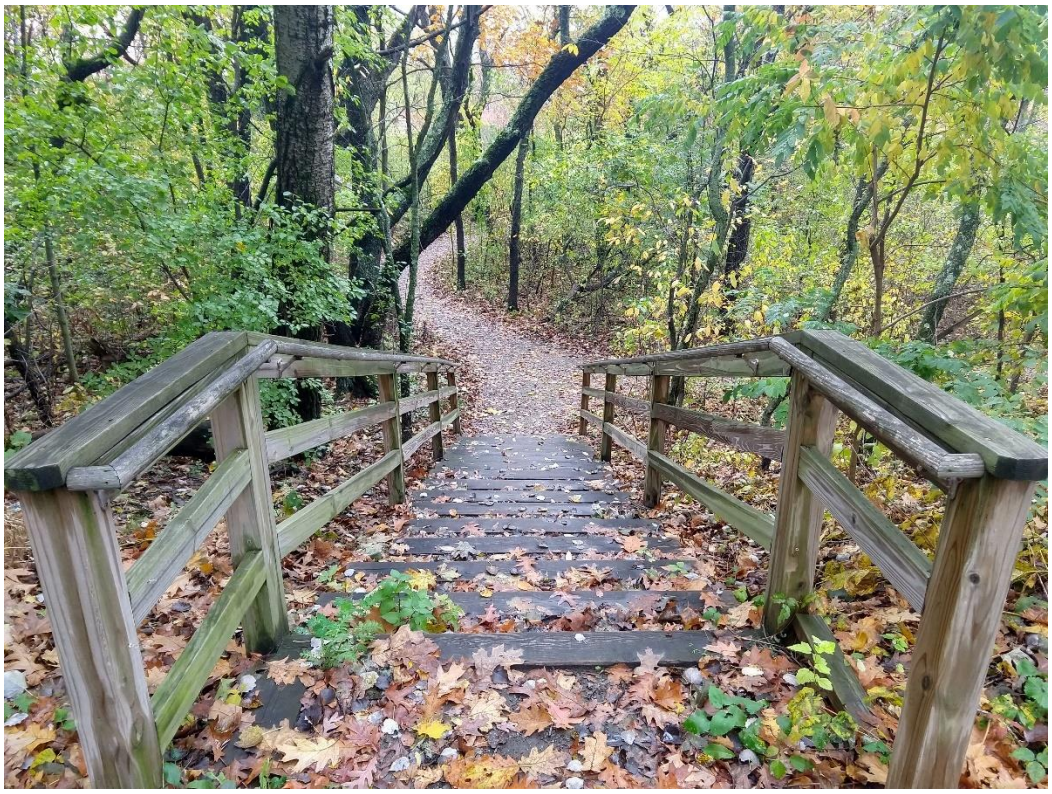
TOWN OF WATERTOWN

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM



Community Resilience Building Workshop

Summary of Findings Report

May 2020

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

KLA KIM LUNDGREN ASSOCIATES, INC.

Table of Contents

Town of Watertown
Community Resilience Building Workshops
Summary of Findings

I. OVERVIEW

As changes in the climate become increasingly prevalent on both the global and local level, the Town of Watertown is eager to assess its vulnerabilities, build community resilience, and expand its potential to address hazards caused by climate change. Therefore, the Town chose to pursue certification from the Massachusetts Municipal Vulnerability Preparedness (MVP) program. In July of 2019, the Town received funds to start a town-wide conversation about climate change and its effects on the community. The MVP Planning Grant provides funding for cities and towns in Massachusetts to plan for climate change resilience and implement priority projects. The state provides communities funding to complete vulnerability assessments and develop action-oriented resilience plans. Communities who complete the MVP Planning Grant program become certified as an MVP Community and are eligible for follow-on MVP Action Grant funding. This Summary of Findings Report presents the results from the MVP Planning Grant phase.

Observed and predicted changes to the climate in Watertown were large motivators for the town to become MVP-Certified. Changes to climate 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.

- **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 Watertown 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 proceeding section.

Watertown is already taking steps to address climate change and ensure community resilience. Watertown is a state-designated Green Community, which makes it eligible for state grants for energy efficiency and renewable energy projects. The Town has used these grants—along with others—to replace its streetlights with LEDs, carry out a fully-funded municipal energy efficiency retrofit project, and install solar arrays at the police station, the Public Works building, and the local high school. The Town has facilitated resident participation in the Solarize Massachusetts program, which helps residents and businesses sign contracts for small-scale solar electricity systems. Watertown also has a number of community gardens, a solar electricity aggregation program, environmentally sensitive design guidelines and standards for commercial and mixed-use projects, and an Environment & Energy Efficiency Committee (WE3C) that reviews and makes recommendations about Town policies and procedures as they relate to energy conservation and emissions reduction. The MVP program allows the Town to continue its efforts to address current and future climate impacts by proposing specific actions.

In September 2019, the Town of Watertown partnered with Kim Lundgren Associates, Inc. (KLA) to design a process that would allow the Town to become a certified MVP Community. The typical MVP scope was expanded to include recommended updates to the Town's Draft Hazard Mitigation Plan, creating a brand for the Town's sustainability efforts, conducting additional community engagement, developing a climate resilience evaluation framework, and building a data-driven online reporting platform. To complete the work outlined in this report, the Town worked with the consultant team 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;
    - several adaptation actions were created; 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 to discuss the results from the workshop and solicit feedback from the community;
- Provide recommendations for updates to the Town's Draft Hazard Mitigation Plan by:
    - Reviewing the current plan;
    - Completing the FEMA-CRB crosswalk;
    - Develop a memo of recommendations for updating the HMP with climate change information;
- Engage the broader public by:
    - Developing a brand for Watertown's climate resilience work;
    - Developing and designing communication materials;
    - Conducting interviews and focus groups with key stakeholders;
    - Providing ongoing social media support;
    - Coordinating online and in-person engagement activities;
- Develop a climate resilience framework to evaluate future Town projects;
- Build an online reporting platform to track metrics of success and communicate key storylines.

