TOWN OF MILTON

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

Community Resilience Building Workshop
DRAFT Summary of Findings Report
March 2020

Prepared for the Town of Milton, MA, by Environmental Partners Group, Inc. and Kim Lundgren Associates, Inc. with a grant from the Massachusetts Executive Office of Energy & Environmental Affairs

ENVIRONMENTAL PARTNERS

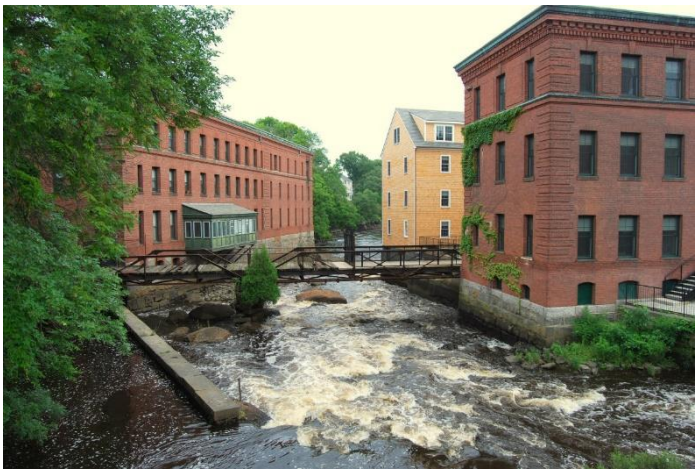
KLA KIM LUNDGREN ASSOCIATES, INC.

Table of Contents

Cover image: Evening in East Milton Square. Moving cars traverse Adams Street. Abby Park restaurant is visible in the foreground.

Town of Milton
Community Resilience Building Workshops
Summary of Findings

I. OVERVIEW



Neponset River at the Baker Chocolate Dam

Driven by the desire to assess its vulnerabilities, build community resilience, and expand its potential to address hazards caused by climate change, the Town of Milton chose to pursue certification from the Massachusetts Municipal Vulnerability Preparedness (MVP) program. In the fall of 2019, the Town received funds to start a town-wide conversation about climate change and its effects on the community. The MVP program provides funding for cities and towns in Massachusetts to plan for climate change resilience and implement priority projects. The state provides communities with funding to complete vulnerability assessments, develop action-oriented resilience plans, as well as other projects. Communities who complete the MVP Planning Grant program become certified as an MVP community and are eligible for MVP Action Grant funding for priority project implementation. This Summary of Findings Report presents the results from the six-month MVP Planning Grant process.

Observed and predicted changes to the climate in Milton were a large motivator for becoming an MVP- certified town. Climate changes are taking shape through four primary hazards:

- **Intense Storms**: The frequency and severity of intense storms—including nor'easters, ice storms, hurricanes, windstorms, and heavy precipitation events—are increasing.
- **Flooding**: Caused by increased precipitation and intense storms, and worsened by periods of drought, inland flooding is the prolonged submerging of land by

water. Flooding is expected to become more of a problem as intense storms continue to increase. Parts of Milton are prone to coastal flooding as well.

- **Heat Waves**: In Massachusetts, a heat wave is defined as three or more days above 90°F. Both the length and frequency of heat waves are expected to increase in the northeast, along with rising annual average temperatures.
- **Drought**: Periods of abnormally dry weather are expected to become an increasingly prominent issue in Massachusetts and can cause crop damage, water supply shortages, and habitat loss.

Combined, these hazards have inspired the Town to begin identifying and implementing actions that will enhance local resilience to these existing conditions and projected changes. More detailed information on these hazards, including trends, projections, and impacts can be found in the following section.

Milton has already taken steps to address climate change and ensure community resilience. In the past few years, the Town installed solar PV arrays on all public schools and on Town Hall, as well as electric vehicle charging stations at Town Hall and 88 Wharf Street. There have been efforts to improve stormwater management at the Police Station and several rights-of-way in town. Also, the Town is requesting that the Lower Neponset River site be listed on the National Priorities list in hopes of remediation of PCBs. This cleanup would clear the way for eventually removing the dam to increase ecological and hydrological connectivity. These actions, among others, will provide a foundation for Milton from which to continue increasing resiliency.

In September 2019, the Town of Milton partnered with Environmental Partners Group, Inc. (EP) and Kim Lundgren Associates, Inc. (KLA) to design a process that would allow the Town to become an MVP Community. The work described in this report is a crucial step in Milton's journey to a more resilient future. To complete the work outlined in this report, the Town worked with EP and KLA to:

- Create a Core Team comprised of key internal stakeholders;
- Establish goals for the MVP process;
- Conduct research on historic and projected changes and impacts from climate change;
- Determine an initial set of high-priority hazards;
- Collaboratively design two MVP workshops using the Community Resilience Building process;
- Identify and invite key stakeholders to participate in the MVP workshops;
- Host two MVP workshops where:
    - the highest priority hazards were confirmed;

    - the impacts, strengths, and vulnerabilities to infrastructure, socio-economic systems, and environmental systems were identified;
    - adaptation actions were identified and discussed; and
    - a final set of high priority action items were collectively defined and agreed upon by workshop participants;
- Prepare for and host a listening session before and after the workshops to prepare for and discuss the results from the workshop while soliciting feedback from the community.

The cornerstone of this work was the two MVP workshops hosted by the Town. The attendees of the workshops represented a diverse group of stakeholders that each brought a specific area of expertise to the table. The workshops served to collaboratively develop solutions that serve the entire Milton community.

Core Team members at the November 19 meeting

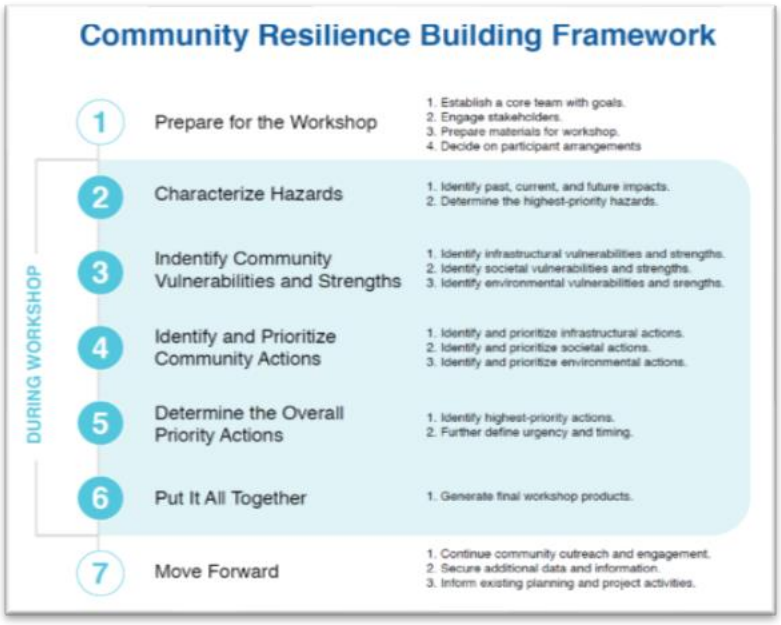
This report provides greater detail about the MVP process that Milton followed, and the actions identified as high priorities to enhance local and regional resilience. The Town would like to thank the Massachusetts Executive Office of Energy and Environmental Affairs for their financial and technical support for this effort.

MVP PLANNING PROCESS

In October 2019, EP and KLA worked with Milton's Environmental Coordinator to identify individuals to serve on the MVP Core Team (see Acknowledgments on page 24for a list of the members). On November 19, 2019, the Core Team members met to learn about the MVP process which is based on the Community Resilience Building Framework (see Figure 1 on the next page). They learned more about their role as a Core Team member, confirmed materials and logistics for the MVP Workshops, brainstormed the top hazards to be discussed at the workshops, and reviewed how Milton can leverage the results of MVP to spark greater community conversation and action on climate change. The Core Team also discussed the maps to be created to support the MVP workshops. Maps were generated by Environmental Partners. These maps displayed environmental, socio-economic and infrastructural features of the Town. The maps are available in Appendix 1.

The Core Team identified individuals to participate in two MVP workshops and was careful to ensure that invitees represented the diversity of the community by including key Town departments, schools, environmental groups, non-profits, faith-based organizations, educational institutions, community advocacy groups, and regional organizations.

Figure 1: Community Resilience Building Framework



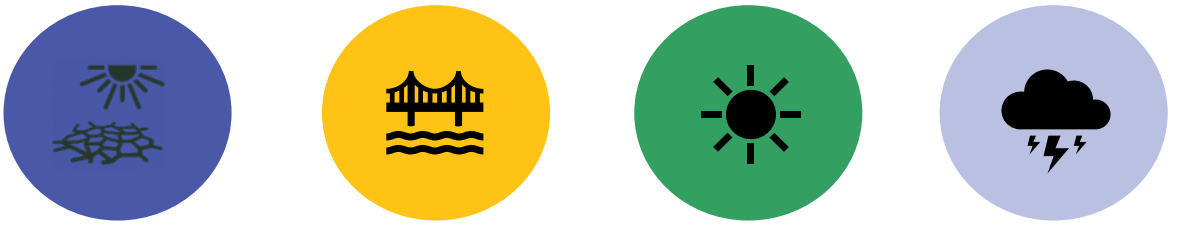
Before the workshops, the Town hosted a public listening session to prepare the public for the MVP process and solicit feedback. This listening session was held on January 9, 2020. Afterwards, Milton staff sent invitations to the stakeholders for the MVP workshops for two, four-hour workshops, scheduled for January 14, 2020 and January 15, 2020 from 9:30 am to 1:30 pm. In total, 65 individuals were invited to participate in the MVP workshops (see Appendix 2 for a list of stakeholders).

Community members providing input at a public listening session

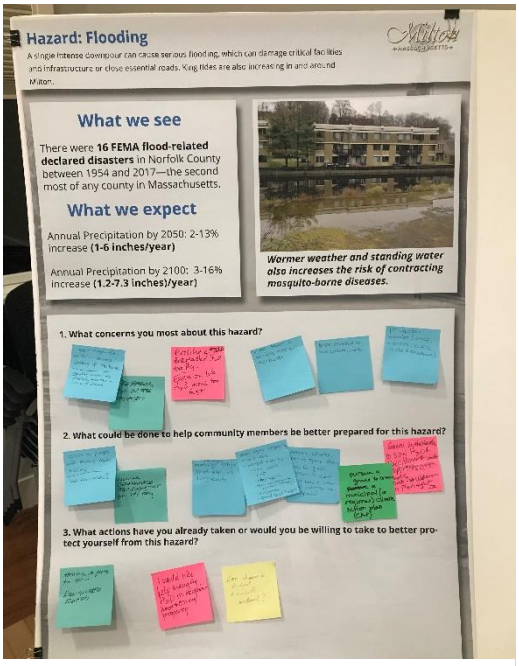
To engage the larger community in the conversation, the Town hosted a public listening session on February 13th. At this meeting, the consultant team presented the identified hazards and the results of the MVP workshops. The meeting attendees then had the opportunity to share their concerns and proposed solutions by writing notes on hazard-specific posters through an open house engagement activity. Outcomes and materials from the Listening Session can be found in Appendix 5, as well as in Section 3 about current concerns and challenges presented by hazards.

II. TOP HAZARDS AND VULNERABLE AREAS

The first step in the MVP process was to identify the four main hazards that have historically impacted the community and are projected to have notable impacts going forward due to climate change. The hazards were identified by the Core Team and confirmed at the beginning of the MVP Workshops. The four hazards identified for Milton are:



Because the Neponset River is tidal, sea level rise was also brought up as a hazard that will affect Milton going forward. These impacts can affect everything from the health of the Town's residents and natural environment, to the robustness of the infrastructure and utilities. Appendix 3 provides a summary of the historic trends and projected changes in weather and climate experienced in Milton. This information was foundational to the MVP process as it helped to establish common ground for the stakeholders and discuss what types of changes and associated impacts to expect going forward.



Community worksheet with information about flooding, community concerns, and potential actions the Town could take to mitigate hazards

At the MVP Workshops, participants discussed the impacts of the four hazards and articulated features they saw as community strengths and vulnerabilities. These features were discussed as they relate to three community components: Infrastructural, Societal, and Environmental. The workshop attendees were broken into four teams. Each team was tasked with reviewing the details of each feature identified under each of the components. Team members used a matrix to track each feature, whether it was a strength and/or a vulnerability, the hazard that affects it, the priority and timeline associated with implementation. Below are the features identified by the teams for the three community components:

Infrastructural Features:

- Bridges
- Communication systems
- Dams/culverts
- Public safety buildings
- Schools
- Town buildings
- Trees
- Utilities (gas and electric)
- Wastewater
- Drinking Water
- Stormwater

Societal Features:

- Businesses
- Communication systems
- Community centers
- Elderly residents
- Emergency services
- Environmental Justice communities
- Faith-based communities
- Historic/cultural sites
- Hospital/health services
- Immigrants
- Library
- Neighborhood associations
- Residents living at a low-income
- Residents with disabilities
- Schools
- Senior services
- Social services
- Youth

Environmental Features:

- Agricultural land
- Blue Hills Reservation
- Floodplain
- Neponset River and tributaries
- Parks/open space
- Ponds

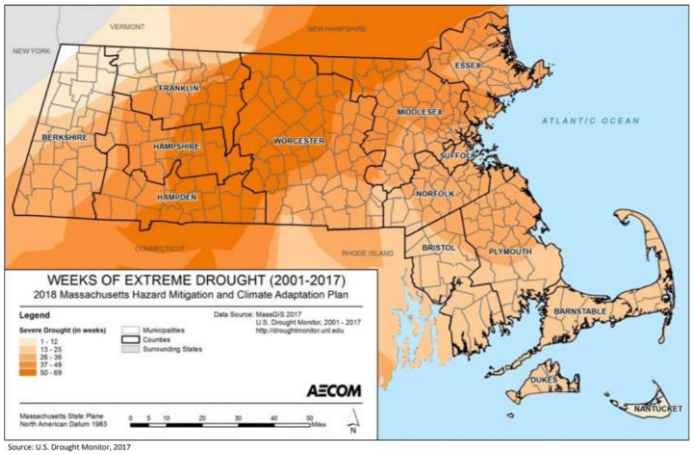
- Recreation areas
- Small parcels
- Trees
- Wetlands
- Wildlife

Most of these features were flagged as both strengths and vulnerabilities. As such, workshop participants discussed the specific strengths as well as vulnerabilities before identifying actions that sought to enhance strengths and mitigate vulnerabilities. Appendix 4 includes the completed matrices from the group discussions.

III. CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

Residents of Milton are noticing changes to the climate. During the Workshops, participants raised their concerns about these impacts. Anticipated challenges included protection of the town's vulnerable populations, threats posed to the community's lifestyle and culture, and disruptions to habitats and ecosystems. Highlights from these discussions are captured below, along with more details on each of the four identified hazards.

DROUGHT



Map of extreme drought in Massachusetts, 2001-2017

Even though more annual precipitation is projected overall, it is anticipated to fall in fewer, more intense events in the winter and spring rather than in smaller more sporadic events throughout the year. Therefore, it is expected that there will be longer periods of time without rainfall, especially in the summer and fall, increasing the potential for drought. In October 2016, 52% of the land area in Massachusetts was in "Exceptional Drought."[1] Workshop participants noted negative effects on tree health and

[1] National Oceanic and Atmospheric Administration. Massachusetts. Retrieved from https://www.drought.gov/drought/states/massachusetts

regional water supply from this drought. More of these types of events can be expected in the future.

Milton's drinking water is provided by the Massachusetts Water Resources Authority (MWRA), which insulates Milton's drinking water from the short-term impacts of drought. However, residents expressed concern over the possibility of drought to negatively affect the water quality of the town's surface water. Local ponds and wetlands are at risk for diminished water quality from prolonged drought.

In addition to the impacts of drought on the town's water, workshop participants also identified drought as a risk to the town's trees and green spaces. Participants voiced concerns over heightened risk of brush fire in the Blue Hills Reservation during times of drought. Tree health—particularly root systems—can be diminished during extended droughts making trees vulnerable to storm damage. Maintaining healthy natural resources is of particular economic importance in Milton due to the Blue Hills Reservation and the tourists it draws for hiking, canoeing, etc. Attendees at the Public Listening Session were most concerned with drought's effect on trees and other wildlife and cited planting of native, drought-resistant species, and continuing an annual inspection and maintenance program as solutions.

In response to these risks, workshop participants explored policies and plans to reduce the impact of the impending climate impacts. To help preserve the town's tree canopy, for example, a nursery program that worked with local schools was proposed. This program would help protect existing trees and promote the adoption of drought-resistant ones. Workshop participants also explored the possibility of partnering directly with the Massachusetts Department of Conservation and Recreation that manages the Blue Hills Reservation to help protect the natural resources of the areas.

FLOODING

Over the last several decades, the entire Northeast has seen a remarkable increase in the amount of precipitation falling during extreme rainfall events, leading to localized flooding. Between 1954 and 2017, there were 16 FEMA flood-related declared disasters in Norfolk County—the second most of

Road closure

any county in Massachusetts.[2] Flooding disrupts transportation systems, damages infrastructure and property, and exacerbates public health concerns (e.g., standing water, flooding in basements, mold dissemination). In light of these concerns, MVP Workshop participants unanimously agreed that flooding was a serious hazard that warranted consideration.

As a coastal town, Milton experiences both inland flooding and tidal flooding due to sea level rise and king tides. Flooding in Milton is primarily concentrated around the banks of the Neponset river, although flooding was also reported surrounding some of the community's larger ponds and brooks, such as Turner's Pond, Pine Tree Brook, and Unquity Brook. Along the Neponset, flooding impacts both the town's popular trails and some of the low-lying businesses and residences near its banks. Workshop participants indicated that much of this flooding correlated with king tide events, which influences the coastal area of the river below the local dam. Often, this flooding results in limited access to parts of the town, and puts several neighborhoods at risk for property damage. Commonly flooded roads include Central Avenue, Granite Avenue, and Brook Road.

Proposals on handling these issues included conducting a vulnerability assessment of at-risk neighborhoods, assessing the condition of the Town's culverts and ensuring they are appropriately sized for larger flood events, and ensuring critical facilities are resilient to flooding. A number of participants also proposed the removal of one of the local dams in order to restore the area's ecology, and this was in fact one of the most popular actions supported by the community. Public concerns centered around critical equipment damage, potential for becoming stranded as a result of flooding, and increased risk of vector-borne diseases from standing water.

