flooding. The local HMP planning team identified the following strategies that could be used to reduce the threat of flooding in Boylston:

- Install a culvert on West Temple Street to prevent washouts in the future.
- Complete and administer a town-wide culvert plan for replacing aging stormwater infrastructure with nature-based solutions.

4.4 Severe Snowstorms / Ice Storms / Nor'easters

Severe winter storms can pose a significant risk to property and human life. Severe snowstorms and ice storms can involve rain, freezing rain, ice, snow, cold temperatures, and wind. Heavy snowfall and extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold event. Winter storms can result in flooding, storm surges, closed highways, blocked roads, downed power lines, and hypothermia among residents. A northeast coastal storm, known as a nor'easter, is typically a large counterclockwise wind circulation around a low-pressure center; nor'easters often result in heavy snow, high winds, and rain.

Location

The entire Town of Boylston is susceptible to severe snowstorms, ice storms, and nor'easters; this means that the location of occurrence of severe snowstorms in town is "large." Because these storms occur regionally, the entire town is equally vulnerable to them.

Extent

The Northeast Snowfall Impact Scale (NESIS) characterizes and ranks high-impact snowstorms in the northeast USA. These storms have large areas of 10-inch or greater snowfall accumulations. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus, NESIS gives an indication of a storm's societal impacts.

NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the storm's path. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one (for smaller storms) to over ten (for extreme storms). The raw score is then classified into one of the five NESIS categories. The largest NESIS values are given to storms producing heavy snowfall over large areas which include major metropolitan centers.

Table 14: Northeast Snowfall Impact Scale Categories[53]

Category	NESIS Value	Description
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

[53] National Centers for Environmental Information, "The Northeast Snowfall Impact Scale (NESIS)," Ncei.noaa.gov, National Oceanic and Atmospheric Association, accessed June 12, 2024, https://www.ncei.noaa.gov/access/monitoring/rsi/nesis.

The Sperry-Piltz Ice Accumulation Index rates approaching ice storms based on the potential damage they are projected to cause, their projected footprint, and their predicted total ice accumulation.

Table 17: The Sperry-Piltz Ice Accumulation Index[54]

Ice Damage Index	Damage and Impact Descriptions
0	Minimal Risk of Damage to exposed utility systems; no alerts or advisories needed for crews, few outages
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

The Miller classification is a system used to classify nor'easters.[55] The types of storm classifications under the Miller classification are listed below.

Table 18: The Miller Classification for Nor'easters

Miller Classification	Description
Miller A / Storm Type A	Miller A, or Storm Type A, nor'easters form in the southeastern USA or along the Gulf of Mexico and intensify as they move north until turning east to the Atlantic Ocean. They are most impactful the mid-Atlantic region but can also lead to major snow events in New England if they are strong enough.

[54] "What is the Sperry-Piltz Ice Accumulation Index?," Spia-index.com, SPIA Index, accessed March 18, 2025, https://spia-index.com/

[55] Mike Priante, "The Miller Classification," Weatherworksinc.com, WeatherWorks, December 4, 2020, https://weatherworksinc.com/news/Miller-A-vs-Miller-B; "Mid-Atlantic Winter Storm Patterns," Glenallenweather.com, Glen Allen, VA Weather, accessed March 20, 2025, https://glenallenweather.com/alink/18snow/stormtypes.htm.

Miller B / Storm Type B	Miller B, or Type B, nor'easters form in the midwestern USA and move slightly southeast to the southern mid-Atlantic region until they combine with / transfer energy to a storm originating along the coast in this region. This combined storm then travels north, impacting inland and coastal areas of the northeast USA with major snow events, before turning east to the Atlantic Ocean.
Miller C / Storm Type C	Miller C, or Type C, nor'easters are similar to Miller B nor'easters but are stronger and tend to be more impactful in the midwestern USA and southern New England.
Miller D / Storm Type D	Miller D, or Type D, nor'easters are similar to Miller B nor'easters but are weaker and tend to have more limited impacts in the southern mid-Atlantic region.
Miller E / Storm Type E	Miller E, or Type E, nor'easters are similar to Miller B nor'easters but form further to the south and tend to have a long band of area they are highly impactful in which stretches from the northern part of the inland southeastern states, through the mid-Atlantic region, and to inland New England.

Due to the location of all of these storms being regionwide, similarly the extent of Snow Storms, Ice Storms and Nor'Easters extends across the region, and is dependent on the type of storm as classified above.

Previous Occurrences

Based on data available from the National Oceanic and Atmospheric Administration, there have been 88 high-impact snowstorms since 1956 that have affected the northeast USA. Of these, approximately 35 storms resulted in at least 10 inches of snow fall in Boylston. These storms are listed in the table below:[56]

Table 16: High-Impact Snowstorms with Snow Falls in Boylston of at Least 10 Inches Since 1958

Start Date	NESIS Value	NESIS Category	NESIS Classification
1/28/2022	1.73	1	Notable
1/30/2021	4.93	3	Major
12/14/2020	3.21	2	Significant
3/03/2019	1.29	1	Notable
3/11/2018	3.16	2	Significant
1/3/2018	2.27	1	Notable
3/12/2017	5.03	3	Major
2/8/2015	1.32	1	Notable
1/29/2015	5.42	3	Major

[56] Ibid.

Start Date	NESIS Value	NESIS Category	NESIS Classification
1/25/2015	2.62	2	Significant
3/4/2013	3.05	2	Significant
2/7/2013	4.35	3	Major
1/26/2011	2.17	1	Notable
1/9/2011	5.31	3	Major
12/24/2010	4.92	3	Major
12/18/2009	3.99	2	Significant
2/12/2006	4.10	3	Major
1/21/2005	6.80	4	Crippling
2/15/2003	7.50	4	Crippling
3/31/1997	2.29	1	Notable
2/8/1994	5.39	3	Major
3/12/1993	13.2	5	Extreme
2/10/1983	6.25	4	Crippling
4/6/1982	3.35	2	Significant
2/5/1978	5.78	3	Major
1/19/1978	6.53	4	Crippling
2/18/1972	4.77	3	Major
2/22/1969	4.29	3	Major
2/8/1969	3.51	2	Significant
2/5/1967	3.50	2	Significant
2/2/1961	7.06	4	Crippling
1/18/1961	4.04	3	Major
12/11/1960	4.53	3	Major
3/2/1960	8.77	4	Crippling
2/14/1958	6.25	4	Crippling

Additionally, the National Centers for Environmental Information (NCEI) database notes the following instances of heavy snowfall in Worcester County:[57]

- 01/07/2024 – Heavy Snow: A strong storm moved up the east coast passing near the 70/40 benchmark brought heavy snow to southern New England beginning late Monday night and continuing on Sunday. The first round of heavy snow fell overnight followed by a lull in the snow and mixing with rain Sunday morning. Comma head snow then filled back into eastern MA and RI bringing moderate to heavy snow Sunday afternoon and evening. Snow amounts ranged from

[57] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2024, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Heavy+Snow&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2020&endDate_mm=06&endDate_dd=30&endDate_yyyy=2024&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

2 to 18 inches.

- 12/16/2020 – Heavy Snow: A storm system produced heavy snow, strong to damaging winds, and minor coastal flooding in southern New England. This was a tough storm to forecast. Although it was not deep low pressure and although it passed just south of the 40N/70W benchmark, its precipitation shield was expansive because of a broad 700 mb low over southeast New England, abundant moisture, and a very cold air mass in place. By far, the heaviest snow fell to the north (Laconia, NH) and west (Binghamton, NY), where more than 3 feet fell. But amounts ranged from 10 to 20 inches across much of southern New England. There was some minor coastal flooding at the time of high tide and also a flash freeze in eastern Massachusetts as the storm pulled away to the northeast. Heavy snow in northern Worcester County generally ranged from 9 to 15 inches. Some specific amounts included 15.1 inches in Lunenburg, 14.0 inches in Winchendon, 12.9 inches in Leicester, 12.8 inches in Fitchburg, 11.5 inches in Hubbardston, 11.0 in Ashburnham, 10.2 inches in Boylston. Winds generally were gusting to 25 to 35 mph.
- 03/23/2020 – Heavy Snow: Low pressure moved from south of Long Island to south of Nantucket late on March 23rd and then to Nova Scotia on the morning of March 24th. Snow changed to rain in eastern Massachusetts, but a band of heavy snow set up in the higher elevation areas in the east slopes of the Berkshires and in the northern Worcester Hills. Heavy snow totals ranged from 5.5 inches to 8.0 inches. The highest was a public report in Royalston of 8.0 inches. Other reports included an amateur radio observer in Winchendon with 7.5 inches; a Public report of 7.2 inches in Fitchburg; a Trained Spotter report of 6.4 inches in Lunenburg; a Trained Spotter report of 5.8 inches in Boylston; an amateur radio report of 5.5 inches in Ashburnham; and a Public report of 5.5 inches in Sterling.
- 11/15/2018 – Heavy Snow: An early-season nor'easter moved from the Mid-Atlantic coast to southeastern Massachusetts on the 15th and away from the region on the 16th. A quick thump of heavy snow occurred on the front end of the storm, with most accumulations over with by or shortly after midnight on the 16th. Snowfall amounts ranged from only a couple of inches in southeasternmost sections of MA to 8 to 10 inches in western and northern MA. Mainly rain occurred at Boston's Logan Airport. Strong east to northeast winds battered coastal areas ahead of the low pressure system. Based on numerous reports from CoCoRaHS, Co-Op, trained spotter, and amateur radio observers, snowfall ranged from 7 to 10 inches in northern Worcester County. Here are some sample amounts: Lunenburg had 8.5 inches, Westborough, Fitchburg, Clinton, and Boylston all had 9.0 inches; and the highest total was 10.0 inches in Princeton.

The local HMP team in Boylston noted that the two worst heavy snowfall events in recent memory in town occurred in 2009 and 2011; both of these events led to major damages, trees down, and extended power outages in town.

The 2023 ResilientMass Plan notes that, on average, Massachusetts experiences one to two nor'easters per year.[58] Between 2013 and 2022, there were 63 heavy snow days, 12 blizzard days, and two ice storm days in Massachusetts.

Probability of Future Events

Based upon the availability of records for Worcester County, the likelihood that severe snowstorm, ice storm, or nor'easter will affect Boylston in any given year is "very high" (70% or greater).

The 2023 ResilientMass Plan notes that, on average, Massachusetts experiences one to two nor'easters per year. Between 2013 and 2022, there were 63 heavy snow days, 12 blizzard days, and two ice storm days in Massachusetts.

Impact

Boylston faces a "minor" impact, with less than 10% of total property in affected areas damaged, from snowstorms, ice storms, and nor'easters. The weight from multiple snowfall events can test the load ratings of building roofs and can potentially cause significant damage. Multiple freeze-thaw cycles can also create large amounts of ice and can lead to even heavier, even more dangerous roof loads.

Other impacts from snowstorms and ice storms include:

- Tree damage and fallen branches that cause utility line damage and roadway blockages;
- Disrupted power and phone service;
- Unsafe roadways and increased traffic accidents;
- Infrastructure and other property also being at risk from severe winter storms and the associated flooding that can occur following heavy snow melt;
- Damage to telecommunications structures; and
- Reduced ability of emergency officials to respond promptly to medical emergencies and fires.

The local HMP planning team in Boylston noted snow drift concerns near sections of Route 140 and Route 70. MassDOT has installed snow fences at these locations, and this has helped with these snow drift issues, but snow drifts do blow down from Tower Hill and across Wachusett Reservoir in town. The local HMP planning team also noted that Boylston tends to get more snow than surrounding towns due to its higher elevation.

Exposure

[58] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

Certain features within Boylston's infrastructure, society, and environment may face more exposure to severe snowstorms, ice storms, and nor'easters, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3 of this plan. These features include:

- Elderly residents, who may have more difficulty clearing snow and walking on icy or snow-covered sidewalks. Elderly residents may also be more vulnerable to extremely low temperatures;
- Households with low or fixed incomes, who may be less able to afford sufficient heating or home improvements to improve energy efficiency and insulation;
- Renters, who may have less control over their living situation and indoor environment than homeowners;
- Public safety, utility, and highway department workers, who are tasked with responding to emergency calls, keeping the heat and power on, and keeping the streets clear during winter storms.

The Boylston Local Hazard Mitigation Planning Team noted that the following key buildings within town are susceptible to snow loads on their flat roofs:

- Boylston Elementary School,
- Tahanto Middle School, and
- Warehouses built along Shrewsbury Street and Pine Hill Drive.

The Town's elementary school in particular was indicated by the local HMP planning team as having experienced roof leaks after major snowfall events. As this building is also the Town's emergency shelter, this issue represents a unique exposure to snowfall hazards that the Town has. As of the writing of this plan, the Town has invested in mitigating the roof through structural improvements and hopes to see a reduction in damage to the school from roof leaks during this upcoming winter.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, sea level rise, warming ocean temperatures, and changing atmospheric circulation patterns are likely to increase the frequency and severity of winter storms. Warmer temperatures indicate that more precipitation will fall as rain rather than snow throughout the 21st century. The result of this will be fewer overall snowstorms; however, the snowstorms that do occur will likely be worse. Increased wintertime rain also creates a greater risk for wintery mix, sleet, and ice storms; in addition, it will cause hazardous roadway conditions, as temperature drops overnight will cause transportation infrastructure to ice over if mitigation measures are not put in place.

In summary, climate change is likely to increase the extent and probability of future severe snowstorms, ice storms, and nor'easter events in Boylston. This may have societal impacts; more frequent severe winter storms may change land use and development protocols, as

more homes and community buildings may need to have greater sheltering infrastructure to prepare for heavy snowfall. The local HMP planning team in town noted that extreme snowfall events are high on their list of concerns.

VULNERABILITY

Based on the above assessment, Boylston has a hazard index rating of "2 – high risk" from snowstorms, ice storms, and nor'easters. Snowstorms, ice storms, nor'easters, and other forms of winter precipitation are a frequent occurrence in Massachusetts, and they are expected to only become more frequent over time. Additionally, the expected increase in "wintery-mix" precipitation may lead to increased roadway hazards, as standing water freezing in overnight temperatures creates hazardous road conditions for travelers and responders. Finally, the local hazard team noted that due to their elevation they are at increased risk for larger and more frequent snow events.

MITIGATION STRATEGIES

The Town of Boylston is currently able to effectively respond to severe snowstorms, ice storms, and nor'easters through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. Given that Boylston, as well as other towns in the region, experience snowstorms frequently, local and state officials as well as emergency response personnel amply prepare for major snow events. However, there are numerous opportunities to expand upon the Town's existing capabilities to mitigate and respond to severe snowstorms, ice storms, and nor'easters. The local HMP planning team identified the following strategies that could be used to reduce the threat of snowstorms in Boylston:

- Address snow load issue on Boylston Elementary school, leaks every time after big rainfall or snowfall.
- Investigate increasing municipal resilience through generating power with municipally owned green energy technology, potentially through utilizing public-private partnerships with warehouse developers.
- Enhance road information coordination as well as planning for snow removal.

4.5 HURRICANES

Hurricanes begin as tropical storms that form over warm ocean waters in the Atlantic Ocean off the west coast of Africa or the Pacific Ocean. These storms form as heated, moist air is drawn up into the atmosphere and begins circulating clockwise or counterclockwise, depending on which hemisphere they are in. Tropical storms become hurricanes when their sustained winds exceed 74 miles per hour. The primary damaging forces associated with these storms are high-level sustained winds and heavy precipitation. Hurricane winds can reach speeds of up to 200 miles per hour and can grow to 500 miles in diameter. The official hurricane season starts on June 1st. In New England, hurricanes generally occur in August, September, and the first half of October due to the time required for the waters south of Long Island to warm enough to sustain hurricane activity this far north. Hurricanes in the region can result in flooding and wind damage to structures and above-ground utilities.[59]

LOCATION

Because of this hazard's regional nature, all of Boylston is at risk from hurricanes, meaning the location of occurrence is "large." Ridgetops in town are more susceptible to wind damage. Areas susceptible to flooding are also likely to be affected by heavy rainfall from hurricanes.

EXTENT

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, is given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour, the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

Table 16: The Saffir-Simpson Scale (1)[60]

Category	Maximum Sustained Wind Speed
1	74–95 mph: very dangerous winds will produce some damage
2	96–110 mph: extremely dangerous winds will cause extensive damage
3	111–129 mph: devastating damage will occur
4	130–156 mph: catastrophic damage will occur
5	157 + mph: catastrophic damage will occur

[59] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[60] National Hurricane Center and Central Pacific Hurricane Center, "Saffir-Simpson Hurricane Wind Scale," National Oceanic and Atmospheric Association, accessed June 10, 2024, https://www.nhc.noaa.gov/aboutsshws.php.

Previous Occurrences

Hurricanes which have affected the region near Boylston are shown in the following table:[61]

Table 17: Hurricanes Which Have Affected the Region Near Boylston

Storm Name	Year	Saffir/Simpson Category (when reached MA)
Belle	1976	Tropical Storm
Gloria	1985	1
Henri	1985	Tropical Storm
Chris	1988	Minor Storm
Bob	1991	2
Beryl	1994	Tropical Storm
Bertha	1996	Tropical Storm
Floyd	1999	Tropical Storm
Gordon	2000	Minor Storm
Hermine	2004	Tropical Storm
Barry	2007	Minor Storm
Hanna	2008	Minor Storm
Irene	2011	Tropical Storm
Sandy	2012	Extratropical Storm, made landfall south of MA but still had impacts in the state
Andrea	2013	Minor Storm
Elsa	2021	Tropical Storm
Fred	2021	Extratropical Storm
Henri	2021	Tropical Storm/Depression

Probability of Future Events

Boylston's inland location in central Massachusetts reduces the risk to in town of extremely high winds that are associated with hurricanes, although the Town can still experience some high wind events. Based upon past occurrences, it is reasonable to say that there is a "low" probability (1% to 10% in any given year) of hurricanes in Boylston. However, climate change is projected to result in more severe weather, including increased occurrence of hurricanes and tropical storms. Because of this, the occurrence of hurricanes will likely increase in town in the future.

[61] "Historical Hurricane Tracks," Coast.noaa.gov, National Oceanic and Atmospheric Administration, accessed September 17, 2024, https://coast.noaa.gov/hurricanes/#map=6.02/42.065/-71.688&search=eyJzZWFyY2hTdHJpbmciOiJNYXNzYWNodXNldHRzLCBVU0EiLCJzZWFyY2hUeXBlIjoiZ2VvY29kZWQiLCJvc21JRCI6IjYxMzE1IiwiY2F0ZWdvcmllcyI6WyJlNSIsIkg0IiwiSDMiLCJlMiIsIkgxIiwiVFMiLCJURCIsIkVUll0sInlIYXJzIjpbXSwibW9udGhzIjpbXSwiZW5zbyI6W10sInByZXNzdXJlIjp7InJhbmdlIjpbMCwxMDMwXSwiaW5jbHVkZVVua25vd25QcmVzc3VyZSI6dHJ1ZX0sImJ1ZmZlciI6NjAsImJ1ZmZlcIVuaXQiOiIsiTmF1dGljYWwgTWIsZXMiXSwic29ydFNlbGVjdGlvbiI6eyJ2YWx1ZSI6InllYXJzX25Id2VzdCIsImxhYmVsIjoiWWVhciAoTmV3ZXN0KSJ9LCJhcHBseVRvQU9JIjp0cnVlLCJpc1N0b3JtTGFiZWxzVmlzaWJsZSI6dHJ1ZX0=.

IMPACT

Descriptions of damages that could occur due to hurricanes of different storm categories of the Saffir-Simpson scale are shown below:

Table 18: The Saffir-Simpson Scale (2)

Storm Category	Damage Level	Description of Damages	Wind Speed (MPH)
1	MINIMAL Very dangerous winds will produce some damage	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95
2	MODERATE Extremely dangerous winds will cause extensive damage	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
3	EXTENSIVE Devastating damage will occur	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
4	EXTREME Catastrophic damage will occur	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to the lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA to estimate losses due to a variety of natural hazards. The HAZUS software was used to model potential damage to Boylston from 1% and 0.2% hurricane events (storms that are 1% and 0.2% likely to happen each year, and roughly equivalent to Category 1 and Category 2 hurricanes,

respectively). The damage caused by these hypothetical storms were modeled as if the storm track passed directly through the Town, bringing the strongest winds and greatest damage potential.

Table 19: HAZUS Potential Damages to Boylston from 1%/0.2% Annual Chance Hurricane Events

	1% storm (89 mph winds)	0.2% storm (102-105 mph winds)
Building Characteristics		
Estimated total number of buildings	1,202	
Estimated total building replacement value (2014 $)	$ 762,072,000.00	
Building Damages		
# of buildings sustaining minor damage	50	192
# of buildings sustaining moderate damage	4	31
# of buildings sustaining severe damage	0	2
# of buildings destroyed	0	1
Population Needs		
# of households displaced	1	9
# of people seeking public shelter	0	4
Debris		
Building debris generated (tons)	227	921
Tree debris generated (tons)	10,742	17,693

# of truckloads to clear building debris	9	37
Value of Damages		
Total property damage (buildings and content)	$ 5,784,600.00	$17,687,040.00
Total losses due to business interruption	$ 206,240.00	$1,017,260.00

Though there are no recorded instances of a hurricane equivalent to a 0.2% storm passing through Massachusetts, this model was included in this plan in order to present a reasonable "worst case scenario" that can help planners and emergency personnel evaluate the impacts of storms that might be more likely in the future, as more intense and frequent storms become more common. For more information on the HAZUS-MH software, go to http://www.fema.gov/hazus-software.

Boylston faces a "minor" impact from hurricanes, with 10% or less of property in the affected area of town being damaged or destroyed in any given hurricane instance.

Exposure

Certain features within Boylston's infrastructure, society, and environment may face more exposure to hurricanes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- The electrical grid, which is vulnerable to outages from trees falling across power lines. National Grid proactively trims trees in their right of way, but outages are still common.
- Municipal buildings have been impacted by high winds in the past. Damage to these buildings could impact critical town functions and distract people from other essential emergency response and recovery activities; and
- Public safety, utility, and highway department workers, who are tasked with responding to emergency calls and keeping the streets clear during hurricanes.

In addition to high winds, hurricanes can also bring heavy precipitation and cause flooding. The vulnerable features identified in the flooding section above also apply to hurricanes.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, there are two major ways that climate change influences hurricanes and tropical storms:

- Warming oceans will provide more energy for hurricanes and tropical storms, which could lead to more intense or potentially damaging storms in the future, and larger storms could result in more storms that are likely to impact Massachusetts; and
- Warmer air can hold more water vapor and will enable greater precipitation rates during future storms.

In summary, climate change is likely to increase the frequency and extent of hurricanes in Boylston.

VULNERABILITY

Based on the above analysis, Boylston has a hazard index rating of "4 – low risk" from hurricanes. Its location and elevation decrease the risk of hurricane force winds and rains, though it does not remove them entirely. Historically, by the time a storm has arrived in Boylston, it has been typically downgraded to a tropical storm or tropical depression; however, climate change may increase the severity of these types of storms in town in the future.

MITIGATION STRATEGIES

The Town of Boylston is currently able to effectively respond to hurricanes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities to expand upon the Town's existing capabilities to mitigate and respond to hurricanes. The local HMP planning team identified the following strategies that could be used to reduce the threat of hurricanes in Boylston:

- Maintain vegetative debris program, trimming brush and growth away from roads and clearing growth impact flow away from stormwater infrastructure.
- Enhance the Town's participation in and coordination and planning relating to regional disaster and emergency response training and drills.

4.6 Severe Thunderstorms / Wind / Tornadoes

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud; thunderstorms usually produce gusty winds as well as heavy rain and sometimes generate hail. Effective January 5, 2010, the National Weather Service (NWS) modified the hail size criterion to classify a thunderstorm as 'severe' when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado.

Every thunderstorm has an updraft (rising air) and a downdraft (sinking air). Sometimes strong downdrafts, known as downbursts, can cause tremendous wind damage that is similar to that of a tornado. A small (less than 2.5-mile path) downburst is known as a "microburst", and a larger downburst is called a "macro-burst." An organized, fast-moving line of microbursts traveling across large areas is known as a "derecho" – these occasionally occur in Massachusetts. The strongest downburst ever recorded was a 175 mph downburst in North Carolina. Downburst winds exceeding 100 mph have been measured in Massachusetts.[62]

Wind is air in motion relative to the surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (for sustained winds of 31 to 39 mph for at least 1 hour and for any gusts of 46 to 57 mph) or a High Wind Warning (for sustained winds 40+ mph and for any gusts 58+ mph). For non-tropical events over water, the NWS issues a small craft advisory (for sustained winds of 25 to 33 knots), a gale warning (for sustained winds of 34 to 47 knots), a storm warning (for sustained winds of 48 to 63 knots), or a hurricane force wind warning (for sustained winds of 64+ knots). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph, and a hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph or greater. High winds are a hazard for the boating, shipping, and aviation industry sectors. They can also cause scattered power outages, downed trees and/or power lines, and damage to parts of structures like roofs and windows.

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along paths that range from a few dozen yards to over a mile in width. The path of a tornado can be unpredictable because tornadoes can stall or change direction abruptly. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property. In Massachusetts, tornadoes have occurred most frequently in the Connecticut River Valley and in western Worcester County, with Boylston approximately 40 miles east of the zone of most frequent past occurrences.

Location

As per the 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan, the entire Town is at risk of high winds, severe thunderstorms, and tornadoes. This plan identifies

[62] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

Boylston and the communities surrounding it as having a moderate frequency of tornado occurrence within the Massachusetts context. However, the area affected by thunderstorms, wind, or tornadoes in town is "small," with less than 10 percent of the Town generally affected.

EXTENT

An average thunderstorm is 15 miles across and lasts for 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. Thunderstorms can cause hail, wind, lightning damage, and flooding.

High wind is linked to a number of other hazards, including hurricanes and winter storms, in addition to thunderstorms and tornadoes. High winds can cause damage to structures and trees and can also increase the risk of wildfire.

Tornadoes are measured using the Enhanced Fujita Scale, which is shown below with the following categories and corresponding descriptions of damage:

Table 20: Enhanced Fujita Scale Levels and Descriptions of Damage[63]

EF-Scale Number	Intensity Phrase	3-Second Gust (MPH)	Type of Damage Done
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damage to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

[63] National Weather Service, "The Enhanced Fujita Scale (EF Scale),"Weather.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.weather.gov/oun/efscale.

Table 21: Extent Scale for Hail[64]

Hail Size (in.)	Object Analog Reported
.50	Marble, moth ball
.75	Penny
.88	Nickel
1.00	Quarter
1.25	Half Dollar
1.50	Walnut, ping pong
1.75	Golf ball
2.0	Hen egg
2.5	Tennis ball
2.75	Baseball
3.00	Tea cup
4.00	Grapefruit
4.50	Softball

Previous Occurrences

Because thunderstorms and wind affect Boylston regularly, there is not a comprehensive record available of all thunderstorm and wind events which have affected the Town. As per the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

In Worcester County, there have been several F1 tornadoes over the years; Tornadoes with a rating of 3 or above and tornadoes resulting in a death or injury, or significant property damage, are listed below.[65]

- In 1953, an F4 tornado struck Worcester. The event resulted in at least 90 fatalities and more than 1,200 injuries. There was extensive property damage. On the same date, an F3 tornado began in the Town of Sutton.
- In 1981 an F3 tornado struck Westminster, resulting in 3 injuries and very little reported property damage.
- In June 2011, an F3 tornado struck Massachusetts. Few deaths were reported, all in Hampden County. No deaths were reported in Worcester County.

The local HMP planning team in Boylston noted that the Town experienced a microburst storm behind

[64] Storm Prediction Center, "Converting Traditional Hail Size Descriptions," Spc.noaa.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.spc.noaa.gov/misc/tables/hailsize.htm.

[65] "Tornado Paths," Arcgis.com, ESRI, accessed March 13, 2025, https://www.arcgis.com/apps/View/index.html?appid=01672085b139432e8fe1296a743f67d7.

Tahanto Middle School in 1986 which downed trees behind this school.

In the last 6 years, there has only been one small tornado that has affected communities near Boylston:

2018 Tornado (East Douglas, Uxbridge, Upton)

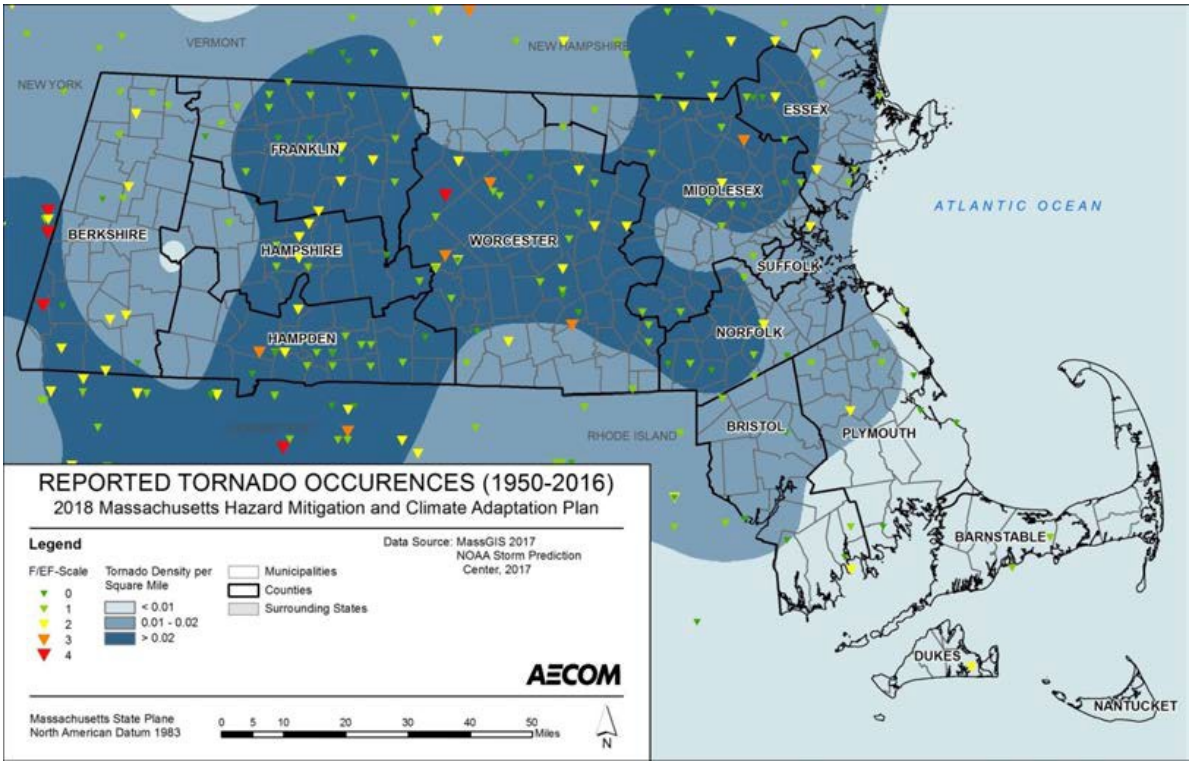


Figure 1: Density of Reported Tornados per Square Mile (1950-2016)[66]

[66] "Massachusetts State Hazard Mitigation and Climate Adaptation Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, September 2018, https://www.mass.gov/doc/state-hazard-mitigation-and-climate-adaptation-plan/download.



Image 1: Above - NASA released this image of part of the 39-mile-long tornado track through south-central Mass. The image was captured on June 5, 2011 by the Landsat 5 satellite.

Thunderstorm occurrences are more frequent in Massachusetts than occurrences of tornados, and thunderstorms have the potential to produce tornadoes. Supercells are the type of storm that most commonly produces tornadoes; they are severe, long-lived thunderstorms. Approximately 20 percent of supercells produce tornadoes. In Boylston there have been several severe thunderstorm/wind occurrences:[67]

- 05/04/2010 – Thunderstorm Wind: An upper level disturbance combined with a weakening cold front to initiate showers and thunderstorms across southern New England. These storms produced damaging winds, downing trees, wires, and power poles throughout the area. Multiple trees in Clinton and a large branch in Boylston were downed by thunderstorm winds. In addition, an amateur radio operator recorded a 59 mph wind gust on their home weather station.
- 01/31/2013 – High Wind: A warm front moved northward across southern New England. This brought a period of mainly rain and warm temperatures. In addition, a strong low level jet (up to 80 kts) resulted in high winds across much of southern New England. There was some tree damage and downed power lines with winds gusting to 60 to 70 mph. An amateur radio operator in Milford recorded a wind gust to 64 mph on their home weather station. The Automated Surface Observation System at Worcester Regional Airport (KORH) recorded a wind

[67] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2024, https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Hail&eventType=%28Z%29+High+Wind&eventType=%28Z%29+Strong+Wind&eventType=%28C%29+Thunderstorm+Wind&eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2013&endDate_mm=11&endDate_dd=30&endDate_yyyy=2023&county=WORCESTER%3A27&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=25%2CMASSACHUSETTS.

gust to 55 mph.

- 02/25/2015 – High Wind: A storm moving north through the Great Lakes redeveloped along the Mid Atlantic coast on the 24th, then moved up the coast past Southern New England. This coastal storm brought damaging west-northwest winds to Massachusetts as it moved off through the Maritimes on the 25th.
- 09/06/2018 – Thunderstorm Wind: A cold front moved into very warm humid air over Massachusetts on September 6th. This brought showers and strong thunderstorms to the region during the afternoon and evening. At 3:25 PM EST, wind brought a tree down on Rocky Pond Road in Boylston.
- 12/25/2020 – Thunderstorm Wind: An anomalously deep, full-latitude mid-level trough over the Mississippi Valley caused a strong frontal system to move up the Appalachians. It brought strong to damaging winds, heavy rain with minor flooding, and well above normal temperatures to southern New England early on Christmas Day. Winds generally gusted to 40 to 60 mph, except 65 to 70 mph along the southeast Massachusetts coast. South winds were blowing more than 100 mph only 2000 feet above the ground in eastern Massachusetts and Rhode Island, but despite temperatures in the lower 60s there, a surface inversion was strong enough to prevent these very damaging winds from reaching the surface. Two to four inches of rain fell across the region, with the highest totals from central Rhode Island northwestward across northern Connecticut and portions of western and central Massachusetts. Winds generally were gusting to around 50 mph.
- 07/27/2021 – Thunderstorm Wind: A cold front entered a marginally unstable, but highly sheared environment during the late afternoon and evening hours. A broken line of severe thunderstorms moved across most of Massachusetts and a portion of northern Connecticut and northern Rhode Island.
- 02/28/2024 – High Wind: A strong cold front crossed southern New England on Wednesday night the 28th bringing soaking rains and strong wind gusts to southern New England followed by sharply falling temperatures. This cold frontal passage included a fine line stronger storms. Winds generally gusted 45 to 55 mph. The strongest gusts were 59 mph at the Worcester Airport ASOS (KORH) at 2:18 AM EST on the 29th and a gust to 55 mph at the Fitchburg Airport ASOS (KFIT) at 1:57 AM EST on the 29th.

Probability of Future Events

According to the 2023 ResilientMass Plan, Massachusetts averages two to five tornadoes per year. Only two tornadoes in the state (which occurred in 1953 and 2011) received disaster declarations. Massachusetts has experienced 12 EF0 to EF1 tornadoes since 2018; six EF0 tornadoes occurred in the state in 2021, and these 2021 EF0 tornadoes caused under $50,000 in property damage. Because tornadoes are relatively rare in the Commonwealth, residents are less likely to be prepared for them in the Commonwealth than in other parts of the country. People who live in manufactured housing, such as mobile homes, are more at risk to tornadoes. Tornadoes can affect all sectors and populations, and their primary effect is damage from their high winds to structures and the environment. Any structure located in a

tornado zone or path is at risk. Tornado activity may become more variable due to climate change, so predicting the likelihood of future tornado events in Boylston is difficult.

Based upon the available historical record, as well as Boylston's location in a moderate-density cluster of tornado activity for Massachusetts, there is a "very low" probability (less than 1% chance in any given year) of a tornado affecting the Town, and a moderate (10% to 40% chance in any given year) probability of a severe thunderstorm and/or high winds affecting the Town.

IMPACT

Overall, Boylston faces a "minor" impact from severe thunderstorms, with less than 10% of property in the affected area of town expected to be damaged in this type of hazard event. Boylston also faces a "limited" impact from severe winds and tornados, with between 10% and 25% of property in town expected to be damaged in these types of hazard events.

As indicated in Table 20 above, the following likely impacts on the physical environment can result from tornadoes of different levels:

- EF0 - Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damage to sign boards.
- EF1 - The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving automobiles pushed off the roads; attached garages may be destroyed.
- EF2 - Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
- EF3 - Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
- EF4 - Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In Boylston, a tornado that hits residential areas would leave much more damage than a tornado with a travel path that ran along the town's uplands or along the Wachusett Reservoir, where there is less settlement. Most buildings in town have not been built to Zone 1 Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, and 56.7% percent of the Town's 1,896 total housing units were constructed in 1979 or earlier (according to 2022 American Community Survey 5-year estimates).[68]

[68] "DP04: Selected Housing Characteristics," Data.Census.gov, United States Census Bureau, accessed December 2, 2024, https://data.census.gov/table/ACSDP5Y2022.DP04?q=dp04%20selected%20housing%20characteristics&g=060XX00US2502707525.

Boylston's median home value is $498,000 (according to 2022 American Communities Survey 5-year estimates).[69] Utilizing the total value of all property in town from Fiscal Year 2024, $1,280,269,265,[70] and an estimated 10 percent of damage to 5 percent of all structures, the estimated amount of damage from a tornado in town is $6,401,346.325. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate. The cost of repairing or replacing roads, bridges, utilities, and contents inside structures is not included in this estimate.

EXPOSURE

Certain features within Boylston's infrastructure, society, and environment may face more exposure to severe thunderstorms/wind/tornadoes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. Vulnerable features to severe thunderstorms/wind/tornadoes overlap with the features vulnerable to hurricanes and flooding described in the sections of this plan focusing on these other hazards.

The local HMP planning team in Boylston has identified the following factors which increase the exposure of the Town to thunderstorms.

Previous Tree Damages and Forest Vulnerability

The local HMP planning team identified tree damage caused by invasive beetles on Routes 70 & 140 in areas under MassDOT jurisdiction that legally cannot be addressed by the Town's tree warden. These trees are not yet dead, but are weakened by beetle infestation, so MassDOT cannot remove them either. There are also a number of stands of dead pine trees that the local HMP planning team identified along the following two town-owned roads:

- West Temple Street
- Paul Tivnan Drive

The forests surrounding Boylston, particularly around the Wachusett Reservoir, have an abundance of spruce and fir trees; there are also many oak and pine trees throughout Boylston.[71] These trees are susceptible to damage from storm events due to their ability to catch the wind. The Town currently only has funding to remove a few dead trees a year that pose a hazard to the right of way, and it cannot address trees on private property or on DCR lands in town.

Natural and Manmade Features

The local HMP planning team identified two other factors which lead to there being more storm activity

[69] Ibid.

[70] Data Analytics and Research Bureau, "Assessed Values by Class," Dlsgateway.dor.state.ma.us, Massachusetts Department of Revenue, December 2, 2024, https://dlsgateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=PropertyTaxInformation.AssessedValuesbyClass.assessedvaluesbyclass&tblassessedvalues-PageNr=5&rdDataCache=400584956&rdShowModes=&rdSort=&rdNewPageNr=True1&rdRequestForwarding=Form.

[71] United States Forest Service. (n.d.-b). Important Tree Species Ranges. Forest Atlas. https://apps.fs.usda.gov/forest-atlas/grow-forest-types.html

in Boylston than in other nearby towns; the Wachusett Reservoir and the geologic characteristics of the Town. The natural convective currents caused by the Reservoir influence localized weather and storms; This factor is corroborated by research which suggests that reservoirs created by dams can increase the amount of rainfall in a region.[72] The local HMP planning team also noted that an area of town with a large manganese deposit, specifically on Sylvan Street near Cross Street, appears to get more lightning strikes than other parts of town and other nearby towns.

Potential Climate Change Effects

The 2023 ResilientMass Plan identifies that current climate models predict an increase in severe thunderstorms, which have the potential to produce tornadoes. However, it is unknown if tornado frequency will increase with climate change. Some studies suggest there will be a decrease in the number of tornado days, but an increase in the number of tornadoes per day.[73]

Without a clear understanding of how climate change will impact tornadoes, the Town is not able to determine exactly how this hazard will impact population patterns and land use needs for the Town of Boylston. However, if climate change does increase the likelihood of tornado occurrence, the Town may have to incorporate additional emergency shelters into development and land use.

Vulnerability

Based on the above assessment, Boylston has a hazard index rating of "2 – high risk" from severe thunderstorms and winds, and a "4 – low risk" hazard index rating from tornadoes. Strong winds in Boylston pose a greater threat to transportation and other infrastructure in town than in nearby towns due to the characteristics of the Town's forests and the frequency of high wind events in town; however, the rarity of tornado events in town and the overall development patterns of Boylston reduces the overall risk to life and property if a tornado event were to occur in town.

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to severe thunderstorms, wind, and tornadoes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to severe thunderstorms, wind, and tornadoes. The local HMP planning team identified the following strategies that could be used to reduce the threat of severe thunderstorms, wind, and tornados in Boylston:

- Investigate establishing a lightning rod program to offer discounted rates for lightning rods.

[72] Other News Sources. (2011, November 1). *Dams trigger stronger storms, study suggests.* Probe International. https://journal.probeinternational.org/2010/02/04/dams-trigger-stronger-storms-study-suggests/

[73] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-56.

4.7 Wildfires / Brush Fires

Wildfires are fires involving full-sized trees, meadows, and/or scrublands. Typical causes of wildfires are lightning strikes, human carelessness, and arson. Relative humidity and wind and two weather-related factors that influence fire danger. Relative humidity refers to "the ratio of the amount of moisture in the air to the amount of moisture necessary to saturate the air at the same temperature and pressure."[74] When relative moisture drops, light fuels like grasses become drier and burn more easily.[75]

FEMA has classifications for three different types of wildfires:

- Surface fires are the most common type of wildfire, with the surface burning slowly along the floor of a forest, killing or damaging trees.
- Ground fires burn on or below the forest floor and are usually started by lightning.
- Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions.

Potential effects of wildfires include damage to structures and other human infrastructure as well as impacts on natural resources. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly, and people with respiratory and cardiovascular diseases.

Location

Approximately 74.4% of total land area in Worcester County is deciduous forest, evergreen forest, forested wetland, scrub/shrub land, scrub/shrub wetland, or grassland.[76] Much of this region of Massachusetts, including the Boylston area, has a high risk of wildfires for the state.[77] In Boylston, the total acreage of the town is broken up by the following land coverage: approximately 37% is deciduous forest, approximately 18% is evergreen forest, approximately 9% is forested wetland, approximately 1% is scrub/shrub land, approximately 2% is grassland and approximately 19% of Boylston is covered by the reservoir and other water bodies.[78] If waterways and water bodies are removed from this analysis, in Boylston, an estimated 83% of the land is forested or scrubland/grassland and represents the burnable acreage in a wildfire event.[79] Boylston's development is mostly concentrated in the southwest corner of town along Route 70 and Route 140; suburban and

[74] "Understanding Fire Danger," Nps.gov, United States National Park Service, August 17, 2023, https://www.nps.gov/articles/understanding-fire-danger.htm.

[75] Ibid.

[76] Massachusetts Bureau of Geographic Information, "MassGIS Data: 2016 Land Cover/Land Use," Mass.gov, Massachusetts Executive Office of Technology Services and Security, May 2019, https://www.mass.gov/info-details/massgis-data-2016-land-coverland-use.

[77] "Massachusetts State Hazard Mitigation and Climate Adaptation Plan," September 2018

[78] Massachusetts Bureau of Geographic Information, "MassGIS Data: 2016 Land Cover/Land Use"

[79] Ibid.

semi-rural development is scattered throughout the rest of town, and there are great expanses of uninterrupted tree cover, including MassDCR-managed woodlands near the Wachusett Reservoir, in the northern parts of town. Therefore, the total amount of the Town that could be affected by a wildfire is categorized as "medium", with 10-50% of the Town's area potentially being affected.