HEAT WAVES

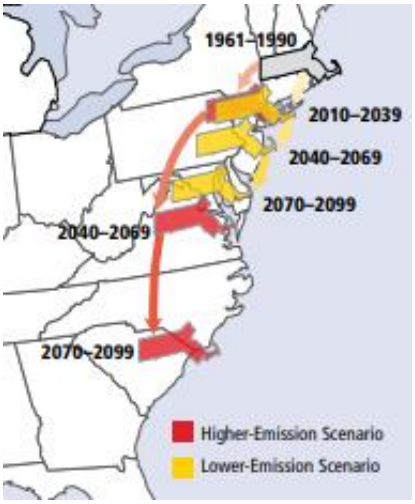
Extreme heat and heat waves—defined as periods of 3 or more days over 90°F—are on the rise in Milton. The figure to the left demonstrates this point by showing how Massachusetts' climate may seem more like South Carolina's by the end of the century under a "business as usual" greenhouse gas emission scenario.[3] Between 1970 and 2000, an average of 8.1 days a year were over 90°F in Norfolk County. By mid-century it

[2] Massachusetts State Hazard Mitigation and Climate Action Plan. Massachusetts Emergency Management. 2018.

[3] Confronting Climate Change in the Northeast. 2007. Union of Concerned Scientists. Retrieved from https://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/pdf/confronting-climate-change-in-the-u-s-northeast.pdf

could be closer to 30 days and by the end of the century it could reach 46 days.[4] Similarly, there will be a reduction in the average number of days below 32°F each winter. This information led the MVP Core Team and Workshop participants to prioritize heat waves as one of the four primary hazards in Milton.

Of particular concern to Milton's MVP participants was the impact heat could have on the area's trees and other natural resources. Milton is a community well known for its hiking options and nature tourism. Many people voiced concerns over canopy loss as the heat- weakened trees become more susceptible to disease and fire, especially among species that are better suited to colder conditions. Participants discussed possible solutions such as a nursery program that partners with local schools, revisions to the tree protection bylaws, the cultivation of heat-tolerant species, and expansion of a town-wide tree inspection and maintenance program.



Comparing Massachusetts' current climate to how it may be in the future, using other East Coast states as examples

The impact of heat waves on Milton's power grid was also discussed at length. Concerns were raised over the possibility of Milton facing "rolling blackouts" as a consequence of increased AC usage. Heat-weakened trees were also highlighted as threats to powerlines. To combat this threat, participants proposed the implementation of resilient micro-grids. With micro-grids, failure in one point of the town's power grid would have less of an impact. Because Milton does not have a municipal light plant, damage to the grid often takes considerable time to repair.

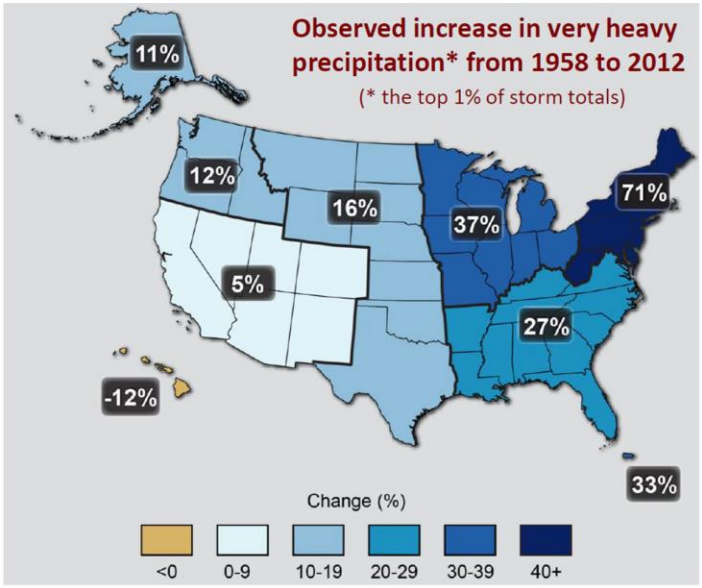
Beyond the tree canopy and grid sensitivity, participants also discussed increased mosquito and insect activity in warmer weather and explored how existing buildings could serve as cooling centers. Participants identified key structures, such as the senior center, that are in need of backup generators. Attendees at the workshop were concerned by heat effects on the elderly and the increased demand for energy. A resilience hub equipped with cooling capacity and a comprehensive climate action plan were both suggested as solutions.

[4] Northeast Climate Adaptation Science Center. 2019. "Days with Maximum Temperature Above 90°F." Resilient MA Datagrapher. MA Climate Change Clearinghouse. Retrieved from http://resilientma.org/datagrapher/?c=Temp/county/tx90/ANN/25017/

INTENSE STORMS

Over the last several decades, the number and intensity of storms has been on the rise. This includes hurricanes, nor'easters, ice storms, and rainstorms. Research shows that these types of storms are likely to become more frequent, intense, and possibly longer in duration in the future.[5] In New England, there has been a 70% increase in the intensity of rain events between 1958 and 2010.[6]

According to climate projections, the state of Massachusetts may see up to 2.4 additional inches of precipitation by 2050, and up to 3.9 inches by 2100.[7] Intense storms can lead to flooding, property damage, downed trees, power outages, and significant economic disruption.



Observed increase in very heavy precipitation in the US from 1958 to 2012. The Northeast region has the highest increase at 71%.

The MVP workshop participants expressed particular concern over the tendency of roads throughout town to flood during intense storms. Several key streets and residential neighborhoods were identified as frequent sites for flooding, and a popular response discussed at the workshop was a risk assessment of neighborhoods located within the town's floodplains. Another popular response was to assess and upgrade the town's culverts, allowing for better stormwater management.

In addition to the risk of induced flooding, participants discussed the issue of power outages during storms with intense wind. There was much discussion around the way in which stormwater runoff contaminated surface water and impacted the local environment. There are regions of the town, for example, that are not traditionally considered wetlands, but which are becoming wetlands due to the way stormwater drains throughout the town. To manage these issues, participants suggested formally expanding these wetlands to improve stormwater capacity and exploring the possibility

[5] MA Climate Change Clearinghouse. 2019. "Changes in Precipitation." Retrieved from http://resilientma.org/changes/changes-in-precipitation

[6] City of Boston. 2016. Climate Ready Boston.

[7] MA Climate Change Clearinghouse. 2019. "Changes in Precipitation." Retrieved from http://resilientma.org/changes/changes-in-precipitation

of developing local micro-grids to improve the resilience of the power grid. Conversations at the public workshop focused on falling trees, power outages, and preparedness measures.

IV. CURRENT STRENGTHS AND ASSETS

One of the focal points of the MVP Workshops was identifying the Town's vulnerabilities and strengths for the features impacted by the four climate hazards outlined above. Through the workshop discussions, open space and recreation resources rose to the top as strengths for the Town. The Blue Hill Reservation has 125 miles of trails and provides recreation options and habitat for wildlife along with Cunningham and other parks. The Neponset River also provides recreation options, such as canoeing. The presence of educational institutions is also a strength for Milton. Both public schools and private schools, such as Milton Academy and Fontbonne Academy, have the potential to serve a gathering spaces or shelters during times of need. Milton is also home to Curry and Laboure Colleges. Other town assets include the hospital, a strong neighborhood association network, and a state-of-the-art public library.

When it comes to infrastructure, Milton is fortunate to be connected to the Massachusetts Water Resource Authority water supply because the larger regional water system is less vulnerable to the effects of drought. The Town also has some of its electrical wires underground, which decreases the likelihood of power outages during intense storms. While Milton's public transportation system is somewhat limited, there is access to a trolly that connects to the Mattapan MBTA station. Public safety buildings were also reported to be in good condition and located in out of the way of areas particularly vulnerable to climate hazards, such as flooding.

V. TOP RECOMMENDATIONS AND STRATEGIES TO IMPROVE RESILIENCE

After identifying Town features, strengths and vulnerabilities, MVP Workshop participants brainstormed a list of potential resilience actions Milton could take to combat the impacts from the four climate hazards. Actions were intended to build on the existing strengths of the Town, while addressing current or future vulnerabilities. This process was conducted individually in each group and then was followed by a full team prioritization of the actions to identify which steps the Town should take first.

MVP Workshop stakeholders generated a list of nearly 150 actions. Each participant was asked to vote on their top three priorities across the three community components. With a three-way tie for the third action, the following are the top five actions that were

collectively identified as top priorities for Milton. The numbers in parenthesis indicate the number of votes received.

- Communication plan that ensures ability to reach all residents (13)
- Assess and upgrade culverts, ensuring they are appropriately sized (6)
- Complete a feasibility study of microgrid power and renewable energy options for the town (5)
- Risk assessment of neighborhoods impacted by flooding (5)
- Dam removal for ecological restoration (5)

Below are the top actions identified by each group under each community component, organized by priority:

Infrastructure:

- Assess and upgrade culverts, ensuring they are appropriately sized (6)
- Complete a feasibility study of microgrid power and renewable energy options for the town (5)
- Develop a nursery program that partners with schools to care for and plant trees (4)
- Conduct a drinking water vulnerability assessment

Societal:

- Communication plan that ensures ability to reach all residents (13)
- Implementation and promotion of Smart 911 (2)
- Establish communication standards and strategy
- Identify/survey senior citizen population and develop communication/outreach strategies

Environmental:

- Risk assessment of neighborhoods impacted by flooding (5)
- Dam removal for ecological restoration (5)
- Education around smart tree planting (i.e. native, drought-resistant) and maintenance best practices (4)
- Coordination with state on Blue Hills Reservation management planning/risk assessment (1)

BLUEPRINTS

To increase the lasting value of this report, EP and KLA worked with Milton Town staff to identify three of these top actions for which to create action implementation blueprints. The blueprints are intended to provide a workplan for town staff, as well as provide ideas about potential partners and funding mechanisms.

The team picked three actions that had a high likelihood of being implemented in the near term or were identified as particularly timely by Town staff and were not already covered by another planning process. Below are the results of those efforts.

Action: Conduct a culvert assessment, ensuring they are appropriately sized

DESCRIPTION OF ACTION	*Work with various partners to identify, prioritize, and address culvert and stormwater infrastructure maintenance needs based on age, quality, and capacity.*
CHAMPION	Department of Public Works

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Complete a systematic inventory of all culverts and stormwater infrastructure.	6 months	• MassDOT • Department of Conservation & Recreation • Public Works • Engineering Department	MVP Action Grant State grants
2. Affirm existing evaluation criteria and integrate MS4 components to create a formalized inspection and evaluation framework for prioritizing infrastructure upgrades.	6 months (annual basis)	• Planning & Community Development • Health Department • Neponset River Watershed Association • Conservation Committee	MVP Action Grant State grants

3. Apply for funding and address highest priority stormwater infrastructure upgrades. Upgrades should include green infrastructure and the reduction of impervious surfaces whenever possible.	2-5 years	• Planning & Community Development • MassDEP • Conservation Commission	MVP Action Grant State grants
4. Continue ongoing culvert and stormwater infrastructure monitoring.	Ongoing	• MassDEP • Neponset River Watershed Association	State grants

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to existing Town goals/actions and other MVP actions? Other proposed MVP actions: • Hydraulic study to understand drainage limitations and increase capacity • Analyze health, longevity and capacity of dams/culverts and create prioritization of upgrades • Increase the use of green infrastructure	*How can the community incorporate equity into the implementation of this action?* • Take into account the populations affected by any water quality or flooding issues • Prioritize work that will benefit low-income or senior residents
MEASURING SUCCESS	**ENGAGING THE COMMUNITY**
How can we measure the progress and success of this action? Outputs: • Number of stormwater management upgrades completed • Dollars of grant money awarded for upgrades Outcomes: • Reduced flooding on roadways and in buildings • Improved water quality	*How can we engage the populations that benefit from implementing this action?* • Couple this work with an educational campaign about how residents can protect water quality: flyers in utility bills, public workshops, and information on the Town website and social media

Action: Communication plan that ensures ability to reach all residents

DESCRIPTION OF ACTION	*Develop a communication plan that leverages pre-existing communication channels, ensures web accessibility, and includes low-tech strategies to maximize reach to all populations.*
CHAMPION	Town Administrator

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Create an online and print communication resource center to include: • Links to Town news alert and Smart 911 systems • A place to sign up to be on a list of individuals to be checked on during emergency events • Preparedness tips and resources (i.e. FEMA, MEMA) • Other essential resident information	1-2 months	• Police/Fire • Health Department • Information Technology • Local Emergency Planning Committee • Local businesses and employers • Utilities	Staff time Hazard Mitigation Fund Grant
2. Assess and inventory existing communication systems with a focus on those systems that reach the elderly, low-income, renters, and other vulnerable populations	2-3 months	• Town clerk • Police/Fire • Health Department • Council on Aging • Schools • Houses of worship • Veteran's Service • Commission on Disability • Housing Authority • Neighborhood associations • Community organizations	Staff time Hazard Mitigation Fund Grant
3. Form a "Neighborhood Liaisons" program that can help set up alert systems and share resources at the neighborhood level, utilizing the above communication systems	1 year	• School parent-teacher organizations • Neighborhood associations	Staff time Hazard Mitigation Fund Grant

4. Leverage existing town communications systems to expand the reach of emergency preparedness education and other essential communications with the following: • Newsletters, social media, and mailings from existing organizations • Low tech solutions for those without phones or computers (utility bills, flyers) • Partner with local organizations to host workshops • Tabling at community events • Collaboration with neighboring towns	1 year	• Town clerk • Police/Fire • Health Department • Council on Aging • Schools • Library • Houses of worship • Housing Authority • Neighborhood associations • Community organizations • Neighboring towns	Staff time Hazard Mitigation Fund Grant

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to existing Town goals/actions and other MVP actions? <u>Other proposed MVP actions:</u> • Promote the use of Smart 911 • Establish Town communication strategy • Develop action plan to reach residents not covered by communication outlets • Improve database of senior population (connect existing directories, improve outreach materials, survey population on needs) • Enhance level of civic engagement through community groups/neighborhood associations/sports/schools • Develop additional methods of communication beyond social media/website (eliminate gaps) • Increase translations of Town communications	*How can the community incorporate equity into the implementation of this action?* • Provide translations for essential resources and communications • Prioritize neighborhood liaisons and check in program in areas with especially vulnerable populations
MEASURING SUCCESS	ENGAGING THE COMMUNITY

How can we measure the progress and success of this action? Outputs: • Number of residents signed up for Reverse 911 • Percent of residents reached through communications Outcomes: • Increased safety during and after extreme weather events and other emergencies • Ensure communication systems are redundant and resilient to address impacts • More equitable access to essential town information	*How can we engage the populations that benefit from implementing this action?* • Partnering with the groups listed in Step 2 to maximize reach and utilize preexisting communication channels • Work with schools to reach parents • Outreach to seniors and medically vulnerable to encourage sign ups to be checked on after an emergency • Pull additional best practices from counterparts in neighboring towns

Action: Conduct a risk assessment for neighborhoods impacted by flooding

DESCRIPTION OF ACTION	*Conduct a thorough risk assessment of neighborhoods impacted by flooding with special attention to areas with a high concentration of vulnerable populations.*
CHAMPION	Department of Public Works

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Using GIS map layers, identify vulnerable areas in the floodplain, paying special attention to: • Businesses • Low-income housing • Elderly housing • Critical infrastructure • Public health/safety buildings • Evacuation routes *Assess the need for more detailed hydrodynamic modeling as relevant.*	1 month	• Planning & Community Development • Engineering Department	Staff time MVP action grant State grants
2. Conduct interviews and round table discussions with representatives of vulnerable populations to gather additional information about the effects of flooding.	6 months	• Council on Aging • Health Dept • Schools • Neighborhood Organizations • Chamber of Commerce	Staff time MVP action grant State grants
3. Compile information from GIS analysis and interviews to create a prioritized list of areas requiring flooding mitigation.	1-3 months	• Planning & Community Development	Staff time MVP action grant State grants
4. Share flooding adaptation resources with populations affected by identified flooding issues.	Ongoing	• FEMA/MEMA • Neponset River Watershed Association	Staff time MVP action grant State grants
LINKS TO OTHER PLANS & ACTIONS		EQUITY CONSIDERATIONS	

How does this action connect to existing Town goals/actions and other MVP actions? <u>Other proposed MVP actions:</u> • Drinking/storm/wastewater vulnerability assessment • Evacuation route assessment • Analysis of street flooding and potential remediation • Ensure police and fire stations are resilient to flooding • Risk and readiness assessments for elderly and public housing, schools • Storm water flow routing/drainage management (direct to open space or unused areas) • Ensure accessibility of handicap trails around ponds with regard to flooding	*How can the community incorporate equity into the implementation of this action?* • Include vulnerable populations (low-income, elderly, minority, disabled, etc.) in discussions and interviews about flooding risks • Focus mitigation action on the areas that most impact those with the fewest resources to adapt • Provide any resources about flood mitigation and adaptation in multiple languages, and accessible to visually and hearing impaired
MEASURING SUCCESS	ENGAGING THE COMMUNITY
How can we measure the progress and success of this action? Outputs: • Complete assessment of flooding risks in Milton Outcomes: • Increased flooding preparedness • Flooding mitigation work plan	*How can we engage the populations that benefit from implementing this action?* • Partner with community organizations to schedule interviews/focus groups with the populations affected by flooding • Provide educational resources to the same partner organizations to share with those populations • Share information about the project on the Town website and over social media • Provide tips to homeowners about how to avoid flooding on and around their own property

VI. CONCLUSION AND NEXT STEPS

Ultimately, the MVP process was only the first step in starting a conversation about climate change impacts in Milton. The Town is eager to keep the conversation going, while diving into action. Both the blueprints in this plan and the application for further funding from the MVP program will be key to beginning the transition into action. The Town is eager to pursue creating a climate action and resilience plan to bring this work to the next level and help establish Milton as a leader in the field.

ACKNOWLEDGEMENTS

The Town of Milton would like to thank all the Core Team members that made this project a success:

Core Team Members	Affiliation
Chase Berkeley	Department of Public Works
Hillary Waite	Environmental Coordinator
John Thompson	Town Engineer
Joseph Prondak	Building Commissioner
Laura DelleChiaie	Health Department
Mike Dennehy	Town Administrator
William Clark	Planning Board

Report Citation

Town of Milton (2020). Community Resilience Building Workshop Summary of Findings. Milton, Massachusetts.

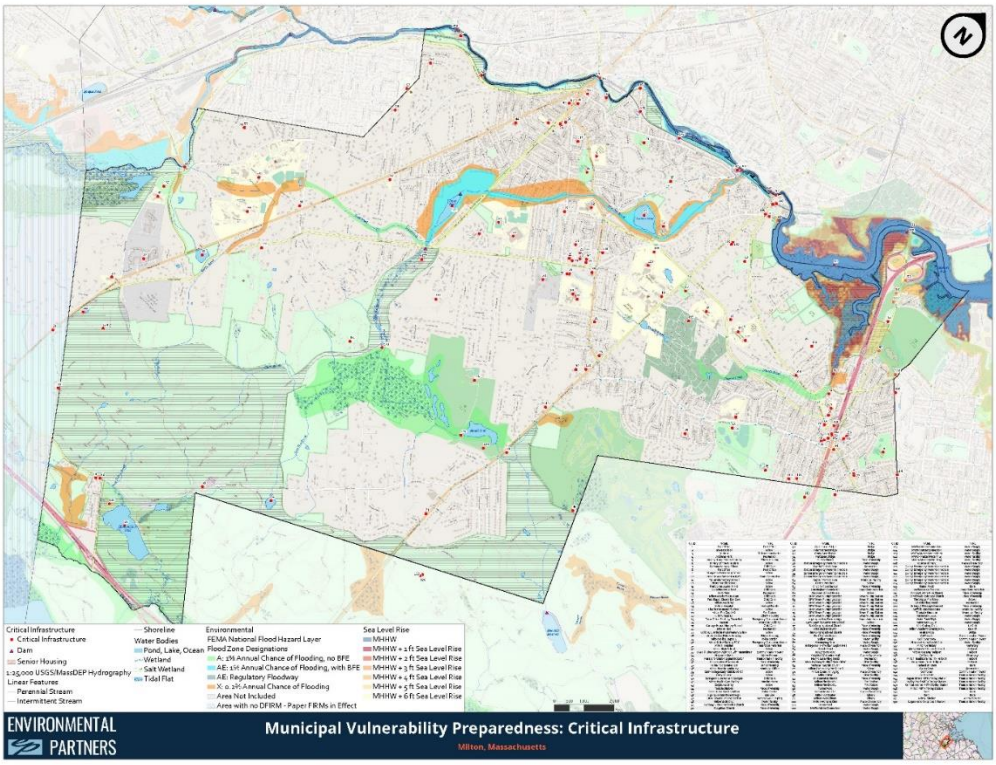
Community Resilience Building Project Team

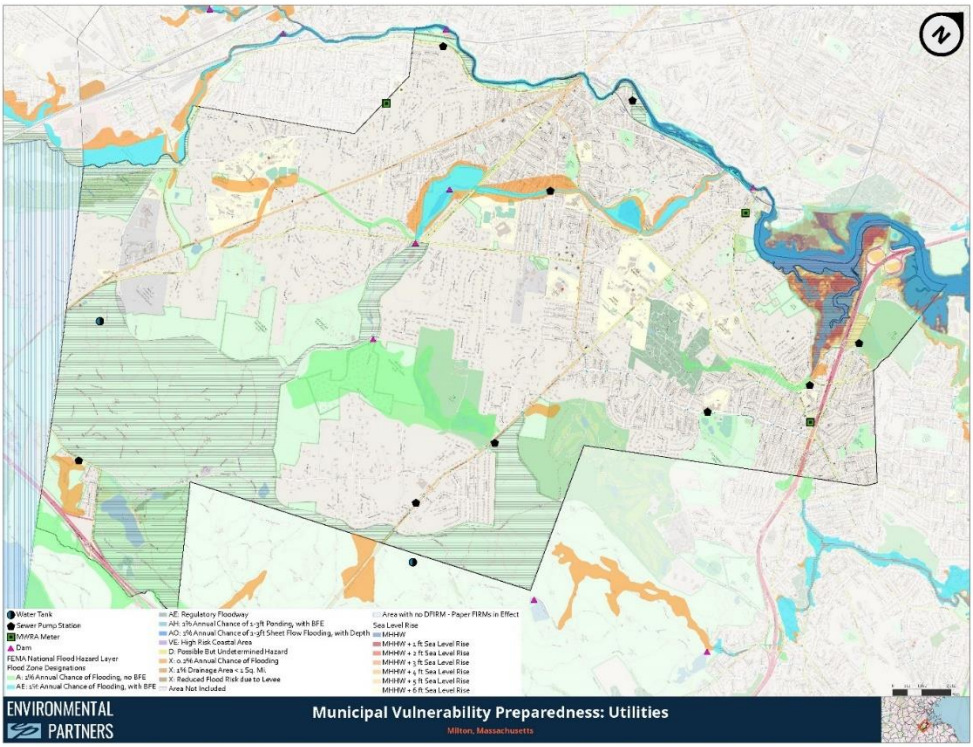
Name	Title	Affiliation
Hillary Waite	Environmental Coordinator	Town of Milton
Kari Hewitt	Lead Facilitator	KLA
Eric Kelley	Lead Facilitator	Environmental Partners
Maggie Peard	Facilitator	KLA
Natalie Pommersheim	Facilitator	Environmental Partners

APPENDICES

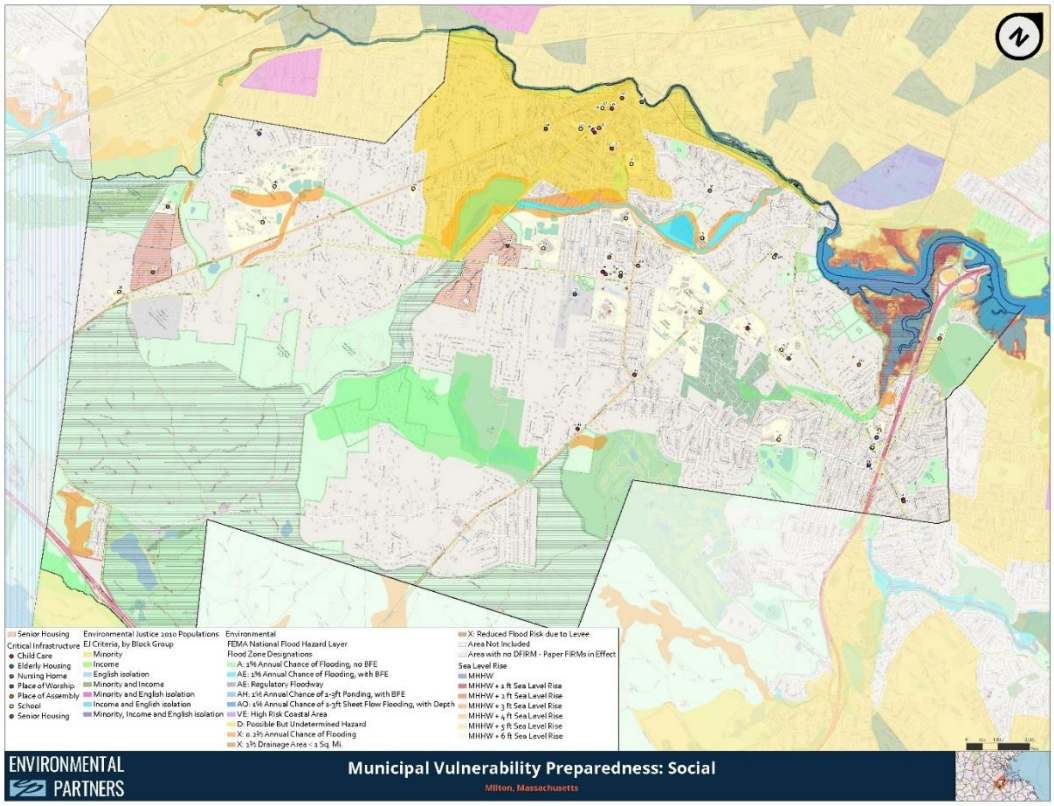
APPENDIX 1: MAPS FOR MVP WORKSHOPS

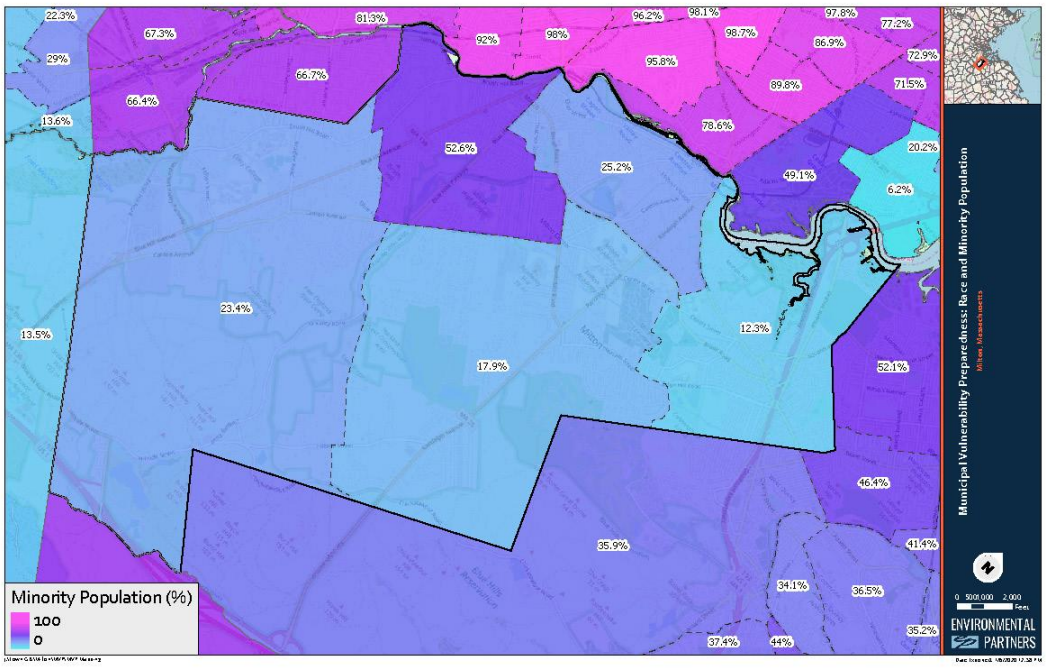
Infrastructure

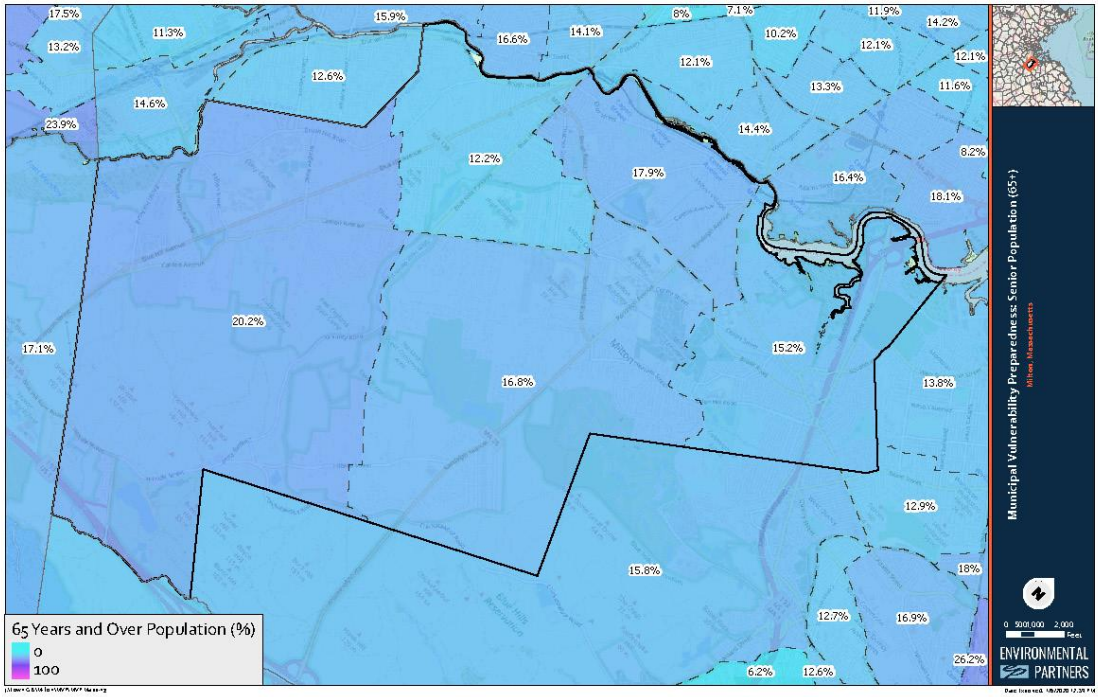




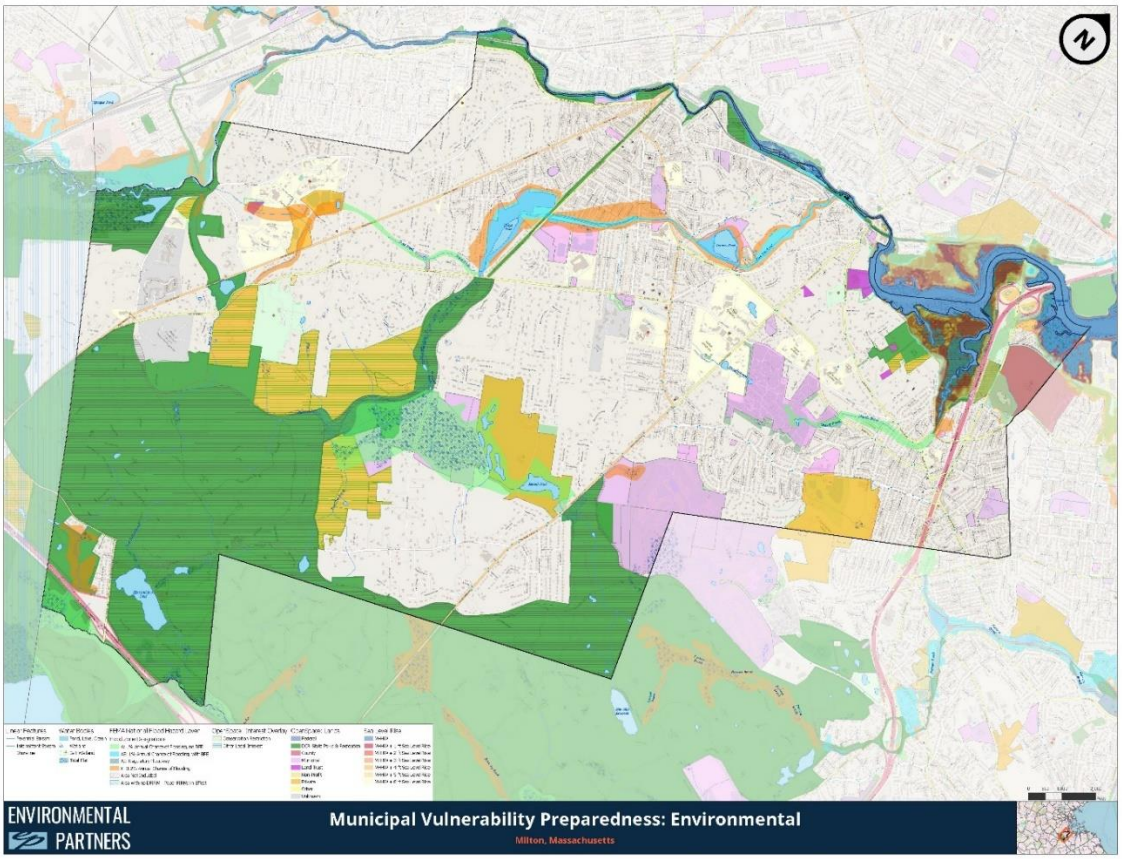
Societal


Municipal Vulnerability Preparedness: Social
Milton, Massachusetts
ENVIRONMENTAL PARTNERS


Municipal Vulnerability Preparedness: Race and Minority Population
Milton, Massachusetts
Minority Population (%)
100
0
ENVIRONMENTAL PARTNERS



Environmental



APPENDIX 2: MVP WORKSHOP ATTENDEES

Name	Title	Affiliation
Town Lead		
Hillary Waite	Environmental Coordinator	Town of Milton
Consultant Team		
Kari Hewitt	Lead Facilitator	Kim Lundgren Associates, Inc. (KLA)
Eric Kelley	Lead Facilitator	Environmental Partners
Maggie Peard	Facilitator	Kim Lundgren Associates, Inc. (KLA)
Natalie Pommersheim	Facilitator	Environmental Partners
Workshop Attendees		
Barbara Higgins	Administrative Assistant	Fontbonne Academy
Caroline Kinsella	Director	Health Department
Chase Berkeley	Director	Department of Public Works
Chuck Caputo	Lieutenant	Police Department
Dave Walgren	Park Manager	Cunningham Park
Deborah Felton	Executive Director	Fuller Village
Erikk Hokenson	Boston Harbor Regional Coordinator	Massachusetts Office of Coastal Zone Management
E. Sanford		Seasons Hospice
Hillary Lacirignola	Vice President	Weston and Sampson
Hillary Waite	Environmental Coordinator	Town of Milton
Jay Hackett	Campus Safety Director	Milton Academy
John Thompson	Town Engineer	Department of Public Works
Joseph Prondak	Building Commissioner	Inspectional Services
Kerry Snyder	Advocacy Director	Neponset River Watershed Association
L. Tucker Smith	Member	Sustainable Milton
Lisa Ahern	Superintendent	Milton Cemeteries
Noreen Dolan		Milton Residents Fund
Richard Palmer	Professor	UMass Amherst

Shelley Davis	Chairperson	Milton Interfaith Clergy Association
Susan Dolan	Director	Milton Early Childhood Alliance
Walter Timilty	State Senator	Massachusetts Senate
William Clark	Director	Planning & Community Development
Judy Lehrer Jacobs	Member	Friends of the Blue Hills
Maile Paniero-Langer	Member	Friends of the Blue Hills
Paul Hopkins	Member	Local Emergency Preparedness Corps
Robert O'Connell		Curry College
Bill McDonald	Vice President of Finance and Administration	Laboure College
Paul Travis		Milton Chamber of Commerce

APPENDIX 3: CLIMATE CHANGE SUMMARY

Like most Massachusetts communities, Milton has seen an increase in the frequency and severity of intense storm events, flooding, and extreme heat. These impacts affect everything from the health of the Town's residents, natural resources, and infrastructure. Through the Massachusetts Municipal Vulnerability Preparedness (MVP) program, the Town identified four primary climate related hazards: intense storms, flooding, drought, and heat waves.

Intense Storms

Nor'easters, ice storms, blizzards, hurricanes, and heavy rain events lead to downed trees, power outages, and property damage.

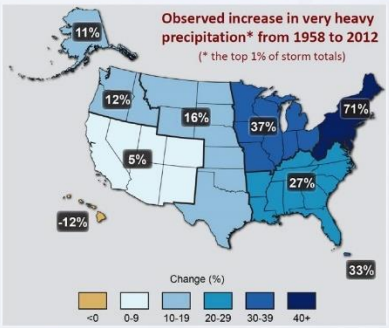
Trends

In the Northeast, the amount of precipitation falling in very heavy events between 1958 and 2010 increased by more than 70%.

Projections

Intense storms will become more frequent and more intense, with precipitation concentrated in fewer but heavier events.

[1] National Oceanographic and Atmospheric Association. Storm Events Database. 2016.