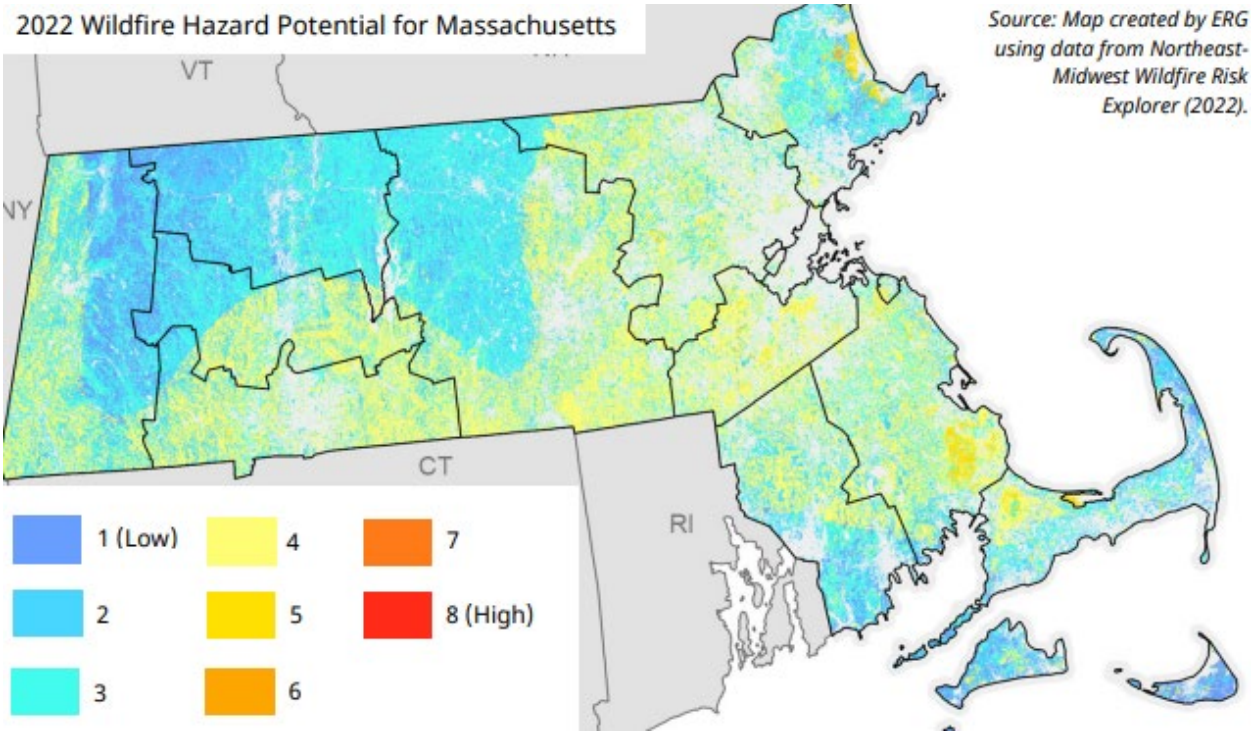


Figure 2: Wildfire Risk Areas for the Commonwealth of Massachusetts.[80]

EXTENT

Wildfires can cause widespread damage. They can spread very rapidly, depending on local wind speeds, and can be very difficult to get under control. Wildfires can last from several hours up to several days.

In Boylston, approximately 83%% of the town's total land area is deciduous forest, evergreen forest, forested wetland, scrub/shrub land, or grassland. These areas are at risk of fire and are concentrated in the northern two-thirds of town.

The National Fire Danger Rating system illustrates the potential extent of wildfires should they occur under different fire danger conditions:

[80] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

Table 22: The National Fire Danger Rating System

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) Color Code: Green	Fires not easily started	Fire starts are unlikely. Weather and fuel conditions will lead to slow fire spread, low intensity, and relatively easy control with light mop up. Controlled burns can usually be executed with reasonable safety.
CLASS 2: Moderate Danger (M) Color Code: Blue	Fires start easily and spread at a moderate rate	Some wildfires may be expected. Expect moderate flame length and rate of spread. Control is usually not difficult and light to moderate mop up can be expected. Although controlled burning can be done without creating a hazard, routine caution should be taken.
CLASS 3: High Danger (H) Color Code: Yellow	Fires start easily and spread at a rapid rate	Wildfires are likely. Fires in heavy, continuous fuel, such as mature grassland, weed fields, and forest litter, will be difficult to control under windy conditions. Control through direct attack may be difficult but possible, and mop up will be required. Outdoor burning should be restricted to early morning and late evening hours.
CLASS 4: Very High Danger (VH) Color Code: Orange	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and may spread faster than suppression resources can travel. Flame lengths will be long with high intensity, making control very difficult. Both suppression and mop up will require an extended and very thorough effort. Outdoor burning is not recommended.
CLASS 5: Extreme (E) Color Code: Red	Fire situation is explosive and can result in extensive property damage	Fires will start and spread rapidly. Every fire start has the potential to become large. Expect extreme, erratic fire behavior. NO OUTDOOR BURNING SHOULD TAKE PLACE IN AREAS WITH EXTREME FIRE DANGER.

Beyond the direct hazards that wildfires pose, wildfires pose the indirect hazard of air quality reduction from smoke particulates. Smoke particulates are measured, along with other particulates that affect air quality, by the EPA's Air Quality Index.[81] For each pollutant, an AQI value of 100 generally corresponds to an ambient air concentration that equals the level of the short-term national ambient air quality standard for the protection of public health. AQI values at or below 100 are generally thought of as satisfactory. When AQI values rise above 100, air quality is unhealthy; at first for certain sensitive groups of people, then for everyone as AQI values get higher. The EPA establishes an AQI for five major air pollutants regulated by the Clean Air Act. Each of these pollutants has a national air quality

[81] "Air Quality Index (AQI) Basics," Airnow.gov, United States Environmental Protection Agency, accessed June 10, 2024, https://www.airnow.gov/aqi/aqi-basics/.

standard set by EPA to protect public health, and these pollutants are: ground-level ozone; particle pollution (also known as particulate matter, including PM2.5 and PM10); carbon monoxide; sulfur dioxide; and nitrogen dioxide.

The AQI is divided into six categories. Each category corresponds to a different level of health concern. Each category also has a specific color. The color makes it easy for people to quickly determine whether air quality is reaching unhealthy levels in their communities.

Table 23: AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

PREVIOUS OCCURRENCES

Boylston has an on-call paid professional fire department providing 24/7 coverage. In addition, Boylston is part of the Massachusetts Fire District 8 with 34 other Towns. Boylston experienced 46 wildfires between 2001-2020; however, each of these fires were quite small, and altogether they consumed only 7 acres of brush/wildland.[82] The local HMP planning team noted that the MassDCR lands surrounding the Town have experienced wildfires in the past, with one of these fires occurring in Boylston itself. This wildfire occurred on April 14th, 2023 at the Boylston / Sterling / West Boylston border in an area of DCR land across the Wachusett Reservoir from the main part of Town but still within the Town's borders; This wildfire required boat access and travel around the Reservoir through Sterling to fight.

As of the writing of this plan, over 837 wildfires have started since October 2024 in the State of Massachusetts.[83]

Probability of Future Events

The 2023 ResilientMass Plan notes that climate-change driven changes in the intensity and frequency of precipitation and thunderstorms, prolonged drought conditions, and rising temperatures are expected to increase the frequency and severity of wildfires. In drought conditions, forest types that are not typically prone to wildfires will become more likely to burn. Globally, wildfires are projected to increase worldwide by 14% by 2030, 30% by 2050, and 50% by 2100.

Changes in weather patterns driven by climate change can intensify fires which in turn heighten the effects of climate change. By mid-century, mean summer temperatures in the Nashua River Basin are projected to increase by between 4.5° F and 8.1° F due to climate change.[84] Rising temperatures coupled with variable precipitation could exacerbate summer drought and could encourage more high-elevation wildfires; These wildfires release stores of carbon that contribute to the buildup of greenhouse gases and therefore further exacerbate climate change.

Climate change is also predicted to bring increased wind damage from major storms and bring new types of pests, including invasive species, to the region. Both increased wind and the introduction of new pests could potentially create more debris in wooded areas and result in a larger risk of fires.

The Boylston HMP Planning Team found it difficult to predict the likelihood of wildfires in a probabilistic manner because of the number of variables involved; fuel availability, weather and climate conditions, and human activity all factor into wildfire occurrences. However, based on regular previous occurrences

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[82] "Wildfire Data," Cmrpc-my.sharepoint.com, Massachusetts Fire Incident Reporting System, accessed December 3, 2024, https://cmrpc-my.sharepoint.com/:x:/r/personal/wtalbot_cmrpc_org/_layouts/15/Doc.aspx?sourcedoc=%7B1F0B29EB-3A47-4669-B4E6-FA4FC08AD498%7D&file=Wildfire%20Data.xlsx&action=default&mobileredirect=true.

[83] Massachusetts Emergency Management Agency. (2024). (issue brief). *Statewide Brushfire Operations Since 10/25* (Vol. # 9, Ser. Situational Awareness Statement, pp. 1–12). Boston, Massachusetts. Retrieved November 14, 2024,.

[84] ResilientMass Maps and Data Center, "Climate Change Projections Dashboard," Resilientma-mapcenter-mass-eoeea.hub.arcgis.com, ResilientMass, accessed August 15, 2024, https://resilientma-mapcenter-mass-eoeea.hub.arcgis.com/#ClimateDashboard.

of minor wildfires in town and the increase in invasive species within the Town of Boylston (which is elaborated on in greater details in Section 4.12), the planning team determined the probability of future damaging wildfire events in town to be "moderate" (10% to 40% probability in the next year).

IMPACT

While a large wildfire could in theory damage much of the landmass of Boylston, most forested areas are sparsely developed; this means that fires in the most wildfire-prone areas of town are not likely to cause damage to property. For this reason, the Town faces a "limited" impact from wildfires, with damage to 10% or more of property in the affected area of town likely to occur in the case of a wildfire hazard event.

Wildfires can consume homes, other buildings, and/or agricultural resources. Wildfires impact:

- Benefits that people receive from the environment, such as food/water and the regulation of floods and drought;
- Local heritage, through the destruction of natural features;
- The economy, due to damage to property and income from land following a wildfire;
- The overall destruction of property, loss of life, and/or injuries.

Utilizing the Fiscal Year 2024 total value of all property, $1,280,269,265,[85] and an estimated 5 percent of damage to 1 percent of all structures, the estimated amount of damage from a wildfire in town is $640,134.63. The cost of repairing or replacing roads, bridges, utilities, and contents inside structures is not included in this estimate.

The Wildland Urban Interface (WUI) is defined as the area where houses meet or intermingle with undeveloped wildland vegetation; the WUI represents a large percentage of the land use within Worcester County as a whole.[86]

EXPOSURE

Certain features within Boylston's infrastructure, society, and environment may face more exposure to wildfires, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- People who are sensitive to smoke, including children, the elderly, and individuals with health conditions. Air pollution from wildfires is a public health concern, as it leads to smoke inhalation which can be severe. Smoke can exacerbate respiratory conditions like asthma and can carry toxic chemicals and particulate matter. In 2021, wildfire smoke from western states and Canada extended across the continental US and forced

[85] Data Analytics and Research Bureau, "Assessed Values by Class," Dlsgateway.dor.state.ma.us, Massachusetts Department of Revenue, December 2, 2024, https://dlsgateway.dor.state.ma.us/reports/rdPage.aspx?rdReport=PropertyTaxInformation.AssessedValuesbyClass.assessedvaluesbyclass&tblassessedvalues-PageNr=5&rdDataCache=400584956&rdShowModes=&rdSort=&rdNewPageNr=True1&rdRequestForwarding=Form.

[86] Volker C. Radeloff et al., "The 1990-2020 wildland-urban interface of the conterminous United States - geospatial data," FS.USDA.gov, Forest Service Research Data Archive, 2023, https://www.fs.usda.gov/rds/archive/products/RDS-2015-0012-4/_metadata_RDS-2015-0012-4.html.

the Massachusetts Department of Environmental Protection to issue an air quality alert;[87] and

- First responders, especially the town's firefighters.

As previously described in the 2021 example above, wildfires do not have to take place within town to affect the Town; in March through July of 2023, historic wildfires in Canada sent smoke across a broad swath of New England, peaking in June of that year. In Worcester County, these fires reduced air quality throughout the months of May and June. The AQI for Worcester County peaked at 148 – Unhealthy for Sensitive Groups for fine particulate matter (PM2.5) – on June 6th 2023.[88]

Potential Climate Change Effects

Climate change effects will impact future wildfires, as is noted in the "Probability of Future Events" section above. According to the 2023 ResilientMass Plan, precipitation changes, prolonged drought, rising temperatures, and increased frequency of lightning are expected to contribute to increased frequency and severity of wildfire. As droughts become more frequent and severe, forest types that do not usually burn and are not fire adapted will be more likely to burn. Wildfires are projected to increase worldwide by 14% by 2030, 30% by 2050, and 50% by 2100.

Seasonal drought exacerbated by climate change may also make it more difficult to ensure a reliable water source for firefighting.

In summary, climate change is likely to increase the frequency and extent of wildfires in Boylston. This increase in wildfires may lead to changes in land use, such as the Town no longer being able to develop near dense forest. Additionally, if wildfires worsen significantly, residents may desire to move away from dense forest, shifting populations from more rural areas to cities or downtown communities. The future air quality risks to Boylston from wildfires are hard to predict with any certainty and represent a threat to the broader region; town officials could consider including air purifying equipment as a needed aspect of shelter planning in the future.

Vulnerability

Based on the above assessment, Boylston has a hazard risk index of "3 – moderate risk" from wildfires. However, this risk assessment is highly dependent on short-term weather patterns like wind, lightning, and rainfall, which are nearly impossible for the Town to predict with certainty.

[87] Kat J. McAlpine (2021, July 27). "Wildfire Smoke in New England Is 'Pretty Severe from Public Health Perspective'," BU.edu, The Brink: Pioneering Research from Boston University, July 27, 2021, https://www.bu.edu/articles/2021/wildfire-smoke-in-new-england/.

[88] "Pre-Generated Data Files," Aqs.epa.gov, United States Environmental Protection Agency, October 26, 2023, https://aqs.epa.gov/aqsweb/airdata/download_files.html.

MITIGATION STRATEGIES

The Town of Boylston is currently able to effectively respond to wildfires through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to wildfires and brush fires. The local HMP planning team identified the following strategies which could reduce the threat of wildfires in Boylston:

- Maintain fire access roads in isolated areas and improve coordination with MassDCR in relation to wildland firefighting.
- Consider obtaining Firewise Community Certifications for the neighborhoods in town which are at greatest risk of being affected by wildfires.

4.8 EARTHQUAKES

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly and without warning at any time of the year. Ground shaking from earthquakes can rupture gas mains and disrupt other utility services, can damage buildings, bridges, and roads, and can trigger other hazardous events such as avalanches, flash floods (which can be caused by dam failure), and fires. Unreinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated and unstable soil, and mobile homes not tied to their foundations are especially vulnerable during an earthquake.

LOCATION

Because of the regional nature of the hazard, the entire Town of Boylston is susceptible to earthquakes. This makes the location of occurrence for this hazard "large."

EXTENT

Earthquake magnitude and intensity are two measures of the overall extent of earthquakes in a given area. Magnitude is defined as the energy produced by an earthquake, and intensity is defined as an earthquake's level of effect on the Earth's physical environment, nature, people, and structures.

The magnitude of an earthquake can be measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on a seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) indicates an increase in energy of an earthquake of more than 30 times. Earthquakes are also commonly measured using the moment magnitude scale, which provides similar measurements to the Richter scale but more accurately measures earthquakes with magnitudes greater than 8.[89]

Table 24: Richter Scale Magnitudes and Effects

Magnitude	Effects
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

[89] "How Do We Measure Earthquake Magnitude? Michigan Technological University," MTU.edu, Michigan Tech, accessed June 10, 2024, https://www.mtu.edu/geo/community/seismology/learn/earthquake-measure/.

The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII; I denotes a weak earthquake and XII denotes an earthquake that causes almost complete destruction.

Table 25: Modified Mercalli Intensity Scale for and Effects[90]

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

[90] Earthquake Hazards Program, "The Modified Mercalli Intensity Scale," USGS.gov, United States Geologic Survey, accessed June 10, 2024, https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale?qt-science_center_objects=0#qt-science_center_objects.

Previous Occurrences

The last recorded earthquake to cause major damage in New England occurred in 1755,[91] though seismologists state that another serious earthquake occurrence in the region in the future is possible. There are five seismological faults in Massachusetts, but there is no discernible pattern of previous earthquakes along these fault lines. Additionally, earthquakes that are based in more seismologically active regions like parts of Canada may also impact Massachusetts.[92] Earthquakes occur without warning and may be followed by aftershocks. Figure 3 below shows the locations of earthquakes that have occurred across the New England region and beyond from January 1975 through October 2017.

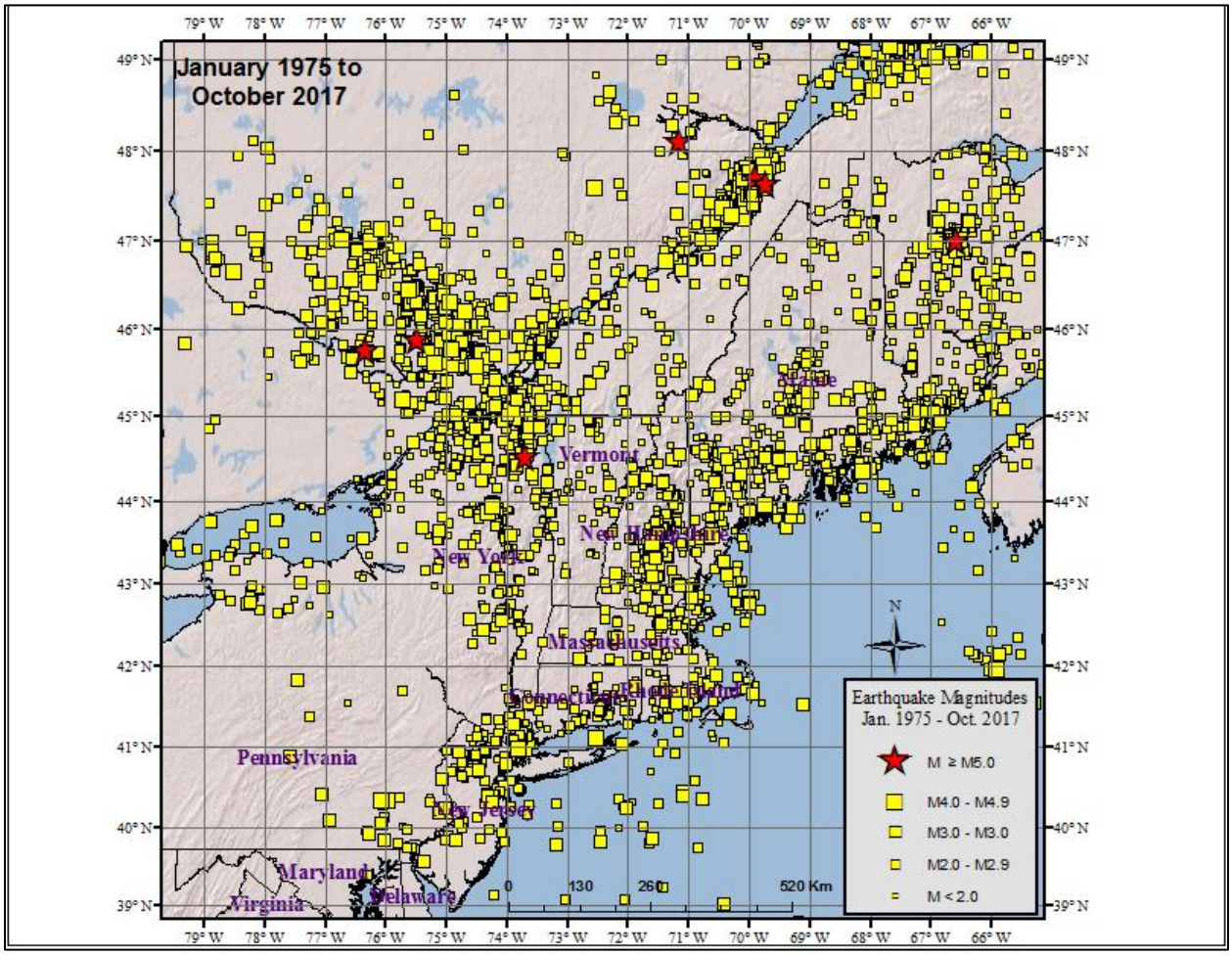


Figure 3: Map of Earthquakes of the Northeastern US and Southeastern Canada 1975 to 2017.[93]

[91] Northeast States Emergency Consortium and John E. Ebel, PhD. Boston College, Weston Observatory, "Massachusetts Earthquakes," NESEC.org, Northeast States Emergency Consortium, accessed June 10, 2024, http://nesec.org/massachusetts-earthquakes/.

[92] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[93] "New York Earthquakes," NESEC.org, Northeast States Emergency Consortium, accessed September 16, 2024, https://nesec.org/new-york-earthquakes/.

The local hazard mitigation planning team reports that no earthquakes have recently been felt in Boylston. To determine whether earthquakes have occurred recently near Boylston, earthquake data over the past six years for all Massachusetts cities and towns gathered by the Weston Observatory at Boston College was reviewed.

The Weston Observatory utilizes two scales to track the magnitude of earthquakes. One of these scales is the Nuttli magnitude (Mn) for North America east of the Rocky Mountains. Weston Observatory also utilizes the Coda Duration magnitude (Mc) scale, which is based on the duration of shaking at a particular station. The Coda Duration magnitude can quickly estimate the magnitude of an earthquake before its exact location is known.

The following earthquakes with a magnitude of over 2.0 on either the Nuttli magnitude or Coda Duration magnitude scales have been recorded at the Weston Observatory since 2018:

- 12/21/2018 – 3 km WSW of Gardner, 2.1/2.1 [Mn*/Mc**]
- 8/21/2019 – 2 km SSE of Wareham, 1.7/2.4
- 12/3/2019 – 4 km SSE of Plymouth, 1.6/2.2
- 11/8/2020 – 11 km SW of New Bedford, 3.8/3.4
- 11/22/2020 – 12 km WSW of New Bedford, 1.7/2.6
- 07/25/2021 – 5.0km W OF PEABODY 1.4/2.5 [Mn*/Mc**]
- 01/01/2022 – 13.0km N OF ROCKPORT 2.3/3.0
- 03/04/2022 – 5.0km WSW OF ORANGE 2.2/2.7
- 11/10/2022 – 12.0km NW OF NANTUCKET 2.6/3.0
- 11/13/2023 – 208.0km E OF CHATHAM 2.8/3.3
- 12/26/2023 – 52.0km ENE OF ROCKPORT 2.2/2.8
- 03/11/2024 – 6.0KM E OF LAWRENCE 1.1/2.1

  *Mn is the Nuttli Magnitude (see below)

  **Mc is the Coda Duration Magnitude (see below)

Each of these earthquakes are minor. Additionally, earthquakes with a magnitude of about 2.0 or less are usually called "microearthquakes" and are generally only recorded locally.

On August 23, 2011, an earthquake measuring 5.8 on the Richter scale centered in Virginia was felt in much of the northeast, but this earthquake was not felt in Boylston according to the local HMP planning team.[94]

[94] Northeast States Emergency Consortium and John E. Ebel, PhD. Boston College, Weston Observatory, "Massachusetts Earthquakes," NESEC.org.

Probability of Future Events

The 2023 ResilientMass Plan notes that "The probability of a magnitude 5.0 or greater earthquake centered in New England in a 10-year period is about 10–15%."[95] Additionally, this plan notes that while Massachusetts is not near any tectonic plate boundaries, it is still susceptible to earthquakes on the North American Plate. Earthquakes elsewhere could also have secondary effects on the state and the region, such as potentially disrupting supply chains.

Based upon existing records, there is "very low" frequency (less than 1 percent probability in any given year) of damaging earthquakes in Boylston.

Impact

Massachusetts introduced earthquake design requirements into its state building code in 1975 and improved its state building code for seismic resilience in the 1980s. However, these specifications apply only to new buildings or to extensively modified existing buildings. Buildings, bridges, water supply lines, and electrical power lines and facilities built before the 1980s may not be designed to withstand the forces of an earthquake. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, and 56.7% percent of the Town's 1,896 total housing units, according to 2022 American Community Survey 5-year estimates, were constructed in 1979 or earlier.[96] Seismic standards in Massachusetts were upgraded with the 1997 revision of the state building code. Despite its fairly old average housing stock, Boylston faces a "minor" impact from earthquakes, with little damage likely to occur due to the extreme rarity of damaging events.

HAZUS-MH (multiple-hazards) is a computer program developed by FEMA which estimates losses due to a variety of natural hazards. The HAZUS earthquake module allows users to define an earthquake magnitude and model the potential damages caused by that earthquake as if its epicenter is at the geographic center of the study area. For the purposes of this plan, a magnitude 5.0 earthquake was selected for analysis. Historically, major earthquakes are rare in New England, although a magnitude 5 earthquake occurred in the region in 1963.

[95] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-42.

[96] "DP04: Selected Housing Characteristics," Data.Census.gov

Table 26: HAZUS Potential Damages from a Magnitude 5.0 Earthquake with an Epicenter in Boylston

	Magnitude 5.0
Building Characteristics	
Estimated total number of buildings	1202
Estimated total building replacement value (2024 $)	$ 762,074,000.00
Building Damages	
# of buildings sustaining slight damage	360
# of buildings sustaining moderate damage	192
# of buildings sustaining extensive damage	46
# of buildings completely damaged	11
Population Needs	
# of households displaced	43
# of people seeking public shelter	17
Debris	
Building debris generated (tons)	12,000
# of truckloads to clear debris (@ 25 tons/truck)	480
Value of Damages (dollars)	
Total property damage	$86,970,200.00
Total losses due to business interruption	$12,611,100.00

For more information on the HAZUS-MH software, go to www.fema.gov/hazus-software.

Exposure

Certain features within Boylston's infrastructure, society, and environment may face more exposure to earthquakes, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Older buildings constructed prior to the first edition of the Massachusetts State Building Code.

The local hazard mitigation team indicated that many of Boylston's buildings have been built on ledge, which they note would be detrimental to the town should an earthquake occur.

Also, the Wachusett Reservoir Dam was noted by the local HMP planning team in town as being susceptible to earthquakes.

Potential Climate Change Effects

The 2023 ResilientMass Plan identifies no climate change effects that pertain to earthquake hazards.

Vulnerability

Based on the above analysis, Boylston has a hazard index rating of "5 – lowest risk" from earthquakes. Despite the hazard that earthquakes pose to the Town, the rarity of them in the region reduces the overall risk of the Town to them at this time.

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to earthquakes through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities to mitigate and respond to earthquakes. The local HMP planning team identified the following strategies that could be used to reduce the threat of earthquakes in Boylston.

- Look into increasing municipal resilience by creating municipally owned power generation through green energy, potentially through public-private partnerships with warehouse developers.
- Participate in Regional Evacuation Plan updates.
- Inventory unreinforced masonry and brick buildings in town which may be vulnerable to earthquakes. Conduct a study which identifies ways that these buildings, which include the Boylston Public Library and the Boylston Historical Museum, can meet the Massachusetts State Building Code's seismic standards.
- Review and update local plans and development review processes (planning, zoning, stormwater management, conservation, etc.) to ensure new construction will not be affected by hazards.

4.9 DAM FAILURE

Dams and their associated impoundments provide many benefits, such as water supply, recreation, hydroelectric power generation, and flood control, to communities. However, dams also pose a risk to lives and property in cases in which they fail. Dam failure is not a common occurrence, but dams do represent a potentially disastrous hazard.

When a dam fails, the potential energy of the stored water behind the dam is released rapidly. Some dam failures occur when floodwaters overtop and erode the material components of the dam. Other dam failures are caused by foundation defects, inadequate maintenance, internal erosion caused by seepage, and other specific causes.[97] Dam failures may be influenced by storm floodwaters, but most dam failures are caused by structural, mechanical, or hydraulic failures.[98] Dam breaches can lead to catastrophic consequences; they cause water to rush in a torrent downstream, flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage resulting from a dam failure will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built during the 19th century without the benefit of modern engineering design and construction oversight. Dams of this age are more vulnerable to failing because of structural problems caused by their age and/or lack of proper maintenance, as well as due to structural damage caused by an earthquake or flooding. The Massachusetts Department of Conservation and Recreation (DCR) Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00).[99] Dams that are in excess of 6 feet in height (regardless of storage capacity) and that have more than 15 acre-feet of storage capacity (regardless of height) are under DCR regulation. Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the Commonwealth of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

The Town of Boylston does not have any high hazard potential dams in town, nor does the Town have any high hazard potential dams that would affect the Town if they were to fail: the nearby Wachusett Reservoir Dam does pose some risk to the region, however the local planning team noted that the town itself sits above the dam and would likely not be affected by a potential flooding event that would occur there. Therefore, the Town has therefore

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[97] Association of State Dam Safety Officials. (n.d.). Dam Failures and Incidents. Association of State Dam Safety Officials. Retrieved December 29, 2021, from https://damsafety.org/dam-failures

[98] "Living with Dams: Know Your Risks (FEMA P-956)," Federal Emergency Management Agency, February 2013, page 9, https://www.fema.gov/sites/default/files/2020-08/fema_living-with-dams_p-956.pdf.

[99] "Section 44: Definitions applicable to Secs. 44 to 48B," MAlegislature.gov, The 193rd General Court of the Commonwealth of Massachusetts, accessed September 17, 2024, https://malegislature.gov/Laws/GeneralLaws/PartIII/TitleIV/Chapter253/Section44; "302 CMR 10.00: Dam safety," Mass.gov, The Commonwealth of Massachusetts, Massachusetts Court System, February 10, 2017, https://www.mass.gov/regulations/302-CMR-1000-dam-safety#:~:text=302%20CMR%2010.00%20provides%20regulatory%20guidelines%20for%20the,public%20review%20of%20the%20performance%20of%20a%20dam.

opted to not include a specific section on high hazard potential dams in this plan. Future revisions to this plan may include a high hazard potential dams section.

LOCATION

According to the Massachusetts Office of Dam Safety, there are 4 dams in Boylston. Of these, one is ranked as a Significant Hazard and two are ranked as Low Hazard. In addition to the 4 dams in town identified by the Office of Dam Safety, the Wachusett Reservoir South Dike (MA03263, a High Hazard Dam owned by the Massachusetts Water Resources Authority) in neighboring Clinton lies roughly mile from a populated section of Boylston.

Table 27: Dams within Boylston

National ID	Dam Name	Owner	Regulatory Authority	Hazard Code	Notes
MA01231	Rocky Pond Dam	Private	Office of Dam Safety	Low Hazard	This dam has been identified as having Invasive Species encroachment by waterborne aquatic species. For further information please review section 4.13 Invasive Species Later on in this planning document.
MA02596	Mt. Pleasant Pond Dam	Private	Office of Dam Safety	Significant Hazard	A beaver-caused hazard was identified at this dam by the local HMP planning team in town.
MA03342	Spruce Pond Dam	Private	Office of Dam Safety	Low Hazard	A dam failure hazard was identified at this dam by the local HMP planning team in town because this dam overtopped during one year and is near to town wells.
MA01630	Sheperd Knapp Dam	Private	Office of Dam Safety	N/A	There are no noteworthy concerns regarding natural hazard impacts on this dam.
N/A	Mill Road Dam	Private	Unknown	N/A	This dam has been identified by the Local Hazard Mitigation Planning Team, as the breakwater at this dam has a beaver problem, with beavers damming up the site. The site of this dam used to be a hydroelectric plant. This dam has not been identified by the Massachusetts Office of Dam Safety, and it is located beneath Mill Road in Boylston.
MA01511	Fish Pond Dam	Private	Non-Jurisdictional - Other	N/A	There are no noteworthy concerns regarding natural hazard impacts on this facility.

Inundation areas for these dams within Boylston cover less than 10% of the Town, or a "small" portion of its area.

Extent

As stated in the introduction to this dam failure section, dam or levee breaches often lead to catastrophic consequences; water released by a breach ultimately rushes in a torrent downstream, flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage which a dam failure causes will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Dams in Massachusetts are assessed according to their risk to life and property. The state has three hazard classifications for dams:

- High Hazard: Dams located where failure or improper operation will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.
- Significant Hazard: Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways, or railroads or cause interruption of use or service of relatively important facilities.
- Low Hazard: Dams located where failure or improper operation may cause minimal property damage to others; Loss of life is not expected.

Some dams do not have a hazard rating, either due to their size or because they would not cause a hazard if they were to fail.

Previous Occurrences

To date, there have been no catastrophic dam failures in Boylston.

Probability of Future Events

The probability of future dam failure events in Boylston is "very low," with a less than 1% chance of a dam in town failing in any given year.

Impact

The Town faces a "limited impact" from the failure of dams, with 10% to 25% of property in the affected area of town likely to see damage in the case of a dam failure event.

It is not possible to estimate the property loss impacts of dam failure quantitatively given the large number of variables involved in failure events. Qualitatively, losses from failure of an individual dam could be significant but would likely be geographically limited to portions of the dam's inundation zone. The geographic areas included in dam inundation zones may change with future improvements to dam breach modeling software which are being developed and are currently in early trial stages, such as the DSS-WISE™ (Decision Support System for Water Infrastructural Security) program.[100]

[100] "About DSS-WISE™ Web," Dsswiseweb.ncche.olemiss.edu, University of Mississippi, accessed June 10, 2024, https://dsswiseweb.ncche.olemiss.edu/userpages/about.php.

Exposure

Certain features within Boylston's infrastructure, society, and environment may face more exposure to dam failures, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Structures located within the inundation areas of Significant and High Hazard Dams;
- Downstream waterway infrastructure; and
- Poorly maintained or inspected dam infrastructure held in public or private hands.

Potential Climate Change Effects

Intensified and more frequent flooding caused by climate change can increase dam failure risk. Flooding can cause dam failure through overtopping; Overtopping occurs when floodwaters flowing into a dammed body of water exceed the spillway capacity of the dam and cause water to flow over the top of the dam. If the water flowing over the dam erodes the dam, then a dam failure can occur. Therefore, the risk of dam failure may be indirectly impacted by climate change through intensified flooding.

Vulnerability

Based on a mostly qualitative assessment, Boylston has a hazard index rating of "4 – low risk" from dam failure. The Town of Boylston does not have any high hazard potential dams in town, nor does the Town have any high hazard potential dams that would affect the Town if they were to fail: the nearby Wachusett Reservoir Dam does pose some risk to the region, however the local planning team noted that the town itself sits above the dam and would likely not be affected by a potential flooding event that would occur there. Boylston's elevation naturally makes the town safer from dam failure, and there are few dams in town that pose a threat to the people of Boylston specifically, and the threats posed to the town are primarily to infrastructure. The Town's Department of Public Works has a standing order from the towns Comprehensive Emergency Management Plan to monitor all dams during natural hazard events and give advanced warning from the threat of dam failure, which has been effective in the past.[101]

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to dam failure through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities to mitigate and respond to dam failures. The local HMP planning team identified the following strategies that could be used to reduce the threat of dam failure in Boylston:

- Enhance the Town's participation in and coordination and planning relating to regional disaster and emergency response training and drills.

[101] Emergency Management, Flanagan and Phillips, 1.1 COMPREHENSIVE EMERGENCY MANAGEMENT PLAN § (2022).

- Increase coordination between Shrewsbury and Boylston concerning the water levels and nitrogen levels at Newton Pond.

4.10 DROUGHT

Drought is a normal and recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Drought is a lack of precipitation over an extended period of time which results in a prolonged water shortage for some activity, group, or environmental sector. The direct impacts of droughts include: reduced crop yields; reduced rangeland and forest productivity; increased fire hazards; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat. Drought impacts can have far-reaching effects throughout the region and even the country.

LOCATION

Because of this hazard's regional nature, a drought would likely impact the entire community, meaning the location of occurrence within Boylston of this hazard is "large."

EXTENT

The National Drought Mitigation Center records information on historical drought occurrences. Unfortunately, drought data are only available at the state and county levels and not at the local level. The National Drought Mitigation Center categorizes drought severity on a D0-D4 scale as is shown below.

Table 28: National Drought Mitigation Center D0-D4 Scale[102]

Classification	Category	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

The Boylston Hazard Mitigation Planning Team has noted that dryer conditions in town over the past few years have caused some perennial streams in town to have reduced flow rates. Developers interested in utilizing properties near these streams have attempted to try to change their designation to intermittent streams, which would reduce the level of protection afforded to those waterways. The local HMP planning team in town has concern that development in areas near these perennial streams may lead to an increase in the number of hazard instances near them as well as the degradation of local ecology which lives near them.

[102] "Drought Classification," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx.

More severe drought will lead to more impactful changes in groundwater by reducing water table levels and affecting groundwater quality. The United States Geological Survey's National Groundwater Conditions web application measures groundwater levels by monthly percentiles as compared to historic levels at each particular site.[103] In Massachusetts, the quality of drinking water, including from groundwater sources, is assessed by measuring maximum containment levels (MMCLs) from a number of inorganic and organic chemical, radionuclide, and biological contaminants.[104]

Previous Occurrences

In Massachusetts, five statewide extreme droughts have occurred since 1930. These historic major droughts range in severity and in length, lasting from three to nine years. During many of these droughts, water supply systems around the state were found to be inadequate; At the times of these droughts, water was piped into urban areas, and water-supply systems were modified to permit withdrawals at lower water levels. The Boylston area has been spared the most severe impacts in each of these droughts according to the information for Massachusetts included in the USGS Water Supply Paper #2375.[105]

The following table shows peak drought severity data in Massachusetts from the National Drought Mitigation Center for each year since 2000:

Table 29: Peak Drought Severity Data in Massachusetts Per Year Since 2000[106]

Year	Maximum Severity
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 100% of the state
2003	No drought
2004	D0 conditions in 48% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 69% of the state
2009	D0 conditions in 45% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state

[103] Lee Stanish, "Introducing the National Groundwater Conditions web application," Waterdata.usgs.gov, United States Geological Survey, accessed April 7, 2025, https://waterdata.usgs.gov/blog/groundwater-levels-app/.
[104] "Drinking Water Standards and Guidelines," Mass.gov, the Massachusetts Department of Environmental Protection, accessed April 7, 2025, https://www.mass.gov/guides/drinking-water-standards-and-guidelines.
[105] Richard W. Paulson et al., "National Water Summary 1988-89 – Hydrologic Events and Floods and Droughts," *United States Geological Survey Numbered Series Water Supply Paper*, no. 2375 (1991), https://doi.org/10.3133/wsp2375, page 329.

[106] "Statistics by Threshold," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/DmData/DataDownload/StatisticsbyThreshold.aspx.

2013	D1 conditions in 60% of the state
2014	D1 conditions in 54% of the state
2015	D1 conditions in 58% of the state
2016	D3 conditions in 52% of the state
2017	D3 conditions in 9% of the state
2018	D1 conditions in 36% of the state
2019	D0 conditions in 85% of the state
2020	D3 conditions in 36% of the state
2021	D2 conditions in 1% of the state
2022	D3 conditions in 70% of the state
2023	D1 conditions in 0.4% of the state
2024 (through late November)	D3 conditions in 47% of the state

The following table shows peak drought severity data in Worcester County from the National Drought Mitigation Center for each year since 2018:

Table 30: Peak Drought Severity Data in Worcester County Per Year Since 2018[107]

Year	Maximum Severity
2018	D1 conditions in 33% of Worcester County
2019	D0 conditions in 100% of Worcester County
2020	D3 conditions in 14% of Worcester County
2021	D1 conditions in 51% of Worcester County
2022	D3 conditions in 53% of Worcester County
2023	D0 conditions in 74% of Worcester County
2024 (through late November)	D3 conditions in 51% of Worcester County

In Boylston, there have been no recorded drought events with substantial impacts in recent decades. Boylston follows Massachusetts Department of Environmental Protection's water usage guidelines for issuing water bans. The Town typically restricts outdoor water use to just a few hours per day when water bans are in effect. The local HMP planning team noted that the Town has experienced drought conditions in 2016/2017, during which open burning was restricted by the fire department, and during the summer of 2022.

As of the writing of this plan, the Town of Boylston and large portions of Massachusetts are currently in critical drought conditions; since August 2024, all regions of the state except for the Cape and Islands

[107] Ibid.

have seen a rainfall deficit of 7 to 9 inches.[108]

[108] "MASSACHUSETTS DROUGHT ALERT", Executive Office of Energy and Environmental Affairs and the Massachusetts Emergency Management Agency, November 8, 2024.

Probability of Future Events

In Boylston, as in the rest of the state, the probability of extreme and exceptional droughts is "low" (a 1% to 10% chance in the next year). Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, Central Massachusetts may be slightly more vulnerable than parts of eastern Massachusetts to severe drought conditions.[109] However, many factors such as water supply sources, population, economic factors (i.e., if an area has an agriculture-based economy), and infrastructure may affect the severity and length of a drought event in different parts of the state.

The long-term risk of drought, including extreme and exceptional drought, may increase in Boylston due to climate change influences. Specifically, climate change may cause an increase in consecutive dry days over time.

Impact

The specific impacts of historical droughts in Massachusetts are categorized by the National Drought Mitigation Center in Table 31 below:

Table 31: Historic Impacts of Drought in Massachusetts[110]

Category	Historically observed impacts
D0	Crop growth is stunted; planting is delayed
	Fire danger is elevated; spring fire season starts early
	Lawns brown early; gardens begin to wilt
	Surface water levels decline
D1	Irrigation use increases; hay and grain yields are lower than normal
	Honey production declines
	Wildfires and ground fires increase
	Trees and landscaping are stressed; fish are stressed
	Voluntary water conservation is requested; reservoir and lake levels are below normal capacity
D2	Specialty crops are impacted in both yield and fruit size
	Producers begin feeding cattle; hay prices are high
	Warnings are issued on outdoor burns; air quality is poor
	Golf courses conserve water
	Trees are brittle and susceptible to insects
	Fish kills occur; wildlife move to farms for food
	Water quality is poor; groundwater is declining; irrigation ponds are dry; outdoor water restrictions are implemented

[109] "Massachusetts Drought Management Plan," Mass.gov, Massachusetts Executive Office of Energy and Environmental Affairs and Massachusetts Emergency Management Agency, December 2023, https://www.mass.gov/doc/massachusetts-drought-management-plan/download.

[110] "State Impacts," Droughtmonitor.unl.edu, National Drought Mitigation Center, University of Nebraska-Lincoln, accessed June 10, 2024, https://droughtmonitor.unl.edu/DmData/StateImpacts.aspx.

D3	Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially
	Well drillers and bulk water haulers see increased business
	Water recreation and hunting are modified; wildlife disease outbreak is observed
	Extremely reduced flow to ceased flow of water is observed; river temperatures are warm; wells are running dry; people are digging more and deeper wells

The 2023 ResilientMass plan notes that while drought is a naturally occurring climate phenomenon, its impacts can be exacerbated by human behavior. The volume and rate of groundwater withdrawn from underground aquifers can impact the amount of water that flows through surface water bodies; therefore, high rates of groundwater withdraw can negatively impact aquatic ecosystems. Additionally, more impervious surface coverage, and some forms of stormwater infrastructure, can prevent the natural infiltration of precipitation into groundwater and can therefore exacerbate drought.[111]

Specific drought impacts in Boylston may vary among and between customers of the Town's water system and private well users. While the impact of a drought can be assessed as "minor" overall, with very little damage to property (damage to less than 10% of property in the area affected by the hazard), injuries, or loss of life likely to occur in town, drought impacts may be higher in the parts of town that are not located within the Town's water service area.

EXPOSURE

Certain features within Boylston's infrastructure, society, and environment may face more exposure to drought, or be disproportionately impacted by it, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Residences or businesses with shallow wells;
- Wild plants and animals, including trees; and
- Vegetation, which may become more vulnerable to wildfire due to prolonged drought.

The local HMP planning team in Boylston noted that while the Town does not typically have issues with its water supply, larger water users such as the Haven Country Club and other golf courses in town are vulnerable to reductions in the Towns water supply caused by drought.

Higher water bills and/or the cost of re-drilling private wells due to drought impacts could also negatively affect residents in town. Other factors like PFAS contamination of water sources could compound drought-related water supply challenges. Contaminants, including PFAS, can pose greater risk to the community after shifting position due to drought-driven changes in groundwater.[112]

[111] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[112] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, there are two major ways that climate change influences drought frequency and severity.

- The frequency and extent of droughts are projected to increase in summer and fall as higher temperatures result in more evaporation, snow melts earlier in the year, and precipitation becoming less frequent yet more extreme when it does occur.
- Rising temperatures and changes in precipitation patterns will reduce snowpack and hasten snowmelt and therefore can exacerbate drought. The process of reduced snowmelt can result in less snowmelt recharge of groundwater, less snowmelt feeding stream flows, and less snowmelt available as an agricultural water source.