New England's most powerful storms now produce 71% more precipitation during their lifecycles than in 1958. [1]

Flooding

A single intense downpour can cause serious flooding, which can damage critical facilities and infrastructure or close essential roads.

Trends

There were 16 FEMA flood-related declared disasters in Norfolk County between 1954 and 2017—the second most of any county in Massachusetts. [1]

Projections

Annual Precipitation by 2050: 2-13% increase **(1-6 inches/year)**

Annual Precipitation by 2100: 3-16% increase **(1.2-7.3 inches)/year)**[2]

[1] Massachusetts State Hazard Mitigation and Climate Action Plan. Massachusetts Emergency Management. 2018

Warmer weather and standing water also increases the risk of contracting mosquito-borne diseases.

[2] Changes in Precipitation. Resilient MA. Retrieved from: https://www.resilientma.org/changes/changes-in-precipitation.

Drought

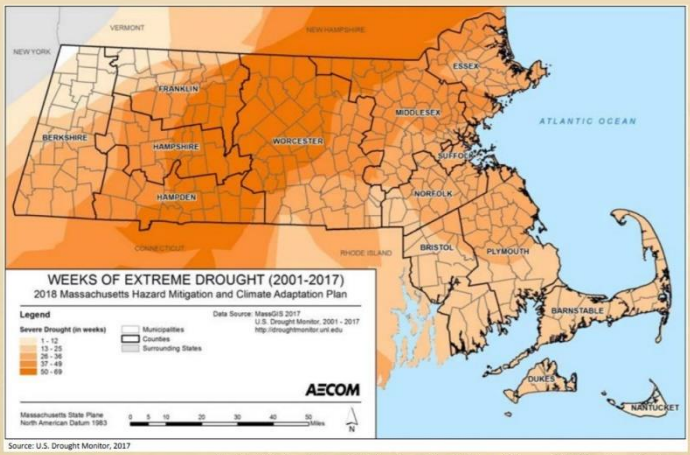
Precipitation will be concentrated in fewer storm events. This can lead to water supply shortages, crop damage, and habitat stress.

Trends

Between 2001 and 2017, Milton saw 20 weeks of **severe drought** (water restrictions) and 20 weeks of **extreme drought** (water shortages). [1]

Projections

Extended periods of little to no precipitation coupled with rising temperatures are projected to increase the frequency of short-term droughts.



[1]United States Drought Monitor. The National Drought Mitigation Center.

Heat Waves

An increase in the number of days with high temperatures—particularly days over 90° F—will lead to heat-related illnesses and higher energy demand in the summer.

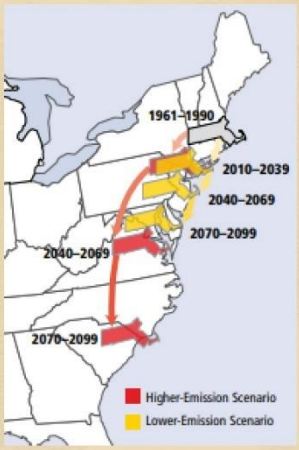
Trends

There were **11.5 days** above 90°F between 2010 and 2014—the highest number **since 1950.** [1]

Projections

Increase in the number of days over 90°F by 2050: **10-35**
Decrease in the number of days under 32°F by 2050: **17-39** [2]

MA could have the climate of South Carolina by the end of the century without emissions reductions driven by the reduced use of fossil fuels.



[1] NOAA National Centers for Environmental Information – State Climate Summaries

[2] Massachusetts Climate Change Projections - Statewide and for Major Drainage Basins. Northeast Climate Adaptation Science Center. MA Climate Change Clearinghouse. 2018

Get Involved!

Submit questions, comments, or ideas to Hillary Waite, Environmental Coordinator:

hwaite@townofmilton.org

KLA KIM LUNDGREN ASSOCIATES, INC.
Customized Solutions for the Community You Want

This summary was prepared for the Town of Milton, MA, by Kim Lundgren Associates, Inc. with a grant from the Massachusetts Office of Energy and Environmental Affairs Municipal Vulnerability Preparedness Program

APPENDIX 4: COMBINED MATRICES FROM WORKSHOPS

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Parks/Open Space	Town-wide	Both	S/V		1. Mindful landscape architecture (drought-resistant planting, native plants)	2. Water flow/drainage management (direct to open space or unused areas)	3. Promote public access of park as cooling places in the summer	4. Better maintenance of unhealthy trees (trimming, etc.)	1. H 2. H 3. L 4. H	1. O 2. S/O 3. O 4. O
Blue Hills	SW corner	DCR	S/V			5. Education on wildlife protection and tick avoidance in Blue Hills		6. Seek additional funding for trail/waterway maintenance	5. L 6. H	5. O 6. O
Neponset River	Town-wide	DCR	S/V			7. Seek funding for PCB clean up 8. Feasibility study on dam removal in Neponset River	9. Maintenance of path issues from flooding	10. Installing water quality monitors/storm septers for water flowing into river 11. Reducing impervious surfaces around waterways	7. H 8. H 9. M 10. H 11. H	7. S 8. S 9. O 10. O 11. L
Ponds/Rivers	Town-wide	Town	S/V		12. Investigate need for dredging Turner Pond	13. Ensure accessibility of handicap trail with regard to flooding 14. Investigate natural solutions for mosquito reductions			12. H 13. L 14. H	12. S 13. O 14. O
Trees	Town-wide	Public and private	S/V		15. Expand upon Tree City USA programs (i.e. education around appropriate native trees to plant and maintenance best practices)	16. Investigate healthy spraying options for tree pests		17. Intentional placing of trees around powerlines, etc 18. Replacement program of trees for development	15. H 16. H 17. H 18. H	15. S 16. S 17. S 18. S
Wetlands	Town-wide	Public and private	S/V		19. Wetland relication projects	20. Green infrastructure solutions to flooding issues			19. H 20. M	19. L 20. S
Wildlife	Town-wide	_	V/S			21. Education on proper disposal of pet waste			21. M	21. O

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Neponset River and Tributaries	Town-wide	Town (some Boston)	V/S	Drainage Flooding Recreation Water quality		1. Maintenance/culvert upgrades and retrofits 2. Risk assessment/study of neighborhoods impacted 3. Granite Ave (State)		4. Flash flood impacts (sustained rain) 5. Size of channels	1. H 2. H 3. H 4. M 5. M	1. S 2. O 3. L 4. O 5. L
Tree Canopy	Town-wide	Town/Private /State	V/S	Fall risk Shade/cooling Habitat Water/Air quality	6. Stressed tree assessment 7. Drought-resistant species			8. Electric wires/power/damage	6. M 7. L 8. H	6. O 7. O 8. S
Blue Hills	South side	State	V/S	Open space/rec Protected land Habitat degredation Destination		9. Risk assessment of Harland floodplain			9. M	9. L
Floodplain (ACECs)	Fowl Meadow Harland St Neponset Estuary	Town/State	V/S	Flood storage Habitat (good and bad) Flooding impacts Air/water quality Dams		10. Risk assessment			10. L	10. L
Wildlife	Town-wide	Town/Private /State	V/S	Disease/ticks Traffic risk Birding/hunting Fishing/fishery Vegetation destruction	11. Continue to work with wildlife groups/animal control for wellbeing				11. L	11. O
Recreational Areas (Golf Courses/Cunningham Pk)	Town-wide	Town/Private /State	S/V	Stewardship Runoff Health/wellness Economic value Education opportunities	12. Partnering for educational opportunites				12. M	12. S
Agricultural Land	SW side of town	Private State	S/V	Food security Open space/drainage Envi services Character--low impact	13. Partnering for resources and education				13. L	13. L
Small Parcels	Town-wide	Town	S	Conservation areas Potential stormwater BMPs LID		14. Flood mitigation and storage 15. Retrofit opportunity study (NPDES)			14.M 15. H	14. S/O 15. S

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Blue Hill Reservation	South side Quincy/Canton line	State	V/S	Wind damage Fire Stormwater	1. Understand stat forest management planning--fire risk management (drought/tree damage)				1. L	1. O
Neponset River	W/N Town line	State Town Private	V/S	Flooding Contaminated sediments Tidal flood/SLR Stormwater quality Salt marsh	2. Vulnerability assessment for dam remediation/removal and planning for post-removal 3. Riverfront area land protection 4. Drainage evaluation/assessment					
Parks/recreation (golf)	Town-wide	Town Private County	S	Trees/protected space Flooding Town dump	5. Master plan/CIP for town parks 6. Drainage evacuation for SW management and parks (Green infrastructure/LID) 7. Maintain public facilities				5. H 6. M 7. H	5. S 6. L 7. O
Cunningham Park	Southeast	Private	V/S	Development risk	8. Improve level of communication with trust on public use				8. H	8. O
Wetlands/Ponds/Streams	Town-wide	Town Private	V/S	Flooding Stormwater quality	9. Maintain primary drainage channels 10. Evaluate drainage systems--capacity 11. Encourage green infrastructure and low impact development				9. H 10. M 11. L	9. O 10. O 11. S

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H - M - L	Time Short Long Ongoing
Environmental										
Neponset River	Tidal, coast	Access points--Town and DCR	V/S	Reduced water quality, habitat impacts Upstream impacts to water supply Flooding (coast to Baker Dam) Upstream contamination (esp from Boston)		1. Full or partial dam removal for ecological restoration			1. H	1. O/L
Blue Hill Reservation	Southwest	DCR	V/S	Brushfire Change in tree species (impact ot habitat) Flooding with undersized culverts Downed trees S: Meteorological tower Influx of people/traffic Types of rec with less snow	2. Wildfire education/risk reduction 3. Native vegetation planting	4. Tick education program (controlled burns)			2. M 3. H 4. H	2. L 3. O 4. O
Ponds	Multiple	_	V/S	S: Fresh water habitat S: Flood storage S: recreation Flooding Lack of access						
Unquity Brook	East	_	V/S	Drought/flood Contaminants		5. Continue to implement stormwater bylaw			5. H	5. O
Pine Tree Brook	North and West	_	V/S	Limited access Fish habitat impacts		6. Maintenance of flood control structures			6. H	6. O
Neponset Marshes	Coast	Town DCR	V/S	Invasives S: Flood storage and habitat Mosquito spraying		7. Restoration of marshes 8. Stop casting dredge spoilage into marsh 9. Study health of march due to climate impacts			7. H 8. H 9. H	7. L 8. O 9. L
Tree Canopy	Town-wide	—	V/S	Invasives Downed trees/branches						
Open Space	Town-wide	Private Town DCR	S	Primarily strength Stormwater Recreation Cooling						

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H - M - L	Time Short Long Ongoing
Infrastuctural										
Drinking water	Town-wide	Public Private Other	S	Public health Infrastructure damage Age/condition Contamination	1. Participate in MWRA advisory committee Funding for PB service replacements	2. Vulnerability assessment		3. Vulnerability assessment 4. Public education/outreach	1. H 2. H 3. H 4. H	1. O 2. O 3. O 4. O
Wastewater (sewer, septic)	Town-wide	Public Private	S	Public health Damage Age/condition Localized flooding	Funding for sewer/septic maintenance--owner/tenants	5. Vulnerability assessment 6. Public education/outreach (continue MWRA grant program)		7. Vulnerability assessment 8. Public education/outreach	5. H 6. M 7. H 8. M	5. O 6. O 7. O 8. O
Utilities (Gas, electric, communication)	Town-wide	Public Private	gas-S elec-S/V Comm-S/V	Public health (vulnerable pops) Damage Age/condition Tree damage	9. Maintain tree inventory and inspection program and identify drought-tolerance of shade trees		10. Study peak demands on electric grid (electric utility subsidy gas for A/C and heat)	11. Tree maintenance and inspection program (Town/Eversource)	9. H 10. M 11. H	9. O 10. O 11. O
Transportation	Town-wide	Public	Roads-V Mass transit- V Bridges-V Trolly-S	Damage Lack of/limited service Age/condition Productivity Emergency access		12. Participate in regional planning advisory groups 13. Tidal flooding mitigation Granite Ave			12. L 13. M	12. O 13. S
Stormwater	Town-wide	Public	S/V	Damage Age/condition Localized flooding		14. Vulnerability assessment 15. Increase culvert/drain maintenance 16. Public education and outreach program		17. Vulnerability assessment 18. Increase culvert/drain maintenance (evaluate/prioritize) 19. Public education/outreach	14. H 15. H 16. M 17. H 18. H 19. M	14. O 15. S 16. O 17. O 18. S 19. O

H-M-L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength					Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)				Priority	Time
					Drought	Flooding	Heat Waves	Intense Storms	H - M - L	Short Long Ongoing
Features	**Location**	**Ownership**	**V or S**	**Impacts**						
Infrastuctural										
Transit (trolly, roads, traffic system)	Town-wide	Town State DCR Private MBTA	V/S	Evacuation routes Access to town Blockages/flooding Traffic	1. Evacuation route assessment				1. M	1. L
Utilities (water, sewer, drainage, gas, electric)	Town-wide	Town State Private MWRA	V/S	Blackouts Natural Events effect resources Blockages: health hazards	2. Community outreach--Eversource/National Grid--outage reports 3. Feasibility study of microgrid power options/renewable energy for Town				2. M 3. H	2. S 3. L
Bridges, dams, culverts	Town-wide	Town State DCR Boston	V/S	Conveyance/connectivity for hydraulic needs Fail/flood under stress Traffic Capacity issues		4. Hydraulic study to understand drainage limitations and increase capacity			4. H	4. S
Buildings--town property (Library, council on aging, schools)	Town-wide	Town	S/V	Shelter/communication center Prone to hazards Generators	5. Inventory of potencial shelter locations, emergency resources, potential for a resilience hub. Community outreach and inventory. Update on Hazard Mitigation Plan				5. H	5. S
Private schools (Milton Academy, Curry College, Fontbonne...)	Town-wide	Private	S/V	Leverage/share resources Boarding opportunites Shelter in place						
Vulnerable pop centers (Hospital, hospice, senior housing, low income, preschools)	Town-wide	Private Town	S/V	Generators? Isolation Communication Capacity in emergency						
Public Safety (police, fire	Town-wide	Town	S	Good reach/access Communication Social media alert	6. Study other emergency communication outlets 7. New facilities built to expand with future policies and concerns				6. H 7. M	6. S 7. S

H-M-L priority for action over the Short or Long term (and Ongoing) V = Vulnerability S = Strength					Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)				Priority	Time
					Drought	Flooding	Heat Waves	Intense Storms	H - M - L	Short Long Ongoing
Features	**Location**	**Ownership**	**V or S**	**Impacts**						
Infrastuctural										
Transportation system	Town-wide	Town MBTA State Private	V/S	Flooded streets Power outages for traffic lights No shelter on bus stops Limited service in snow Aging infrastructure Block roads (trees/snow) Potholes		1. Analysis of stree flooding and potential remediation (including trolly tracks)	2. Investigate alternative pavement options and increase pervious surface	3. Safer, better-covered bus stops	1. H 2. H 3. M	1. S 2. L 3. L
Dams/culverts	Town-wide	Town State	V/S	Aging Sediment from old factory		4. Analyze health, longevity and capacity of dams/culverts and create prioritization of upgrades			4. H	4. S
Utilites (gas, electric, cable, cell)	Town-wide	Eversource National Grid Private	V/S	Loss of service Downed wires	5. Improve transparency of underground utility line inspections--ensure lines of communication with utility contacts to ensure smooth service recovery 6. Feasibility study of burying power lines				5. H 6. M	5. S 6. L
Water/sewer/drainage	Town-wide	Town	V/S	Overtaxed by flooding Contamination Rainwater in sewer system Cutoff service contaminated DW Stations reliance on power Water restrictions	7. Education on water consercation	8. Capacity study of drainage system		9. Better enforcement of private discharge of rainwater	7. H 8. H 9. H	7. S/O 8. S 9. L
Trees	Town-wide	Town Private	V/S		10. Tree nursury program in schools where students care for and plant saplings 11. Expand tree canopy			12. Tree maintenance plan	10. H 11. H 12. H	10. S 11. L 12. O
Buildings (public safety facilities)	Town-wide	Public Private	V	Flooding, damage to critical equipment				13. Vulnerability assessment of town buildings, prioritizing critical service buildings--back up power redundancy plan	13. H	13. S

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H · M · L	Time Short Long Ongoing
Infrastuctural										
Dams	Multiple	Town DCR	V/S	Flooding/flood control Impacts to habitat	1. Contaminated clean up an sediment removal				1. H	1. L
Culverts	Town-wide	Town	V/S	Flooding risk Flow restrictions Habitat impact/improvement size and age	2. Assess, upgrade, and repair culverts (appropriate size for precipitation projection				2. H	2. O
Public Safety Facilities	Multiple (police and fire)	Town State	S	Minimal risks -- asset to town New upgraded system						
Roadways	Town-wide	Town DOT Private	V	Flooding, esp at Brook Rd, Cunningham Brook, Hulcraft Road conditions/maintenance Down trees/debris in storms Traffic--evac routes	3. Road repair and elevation 4. Plan for detours/rerouting 5. Add green infrastructure				3. H 4. M 5. H	3. O 4. L 5. O
Electric utility lines and substations	Town-wide	Eversource	V	Lines down Power outages Heat overwhelming grid	6. Explore renewable energy and storage 7. Vegetation to protect 8. Consider diversity of ways to heat/cool 9. Assess need for upgrade/replacement of substations				6. H 7. H 8. M 9. M	6. O 7. O 8. L 9. L
Bridges	Town-wide	Town State	S/V	Impacted by flooding and storms SLR impact to Granit Ave Bridge	10. Assess, repair, replace as needed				10. M	10. L
Public Transit (Trolly, bus, train)	Town-wide	MBTA	V	Flooding and storms disrupt service						
Stormwater infrastructure	Town-wide	Mixed Town/private	S/V	Flooding/precip impacts to infrastructure, habitat, and property damage	11. Implementation of OEM plan 12. Assess capacity and state of repair				11. M 12. H	11. O 12. S

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H · M · L	Time Short Long Ongoing
Socio-Economic										
Seniors/senior services	Town-wide	_	V	Health risks, lack of a/c Transportation to services (flood impacts) Power distruption--access to services Communication limits				1. Provide transportation services for senior/disabled to cooling/shelters 2. Reverse 911 and promotion of it	1. H 2. H	1. S 2. O
High school and middle school (public and catholic)	Town-wide	Town and Catholic	S	Heat waves and classrooms HS becomes a shelter (has A/C)			3. Policy/program for extreme heat days 4. Review and expand emergency prep plan		3. H 4. H	3. O 4. O
Elementary schools	Town-wide	Town and Catholic and private	V/S	lack of AC All are out of floodplain						
Milton Hospital	Town-wide	Private (BID)	S	Resource to the town Increase need for care/response			5. Investigate capacity issue		5. M	5. S
Business Districts	Town-wide	Private	S	flooding in locations (roadway access) Power outages--bus downtime				6. Do an assessment on who has backup power	6. M	6. O
Public Health Services	Town-wide	Town health dept, state, res. Fund, VNA	V/S	Access to resources Increased need for services Power outages (food pantries, no generators)			7. More robust medical reserve corps 8. Having Rx, food supply (for min of 2 weeks?) 9. Create a public health app and use Milton Cable		7. H 8. H 9.M	7. O 8. L 9. L
Milton Academy and Curry College	Town-wide	Independent	S	Residential pop--power outages Have back up power, A/C, etc.			10. Use Curry and Milton as cooling centers (review capacity issues)		10. M	10. M
Senior Housing	Town-wide	Private and housing authority	V/S	Unquity flooding risks Lack of cooling Strength is back up gen for seniors on life support No back up heat source			11. Facility upgrades for A/C 12. Backup power supply (w/ fuel resources)		11. M 12. M	11. O 12. O
Library	Town-wide	Town	S	Can serve as a cooling/warming center			13. Finalize plan for using library as cooling center		13. H	13. S

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

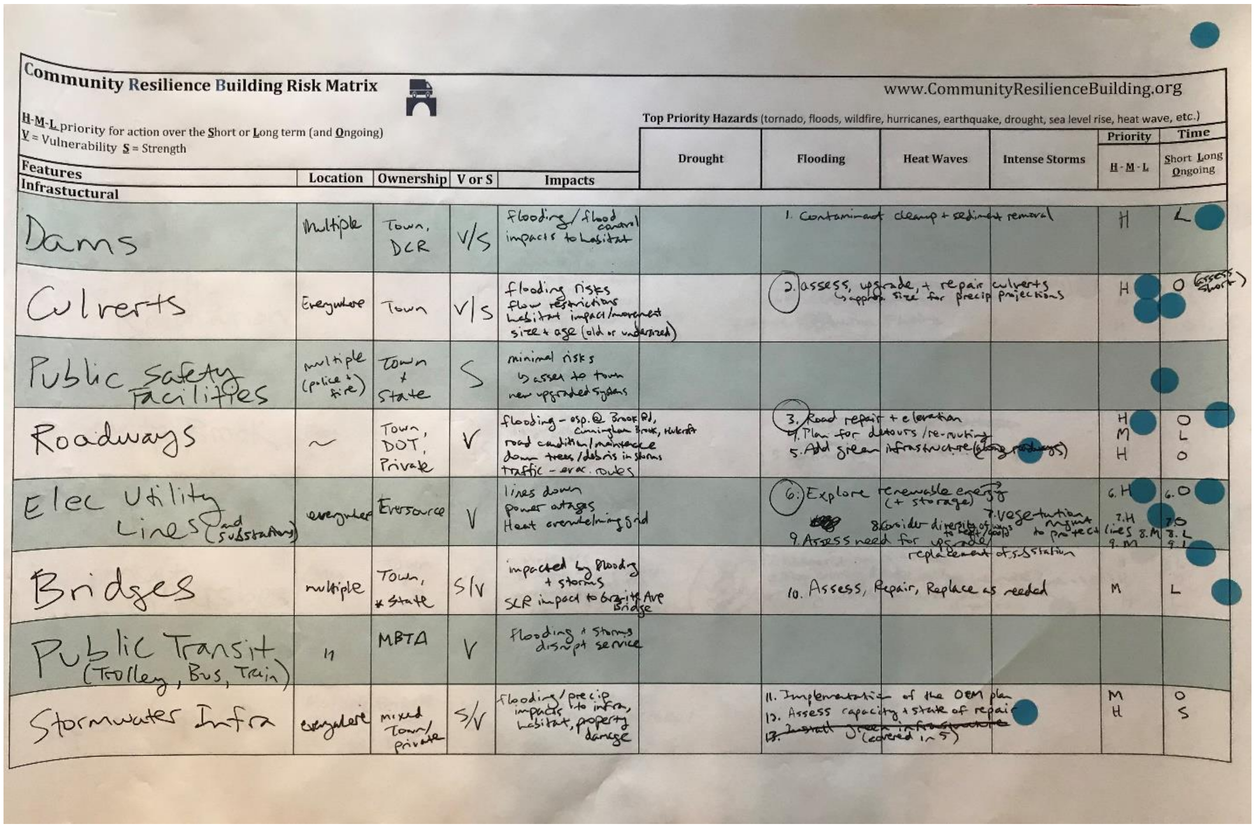
Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Environmental Justic Communities	NW Town	Residential	V	Transportation Lower income Language barriers Disability/age	1. Establish communication standards and strategy for Town				1. H	1. S
Immigrant Social Networks	Town-wide	Informal	S	Communication outlet Resource sharing	2. Develop action plan to reach residents not covered by communication outlets				2. M	2. S/L
Faith based groups	Town-wide	Non-profit	S	Provide direct support Social assistance Communication outlet	3. Develop partnership/resilience hub				3. M	3. S
Neighborhood associations	Town-wide	Non-profit	S	Provide feedback Resource Communication	4. Develop partnership/communication strategy				4. M	4. S
Low-income residents	Town-wide	_	V	Transportation Heating/cooling Insurance Health care	5. Develop needs assessment report to better understand emergency transportation and food/water needs				5. H	5. L
Senior residents	Town-wide	_	V	Child care Transportation Heating/cooling Insurance Health care						
Disabled residents	Town-wide	_	V	Transportation Heating/cooling Insurance Health care						
Children	Town-wide	_	V	Transportation Heating/cooling Health care Food/water						

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Senior population	Town-wide	_	V/S	Communication limitation Assistance--medical Housing options Mobility--check in	1. Improve database of senior population--connect existing directories, improve outreach materials, survey population on needs 2. Improve methods of communication				1. H 2. H	1. L 2. O
Environmental Justice community (immigrant, low income, ESL, minority)	Tucker	_	V/S	Financial limitations Public health Communications Community Engagement	3. Develop public education/outreach to specific community 4. Enhance level of civic engagement through community groups/neighborhood associations/sports/schools				3. H 4. M	3. O 4. O
Town communications	Town-wide	_	V	Limited options/availability Access varies	5. Develop E911/reverse notification 6. Develop additional methods of communication beyond social media/website (eliminate gaps)				5. H 6. H	5. S 6. O
Support services	Town-wide	_	V/S	USE Geographic distribution Level of planning	7. Assess existing facilities (public, private, churches, schools) for use as shelters/support centers 8. Emergency response drills/planning (messaging, neighborhood liasons/incident command)				7. H 8. H	7. S 8.L

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Elderly (housing, COA)	Town-wide	_	V	Unquity--flooding, heat, storms Heat-related illness Transportation Limited transportation Elderly w/o A/C	1. Investigate feasibility of purpose-based communities to services (multi-use?)		2. Establish accessible cooling centers	3. Risk and readiness assessments for elderly and public housing, schools	1. M 2. H 3. H	1. L 2. S 3. S
Communication	Town-wide	_	S/V	Lack of knowledge/announcements Power outages (Granite Ave)	4. Analysis of current stat of town communication system and study on how to expand/improve 5. Explore options to creat an inventory of disabled population			6. Work with existing communication channels to expand town-wide communication system to reach ALL residents	4. H 5. H 6. H	4. S 5. S/O 6. S
Environmental Justice community	Town-wide	_	V	English isolation Very small--often ignored Limited access to resources	7. Work with schools and churches to connect EJ population to resources during emergencies	8. Increase translations of Town communications		9. Education about how to access resilience funds (FEMA, South Shore Community Action, etc)	7. H 8. H 9. H	7. S 8. S 9. S
Emergency Services	Town-wide	Public Private	V	No children services at hospital Fire stations in need of replacement Police basement flooding		10. Ensure police and fire stations are resilient to flooding			10. H	10. S
Schools	Town-wide	Public Private	S/V	Not air conditioned Some have generators, not all	11. Build collaboration capacity with Milton Academy and Curry College		12. Renewable energy systems and sustainable cooling systems 13. Designate schools as formal shelters/cooling centers		11. M 12. H 13. H	11. O 12. L 13. S
Community Centers (library, houses of worship, MAC, cunningham, gyms, Legion, etc)	Town-wide	Public Private	S	S: gathering place/sheltering S: volunteer base	14. Needs/assest assessment of community centers and better communication about resources				14. M	14. O
Historical/Cultural sites	Town-wide	Private	V		15. Inventory/vulnerability assessment of cultural/historical sites				15. M	15. L

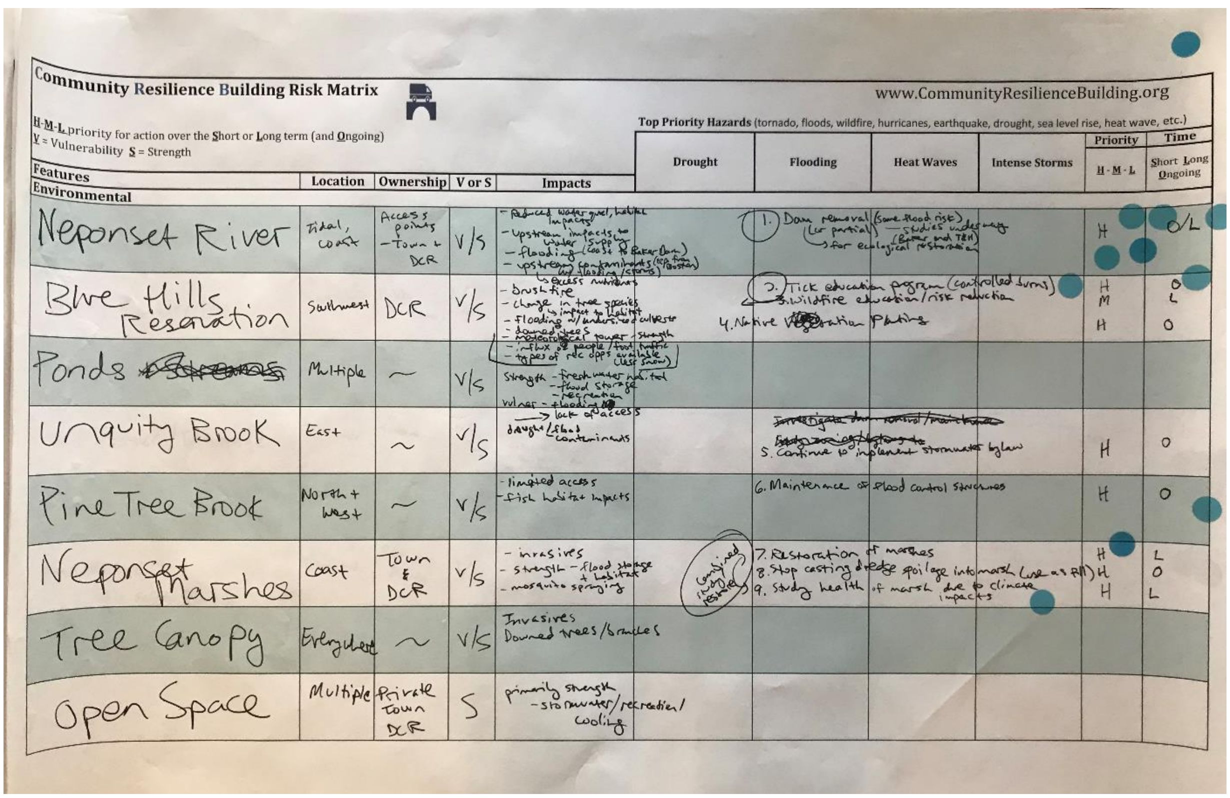


Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastuctural										
Dams	Multiple	Town, DCR	V/S	flooding/flood control impacts to habitat		1. Contaminant cleanup + sediment removal			H	L
Culverts	Everywhere	Town	V/S	flooding risks; flow restrictions; habitat impact/movement; size + age (old or undersized)		2. assess, upgrade, + repair culverts → appropriate size for precip projections			H	O (assess short)
Public Safety Facilities	multiple (police + fire)	Town + State	S	minimal risks → asset to town; new upgraded systems						
Roadways	~	Town, DOT, Private	V	flooding – esp. @ Brook Rd, Cunningham Brook, Hillcroft; road condition/maintenance; down trees/debris in storms; traffic – evac. routes		3. Road repair + elevation 4. Plan for detours/re-routing 5. Add green infrastructure ~~(along roadways)~~			H M H	O L O
Elec Utility Lines (and substations)	everywhere	Eversource	V	lines down; power outages; heat overwhelming grid		6. Explore renewable energy (+ storage) 7. vegetation mgmt to protect lines 8. Consider diversity of ways to heat/cool 9. Assess need for upgrade/replacement of substation			6. H 7. H 8. M 9. M	6. O 7. O 8. L 9. L
Bridges	multiple	Town, * State	S/V	impacted by flooding + storms; SLR impact to Granite Ave Bridge		10. Assess, Repair, Replace as needed			M	L
Public Transit (Trolley, Bus, Train)	"	MBTA	V	flooding + storms disrupt service						
Stormwater Infra	everywhere	mixed Town/private	S/V	flooding/precip impacts to infra, habitat, property damage		11. Implementation of the OEM plan 12. Assess capacity + state of repair ~~13. Install green infrastructure~~ (covered in 5)			M H	O S

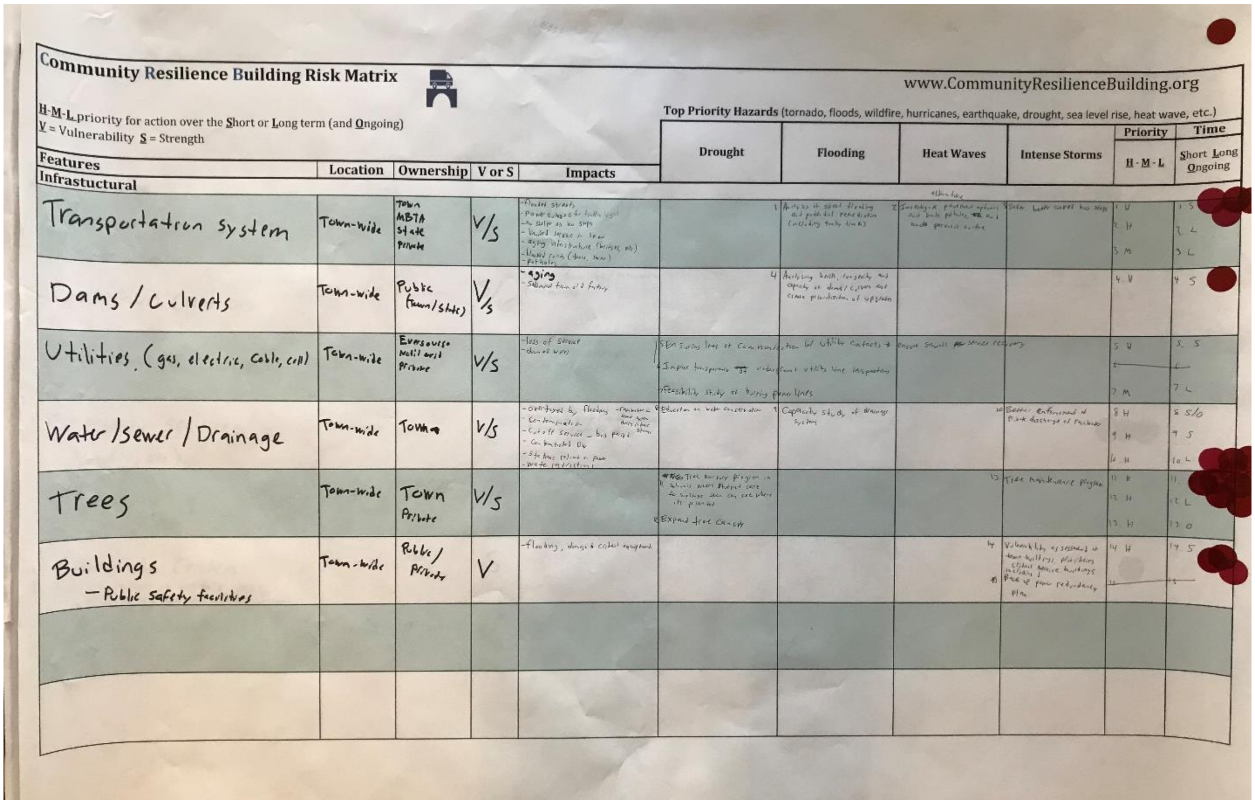


Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Neponset River	Tidal, coast	Access points – Town + DCR	V/S	– Reduced water qual, habitat impacts; – upstream impacts to water supply; – flooding (coast to Baker Dam); – upstream contaminants (esp from Boston) w/ flooding/storms → excess nutrients		1. Dam removal (some flood risk) (or partial) — studies underway (Baker and T&H) → for ecological restoration			H	O/L
Blue Hills Reservation	Southwest	DCR	V/S	– brush fire; – change in tree species → impact to habitat; – flooding w/ undersized culverts; – downed trees; – meteorological tower – strength; – influx of people/foot traffic; – types of rec opps available (less snow)	4. Native Vegetation Planting	2. Tick education program (controlled burns) 3. wildfire education/risk reduction			H M H	O L O
Ponds ~~[illegible]~~	Multiple	~	V/S	Strength – fresh water habitat – flood storage – recreation; vulner – flooding → lack of access						
Unquity Brook	East	~	V/S	drought/flood contaminants		~~Investigate dam removal/maintenance~~ ~~[illegible]~~ 5. Continue to implement stormwater bylaw			H	O
Pine Tree Brook	North + West	~	V/S	– limited access; – fish habitat impacts		6. Maintenance of flood control structures			H	O
Neponset Marshes	Coast	Town & DCR	V/S	– invasives; – strength – flood storage + habitat; – mosquito spraying	Combined study/restore	7. Restoration of marshes 8. Stop casting dredge spoilage into marsh (use as fill) 9. Study health of marsh due to climate impacts			H H H	L O L
Tree Canopy	Everywhere	~	V/S	Invasives; Downed trees/branches						
Open Space	Multiple	Private, Town, DCR	S	primarily strength – stormwater/recreation/cooling						