A common concern among town residents who responded to the survey was that wells in town may dry up in the future during drought events. According to the 2023 ResilientMass Plan, climate change is predicted to affect groundwater availability;[113] the increased frequency and duration of drought conditions will increase the risk in town of wells drying up.

In summary, climate change is likely to increase the frequency and extent of drought in Massachusetts. Drought that is worsened by climate change can have numerous community-wide implications in Boylston. Due to the impacts of drought on crop yield, land use designated for farming could be altered or reduced. In addition, drought is predicted to worsen significantly in other parts of the country, particularly in the southwestern United States, and it is possible that this could result in people from other parts of the country moving to the northeast, including to Boylston.

Vulnerability

Based on the above assessment, Boylston has a hazard index rating of "4 – low risk" from drought. Minimal or no loss of or damage to property, injuries, or loss of life is expected from drought in town. Wildfire hazards associated with droughts are captured earlier in this plan. Boylston is less vulnerable to dried-up wells resulting from drought than other communities in the CMRPC region, as the majority of the Town's residents are connected to the Town's public water system and get their water from Massachusetts Water Resources Authority-owned reservoirs. In addition, the town's proximity to the Wachusett reservoir creates a the natural recharge of private wells nearby as water infiltrates in to the nearby water table. This is likely to remain the case into perpetuity, and at the very least for the lifecycle of this planning document.

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to drought through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand its existing capabilities

[113] "ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

to mitigate and respond to drought. The local HMP planning team identified the following strategies that could be used to reduce the threat of drought in Boylston:

- Provide information to residents and businesses on how to conserve water through low-impact landscaping and other measures (in part to conserve water for firefighting).
- Investigate adopting a bylaw that prevents chemical fertilizer use in vulnerable watershed areas, particularly around Spruce Pond. Educate the public about stormwater management best practices, especially best practices for stormwater management near ponds.

4.11 Extreme Temperatures

The 2023 ResilientMass Plan states that there are no universal definitions of "extreme heat," "extreme cold," or "extreme temperatures"; these terms are relative terms whose meaning depends on the normal average temperatures and climatic highs and lows in a region. Extreme heat in Massachusetts is typically defined as a period of three or more consecutive days with temperatures above 90 °F.[114] Extreme heat may also refer to any prolonged period of especially hot weather (which is called a heat wave) which may also be accompanied by high humidity. Extreme cold, like extreme heat, is a dangerous situation that can result in health emergencies for susceptible people. People without shelter, who are stranded, or who live in homes that are poorly insulated or are without heat and/or air conditioning are especially at risk to extreme temperatures.

For Massachusetts, extreme temperatures can be defined as those that are far outside the normal ranges. Normal temperatures within the period ranging from 1991-2020 for the area near Boylston are:

Table 32: Normal Temperatures in the Period Between 1991-2020 in the Area Near Boylston[115]

	July (Hottest Month)	January (Coldest Month)
Average High (°F)	79.8°	32.3°
Average Low (°F)	61.7°	17.1°

The National Weather Service's (NWS's) specific criteria for issuing extreme heat and extreme cold watches, warnings, and advisories are described in the Extent section below.

Location

Extreme temperatures can be expected to be uniform across Boylston during a given extreme temperature event, due to the Town's lack of extreme elevations, urban areas, and coastal areas. Therefore, this hazard has a "large" geographic coverage in town.

Extent

The NWS uses the heat index scale to categorize extremely hot temperatures. This scale combines relative humidity with actual air temperature to determine the risk to humans. The NWS issues an Excessive Heat Advisory if the heat index is forecast to reach 95°F-99°F for 2 or more hours over 2 consecutive days, or 100°F-104°F for 2 or more hours over 1 day. The NWS issues an Excessive Heat Warning when the daytime heat index is forecasted to reach 105°F for 2 or more hours. The NWS defines a Heat Wave as 3 or more days of greater than or equal to 90°F temperatures. The following chart indicates the relationship between heat index and relative humidity:

[114] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-2.

[115] These temperature estimates are based on data recorded at a weather station at Worcester Regional Airport.
"U.S. Climate Normals Quick Access," Ncei.noaa.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 25, 2024, https://www.ncei.noaa.gov/access/us-climate-normals/.

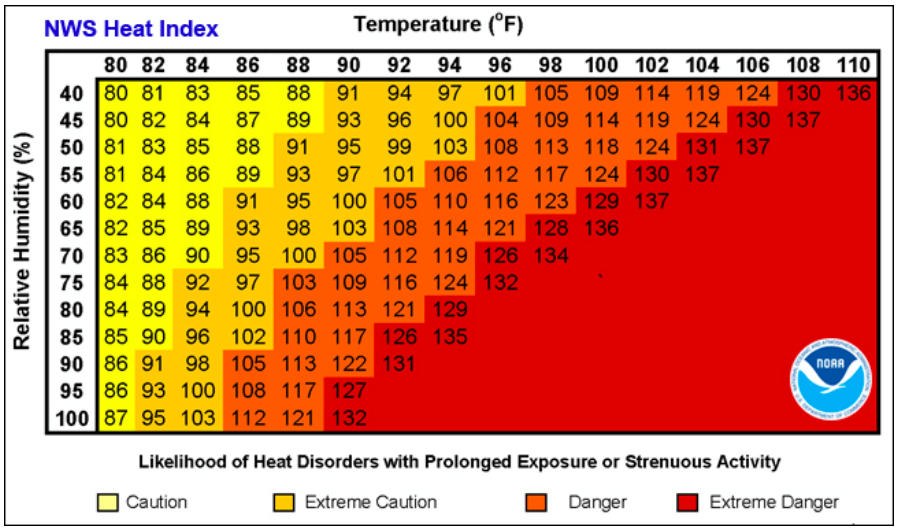


Figure 4: Heat Index[116]

Extreme heat causes more fatalities in the United States that all other weather-related natural hazards combined.[117] Extreme heat can be the underlying cause of death or can worsen other medical conditions like heart disease, hypertension, alcohol poisoning, and drug overdoses.[118] The heat-related mortality rate is higher among males and people aged 65 years and older.[119]

Table 33: Heat Effects on the Body lists the effects of extreme heat on the body at different levels of the heat index. It is important to note that while temperatures exceeding 100°F are unusual for Central Massachusetts, high humidity is very common during the summer and can drive the heat index in the region to dangerous levels / temperatures above 100°F.

[116] National Weather Service, "What is the heat index?," Weather.gov, National Oceanic and Atmospheric Administration, accessed September 16, 2024, https://www.weather.gov/ama/heatindex.

[117] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan,"

[118] Ambarish Vaidyanathan et al., "Heat-Related Deaths—United States, 2004–2018," *Morbidity and Mortality Weekly Report* 69, no. 24 (2020): 729-734. https://doi.org/10.15585/mmwr.mm6924a1.

[119] Ibid.

Table 33: Heat Effects on the Body[120]

Classification	Heat Index	Effect on Body
Caution	80°-90°F	Fatigue possible with prolonged exposure and/or physical activity.
Extreme Caution	90°-103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°-124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F+	Heat strokes highly likely.

Other impacts of high temperatures include drought, wildfire, and the formation of ground-level ozone.[121] Prolonged heat can cause power use to spike and in turn can overload the electrical grid, causing outages.[122] Extreme heat and cold can both negatively impact transportation infrastructure; Railroad tracks are a particular concern because metal rails can kink in high temperatures.[123]

The 2023 ResilientMass Plan notes that the extent (severity or magnitude) of extreme cold temperatures is generally measured through the Wind Chill Temperature Index. The wind chill temperature is the temperature that people and animals feel when outside; it is based on the rate of heat loss from exposed skin due to the effects of wind and cold.[124] In Massachusetts, the National Weather Service (NWS) Norton Forecast Office issues a wind chill warning when the Wind Chill Temperature Index, based on sustained wind, is –25°F or lower for at least three hours. The NWS Wind Chill Chart below shows three shaded areas of combinations of wind and temperature conditions in which there is frostbite danger; Each shaded area shows how long a person can be exposed before frostbite develops.

[120] National Weather Service, "What is the heat index?," Weather.gov, National Oceanic and Atmospheric Administration, accessed June 10, 2024, https://www.weather.gov/ama/heatindex.
[121] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan,"

[122] Ibid.

[123] Ibid.

[124] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-3.

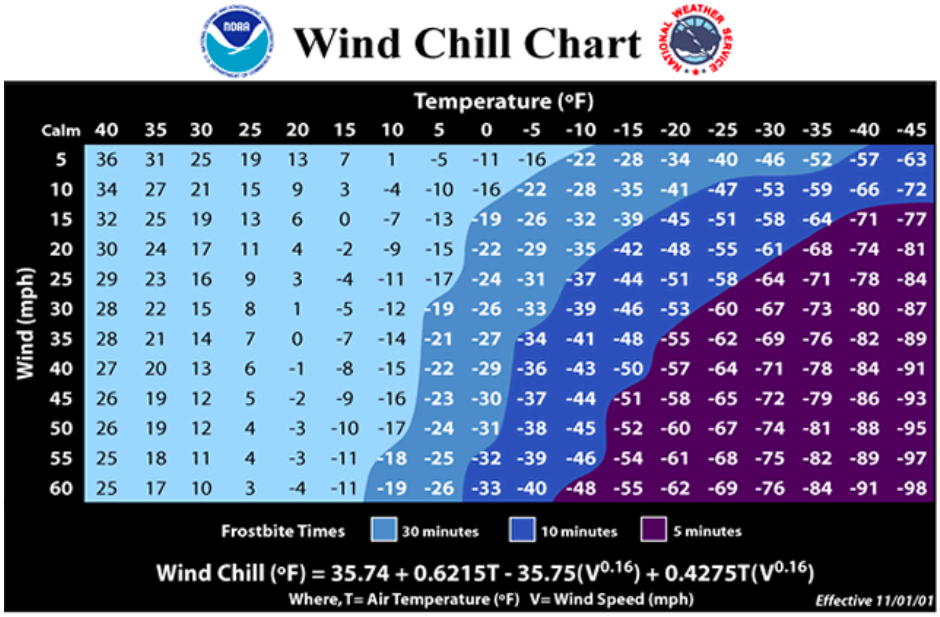


Figure 5: NWS Wind Chill Temperature (WCT) index.[125]

Cold temperatures are often combined with winter storms. People may experience the loss of heat and power in their homes and workplaces due to storm damage, which could further subject them to the cold.[126] Carbon monoxide poisoning is another risk during cold weather, especially when households lack adequate power or heat.[127]

Previous Occurrences

There is not a comprehensive data source that lists instances when the National Weather Service has issued extreme heat or cold warnings or advisories in Worcester County.

According to the 2023 Resilient Mass Plan, there have been 118 warm weather events (heat and excessive heat events) in the state between 1995 and 2022.[128] 2010–2022 had seven of the 10 warmest summers on record in the state.

2012 and 2013 were notably hot summers in Massachusetts[129] In July 2013, a long period of hot and humid weather occurred throughout New England. One fatality occurred on July 6, when a postal worker collapsed as the heat index reached 100°F.[130]

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[125] National Weather Service, "Understanding Wind Chill," Weather.gov, National Oceanic and Atmospheric Administration, accessed September 16, 2024, https://www.weather.gov/safety/cold-wind-chill-chart.

[126] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-1-5.2-3.

[127] Ibid.

[128] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.2-7-5.2-8.

[129] Ibid.

[130] Ibid.

The hottest two summers on record in the Commonwealth were 2020 and 2022.[131] August 2022 was the hottest August ever recorded in the Commonwealth, with temperatures more than 6°F greater than the 20th century average. In August 2022, Boston experienced at least 17 days above 90 degrees, including two six-day heat waves.

Statewide, there were 33 extreme cold weather events between 1994 and 2018. The NOAA storm Events database lists the following Extreme Cold / Wind Chill Events as having occurred in Southern Worcester County since the last Boylston HMP was developed in 2018:[132]

- 01/06/2018: Strong west winds trailed the January 4 winter storm. These winds drew bitterly cold arctic air over Massachusetts. The combination of strong wind and low temperatures created a dangerous wind chill, with readings reaching 25 degrees below zero or colder in a couple of locations during the early mornings of January 6 and 7.
- 01/21/2019: Strong west to northwest winds trailing the January 20th storm drew cold air across Southern New England on January 21st and caused wind chill values of 25 below zero or colder in Central and Western Massachusetts. The wind diminished during the afternoon and evening of January 21st allowing wind chill values to become less extreme, in the teens below zero.

The local HMP planning team in Boylston noted an extreme hot weather event in which occurred in August/September 2023; temperatures reached around 100°F during this event.

Inland portions of Massachusetts are more subject to extreme temperatures because they lack the moderating effect of the Atlantic Ocean. However, densely developed cities are more likely to be impacted by heat waves than smaller towns like Boylston

Probability of Future Events

The probability of future extreme heat or extreme cold events occurring in Boylston is considered to be "moderate," or between 10% and 40% in the next year.

Impact

The impact of extreme heat or cold in Boylston is considered to be "minor", with no property damage and a limited effect on humans anticipated in the case of extreme temperature events.

Exposure

Certain features within Boylston's infrastructure, society, and environment may face more exposure to extreme temperatures, or be disproportionately impacted by them, relative to

[131] Ibid.

[132] "Storm Events Database Search Results for Worcester County, Massachusetts," NCDC.NOAA.gov, National Oceanic and Atmospheric Administration National Centers for Environmental Information, accessed September 17, 2024, https://www.ncdc.noaa.gov/stormevents/listevents.jsp.

the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- Children and elderly residents, who are more vulnerable to the effects of extremely hot or cold conditions;
- Low-income residents who are unable to afford adequate cooling or heating;
- Renters who may have few home improvement options for mitigating extreme heat and cold;
- People who work outdoors such as construction or farm workers;
- The utility grid, which could be vulnerable to outages due to surges in power use during extreme temperatures. Power outages during extremely hot or cold days could cause further problems for people who rely on air conditioners or electric heaters; and
- Certain forms of agriculture which may be negatively affected by extreme temperatures, especially extreme heat.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, climate change is already causing more high heat days and fewer extreme cold events in Massachusetts and beyond. Climate change is also shifting the average temperature in Massachusetts higher, leading to longer warm seasons as well as shifts to growing seasons, habitat and vegetation ecosystems, and migratory patterns. Rising temperatures will also cause warming seas, a degradation in air quality, impacts on people's health, and an increased demand for energy and government services. Secondary climate change effects of extreme temperatures include increased severity of wildfires, droughts, and flooding as well as encroachment by invasive species. According to the 2023 ResilientMass Plan:

- By 2050, average annual temperatures are expected to increase by between 5.9° and 7.9°F. This is a drastically shortened timeline from the 2018 state hazard mitigation plan, where increases of this magnitude were not expected until the end of the century.[133]
- By 2100, annual average temperatures are expected to increase by between 10.0° and 12.9°F compared to the 1971-2000 baseline.

According to the 2022 Massachusetts Climate Change assessment, by 2030, the summer mean temperature could increase by 3.6°F from the period between 1950 and 2013, worsening stress on electric transmission and utility distribution infrastructure.[134]

In summary, climate change is likely to increase the frequency and duration of extreme heat events in

[133] "Massachusetts State Hazard Mitigation and Climate Adaptation Plan," September 2018

[134] "2022 Massachusetts Climate Change Assessment," page RS30.

Massachusetts. Changes to average annual temperatures will also impact Boylston. Seasonal temperatures will shift, with spring and summer temperatures extending through more of the year.[135] Winters may also be milder than historical norms.[136] Changes to average temperatures could impact the agricultural industry and the natural environment. Farmers may need to shift their practices to account for new climate conditions, and certain specific plants and animals may need to migrate to new ranges to find suitable habitat.[137]

To respond to climate change-induced changes in temperatures, Boylston residents and businesses may have to alter work patterns during extreme heat days and events to reduce workplace injuries in vulnerable jobs such as construction trades and agricultural labor. The Town may have to plan to offer more cooling stations for residents, particularly vulnerable populations such as the elderly and low-income residents. Boylston may also have to account for an increase in people moving to town and/or visiting town to seek refuge from extreme heat in other parts of the country.[138]

VULNERABILITY

Boylston's vulnerability to extreme heat and cold is considered to be "3 – moderate risk." While the Town's extremes in temperature are moderated by its forest cover and its location near the Wachusett Reservoir, the Town's shelters do not currently have adequate cooling capabilities, especially for seniors and children.

MITIGATION STRATEGIES

The Town of Boylston is currently able to effectively respond to extreme temperatures through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, the Town has numerous opportunities to expand upon its existing capabilities to mitigate and respond to extreme temperatures. The local HMP planning team identified the following strategies that could be used to reduce the threat of extreme temperatures in Boylston:

- Develop the Municipal Building and/or the Gough House into a shelter location through retrofitting and upgrading shower facilities, ADA compliance, upgrading heating and cooling systems, and installing backup power generation.
- Monitor implementation of the Town's Hazard Mitigation Plan. On an annual basis and/or as hazards occur, review the mitigation strategies in the plan and assess implementation progress by holding a meeting of the Hazard Mitigation Planning Team.

[135] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[136] Ibid.

[137] Ibid.

[138] Ibid.

4.12 Invasive Species

An invasive species, as defined by the Invasive Species Advisory Committee (ISAC) of the U.S. Department of the Interior, is "a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health."[139] Invasive species are not the same as native pest species, such as beavers and deer. The State of Massachusetts, being heavily forested with relatively new growth forest, as well as having a great deal of its water sourced from open reservoirs, is vulnerable to the threat of both land and aquatic invasive species. Invasive species can damage and disrupt existing ecosystems by outcompeting the native flora and fauna: many invasive aquatic species harm water quality, and many land-borne invasive species increase the risk of wildfires. The effects of invasives are species-dependent, and a challenge for invasive species management is that many municipalities are affected by some invasive species but not others.

Location

Several invasive species affect broad regions of Massachusetts. The Emerald Ash Borer (*Agrilus planipennis*) has been detected in every city and town within the Central Region.[140] However, invasives and their effects can also be very species-dependent and localized, so invasive species hazards can also bear a resemblance to other more localized hazards such as localized flooding. More than 50% of the Town is vulnerable to invasives, so this hazard has a "large" geographic coverage in town.

Extent

It is difficult for local officials to understand the extent of the impacts that invasive species have on their communities. Factors that lead to a dearth of knowledge about the extent of impacts of invasive species include: the unpredictable nature of invasives, the lack of verified data clearinghouses about invasive species, and the lack of resources and capacity for local conservation officials to track invasives. Often, it is not until the damage caused by invasives is apparent that local officials discover the true extent of the hazard. Still, there are some resources available to the local hazard mitigation planning team. This plan utilizes the Massachusetts Department of Agriculture's Invasive Pest Dashboard;[141] the Center for Invasive Species and Ecosystem Health's Early Detection and Distribution Mapping System (EDDMapS) hosted by the University of Georgia;[142] and the Forest Ecosystem Monitoring Cooperative's Northeastern

[139] Definitions Subcommittee of the Invasive Species Advisory Committee (ISAC). "Invasive Species Definition Clarification and Guidance," Doi.gov, United States Department of the Interior, April 27, 2006, https://www.doi.gov/sites/doi.gov/files/uploads/isac_definitions_white_paper_rev.pdf.

[140] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," page 5.1-48.

[141] "MDAR Invasive Pest Dashboard," Experience.arcgis.com, Massachusetts Department of Agricultural Resources, accessed June 10, 2024, https://experience.arcgis.com/experience/a25afa4466a54313b21dd45abc34b62d/page/Page-2/?views=Town-by-Town.

[142] "My EDDMapS," EDDMapS.org, Center for Invasive Species and Ecosystem Health, accessed June 10, 2024, https://www.eddmaps.org/tools/query/index.cfm?observationDateStart=06/03/2017&observationDateEnd=06/03/2024&eradicatio

Forest Health Atlas.[143]

In Worcester County from 2017 to 2024, according to EDDMapS analysis of verified invasive species reporting, there have been 378 records of locations with invasive species; In the county, 353 distinct sightings of invasive species ranging from plants to insects have been left unchecked, 2 invasive species are being treated, and a total of 47 acres are considered to be infested with invasive species.[144]

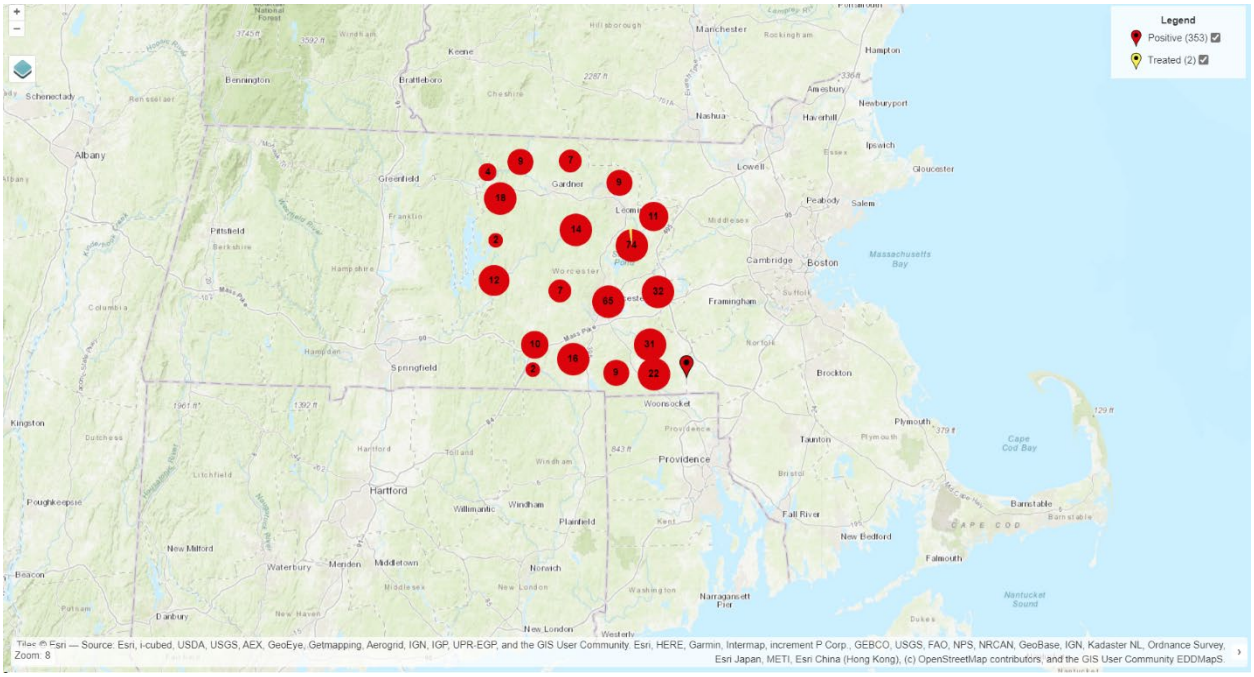


Figure 6: EDDMapS Analysis of Worcester County Invasives 2017-2024

The Massachusetts Department of Agriculture's Invasive Pests Dashboard notes that the Emerald Ash Borer was detected in Boylston in 2019, Mile-A-Minute Vine detected in town in 2020, and Beech Leaf Disease was detected in town in 2022.[145] Boylston is within Worcester county's Asian Longhorn Beetle Regulated area,[146] and the local HMP planning team in town noted that there are a number of dead tree stands in town which were killed by this invasive beetle. Boylston is bordered by communities with spotted lanternfly and Mile-A-Minute vine infestations.[147] Also, as of the time of writing of this plan, the entire state of Massachusetts is under a U.S. Department of Agriculture quarantine to restrict the

nstatus=1,2&country=926&state=92625000&fipscode=92625027.

[143] "Northeastern Forest Health Atlas," UVM.edu, Forest Ecosystem Monitoring Cooperative, accessed June 10, 2024, https://www.uvm.edu/femc/forest-health-atlas.

[144] "My EDDMapS," EDDMapS.org.

[145] "MDAR Invasive Pest Dashboard," Experience.arcgis.com, Massachusetts Department of Agricultural Resources, June 10, 2024, https://experience.arcgis.com/experience/a25afa4466a54313b21dd45abc34b62d/page/Page-2/?views=Emerald-Ash-Borer#data_s=id%3AdataSource_3-17f4202b73c-layer-3%3A87.

[146] Ibid

[147] Ibid

spread of the Box Tree Moth.[148]

A lack of reporting on invasives may mean that the extent of invasives in Boylston is far greater than these databases report.

Previous Occurrences

According to the Northeast Forest Health Atlas, in the past 20 years of reporting, Massachusetts has experienced tree damage (including defoliation and mortality events) to 43,127,411 acres of forests from a variety of invasive pests; alarmingly, the greatest proportion of this damage has occurred in the past 3 years.[149]

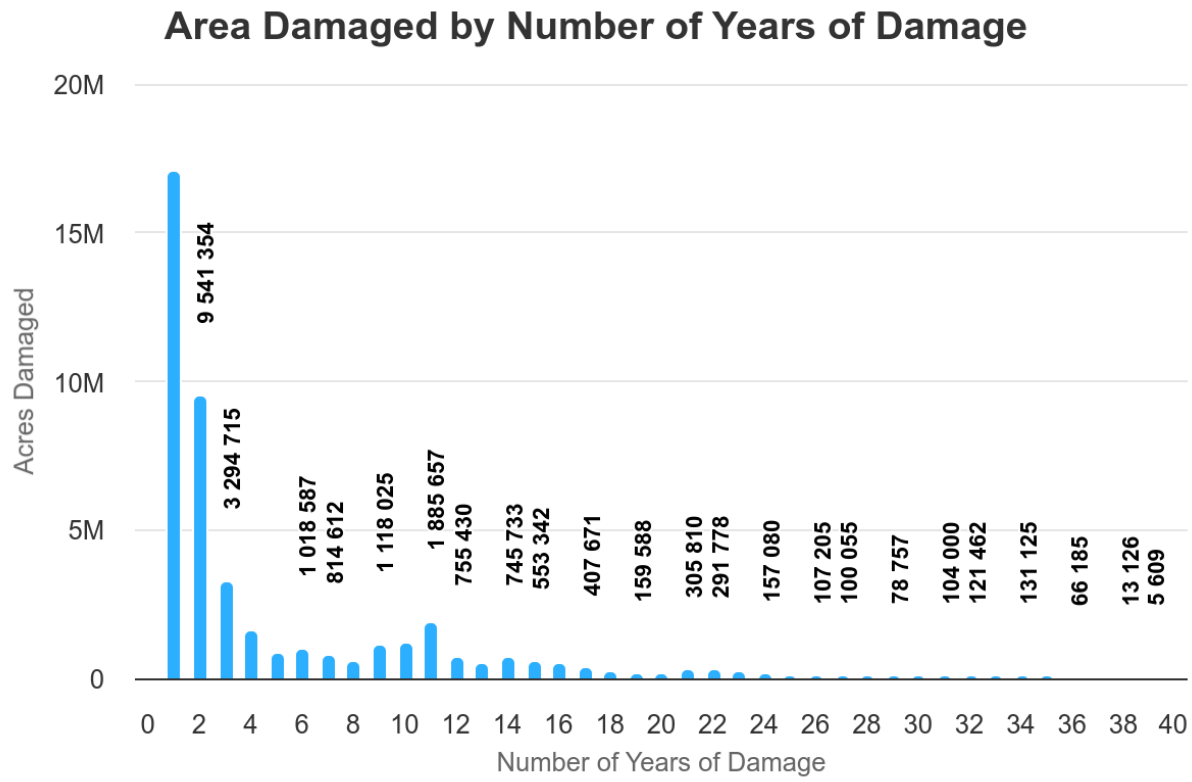


Figure 7: Area Damaged by Spongy Moth, Forest Tent Caterpillar, and Winter Moth from 1979 to 2019

In Worcester County, the vast majority of these invasive pest tree damage events occurred in the southern part of the county. Significant damage events have also occurred in the west and southwest of the county (near the border with Hampshire and Hamden Counties). In addition, localized defoliation events have occurred around the Town of Barre, the Tatnuck neighborhood of Worcester, and other communities. Tree mortality correlated with invasive species has been concentrated in the southern half of Worcester County.[150] In 2008, an outbreak of Asian long-horned beetles in Worcester destroyed nearly 30,000

[148] Ibid.

[149] "Northeastern Forest Health Atlas - Defoliation: Years of Damage," UVM.edu, Forest Ecosystem Monitoring Cooperative, accessed June 10, 2024, https://www.uvm.edu/femc/forest-health-atlas?premade=All_Defo.

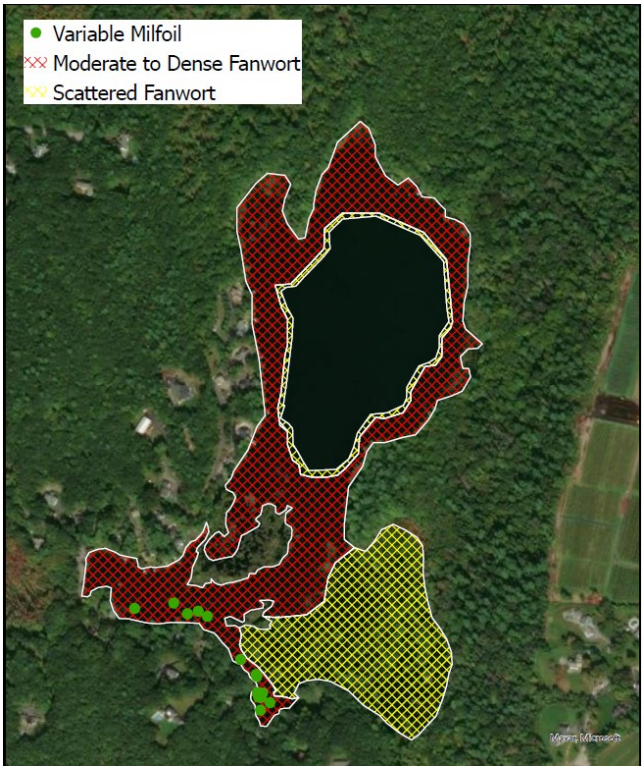
[150] Ibid.

trees.[151]

Boylston has experienced invasives-related defoliation events from 1998 through 2020, with significant mortality events occurring in 2018, 2019, and 2020. Based on trends identified in the Atlas, there is no reason to assume that invasive forest species hazards have lessened in more recent years.

The local HMP planning team in Boylston noted that invasive species have been a growing concern within town; beyond the already mentioned invasives, Rocky Pond has become infested with water born invasives and hemlock trees within MassDCR properties in town have experienced aphid defoliation. The USGS Non-Indigenous Aquatic Species Dashboard also notes that there has been one recorded instance of a non-native (to Massachusetts) turtle being released in the Wachusett Reservoir; this instance occurred in 1991, and this turtle was later collected.[152]

The established presence of a variety of invasive species at Rocky Pond has been noted by nearby residents and interest groups; in a survey of the pond, the presence of Fanwort and Variable Milfoil was detected in significant amounts. According to this survey, Fanwort was both the most dominant invasive species and most dominant species throughout the pond.[153]



[151] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

[152] USGS. (n.d.). *NAS - Nonindigenous Aquatic Species - Pseudemys concinna floridana*. Florida cooter (Pseudemys concinna floridana) - collection record. https://nas.er.usgs.gov/queries/SpecimenViewer.aspx?SpecimenID=115653
https://nas.er.usgs.gov/queries/SpecimenViewer.aspx?SpecimenID=115653

[153] Lacasse, J. (2024). (rep.). *Rocky Pond Survey* (pp. 1–7). Upton, Massachusetts: Water and Wetland: Lake, Pond & Wetland Management.

Figure 8: Invasive Species Map of Rocky Pond

The Town and residents living around the pond are currently planning the remediation of the pond and continued monitoring of invasive species in the pond and its surroundings.

Probability of Future Events

The 2023 ResilientMass Plan notes that increased globalization of trade has created new paths for invasive species to spread. Climate change is also an aggravating factor in the spread of invasives, as natural ecosystems become strained by increased temperatures and shifting precipitation patterns; Climate change therefore creates more opportunities for invasives to disrupt an already fragile ecology. Based on the previously identified occurrences and trends, the probability of an invasive species event occurring in Boylston is very high, with a 70% to 100% probability of occurrence in the next year.

Impact

Specific impacts of invasive species in Boylston may vary, depending on the type of invasive, the habitat that it is supplanting within the native ecosystem, and other factors. Invasive species' direct impact on the natural ecology has many notable secondary impacts. The 2023 ResilientMass plan identifies that invasive species can introduce new diseases to a region (such as the 2005 Chikungunya Epidemic, spread in part by a viral mutation that allowed for the virus to be more commonly present in the *Aedes albopictus* mosquito, an invasive subspecies).[154] Invasives are also one of the costliest natural hazards in terms of control efforts, costing the United States and estimated $21 billion per year.[155] Given what information is known about the extent of invasive species within Boylston, the local HMP planning team estimates a "critical" impact on the Town from invasive species, with between 25% and 50% of property in the areas affected by this hazard being damaged or destroyed.

Exposure

Certain features within Boylston's infrastructure, society, and environment may face more exposure to invasive species, or be disproportionately impacted by them, relative to the rest of the community. Some of these features may be documented in the list of critical facilities and vulnerable populations in Section 3. These features include:

- People with compromised immune systems or preexisting health conditions, children under the age of five, and people over 65 years old who might be particularly vulnerable to new diseases or aggravated health problems caused by invasives;
- Roadways, as Japanese Knotweed, an invasive known to cause streambank destabilization, can contribute to flood damages and can affect sightlines along roadways, potentially causing roadway hazards;
- Local government, as invasive species may pose a management cost burden that exceeds local financial capacity, especially for departments tasked with their management and for

[154] Konstantin A. Tsetsarkin et al., "A single mutation in chikungunya virus affects vector specificity and epidemic potential," *PLOS Pathogens* 3, no. 12 (December 7, 2007): e201, https://doi.org/10.1371/journal.ppat.0030201.

[155] Kerry Sheridan, "Invasive species cost the US $21 billion per year, study finds," WUSF.org, WUSF Public Media, January 4, 2022, https://www.wusf.org/local-state/2022-01-04/invasive-species-cost-the-us-21-billion-per-year-study-finds.

departments tasked with the maintenance of facilities that are impacted by invasives;

- The local ecology, as invasive species can also change the local ecology to make it more fire prone, either by damaging the native plants or by being prone to fire themselves.

Boylston is uniquely vulnerable to both land-based and aquatic invasives due to large portions of the Town's total acreage being taken up by forested land and the Wachusett Reservoir.

Potential Climate Change Effects

According to the 2023 ResilientMass Plan, climate change is predicted to increase the spread of invasive species and expand their range. Already fragile ecosystems, if left unmanaged, will suffer the worst effects of invasive species; native flora and fauna species could be supplanted by invasive species that outperform or outright damage them. The vast majority of invasive species introductions are caused by human activity, either accidental or intentional.

Both changes in precipitation patterns and temperature may increase chances of successful invasion of ecosystems by non-native species.

1. Precipitation
    a. Elevated atmospheric CO2 concentrations could reduce the ability of ecosystems to recover from climate shocks; this can create an opportunity for invasive species, which can often rapidly establish themselves following a disturbance, to successfully propagate.
2. Temperature
    a. Climate-driven temperature changes exacerbate the impacts of invasive species by altering ecosystem conditions in ways that enhance their ability to reproduce, spread, and in some cases outcompete native species.
    b. As warmer temperatures place stress on native cold-weather species in the region, invasive species accustomed to higher temperatures are able to more easily fill native species' niches and therefore expand their habitat ranges northward.

Secondary hazard impacts from invasive species include increased temperatures, damage to agricultural crops, and increased wildfire risk; as described in previous sections, all of these hazard impacts have associated potential societal implications through population shifts and changes in land use and development.

Vulnerability

Based on the above assessment, Boylston has a hazard index rating of "2 – high risk" from invasive species.

Mitigation Strategies

The Town of Boylston is currently able to effectively respond to invasive species through the emergency response facilities and services identified in the critical infrastructure and facilities and existing protection sections of this plan. However, there are numerous opportunities for the Town to expand upon its existing capabilities to mitigate and respond to invasive species. The local HMP planning team identified the following strategies that could be used to reduce the threat of invasive species in Boylston:

- Develop a management plan for Rocky Pond to remove invasive species and improve water

quality.

- Educate residents about invasive species management. Explore establishing a regionalized education and abatement program for invasive species management.

4.13 Other Hazards

In addition to the hazards identified in previous sections, the Boylston Hazard Mitigation Planning Team reviewed the other hazards listed in the Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP). Hazards from the SHMCAP deemed irrelevant to Boylston due to the Town's location are coastal hazards, atmospheric hazards, ice jams, coastal erosion, sea level rise, and tsunamis. Coastal hazards, coastal erosion, sea level rise, and tsunamis are recognized to affect coastal jurisdictions in Massachusetts and other New England states but have been deemed irrelevant to Boylston due to the Town being just over 30 miles from the nearest coastline.

Although landslides have been recognized as affecting communities in Central Massachusetts, the HMP team in Boylston did not identify them as affecting the Town; therefore, they were omitted from having a full section in this plan. A brief overview of this hazard is included below.

Landslides

One other hazard discussed in the SHMCAP that can affect Boylston is landslides. Landslides occur in all U.S. states and territories. During a landslide, masses of rock, earth, or debris move down a slope. Landslides may be small or large, slow or rapid. They are generally activated by:

- Storms,
- Earthquakes,
- Volcanic eruptions,
- Fires,
- Alternate freezing and thawing, and/or
- Steepening of slopes caused by natural erosion or human modification.

Debris and mud flows (landslides) are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or "slurry." They can flow rapidly, striking with little or no warning at avalanche speeds. They also can travel several miles from their source, growing in size as they pick up trees, boulders, cars, and other materials. Vulnerabilities in the Central Massachusetts region to landslides could include damage to structures, damage to transportation and other infrastructure, and localized road closures. Injuries and casualties, while possible, would be unlikely given the low extent and impact of landslides in the region.

Landslides are therefore considered low frequency events that may occur once in 50 to 100 years (with a 1% to 2% chance of occurring per year) in Central Massachusetts.

There are no documented previous occurrences of significant landslides in Boylston. However, there have been incidences of roadway washouts on West Temple Street in town due to culvert failure during a high rain event. The local HMP planning team in town also noted that there have been minor incidences of breakout problems relating to construction; these incidences have largely been addressed by the Town's

Earth Removal Board, who oversee required earth removal and stormwater management permitting for construction projects in town. Roadways in town are not generally built close to river channels; this reduces undercutting risk from stormwater-induced bank erosion. Should a landslide occur in town in the future, the type and degree of impacts would be highly localized. Vulnerabilities in town to landslides could include damage to structures, damage to transportation and other infrastructure, and localized road closures, though CMRPC's data review noted no specific concerns. Injuries and casualties, while possible, would be unlikely given the low extent and impact of landslides in Boylston.

Changes in Groundwater

Another hazard of concern that affects Boylston is changes in groundwater. This hazard was identified primarily through the community survey for this plan; common concerns among town residents who responded to the survey included basement flooding from water as well as concerns regarding wells drying up in the future. While the 2023 ResilientMass Plan notes changes in groundwater as a specific hazard, our plan identifies it as being a secondary effect of drought and flooding.[156] Boylston is no more or less vulnerable to changes in groundwater than any other community in the CMRPC region, with the Town being reservoir fed and having the ability to connect to nearby water resources. The details of the Town's specific vulnerabilities to changes in groundwater are included in both the drought and flooding sections of this plan. At time of plan writing the local hazard mitigation planning team in Boylston has determined that there are no hazards specific to changes in groundwater that affect Boylston that are not already captured earlier in the plan in the drought and flooding sections.

According to the 2023 ResilientMass Plan, climate change is predicted to affect groundwater availability; Sea level rise, extreme temperature events, changes in precipitation patterns, and the increased frequency and duration of drought conditions will all reduce the amount of available groundwater to the Town.[157]

[156] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan," pages 5.1-34-5.1-35.

[157] Ibid.

5.0 EXISTING PROTECTION

Sections 5.0 and 5.1 help meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3));*
- *B2. "Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods?" (Requirement 44 CFR § 201.6(c)(2)(ii));*
- *C1. "Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?" (Requirement 44 CFR § 201.6(c)(3)); and*
- *C2. "Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?" (Requirement 44 CFR § 201.6(c)(3)(ii))*

The Town of Boylston currently makes use of most available locally controlled tools, including zoning regulations, planning, and physical improvements, to help mitigate the consequences of natural hazards. The Town does not participate in federal StormReady certification or Firewise community certification, but it does utilize CodeRed and Reverse 911 for emergency notifications. The Town plans to research the utility of public awareness and education programs as a result of this planning process.

Boylston has most no-cost or low-cost hazard mitigation capabilities in place. These include land use, zoning, and subdivision regulations as well as an array of specific policies and regulations that include hazard mitigation best practices, such as limitations on development in floodplains, tree maintenance, and other practices. Boylston also has appropriate staff dedicated to hazard mitigation-related work for a community of its size, including a Town Administrator, an Emergency Management Director/Fire Chief, a Town Planner, a professionally run Department of Public Works, a Building Inspector, and a Tree Warden. Boylston has several relevant plans in place, including a Comprehensive Emergency Management Plan (2022), an Open Space and Recreation Plan (2020), a Municipal Vulnerability Preparedness Plan (2022), and a Master Plan (2022). Not only does Boylston have these capabilities in place, but they are also deployed for hazard mitigation as is appropriate. The Town also has very committed and dedicated volunteers who serve on boards, commissions, and committees as well as in other volunteer positions. The Town collaborates closely with surrounding communities through the South Wachusett Regional Emergency Planning Committee and has opted into fire protection and DPW mutual aid agreements through MEMA. The Town's Conservation Commission is an active participant in the Massachusetts Statewide Stormwater Coalition and the Massachusetts Association of Conservation Commissions. Boylston is also an active member community of the Central Massachusetts Regional Planning Commission (CMRPC) and can take advantage of no cost local planning assistance provided by the professional planning staff at CMRPC as is needed.

The table below describes existing hazard mitigation protections in Boylston. It includes a brief description of each activity, a subjective evaluation of each activity's effectiveness, and a description of any recommendations for improvement for each activity.

5.1 Existing Protection Matrix

Table 34: Existing Protection Matrix

Existing Measure	Description	Action	Effectiveness & Recommendations
Participation in National Flood Insurance Program (NFIP)	The NFIP provides flood insurance for structures located in flood-prone areas. Also, communities participating in the NFIP have adopted and enforce ordinances, bylaws, and regulations that meet or exceed FEMA requirements to reduce the risk of flooding.	Boylston has participated in the National Flood Insurance Program since July 2nd, 1981. As of July 2nd, 2024, there is approximately 1 homeowner in town with a flood insurance policy.[158] There are 0 repetitive loss properties in Boylston. The Town's Select Board, in conjunction with the Planning Board and Building Inspector, are the appointed designees who implement the addressed commitments and requirements of the NFIP in town as well as administer the substantial improvement / substantial damage (SI/SD) provisions of the	Somewhat Effective Boylston should seek to further limit development in the 1% / 100-year flood zone. It should work to score in the Community Rating System (CRS) under NFIP to enable its residents to obtain lower flood insurance rates. Boylston should also educate its residents about NFIP. The Town is recommended to update their Flood Plain Zoning Bylaws to reflect the recent updates to the FIRMs dated to July 4th 2011[159] and July 16, 2014.[160] The Town is working on improving its process for carrying out the substantial

[158] "Community Overview: Boylston, Town of," NFIP Community Information System.

[159] FEMA Flood Map Service Center FIRM Panels Dated 07/04/2011: FIRM Panels: 25027C0444E, 25027C0463E, **25027C0607E**, **25027C0626E**, **25027C0610E** **https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd**

[160] FEMA Flood Map Service Center FIRM Panels Dated 07/16/2014: **FIRM Panels: 25027C0464F, 25027C0468F, 25027C0627F, 25027C0631F, 25027C0628F, 25027C0629F, 25027C0633F** **https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd**

Participation in National Flood Insurance Program (NFIP) (cont.)		Town's floodplain management regulations in compliance with the NFIP (CFR Title 44, Parts 59 through 65), the Massachusetts State Building Code (780 CMR), and the Town's bylaws. The Town monitors building activity within the flood plain to ensure compliance with provisions of state building code. The Town has adopted the Flood Insurance Rate Map (FIRM) dated from July 2, 1981;[161] this information is noted in the Floodplain Overlay District section 6.0 of Boylston's Zoning Bylaws.[162] The Town's Floodplain Overlay District, described in this same section of the Zoning Bylaw, includes all special flood hazard areas (SFHAs) designated as Zone A or A1-30 and regulates and permits development within these areas.	improvement/substantial damage (SI/SD) provisions of its floodplain regulations, along with substantial damage claims. In the future, the Town will collaborate with Flood Hazard Management Program staff at the state level to ensure a post-disaster plan is put in place to employ SI/SD provisions.
Stormwater Management policy and regulations in place	The Town's Planning Board and Conservation Commission review projects for consistency with MA DEP standards. This helps ensure adequate on-site retention and recharge.	Boylston has enacted Stormwater Management Regulations which are included in section 9.0 of the Town's General Bylaws. Boylston also participates in the Central Massachusetts Stormwater Coalition. These regulations are reviewed every 2 years and as is required by regulatory changes.	Very effective No changes recommended

[161] "Section 6 – Flood Plain District Regulations" Town of Boylston Massachusetts. (n.d.). Zoning by-laws for the town of Boylston, Massachusetts. https://cms3.revize.com/revize/boylstonma/Documents/Services/Clerk/By-Law/zoning_by-laws_revised_2021.pdf

[162] Ibid.

Local Wetlands Protection Bylaw and Regulations in Place (Massachusetts Association of Conservation Commissions)	These local policies build upon the State's Wetlands Protection Act and Regulations. They add regulatory oversight provisions for development within the jurisdictional buffer zone which increases attention to the alteration of wetlands and provides the opportunity to preserve wetland capacity and quality in town.	Boylston has implemented polices to increase wetland setbacks beyond the requirements of state regulations.	Effective Boylston should consider codifying its wetlands policies into a local wetlands bylaw in order to assist in efforts to sustain natural barriers to flooding.
Culvert and drainage system maintenance and repair program	This program keeps municipal drainage facilities (storm drains, culverts, etc.) in good order.	Boylston performs street sweeping and catch basin cleaning from April to November. The Town and the State have historically maintained and replaced problem culverts when needed and as funding allows.	Effective Boylston should develop a prioritized inventory of problem culverts which can inform efforts to seek external financial support for culvert-related projects.
Code Red System	This emergency alert system provides immediate notice to residents in emergency situations, including natural disasters and other incidents.	Boylston activated its Code Red System in 2014; this system sends alerts from town officials to residents by phone, text, and e-mail. The town Fire and Police Departments as well as other town departments and the Town Administration have access to the system for use during water and other emergencies.	Effective No changes recommended
Tree Trimming	This program consists of the routine maintenance of trees and reduces the likelihood of vegetative debris problems during and after storm events.	Boylston conducts roadside mowing from April to November to remove juvenile trees. Tree trimming (take-downs and clearing dead branches) is completed as is needed by the Boylston Light Department in conjunction with the assistance of the power company. In addition to this, the Town's Tree Warden and Highway Department clear hazardous trees from the right of way and public property.	Very Effective No changes recommended

Town Planning Initiatives: Master Plan	The Master Plan serves as a policy guide as well as the Town's future vision of itself. It compiles a comprehensive analysis of all aspects of community development and is designed to be a resource for the Town over the next 10-20 year time period.	The Boylston Master Plan was adopted in 2022.	Very Effective In the future, the Town should review the implementation of the Master Plan on a biannual basis instead of every four years. The Town should continue to consider hazard mitigation concerns in Master Plan implementation.
Town Planning Initiatives: Municipal Vulnerability Preparedness (MVP) Plan	This plan is a guide for climate resiliency implementation projects in town. It includes a vulnerability assessment and an action-oriented resiliency plan. This plan makes the town eligible for MVP Action Grant funding.	The Boylston Municipal Vulnerability Preparedness Plan was adopted in 2022. The Town has acted on some recommendations of this plan through other means, but it has not been successful with MVP Action Grant proposals. The town has not referred to this plan as a roadmap for future plans and actions.	Somewhat effective The Town should incorporate its MVP Plan recommendations into its broader planning goals and objectives.
Town Planning Initiatives: Open Space and Recreation Plan	This local plan identifies significant natural resources to ensure their protection. Following Massachusetts Department of Conservation and Recreation guidance for the development of OSRPs, this document does not focus on specific hazards. Open Space Plans can provide many tools. The Town must commit to making the land	Boylston's Open Space and Recreation Plan was recently updated in 2020, was approved by the Massachusetts Division of Conservation Services in 2020, and is valid through January 2027. It included recommendations to include hazard mitigation considerations.	Effective

	acquisitions and regulatory changes which are included in this plan's action items. It also must give increased attention to preserving undeveloped flood-prone areas and associated lands.		
Town Planning Initiatives: Low Impact Development (LID) Bylaw	The purpose of this Bylaw is to protect, maintain and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff and nonpoint source pollution associated with new development and redevelopment.	Boylston is currently bringing its town bylaws into compliance with the State's low impact development recommendations and is expected to adopt these changes to its bylaw.	Somewhat Effective It is recommended that the town implement the LID Bylaw updates within the timeframe of this planning document.
State Building Code	Compliance with the state building code means that buildings in town meet the minimum established requirements for structural strength, sanitation, and efficiency and are safe for regular use as well as during hazard events and other emergency situations.	The Town's Planning Board, Zoning Board of Appeals, and Building Inspector work to implement compliance with the state building code. The new update to the state building code (the 10th Edition of the Base Building Code (Massachusetts Amendments)) became effective on October 11th, 2024 and will be concurrent with the previous edition through June 30th, 2025.	Somewhat Effective The Town should look into coordinating with other towns to increase capacity for building inspection.

6.0 STATUS OF MITIGATION MEASURES FROM 2018 PLAN

Section 6.0 helps meet the following FEMA local mitigation plan requirements:

- *E2. "Was the plan revised to reflect changes in priorities and progress in local mitigation efforts?" (Requirement 44 CFR § 201.6(d)(3))*

During this hazard mitigation plan update process, the local HMP team in Boylston provided updates on the status of mitigation measures from the Town's 2018 Hazard Mitigation Plan. Certain measures were incomplete as of 2025 and were deemed as still being relevant; These relevant measures were re-incorporated in the 2025 Hazard Mitigation Plan action strategy if they are anticipated to be effective. The changes in the Town's priorities from the 2018 plan to this plan are noted in the bolded passages from the "**2025 Notes**" column in the table below. These changes in community priorities have resulted from reassessments of specific hazards-related challenges described in the 2018 plan.

Table 35: Status of Mitigation Measures from 2018 Plan

Structure & Infrastructure Strategies			
2018 Task	**2025 Status**	**2025 Notes**	**Include in 2025 Plan?**
Maintain tree trimming program across the town to protect utility wires.	Ongoing	The Town has implemented a tree trimming program **and has expanded this strategy to include the Municipal Light Department, the Highway Department, and power utilities to protect infrastructure and the right of way. This is an ongoing effort.** This strategy has been moved to the existing protection matrix.	NO
Maintain vegetative debris program, trimming brush and growth away from roads and clearing growth impact flow away from stormwater infrastructure.	Ongoing	The Town continues to clean and maintain its stormwater infrastructure and implement its vegetative debris program as is needed after storm events occur. This strategy has been moved to the existing protection matrix.	NO
Properly clean and maintain all stormwater structures and basins	Ongoing	The Town continues to clean and maintain its stormwater infrastructure on a regular basis. This strategy has been moved to the existing protection matrix.	NO

Preparedness, Coordination & Response Action Strategies			
2018 Task	**2025 Status**	**2025 Notes**	**Include in 2025 Plan?**
Continue to participate in National Flood Insurance Program (NFIP) (or other) training offered by the State and/or FEMA that addresses flood hazard planning and management	Ongoing	The Town continues to participate in NFIP and will be updating its Floodplain Zoning Bylaw to reflect the most up to date FIRMs. **The Town is also including runoff pollution (nitrogen, phosphorus, etc..) mitigation measures in this new plan.**	YES
Investigate Community Rating System (CRS) benefits and requirements and decide whether to participate	In Progress	**The Town is still considering seeking CRS credit.** If the Town does decide to pursue CRS credit, they can utilize this plan for Section 510/512 credit points.	YES
Road information coordination and planning for snow removal	Ongoing	The Town continues to coordinate communication relating to snow removal between the Highway Department, MassDOT, and other organizations. **The Town is interested in building stronger connections with these entities.**	YES
Evacuation Plan updates	In Progress	**The Town has indicated that they are interested in participating in a CMRPC region-wide evacuation planning update. CMRPC is seeking funding for this regional update.**	YES
Maintain fire access roads in isolated areas	In Progress	**The Town is seeking to increase its coordination with the Massachusetts Department of Conservation and Recreation in maintaining fire roads on state property.**	YES
Continue regional training and drills for emergency response in case of disaster	Ongoing	**Boylston recently participated in a statewide search and rescue exercise as well as other statewide exercises. The Town also performs annual preparedness drills with the Massachusetts Water Resources Authority and Department of Conservation and Recreation in areas surrounding the Wachusett Reservoir. This strategy relies on grant funding on a case-by-case basis so the town has elected to include this strategy in the plan update.**	YES

Education & Awareness Strategies			
2018 Task	**2025 Status**	**2025 Notes**	**Include in 2025 Plan?**
Provide information to residents and businesses on water conservation through low-impact landscaping and other measures (to conserve water for firefighting)	In Progress	The Town is incorporating low impact development guidelines into their bylaws. **Educational outreach to residents has been included in this current plan as well.**	YES
Continue SAFE & Senior SAFE program, educating students and the older population	Ongoing	The Town receives annual grant funding from the Massachusetts Department of Fire Services that pays for fire safety programs for seniors, replacing smoke detectors, student fire safety education in elementary schools, and other fire prevention activities. Funding for the SAFE and Senior SAFE programs had been reduced during the COVID 19 pandemic; however this funding source is being replenished and is being utilized by the Town to the fullest extent possible. **The Town is interested in seeking additional funding to fund these programs if possible.**	YES
Promote use of Federal and State resources related to hazard mitigation to combat complacency and foster individual responsibility.	No movement on this action yet	**The Town is interested in making this strategy more direct and actionable in the new plan.**	NO
Develop and maintain means for sharing information on a regional basis about successful hazard mitigation planning and programs. Create a feedback loop to improve pre-disaster planning by establishing a formal post-disaster assessment process.	Ongoing	The Town's Highway department and emergency services departments maintain active social media pages and coordinate pre- and post-disaster on community outreach around preparedness, mitigation, response and recovery activities, **however a regionalized information sharing methodology has not yet been created due to financial constraints.**	YES

Local Plan & Regulation Strategies			
2018 Task	**2025 Status**	**2025 Notes**	**Include in 2025 Plan?**
Review and update local plans and development review processes (planning, zoning, stormwater management, conservation, etc.) to ensure new construction will not be affected by hazards	In Progress	The Town has begun to incorporate hazard mitigation planning into its other plans and regulatory activities. **The Town is interested in improving on these efforts.**	YES
Continue enforcement and compliance of the Massachusetts Wetlands Protection Act	Ongoing	The Town works to enforce compliance with the Massachusetts Wetlands Protection Act; **the Town is also working on increasing internal coordination to provide an improved experience for permit applicants.**	YES
Review the Hazard Mitigation Plan on a 5 year cycle	In Progress	**The Town is implementing an annual review process as part of this hazard mitigation planning process to ensure that the plan is reviewed on a regular basis and updated as is needed.**	YES
Monitor implementation of Hazard Mitigation Plan	In Progress	**The Town plans on prioritizing mitigation strategies for grant seeking and implementation during the annual review process described above.**	YES
Maintain certification of officials in the Unified Incident Command program.	Ongoing	**Department heads in town are encouraged to get minimum Unified Incident Command training, as is described in the Town's 2022 CEMP Plan update. This often requires grant funding on a case-by-case basis.**	YES
Maintain shelter and emergency resources, ensuring accurate and up to date inventory is maintained and rotation of expiring resources replaced.	In Progress	The Town meets with the Red Cross regularly to ensure that town shelters are adequately supplied. **The Town is exploring establishing alternative shelter locations to increase the sheltering capabilities of the Town and the region in the case of disaster events.**	YES

7.0 Mitigation Strategy

The Boylston Hazard Mitigation Planning team developed a list of mitigation strategies (both new and previously identified by local officials) and prioritized them using the criteria described below. This list of factors is broadly derived from FEMA's STAPLE+E feasibility criteria.

7.1 Priority and Impact

Section 7.1 helps meet the following FEMA local mitigation plan requirements:

- C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

Real world considerations were brought into the analysis to inform the priority ranking process for the different mitigation strategies. Factors considered in this step include costs and cost effectiveness (including eligibility and suitability for outside funding), timing, political and public support, and local administrative burden. Each strategy was ranked as being high, medium, or low priority.

- High priority strategies have obvious mitigation impacts that clearly justify their costs and to a large degree can be funded, can be completed in a timely fashion, can be administered effectively, and are locally supported.
- Medium priority strategies have some clear mitigation impacts that generally justify their costs and generally can be funded, can be completed in a timely fashion, can be administered effectively, and are locally supported.
- Low priority strategies have relatively low mitigation impacts that do not necessarily justify their costs and may have difficulty being funded, being completed in a timely fashion, being administered effectively, and garnering local support.

Costs and cost effectiveness – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have clear and viable potential funding streams, such as FEMA's Hazard Mitigation Grant Program (HMGP), are also given higher priority.

Time required for completion – Projects that are faster to implement, either due to short work duration, current or near-term availability of funds, and/or ease of permitting or other regulatory procedures, are given higher priority.

Political and public support – Strategies are given higher priority if they have political and/or public support which is shown through public feedback, prioritization in previous regional and local plans, initiatives that were locally initiated or adopted, and/or prioritization in the Municipal Vulnerability Preparedness Program Community Resilience Building workshop process.

Administrative burden – Strategies that are realistically within the administrative capacity of the Town and its available support network (CMRPC, local non-profit organizations, regional collaborative associations etc.) are prioritized. Grant application requirements, grant administrative requirements (including audit requirements), procurement, and staff time to oversee projects are all considered when figuring out the administrative burden of a strategy.

Impact – The HMP Core Team's consideration of each strategy included an analysis of the mitigation impact each can provide, regardless of cost, political support, funding availability, and other constraints. The intent of this step is to separately evaluate the theoretical potential benefit of each strategy to answer the question: if cost were no object, what strategies have the most benefit? Factors considered in this analysis include the number of hazards each strategy helps mitigate (more hazards equals higher impact), the estimated benefit of the strategy in reducing loss of life and property (more benefit equals higher impact), and the geographic extent of each strategy's benefits (other factors being equal, a larger area equals higher impact).

- High impact actions help mitigate several hazards, substantially reduce loss of life and property (including loss of critical facilities and infrastructure), and/or aid a relatively large portion of the community.
- Medium impact actions help mitigate multiple hazards, somewhat reduce loss of life and property (including loss of critical facilities and infrastructure), and/or aid a sizeable portion of the community.
- Low impact actions help mitigate a single hazard, lead to little or no reduction in loss of life and property (including loss of critical facilities and infrastructure), and/or aid a highly localized area.

7.2 Estimated Cost

Each implementation strategy is provided with a rough cost estimate based on available third party or internal estimates and past experience with similar projects. Each cost estimate includes hard costs (construction and materials), soft costs (engineering design, permitting, etc.), and, where appropriate, Town staff time (valued at appx. $25/hour for grant applications, administration, etc.). Strategies that already have secured funding are noted. Detailed and current cost estimates for strategies were generally not available, so costs are summarized within the following ranges:

- Low – less than $50,000
- Medium – between $50,000 – $100,000
- High – over $100,000

7.3 Expected Timeline

Section 7.3 helps meet the following FEMA local mitigation plan requirements:

- *C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))*

Each strategy is provided with an estimated length of time it will take for implementation. For strategies for which funding has been secured, a specific future date is provided for when completion is expected. However, most projects do not currently have funding and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available. Each strategy has a timeframe of either a specified period of less than 5 years, a 5+ year timeframe, or an ongoing timeframe.

7.4 Strategy Types

Mitigation strategies included in this plan are subdivided into the following four broad categories which can help facilitate local implementation discussions, especially regarding budget considerations and staff roles/responsibilities:

Structure and Infrastructure Projects relate to constructing "brick & mortar" infrastructure and building improvements in order to eliminate or reduce hazard threats or in order to mitigate the impacts of hazards. Examples of this type of project include drainage system improvement, dam repair, and generator installation. Structure and infrastructure improvements tend to have the greatest level of support at the local level but are highly constrained by funding limits.

Preparedness, Coordination and Response Actions ensure that a framework exists to facilitate and coordinate the administration, enforcement and collaboration activities described in this plan. They integrate disaster prevention/mitigation and preparedness into every relevant aspect of town operations, including the operations of the Police Department, Fire Department, EMD, EMS, DPW, Planning Board, Conservation Commission and Select Board; they also help the Town coordinate with neighboring communities where appropriate. Recommendations in this category often help standardize generally practiced activities.

Education and Awareness Programs help raise awareness of overall or hazard-specific risk and generate support for individual or community-wide efforts to reduce risk. Education and awareness seek to affect broad patterns of behavior. Awareness-building activity tends to have a fairly slow effect, although in the end it can provide extraordinary benefits with relatively little cash outlay.

Local Plans and Regulations propose updates to or formally update or establish local bylaws, ordinances and other regulations to protect vulnerable resources and prevent future natural hazard impacts on these resources. Local plans can also review the effectiveness of past mitigation projects, programs, procedures, and policies so that strategies for making them more effective in the future can be formed. An example of a project which fits under this category is incorporating mitigation planning into master plans, open space plans, capital improvement plans, facility plans, and other town plans.

Planning and regulatory activity tends to provide extraordinary benefits to towns with relatively little cash outlay. However, in smaller communities where planning activities are largely the purview of volunteers, outside assistance from the state or regional levels may be required to maximize the benefits of planning. Political support may be difficult to achieve for some planning and regulatory measures, especially those that place new constraints on land use.

In addition to describing action items in each of these categories, the row for each strategy also identifies what hazard(s) the strategy is intended to address. Each row also identifies the lead organizations who serve as the primary points of contact for coordinating efforts associated with the corresponding strategy and identify potential funding sources for implementing the strategy.

7.5 Strategy Goals

Section 7.5 helps meet the following FEMA local mitigation plan requirements:

- *C3. "Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?" (Requirement 44 CFR § 201.6(c)(3)(i))*

For each of the strategy types included above, there is an associated mitigation goal. The goals are as follows:

Structure and Infrastructure Projects – Harden and adapt the Town's current infrastructure to withstand hazards in the near-term and the long-term, incorporating nature-based strategies whenever feasible and desirable to build a more resilient municipality.

Preparedness, Coordination and Response Actions – Improve the Town's emergency and municipal service capabilities to effectively respond to and recover from natural disasters, as well as to build and establish relationships with stakeholders to ensure the continuation of essential services in the event of a disaster.

Education and Awareness Programs – Educate and inform the public about the threats of natural hazards and climate change; provide the resources for individual and community preparedness and foster a whole community response to natural hazards and climate change.

Local Plans and Regulations – Adopt and approve plans and legislation that prioritize climate resiliency and hazard mitigation; incorporate principles of resiliency within local and regional planning and legislative actions.

7.6 Town of Boylston 2025 Hazard Mitigation Strategies

Section 7.6 helps meet the following FEMA local mitigation plan requirements:

- *C3. "Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?" (Requirement 44 CFR § 201.6(c)(3)(i));*
- *C4. "Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?" (Requirement 44 CFR § 201.6(c)(3)(ii));*
- *C5. "Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction?" (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii)); and*
- *D2. "Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)?" (Requirement 44 CFR § 201.6(c)(4)(i))*

The Town has decided to prioritize the following mitigation strategies. The columns of the table below reflect the criteria described above. In the "Who (Agencies Involved)" column, the lead agencies for each strategy are bolded.

OVERALL GOAL: The overall goal of these mitigation strategies is to facilitate activity within the Town of Boylston that reduces the loss of people's lives, property in town, and environmental resources in town as well of the risk of these losses in the case of natural hazard occurrences. Please view section 8.4, Potential Federal and State Funding sources, for more information on the funding sources listed below.

Table 36: Town of Boylston 2025 Hazard Mitigation Strategies

Structure & Infrastructure Strategies								
Number	**Actions**	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
A-1	Install a culvert on West Temple Street to prevent washouts in the future.	FL	**Highway Department,** MassDOT	Local (capital budget), State (MVP Action Grant, Culvert Replacement Municipal Assistance Grant Program) Federal (National Culvert Removal, Replacement, and Restoration Grant)	High	High	High	2 years
A-2	Address the snow load issue at Boylston Elementary School, as this school's roof leaks every time a major rainfall or snowfall event occurs. The Town has recently completed infrastructure improvements at this school; this mitigation strategy is being included in this plan in case increased resiliency retrofits are required.	SS	**School District,** BOS	State (Green Repair Program, MSBA Repair Program) Federal (ARPA, FEMA BRIC Grant)	High	High	High	0-1 years, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
A-3	Develop the Municipal Building and/or the Gough House into a shelter location through retrofitting as well as upgrading shower facilities, ADA compliance, upgrading heating and cooling systems, and installing backup power generation.	XT	**Council on Aging,** Feasibility Committee	Local (general operating budget, capital budget), Federal (CDBG, Safeguarding Tomorrow Revolving Loan Fund, FEMA grants)	High	High	High	2-3 years
A-4	Investigate increasing municipal resilience through generating power with municipally owned green energy technology, potentially through utilizing public-private partnerships with warehouse developers.	All	Municipal Light Department, BOS	Pace Program (MassDevelopment)	Low	Medium / High	High	5+ years
A-5	Complete a feasibility study for the relocation and construction of a fire, police, and senior community center facility. Utilize a climate resilient design for this facility.	All	**Town Government,** Feasibility Committee	Local (Town Meeting), State (MVP), Federal (BRIC/FMA)	High	High	High	2-3 Years

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
A-6	Create town-wide microgrid(s) by installing the following: solar canopy system(s) on municipal and/or school parking lots, brownfields, capped landfills, and closed fuel facilities, rooftop solar array(s) for municipal, public hospital, and/or public school building rooftops, and a battery storage substation which connects to the grid.	SS, ST, HU, WF	**Regional School District**, Municipal Government, Municipal Light & Power	Local (Town Meeting), State (MVP Action Grant), Federal (FEMA BRIC Grant)	Medium	High	High	1-2 Years

Preparedness, Coordination & Response Action Strategies								
Number	**Actions**	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
B-1	Investigate the benefits and requirements of the Community Rating System (CRS) and decide whether to participate in this program or not.	FL, SS, ST, HU	Highway Department, **Local Emergency Management**, PB	Local (general operating budget)	Low	Low	Low	1-2 Years
B-2	Enhance road information coordination as well as planning for snow removal.	SS	**Highway Department**, MassDOT, Mass State Police, CMRPC	Local (general operating budget), Federal (FEMA BRIC Grant, Homeland Security Grant funding through EOPSS and CRHSAC), Private Contracts	High	High	Low	0-1 year, then ongoing
B-3	Participate in Regional Evacuation Plan updates.	All	**Local Emergency Management**, Highway Department, CMRPC, MassDOT	Local (general operating budget), Federal Grants (Homeland Security Grant funding through EOPSS and CRHSAC)	High	High	Low	1-2 Years (update every 5 Years)
B-4	Maintain fire access roads in isolated areas and improve coordination with MassDCR in relation to wildland firefighting.	DR, WF	**Fire**, Highway Department, MassDCR	Local (general operating budget); Federal (FEMA Assistance to Firefighters Grant) for equipment	High	High	Low	1-2 years, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
B-5	Enhance the Town's participation in and coordination and planning relating to regional disaster and emergency response training and drills.	All	**Fire**, Police, Highway Department, MassDCR, MWRA, State Police, REPC	Local (general operating budget), State (CRHSAC), Federal (EMPG)	High	High	Low / Medium	0-1 year, then ongoing
B-6	Investigate establishing a sump pump program which can help residents address localized flooding concerns.	FL	**BOH**, CC, Fire, Highway Department	Local (general operating budget), State (COMMBUYS)	Low	Low	Low	1-2 years
B-7	Investigate resuming the town septic program.	FL	**Board of Health**	State Grants (DEP)	High	High	Low to investigate, High to implement	1-2 years
B-8	Investigate establishing a lightning rod program to offer discounted rates for lightning rods.	LS	**Municipal Light Department**, Fire	Local (Municipal Light Department operating budget), State (COMMBUYS)	Low	Low	Low	1-3 years
B-9	Investigate mitigation strategies to address beaver dams at the waterways near Mill Road Dam and in other areas in town at which beavers are causing detrimental impacts.	FL	**CC**, BOH, Highway Department, Central MA Mosquito Control	Local (general operating budget), State (MVP), Federal (BRIC/FMA)	Medium	High	Low to look into, High to implement	1-2 years, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
B-10	Develop a management plan for Rocky Pond to remove invasive species and improve water quality.	IS	**Rocky Pond Association,** Conservation Commission, Parks and Recreation Commission	Local (general operating budget) State(MVP/EEA), Federal (BRIC)	Medium	Medium	Low	6 months to 1 year, then ongoing
B-11	Coordinate with New England Botanical Garden at Tower Hill regarding hazard mitigation as well as emergency preparedness and response efforts.	All	**BOS,** New England Botanic Garden at Tower Hill	Local (general operating budget)	Medium	Medium	Low	6 months to 1 year, then ongoing
B-12	Consider obtaining Firewise Community Certifications for the neighborhoods in town which are at greatest risk of being affected by wildfires.	WF	**Fire Department**	Local (general operating budget)	Medium	Medium	Low	6 months to 1 year, then ongoing

Education & Awareness Strategies								
Number	**Actions**	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
C-1	Provide information to residents and businesses on how to conserve water through low-impact landscaping and other measures (in part to conserve water for firefighting).	DR, WF	**Conservation Commission,** Water District	Local (Water District operating budget), Private (water companies), State (EEA)	High	Medium	Low	6 months to 1 year, then ongoing
C-2	Promote the use of federal and state resources (such as NPDES guidelines and the StormReady program) related to hazard mitigation to increase individuals' ability to prepare for and respond to hazards.	All	**BOS,** All Town Departments	Local (general operating budget), State (MVP), Federal (EMPG)	Medium	Medium	Low	6 months to 1 year, then ongoing
C-3	Develop and maintain a means for sharing information on a regional basis about successful hazard mitigation planning and programs. Create a feedback loop to improve pre-disaster planning by establishing a formal post-disaster assessment process.	All	Fire, Police, **EMD,** Highway Department, REPC, CMRPC	Local (general operating budget), State (DLTA, CMRPC Local Planning Assistance, MVP Action Grants), Federal (BRIC/FMA, HMGP)	Low	Low	Medium	1-2 years

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
C-4	Coordinate with community partners (i.e. the Garden Club, the New England Botanic Garden at Tower Hill) to spread information about the use of chemical fertilizers and how they affect water quality.	All	**Conservation Commission,** Building Department, Water District, Golf Courses	Local (general operating budget), Property owner funding	Medium	Medium	Low	6 months to 1 year, then ongoing
C-5	Provide public outreach on warming/cooling centers in town.	XT	**Fire Department**	Local (general operating budget)	Medium	Medium	Low	6 months to 1 year, then ongoing
C-6	Establish a climate resilience / hazard mitigation internship program in partnership with the Berlin-Boylston School District.	All	Water District, Highway Department, Municipal Light Department, **School District,** Emergency Management Director	Local (general operating budgets for Water District, Municipal Light Department, and/or town)	Medium	Low	Low	6 months to 1 year, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
C-7	Educate residents regarding well water quality testing methods and programs.	FL	**BOH**, Water District	Local (general operating budgets for Water District and town), State (EEA)	Medium	Medium	Low	6 months to 1 year, then ongoing
C-8	Educate residents about invasive species management. Explore establishing a regionalized education and abatement program for invasive species management.	IS	**CC**, Highway Department (Tree Warden)	Local (general operating budget), State (MVP Action Grant)	Medium	Medium / High	Low	6 months to 1 year, then ongoing

Local Plan & Regulation Strategies								
Number	**Actions**	**Hazards Addressed**	**Agencies Involved**	**Potential Funding Sources**	**Priority**	**Impact**	**Estimated Cost**	**Expected Timeline**
D-1	Review and update local plans and development review processes (planning, zoning, stormwater management, conservation, etc.) to ensure that new construction will not be affected by hazards.	All	**All Town Departments**, CMRPC	Local (general operating budget), State Grants (EEA Planning Assistance Grant)	Medium	High	Low	6 months to 1 year, then ongoing
D-2	Continue enforcement and compliance of the Massachusetts Wetlands Protection Act. Improve coordination with MassDCR for the enforcement and compliance with the Watershed Protection Act.	All	**CC**, Planning, Building Department (Zoning Enforcement Officer), MassDCR	Local (general operating budget)	High	High	Low	6 months to 1 year, then ongoing
D-3	Expand the use of the Capital Improvement Program to incorporate hazard mitigation into this planning program.	All	**BOS**	Local (capital budget)	Medium	Medium	Low	1-2 years

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
D-4	Monitor implementation of the Town's Hazard Mitigation Plan. On an annual basis and/or as hazards occur, review the mitigation strategies in the plan and assess implementation progress by holding a meeting of the Hazard Mitigation Planning Team.	All	**EMD**, All Town Departments, CMRPC	Local (general operating budget)	High	High	Low	6 months to 1 year, then ongoing
D-5	Maintain the certification of town officials in the Unified Incident Command program.	All	**EMD**, All Town Departments	Federal (FEMA Grants, Homeland Security Grant funding through EOPSS and CRHSAC)	High	High	Low	6 months to 1 year, then ongoing
D-6	Maintain shelter and emergency resources; ensure that an accurate and up to date inventory is maintained and that expired resources are routinely replaced.	All	**EMD**	Local (general operating budget)	Medium	Medium	Low	1 to 2 years, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
D-7	Investigate adopting a bylaw that prevents chemical fertilizer use in vulnerable watershed areas, particularly around Spruce Pond. Educate the public about stormwater management best practices, especially best practices for stormwater management near ponds.	DR	CC, **Planning**, Water District	Local (general operating budget), State (EEA Planning Assistance Grant, MVP Action Grant, DLTA)	Medium	Medium	Low	1-2 years
D-8	Increase coordination between Shrewsbury and Boylston concerning the water levels and nitrogen levels at Newton Pond.	FL	**Town Government**, MassDEP, CC	Local (general operating budget), State (DEP)	High	Medium	Low	6 months to 1 year, then ongoing
D-9	Complete and administer a town-wide culvert plan for replacing aging stormwater infrastructure with nature-based solutions.	FL	**Highway Department**	Local (Town Meeting), State (MVP Action Grant)	High	High	Low	1 to 2 years, then ongoing

Number	Actions	Hazards Addressed	Agencies Involved	Potential Funding Sources	Priority	Impact	Estimated Cost	Expected Timeline
D-10	Look into increasing developers' compliance with stormwater control bylaws by increasing fines for non-compliance or by including other penalties as well as by obtaining MS4 certification.	FL	**Town Government,** CC, Engineering Firm (Tighe and Bond)	Local (general operating budget)	High	High	Low	1 to 2 years, then ongoing
D-11	Explore becoming a Massachusetts-designated Green Community.	All	BOS, **Planning,** Building Commissioner	Local (general operating budget)	High	High	Low	1-2 years
D-12	Investigate the viability of establishing a stormwater utility in Boylston.	FL	**BOS**, CC, Planning	Local (general operating budget)	Medium	High	Low	1-2 years
D-13	Inventory unreinforced masonry and brick buildings in town which may be vulnerable to earthquakes. Conduct a study which identifies ways that these buildings, including the Boylston Public Library and the Boylston Historical Museum, can meet the Massachusetts State Building Code's seismic standards.	EQ	**Building Department,** Planning Department	Local (general operating budget), State (MEMA Grants), Federal (FEMA Grants (National Earthquake Hazards Reduction Program's State Assistance Program))	Low	Medium	Low	0-3 years, then ongoing

Note: Mitigation strategies with an ongoing expected timeline after their initial expected timeline are hazard mitigation actions that the Town should continually work on advancing and/or periodically work on once they have begun.

'Hazards Addressed' abbreviations:

DF	Dam Failure	DR	Drought
EQ	Earthquake	FL	Flooding
HU	Hurricane	IS	Invasive Species
OT	Other	SS	Severe Snowstorm / Ice Storm / Nor'easter
ST	Severe Thunderstorm / Wind / Tornado	WF	Wildfire / Brushfire
XT	Extreme Temperatures		

Who? Agencies Involved' abbreviations:

CMRPC	Central Mass. Regional Planning Commission	CC	Conservation Commission
DPW	Department of Public Works	EMD	Emergency Management Director
PB	Planning Board	LEPC	Local Emergency Planning Committee
ZBA	Zoning Board of Appeals		

8.0 Plan Adoption, Implementation, and Maintenance

8.1 Plan Adoption

A public meeting was held on September 9, 2024 as part of the Select Board's meeting in order detail the Boylston Hazard Mitigation Plan update process to that date and to solicit comments and feedback from the public and the Select Board on the draft plan which was then being developed. The draft plan was provided to the Town for distribution and was posted on the Town's website for four weeks starting on September 20, 2024 for public review and input. The Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their review. Upon receiving conditional approval of the plan by FEMA, the final plan was adopted by vote of the Boylston Select Board and certified on January 26th, 2026.

8.2 Plan Implementation

Section 8.2 helps meet the following FEMA local mitigation plan requirements:

- *A4. "Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information?" (Requirement 44 CFR § 201.6(b)(3)); and*
- *E2. "Was the plan revised to reflect changes in priorities and progress in local mitigation efforts?" (Requirement 44 CFR § 201.6(d)(3)).*

The Town of Boylston has completed the 2022 Boylston Municipal Vulnerability Preparedness Plan, the 2022 Boylston Master Plan, the 2020 Boylston Open Space and Recreation Plan, and the 2022 Boylston Comprehensive Emergency Management Plan; Findings from the 2025 Boylston Hazard Mitigation Plan update, including the data, ideas, and strategies incorporated into the plan ,may be integrated into future iterations of all of these plans as well as zoning updates for the Town, stormwater and/or flooding studies/plans completed in town, and other planning mechanisms and documents.

The implementation of this 2025 plan update began upon its formal adoption by the Select Board and approval by MEMA and FEMA. Town departments and boards responsible for ensuring the development of policies, ordinance revisions, and programs as described in Sections 6 and 7 of this plan will be notified of their responsibilities immediately following this plan's approval. The local Hazard Mitigation Team in town will oversee the implementation of this plan.

Incorporation with Other Planning Documents

Findings from the 2018 Boylston Hazard Mitigation Plan were incorporated into other planning mechanisms and policies in town besides this plan update, including the 2022 Boylston Comprehensive Emergency Management Plan and the Boylston Zoning Bylaws. In addition, existing plans, studies, reports, and municipal documents completed by and/or relating to the Town were incorporated throughout this planning process. The following key documents were reviewed as part of the planning process, and information from these documents was incorporated into this plan update:

- ***Boylston Comprehensive Emergency Management Plan*** (particularly the Critical Infrastructure Section) – The critical infrastructure section of this plan was used to help identify infrastructure components in town that have been identified as

crucial to the function of the Town; this resource was also used to identify potentially vulnerable populations and potential emergency response shortcomings.

- ***Regional Evacuation Plan*** – Funded by United States Department of Homeland Security via the Commonwealth of Massachusetts and the Central Region Homeland Security Advisory Council, this regional evacuation plan prepared by CMRPC was used to identify evacuation routes and emergency shelters. This plan will soon be updated by CMRPC.
- ***Boylston Open Space and Recreation Plan*** – This Plan was used to identify the natural context within which mitigation planning takes place; it proved useful for this planning process insofar as it identified water bodies, rivers, streams, infrastructure components (i.e., water and sewer, or the lack thereof), and population trends. This information was incorporated into this plan to ensure that the Town's mitigation efforts would be sensitive to the surrounding environment.[163]
- ***Boylston Zoning Bylaw*** – The Zoning Bylaw was used in this planning process to identify the actions that the Town is already taking (such as implementing and enforcing floodplain regulations) that reduce the potential impacts of a natural hazard and to make sure that this plan's mitigation strategies do not duplicate existing successful efforts.[164]
- ***Boylston Master Plan*** – This plan was used to identify the main priorities for the Town so that the Hazard Mitigation Plan's strategies can align with these priorities.[165]
- ***Boylston Municipal Vulnerability Preparedness Plan –*** Recommendations from this plan deemed important to hazard mitigation by the planning team in town were incorporated into the Hazard Mitigation Plan's mitigation strategies.[166]
- ***ResilientMass State Hazard Mitigation and Climate Adaptation Plan*** - This plan was used to ensure that the town's HMP data and priorities are consistent with the State's data and priorities.[167]

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[163] Town of Boylston Open Space Committee et al., "Town of Boylston Open Space and Recreation Plan – 2020," Town.boylston.ma.us, The Town of Boylston, accessed August 18, 2024, https://cms3.revize.com/revize/boylstonma/Documents/Community/Government/Open%20Space%20Recreation%20Committee/Plans/town_of_boylston_osrp_2020.pdf.

[164] "Town of Boylston, MA Municipal Code - Part 7: Zoning, The Town of Boylston, August 18, 2024, https://cms3.revize.com/revize/boylstonma/Documents/Community/Government/Planning%20Board/Zoning/zoning_by-laws_revised_2021_0.pdf.

[165] Central Massachusetts Regional Planning Commission, "Town of Boylston 2022 Master Plan," storymaps.arcgis.com, Central Massachusetts Regional Planning Commission, June 2022, https://storymaps.arcgis.com/stories/6e3e555c2d1c49989572947d3fe2b906

[166] Central Massachusetts Regional Planning Commission, "Community Resilience Building Workshop Summary of Findings," Town.boylston.ma.us, The Town of Boylston, June 2022, https://cms3.revize.com/revize/boylstonma/sites/g/files/vyhlif4171/f/news/boylston_mvp_listening_session.pdf

[167] "ResilentMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan"

- ***2022 Massachusetts Climate Change Assessment*** - This plan was used to ensure that the town's HMP data and priorities, especially in the hazards section of the plan, are consistent with the State's data and priorities.[168]

Additionally, this plan incorporated information from the 1981 FIRM maps for Boylston and the 2023 Worcester County Flood Insurance Study.

After this plan has been approved by both FEMA and the Boylston Select Board, a link to the plan will be emailed to all Town staff, boards, and committees; along with this link, the Town staff, boards, and committees will be sent a reminder to review the plan periodically and work to incorporate its contents, especially the action plan, into other town planning processes and/or documents. In addition, during annual monitoring meetings for the Hazard Mitigation Plan implementation process, the local Hazard Mitigation Team will review whether any of these plans are in the process of being updated. If so, the Hazard Mitigation Team will remind people working on these plans and/or documents of the Hazard Mitigation Plan and will encourage them to incorporate information and strategies from the Hazard Mitigation Plan into their efforts. The Hazard Mitigation Team will also review current town programs and policies to ensure that they are consistent with the mitigation strategies described in this plan. Information from the Hazard Mitigation Plan will also be incorporated into updates of the Town's Comprehensive Emergency Management Plan.

[168] "2022 Massachusetts Climate Change Assessment"

8.3 Plan Monitoring and Evaluation

Section 8.3 helps meet the following FEMA local mitigation plan requirements:

- *D1. "Is there discussion of how each community will continue public participation in the plan maintenance process?" (Requirement 44 CFR § 201.6(c)(4)(iii));*
- *D2. "Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)?" (Requirement 44 CFR § 201.6(c)(4)(i)); and*
- *D3. "Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?" (Requirement 44 CFR § 201.6(c)(4)(ii))*

The Town will review and update the Hazard Mitigation Plan every five years through forming a HMP planning team and working with a contractor to complete the update. The Town's Planner will also call meetings of all responsible parties to review, track, and monitor the progress of the Hazard Mitigation Plan on a yearly basis and/or as is needed based on the occurrence of hazard events. They will also discuss how the data, ideas, and strategies from this plan update will be incorporated into other planning mechanisms and documents actively being worked on in town, including but not limited to updates to the Town's Master Plan, Open Space and Recreation Plan, Comprehensive Emergency Management Plan, and zoning bylaw as well as Municipal Vulnerability Preparedness program efforts in town. Any substantial revisions made to the plan will be made open for public comment and/or will be presented on at a Select Board meeting which is open to the public. Parties identified as responsible for specific mitigation actions will be asked to submit their reports relating to these actions in advance of town hazard mitigation planning meetings.

Town hazard mitigation planning meetings will involve evaluation, assessment, tracking, and monitoring of the most recent HMP plan update. Responsible parties will review the plan's effectiveness at achieving its goals and stated purpose at these meetings. The following questions will serve as the criteria that are used to evaluate the plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.
- Is there any new data available from local, state, or federal sources relating to the impact of previous hazard events or the probability of future hazard occurrences? If so, this information should be incorporated into the plan.
- How will progressing climate change impact the risk of each natural hazard? What impacts do hotter, wetter, and more variable weather have on each natural hazard?

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effects of any recent hazard events?
- Has there been any damage to property caused by natural hazards since the plan was last reviewed?
- How could the existing mitigation strategies be improved to reduce the impacts of recent occurrences of hazards? If there are improvements which should be made, these should be incorporated into the plan.

Proposed Mitigation Strategies

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any recently completed mitigation strategies affected the level of impact in town of hazards that have occurred since these strategies were completed?
- Should the criteria for prioritizing the mitigation strategies in the plan be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources and/or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? Could it be improved?
- Are there any town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them?
- How can the current Hazard Mitigation Plan be better integrated with other Town planning tools and operational procedures, including the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement Plan?

Plan tracking and monitoring will be accomplished by a group of town stakeholders led by the Town's Planner who have similar to if not the same credentials as the local HMP planning team for this plan update. When this team meets, they will review the mitigation strategies table from this plan update, will update it with any progress on the strategies which has been made since the plan update was adopted, and will discuss priorities for

mitigation strategies which have not yet been implemented. Following these meetings, it is anticipated that the HMP planning team in town may decide to reassign the roles and responsibilities for implementing mitigation strategies to different Town departments and/or revise the goals and objectives contained in the most recent plan update. The Town also has the option to work with a contractor to help facilitate the tracking and monitoring of the plan.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. Any substantial revisions to the plan will be made open for public comment and/or will be presented on at a Select Board meeting which is open to the public. Plan implementation will be approved through standard capital planning, Town Meeting, and/or other publicly accessible local approval processes. The public will be notified of any changes to the Plan via the meeting notices board at Town Hall, and copies of the revised Plan will be made available to the public at Town Hall.