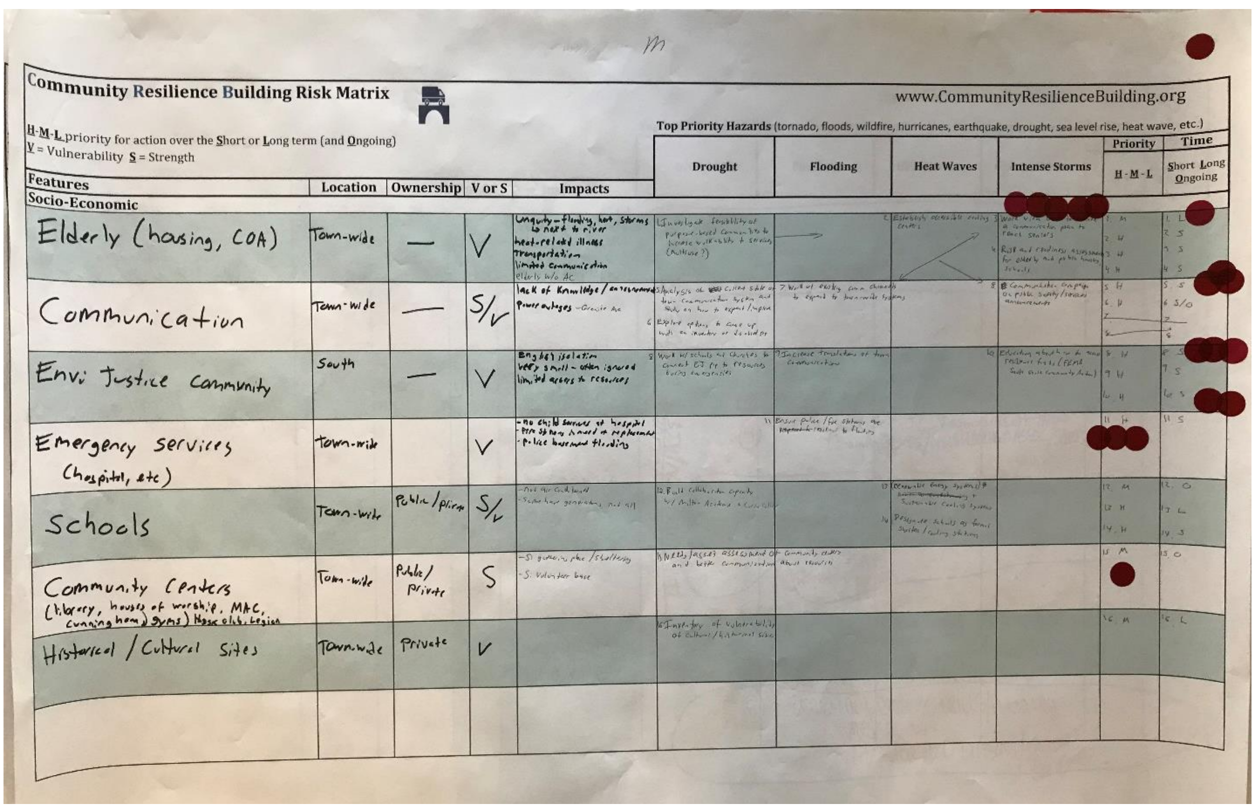


Community Resilience Building Risk Matrix — www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastructural										
Transportation system	Town-wide	Town, MBTA, State, Private	V/S	-Flooded streets -Power outages for traffic lights -No shelter at bus stops -Limited service in snow -aging infrastructure (bridges, etc) -blocked roads (trees, snow) -potholes		1 Analysis of street flooding and potential remediation (including trolley tracks)	2 Investigate pavement options that limit potholes and needs pervious surface	3 Safe, better covered bus stops	1 H, 2 H, 3 M	1 S, 2 L, 3 L
Dams / culverts	Town-wide	Public (town/state)	V/S	-aging -[illegible]		4 Analyzing health, longevity and capacity of dams/culverts and create prioritization of upgrades			4 H	4 S
Utilities (gas, electric, cable, cell)	Town-wide	Eversource, National Grid, Private	V/S	-loss of service -downed wires	5 Ensuring lines of communication w/ utility contacts + ensure smooth service recovery; 6 Improve transparency of underground utility line inspection; 7 Feasibility study of burying power lines				5 H, 7 M	5 S, 7 L
Water / Sewer / Drainage	Town-wide	Town	V/S	-overtaxed by flooding -contamination -Cut off service -[illegible]	8 Education on water conservation	9 Capacity study of drainage system		10 Better enforcement of illicit discharge of [illegible]	8 H, 9 H, 10 H	8 S/O, 9 S, 10 L
Trees	Town-wide	Town, Private	V/S		11 Tree nursery program in schools where students care for saplings then can see where it's planted; 12 Expand tree canopy			13 Tree maintenance program	11 H, 12 H, 13 H	11 [illegible], 12 L, 13 O
Buildings – Public safety facilities	Town-wide	Public / Private	V	-flooding, damage to critical equipment				14 Vulnerability assessment of town buildings, prioritizing critical service buildings [illegible]; 15 Back up power redundancy plan	14 H	14 S

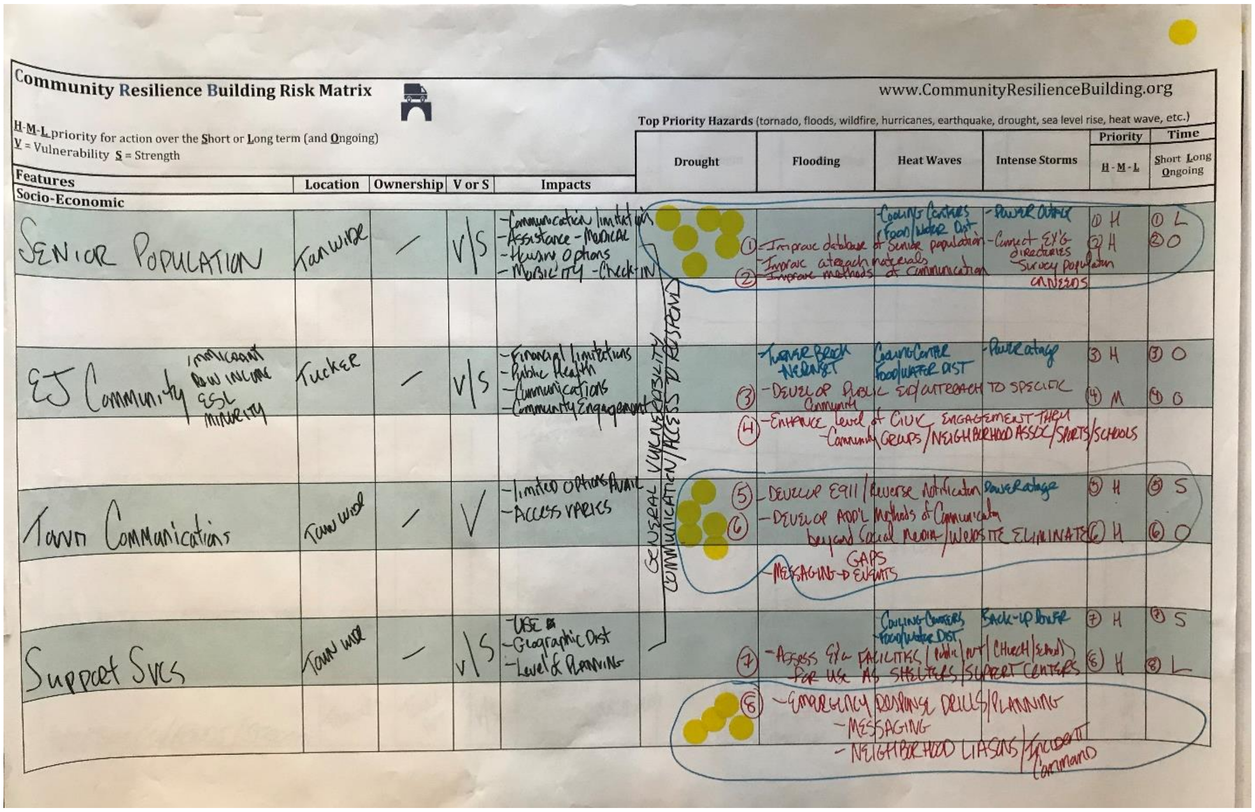


Community Resilience Building Risk Matrix — www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Elderly (housing, COA)	Town-wide	—	V	Ubiquity – flooding, heat, storms; next to river; heat-related illness; Transportation; limited communication; elderly w/o AC	1 Investigate feasibility of purpose-based communities to increase walkability + services (Multiuse?)		2 Establish accessible cooling centers	3 Work with [illegible] a communication plan to reach seniors; 4 Risk and resiliency assessment for elderly and public housing, schools	1 M, 2 H, 3 H, 4 H	1 L, 2 S, 3 S, 4 S
Communication	Town-wide	—	S/V	lack of knowledge/awareness; Power outages – Granite Ave	5 Analysis of current state of town communication system and study on how to expand/improve; 6 Explore options to [illegible]	7 Work w/ existing communications to expand to town-wide systems		8 Communication campaign on public safety/services announcements	5 H, 6 H	5 S, 6 S/O
Envi Justice Community	South	—	V	English isolation; very small – often ignored; limited access to resources	8 Work w/ schools + churches to connect EJ pop to resources during emergencies	9 Increase translation of town communication		10 Educating about [illegible] resilience hubs (FEMA [illegible])	8 H, 9 H, 10 H	8 S, 9 S, 10 S
Emergency services (hospital, etc)	town-wide		V	-no child services at hospital -Fire stations in need of replacement -Police basement flooding		11 Ensure police/fire stations are resilient to flooding			11 H	11 S
Schools	Town-wide	Public / private	S/V	-Not air conditioned -Some have generators, not all	12 Build collaborative capacity w/ Milton Academy + Curry College		13 Renewable energy systems + sustainable cooling systems; 14 Designate schools as formal shelters / cooling stations		12 M, 13 H, 14 H	12 O, 13 L, 14 S
Community Centers (library, houses of worship, MAC, Cunningham, gyms) Masonic club, Legion	Town-wide	Public / Private	S	-S: gathering place / sheltering -S: Volunteer base	15 Needs/asset assessment of community centers and better communication about resources				15 M	15 O
Historical / Cultural sites	Town-wide	Private	V		16 Inventory of vulnerability of cultural/historical sites				16 M	16 L



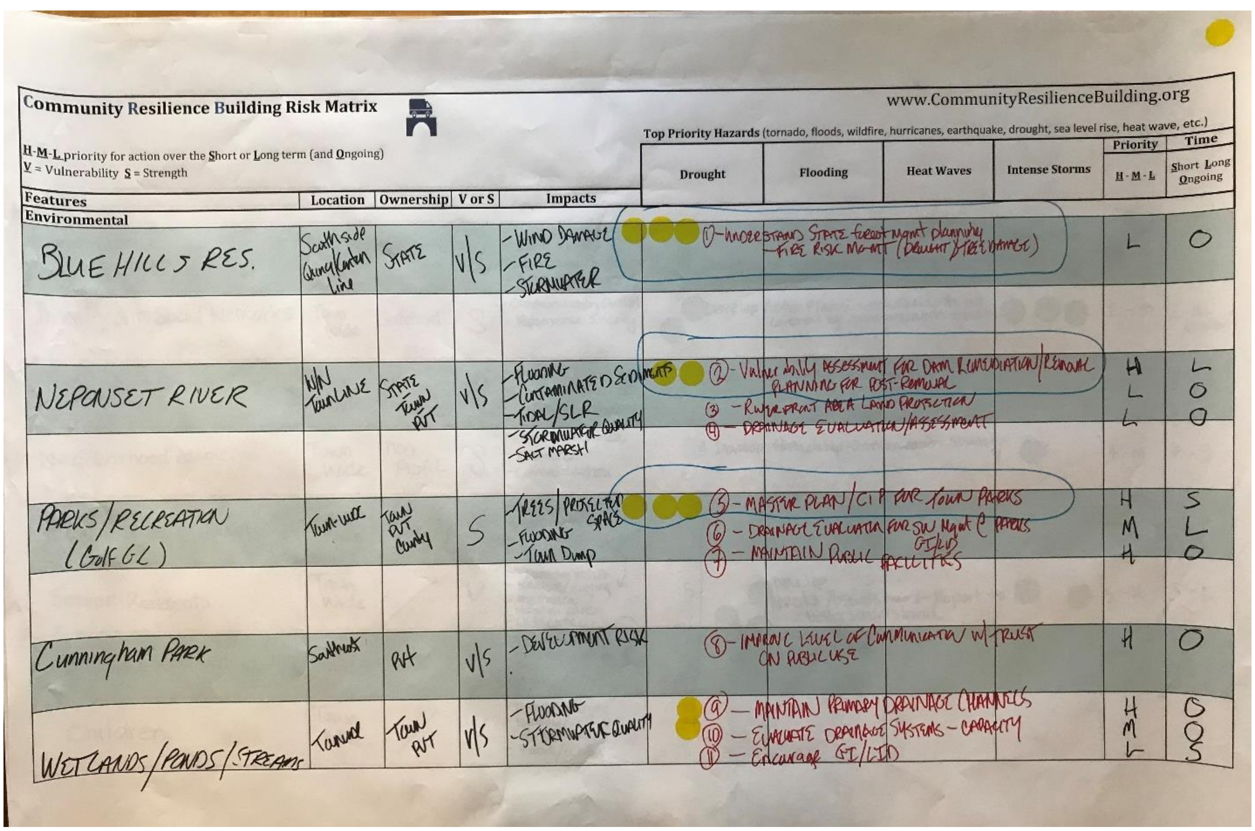
Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Senior Population	Townwide	/	V/S	-Communication limitations -Assistance - Medical -Housing Options -Mobility -Check-in	① -Improve database of Senior population -Improve outreach materials ② -Improve methods of communication	Cooling Centers Food/Water Dist	-Power Outage -Connect EY'G directories Survey population needs	① H ② H	① L ② O
EJ Community (Immigrant, Low income, ESL, Minority)	Tucker	/	V/S	-Financial limitations -Public Health -Communications -Community Engagement	③ -Develop Public Ed/Outreach to specific Community ④ -Enhance level of Civic Engagement thru Community Groups/Neighborhood Assoc/Sports/Schools	Neponset River Cooling Center Food/Water Dist	-Power outage	③ H ④ M	③ O ④ O
Town Communications	Town wide	/	V	-Limited options avail -Access varies	⑤ -Develop E911/Reverse Notification ⑥ -Develop add'l methods of communication beyond social media/website eliminate gaps -Messaging → events		Power outage	⑤ H ⑥ H	⑤ S ⑥ O
Support Svcs	Town wide	/	V/S	-Use -Geographic Dist -Level of Planning	⑦ -Assess e/o facilities (public/pvt/church/school) for use as shelters/support centers ⑧ -Emergency response drills/planning -Messaging -Neighborhood liaisons/Incident Command	Cooling Centers Food/Water Dist	Back-up Power	⑦ H ⑧ H	⑦ S ⑧ L

General Vulnerability Communication/Access to Response

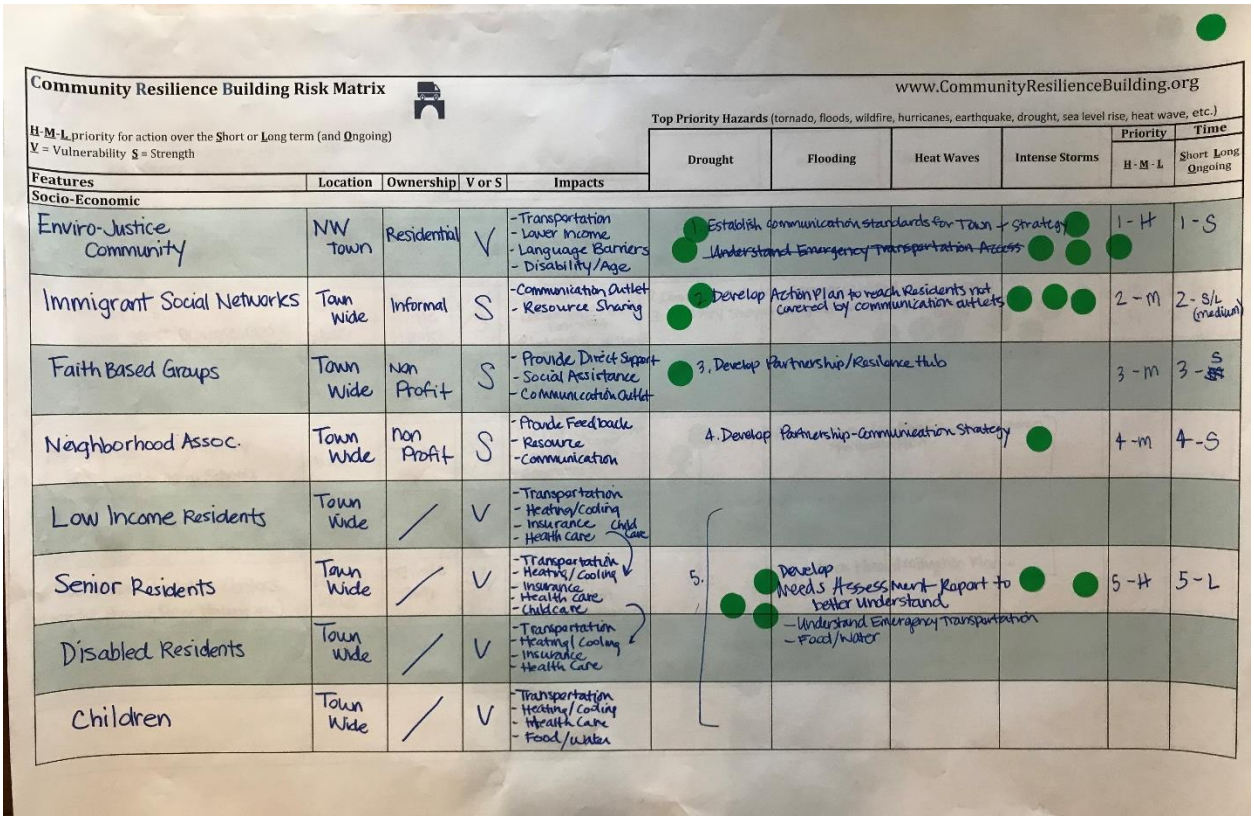


Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought / Flooding / Heat Waves / Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental							
Blue Hills Res.	Southside Quincy/Canton Line	State	V/S	-Wind Damage -Fire -Stormwater	① -Understand State forest mgmt planning -Fire risk mgmt (drought/tree damage)	L	O
Neponset River	N/N Townline	State Town Pvt	V/S	-Flooding -Contaminated Sediments -Tidal/SLR -Stormwater Quality -Salt Marsh	② -Vulnerability assessment for dam remediation/removal planning for post-removal ③ -Riverfront area land protection ④ -Drainage evaluation/assessment	H L L	L O O
Parks/Recreation (Golf GC)	Town-wide	Town Pvt County	S	-Trees/Protected Space -Flooding -Town Dump	⑤ -Master Plan/CIP for Town Parks ⑥ -Drainage evaluation for SW Mgmt @ parks GI/LID ⑦ -Maintain public facilities	H M H	S L O
Cunningham Park	Southeast	Pvt	V/S	-Development Risk	⑧ -Improve level of communication w/ Trust on public use	H	O
Wetlands/Ponds/Streams	Townwide	Town Pvt	V/S	-Flooding -Stormwater Quality	⑨ -Maintain primary drainage channels ⑩ -Evaluate drainage systems - capacity ⑪ -Encourage GI/LID	H M L	O O S

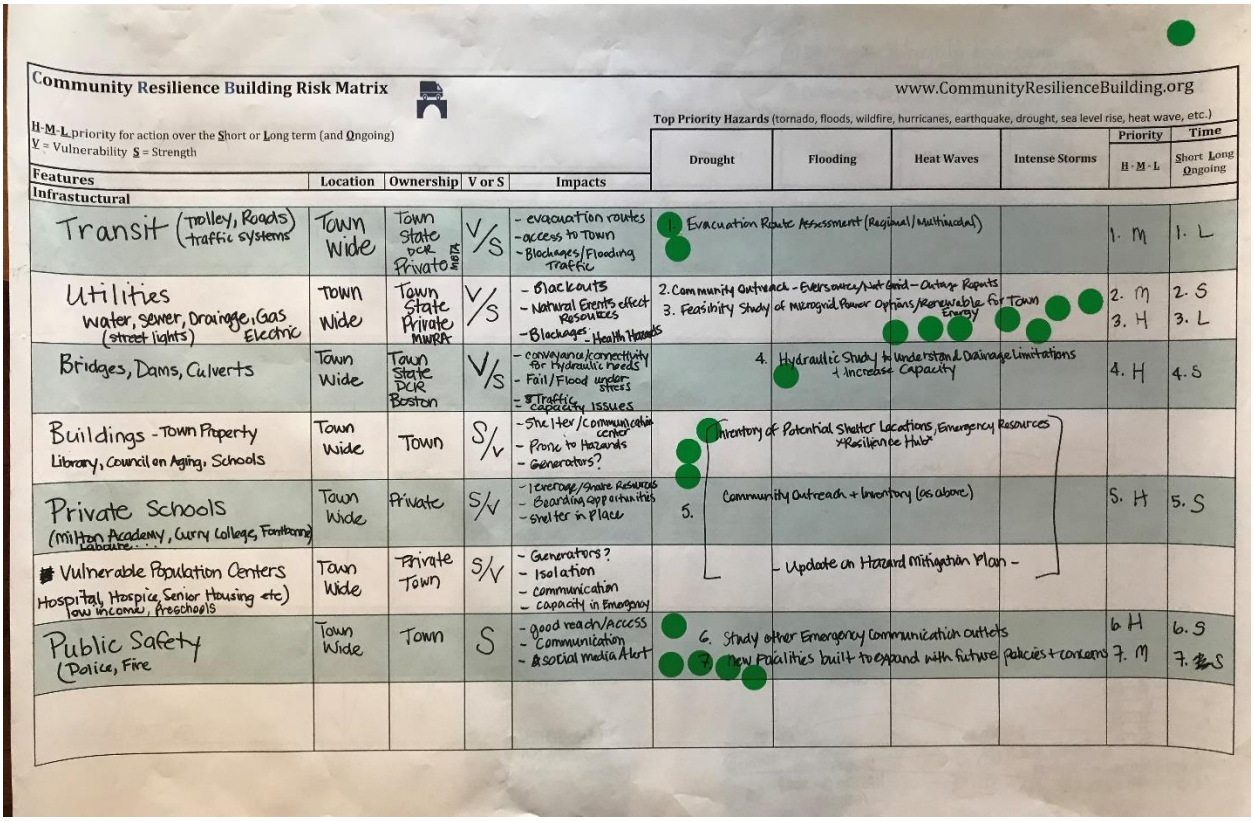


Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Enviro-Justice Community	NW Town	Residential	V	- Transportation - Lower Income - Language Barriers - Disability/Age	1. Establish communication standards for Town + Strategy Understand Emergency Transportation Access				1 - H	1 - S
Immigrant Social Networks	Town Wide	Informal	S	- Communication Outlet - Resource Sharing	2. Develop Action Plan to reach Residents not covered by communication outlets				2 - M	2 - S/L (medium)
Faith Based Groups	Town Wide	Non Profit	S	- Provide Direct Support - Social Assistance - Communication Outlet	3. Develop Partnership/Resilience Hub				3 - M	3 - S
Neighborhood Assoc.	Town Wide	non Profit	S	- Provide Feedback - Resource - Communication	4. Develop Partnership-Communication Strategy				4 - M	4 - S
Low Income Residents	Town Wide	/	V	- Transportation - Heating/Cooling - Insurance - Health Care Child Care	5.	Develop Needs Assessment Report to better understand - Understand Emergency Transportation - Food/Water			5 - H	5 - L
Senior Residents	Town Wide	/	V	- Transportation - Heating/Cooling - Insurance - Health Care - Childcare						
Disabled Residents	Town Wide	/	V	- Transportation - Heating/Cooling - Insurance - Health Care						
Children	Town Wide	/	V	- Transportation - Heating/Cooling - Health Care - Food/Water						

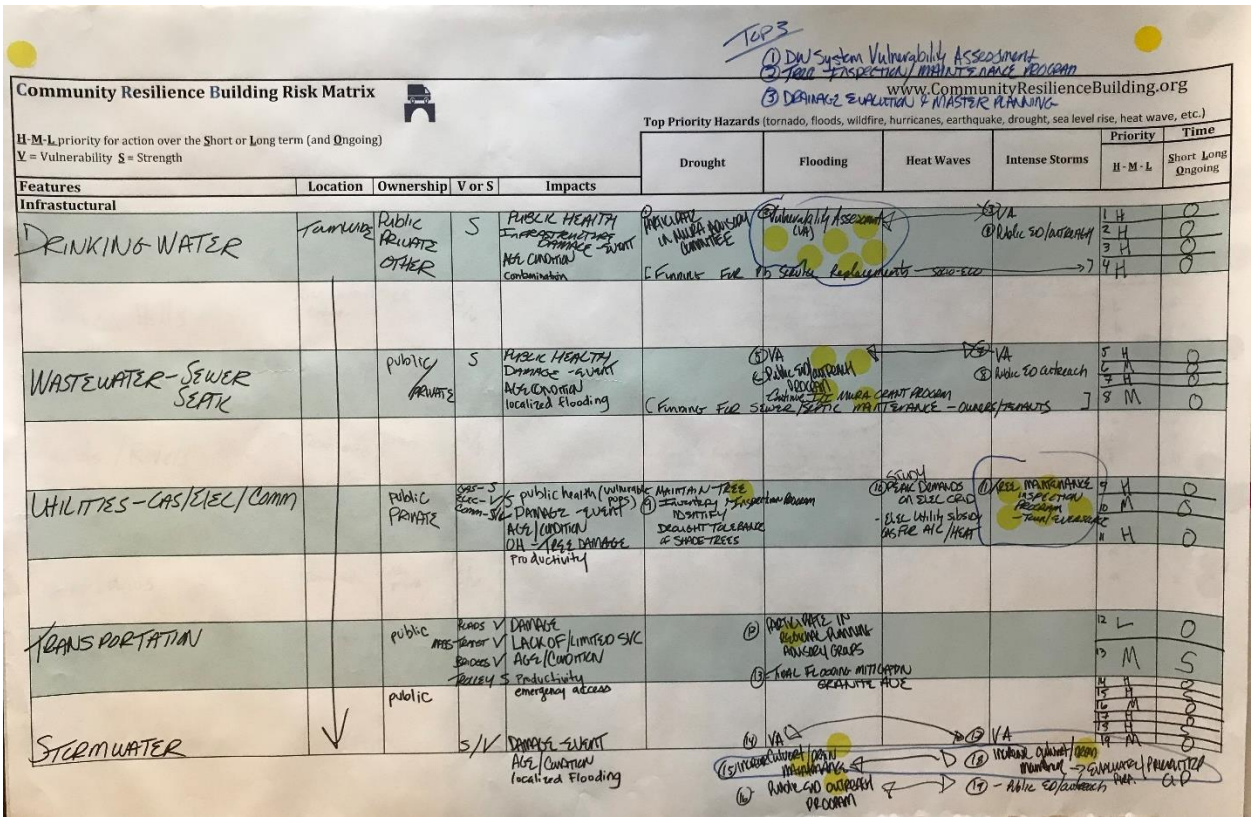


Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastuctural										
Transit (Trolley, Roads) Traffic systems	Town Wide	Town State DCR Private MBTA	V/S	- evacuation routes - access to Town - Blockages/Flooding Traffic	1. Evacuation Route Assessment (Regional/Multimodal)				1. M	1. L
Utilities Water, Sewer, Drainage, Gas Electric (street lights)	Town Wide	Town State Private MWRA	V/S	- Blackouts - Natural Events effect Resources - Blockages - Health Hazards	2. Community Outreach - Eversource/Net Grid - Outage Reports 3. Feasibility Study of Microgrid Power Options/Renewable for Town Energy				2. M 3. H	2. S 3. L
Bridges, Dams, Culverts	Town Wide	Town State DCR Boston	V/S	- conveyance/connectivity for Hydraulic needs! - Fail/Flood under-stress - Traffic capacity issues	4. Hydraulic Study to understand Drainage Limitations + Increase Capacity				4. H	4. S
Buildings - Town Property Library, Council on Aging, Schools	Town Wide	Town	S/V	- Shelter/Communication center - Prone to Hazards - Generators?	1. Inventory of Potential Shelter Locations, Emergency Resources + Resilience Hubs					
Private Schools (Milton Academy, Curry College, Fontbonne Academy, Labcure)	Town Wide	Private	S/V	- Leverage/Share Resources - Boarding opportunities - Shelter in Place	5. Community Outreach + Inventory (as above)				5. H	5. S
Vulnerable Population Centers Hospital, Hospice, Senior Housing etc) low income, Preschools	Town Wide	Private Town	S/V	- Generators? - Isolation - communication - capacity in Emergency	- Update on Hazard Mitigation Plan -					
Public Safety (Police, Fire	Town Wide	Town	S	- good reach/access - Communication - Social media Alert	6. Study other Emergency Communication outlets 7. New Facilities built to expand with future policies + concerns				6 H 7. M	6. S 7. S



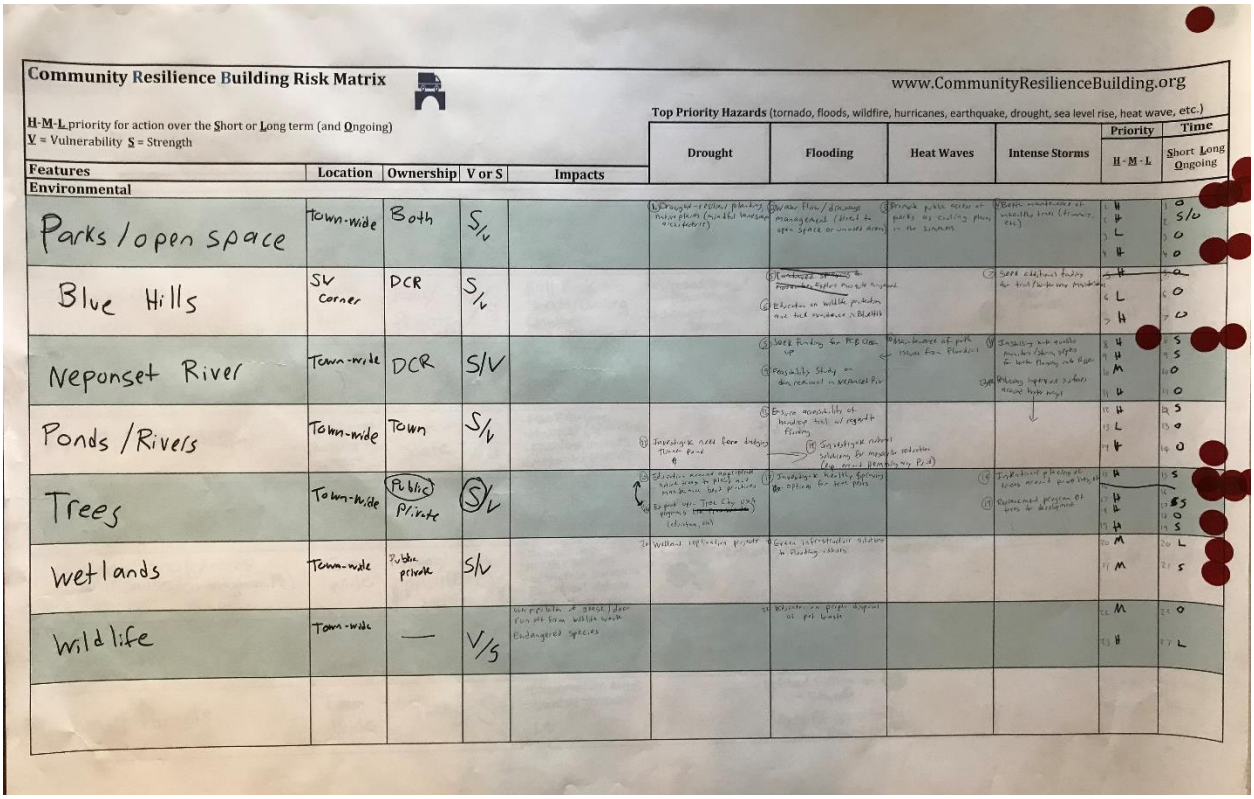
Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastructural										
DRINKING WATER	Townwide	Public Private Other	S	PUBLIC HEALTH Infrastructure Damage - Event Age/Condition Contamination					1 H 2 H 3 H 4 H	O O O O
WASTEWATER - SEWER SEPTIC		public / private	S	PUBLIC HEALTH Damage - Event Age/Condition localized flooding					5 H 6 H 7 H 8 M	O O O O
UTILITIES - GAS/ELEC/Comm		public private	Gas - S Elec - V/S Comm - S/V	public health (vulnerable pops) Damage - Event Age/Condition OH - Age Damage Productivity					9 H 10 M 11 H	O O O
TRANSPORTATION		public	Roads V Transit V Bridges V Trolley S	Damage Lack of/Limited S/C Age/Condition Productivity emergency access					12 L 13 M 14 H 15 H 16 M 17 H 18 H 19 M	O S O O O O O O
STORMWATER		public	S/V	Damage - Event Age/Condition localized Flooding						



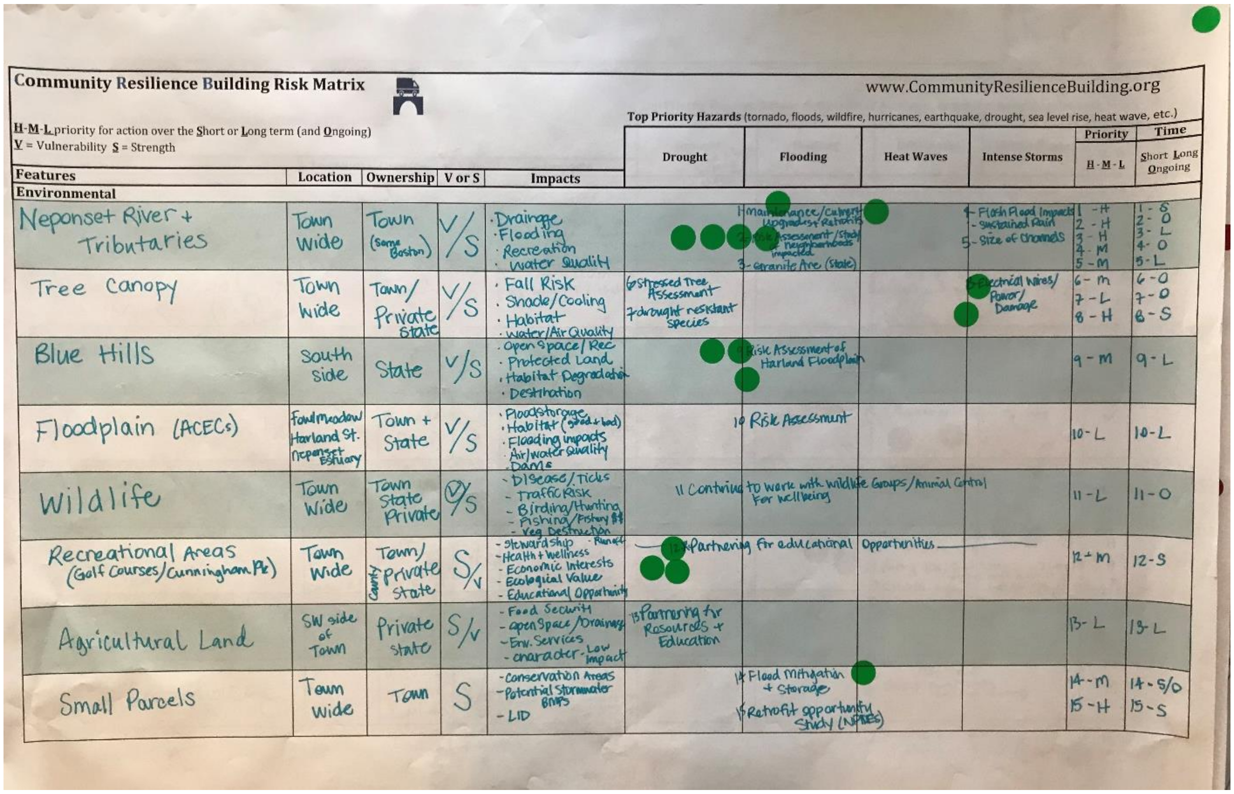
Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Parks / open space	Town-wide	Both	S/V						1 H 2 H 3 L 4 H	O S/V O O
Blue Hills	SW corner	DCR	S/V						5 H 6 L 7 H	O O O
Neponset River	Town-wide	DCR	S/V						8 H 9 H 10 M 11 H	S S O O
Ponds / Rivers	Town-wide	Town	S/V						12 H 13 L 14 H	S O O
Trees	Town-wide	Public Private	S/V						15 H 16 H 17 H 18 H 19 H	S S O S S
Wetlands	Town-wide	Public private	S/V						20 M 21 M	L S
Wildlife	Town-wide	—	V/S						22 M 23 H	O L