8.4 Potential Federal and State Funding Sources

8.4.1 Federal Funding Sources

The following is a summary of the programs which are the primary sources for federal funding of hazard mitigation projects and activities in Massachusetts:

Table 37: Federal Hazard Mitigation Funding Sources

Program	Type of Assistance	Availability	Managing Agency	Funding Source
National Flood Insurance Program (NFIP)	Pre-disaster insurance	Any time (pre & post disaster)	DCR Flood Hazard Management Program	Property Owner, FEMA
Community Rating System (CRS) (Part of the NFIP)	Flood insurance discounts	Any time (pre & post disaster)	DCR Flood Hazard Management Program	Property Owner
Hazard Mitigation Grant Program (HMGP)	Post-disaster cost-share grants	Post disaster program	MEMA	75% FEMA / 25% non- federal
Building Resilient Infrastructure and Communities (BRIC)	National, competitive cost-share grant program for projects & planning	Annual, pre-disaster mitigation program	MEMA	75% FEMA / 25% non- federal
Flood Mitigation Assistance (FMA) Program	Cost share grants for pre-disaster planning & projects	Annual pre-disaster grant program	MEMA	75% FEMA / 25% non- federal
Public Assistance	Post-disaster aid to state & local governments	Post Disaster	MEMA	FEMA, plus a non-federal share
Small Business Administration (SBA) Mitigation Loans	Pre- & Post- disaster loans to qualified applicants	Ongoing	MEMA	Small Business Administration
Emergency Management Performance Grant (EMPG)	Pre- & post-disaster management and implementation grants	Annual	MEMA	50% FEMA / 50% non-federal match

Homeland Security Grant Program (HSGP)	Funding to prevent, respond to, and recover from acts of terrorism	Annual	MEMA	FEMA
Hazard Mitigation Grant Program Post-Fire (HMGP-PF)	Cost-share post-wildfire disaster mitigation measures	Annual, within six months after a Fire Management Assistance Grant declaration	FEMA	75% FEMA / 25% non-federal
Assistance to Firefighters Grants (AFG)	Training & equipment for wildfire-related hazards	Annual	FEMA	FEMA
Fire Prevention & Safety Grant Program (AFG) (FP&S)	Cost-share funding to support projects that protect people from fire-related hazards	Annual	FEMA	95% FEMA / 5% non-federal
Fire Management Assistance Grants (FMAG)	Cost-share funding to mitigate & manage major disasters caused by fire	Any time (pre- & post disaster)	FEMA	75% FEMA / 25% non-federal
National Dam Safety Program (State Assistance Grant Program) (NDSP)	Funding to improve dam safety & state dam safety programs	Annual	FEMA	FEMA, Bipartisan Infrastructure Law
Rehabilitation of High Hazard Potential Dam Program (State Dam Safety Divisions) (HHPD)	Cost-share funding to plan and rehabilitate high hazard potential dams	Annual	FEMA	65% FEMA / 35% non-federal
National Earthquake Hazards Reduction Program's State Assistance Program (NEHRP)	Cost-share funding for pre-earthquake risk management	Annual	FEMA	75% FEMA / 25% non-federal

Emergency Food and Shelter Program (EFSP)	Grant funding for supplemental food & shelter for those experiencing / at risk of experiencing homelessness	Annual	FEMA	FEMA
Public Health Crisis Response Cooperative Agreement (PHCRCA)	Funding to support surge needs of existing public health programs responding to public health emergencies	Annual for approved by unfunded (ABU) roster	CDC	Varies
Army Corp of Engineers Planning Assistance	Water supply, conservation, wetlands, & dam safety funding	Any time (pre & post disaster)	U.S. Army Corps of Engineers	50% Federal / 50% non-federal
Forest Service Community Wildfire Defense Grant (USDA-FSCWDG)	Grant funding to plan for and reduce wildfire risk	Annual	USDA-FS	75% USDA / 25% non-federal
Emergency Watershed Protection Program (EWP)	Technical assistance and funding for helping communities mitigate natural disaster risks which affect watersheds	Ongoing	USDA-NRCS	75% USDA / 25% non-federal (90% USDA / 10% non-federal in limited resource areas)
Agricultural Management Assistance (Drought Mitigation Funding Program) (AMA)	Technical assistance for agricultural producers to manage financial risks	Ongoing	USDA-NRCS	75% USDA / 25% non-federal
USDA Community Facilities Direct Loan & Grant Program (Rural Development) (CFDLGP)	Funding for improving essential community facilities	Annual	USDA-RD	Varies
National Culvert Removal, Replacement, & Restoration Grant (NCRRRG)	Competitive grant funding to replace, remove, and repair culverts or weirs	Annual	US DOT	Varies

Bridge Investment Program (BIP)	Competitive grant program for improving the conditions of existing bridges	Annual	US DOT	80% FHWA / 20% other
Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT)	Discretionary program which includes Competitive Resilience Improvement Grants and planning grants	Annual	US DOT	Varies (generally, up to 80% federal share)

This FEMA web page describes several funding opportunities: FEMA Grants | FEMA.gov. The programs listed in the above table are described in more detail below.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) AND COMMUNITY RATING SYSTEM (CRS) (PART OF THE NFIP)

The National Flood Insurance Program (NFIP) provides insurance to communities required to manage and adopt mitigation practices for high flood-risk areas. The Community Rating System (CRS) incentivizes communities to incorporate flood management practices and mitigation strategies through discounted flood insurance rates; Incentives are available on a voluntary and participatory basis to encourage communities to meet the minimum requirements of the NFIP. In encouraging communities to meet NFIP's minimum requirements, CRS can extend the availability of funding to homeowners, businesses, and renters for whom flood insurance may not be accessible. CRS allocates insurance discount rates according to a community's demonstrated efforts to implement the program's three goals:

- Reduce flood damage to insurable properties;
- Strengthen and support NFIP; and
- Incentivize proactive floodplain management.

Communities can earn CRS points based on their implementation of various flood mitigation initiatives, including but not limited to: (1) restricting development on flood prone areas, (2) extending public risk communication with flood warning systems, and (3) enhancing infrastructural resilience to flood damage. Please refer to | The National Flood Insurance Program (floodsmart.gov) and Community Rating System | FEMA.gov for more information.

HAZARD MITIGATION ASSISTANCE (HMA)

The Hazard Mitigation Assistance (HMA) grant programs provide funding opportunities for pre- and post-disaster mitigation. While the statutory origins of these programs differ, all share the common goal of reducing the risk of loss of life and property from natural hazards. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific fiscal year, please click on one of the program links.

Hazard Mitigation Grant Program (HMGP)

The Hazard Mitigation Grant Program (HMGP) assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available under this program to implement projects in accordance with state, tribal, and local priorities. Please refer to Hazard Mitigation Assistance Grants | FEMA.gov for additional information.

HMGP funds may be used to fund projects that will reduce or eliminate the losses from future disasters. Projects completed under this program must provide a long-term solution to a problem; for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight a flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Examples of eligible HMGP projects include, but are not limited to:

- Acquisition of real property from willing sellers and demolition or relocation of buildings to convert this property to open space use;
- Retrofitting structures and facilities to minimize damages from high winds, earthquakes, flooding, wildfires, or other natural hazards;
- Elevation of flood prone structures;
- Development and initial implementation of vegetative management programs;
- Minor flood control projects that do not duplicate the flood prevention activities of other federal agencies;
- Localized flood control projects, such as certain ring levees and floodwall systems, that are designed specifically to protect critical facilities; and
- Post-disaster building code related activities that support building code officials during the reconstruction process.

Hazard Mitigation Grant Program Post-Fire (HMGP-PF)

The Hazard Mitigation Grant Program Post-Fire (HMGP-PF) is a program aimed at providing financial funding to localities to reduce risk of damage from future fires after a given area has experienced a fire. Funds are determined through benefit-cost analysis software. For more information, please refer to: Hazard Mitigation Grant Program Post Fire | FEMA.gov.

Building Resilient Infrastructure and Communities (BRIC)

The Building Resilient Infrastructure and Communities (BRIC) program aims to categorically shift the federal focus away from reactive disaster spending and toward research-supported, proactive investment in community resilience. Examples of BRIC projects are projects that demonstrate innovative approaches to partnerships, such as shared funding mechanisms, and/or project design. For example, an innovative BRIC project may bring multiple funding sources or in-kind resources from a range of private and public sector partners. Or an innovative project may offer multiple benefits to a community in addition to the benefit of risk reduction. The BRIC program has replaced

the Pre-Disaster Mitigation (PDM) grant program. More information on the BRIC program can be found here: Building Resilient Infrastructure and Communities | FEMA.gov.

The Massachusetts Emergency Management Agency (MEMA) coordinates BRIC applications for municipalities within the Commonwealth. Links to MEMA resources and BRIC application materials can be found here: Building Resilient Infrastructure and Communities (BRIC) & Flood Mitigation Assistance (FMA) Grant Programs | Mass.gov.

Note: the FEMA BRIC program is currently not being funded as of May 2025

FLOOD MITIGATION ASSISTANCE (FMA)

Flood Mitigation Assistance (FMA) provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program. Please refer to the FMA website: Flood Mitigation Assistance Grant Program | FEMA.gov.

The following types of FMA grants are available to states and communities:

- **Project Scoping Grants** are designed to develop mitigation strategies and obtain data to prioritize, select, and develop complete applications in a timely manner that result in either an improvement in the capability to identify appropriate mitigation projects or in the development of an application-ready mitigation project for FMA or another program.
- **Planning Grants** to prepare flood mitigation plans; Only NFIP-participating communities with approved flood mitigation plans can apply for FMA project grants.
- **Technical Assistance Grants** are awards of up to $50,000 federal cost share for recipients to which FEMA obligated at least $1 million federal share the previous FMA cycle.
- **Project Grants** to implement measures to reduce flood losses, such as the elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties (structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978).

MEMA coordinates FMA applications for municipalities within the Commonwealth. Links to MEMA resources and FMA application materials can be found here: Building Resilient Infrastructure and Communities (BRIC) & Flood Mitigation Assistance (FMA) Grant Programs | Mass.gov.

DISASTER ASSISTANCE

Disaster Assistance is money or direct assistance to individuals, families, and businesses whose property has been damaged or destroyed and whose losses are not covered by insurance. It is meant to help with critical expenses that cannot be covered in other ways. This assistance is not intended to restore damaged property to its condition before the disaster. While some housing assistance funds are available through FEMA's Individuals and Households Program, most disaster assistance from the Federal government is in the form of loans administered by the Small Business Administration.

Assistance from FEMA in the event of a disaster declaration is grouped into the following 3 categories:

A. Housing Needs

- **Temporary Housing** (a place to live for a limited period of time): Money is made available to rent a different place to live, or a government-provided housing unit when rental properties are not available.
- **Repair**: Money is available to homeowners to repair damage from the disaster to their primary residence that is not covered by insurance. The goal is to make the damaged home safe, sanitary, and functional.
- **Replacement**: Money is available to homeowners to replace their home destroyed in the disaster that is not covered by insurance. The goal is to help the homeowner with the cost of replacing their destroyed home.
- **Permanent Housing Construction**: Direct assistance or money is made available for the construction of a home. This type of help occurs only in insular areas or remote locations specified by FEMA, where no other type of housing assistance is possible.

B. Other than Housing Needs

- Money is available for necessary expenses and serious needs caused by a disaster, including:
    - Disaster-related medical and dental costs;
    - Disaster-related funeral and burial costs;
    - Clothing;
    - Household items (room furnishings, appliances);
    - Tools (specialized tools or protective clothing and equipment) required for people's jobs;
    - Necessary educational materials (computers, schoolbooks, supplies);
    - Fuels for primary heat source (heating oil, gas);
    - Clean-up items (wet/dry vacuums, dehumidifiers);
    - Expenses relating to disaster-damaged vehicles;
    - Moving and storage expenses related to the disaster (moving and storing property to avoid additional disaster damage while disaster-related repairs are being made to the home);
    - Other necessary expenses or serious needs as determined by FEMA; and
    - Other expenses that are authorized by law.

C. Additional Services

- Crisis Counseling
- Disaster Unemployment Assistance
- Legal Services
- Special Tax Considerations

For additional information, please refer to: Get Assistance After a Disaster | FEMA.gov.

DISASTER LOANS AVAILABLE FROM THE U.S. SMALL BUSINESS ADMINISTRATION

The U.S. Small Business Administration (SBA) can make federally subsidized loans to repair or replace homes, personal property, or businesses that sustained damages not covered by insurance. The Small Business Administration can provide the following three types of disaster loans to qualified homeowners and businesses:

- Physical damage loans: Loans to cover repairs and replacement of physical assets damaged in a declared disaster.
- Mitigation assistance: Funding to cover small business operating expenses after a declared disaster.
- Economic injury disaster loans: Loans which provide economic relief to small businesses and nonprofit organizations that have suffered damage to their home or personal property.
- Military reservist loans: Loans to help eligible small businesses with operating expenses to make up for employees on active duty leave.

For many individuals, the SBA disaster loan program is the primary form of disaster assistance. Please find more information about this loan program here: Disaster assistance | U.S. Small Business Administration (sba.gov).

DISASTER ASSISTANCE FROM OTHER ORGANIZATIONS AND ENTITIES

Home | disasterassistance.gov is a secure, user-friendly U.S. Government web portal that consolidates disaster assistance information in one place. If individuals need assistance following a Presidentially declared disaster which has been designated for individual assistance, they can now go to DisasterAssistance.gov to register for receiving assistance online. Local resource information to help keep citizens safe during an emergency is also available. Currently, 17 U.S. Government agencies, which sponsor almost 70 forms of assistance, contribute to the portal.

DisasterAssistance.gov speeds up the application process by feeding common data to multiple online applications. Application information is shared only with those agencies individuals identify and is protected by the highest levels of security. DisasterAssistance.gov will continue to expand to include forms of assistance available at federal, state, tribal, regional, and local levels.

EMERGENCY MANAGEMENT PERFORMANCE GRANT (EMPG)

The Emergency Management Performance Grant (EMPG) provides resources for state, local, tribal, and territorial emergency response organizations required for the National Preparedness System. EMPG supports efforts in building and strengthening capabilities in areas related to protection, mitigation, prevention, response and recovery. In fiscal year 2024, this grant had a total available funding of $319.55 million. Please find more information about this grant program at the link here: Emergency Management Performance Grant | FEMA.gov.

HOMELAND SECURITY GRANT PROGRAM (HSGP)

The Homeland Security Grant Program (HSGP) provides a suite of grant opportunities in support of efforts in the mitigation of, prevention of, protection from, and recovery from terrorist and other threats at the state, local, tribal, and territorial levels. As of the 2024 fiscal year, the program, including its three separate grants, had $1.008 billion in funding. The three grants available under this program are:

- The State Homeland Security Program (SHSP);
- The Urban Area Security Initiative (UASI); and
- Operation Stonegarden (OPSG).

Please find more about this program at the link here: Homeland Security Grant Program | FEMA.gov.

ASSISTANCE TO FIREFIGHTERS GRANTS (AFG) AND FIRE PREVENTION & SAFETY GRANT PROGRAM (FP&S)

The FEMA Assistance to Firefighters Grants (AFG) program provides funds to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience. Under AFG, funds may be available for equipment, vehicles, and/or training that can be used to mitigate and/or respond to wildfire-related hazards. AFG also has a Fire Prevention and Safety (FPS) component which funds public outreach programs and prevention activities, which can emphasize wildfire mitigation. More about these programs can be found at these links: Assistance to Firefighters Grants Program | FEMA.gov, Fire Prevention and Safety (FP&S) | FEMA.gov.

FIRE MANAGEMENT ASSISTANCE GRANTS (F-MAG)

The Fire Management Assistance Grants (F-MAG) Program supports firefighting efforts in cases of fire-related disasters impacting public and private forests as well as grasslands at the state, local and tribal levels. For more information on this program, please refer to: Fire Management Assistance Grants | FEMA.gov.

NATIONAL DAM SAFETY PROGRAM (STATE ASSISTANCE GRANT PROGRAM) (NDSP)

The National Dam Safety Program (NDSP) provides financial assistance to strengthen the individual dam safety programs of states and territories. In the 2024 fiscal year, this program distributed $24.2 million among 49 states and Puerto Rico. For more information on this program, please refer to: Grant Assistance to States | FEMA.gov.

REHABILITATION OF HIGH HAZARD POTENTIAL DAM PROGRAM (STATE DAM SAFTEY DIVISIONS) (HHPD)

The Rehabilitation of High Hazard Potential Dams Program (HHPD) provides technical, planning, design, and construction assistance in the form of grants for the rehabilitation of high hazard potential dams in eligible states and territories. For more information, please refer to: Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program | FEMA.gov.

NATIONAL EARTHQUAKE HAZARDS REDUCTION PROGRAM'S STATE ASSISTANCE PROGRAM (NEHRP)

The National Earthquake Hazards Reduction Program's State Assistance Program (NEHRP) provides funding to localities for the reduction of risk associated with earthquakes. This is done through two grants:

- Individual State Earthquake Assistance (ISEA) and
- Multi-State National Earthquake Assistance (MSNEA).

More information about this program can be found at this link: National Earthquake Hazards Reduction Program's State Assistance Program | FEMA.gov.

EMERGENCY FOOD AND SHELTER PROGRAM (EFSP)

The Emergency Food and Shelter Program (EFSP) assists and expands upon the work of local nonprofit and governmental social service organizations to provide shelter, food, and other services to people experiencing or at risk of hunger and/or homelessness. For more information, please refer to: Emergency Food and Shelter Program | FEMA.gov.

PUBLIC HEALTH CRISIS RESPONSE COOPERATIVE AGREEMENT (PHCRCA)

The Center for Disease Control and Prevention's Public Health Crisis Response Cooperative Agreement (PHCRCA) allows for opportunities for state, local, and tribal government to receive funding in response to public health emergencies. For more information, please refer to: The Centers for Disease Control and Prevention's Public Health Crisis Response Cooperative Agreement Program Awards (hhs.gov).

ARMY CORP OF ENGINEER PLANNING ASSISTANCE

Under the authority provided by Section 22 of the Water Resources Development Act of 1974 (PL 93-251), as amended, the U.S. Army Corps of Engineers can provide states, local governments, other non-federal entities, as well as eligible Native American Indian tribes, assistance in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources. Typical studies funded under this program are only at the planning level of detail; they do not include detailed engineering designs intended for project construction. The program can encompass many types of planning studies which address water resources issues. Types of studies conducted in recent years under the program include the following: water supply/demand, water conservation, water quality, environmental/conservation, wetlands evaluation/restoration, dam safety/failure, flood damage reduction, coastal zone protection, and harbor planning. For more information, please refer to: Planning Assistance to States, U.S. Army

Corps of Engineers, New England District.

FOREST SERVICE COMMUNITY WILDFIRE DEFENSE GRANT (USDA-FSCWDG)

The Forest Service Community Wildfire Defense Grant Program (USDA-FSCWG) provides funding and assistance to at-risk local communities and tribes to reduce wildfire risk. Funding and assistance under this program are primarily used to revise and develop community wildfire protection plans and to assist in implementing new projects described in said plans. For more information on this program, please refer to: Community Wildfire Defense Grant Program | US Forest Service (usda.gov).

EMERGENCY WATERSHED PROTECTION PROGRAM (EWP)

The Emergency Watershed Protection Program (EWP) provides technical and financial assistance to localities in response to imminent life- and property-threatening natural disasters which negatively impact local watersheds. For more information about this program, please refer to: Emergency Watershed Protection | Natural Resources Conservation Service (usda.gov).

AGRICULTURAL MANAGEMENT ASSISTANCE (DROUGHT MITIGATION FUNDING PROGRAM) (AMA)

Agricultural Management Assistance (AMA) is a program to help farmers build on and diversify their agricultural practices. The program is available in 16 states that have had historically low rates of participation in the Federal Crop Insurance Program. AMA covers up to 75% of funds needed to install conservation practices on farms, with a cap of $50,000 per individual participant in a given fiscal year. For more information, please refer to: Agricultural Management Assistance | Natural Resources Conservation Service (usda.gov).

USDA COMMUNITY FACILITIES DIRECT LOAN & GRANT PROGRAM

The UDSA Community Facilities Direct Loan & Grant program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings. Rural areas including cities, villages, and townships and towns, including Federally Recognized Tribal Lands, with no more than 20,000 residents according to the latest U.S. Census Data are eligible for this program. Program funds can be used to purchase, construct, and / or improve essential community facilities, purchase equipment, and pay related project expenses. For more information on this program, please refer to: Community Facilities Direct Loan & Grant Program | Rural Development (usda.gov).

NATIONAL CULVERT REMOVAL, REPLACEMENT, & RESTORATION GRANT (NCRRRG)

The National Culvert Removal, Replacement, and Restoration Grant Program (NCRRRG) (Culvert Aquatic Organism Passage (AOP) Program) assists eligible tribes, states and local governments in issues related to culverts and weirs to improve and/or restore passage for anadromous fish in freshwater waterways. Anadromous fish are those that

spawn in freshwater but live most of their lives in saltwater. More information about this program can be found at this link: Aquatic Organism Passage - Culvert Hydraulics - Hydraulics - Bridges & Structures - Federal Highway Administration (dot.gov).

BRIDGE INVESTMENT PROGRAM (BIP)

The Bridge Investment Program (BIP) provides the opportunity for governments at all levels to receive funding to repair and restore aging bridge infrastructure. BIP grant applications have a maximum grant award of 80% of the total eligible bridge project costs. For more information regarding this program, please refer to: BIP - Funding Programs - Management and Preservation - Bridges & Structures - Federal Highway Administration (dot.gov).

PROMOTING RESILIENT OPERATIONS FOR TRANSFORMATIVE, EFFICIENT, AND COST-SAVING TRANSPORTATION PROGRAM (PROTECT)

The Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (Protect) Program is a program established by the Bipartisan Infrastructure Law (BIL) which funds resilience-building activities for surface transportation, such as plans (including evacuation plans) and infrastructure improvements, which increase reliance to natural hazards and climate change. For more information regarding this program, please refer to: Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT) | US Department of Transportation and Bipartisan Infrastructure Law - Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program Fact Sheet | Federal Highway Administration (dot.gov).

8.4.2 State Funding Sources

The following is a summary of state funding opportunities for hazard mitigation projects and activities in Massachusetts:

Table 39: State Hazard Mitigation Funding Sources

Program	Type of Assistance	Availability	Managing Agency	Funding Source
604b Water Quality Management Planning Grant Program	Grants focused on nonpoint source pollution assessment and watershed planning	Annual	Mass DEP	State funding (match not required but recommended)

Section 319 Nonpoint Source Competitive Grants Program	Competitive grant program funding projects that address the prevention, control, and abatement of nonpoint source (NPS) pollution	Annual	Mass DEP	State funding
Water Quality Monitoring Grant Program	Reimbursement funding for monitoring and/or data collection efforts that support water quality assessments	Annual	Mass DEP	State funding
Statewide Water Management Act Grant	Reimbursement grant funding for projects to help public water suppliers plan and manage water use	Annual	Mass DEP	Reimbursement grant
Massachusetts Gap Energy Grant Program (Gap III)	Program providing grant assistance (up to $200,000 per community) for implementing energy efficiency and clean energy generation projects at water and wastewater plants	Annual (likely)	Mass DEP	State funding
State Revolving Fund	Low-interest loans	Annual	Mass DEP	Municipal funding with state loan
Municipal Vulnerability Preparedness (MVP) Action Grants	Competitive climate adaptation grants	Annual	EEA	75% EEA / 25% non-state match

Planning Assistance Grants (EEA PAG)	Competitive grants that support efforts to plan, regulate (zone), and act to conserve and develop land consistent with the Massachusetts Sustainable Development Principles	Annual	EEA	75% EEA / 25% non-state match
Dam and Seawall Repair or Removal Program	Competitive grants for dam and seawall repair and removal, as well as construction loans	Annual	EEA	State funding
Massachusetts Land & Water Conservation Fund Grant Program (LWCF)	Federal grant program to help improve access to and protection for public lands and waters	Annual	DCS	Federal program that funds up to 50% of total costs for acquisition, development, and renovation
Local Acquisitions for Natural Diversity (LAND)	Financial assistance to municipalities for the acquisition of conservation land	Annual	DCS	Reimbursement grant, the reimbursement rate varies per town
Drinking Water Supply Protection Grant (DWSP)	Competitive grants for protection of drinking water supplies	Annual	DCS	State funding
Land and Recreation Grants and Loans	Varies, though primarily grant funding for conservation and recreation projects	Varies, generally annually	DCS	Varies
Land Conservation Assistance Grant Program	Financial assistance for permanently protecting land	Annual (Likely)	DCS	90% state reimbursement / 10% other

Forest Legacy Grant Program (USDA-FS) (FLGP)	Grant funding to protect environmentally important forestland from conversion	Annual	DCR	75% USDA FS / 25% non-federal
Culvert Replacement Municipal Assistance Grant Program	Competitive grants for replacing an undersized, perched, and/or degraded culvert located in an area of high ecological value	Annual	DER	State funding
Division of Ecological Restoration Priority Project Program	State competitive grant program that funds projects that restore and protect the state's rivers, wetlands, and watersheds (priority projects may differ each year)	Annual	DER	State funding
Mass Wildlife Habitat Management Grant Program (MWHMGP)	Reimbursement grant funding to assist municipalities in enhancing wildlife habitat and increasing recreational opportunities on protected lands	Annual	DFW	USDA NRCS
Agricultural Climate Resiliency and Efficiencies Program (ACRE)	Competitive reimbursement grant funding that supports practices that mitigate the agricultural sector's vulnerability to climate change	Annually through Climate Smart Agriculture Program (CSAP)	MDAR	MDAR
Agricultural Preservation Restriction Program (APR)	Financial assistance in exchange for permanent deed restriction to protect lands' agricultural viability	Any time for owners of at least 5 acres of farmland	MDAR	MDAR

Hazard Mitigation Grant Program (State) (HMGP)	Sub-grant programs for the Hazard Mitigation Grant Program	Annual	MEMA	State funding
Community Development Block Grants (CDBG)	Competitive community development grants	Annual	EOHLC	US Department of Housing and Urban Development
Emergency Solutions Grant (ESG)	Competitive grant funding designed to support services that assist those experiencing / at risk of experiencing homelessness	Annual	EOHLC	MA EOHLC
Mass Works	Competitive infrastructure grants	Annual	EOED	State funding
Community Preservation Act (CPA)	Establishes a local community preservation fund through tax surcharge to support a variety of project related to conservation and housing	Ongoing	Department of Revenue (DOR)	Statewide Community Preservation Trust Fund / Local Community Preservation Fund
Special appropriations and legislative earmarks	Varies	Infrequent, after natural disasters or legislature vote	Massachusetts General Legislature	State funding
District Local Technical Assistance (DLTA)	Funding to support planning and technical assistance for housing, economic growth, and regional projects	Varies, generally annually	Massachusetts General Legislature, CMRPC	State funding
Local Planning Assistance (LPA)	Planning and technical assistance	Annual	CMRPC	Planning assistance hours
Support and Incentive Grant	Reimbursement grant funding designed to assist in providing enhanced 911 service	Annual	MA EOPSS	MA EOPSS

Municipal Small Bridge Program	Competitive grants for small bridge replacement, preservation, and rehabilitation projects	Annual	MassDOT	State funding
Chapter 90 Program (Transportation Capital Improvement Projects) (Chpt. 90)	Reimbursable grants to support capital improvements on local public ways	Ongoing	MassDOT	State funding
State Transportation Improvement Program (STIP)	Competitive funding opportunity for transportation projects along federal-aid roadways	Annually updated five-year programming document	MassDOT	MassDOT
Complete Streets (CS)	Reimbursement grant funding to provide safe and accessible options for all travel modes	Annually available to municipalities that adopt a Complete Streets Policy	MassDOT	State funding
Drought Resiliency and Water Efficiency Grant Program	Funding for reducing indoor and outdoor water use, improving water loss control, and increasing drought management and planning in public water systems across the state	Annual	EEA	State funding

The Community Grant Funder web page includes the municipal grant programs listed above, as well as other funding opportunities: Community Grant Finder | Mass.gov. The programs listed in the above table are described in more detail below.

604B WATER QUALITY MANAGEMENT PLANNING GRANT PROGRAM

The 604B Water Quality Management Planning Grant Program provides funding opportunities to regional planning agencies, councils of governments, conservation districts, counties, cities and towns, federally and state recognized tribes, and other substate public planning agencies and interstate agencies to determine and correct water quality issues in Massachusetts. For more information on this program, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

SECTION 319 NONPOINT SOURCE COMPETITIVE GRANTS PROGRAM

Section 319 of the Clean Water Act provides funding opportunities for the prevention, control, and abatement of nonpoint source (NPS) pollution. These grants are available to eligible Massachusetts public or private organizations, including: state and federally recognized tribes, regional planning agencies, councils of governments, counties, conservation districts, cities and towns, other substate public planning agencies, and interstate agencies. To be eligible for this program, these entities' projects must: include measures that address the prevention, control, and abatement of NPS pollution, target major sources of NPS pollution within a watershed, contain an appropriate method for evaluating the project results, and address activities in the current Massachusetts NPS Management Program Plan. For more information on this program, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

WATER QUALITY MONITORING GRANT PROGRAM

The Water Quality Monitoring Grant Program provides funding opportunities to eligible entities and organizations to increase the amount of data on water quality in Massachusetts. For more information, please refer to: Grants & Financial Assistance: Watersheds & Water Quality | Mass.gov.

STATEWIDE WATER MANAGEMENT ACT GRANT

The Statewide Water Management Act Grant provides grant funding for projects which improve the ecological conditions of specific watersheds and projects aimed at reducing water demand. Specifically, projects funded under this program must: improve or increase instream flow, keep wastewater local, relate to stormwater management, reduce impervious cover and/or improve water quality, relate to water supply operational improvements, improve habitat, reduce wastewater inflow and infiltration, and/or be another type of project which can be demonstrated to mitigate the impacts of water withdrawals. This program awards approximately 10 grants a year and has a reimbursement rate of 80%. Grants are awarded to eligible public water suppliers and municipalities with Water Management Act permits. For more information, please refer to: Water Management Act Grant Programs for Public Water Suppliers | Mass.gov.

MASSACHUSETTS GAP ENERGY GRANT PROGRAM (GAP III)

Through a partnership between the Massachusetts Department of Energy Resources (DOER) and the Massachusetts Clean Energy Center (MassCEC), the Massachusetts Gap Energy Grant Program (Gap III) provides funding to fill the last financial "gap" needed for clean energy projects spearheaded by a variety of organizations to promote clean and efficient energy projects. In 2022, the GAP III program awarded a total of $8.1 million in grants. For more information about this program, please refer to: Massachusetts' Gap Energy Grant Program | Mass.gov.

PLANNING ASSISTANCE GRANTS (EEA PAG)

Executive Office of Energy and Environmental Affairs Planning Assistance Grant (EEA PAG) program grants are available to municipalities and regional planning agencies acting on their behalf to financially support efforts to conserve and develop land consistent with the Massachusetts Sustainable Development Principles. Top priorities of the program include: zoning for sustainable housing production, mitigation of climate change through zoning and other regulatory actions, and zoning that results in permanent

land conservation. For more information about these grants, please refer to: Planning Assistance Grants | Mass.gov.

STATE REVOLVING FUND

This statewide loan program through the Massachusetts Department of Environmental Protection assists communities in funding local drinking water, wastewater, and stormwater infrastructure improvements.

MUNICIPAL VULNERABILITY PREPAREDNESS ACTION GRANT PROGRAM

The Municipal Vulnerability Preparedness (MVP) Action Grant program offers financial resources to municipalities that are seeking to advance priority climate adaptation actions to address impacts resulting from extreme weather, sea level rise, inland and coastal flooding, severe heat, and other climate change-related events. Towns are eligible for this competitive grant program after successfully completing an MVP planning grant. A variety of project types are eligible for funding under this program, but projects must address local vulnerabilities to climate change and incorporate MVP Core Principles. Grant application information can be found here: MVP Action Grant | Mass.gov. The MVP Core Principles can be found here: https://www.mass.gov/doc/mvp-core-principles/download.

DAM AND SEAWALL REPAIR OR REMOVAL PROGRAM

The EEA funds projects for the repair and removal of dams, levees, seawalls, and other forms of inland and coastal flood control under the Dam and Seawall Repair or Removal Program. For additional information, please refer to Dam and Seawall Repair or Removal Program Grants and Funds | Mass.gov.

LAND & WATER CONSERVATION FUND GRANT PROGRAM (LWCF)

The Land & Water Conservation Fund Grant Program (LCWF) provides up to 50% of total project funding to eligible municipalities, tribes, and state agencies for park, trail and conservation area related projects. For more information, please refer to: Massachusetts Land and Water Conservation Fund Grant Program | Mass.gov.

LOCAL ACQUISITIONS FOR NATURAL DIVERSITY (LAND)

The Local Acquisitions for Natural Diversity (LAND) grant program assists cities and towns in acquiring new lands for conservation and passive recreation purposes. Grants are awarded at a maximum of $500,000 with reimbursement rates ranging from 52% to 70%. For more information, please refer to: Local Acquisitions for Natural Diversity (LAND) Grant Program | Mass.gov.

DRINKING WATER SUPPLY PROTECTION GRANT (DWSP)

The Drinking Water Supply Grant (DWSP) program provides financial assistance to public water systems and municipal water departments for the purchase of land or interests in land for the following purposes: 1) protection of existing DEP-approved public drinking water supplies; 2) protection of planned future public drinking water supplies; or 3) groundwater recharge. This is a reimbursement program. For more information, please refer to Drinking Water Supply Protection Grant Program | Mass.gov.

LAND AND RECREATION GRANTS AND LOANS

The Massachusetts Division of Conservation Services (DCS) manages several grant and loan programs that enable land preservation, natural resources conservation, and public recreation. Municipalities with an active Open Space and Recreation Plan are generally eligible to apply for these programs. Preserving natural open space can buffer natural systems from development impacts, protect open spaces from future development, and maintain ecosystem services like natural flood mitigation. The full list of DCS grant programs can be found here: Land and Recreation Grants & Loans | Mass.gov.

LAND CONSERVATION ASSISTANCE GRANT PROGRAM

The Land Conservation Assistance Grant Program from the Massachusetts Division of Conservation Services (DCS) provides reimbursement funding to municipalities, qualified 501(c)(3) land trusts, tribal governments, and other public entities for the permanent protection of land as well as to Regional Planning Agencies (RPAs) and qualified 501(c)(3) land trusts which assist these entities in this goal. Eligible activities under this program include preparing grant applications for permanently protecting land, completing other tasks which progress transactions which permanently protect land, developing or updating municipal Open Space and Recreation Plans, and planning for developing and/or renovating a park to help with a grant application to DCS. For more information on this program, please refer to: Apply to the Land Conservation Assistance Grant Program | Mass.gov.

FOREST LEGACY GRANT PROGRAM (USDA-FS) (FLGP)

The Forest Legacy Grant Program (FLGP) is a voluntary grant funding opportunity for private landowners to either sell their land outright or to sell a conservation restriction on their land. A conservation restriction is a legally binding agreement which limits the types of land use on a property, in this case restricting land to forestry, recreation, or another conservation-related use. For more information about this program, please refer to: Forest Legacy Program | Mass.gov.

CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT PROGRAM

The Culvert Replacement Municipal Assistance Grant program provides a funding opportunity for local governments to replace undersized, perched, and/or degraded culverts in areas of high ecological value. For more information on this program, please refer to: Culvert Replacement Municipal Assistance Grant Program | Mass.gov.

DER PRIORITY PROJECTS

The Priority Project Program is an opportunity under the Division of Ecological Restoration (DER) for organizations to receive technical assistance, consulting, and/or direct grant funding for wetland and river restoration projects through a state-wide, competitive process. DER chooses high-priority projects that bring significant ecological and community benefits to the Commonwealth. DER's most recent call for applications solicited projects that focus on cranberry bog wetland restoration, dam removal and river restoration, coastal wetland restoration projects, or a combination of these topics. More information on the Priority Projects program can be found here: Become a DER Priority Project | Mass.gov. This program can be used to remove significant or high hazard dams that communities no longer want to maintain; the removal of these dams may improve the health and resilience of aquatic systems.

MASS WILDLIFE HABITAT MANAGEMENT GRANT PROGRAM (MWHMGP)

The Mass Wildlife Habitat Management Grant Program (MWHMGP) is a program dedicated to the protection and restoration of wildlife habitat. MWHMGP awards grants ranging from $10,000 to $75,000 to private landowners for habitat restoration projects. The program places emphasis on the protection of endangered species, the expansion of outdoor recreation opportunities, and the enhancement of ecological communities disproportionally susceptible to climate change. For more information about this program, please refer to: MassWildlife Habitat Management Grant Program | Mass.gov.

AGRICULTURAL CLIMATE RESILIENCY AND EFFICIENCIES PROGRAM (ACRE)

The Agricultural Climate Resiliency and Efficiencies Program (ACRE) is a competitive grant program available to eligible farmers that funds materials and labor to improve climate and economic resilience and forwards the goals of the Massachusetts Local Food Action Plan. For more about this program, please refer to: Agricultural Climate Resiliency & Efficiencies (ACRE) Program | Mass.gov.

AGRICULTURAL PRESERVATION RESTRICTION PROGRAM (APR)

The Agricultural Preservation Restriction (APR) program is a voluntary program that allows farmers to be paid the difference between the "fair market value" and the "agricultural value" of their farms in exchange for a permanent deed restriction by the state. This restriction is meant to prevent any use of the property that will negatively impact the land's future agricultural viability. To qualify for this program, a farm must be at least 5 acres in size, must have been actively devoted to agriculture for at least the past 2 tax years, and must produce at least $500 in gross sales per year for the first five acres plus $5 for each additional acre or 50 cents per each additional acre of woodland and/or wetland; there are various other considered criteria which farms must meet to qualify for this program. For more information on this program, please refer to: Agricultural Preservation Restriction (APR) Program Details | Mass.gov.

HAZARD MITIGATION GRANT PROGRAM (STATE) (HMGP)

The Hazard Mitigation Grant Program (HMGP) provides funds to areas after a natural disaster with the purpose of lowering the risk of damage and loss of life from future natural disasters. This grant program seeks to reduce the reliance on taxpayer-funded federal assistance for disaster recovery. For more information about this program, please refer to: Hazard Mitigation Grant Program (HMGP) | Mass.gov.

COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)

The Community Development Block Grant (CDBG) program remains the principal source of revenue for many communities to use in identifying solutions to address physical, economic, and social deterioration in lower-income neighborhoods and communities. CDBG is primarily a housing and community development program administered through the Executive Office of Housing and Livable Communities (EOHLC). The program can fund certain critical infrastructure projects, and necessary housing improvements that benefit populations who may be more vulnerable to certain natural hazards. The program can also fund the rehabilitation of municipal buildings serving low- and moderate-income populations, which in many cases also serve as Emergency Operations

Centers for their communities. For more information, please refer to: Community Development Block Grant (CDBG) | Mass.gov.

EMERGENCY SOLUTIONS GRANT (EFG)

The Emergency Solutions Grant (EFG) program funds necessary services to help house/rehouse those who are homeless or at risk of homelessness and to provide shelter for those in need of emergency shelter. For more information on this program, please refer to: Emergency Solutions Grant Program (ESG) | Mass.gov.

MASSWORKS INFRASTRUCTURE PROGRAM

The MassWorks Infrastructure Program provides a one-stop shop for municipalities and other eligible public entities seeking public infrastructure funding to support economic development and job creation. Although this program is not specific to natural hazards per se, infrastructure enhancements under MassWorks can address identified hazard mitigation needs. The MassWorks Infrastructure Program is administered by the Executive Office of Housing and Economic Development, in cooperation with the Department of Transportation and Executive Office for Administration & Finance. For additional information on this program, please refer to MassWorks Infrastructure Program | Mass.gov.

COMMUNITY PRESERVATION ACT (CPA)

The Community Preservation Act (CPA) is a smart growth tool that helps communities preserve open space and historic sites, create affordable housing, and develop outdoor recreational facilities. CPA also helps strengthen the state and local economies by expanding housing opportunities and construction jobs for the commonwealth's workforce and by supporting the tourism industry through preservation of the commonwealth's historic and natural resources. All communities in Massachusetts pay into statewide Community Preservation Trust fund through a real estate excise tax. However, communities must set up a local Community Preservation Fund and governing committee to utilize the trust fund. CPA projects can build local resilience by protecting open spaces and/or creating affordable housing; these types of projects can benefit residents who may be the most vulnerable to natural hazards. More information on the CPA program can be found here: CPA: An Overview | Community Preservation Coalition.

SPECIAL APPROPRIATIONS AND LEGISLATIVE EARMARKS

Although there is no separate state disaster relief fund in Massachusetts, the state legislature may enact special appropriations for those communities sustaining damages following a natural disaster that are not large enough for a Presidential disaster declaration. Since 2011, Massachusetts has issued 12 state of emergency declarations. Additionally, individual legislators may seek specific project funding for projects through the legislative budgeting and appropriations process.

DISTRICT LOCAL TECHNICAL ASSISTANCE

District Local Technical Assistance (DLTA) is funding allocated by the Massachusetts General Assembly (Legislature) to the Central Massachusetts Regional Planning Commission (CMRPC) to provide technical assistance to member communities on eligible projects. DLTA planning dollars help cities and towns take on necessary projects that they don't have the staff capacity to address on

their own and partner with neighboring communities to tackle shared projects with reduced administrative burden.

According to the most recent guidelines of the Commonwealth's DLTA program, a proposed project must fall into one of the following four (4) general priority categories to be considered eligible for technical assistance:

1. Planning Ahead for Housing;
2. Planning Ahead for Growth;
3. Technical Assistance to support Community Compact Cabinet Activities including Regionalization; and
4. Supporting the Housing Choice Initiative

The goal of the DLTA Fund is to direct funds to projects and activities that result in change in the municipality/municipalities receiving DLTA Fund services, whether in law, regulation, program management, or practice, that serve to further the objectives listed above. Community Compact Cabinet (CCC) best practices should include both those that the Commonwealth of Massachusetts is seeking to fund as part of the CCC program as a first priority and best practices that explicitly align with CCC best practices but are not best practices identified in a signed CCC agreement. COVID-19 relief / recovery activities that fall under the above priority categories are eligible. For more information, please refer to 2024 District Local Technical Assistance (DLTA) Call for Concepts - CMRPC.

LOCAL PLANNING ASSISTANCE

The Local Planning Assistance (LPA) program was initiated to improve the direct services of CMRPC to its member communities. Under the LPA program, each CMRPC community annually receives a set number of hours of technical assistance to be used in any reasonable planning project authorized by the community's CMRPC commissioner.

SUPPORT AND INCENTIVE GRANT

The Support and Incentive Grant provides opportunity funding to public safety answering points (PSAPs) and regional emergency communication centers (RECCs) in providing enhanced 9-1-1 service. Entities eligible for the Support Grant include: primary or regional public safety answering points, regional secondary public safety answering points, and regional emergency communication centers. To be eligible for the Incentive Grant, a regional public safety answering point or regional emergency communication center must be expanding. For more on this program, please refer to: Apply for the Support & Incentive Grant | Mass.gov.

MUNICIPAL SMALL BRIDGE PROGRAM

The Municipal Small Bridge Program offers funding opportunities to Massachusetts municipalities for small bridge replacement, preservation, and rehabilitation projects. For more information about this program, please refer to: Municipal Small Bridge Program | Mass.gov.

CHAPTER 90 FUNDS

The statewide Chapter 90 program reimburses communities for roadway improvement projects, such as projects relating to resurfacing and related work, preliminary

engineering (including State Aid/Consultant Design Agreements), right-of-way acquisition, shoulders, side road approaches, landscaping and tree planting, roadside drainage, structures (including bridges), sidewalks, traffic control and service facilities, and street lighting (excluding operating costs), as well as for such other purposes specifically authorized. Maintaining and upgrading critical infrastructure and evacuation routes is an important component of hazard mitigation. For more information, please refer to Chapter 90 Program | Mass.gov.

STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

The State Transportation Improvement Program (STIP) is an annual list of transportation infrastructure projects funded and planned through the combined effort of MassDOT and other state agencies. For more information on this program, please refer to: State Transportation Improvement Program (STIP) | Mass.gov.

COMPLETE STREETS (CS)

The Complete Streets (CS) Funding Program provides grants to municipalities in Massachusetts for projects that improve safety and accessibility for all modes of transportation. To qualify for the program, municipalities must pass a Complete Streets Policy and develop a Prioritization Plan. After these requirements have been met, municipalities can apply for up to $500,000 in construction funding. For more information about this program, please refer to: Complete Streets Public Overview (site.com).

DROUGHT RESILIENCY AND WATER EFFICIENCY GRANT PROGRAM

The Drought Resiliency and Water Efficiency Grant Program aims to provide funding for projects that will help the Commonwealth become more climate resilient, specifically by reducing indoor and outdoor water use, improving water loss control, and increasing drought management and planning in public water systems across the state. Target awards are up to $50,000 per project, with potential for larger awards depending on the number of applications received. This grant program helps implement actions in the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP). For more information about this program, please refer to: COMMBUYS.