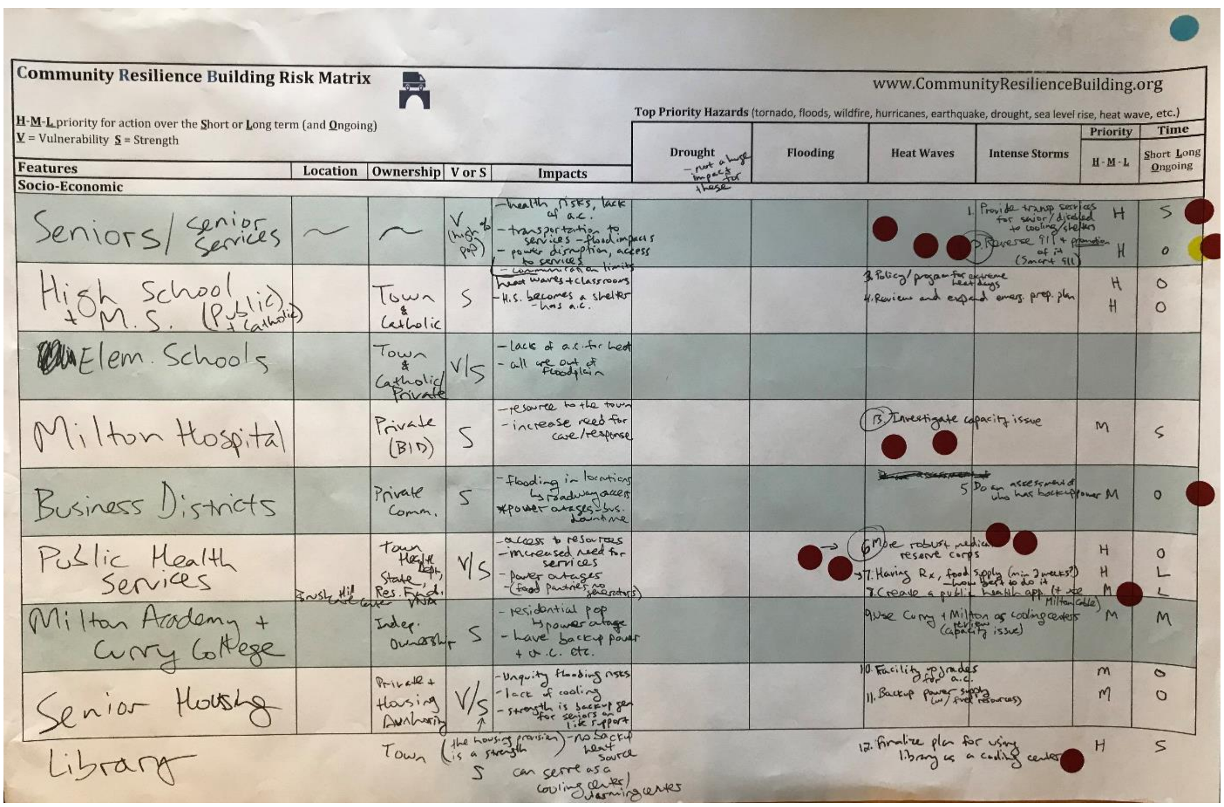


Community Resilience Building Risk Matrix — www.CommunityResilienceBuilding.org

H-M-L priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Environmental										
Neponset River + Tributaries	Town Wide	Town (Some Boston)	V/S	· Drainage · Flooding · Recreation · Water Quality		1 Maintenance/Culvert Upgrades + Retrofits; 2 Risk Assessment/Study of neighborhoods impacted; 3 - Granite Ave (State)		4 - Flash Flood Impacts - Sustained Rain; 5 - Size of Channels	1 - H, 2 - H, 3 - H, 4 - M, 5 - M	1 - S, 2 - O, 3 - L, 4 - O, 5 - L
Tree Canopy	Town Wide	Town/ Private State	V/S	· Fall Risk · Shade/Cooling · Habitat · Water/Air Quality	6 Stressed Tree Assessment; 7 drought resistant species			8 Electrical Wires/ Power/ Damage	6 - M, 7 - L, 8 - H	6 - O, 7 - O, 8 - S
Blue Hills	South side	State	V/S	· Open Space/ Rec · Protected Land · Habitat Degradation · Destination		9 Risk Assessment of Harland Floodplain			9 - M	9 - L
Floodplain (ACECs)	Fowl Meadow, Harland St., Neponset Estuary	Town + State	V/S	· Floodstorage · Habitat (good + bad) · Flooding impacts · Air/water Quality · Dams		10 Risk Assessment			10 - L	10 - L
Wildlife	Town Wide	Town State Private	V/S	- Disease/Ticks - Traffic Risk - Birding/Hunting - Fishing/Fishery $$ - Veg Destruction	11 Continue to work with wildlife Groups/Animal Control For wellbeing				11 - L	11 - O
Recreational Areas (Golf Courses/Cunningham Pk)	Town Wide	Town/ County Private State	S/V	- Stewardship - Runoff - Health + Wellness - Economic Interests - Ecological Value - Educational Opportunity	12 Partnering for educational Opportunities				12 - M	12 - S
Agricultural Land	SW side of Town	Private State	S/V	- Food Security - Open Space/Drainage - Env. Services - character - Low impact	13 Partnering for Resources + Education				13 - L	13 - L
Small Parcels	Town Wide	Town	S	- Conservation Areas - Potential Stormwater BMPs - LID		14 Flood Mitigation + Storage; 15 Retrofit opportunity Study (NPDES)			14 - M, 15 - H	14 - S/O, 15 - S



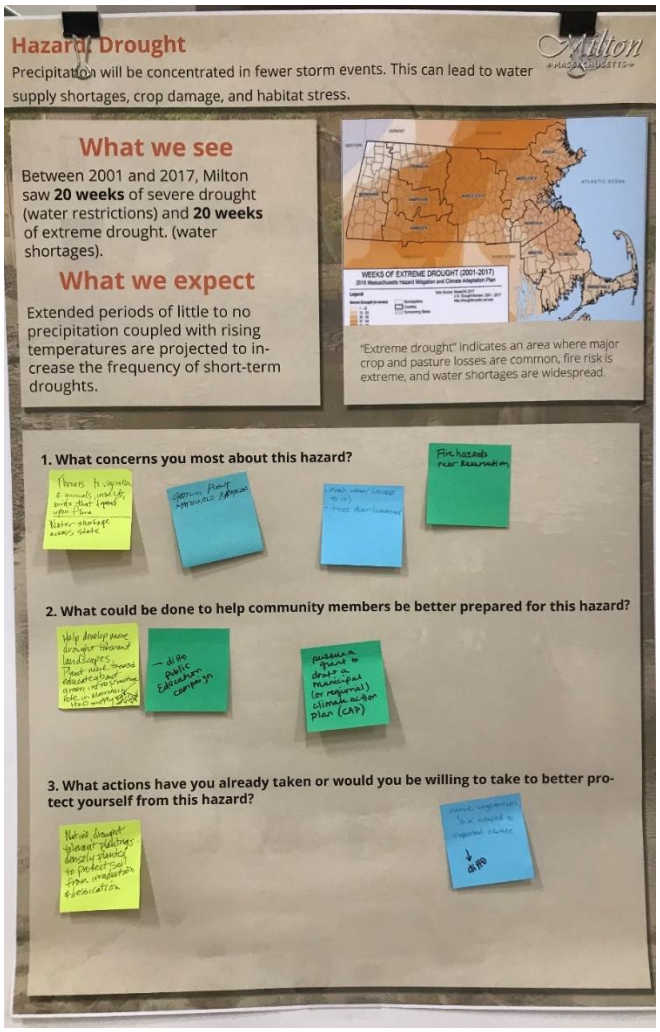
Community Resilience Building Risk Matrix — www.CommunityResilienceBuilding.org

H-M-L priority for action over the **S**hort or **L**ong term (and **O**ngoing)
V = Vulnerability **S** = Strength

Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

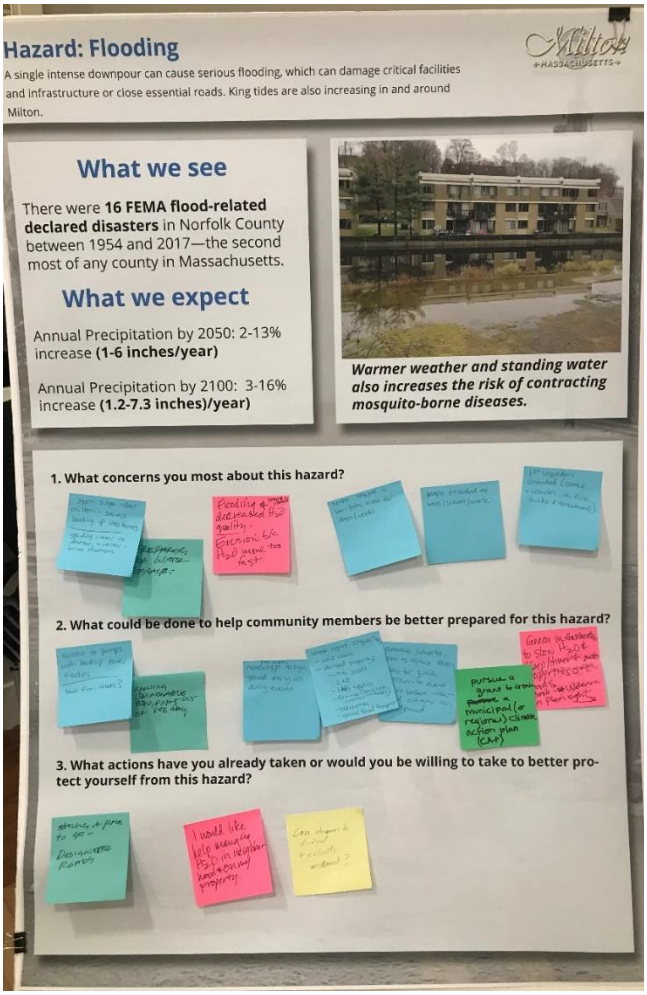
Features	Location	Ownership	V or S	Impacts	Drought – not a huge impact for these	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Seniors/ Senior Services	~	~	V (high % pop)	- health risks, lack of a.c. - transportation to services - flood impacts - power disruption, access to services - communication limits				1. Provide transp services for senior/disabled to cooling/shelters; 2. Reverse 911 + promotion of it (Smart 911)	H, H	S, O
High School + M.S. (Public + Catholic)		Town & Catholic	S	heat waves + classrooms - H.S. becomes a shelter - has a.c.			3. Policy/program for extreme heat days; 4. Review and expand emerg. prep. plan		H, H	O, O
Elem. Schools		Town & Catholic/ Private	V/S	- lack of a.c. for heat - all are out of floodplain						
Milton Hospital		Private (BID)	S	- resource to the town - increase need for care/response			13 Investigate capacity issue		M	S
Business Districts		Private Comm.	S	- flooding in locations ↳ roadway access * power outages - bus. downtime				5 Do an assessment of who has backup power	M	O
Public Health Services	Brush Hill Care Center	Town Health Dept., State, Res. Fund. VNA	V/S	- access to resources - increased need for services - power outages - (food pantries, no generators)			6 More robust medical reserve corps; 7. Having Rx, food supply (min 2 weeks?) – how best to do it; 8. Create a public health app. (+ use Milton Cable)		H, H, M	O, L, L
Milton Academy + Curry College		Indep. Ownership	S	- residential pop ↳ power outage - have backup power + a.c. etc.			9. Use Curry + Milton as cooling centers (review capacity issue)		M	M
Senior Housing		Private + Housing Authority	V/S	- Unquity flooding risks - lack of cooling - strength is backup gen for seniors on life support (the housing provision is a strength)			10. Facility upgrades for a.c.; 11. Backup power supply (w/ fuel resources)		M, M	O, O
Library		Town	S	- no backup heat source; can serve as a cooling center/ warming centers			12. Finalize plan for using library as a cooling center		H	S

APPENDIX 5: COMMUNITY INPUT FROM LISTENING SESSION



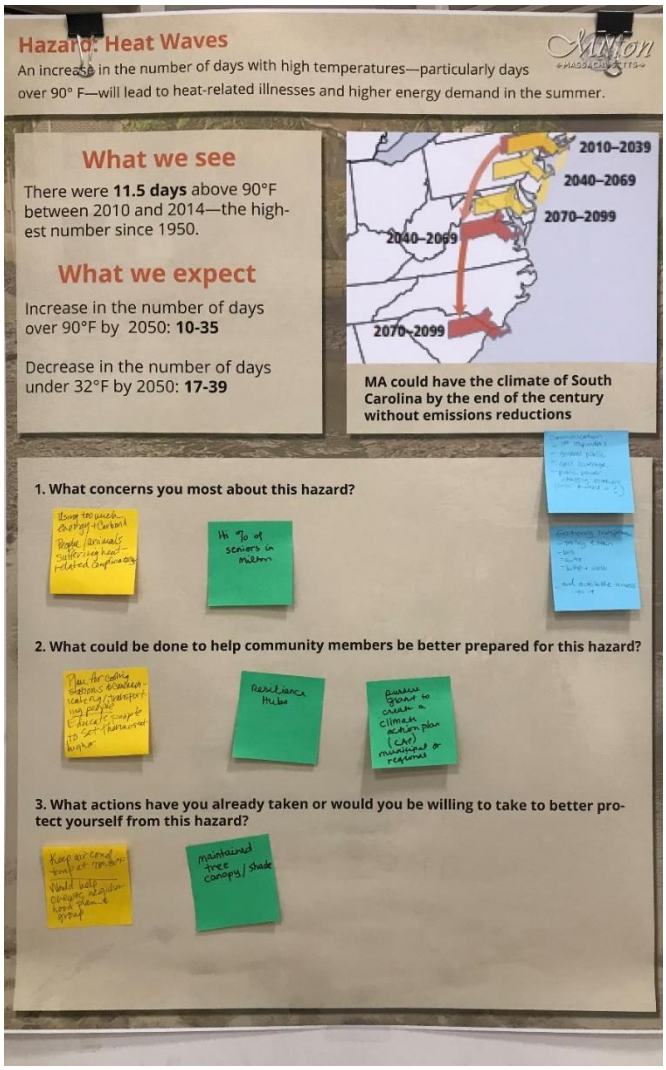
Concerns	What can be done?	Action taken or willing to take
Threats to vegetation and animals, insects, birds that depend on flora	Help develop more drought-tolerant landscapes. Plant more trees and educate about green infrastructure role in maintaining water supply	Native drought tolerant plantings, densely planted to protect soil from eradication and desiccation
Water shortage across state	Partner with the library to make the book Water in Plain Sight the Book of the Month or a Milton Reads book	Need a good tree list for street trees
Getting plants and animals protected	Public education campaign	Native vegetation or adapted to expected climate
Access to fresh water	Produce a grant to draft a municipal (or regional) climate action plan	
Trees down or weakened		

Fire hazards near reservation		

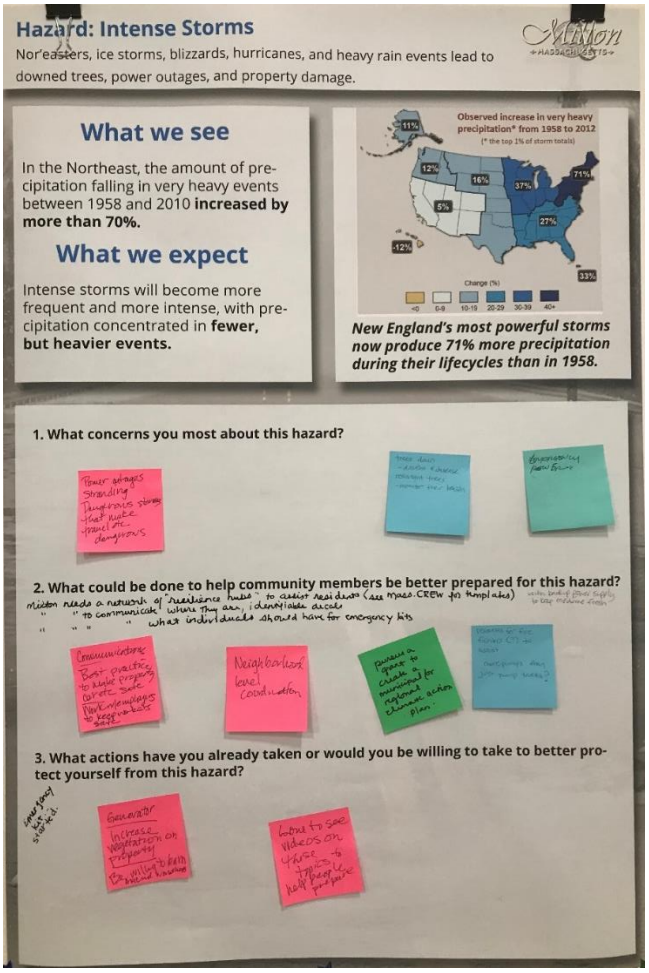


Concerns	What can be done?	Action taken or willing to take
Storm surge in East Milton--sewers backing up into homes	Prepare for water storage	Having a place to go
Standing water leading to disease and vector-borne diseases	Access to pumps with backup power supplies	Designated roads
Flooding decreasing water quality	Buck flow valves	I would like help managing water in neighborhood and on my property
Erosion because of water moving too fast	Moving vulnerable equipment out of the way	Can streams be dredged and culverts widened?
People trapped in low-lying areas for days/weeks	Move public safety equipment to high ground early on during events	

People stranded at home/work/school	Waste management staging areas: solid waste and damaged property (white goods, C & D, bldg. supplies, furniture, electronics, spoiled food and compost)	
1st responders stranded/ staff and vehicles (i.e. fire trucks and ambulances)	Evaluate culverts, plan to replace them, ideas for quick diversion if event occurs before under-sized culverts can be replaced	
	Pursue a grant to create a municipal or regional climate action plan	
	Green infrastructure to slow water and keep/divert on to properties and off roads	
	Educate homeowners and share best practices	



Concerns	What can be done?	Action taken or willing to take
Using too much energy and carbon	Plan for cooling stations and communicating/transporting people	Keep air conditioning temp at 78-80 degrees
People/animals suffering heat related complications	Educate people to set thermostat higher	Would help create neighborhood plan and group
High percentage of seniors in Milton	Resilience hubs	Maintained tree canopy/shade
Communications (1st responders, general public, cell coverage, public power charging stations)	Pursue a grant to create a climate action plan--municipal or regional	
Functioning transportation (trolly, train, bus, auto, bike, walk) and available access to it		



Concerns	What can be done?	Action taken or willing to take
Power outages	Drought and disease resistant trees	Emergency kit started
Stranding	Monitor tree health	Generator
Dangerous storms that make travel etc. dangerous	Communications	Increase vegetation on property
Trees down	Best practices to make property and car safe	By willing to learn
	Work with employees to keep workers safe	Attend workshops
	Neighborhood level coordination	See videos on this topic to help people prepare
	Pursue a grant to create a municipal or regional climate action plan	

	Resources for fire fighters to assist	
	More pumps than just pump trucks	
	Network of resilience hubs to assist residents (see Mass CREW for templates)--should have back-up power supply to keep medicine fresh	
	Communicate where they are, identifiable decals	
	Communicate what individuals should have for emergency kits	