APPENDIX A

Maps

Name	Critical Infrastructure/Hazard	ID	Notes
Boylston Police Dept	CI	1	Has Antennae for Emergency operations
Boylston Fire Dept	CI	2	Has Antennae for Emergency operations
Boylston DPW Garage	CI	3	
Municipal Office Building/COA/BOH/Building Inspector	CI	4	
Tahanto Regional High School	CI	5	Has Antennae for Emergency operations
Boylston Elementary School	CI/H	6	Snow Load on Roof, No AC
Boylston Town House & Council on Aging	CI	7	
Boylston Municipal Light Dept. & Water District	CI	8	
Boylston Water District pump, 310 Main St	CI	9	
Boyston Water Tower	CI	10	
Dry Hydrant - Boulder Way	CI	12	
Boylston Fire Cistern - Duffy Rd	CI	13	
Boylston Fire Cistern - Central St @ Redwood Circle	CI	14	
DCR Regional Office (Regional EOC)	CI	15	
Boylston Historical Museum	CI	16	
Sunbanke Village Senior Living	CI	17	
You Inc. Youth Home	CI	18	
Tower Hill Botanical Garden	CI	19	
Cyprian Keyes Golf Club	CI	20	
The Haven Country Club	CI	21	
Calliope Productions	CI	22	
Hillside Athletic Fields	CI	23	
AYF Football Field	CI	24	
Manor Park - Orient St	CI	25	
Frito-Lay Distribution Center	CI	26	
Verizon Inc. - Shrewsbury St Service Garage	CI	27	
Verizon Inc -Transmission Station - Tier II Chem User	CI	28	
Nuria Energy	CI	29	
47	CI	30	
Luvak Inc.	CI	31	
Fuller Motorhome	CI	32	
Bigelow Nurseries	CI	33	
Rocky Pond Dam	CI	34	
The Haven Country Club Pond Dam/Mt.Pleasant	CI/H	35	Beaver Dams causes flooding regularly at this site
Spruce Pond Dam	CI	36	
Wachusett Reservoir South Dike	CI	37	
Radio Tower	CI	38	
Warehouse Facility - 160 Shrewsbury Street	CI/H	39	Employer
Warehouse Facility - 80 Pine Hill Drive	CI/H	40	Employer
Warehouse Facility - 100 Pine Hill Drive	CI/H	41	Employer
Cell Tower	CI	42	
Cell Tower	CI	43	In Church Steeple
Cell Towers	CI	44	2 Located on this site, one on Municipal tower, other is SBA Comms Tower
Booster Station	CI	45	
Booster Station	CI	46	
Cell Tower	CI	47	
Morgan Circle - 55+ Development	CI	48	
Compass Circle - 55+ Development	CI	49	
Cheryl's Way - 55+ Development	CI	50	
Trailside Apartments - Partial 40B Development	CI	51	
Tiny Explorer's Early Childhood School / daycare	CI	52	
Summer Star Wildlife Sanctuary	CI	53	
Bay Path Barn	CI	54	
Dam Failure - Spruce Pond Dam	H	DF-1	
Dam Failure - Wachusett Reservoir South Dike	H	DF-2	
Dam Failure - Mt. Pleasant Pond Dam breach 10 yrs ago,	H	DF-3	
Drought - Pond near Elmwood place dries up	H	DR-1	
Extreme Temperatures - Tower Hill, pipes freezing	H	ET-1	
FL-1	PFZ	FL-1	
Flooding - Near WWTP	PFZ	FL-2	
FL-3	PFZ	FL-3	
Longly Hill Road Flooding	PFZ	FL-4	
FL-5	PFZ	FL-5	
West Temple Street Washout	PFZ	FL-6	
Spongy Moth Tree Mortality 2017-2018	H	IS-1	
Lightning - Cross St, Ethan Allen Dr, etc. neighborhood	H	L-1	
Ice dam - 221 Main St storage rm	H	SS-2	
Microburst - Tahanto Regional HS	H	ST-2	
Lightning & High Winds - 221 Main St	H	ST-3	

Wildfire on April 14th Weekend 2023	H	WF-1

Hazard Mitigation Plan
Map 1
Critical Infrastructure and Facilities
Town of Boylston, Massachusetts

April 2024

STERLING
WEST BOYLSTON
CLINTON
BERLIN
NORTHBOROUGH
SHREWSBURY
WORCESTER

WEST BOYLSTON POLICE DEPARTMENT
BOYLSTON POLICE DEPARTMENT

Wachusett Reservoir South Dike
Storage Pond Dam
Storage Pond Dam / At Berlin
Mt. Pleasant Pond Dam
Sheperd Knapp Dam
Rocky Pond Dam
Spruce Pond Dam
Fish Pond Dam
Newton Pond Dam
Shrewsbury Sportsmens Pond Dam
Rawson Hill Dam&Dike
Steinhilber Skating Pond Dam
Northborough Reservoir Dam
Cider Mill Pond Dam
Ellis Pond Dam
Storage Pond Dam
Cold Harbor Brook Dam

Wachusett Reservoir
Lily Pond [M.B]
Lily Pond [E.B.]
Clamshell Pond
Rocky Pond
Spruce Pond
Pout Pond
Sewall Pond
Newton Pond

MAIN STREET
BOYDEN HILL ROAD
FALLEN DRIVE
FRENCH DRIVE
SCAR HILL ROAD
WESTVOLT PLACE
OAKFIELD ROAD
BEECH STREET
WOODLAND DRIVE
WESTBOROUGH STREET
STARK TERRACE
SCHOOL STREET
STRAWBERRY HILL LANE
SEWALL STREET NORTH
EDGEBROOK DRIVE
SHERWOOD AVENUE
WEST TEMPLE STREET
CAROL DRIVE
EAST TEMPLE STREET
MARY ANN DRIVE
SHREWSBURY STREET
ELMWOOD PLACE
COMPASS CIRCLE
CHERYL'S WAY
SEWALL STREET SOUTH
PINE HILL DRIVE
PERRY ROAD
CHURCH STREET
PINE STREET
ABBEY ROAD
SMALLWOOD CIRCLE
OAK LEAF ROAD
CRESCENT STREET
HILLSIDE AVENUE
BIRCHWOOD DRIVE
INTERVALE ROAD
GREENWOOD STREET
MORNINGDALE AVENUE
HIGHLAND STREET
UPLAND ROAD
EDGEWOOD STREET
GLAZIER STREET
COOK STREET
DEVEN AVENUE
FLOGG STREET
HILLTOP ROAD
MERRIAM AVENUE
STOCKTON STREET
MILL ROAD
OAKWOOD DRIVE
HEMLOCK DRIVE
HEYWOOD STREET
BIRCH ROAD
CLOVER DRIVE
BROOKSIDE DRIVE
ROBERT ROAD
MILL POND CIRCLE
NATURE'S WAY
GULF STREET
DOCK ROAD
SEWER TRUCK ROAD
WORCESTER COUNTY SHERIFF
Assabet Academy
Cornerstone Academy
GREEN STREET
OSGOOD STREET
MAPLE WAY
FLEASANT LANE
PENDELL CIRCLE
WARREN STREET
BOYLSTON WAY
ROCKFIELD CIRCLE
CENTRAL AVENUE
JUNIPER HILL DRIVE
PINE STREET
ROCKY POND ROAD
GULLY HILL ROAD
RESERVOIR STREET
ETHAN ALLEN DRIVE
SYLVAN LANE
MAPLE COURT
COLUMBUS ROAD
ADAMS STREET
MADISON AVENUE
TWIN SPRING DRIVE
STILES ROAD
BARNEY ROAD
INTERSTATE 290
LINDEN STREET
BERLIN
RUSSELL ROAD
LARSEN ROAD
RYAN LANE
OAK HILL LANE
KNEE HILL ROAD
BAILEY ROAD

Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- Misc Data
- Nursing/Rest Homes
- Daycare
- EOC
- Water Treatment Plant
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Aqueducts
- Active Rail Line
- Out of Service/Abandoned Rail Line

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Dams (2/2012)

- High Hazard
- Significant Hazard
- Low Hazard
- N/A

Locally Defined

- Critical Infrastructure
- Critical Infrastructure
- Critical Infrastructure

N
W
E
S

0.45 0.225 0 0.45 0.9 Miles

Data provided by participating municipalities, CMRPC, massDOT, MassGIS, FEMA and NOAA.
Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

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One Mercantile St. Suite 520, Worcester, MA 01608

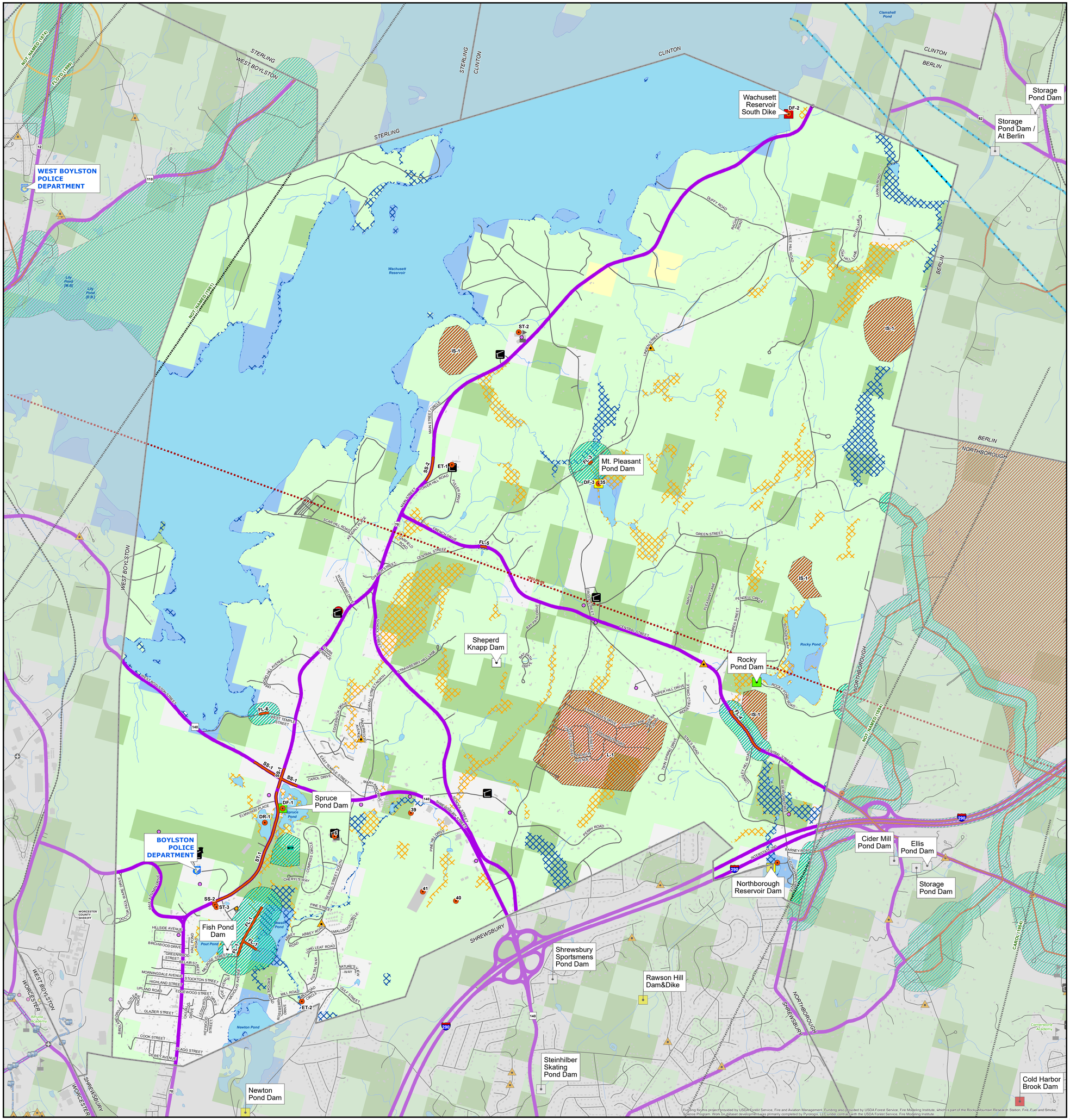
CMRPC
Central Massachusetts Regional Planning Commission

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Hazard Mitigation Plan

Map 2
Hazards
Town of Boylston, Massachusetts

April 2024



Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- Misc Data
- Nursing/Rest Homes
- Daycare
- EOC
- Water Treatment Plant
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Aqueducts
- Active Rail Line
- Out of Service/Abandoned Rail Line

- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

Hazards

Dams (2/2012)
- High Hazard
- N/A

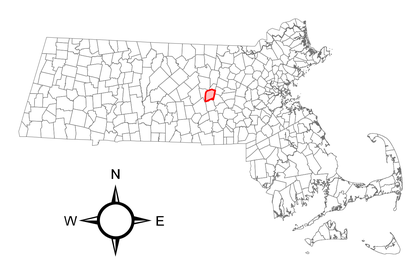
FEMA DFIRM Flood Zones
- 100-year Flood Area*
- 500-year Flood Area
- Repetitive Loss Property Areas
- NOAA Historic Hurricane Tracks (1842-2022)

USDA Wildfire Hazard Potential, Version 2020 Classified

Very Low	Moderate	Very High	Water
Low	High	Non-burnable	

Locally Defined Hazards

- Hazard
- Hazard
- Possible Flood Area
- Hazard



0.45 0.225 0 0.45 0.9 Miles

Data provided by participating municipalities, CMRPC, massDOT, MassGIS, FEMA and NOAA.
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CMRPC Central Massachusetts Regional Planning Commission

Date: 4/24/2024 Document Path: H:\Projects\HLS_GIS\subprojects\hmp\HMP_02_Local_Hazards_36x44.mxd

Funding for this project provided by USDA Forest Service. Fire and Aviation Management. Funding also provided by USDA Forest Service. Fire Modeling Institute, which is part of the Rocky Mountain Research Station, Fire, Fuel and Smoke Science Program. Work on dataset development was primarily completed by Pyrologix, LLC under contract with the USDA Forest Service, Fire Modeling Institute.

Hazard Mitigation Plan

Map 3
Vulnerable Critical Infrastructure and Facilities
Town of Boylston, Massachusetts

December 2024

Legend

- Assisted Living
- Clinics
- Elderly Housing
- Emergency Shelters
- Misc Data
- Nursing/Rest Homes
- Daycare
- EOC
- Other Government Buildings
- Water Treatment Plant
- Town Halls
- Local Police
- Fire Station
- Schools (Pre-K through High School)
- WRTA Bus Stop
- WRTA Bus Routes (IN/OUT)
- Aqueducts
- Active Rail Line
- Out of Service/Abandoned Rail Line
- EJ/Vulnerable Population (Mobility 2040)
- Town Boundaries
- Structures
- Water Bodies
- Streams
- Roads
- Regionwide Evacuation Routes

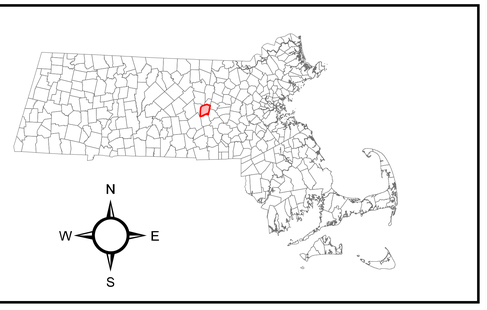
Hazards

Dams
- High Hazard
- Significant Hazard
- Low Hazard
- N/A

- 100-year Flood Area*
- 500-year Flood Area
- FEMA DFIRM Flood Zones / FEMA Q3 Flood Zones
- High Slope (15% and above)
- Repetitive Loss Property Areas

Locally Defined

- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard
- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard
- Vulnerable Critical Infrastructure
- Non-vulnerable Critical Infrastructure
- Hazard
- Possible Flood Area



0.45 0.225 0 0.45 0.9 Miles

Data provided by participating municipalities, CMRPC, massDOT and MassGIS.

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CMRPC Central Massachusetts Regional Planning Commission

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APPENDIX B

Public Survey

Appendix B helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Boylston Hazard Mitigation Plan

Survey Responses Needed

The Town of Boylston is in the process of updating its Hazard Mitigation Plan and is requesting input from residents to inform this plan. An updated HMP will help the Town assess and reduce community risk from natural hazards.

CMRPC
Central Massachusetts Regional Planning Commission

You are invited to submit your thoughts on natural hazards, such as flooding, snowstorms, or thunderstorms, in the Boylston Hazard Mitigation Plan Community Survey.

Take our survey using the QR code below.

Tip: Open your phone camera, point at the QR code, and click the pop-up link to take the survey.

Link to the survey: https://www.surveymonkey.com/r/Z8C7NK9

Boylston Hazard Mitigation Plan Community Survey

Boylston Hazard Mitigation Plan

In November 2023, the Town of Boylston started the planning process to update its Hazard Mitigation Plan (HMP). An updated HMP will help the town identify strategies to reduce its vulnerability to hazards like flooding, winter storms, and drought. Climate change may shift the extent and severity of certain natural hazards, including those that already impact Boylston.

By participating in this survey, you will help the Town of Boylston understand the current and future natural hazards that residents are most concerned about. Survey responses will be accepted until April 22nd, 2024, and may be extended as needed.

1. Check all that apply.

- [ ] I live in Boylston.
- [ ] I work in Boylston.
- [ ] I frequently visit Boylston.

2. Has your family or property, in Boylston, been impacted by any of the following natural hazards? Select all that apply:

- [ ] I have not been impacted by natural hazards in Boylston
- [ ] Winter Storms / Ice
- [ ] Thunderstorms, Microbursts, and/or Extreme Wind
- [ ] Tornadoes
- [ ] Flooding
- [ ] Extreme Heat / Extreme Cold
- [ ] Drought
- [ ] Wildfire / Brushfire
- [ ] Hurricanes
- [ ] Earthquakes
- [ ] Invasive Species
- [ ] Other (please specify)

3. Where have you observed natural hazard impacts in Boylston, and what were those impacts?

Examples: flooding on specific roads, drought/effects on water supply, trees down on roads, beaver dams affecting property and septic systems due to flooding from dams.

4. How much do you think the impacts of natural hazards and climate change will threaten your personal health, safety, or property?

- ◯ I think natural hazards and climate change will negatively impact my life.
- ◯ I'm not sure how natural hazards and climate change will impact my life.
- ◯ I don't think that I personally will be impacted by natural hazards and climate change.

5. If you are concerned about impacts to you or your community from natural hazards and/or climate change, what impacts are you most concerned about?

Examples: basement flooding, wells drying out / contamination of wells, ability to grow food, roads rendered impassable by flooding, extended power outages or loss of internet connectivity

6. How concerned are you about the impacts that natural hazards and climate change will have on the Town of Boylston (the local infrastructure, economy, environment, and/or town residents)?

- ◯ Very concerned
- ◯ Somewhat concerned
- ◯ Unsure
- ◯ Somewhat unconcerned
- ◯ Not concerned at all

7. What community assets are you most concerned about when you consider the potential impact of natural hazards and climate change on the Town of Bolyston? Rank the responses below in order from most concerned (1) to least concerned (5).

- Local natural resources and public lands
- Resident health, safety, and property
- Local infrastructure
- Local business and the town economy
- Local government resources

8. Which of the following aspects of natural hazards and climate change would you like to learn more about? Select all that you are interested in.

- [ ] Impacts on water quantity / quality
- [ ] Future flood risks
- [ ] Impacts on infrastructure
- [ ] Sustainability initiatives
- [ ] Public health impacts like increased risks of vector-borne disease (ex. Lyme disease, West Nile Virus, EEE - Eastern equine encephalitis)
- [ ] Impacts on town budget and finances
- [ ] Impacts on wildlife
- [ ] Impacts on the health of local forests and public lands
- [ ] Impacts on future development
- [ ] Incursion by Invasive Species
- [ ] Other (please specify)

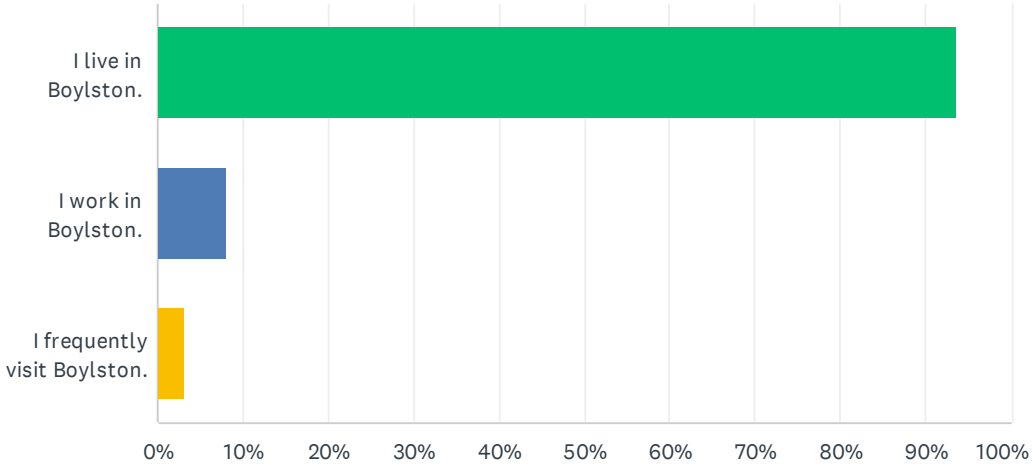
9. What actions should the Town of Boylston take to cultivate local resilience to natural hazards?

Examples: increase local capacity to apply for hazard mitigation grant funding and implement hazard mitigation projects; improve storm water management; provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species; encourage cutting/trimming dead trees beside/hanging over roads; etc.

10. If you would like to stay informed about other opportunities to participate in Boylston's Hazard Mitigation planning process, please enter your E-mail address below.

Q1 Check all that apply.

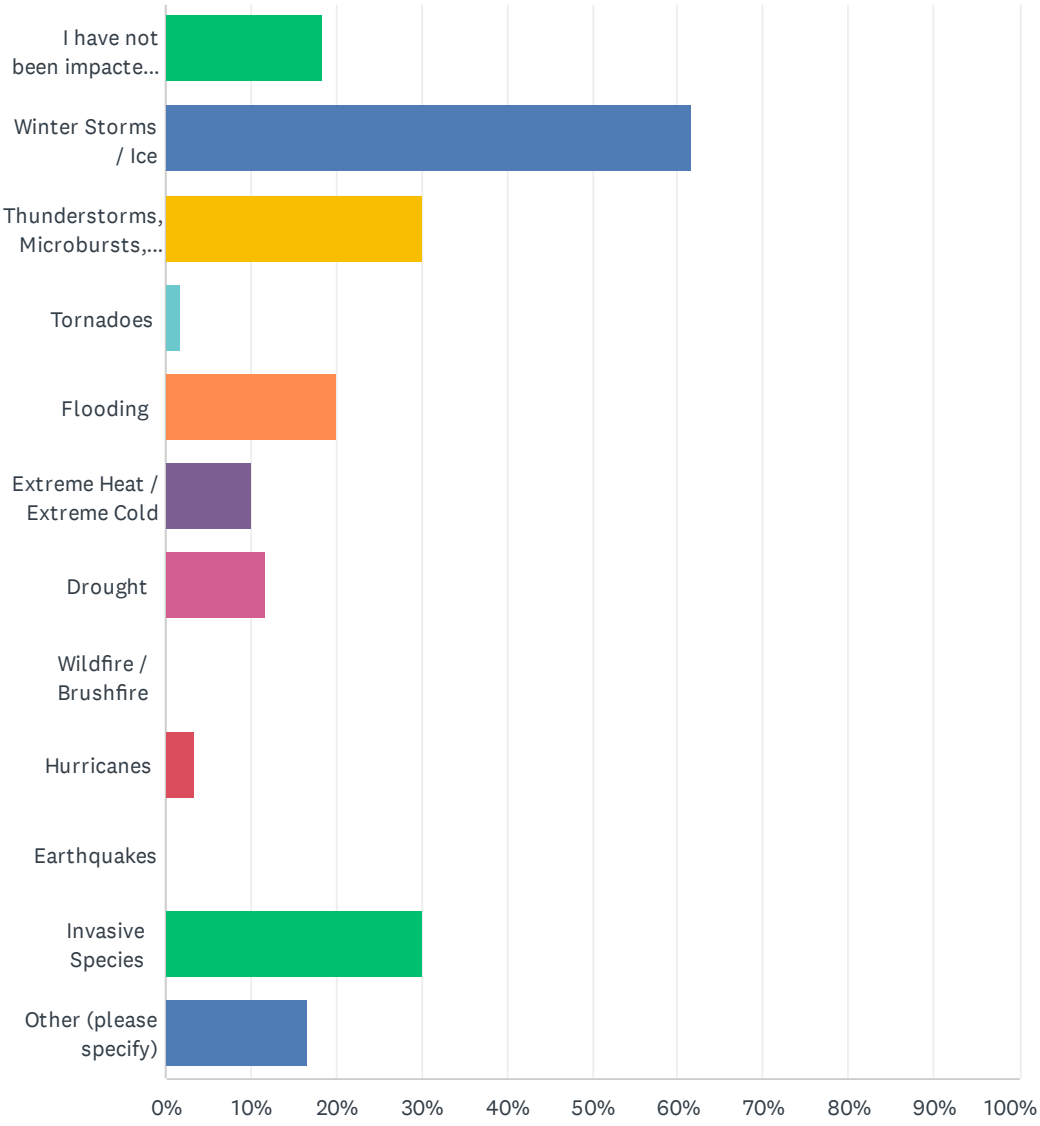
Answered: 62 Skipped: 0



ANSWER CHOICES	RESPONSES	
I live in Boylston.	93.55%	58
I work in Boylston.	8.06%	5
I frequently visit Boylston.	3.23%	2
Total Respondents: 62		

Q2 Has your family or property, in Boylston, been impacted by any of the following natural hazards? Select all that apply:

Answered: 60 Skipped: 2



ANSWER CHOICES	RESPONSES	
I have not been impacted by natural hazards in Boylston	18.33%	11
Winter Storms / Ice	61.67%	37
Thunderstorms, Microbursts, and/or Extreme Wind	30.00%	18
Tornadoes	1.67%	1
Flooding	20.00%	12
Extreme Heat / Extreme Cold	10.00%	6
Drought	11.67%	7
Wildfire / Brushfire	0.00%	0
Hurricanes	3.33%	2
Earthquakes	0.00%	0
Invasive Species	30.00%	18
Other (please specify)	16.67%	10
Total Respondents: 60		

#	OTHER (PLEASE SPECIFY)	DATE
1	Japanese bamboo- not sure of proper name ["Kudzu?" has also been written on this page]	3/26/2024 1:29 PM
2	emerald ash	3/12/2024 2:51 PM
3	Cracking of walls due to excess weight of snow.	3/7/2024 8:14 PM
4	Rain - Water in basement	2/29/2024 9:58 AM
5	No Impact	2/29/2024 9:50 AM
6	There have been numerous downed trees across down due to lack of budget for tree removal/trimming	2/20/2024 9:53 AM
7	Inadequate street drainage system	2/18/2024 7:34 AM
8	Radon	2/16/2024 5:44 PM
9	unclean water	2/7/2024 1:44 PM
10	Note that the potential for drought is worrisome for those of us with private wells.	1/30/2024 2:00 PM

Q3 Where have you observed natural hazard impacts in Boylston, and what were those impacts?Examples: flooding on specific roads, drought/effects on water supply, trees down on roads, beaver dams affecting property and septic systems due to flooding from dams.

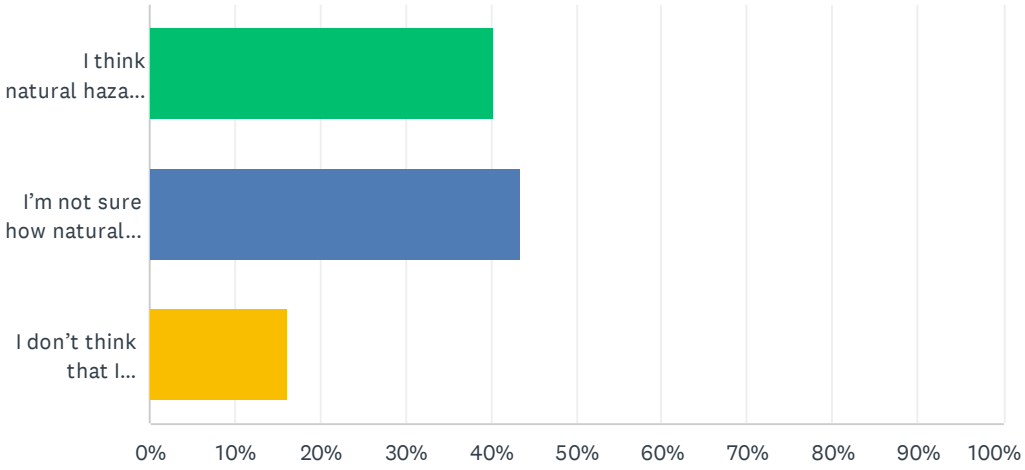
Answered: 44 Skipped: 18

#	RESPONSES	DATE
1	Trees on roads, wires [and] tree branches causing significant damage to fences	3/26/2024 1:29 PM
2	Beaver Activity, ALB and Ash Tree Devastation	3/26/2024 12:47 PM
3	N/A	3/26/2024 12:39 PM
4	Downed trees on roads, pulling down power/communication lines. Downed trees on public accessible lands that block trail access.	3/18/2024 2:19 PM
5	emerald ash in our woods, thunderstorm brought down neighbors tree into my yard, winter storm's ice made ambulance access tricky	3/12/2024 2:51 PM
6	During heavy rains, water is coming off of S Sewell street onto Morgan Circle and leaving large amounts of water pooled in some years.	3/12/2024 1:46 PM
7	Flooding on N. Sewall st. makes less of the road walkable/drivable.	3/7/2024 8:14 PM
8	Trees down, power outages for 11 days ice storm Flooded basement caused by improper earth removal and drainage changes	3/4/2024 10:27 AM
9	None	3/4/2024 8:56 AM
10	Mostly downed trees & branches from very high wind & heavy snow/ice.	3/4/2024 8:49 AM
11	Beaver dams effect our backyard with massive water. Need to breach the dams and relocate the beavers	3/1/2024 8:20 AM
12	Flooding on Roads, Trees in Roadway, on Powerlines	2/29/2024 10:06 AM
13	tree branches fell on my car	2/29/2024 10:04 AM
14	(drought/effects on water supply, trees down on roads, beaver dams affecting property is circled on the paper form)	2/29/2024 10:01 AM
15	Flooding in neighborhood, basement flooding	2/29/2024 9:59 AM
16	E Temple St- road to reservoir: Rutted after Storms; Trees down on edgebrook drive	2/29/2024 9:58 AM
17	Flooding	2/29/2024 9:56 AM
18	None	2/29/2024 9:50 AM
19	Brown Ice, Watter logging	2/29/2024 9:49 AM
20	(trees down on roads is underlined on the paper form)	2/29/2024 9:41 AM
21	Central St. Flooding	2/29/2024 9:40 AM
22	Trees down on our road, blocking access out	2/28/2024 10:16 PM
23	Storms (wind, Ice) Trees down all over power lines and blocking roads. Asian Longhorn beetles	2/25/2024 8:19 PM
24	Trees have become an issue all across town due to the recent years and change in weather. Wind storms have become more frequent. There needs to be more tree removal/trimming done	2/20/2024 9:53 AM
25	Flooding on Sewell Pond. Possibly resident damning.	2/18/2024 7:38 PM

26	Beaver damn affecting property on Ethan Allen Drive	2/18/2024 4:30 PM
27	No drainage system on Cutler Road. An upgradient area floods onto Cutler Road at least annually. Inadequate drainage system on Glazier Street. Fallen trees on public and private properties due to ice accumulation and wind.	2/18/2024 7:34 AM
28	Main st at my house gets flooded with every major rain storm. Water main breaks also happen yearly in front of my house	2/17/2024 4:44 PM
29	N/A	2/17/2024 3:19 PM
30	Beaver dam impacting stiles	2/16/2024 9:44 PM
31	Flooding on cross st, beaver dams behind Ethan Allen drive	2/16/2024 9:09 PM
32	In my home (very high radon level)	2/16/2024 5:44 PM
33	flooding from poorly graded land on public areas is a problem i've experienced. please hire people who know what they are doing for these crucial tasks.	2/16/2024 5:17 PM
34	trees down on Mile Hill Rd, Green St.	2/16/2024 4:51 PM
35	Sewell pond overflowing due to downstream damming by a civilian.	2/11/2024 11:02 AM
36	Beaver dams on stiles road	2/10/2024 8:21 AM
37	Until all the building on Sewall St, we never had problems with town water. I don't water my lawn (and never plan to!) but we have had more water conservation warnings, and we had more polluted looking water in the pond.	2/7/2024 1:44 PM
38	Trees down on Cross, School and Central.	2/3/2024 10:27 AM
39	Tree limbs on streets after severe storms.	1/31/2024 9:26 PM
40	Tornado/micro burst on Green St dropped dozens of trees (Oct 2020)	1/30/2024 10:33 PM
41	pine trees and branches falling from ice and high winds	1/30/2024 2:16 PM
42	Invasive plants such as Oriental bittersweet and burning bush as abundant on Boylston roadsides and are sometimes planted at homes. These plants displace native plants and spread uncontrollably.	1/30/2024 2:12 PM
43	Trees down / flooding on roads / clogged roadside catch basins -- all roads except Rts 290 and 140 -- impact is potential loss of power and water. Extreme cold -- loss of fruit-bearing trees. Invasive species (insects) -- loss of vegetable plants. Invasive plants -- poison ivy is allowed to thrive everywhere on roadsides. It seems to be yearly mowed down which aerosolizes it and makes it more dangerous via skin contact and breathing it in (yikes!!). AND many of the insect / plant problems are treated with dangerous chemicals which impacts human illness. That helps no one.	1/30/2024 2:00 PM
44	Lots of dead/old trees adjacent to roads and power lines; many long driveways funnel runoff onto public ways.	1/30/2024 10:01 AM

Q4 How much do you think the impacts of natural hazards and climate change will threaten your personal health, safety, or property?

Answered: 62 Skipped: 0



ANSWER CHOICES	RESPONSES	
I think natural hazards and climate change will negatively impact my life.	40.32%	25
I'm not sure how natural hazards and climate change will impact my life.	43.55%	27
I don't think that I personally will be impacted by natural hazards and climate change.	16.13%	10
TOTAL		62

Q5 If you are concerned about impacts to you or your community from natural hazards and/or climate change, what impacts are you most concerned about?Examples: basement flooding, wells drying out / contamination of wells, ability to grow food, roads rendered impassable by flooding, extended power outages or loss of internet connectivity

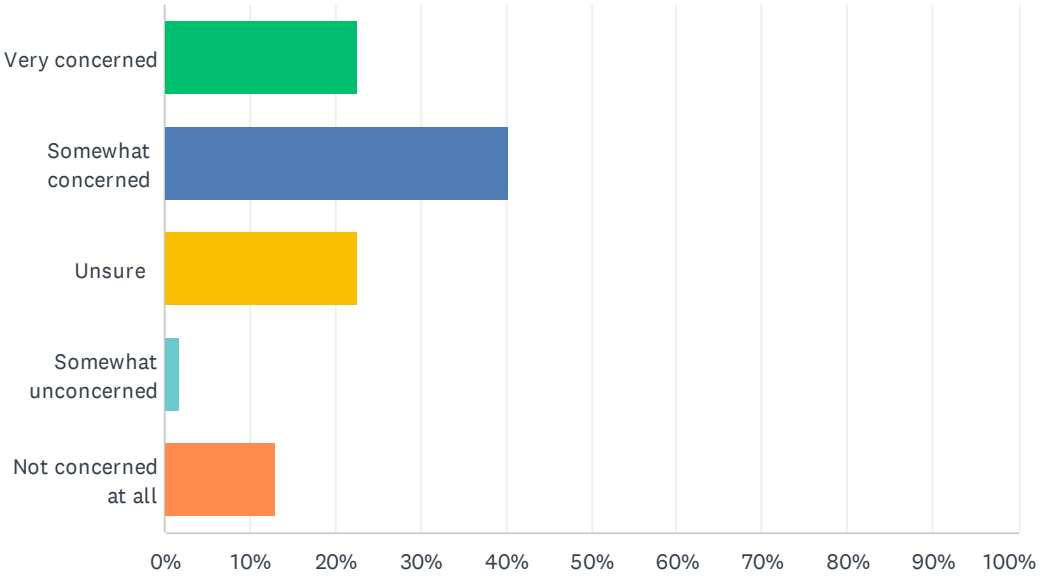
Answered: 47 Skipped: 15

#	RESPONSES	DATE
1	1. Well Contamination from all the buildings on the wetlands off Sewall Street 2. Power outages, Internet, ect.	3/26/2024 1:29 PM
2	Ability to Grow Food	3/26/2024 12:39 PM
3	extended power outages during winter with limited heat backup capability at my house.	3/18/2024 2:19 PM
4	will all of the new residences in Boylston I'm concerned about the ground water supply as more and more demand will result in lowering of subterranean aquifer water level.	3/12/2024 2:51 PM
5	Basement flooding and contamination of wells	3/12/2024 1:46 PM
6	All of the examples above	3/4/2024 10:27 AM
7	Loss of internet	3/4/2024 8:56 AM
8	Safety of water supply	3/4/2024 6:57 AM
9	Exteyoutages. Ability to grow food	3/4/2024 4:43 AM
10	Our gardens get flooded, we lose more and more of usable land due to the flooding	3/1/2024 8:20 AM
11	Flooding in the basement	2/29/2024 10:06 AM
12	Loss of Power	2/29/2024 10:06 AM
13	Response of town to these disasters & proactiveness of Boylston to anticipate likely events	2/29/2024 10:04 AM
14	(wells drying out / contamination of wells, ability to grow food, extended power outages is circled on the form)	2/29/2024 10:01 AM
15	basement flooding	2/29/2024 9:59 AM
16	All of the above	2/29/2024 9:58 AM
17	Flooding	2/29/2024 9:56 AM
18	Falling Trees	2/29/2024 9:52 AM
19	None	2/29/2024 9:50 AM
20	(Wells drying out, ability to grow food is circled on the paper form) CLIMATE CHANGE WILL IMPACT ALL OF OUR LIVES IN VARIOUS WAYS	2/29/2024 9:45 AM
21	(Roads Rendered Impassable by Flooding is circled on the paper form) Do more tree trimming + maintenance.	2/29/2024 9:40 AM
22	Loss of power and internet Influx / infestations of rats moving into town, carrying disease and damaging property	2/28/2024 10:16 PM
23	basement flooding	2/23/2024 7:00 AM
24	Trees	2/20/2024 9:53 AM
25	Contamination of wells and extended power outages	2/18/2024 7:38 PM

26	basement flooding, garden/well drying during drought,	2/18/2024 5:50 PM
27	Flooding	2/18/2024 4:30 PM
28	Basement flooding when the power goes out or my sump pump fails.	2/18/2024 7:34 AM
29	Basement flooding	2/17/2024 4:44 PM
30	Power outages, loss of internet, road conditions	2/17/2024 3:19 PM
31	extended power outages	2/17/2024 6:09 AM
32	Contamination of town drinking water, road flooding, loss of power and internet	2/16/2024 9:09 PM
33	Ability to grow food	2/16/2024 5:55 PM
34	Long term increase cancer risk	2/16/2024 5:44 PM
35	what do you mean by climate change, like, weather? it's new england, we have weather, we deal.	2/16/2024 5:17 PM
36	What is with this climate change propaganda??	2/16/2024 5:08 PM
37	basement flooding, power outage from falling trees (ice or wind), increase in bad bugs with bad diseases (tics , mosquitoes), increase in invasive plants and bugs	2/16/2024 4:51 PM
38	Flooding on my property, not being able to use the property as intended and as expected.	2/11/2024 11:02 AM
39	Basement flooding; we live on Nicholas Ave and our basement has flooded badly twice in the past decade. Our sump pump has not stopped all winter because of the rain and the high water table. Two years ago my vegetable garden was bad because of drought. This past year, I had mold growing on everything and another bad yield.	2/7/2024 1:44 PM
40	Basement flooding, infrastructure damage, tree damage	2/3/2024 10:27 AM
41	Extended power outages	2/1/2024 7:01 PM
42	Climate causing more extreme weather events.	1/31/2024 9:26 PM
43	N/a	1/30/2024 10:33 PM
44	Basement flooding, well / septic issues, extended power outages (my home is all electric) , loss of internet…	1/30/2024 3:23 PM
45	Many food plants in my garden have been severely impacted by dry summer weather. Several perennial plants, including French sorrel, died out. In summer, our street, Stiles Road, has become unpleasant for biking and walking because developers cut hundreds of the mature trees that had cooled and shaded our road. Before their removal, these trees soaked up rain & tree roots moved the water into the groundwater. Our private wells are supplied by this water. The value of our home is decreased by the heat to which we are subjected.	1/30/2024 2:12 PM
46	Power outs. We can fix some personal power / water problems with private generators. Underground electric would be a big help -- I see that (on not, as its underground :-) on new construction in town, which is great, but those of us on older roads see only trees that could fall on high power lines at any time. Hmmmm.....new construction of pricey housing complexes are getting more attention.....why is that?	1/30/2024 2:00 PM
47	Loss of power or water. Also it keeps getting hotter longer, so more climate control needed.	1/30/2024 10:01 AM

Q6 How concerned are you about the impacts that natural hazards and climate change will have on the Town of Boylston (the local infrastructure, economy, environment, and/or town residents)?

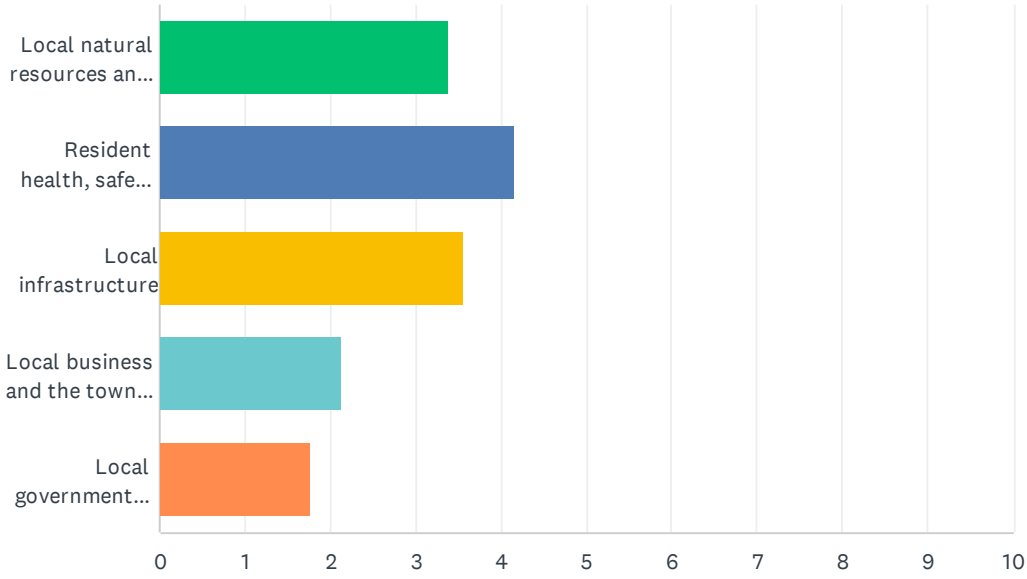
Answered: 62 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very concerned	22.58%	14
Somewhat concerned	40.32%	25
Unsure	22.58%	14
Somewhat unconcerned	1.61%	1
Not concerned at all	12.90%	8
TOTAL		62

Q7 What community assets are you most concerned about when you consider the potential impact of natural hazards and climate change on the Town of Bolyston? Rank the responses below in order from most concerned (1) to least concerned (5).

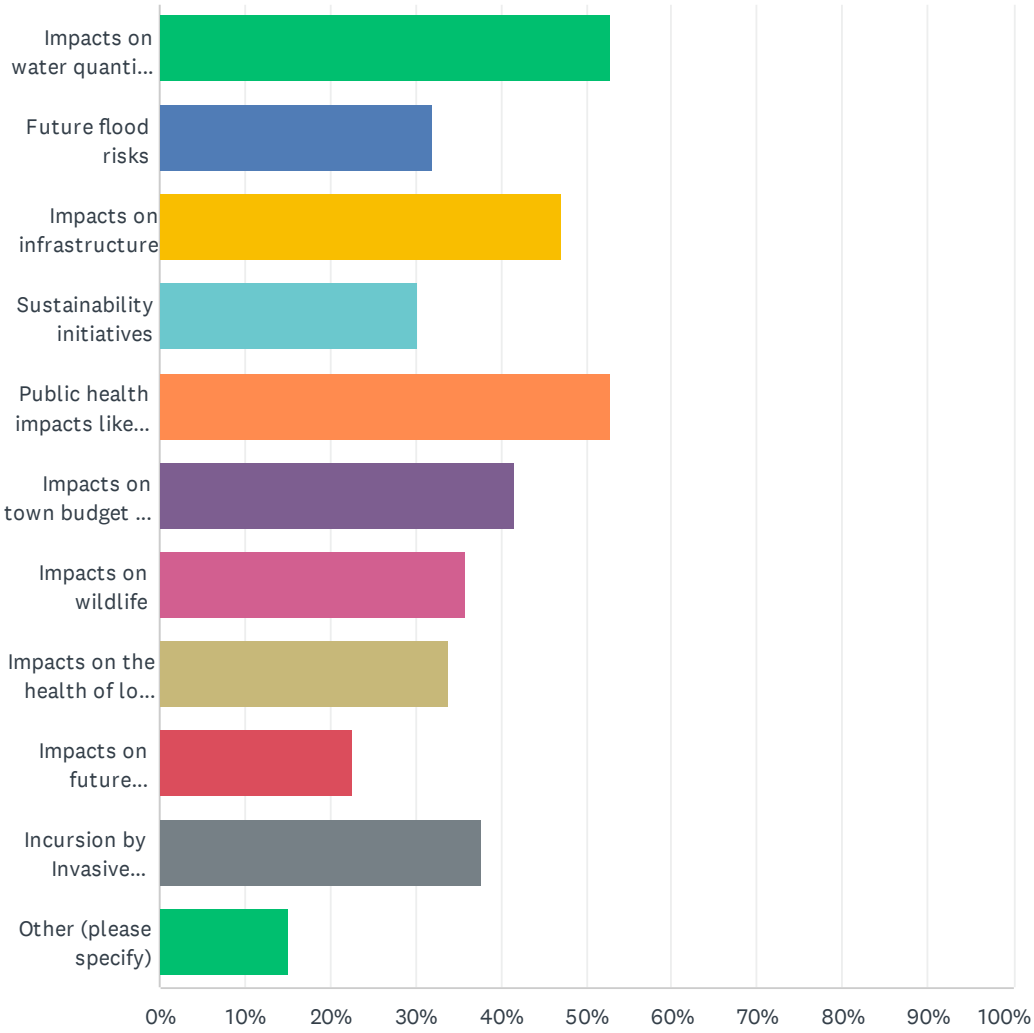
Answered: 54 Skipped: 8



	1	2	3	4	5	TOTAL	SCORE
Local natural resources and public lands	20.37% 11	37.04% 20	14.81% 8	16.67% 9	11.11% 6	54	3.39
Resident health, safety, and property	55.56% 30	18.52% 10	16.67% 9	3.70% 2	5.56% 3	54	4.15
Local infrastructure	22.22% 12	25.93% 14	38.89% 21	11.11% 6	1.85% 1	54	3.56
Local business and the town economy	1.85% 1	9.26% 5	14.81% 8	48.15% 26	25.93% 14	54	2.13
Local government resources	0.00% 0	9.26% 5	14.81% 8	20.37% 11	55.56% 30	54	1.78

Q8 Which of the following aspects of natural hazards and climate change would you like to learn more about? Select all that you are interested in.

Answered: 53 Skipped: 9



ANSWER CHOICES	RESPONSES	
Impacts on water quantity / quality	52.83%	28
Future flood risks	32.08%	17
Impacts on infrastructure	47.17%	25
Sustainability initiatives	30.19%	16
Public health impacts like increased risks of vector-borne disease (ex. Lyme disease, West Nile Virus, EEE - Eastern equine encephalitis)	52.83%	28
Impacts on town budget and finances	41.51%	22
Impacts on wildlife	35.85%	19
Impacts on the health of local forests and public lands	33.96%	18
Impacts on future development	22.64%	12
Incursion by Invasive Species	37.74%	20
Other (please specify)	15.09%	8
Total Respondents: 53		

#	OTHER (PLEASE SPECIFY)	DATE
1	Beavers	3/1/2024 8:20 AM
2	Trees	2/20/2024 9:53 AM
3	Impact on health	2/16/2024 5:44 PM
4	stop building such dense housing and commercial and you'll help the environment.	2/16/2024 5:17 PM
5	extreme heat and drought	2/7/2024 1:44 PM
6	None	1/30/2024 8:49 PM
7	Increase open space to mitigate decrease in open space by development. Developers must be required to offset their private for-profit activity by donating open space.	1/30/2024 2:12 PM
8	It seems as if the town is more interested in development at the expense of town wildlife, forests, public lands, etc. It would be great if those involved with the large town developments (both single homes and apts) and maybe The Kraft Group could be forced to donate to town resources instead of building and then moving away.....	1/30/2024 2:00 PM

Q9 What actions should the Town of Boylston take to cultivate local resilience to natural hazards?Examples: increase local capacity to apply for hazard mitigation grant funding and implement hazard mitigation projects; improve storm water management; provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species; encourage cutting/trimming dead trees beside/hanging over roads; etc.

Answered: 39 Skipped: 23

#	RESPONSES	DATE
1	Send out Town Initiatives on Invasive ground Species - Japanese Bamboo (sp)	3/26/2024 1:29 PM
2	Clear Out Beavers, upgrade culverts and drains	3/26/2024 12:47 PM
3	HMP Implementation	3/26/2024 12:39 PM
4	1) More aggressive tree clearing along overhead infrastructure. 2) Federal funding to pay for the direct burial of critical overhead infrastructure (power, internet) in key locations. 3) Money to add storm water drains/management on local roads that do not have any - to help prevent severe flooding from washing out and damaging the roads.	3/18/2024 2:19 PM
5	License deep wells and monitor their levels	3/12/2024 2:51 PM
6	Provide more education and outreach about climate change	3/12/2024 1:46 PM
7	Improve storm water management; encourage planting climate-resilient trees; encourage trimming dead trees near roads; protect water supply.	3/7/2024 8:14 PM
8	All of the above	3/4/2024 10:27 AM
9	Plant resilient trees.	3/4/2024 8:56 AM
10	Cut/trim/clear ANY plant material which obstructs safe passage either by a vehicle or on foot.	3/4/2024 8:49 AM
11	Encourage planting climate resilient tree species. Encourage cutting trimming dead trees	3/4/2024 4:43 AM
12	Develop a plan to control the beaver population and the damage they cause.	3/1/2024 8:20 AM
13	Tree Cutting/Removal Stormwater management	2/29/2024 10:06 AM
14	1. Volunteer Committee to do trail maintenance 2. Master plan for 20 years to plan appropriate budgets	2/29/2024 10:04 AM
15	Town get educated on subject+ get grants to help the town	2/29/2024 10:01 AM
16	Stop Building / utilize Community/ies to help	2/29/2024 9:56 AM
17	Cutting/Trimming Dead Trees, Food and Water Storage	2/29/2024 9:52 AM
18	Support Solar and Heat Pumps	2/29/2024 9:49 AM
19	(provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species is underlined on the paper form) ALL OF THESE ARE GREAT IDEAS, OUTREACH AND INFROMATION MIGHT BE MOST IMPORTANT TO MY DAILY LIFE	2/29/2024 9:45 AM
20	(Encourage cutting/trimming dead trees beside/hanging over roads; ect. is circled on the paper form)	2/29/2024 9:40 AM
21	Keep doing what you do best and seek funding for special projects as needed. Reach out to	2/28/2024 10:16 PM

	townspeople to volunteer for projects as appropriate.	
22	Apply for state grants to offset the cost put back on residents in there taxes. Be aggressive in your asks at a State level.	2/20/2024 9:53 AM
23	Support a water dept for improved infrastructure which is old and constantly breaking.	2/18/2024 7:38 PM
24	encourage cutting/trimming dead trees beside/hanging over roads;	2/17/2024 6:09 AM
25	Trimming near power lines/limbs over roadways	2/16/2024 9:09 PM
26	Encourage planting climate resilient trees!	2/16/2024 5:55 PM
27	From a parent perspective, given what I have seen in my home, I would like to see adequate radon measurement and mitigation at the schools.	2/16/2024 5:44 PM
28	trimming trees over roads is just common sense, but planting non native species doesn't seem friendly to the local environment or climate.	2/16/2024 5:17 PM
29	More taxes to embezzle	2/16/2024 5:08 PM
30	encourage cutting/trimming dead trees beside/hanging over roads, test for bad bugs (like they do with ALB), give out free DEET to all	2/16/2024 4:51 PM
31	Lower the level of sewill pond. So that it flows better so that the fish can come back, and the water can become Clear and cleaner	2/11/2024 11:02 AM
32	We live in an older (50s) home and we would like to find out about possibilities for mini-splits, heat pumps, solar, and other sustainable/cost effective/environmentally friendly things we can do for our home. Especially for AC (we only have a window unit in the bedroom). Are there initiatives or information locally? Also, I see the dead and dying trees along Tivnan Road, and I worry about them falling on the road or power lines. Better storm water management along Nicholas Ave. They mention planting climate resistant trees, but I keep seeing the forests in town destroyed to do more building. How many climate resistant trees were lost on Sewall?	2/7/2024 1:44 PM
33	provide more education and outreach about how climate change could impact my life; encourage planting climate-resilient tree species; encourage cutting/trimming dead trees beside/hanging over roads	2/3/2024 10:27 AM
34	Tree trimming Moving power lines underground if possible	2/1/2024 7:01 PM
35	Improve storm water management, clearing/eliminating invasives along town roads (poison ivy, bamboo, bittersweet, etc.), removing dead trees in rights of way.	1/31/2024 9:26 PM
36	Provide resources for homeowners to prevent flooding on property	1/30/2024 10:33 PM
37	EDUCATED, EDUCATE, EDUCATE. Implement removal of invasive plants and replace with native trees, shrubs and ground cover. Boylston town can launch this on roadsides. Lawns are deserts for wildlife; replace lawns with native ground covers that feed wildlife. Town should do this on town property as demonstration models at town hall!!! Tower Hill is an obvious partner in this vital effort to keep Boylston liveable.	1/30/2024 2:12 PM
38	Please see comments above. The rapid development going on in town contributes to the problems. Moving electric wires underground is a town issue and does not need education. Cutting dead trees along the road is a town problem -- they should be doing it now..... PS: The beavers were here first, we should work around them.	1/30/2024 2:00 PM
39	All of these are good ideas.	1/30/2024 10:01 AM

Boylston Hazard Mitigation Plan

Survey Responses Needed

The Town of Boylston is in the process of updating its Hazard Mitigation Plan and is requesting input from residents to inform this plan. An updated HMP will help the Town assess and reduce community risk from natural hazards.

CMRPC

You are invited to submit your thoughts on natural hazards, such as flooding, snowstorms, or thunderstorms, in the Boylston Hazard Mitigation Plan Community Survey.

Take our survey using the QR code below.

Tip: Open your phone camera, point at the QR code, and click the pop-up link to take the survey.

Link to the survey: https://www.surveymonkey.com/r/Z8C7NK9



DEC 28–31
BOSTON
BOCH CENTER WANG THEATRE

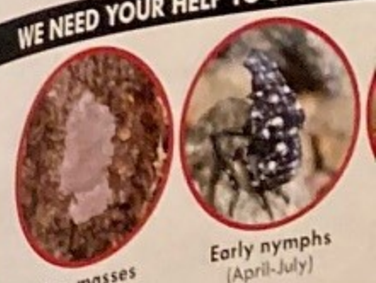
STOP THE
SPOTTED LA



Spotted lanternfly attacks over 70 differ
important crops (grapes, apples, ho
willow, birch), and the invasive tree-of-h

This pest has now been spotted in sever

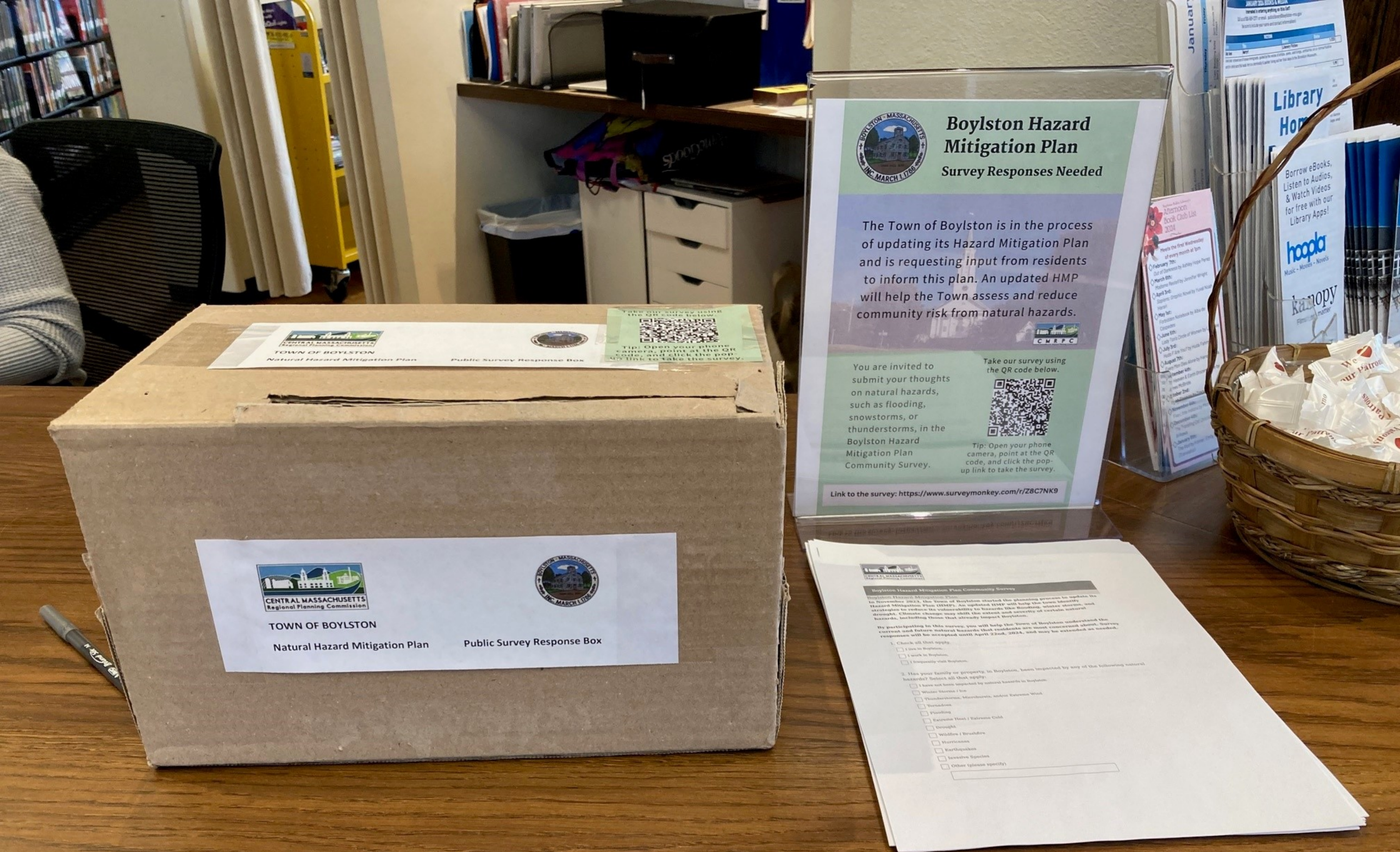
WE NEED YOUR HELP TO STOP IT B



Egg masses
(Sept.-June)

Early nymphs
(April-July)

HAVE YOU SEEN THIS INS
MASSNRC.ORG/PE
Scan this QR Code, or


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TOWN OF BOYLSTON
Natural Hazard Mitigation Plan
Public Survey Response Box
Boylston Hazard Mitigation Plan Community Survey
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CENTRAL MASSACHUSETTS
Regional Planning Commission

TOWN OF BOYLSTON

Natural Hazard Mitigation Plan

Public Survey Response Box

Take our survey using the QR code below.

Tip: Open your phone camera, point at the QR code, and click the pop-up link to take the survey.

CENTRAL MASSACHUSETTS
Regional Planning Commission

TOWN OF BOYLSTON

Natural Hazard Mitigation Plan

Public Survey Response Box

CENTRAL MASSACHUSETTS
Regional Planning Commission

Boylston Hazard Mitigation Plan Community Survey

Boylston Hazard Mitigation Plan

In November 2023, the Town of Boylston started the planning process to update its Hazard Mitigation Plan (HMP). An updated HMP will help the town identify strategies to reduce its vulnerability to hazards like flooding, winter storms, and drought. Climate change may shift the extent and severity of certain natural hazards, including those that already impact Boylston.

By participating in this survey, you will help the Town of Boylston understand the current and future natural hazards that residents are most concerned about. Survey responses will be accepted until April 22nd, 2024, and may be extended as needed.

1. Check all that apply.

- [ ] I live in Boylston.
- [ ] I work in Boylston.
- [ ] I frequently visit Boylston.

2. Has your family or property, in Boylston, been impacted by any of the following natural hazards? Select all that apply:

- [ ] I have not been impacted by natural hazards in Boylston
- [ ] Winter Storms / Ice
- [ ] Thunderstorms, Microbursts, and/or Extreme Wind
- [ ] Tornadoes
- [ ] Flooding
- [ ] Extreme Heat / Extreme Cold
- [ ] Drought
- [ ] Wildfire / Brushfire
- [ ] Hurricanes
- [ ] Earthquakes
- [ ] Invasive Species
- [ ] Other (please specify)



Affordable Housing Committee

Feasibility Study Committee
Notice of Meeting and Agenda

Pursuant to the Massachusetts Open Meeting Law, notice is hereby given of a meeting of the Boylston Board of Selectmen. The Meeting will take place:

Thursday, February 1st, 2024, 1:00 P.M.
Boylston Town Hall
Board of Selectmen Chambers
221 Main Street, Boylston, MA

Topics to be discussed:

** Agenda items without a specific time may be taken out of order.*

I) Approval of meeting minutes: 12/28/2023

II) Scheduled Items:
- Updates
  - Mass Historic Contact
  - Geotech Boring for Elevator
    (1) Vote approval for proposed work
- Review Updated Drawings
- Review Exterior Elevations
- Review Shelter Requirements
- Discuss Layout for New Fire Station

III) Action Items:

IV) Future Agenda Items: (topics to be proposed for discussion at future meetings)

BOYLSTON TOWN CLERK
JAN 25 2024 at 11:12

Boylston Hazard Mitigation Plan

Survey Responses Needed

The Town of Boylston is in the process of updating its Hazard Mitigation Plan and is requesting input from residents to inform this plan. An updated HMP will help the Town assess and reduce community risk from natural hazards.

You are invited to submit your thoughts on natural hazards, such as flooding, snowstorms, or thunderstorms, in the Boylston Hazard Mitigation Plan Community Survey.

Take our survey using the QR code below.

Tip: Open your phone camera, point at the QR code, and click the pop-up link to take the survey.

Link to the survey: https://www.surveymonkey.com/r/Z8C7NK9

PLANNING BOARD

BUILDING DEPARTMENT

TOWN PLANNER

Boylston Hazard Mitigation Plan

Survey Responses Needed

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CMRPC

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Link to the survey: https://www.surveymonkey.com/r/Z8C7NK9

Going Live 10/2/17!

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If you're having trouble making ends meet, Citizens Energy, your local Fuel Assistance Agency and Massachusetts Oilheat Dealers are ready to help. To learn more about purchasing up to 175 gallons of home heating oil at half the retail price, please call 1-877-JOE-4-OIL.

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Don't dig yourself into trouble. Call Dig Safe before you dig. It's Smart. It's Free. It's the Law.



Dial 811

digsafe.com



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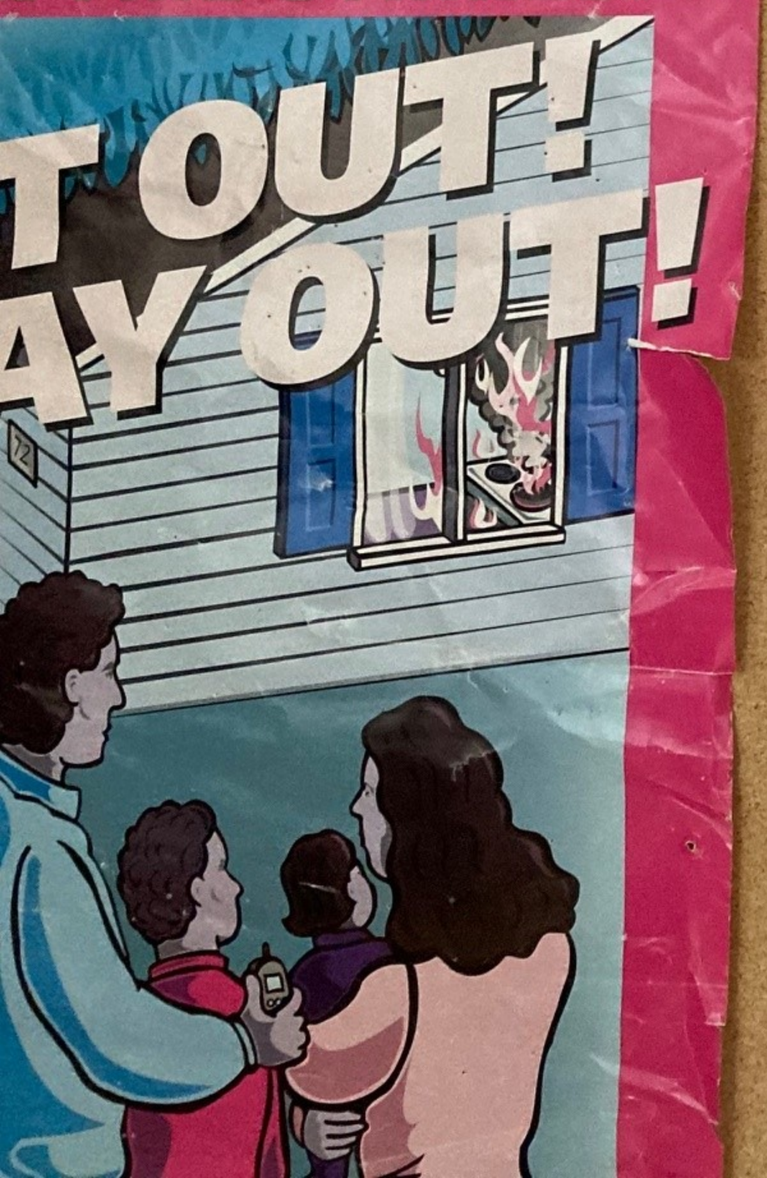
PUBLIC HEALTH CORPS

common q

N FIRE STRIKES:

T OUT!

AY OUT!



Boylston Hazard Mitigation Plan

Survey Responses Needed

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West Bo
Phone: 508.835.2800
Fax: 508.835.2899
www.LivingWellDayHealth.com
Email: info@LivingWellDayHealth.com

Care when you need it.

Your loved ones may not need round-the-clock assistance, but they can still benefit from our services.

BOYLSTON SENIOR LUNCH PROGR

Interested in some good food & fun company? Th
Lunch Program is back & ready for residents to
nutritious, well-balanced meal. This is a great oppo
connections & socialize with othe



WHEN: Tuesdays & Thursdays at 12
WHERE: Boylston Town House, lowe

Participants are asked to make a $2.50 donation pe
the cost of the meal. *

To order lunch, call Elder Services at (508) 85
48 hours' notice is appreciated

*The donation is anonymous & voluntary; any amount you can co
always, no eligible senior will be denied service based on their
donate. We thank you for your continued support &

Please contact the COA office at (508) 869-6022 for

https://www.boylston-ma.gov/home/news/hazard-mitigation-plan-survey

Town of Boylston | PermitPro | GIS | Worcester County L... | Interactive Property... | MA Corporations S... | Google Maps | MA Climate Chang... | GEAR Maps for MV...

Hazard Mitigation Plan Survey

POSTED ON: JANUARY 31, 2024 - 12:52PM

The Town of Boylston is in the process of updating its Hazard Mitigation Plan and is requesting input from residents to inform this plan. An updated HMP will help the Town assess and reduce community risk from natural hazards.

Residents can respond to the survey online, via the QR Code on the flyer, or fill out a paper survey, which will be available at Town Hall, Boylston Public Library, and the Municipal Light Department.

Link to survey: https://www.surveymonkey.com/r/Z8C7NK9



APPENDIX C:

Meetings

Appendix C helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Boylston Hazard Mitigation Plan Update
Local Planning Team Kickoff Meeting

Date/Time: Thursday November 16th, 2023, 9:00am
Location: 221 Main St Ste 2, Boylston, MA 01505

AGENDA

I. Introductions
II. Plan Background
- Review Contract
- Roles and Responsibilities
- Estimated Timeline
    - Plan Expires

III. Project Phases & Preliminary Schedule

Phase	Completion (proposed)
Assembly of local planning team, kickoff	November 2023
Information gathering o Natural hazards o Critical infrastructure and facilities	
Mitigation strategy development	
Stakeholder and public involvement	
Plan narrative development	
Plan submission (initial)	
Plan adoption	

IV. Local Planning Team Meetings/Council Presentations
- Meeting #1 (kickoff)
- Meeting #2 (hazards and critical infrastructure/facilities) (*can be two meetings*)
- Meeting #3 (mitigation strategies)
- Presentation #1 (summary of draft plan – setting is flexible)
- Presentation #2 (final plan and request for adoption @ BOS) (optional)

-

V. Review of Mitigation Strategies

- 2017 HMP Mitigation Strategies

VI. Next Meeting – Natural Hazards and/or Infrastructure

- Date/location
- What to prepare

Meeting Name:
Boylston Hazard Mitigation Plan Kickoff Meeting

Community: Boylston

Location: 221 Main St Ste 2, Boylston, MA 01505

Date: November 16th, 2023

Meeting Time: 9:00 AM

Participant Name	Organization	Title	E-mail
JOE MCGRATH	CONS. COMM	COMMISIONER	JMCGRATH@BOYLSTON-MA.GOV
Dennis Goguen	COA	Chairperson	dennisgogueng@gmail.com
Steven Mero	Hwy Supt.		smero@boylston-ma.gov
Paul DellAgnolo	Town Planner	—	pdellagnolo@boylston-ma.gov
Andrew Loew	CMRPC	—	aloew@cmrpc.org
Marc Gonsalves	CMRPC	—	mgranard@cmrpc.org
Carol Costello	BBRSD	Superintendent	ccostello@bbrsd.org
JOSEPH FLANAGAN	BOYLSTON FIRE FIRE CHIEF/EMD		j.flanagan@boylston-ma.gov

Boylston Hazard Mitigation Plan Update
Local Planning Team Natural Hazards and Critical Infrastructure Meeting

Date/Time: Thursday January 18th, 2024, 10:00am
Location: 221 Main St Ste 2, Boylston, MA 01505

AGENDA

I AGENDA

I. Introductions

II. Meeting #1 Recap

III. Community Lifelines

- When should we include them in the planning Process?

IV. Reference Documents

V. Natural Hazards Review

a. Flooding
b. Severe Snowstorms, Ice Storms, and Nor'easters
c. Hurricanes
d. Severe Thunderstorms, Wind, and Tornadoes
e. Wildfires and Brushfires
f. Earthquakes
g. Dam Failure
h. Drought
i. Extreme Temperatures
j. Landslides and Other Hazards

VI. Break

VII. Critical Infrastructure/Facilities and Vulnerable Populations Review

Review previous CI/F/P lists and update as necessary

- Category 1 – Emergency Response Facilities
- Category 2 – Non-Emergency Response Facilities
- Category 3 – Dams
- Category 4 – Populations and Facilities to Protect

VIII. Community Outreach

X. Next Meeting – Existing Protection Measures Review, Public Forum and Community Survey Planning

- Date/location
- What to prepare

Meeting Name: Boylston Hazard Mitigation Plan Natural Hazards and Critical Infrastructure	Community: Boylston	Location: 221 Main St Ste 2, Boylston, MA 01505
Date: January 18th, 2024		Meeting Time: 10:00 AM

Participant Name	Organization	Title	E-mail
Paul Dell'Aquila	Boylston	Town Planner	pdellaquila@boylston-ma.gov
TERESA PRUNIER	BWD	Comm	TAPRUNIER3@yahoo
Will Talbot	CMRPC		
JOE MCGRATH	BOYLSTON CON COMM		JMCGRATH@BOYLSTON-MA.GOV
JOE FLANAGAN	BOYLSTON FIRE DEPT.	FIRE CHIEF	jflanagan@boylston-ma.gov
DENNIS GOGUEN	COA	Chairperson	dennisgoguen@gmail.com
MARK BARAKIAN	Boylston Light Dept	MANAGER	MBarakian@Boylstonlight.org
Carol Costello	BBRSD	Superintendent	ccostello@bbrsd.org
Paula Davison	DCR	Regional Engineer	paula.davison@mass.gov
Bernadette DeBlander	DCR	Regional Planner	Bernadette.DeBlander2@mass.gov

Boylston Hazard Mitigation Plan Update
Local Planning Team Critical Infrastructure Meeting

Date/Time: Thursday February 15th , 2024, 10:00am
Location: 221 Main St Ste 2, Boylston, MA 01505

AGENDA

I AGENDA

I. Introductions

II. Meeting #2 Recap

III. Community Lifelines
- Updates from MEMA

IV. Reference Documents

V. Critical Infrastructure/Facilities and Vulnerable Populations Review
Review previous CI/F/P lists and update as necessary
- Category 1 – Emergency Response Facilities
- Category 2 – Non-Emergency Response Facilities
- Category 3 – Dams
- Category 4 – Populations and Facilities to Protect

VI. Community Survey Update

VII. Next Meeting – Mitigation Strategies Review, Public Forum and Community Survey Planning

- Date/location
- What to prepare

Meeting Name: Boylston Hazard Mitigation Plan Critical Infrastructure	Community: Boylston	Location: 221 Main St Ste 2, Boylston, MA 01505
	Date: February 14th, 2024	Meeting Time: 10:00 AM

Participant Name	Organization	Title	E-mail
Dennis Goguen	COA	Chairperson	dennisgogian@gmail.com
MARK BARAKIAN	Light Dept	MANAGER	MBARAKIAN@Boylstonlight.org
TERESA PRUNIER	BWD	Comm	tapruniea@yahoo
Carol Costello	BBRSD	Superintendent	ccostello@bbrsd.org
JOE McGRATH	Con Comm	COMMISIONER	JMCGRATH@BOYLSTONMA.GOV
Joe Flanagan	FIRE DEPT.	FIRE CHIEF	jflanagan@boylston-ma.gov
Bernadette DeBlander	DCR	Regional Planner	Bernadette.DeBlander-2@mass.gov
Paula Davison	DCR	Regional Engineer	paula.davison@mass.gov
April Steward	Town	Town Administrator	asteward@boylston-ma.gov
Paul DellAquila	Boylston	Town Planner	pdellaquila@boylston-ma.gov
Steven Mero	Town	Asst Supt	smero@boylston-ma.gov
Andrew Loew	CMRPC	Director of Resiliency Planning	aloew@cmrpc.org
Marc will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org
Graciato	CMRPC	Emergency Planner	mgraciato@CMRPC.org

Boylston Hazard Mitigation Plan Update
Local Planning Team Critical Infrastructure Meeting

Date/Time: Thursday April 25th , 2024, 10:00am
Location: 221 Main St Ste 2, Boylston, MA 01505

AGENDA

I. Introductions

II. Meeting #4 Recap

III. Community Lifelines

IV. Reference Documents

V. Mitigation Strategies Review

A. Structure and Infrastructure Strategies
B. Preparedness, Coordination, and Response Activities
C. Education and Awareness Strategies
D. Local Planning & Regulatory Strategies

VI. Review of Updates to Existing Protection Measures.

VII. Public Presentation

VIII. Next Meeting

- Date/Time/Location
- What to prepare

EXISTING PROTECTION

The Town of Boylston currently makes use of most available locally-controlled tools to mitigate the consequences of natural hazards: zoning regulations, planning, and physical improvements. The Town does not participate in any federal programs such as StormReady certification or Firewise community certification, but it does plan to research the utility of public awareness and education programs as a result of this planning process.

Boylston has most of the no-cost or low-cost hazard mitigation capabilities in place. Land use zoning, subdivision regulations and an array of specific policies and regulations that include hazard mitigation best practices, such as limitations on development in floodplains, stormwater management, tree maintenance, etc. Boylston also has appropriate staff dedicated to hazard mitigation-related work for a community of its size, including a Town Administrator, an, a professionally run Highway Department, a Facilities Technician, and a Tree Warden. Boylston has several relevant plans in place, including a Comprehensive Emergency Management Plan. Not only does Boylston have these capabilities in place, but they are also deployed for hazard mitigation, as appropriate. The Town also has very committed and dedicated volunteers who serve on Boards, Commissions and Committees and in other volunteer positions. The Town collaborates closely with surrounding communities through its Regional Emergency Planning Committee (South Wachusett) and has opted in to fire protection mutual aid agreements through MEMA. Boylston is also an active member community of the Central Massachusetts Regional Planning Commission (CMRPC) and can take advantage of no cost local technical assistance as needed provided by the professional planning staff at CMRPC.

The table below describes existing mitigation protections in Boylston. It includes a brief description of each activity as well as a subjective evaluation of its effectiveness and of any need for modifications.

CMRPC
Central Massachusetts Regional Planning Commission

Meeting Name: Boylston Meeting #4 **Community:** Boylston

Location: Town hall **Date:** 03/28/24 **Meeting Time:** 10 AM

Participant Name	Organization	Title	E-Mail
Joe McGrath	Cons. Comm.	Commissioner	JMCGRATH@BOYLSTON-MA.GOV
Teresa Prunier	BWA	Commissioner	taprunier@yahoo.com
Dennis Goguen	COA	Chairperson	dennisgoguen@gmail.com
Paul Dell'Aquila	Boylston	Town Planner	pdellaquila@boylston.com
Andrew Loew	CMRPC	Dir. of CD + Resiliency	aloew@cmrpc.org
Lily Rosa	CMRPC	Resiliency Intern	lrosa@CMRPC.org
Carol Costello	BBRSD	Superintendent	ccostello@bbrsd.org
Mark Granato	CMRPC	Emergency Prep. Planner	mgranato@cmrpc.org

Boylston Hazard Mitigation

Meeting Name: **Community:**

Location: Boylston Town Hall **Date:** 4/25/24 **Meeting Time:** 9:00 AM

Participant Name	Organization	Title	E-Mail
Andrew Loew	CMRPC	Dir of Comm. Dev. and Resiliency	aloew@cmrpc.org
Paul Dell'Aquila	Boylston	Town Planner	pdellaquila@boylston...
Dennis Goguen	COA	Chairperson	dennisgoguen@gmail.com
Teresa Prunier	BWD	Comm.	tapruniera yahoo
Joe McGrath	Con Com	Comm.	JMCGRATH@BOYLSTON-MA.GOV
Will Talbot	CMRPC	Assistant Planner	wtalbot@cmrpc.org

Boylston Hazard Mitigation Plan Update
Local Planning Team Existing Protection Measures and Public Presentation Planning Meeting

Date/Time: Thursday May 30th , 2024, 10:00am
Location: 221 Main St Ste 2, Boylston, MA 01505

AGENDA

I. Introductions

II. Meeting #5 Recap

III. Community Lifelines Updates

IV. Reference Documents

V. Review of Updates to Existing Protection Measures.

VI. Public Presentation

VII. Next Meeting

- Date/Time/Location
- What to prepare

CMRPC
Central Massachusetts Regional Planning Commission

Meeting Name: Boylston Existing Conditions meeting **Community:** Boylston

Location: Boylston Town Hall **Date:** 5/30/24 **Meeting Time:** 9:00 am

Participant Name	Organization	Title	E-Mail
Paul Dell'Aquila	Town	Town Planner	pdellaquila@boylston-ma.gov
Joe Flanagan	Boylston Fire	Fire Chief	jflanagan@boylston-ma.gov
JOE MCGRATH	BOYLSTON CONCOM.	COMMISSIONER	JMCGRATH@BOYLSTON-MA.GOV
Andrew Loew	CMRPC	Director Conservation and Resiliency	aloew@cmrpc.org
Dennis Goguen	COA	Chairperson	dennisgoguen@gmail.com
Marc Gramko	CMRPC	Emergency Planner	mgramko@cmrpc.org

APPENDIX D:

Public Presentation at

Select Board Meeting

Materials

Appendix D helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

Board of Selectmen

Notice of Meeting and Agenda

Pursuant to the Massachusetts Open Meeting Law, notice is hereby given of a meeting of the Boylston Board of Selectmen. The Meeting will take place:

Monday, September 9th, 2024 6:30 P.M.
Boylston Town Hall
Board of Selectmen Chambers
221 Main Street, Boylston, MA

Topics to be discussed:

** Counsel will be present.*
** Agenda items without a specific time may be taken out of order.*

I) Approval of meeting minutes: 05/06/24, 05/20/24, 08/12/24, 08/26/24

II) Reports: Town Administrator, Chief of Police, Fire Chief and Highway Superintendent

III) Scheduled Items:

- CMRPC presentation on Hazard Mitigation
- Discussion and decision regarding the appointment of James Brown, Barton-Brown-Button American Legion Post 398 Commander, to the Memorial Day Committee
- Acknowledging volunteers in town who really stand out in their public service
- Consider STM in fall for Gough House Senior Center conversion
- Discussion on setting deadlines for submissions to Agendas
- Discuss sending a member to attend a CMMPO Information & Member Selection meeting to be held on September 19th

IV) Action Items:

- HEARING:
  - Vote to approve a change of hours for Central Street 119 Realty LLC, d/b/a Bay Path Barn for a New Years event on 12/31/2024 – 01/01/2025: 11AM to 1AM.
  - Vote to approve a change of hours for Central Street 119 Realty LLC, d/b/a Bay Path Barn to return to the normal business hours: 11 AM to 11PM on 01/02/2025.
  - Vote to approve a one-day serving beer/wine license to Keiths Music House for an event on Sunday, September 22nd, 2024. Timeframe TBD.
- Vote to appoint Kathy Lohnes to the Town House Committee
- Vote to approve and fully execute contract for the BES Roof Repair Project with R&H Roofing
- Review for Approval and Execution a Proposed "Other Post-Employment Benefits ("OPEB") Declaration of Trust and Agreement", as prepared by the Town Treasurer and in accordance with the vote under Article 30 at the 2024 Annual Town Meeting

V) Selectmen's Miscellaneous: (topics submitted by individual Board members)

VI) Future Agenda Items: (topics to be proposed for discussion at future meetings)

VII) Citizens' comments: *(Except in unforeseen or emergency circumstances, any matter presented for consideration of the Board by a member of the public shall neither be acted upon, nor a decision made the night of the presentation. A scheduled time on a future agenda may be necessary, at the Board's discretion.)*

Town of Boylston, Natural Hazard Mitigation Plan
Public Presentation: Sept 9th, 2024

What is hazard mitigation? What is a mitigation plan?

- Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of natural disasters.
- Mitigation is not disaster response; its goal is to reduce hazard impacts before a disaster occurs.
- A mitigation plan identifies natural hazards and the risks they pose to residents, infrastructure, property, and natural resources. It prioritizes projects, policies, education, and procedures for reducing these risks, now and in the future.
- Mitigation helps break the cycle of disaster damage, reconstruction, and repeated damage.

Why should Boylston complete and adopt this kind of plan?

- Natural hazard mitigation planning establishes a road map for achievable actions that can substantially reduce risks.
- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.
- This plan is primarily funded by a grant from FEMA through MEMA (with a local in-kind match).
- FEMA approved and Boylston's Select Board adopted the Town's last natural hazard mitigation plan in January 2018, and this plan expired in January 2023.

What natural hazards pose the greatest risks to Boylston?

- Largest risks: Severe Winter Storms, Severe Thunderstorms and Wind, Invasive Species
- Moderate risks: Flooding, Wildfires/Brushfires, Drought, Extreme Temperatures
- Lower risks: Hurricanes, Dam Failure, Tornadoes, Earthquakes

Local partners

Local knowledge is essential to the mitigation planning process. Partners in Boylston to date include:

- Paul Dell'Aquila, Town Administration, Town Planner
- April Steward, Town Administration, Town Administrator
- Stephen Mero, Highway Department, Superintendant
- Joe Flanagan, Fire Department, Fire Chief
- Joe McGrath, Conservation Commission, Commission Member
- Dennis Goguen, Council on Aging, Chairperson
- Teresa Prunier, Boylston Water Department, Commissioner
- Mark Barakian, Boylston Light Department, Manager
- Carol Costello, Boylston-Berlin Regional School District, Superintendant
- Paula Davidson, Department of Conservation and Recreation, Regional Engineer
- Bernadette DeBlander, Department of Conservation and Recreation, Regional Planner

Planning timeline

- Information gathering via mapping, research, and local input — November 2023 to date
- Draft plan development — March – September 2024

Public comments/questions requested within two weeks of the draft plan being posted on the town website

- Public presentation #1 — September 2024
- MEMA review — Fall 2024
- FEMA approval and local adoption — Winter 2024
- The next 5-year update — 2029

Recent/ongoing mitigation activities from the previous plan include:

- Maintain tree trimming program across the town to protect utility wires.
- Maintain vegetative debris program, trimming brush and growth away from roads and clearing growth impact flow away from stormwater infrastructure.
- Properly cleaning and maintaining all stormwater structures and basins
- Participation in the National Flood Insurance Program (NFIP)
- Road information coordination and planning for snow removal
- Continue regional training and drills for emergency response in case of disaster
- Continue SAFE & Senior SAFE program, educating students and the older population
- Develop and maintain means for sharing information on a regional basis about successful hazard mitigation planning and programs. Create a feedback loop to improve pre-disaster planning by establishing a formal post-disaster assessment process.
- Education and outreach
- Plans, regulations, and studies

Recommended high priority mitigation strategies in the DRAFT plan

A. Structure and Infrastructure Strategies

- Install Culvert on West Temple Street to prevent future washouts
- Perform a feasibility study for the relocation and construction of a fire, police, and senior community center facility. Utilize a climate resilient design for this facility.
- Develop the Municipal Building and/or the Gough house into a shelter location through retrofitting and upgrading shower facilities, ADA compliance, heating and cooling systems, and backup power generation

B. Preparedness, Coordination, and Response Strategies

- Participate in Evacuation Plan updates.
- Maintain fire access roads in isolated areas and improve coordination with DCR for Wildland Firefighting.
- Develop a management plan for Rocky Pond to remove invasive species and improve water quality.

C. Education and Awareness Strategies

- Provide information to residents and businesses on water conservation through low-impact landscaping and other measures (to conserve water for firefighting)

- Coordinate within the town/community partners (ie Garden Club, Tower Hill) to spread information about the use of chemical fertilizers and how they effect water quality

D. Local Plan and Regulation Strategies

- Monitor implementation of Hazard Mitigation Plan, Including an annual review of mitigation strategies implementation with the Hazard Mitigation Planning Team
- Create and Administer Town Wide Culvert plan to replace aging stormwater infrastructure with nature-based Solutions

---

The draft plan with the full list of mitigation strategies will be available shortly on Boylston's town website.

Comments and questions should be directed to Marc Granato (mgranato@cmrpc.org) at CMRPC within two weeks of the draft plan being posted on the town website.

This natural hazard mitigation planning activity is funded by an FY 2023 Hazard Mitigation grant from the Federal Emergency Management Agency through the Mass. Emergency Management Agency

TOWN OF BOYLSTON HAZARD MITIGATION PLAN

Boylston Select Board

September 9th, 2024

Marc Granato, Emergency Preparedness Planner

Will Talbot, Assistant Planner

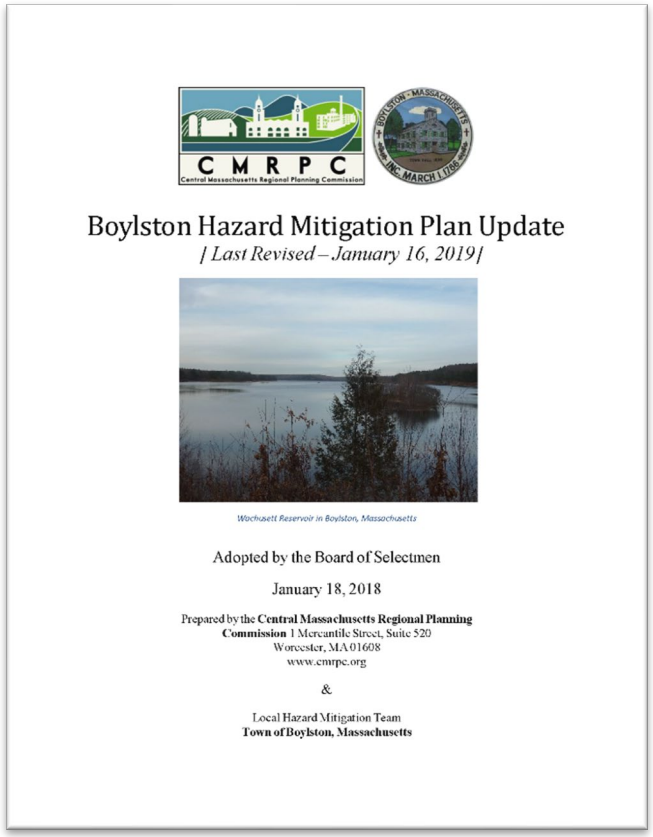
Andrew Loew, Director, Community Development & Resiliency Planning

Central Massachusetts Regional Planning Commission

WHY IS BOYLSTON COMPLETING THIS PLAN?

- The Federal Emergency Management Agency (FEMA) requires that cities and towns adopt and update a natural Hazard Mitigation Plan to be eligible for various FEMA pre-disaster and post-fire hazard mitigation grants.

- This plan will meet FEMA's requirements and help the town make good use of its resources.
- Boylston's last HMP update was adopted in January 2018 and expired in January 2023.



C M R P C
Central Massachusetts Regional Planning Commission

Boylston Hazard Mitigation Plan Update

[Last Revised – January 16, 2019]

Wachusett Reservoir in Boylston, Massachusetts

Adopted by the Board of Selectmen

January 18, 2018

Prepared by the **Central Massachusetts Regional Planning Commission** 1 Mercantile Street, Suite 520
Worcester, MA 01608
www.cmrpc.org

&

Local Hazard Mitigation Team
Town of Boylston, Massachusetts

PLAN FOR MITIGATING DAMAGES FROM NATURAL HAZARDS

- Flooding
- Severe Snowstorms / Ice Storms / Nor'easters
- Hurricanes
- Severe Thunderstorms / Wind / Tornadoes
- Wildfires / Brush Fires
- Earthquakes
- Dam Failure
- Drought
- Extreme Temperatures
- Invasive Species
- Other Hazards (Landslides, Changes in Groundwater)

Not an Emergency Response Plan

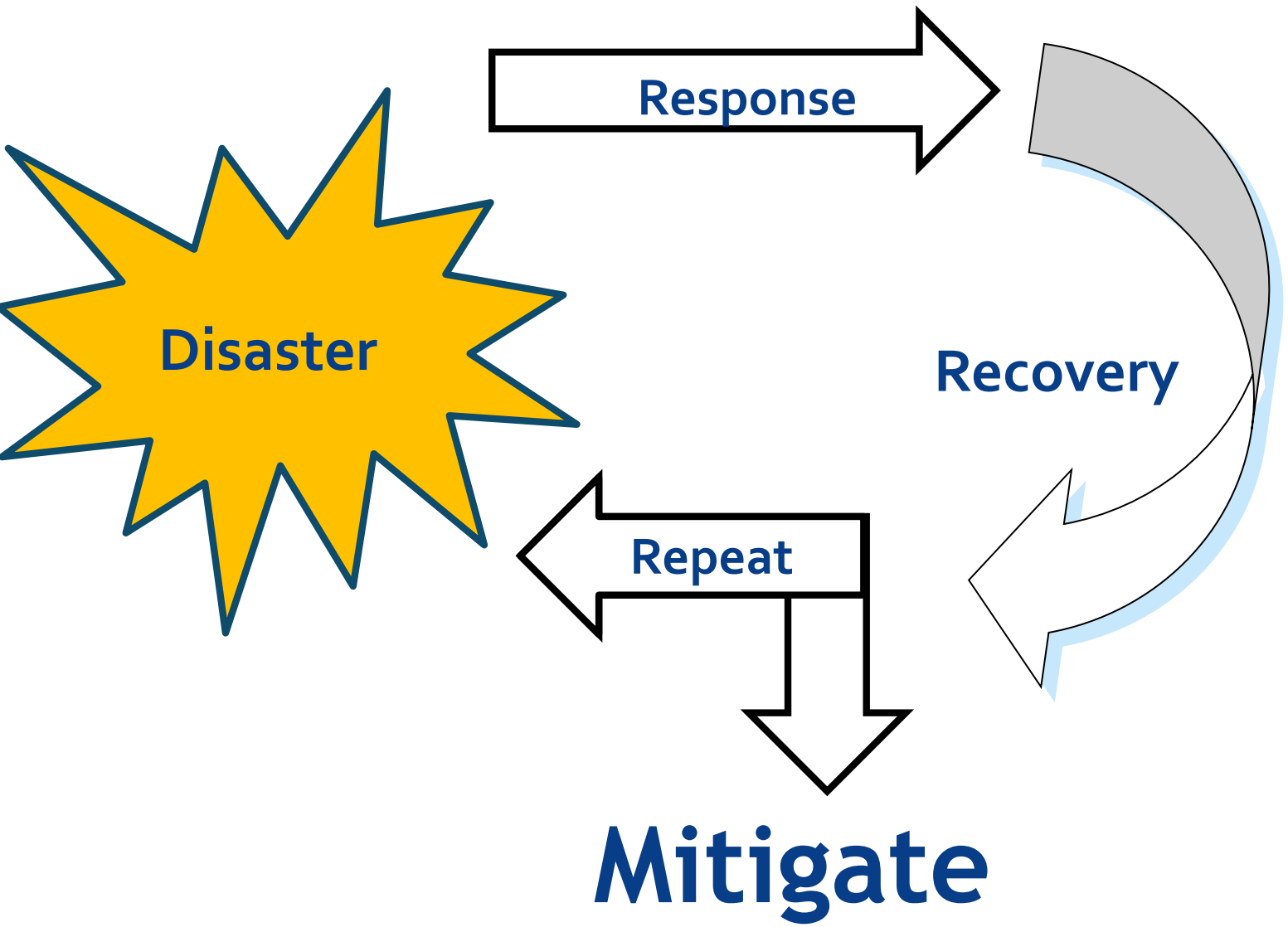
WHAT IS HAZARD MITIGATION?

- *To permanently reduce or prevent losses of life, injuries and property damage by using long-term strategies*
- *What preventive actions are being taken NOW to reduce future risks and damages?*
- *What additional actions can be taken in the FUTURE?*
- *According to the National Institute of Building Sciences Natural Hazard Mitigation Saves: 2019 Report, on average between 4 to 6 dollars is saved for every dollar spent on hazard mitigation*

THE BENEFITS OF MITIGATION

National Benefit-Cost Ratio (BCR) Per Peril *BCR numbers in this study have been rounded	Beyond Code Requirements	Federally Funded
Overall Hazard Benefit-Cost Ratio	**$4:1**	**$6:1**
Riverine Flood	$5:1	$7:1
Hurricane Surge	$7:1	Too few grants
Wind	$5:1	$5:1
Earthquake	$4:1	$3:1
Wildland-Urban Interface Fire	$4:1	$3:1

Breaking the Cycle of Risk



Four Tools & Techniques for Hazard Mitigation

1. Structure & Infrastructure Projects
2. Preparedness, Coordination & Response Actions
3. Education & Awareness Programs
4. Local Plans & Regulations

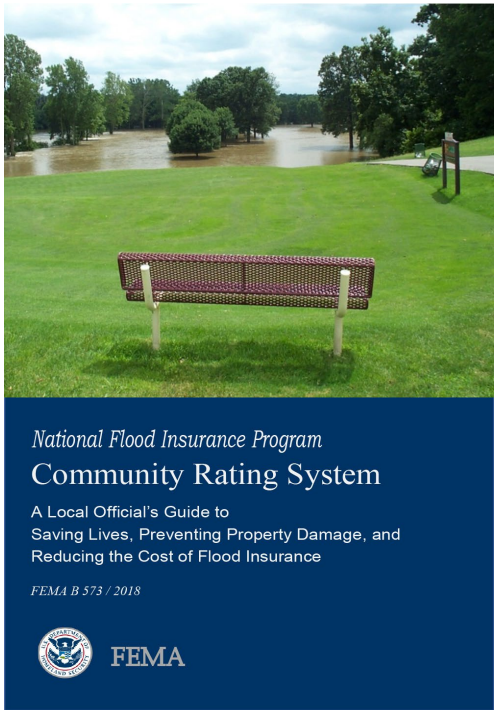
STRUCTURE AND INFRASTRUCTURE PROJECTS

- Culverts, dams, storm drainage facilities, pumping facilities
- Retrofits to existing Infrastructure and facilities to improve resilience
- Acquisition and Relocation of hazard prone properties



PREPAREDNESS AND RESPONSE

- National Flood Insurance Program
- Evacuation Planning
- Community Rating System
- Facilitate and coordinate the administration, enforcement and collaboration



EDUCATION AND AWARENESS

- Natural hazard awareness websites
- Hazard information at libraries, schools, and public buildings
- Information brochures mailed to residents (e.g., safe operation of home generators)
- Public outreach at community events



LOCAL PLANS & REGULATIONS

- Planning & Zoning
- Subdivision and Site Plans
- Floodplain regulations
- Wetlands bylaws
- Storm water regulations
- Building Code
- Master Plans
- MVP Plans



PLANNING PROCESS

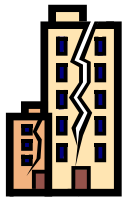
- CMRPC provides technical assistance to the Town for plan development
- The Town coordinates through its Local Hazard Mitigation Team
- Public Survey
- Public presentation (tonight), during plan development and review of the draft plan
- Submittal of Draft Plan to MEMA and FEMA for review, revision, and approval
- Plan adoption by the Select Board

DEVELOPMENT OF THE PLAN

CMRPC assisted the Boylston Local Hazard Mitigation Planning Team to:

- Identify & Map Critical Facilities
- Identify & Map Locally Identified Hazard Areas
- Identify & Review Existing Mitigation Measures
- Identify and Prioritize New Mitigation Strategies
- Gather Feedback & Input from the Public



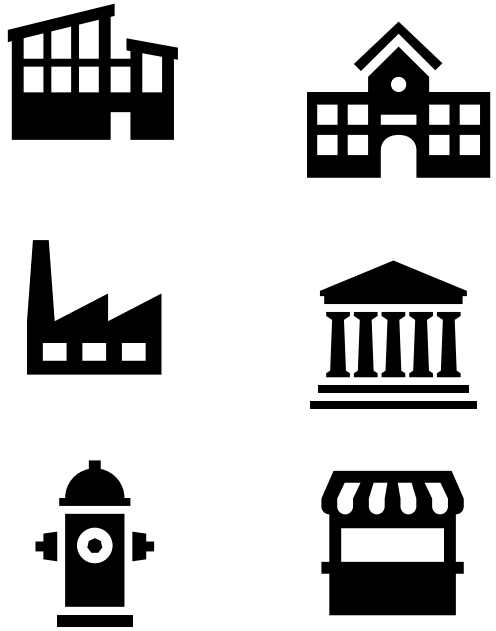



IDENTIFY CRITICAL FACILITIES

Database & GIS maps of critical facilities, infrastructure

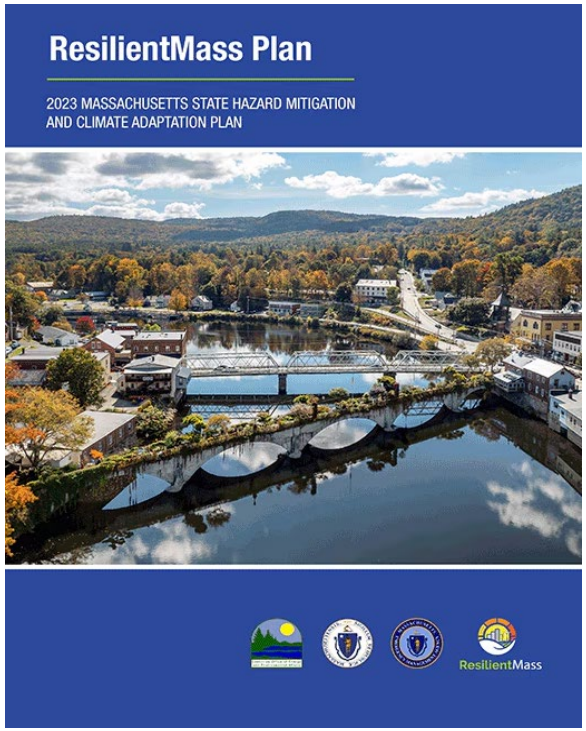
Sites identified include:

- Emergency Response Facilities
- Water Supply and Sewer Facilities, Town Facilities, and Utilities
- Dams
- Facilities and populations to protect



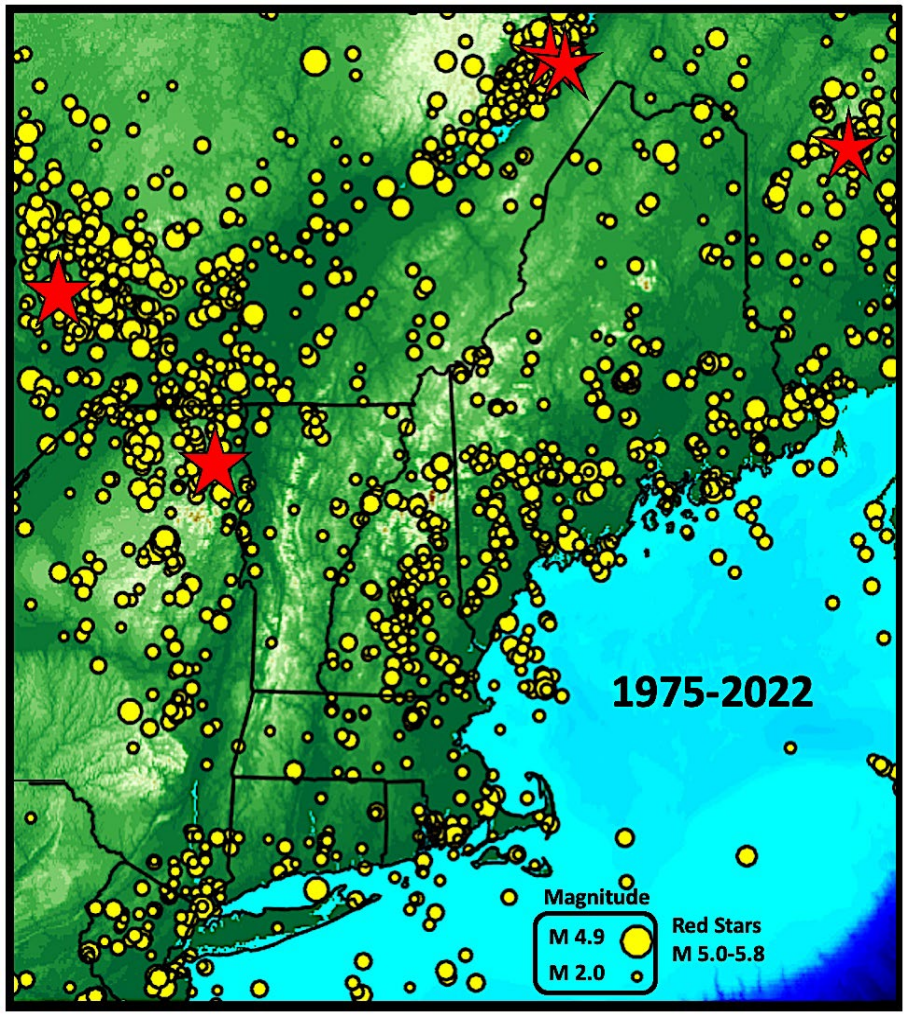
HAZARD IDENTIFICATION & MAPPING

- State & Federal data on floodplains, snowfall, wind speeds, hurricanes, earthquake risk, etc.
- Review Mass. State Hazard Mitigation Plan
- Coordinate with Local Team to get local information on hazard areas and potential future developments



OTHER HAZARDS – GEOLOGIC, WIND, & SNOW

Earthquakes from 1975 to 2022 2+ Magnitude



Recent Declared Hurricanes & Snow Disasters

Disaster	Declaration Date	Incident Period	FEMA ID
Hurricane Lee	09/15/23	09/15/23 - 09/17/23	EM-3599-MA
Mashpee Wampanoag Tribe Tropical Storm Henri	08/22/21	8/20/21 -	3566-EM-Mashpee Wampanoag Tribe

Disaster	Declaration Date	Incident Period	FEMA ID
Massachusetts Severe Winter Storm and Snowstorm	04/18/22	01/28/22 - 01/29/22	DR-4651-MA
Massachusetts Severe Winter Storm and Snowstorm	07/19/18	03/13/18 - 03/14/18	DR-4379-MA

SELECT LOCALLY-IDENTIFIED HAZARD AREAS

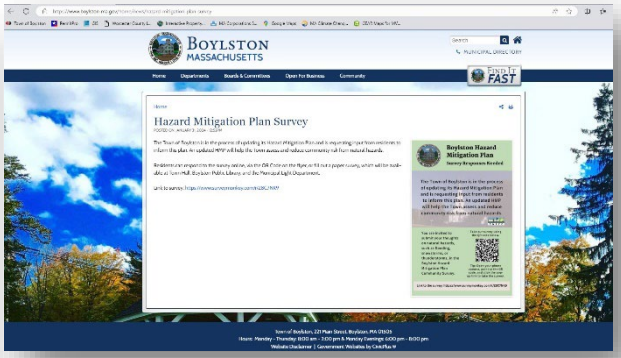
- Flooding
  - Longly Hill Subdivision
  - Central Street
  - West Temple Street
  - Beaver Dams
- Severe Snow / Ice
  - Boylston Elementary School and Tahanto Middle School
- Severe Thunderstorms
  - West Temple Street
  - Paul Tivnan Drive
  - The Wachusett Reservoir
- Wildfire
  - DCR Land
- Invasive Species
  - Rocky Pond
  - Wachusett Reservoir

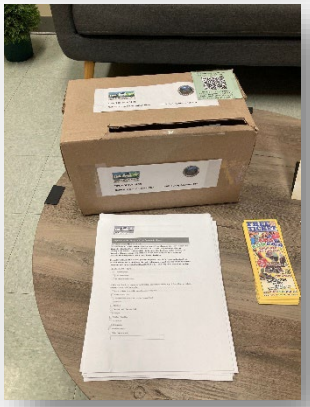




PUBLIC SURVEY – Winter and Spring 2024









- 62 total responses
- Hazards of greatest concern: Winter storms / ice, thunderstorms / microbursts / extreme wind, flooding
- The survey was promoted through the town website, the town and fire department Facebook pages, Survey flyers and paper copies were also posted at several high traffic locations in town.

EXISTING MITIGATION MEASURES

MULITIHAZARD

- Comprehensive Emergency Management Plan (CEMP)
- Education and outreach
- Hazard warning systems and notifications
- Plans, regulations, and studies

FLOOD RELATED HAZARDS

- National Flood Insurance Program
- Street sweeping
- Catch basin cleaning
- Stormwater Management policy and regulations in place
- Drainage preventive practices to reduce clogging
- Subdivision Rules and Regulations
- Zoning Regulations

DAM FAILURES

- State permits for dam construction
- DCR dam safety regulations
- Code Red System

WIND-RELATED HAZARDS

- Tree trimming program

WINTER-RELATED HAZARDS

- Salting and sanding of roads and plowing

BRUSH FIRE RELATED HAZARDS

- Permits for outdoor burning

BOYLSTON MITIGATION STRATEGIES



- Where are the GAPS?
- What actions will further reduce vulnerability?
- Where are the PRIORITIES?

DRAFT PLAN SELECT HIGH PRIORITY MITIGATION MEASURES

- Address snow load issue on Boylston Elementary school, leaks every time after big rainfall or snowfall.

- Look into increasing municipal resilience by creating municipally owned power generation through green energy, potentially through public-private partnerships with warehouse developers

- Install Culvert on West Temple Street to prevent future washouts.

- Develop the Municipal Building and/or the Gough house into a shelter location through retrofitting and upgrading shower facilities, ADA compliance, heating and cooling systems, and backup power generation

PLAN APPROVAL AND ADOPTION

- The Draft plan will be reviewed by MEMA.
- FEMA will review the plan and is the agency that issues conditional approval.
- A Select Board resolution to adopt the plan can occur after FEMA conditional approval.
- FEMA issues final plan approval.
- The plan will be in effect for 5 years.



IMPLEMENTING THE PLAN
WHAT HAPPENS AFTER THE PLAN IS APPROVED?

- Establish a local implementation group.
- Prepare a timeline for implementation.
- Integrate the plan's recommendations with other local plans and policies.
- Seek FEMA and other funding sources and other resolutions for plan mitigation measures.
- Meet at least yearly to review progress of plan implementation.
- Update the plan every 5 years.

DRAFT PLAN

The full draft plan will be available on the Boylston town website.

Please send any comments on or questions about the plan to mgranato@cmrpc.org within two weeks of the draft plan being posted on the town website.

APPENDIX E:

Public Comment

Period Outreach

Materials

Appendix E helps meet the following FEMA local mitigation plan requirements:

- *A1. "Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction?" (Requirement 44 CFR § 201.6(c)(1))*
- *A2. "Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process?" (Requirement 44 CFR § 201.6(b)(2)); and*
- *A3. "Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval?" (Requirement 44 CFR § 201.6(b)(1))*

From: Constant Contact
To: Marc Granato
Subject: Congrats, your email results are in!
Date: Wednesday, September 25, 2024 2:20:41 PM

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Constant Contact

Log in

Your email results are in!

Based on your email's first 48 hours, here's a quick snapshot of your campaign Boylston HMP Community Lifelines Public Comment Email 2024/09/23:

Open Rate

36.4%

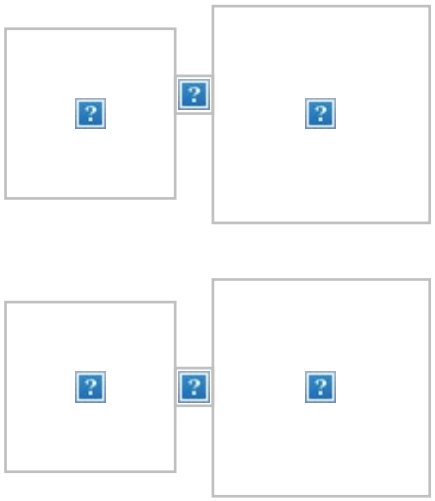
Click Rate

9.1%

View results

Download the app and work anywhere, anytime.

- Design, review and send emails
- Simplify contact management
- Review real-time campaign performance



Want to give your last campaign a boost?

Just use the Resend to Non-openers feature (or RSNO). Try re-sending it to subscribers who didn't originally open - getting more opens, more clicks, and more business.

Ready to try it out? Just find your campaign that was sent within the last 7 days, click the three dots next to it and choose "resend."

Try it out



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Constant Contact User Name: mgranato@cmrpc.org
SXT-1305

From: Paul Dell"Aquila
To: Marc Granato
Subject: FW: Contact us
Date: Friday, September 20, 2024 1:40:47 PM

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From: noreply@revize.com <noreply@revize.com>
Sent: Wednesday, September 18, 2024 5:42 PM
To: Paul Dell'Aquila <pdellaquila@boylston-ma.gov>
Cc: noreply@revize.com
Subject: Contact us

text-1707388719611 = Suzan Boucher
text-1707388742963 = boucher.suzan@gmail.com
text-1707388751531 = Boylston Hazardous Mitigation Plan
textarea-1707388769107 = I support the inclusion of Rocky Pond in the Boylston Hazardous Mitigation Plan. Preserving natural assets like Rocky Pond is essential for maintaining environmental balance and the community's safety and resilience.
Client IP = 74.75.182.167

From: Paul Dell"Aquila
To: Marc Granato
Subject: FW: Contact us
Date: Friday, September 20, 2024 1:40:36 PM

CAUTION: This email originated from **outside of the organization**. DO NOT click links or open attachments unless you recognize the sender and know the content is safe. Thanks.

I think there may have been some coordination with this batch of comments!

From: noreply@revize.com <noreply@revize.com>
Sent: Wednesday, September 18, 2024 5:08 PM
To: Paul Dell'Aquila <pdellaquila@boylston-ma.gov>
Cc: noreply@revize.com
Subject: Contact us

text-1707388719611 = Arthur E Boucher III
text-1707388742963 = ajsboucher@gmail.com
text-1707388751531 = Rocky Pond
textarea-1707388769107 = Paul,Thank you for including us in the Boylston Hazard Mitigation Plan. We recently met with the Boylston Conservation Commission to discuss the pressing issue affecting Rocky Pond—particularly the growing weed problem, including invasive species such as fanwort and milfoil. These weeds are choking the ecosystem and reducing areas where fish can reproduce, which is a concern for both the health of the pond and our enjoyment of it.We understand that reaching our goal of restoring Rocky Pond will be a challenging task, but we greatly appreciate the town's efforts to include this issue in the Hazard Mitigation Plan.Best regards,Arthur Boucher
Client IP = 74.75.182.167

From: Paul Dell"Aquila
To: Marc Granato
Subject: FW: Contact us
Date: Friday, September 20, 2024 1:39:54 PM

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From: noreply@revize.com <noreply@revize.com>
Sent: Wednesday, September 18, 2024 3:32 PM
To: Paul Dell'Aquila <pdellaquila@boylston-ma.gov>
Cc: noreply@revize.com
Subject: Contact us

text-1707388719611 = Ari Lindner
text-1707388742963 = ari.j.lindner@gmail.com
text-1707388751531 = Hazard Mitigation Plan - support for Rocky Pond remediation
textarea-1707388769107 = Hello Paul - We are new Boylston residents - we bought our house October of 2023. We can already see the growing impact of invasive aquatic plants in Rocky Pond and we know the problem will only get worse with time. We are fully supportive of the proposed remediation efforts.Thanks very much.Ari Lindner
Client IP = 71.174.216.75

From: Paul Dell"Aquila
To: Marc Granato
Subject: FW: Contact us
Date: Friday, September 20, 2024 1:39:37 PM

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From: noreply@revize.com <noreply@revize.com>
Sent: Wednesday, September 18, 2024 2:53 PM
To: Paul Dell'Aquila <pdellaquila@boylston-ma.gov>
Cc: noreply@revize.com
Subject: Contact us

text-1707388719611 = Angela Bartlett
text-1707388742963 = brunsonbartlett@gmail.com
text-1707388751531 = Hazard Mitigation Plan
textarea-1707388769107 = My goodness! What a tremendous amount of work that went into gathering the data and developing the action plan. Thank you and the team for all the hard work. I'd really like to encourage the removal of invasive species in Rocky Pond, not only to maintain the health of the pond for native species but also to maintain the pond as a repository for storm water run off.
Client IP = 72.93.234.20

From: Paul Dell"Aquila
To: Marc Granato
Subject: FW: Contact us
Date: Wednesday, September 25, 2024 10:26:33 AM

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FYI.

From: noreply@revize.com <noreply@revize.com>
Sent: Saturday, September 21, 2024 10:11 AM
To: Paul Dell'Aquila <pdellaquila@boylston-ma.gov>
Cc: noreply@revize.com
Subject: Contact us

text-1707388719611 = Matt McCue
text-1707388742963 = mccue.matt@gmail.com
text-1707388751531 = Rocky Pond: Invasive Weed Mitigation
textarea-1707388769107 = Hello Paul, as a resident of Rocky Pond, I am very much in favor of an invasive weed mitigation/removal process. Please let me know if you need more information. I know that we (as residents) are working on getting an analysis performed.
Client IP = 108.49.44.229

From: Teresa Prunier
To: Marc Granato
Subject: Misspelling
Date: Monday, September 23, 2024 4:53:31 PM

[You don't often get email from taprunier@yahoo.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

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Sent from my iPhone
Page 20…..
Location of well listed as Sky Rd
Should be Scar Hill rd
Please confirm correction!
Thanks Teresa BWD

From: angela bartlett
To: Matt McCue
Cc: Marc Granato | CMRPC; Paul Dell"Aquila; Trish Settles | CMRPC; Greer Jarvis | CMRPC; Andrew Loew | CMRPC
Subject: Re: Rocky Pond Invasives
Date: Thursday, October 10, 2024 2:32:45 PM
Attachments: image001.png
Rocky.Pond_2024.Memo_Map.pdf

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CAUTION: This email originated from **outside of the organization**. DO NOT click links or open attachments unless you recognize the sender and know the content is safe. Thanks.

Good afternoon,

Attached please find the weed survey and proposed treatment plan for Rocky Pond. I've reached out to Matt Ladewig at TRC to get an estimate for permitting.

Please let me know if you have any thoughts on next steps or guidance on the process.

Regards,

Angela Bartlett

On Wed, Oct 2, 2024 at 12:03 PM Matt McCue <mccue.matt@gmail.com> wrote:

> Hi Marc,
>
> I've added Angela Bartlett to this email. I'm adding the wealth of information (below) that she provided to me. She's another resident of Rocky Pond:
>
> We sent photos of the pond and weeds to Kara Sliwoski from the Massachusetts DCR Lakes and Ponds program. She identified the weeds as fanwort and milfoil. I've attached the education materials she sent us along with the Massachusetts DCR Response Plan for Fanwort. She shared with us that both species spread by fragmentation. Essentially, if you cut it, it can multiply. She said fanwort is the most prolific and the weed we need to prioritize removing. There are two methods of removal; DASH: diver assisted suction harvesting and EPA approved herbicide. DASH would remove the plant in its entirety by the root. The herbicide would kill the plant at the root.
>
> She said based on the photos, DASH won't be effective due to the proliferation of the plants throughout the pond. She wasn't the only one to discourage me from that. Another company I spoke to quoted DASH to be $2,500-3,000 per day for, I think it was one acre? Rocky Pond is approximately 70 acres. DASH might be effective as a maintenance solution. Small areas of new outcrops could be controlled.
>
> Kara recommended an herbicide called Floridone which is available in a product called Sonar. Sonar is EPA approved and doesn't have any swimming, drinking or fishing restrictions. Depending on the application density, there may be restrictions with irrigation of plants. We spoke to Mr. Tougas, who pulls water from the pond for irrigation. He knew about Sonar as he worked with the Northborough Conservation Committee for many years and they treated Bartlett Pond with it (I believe they still do). The Davidians also pull water from the pond for irrigation.

Kara told us that any significant harvesting (not shoreline raking, which many of us do now) or herbicide treatment would need to be permitted by the Boylston Conservation Committee. She said that even though the lake may be owned by the state, which we believe it is, the town Conservation Committee is responsible for protecting the waterways. She sent us a list of DCR approved vendors to contact to navigate the permitting process and the treatment. She also shared that even if this works, we shouldn't become complacent. There needs to be diligence to ensure weeds aren't returning and public education.

Several of us met with the Conservation Committee. Joe McCarthy, who is the lead on the committee, said that they would be willing to work with us but the committee would maintain their role to ensure that protections were in place and that the DEP regulations were met, which is certainly fair.

I spoke with Joe Onorato from Water and Wetland, an approved vendor on the DCR list. He shared a lot of the same information that Kara did. He said any Conservation Commission permit would need to begin with a Weed Survey. We've paid for that and are waiting on the report. I would assume you (Marc) will want a copy when we receive it. Joe said based on the size of the pond and the herbicide application cycle, the cost would be around $60,000-$70,000. There are three treatments; initial dose in April, then one in May and another at the end of May. The herbicide application would need to be repeated in three years but should be less expensive with fewer weeds. Our Order of Conditions, part of the permit, would need to be renewed every three years. Joe told me it's important to not let that expire.

My next step is to reach out to TRC Environmental to discuss permitting. They are an approved DCR vendor and Water and Wetland recommended them. Several of us discussed trying to navigate the permitting process ourselves. Brian and I did it for our build at #9 but I am concerned the Conservation folks will ask questions about application of floridone and part per million distributions that I don't know the answers to. We may be able to do the notification of abutters, place the ad in the paper, and of course attend all the meetings but I feel we need some scientific experts to answer the tough questions.

There are many surrounding towns who have successfully navigated this. I spoke to the Lake Maspenock Association representative in Hopkinton and she told me we are following all the right steps. She offered to share resource information and the scientific study they completed. If Marc is interested, I can get that information. She offered that even the naysayers have agreed that their efforts have worked.

On Wed, Sep 25, 2024 at 11:16 AM Marc Granato <mgranato@cmrpc.org> wrote:

> Matt,
>
> Good Morning, I am the lead planner for the Boylston Hazard Mitigation Plan. Thank you for reaching out about our strategy around Rocky Pond, we would love to have more information about the pond to incorporate into the plan so we can support your efforts around analysis and removal of invasive weeds within the pond. Whatever you would like to send please by all means send it over.
>
> Respectfully,

Marc Granato



Marc Granato

Emergency Preparedness Planner

(He/Him)

Central Massachusetts Regional Planning Commission

P: (508) 459-3374

mgranato@cmrpc.org

www.cmrpc.org

--
Matt

From:	Matt McCue
To:	Marc Granato | CMRPC
Cc:	Paul Dell"Aquila; Trish Settles | CMRPC; Greer Jarvis | CMRPC; Andrew Loew | CMRPC; brunsonbartlett@gmail.com
Subject:	Re: Rocky Pond Invasives
Date:	Wednesday, October 2, 2024 12:04:09 PM
Attachments:	image001.png fanwort_ma_rrp.pdf dcrinvasiveaquaticspeciesguide.pdf rocky_pond.pdf

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Hi Marc,

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>
> Respectfully,
>
> Marc Granato
>
> CENTRAL MASSACHUSETTS
> Regional Planning Commission
>
> **Marc Granato**
>
> Emergency Preparedness Planner
>
> (He/Him)
>
> Central Massachusetts Regional Planning Commission

P: (508) 459-3374

mgranato@cmrpc.org

www.cmrpc.org

--
Matt

From: angela bartlett
To: Paul Dell"Aquila
Cc: Marc Granato | CMRPC; Trish Settles | CMRPC; Greer Jarvis | CMRPC; Andrew Loew | CMRPC; Matt McCue
Subject: Re: Rocky Pond Invasives
Date: Wednesday, October 23, 2024 1:12:59 PM
Attachments: image001.png

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Good afternoon,

I have received the quote from TRC to assist us with the permitting process for the Rocky Pond weeds. It's expensive. They are estimating the cost would be $7,500 and suggested budgeting a contingency fund of approximately $2,500 to cover the cost of any third party consultants that the Conservation Commission may require to peer review a treatment plan.

Do you think we may be able to find some funding to help us to cover this expense?

Also, I found this resource for a grant opportunity. Paul, thoughts on trying to apply?

https://www.fws.gov/story/rapid-response-fund-aquatic-invasive-species
https://grants.gov/search-results-detail/351110

Thanks,

Angela Bartlett

On Thu, Oct 10, 2024 at 2:32 PM angela bartlett <brunsonbartlett@gmail.com> wrote:

> Good afternoon,
>
> Attached please find the weed survey and proposed treatment plan for Rocky Pond. I've reached out to Matt Ladewig at TRC to get an estimate for permitting.
>
> Please let me know if you have any thoughts on next steps or guidance on the process.
>
> Regards,
>
> Angela Bartlett
>
> On Wed, Oct 2, 2024 at 12:03 PM Matt McCue <mccue.matt@gmail.com> wrote:
>
> > Hi Marc,
> >
> > I've added Angela Bartlett to this email. I'm adding the wealth of information (below) that she provided to me. She's another resident of Rocky Pond:
> >
> > We sent photos of the pond and weeds to Kara Sliwoski from the Massachusetts DCR

Lakes and Ponds program. She identified the weeds as fanwort and milfoil. I've attached the education materials she sent us along with the Massachusetts DCR Response Plan for Fanwort. She shared with us that both species spread by fragmentation. Essentially, if you cut it, it can multiply. She said fanwort is the most prolific and the weed we need to prioritize removing. There are two methods of removal; DASH: diver assisted suction harvesting and EPA approved herbicide. DASH would remove the plant in its entirety by the root. The herbicide would kill the plant at the root.

She said based on the photos, DASH won't be effective due to the proliferation of the plants throughout the pond. She wasn't the only one to discourage me from that. Another company I spoke to quoted DASH to be $2,500-3,000 per day for, I think it was one acre? Rocky Pond is approximately 70 acres. DASH might be effective as a maintenance solution. Small areas of new outcrops could be controlled.

Kara recommended an herbicide called Floridone which is available in a product called Sonar. Sonar is EPA approved and doesn't have any swimming, drinking or fishing restrictions. Depending on the application density, there may be restrictions with irrigation of plants. We spoke to Mr. Tougas, who pulls water from the pond for irrigation. He knew about Sonar as he worked with the Northborough Conservation Committee for many years and they treated Bartlett Pond with it (I believe they still do). The Davidians also pull water from the pond for irrigation.

Kara told us that any significant harvesting (not shoreline raking, which many of us do now) or herbicide treatment would need to be permitted by the Boylston Conservation Committee. She said that even though the lake may be owned by the state, which we believe it is, the town Conservation Committee is responsible for protecting the waterways. She sent us a list of DCR approved vendors to contact to navigate the permitting process and the treatment. She also shared that even if this works, we shouldn't become complacent. There needs to be diligence to ensure weeds aren't returning and public education.

Several of us met with the Conservation Committee. Joe McCarthy, who is the lead on the committee, said that they would be willing to work with us but the committee would maintain their role to ensure that protections were in place and that the DEP regulations were met, which is certainly fair.

I spoke with Joe Onorato from Water and Wetland, an approved vendor on the DCR list. He shared a lot of the same information that Kara did. He said any Conservation Commission permit would need to begin with a Weed Survey. We've paid for that and are waiting on the report. I would assume you (Marc) will want a copy when we receive it. Joe said based on the size of the pond and the herbicide application cycle, the cost would be around $60,000-$70,000. There are three treatments; initial dose in April, then one in May and another at the end of May. The herbicide application would need to be repeated in three years but should be less expensive with fewer weeds. Our Order of Conditions, part of the permit, would need to be renewed every three years. Joe told me it's important to not let that expire.

My next step is to reach out to TRC Environmental to discuss permitting. They are an approved DCR vendor and Water and Wetland recommended them. Several of us discussed trying to navigate the permitting process ourselves. Brian and I did it for our build at #9 but I am concerned the Conservation folks will ask questions about application of floridone and

part per million distributions that I don't know the answers to. We may be able to do the notification of abutters, place the ad in the paper, and of course attend all the meetings but I feel we need some scientific experts to answer the tough questions.

There are many surrounding towns who have successfully navigated this. I spoke to the Lake Maspenock Association representative in Hopkinton and she told me we are following all the right steps. She offered to share resource information and the scientific study they completed. If Marc is interested, I can get that information. She offered that even the naysayers have agreed that their efforts have worked.

On Wed, Sep 25, 2024 at 11:16 AM Marc Granato <mgranato@cmrpc.org> wrote:

> Matt,
>
> Good Morning, I am the lead planner for the Boylston Hazard Mitigation Plan. Thank you for reaching out about our strategy around Rocky Pond, we would love to have more information about the pond to incorporate into the plan so we can support your efforts around analysis and removal of invasive weeds within the pond. Whatever you would like to send please by all means send it over.
>
> Respectfully,
>
> Marc Granato
>
> CENTRAL MASSACHUSETTS
> Regional Planning Commission
>
> **Marc Granato**
>
> Emergency Preparedness Planner
>
> (He/Him)
>
> Central Massachusetts Regional Planning Commission
>
> P: (508) 459-3374
>
> mgranato@cmrpc.org
>
> www.cmrpc.org

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Matt

APPENDIX
F: Glossary

APPENDIX F

GLOSSARY OF TERMS

As used in this plan, these terms are defined as follows:

Blizzard – Issued for sustained or frequent gusts to 35 mph or more for an hour or greater and considerable falling and/or blowing snow. These conditions frequently occur alongside reduced to or below one-quarter mile. These conditions must be the predominant condition over a 3-hour period.

Blizzard warning - Sustained winds or frequent gusts of 35 mph or higher, occurring in combination with considerable falling and/or blowing snow. When proclaimed, these conditions are expected to prevail for a period of at least three (3) hours. Visibilities will frequently be reduced to less than one-quarter mile.

Blowing snow - Wind driven snow that reduces visibility to six (6) miles or less causing significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground picked up by the wind.

Community Lifelines - The most fundamental services in the community that, when stabilized, enable all other aspects of society to function (definition from FEMA)

Conflagration - A large destructive fire; which attains such intensity that it creates and sustains its own wind system. It is most commonly a natural phenomenon, created during some of the largest bushfires, forest fires, and wildfires.

Drifting snow - Uneven distribution of snowfall caused by strong surface winds. Drifting snow is usually associated with blowing snow.

Flurries – Intermittent light snow with no measurable accumulation; a light dusting is all that is expected.

Exposure - The people, property, systems, or functions that could be lost to a hazard. Generally, exposure includes what lies in the area that the hazard could affect.

Freeze - Occurs when the surface air temperature is 32 degrees Fahrenheit or below over a widespread area for a climatologically significant period of time. The term “freeze” is usually restrictive to advective situations or occasions when wind or other conditions prevent frost.

Freezing rain or drizzle – Rain that falls as a liquid but freezes into an icy glaze when it hits the ground or other surfaces such as trees, cars, and roads=.

Frost - The formation of thin ice crystals on the ground or other surfaces in the form of scales, needles, feathers, or fans. Frost develops when the temperature of the earth's surface falls below 32 degrees Fahrenheit, but because frost is primarily an event that occurs as the result of radiation cooling, it frequently occurs with air temperatures in the middle 30s.

Graupel - Small pellets of ice created when super-cooled water droplets coat or rime, a snowflake. The pellets are cloudy or white, not clear like sleet, and are often mistaken for hail. Same as snow pellets or small hail.

Gustnado - A whirlwind of dust or debris at or near the ground with no condensation funnel. Typically forms as an eddy in thunderstorm outflows.

Hail - A form of showery precipitation in the form of irregular pellets or balls of thin ice that occur when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Heavy snow - This definition depends on the region of the USA. In Massachusetts, heavy snow means that six (6) or more inches of snow have fallen in 12 hours, or eight (8) inches in 24 hours. Heavy snow is also observed when snow is falling at a rate of one (1) inch per hour.

Heavy Snow Warning - Snow accumulations are expected to approach or exceed six (6) inches in 12 hours or eight (8) inches or more in 24 hours but will not be accompanied by significant wind. During a heavy snow warning, freezing rain and sleet are not expected.

Hurricane - An intense tropical cyclone in the Atlantic, Caribbean Sea, Gulf of Mexico, or eastern Pacific, which the maximum 1-minute sustained surface wind is 74 mph or greater.

Ice Storm - An ice storm is used to describe occasions when damaging accumulation of ice are expected during freezing rain situations. Significant accumulations of ice are recognized to pull down trees and utility lines, resulting in power loss; they are defined as one-quarter inch or greater.

Ice Storm Warning – Predicted significant coating of freezing rain; one-quarter inch or more is expected to accumulate in an area.

Invasive Species - A species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (definition from the Invasive Species Advisory Committee of the U.S. Department of the Interior).

Mitigation - The process of reducing the severity of the impact of natural hazards through planning. Each hazard requires a specific type of mitigation. In some cases, we can use engineering solutions (such as an earthquake-resistant building) to at least temporarily reduce the impact of a natural hazard. In other cases, the only form of mitigation that is guaranteed to be successful is to limit or not allow human activities where the hazard occurs (such as in floodplains).

Natural Disaster - A hazard event caused by nature or the natural process of the earth, such as a flood or tornado. Natural disasters result in widespread destruction or death to the lives of individuals, damaging their property, causing economic loss and/or the inability for a population to rebuild.

Natural Hazard - An act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.

Risk - Depends on all three factors: hazard, vulnerability, and exposure. Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. It refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.

Sleet – Pellets of ice composed of frozen or mostly frozen rain drops or refrozen partially melted snowflakes. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorists. Heavy sleet occurs when a half of an inch of sleet accumulates

Snow Showers - Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

Snow Squalls - Intense, but of limited duration, periods of moderate to heavy snowfall, accompanied by strong, gusty surface winds and possible lightning.

Storm Surge – An abnormal rise in sea level, accompanying a hurricane or other intense storm, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic tide from the observed storm tide. Storm surges can reach 25' high and 50-100 miles wide. This can cause severe erosion, major flooding and extensive damage to coastal areas.

Sustained Wind - Two-minute average wind measured at about 33' above the surface. BB.

Technological Disaster - A disaster that results from a technological or man-made hazard event.

Technological Hazard - A hazard that originates in accidental or intentional human activity (oil spill, chemical spill, building fires, terrorism, etc.)

Tropical Depression - A tropical cyclone in which the maximum 1-minute sustained surface wind is 38 mph or less.

Tropical Storm - A tropical cyclone in which the maximum 1-minute sustained surface wind ranges from 39-73 mph.

Vulnerability - Susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset's construction, contents, and economic value of its functions. Vulnerability assessment provides the extent of injury and damages that may result from a hazard event of a given intensity in a given area.

Wind Chill Warning - Life-threatening wind chills reaching minus 50 degrees Fahrenheit or lower. Criteria varies by state.

Watch (Storm) - A watch is used when the risk of a hazardous weather event has increased significantly, but the occurrence, location and timing are still uncertain.

Warning/Advisory (Storm) - These products are issued when a hazardous weather event is occurring, is imminent, or has a very high probability of occurrence. A warning is used for conditions posing a threat to life or property. Advisories are for less serious conditions that cause significant inconvenience and, if caution is not exercised, could lead to situations that may threaten life and property.

Whiteout - A condition caused by falling and/or blowing snow that reduces visibility to nothing or zero miles; typically, only a few feet. Whiteouts can rapidly occur, blinding motorists and creating chain-reaction crashes involving multiple vehicles. Whiteouts are most frequent during blizzards.

Wind Chill - The wind chill is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. This temperature is the reading the body "feels" given the combination of wind and air temperature. At wind speeds of four (4) mph or less, the wind chill temperature is the same as the actual air temperature. The threshold for potentially dangerous wind chill conditions is about negative 20 degrees Fahrenheit.