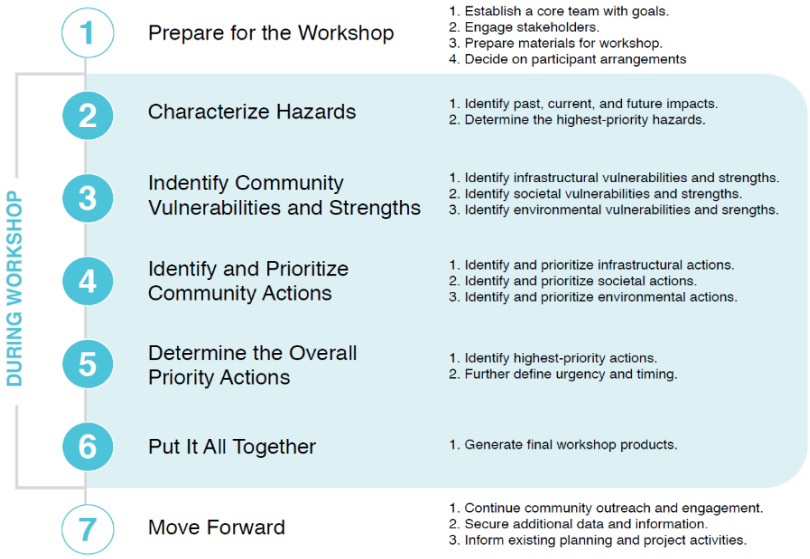
The cornerstone of this work was the two MVP workshops hosted by the Town. The attendees of the workshops represented a diverse group of stakeholders that each brought a specific area of expertise to the table. The workshops served to collaboratively develop solutions that serve the entire Watertown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

This report provides greater detail about the MVP process that Watertown 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, KLA worked with staff from Watertown's Planning Department to identify individuals to serve on the MVP Core Team (see Acknowledgments for a list of the members). On November 12, 2019, the Core Team members met to learn about the MVP process which is based on the Community Resilience Building Framework (see Figure 1). They learned more about their role as Core Team members, confirmed materials and logistics for the MVP Workshops, brainstormed the top hazards to be discussed at the workshops, and reviewed how Watertown can leverage the results of MVP to spark greater community conversation and action on climate change. The Core Team also reviewed maps that would support the MVP workshops. Maps were generated by the Town with support from the consultant team. These maps displayed environmental, socio-economic, and infrastructural features of the Town. The maps are available in Appendix 1.

Figure 1: Community Resilience Building Framework



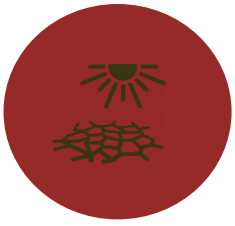
The Core Team identified individuals to participate in two MVP workshops and was careful to ensure that invitees represented the diversity of the community, including key Town departments, schools, environmental groups, non-profits, utilities, and regional organizations.

The Town sent invitations to the stakeholders for the MVP workshops for two, four-hour workshops, scheduled for December 12, 2019 and December 18, 2019. In total, 60 individuals were invited to participate in the MVP workshops (see Appendix 2 for a list of participants).

To engage the larger community in the conversation, the Town hosted a public listening session on January 23, 2020. At this meeting, the consultant team presented on the identified hazards and the results of the previous workshops. The 33 meeting attendees then had the opportunity to share their concerns and proposed solutions through an open house engagement activity with posters for each of the hazards. 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.

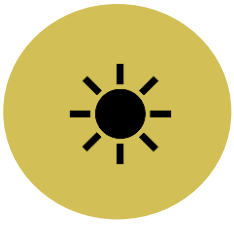
II. TOP HAZARDS AND VULNERABLE AREAS

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



DROUGHT

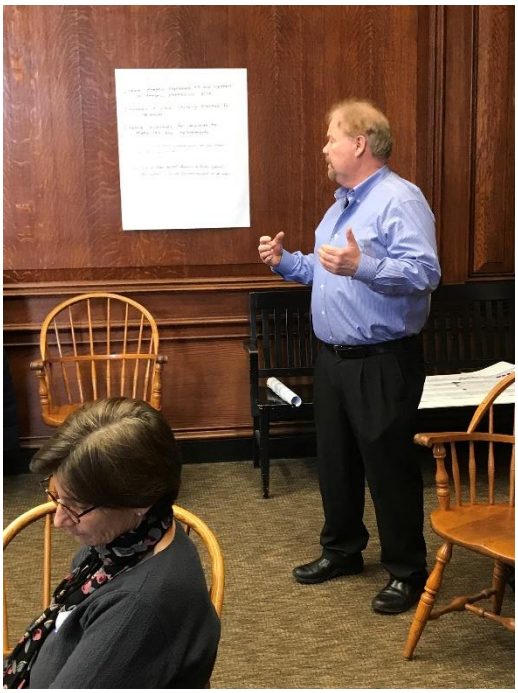
FLOODING



HEAT WAVES

INTENSE STORMS

confirmed at the beginning of the MVP Workshops. The four hazards identified for Watertown are:
Like most Massachusetts communities, Watertown has seen an increase in the frequency and severity of flooding, heat waves, and intense storm events. These impacts 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 Watertown. 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.



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 three 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, and the priority and timeline associated with implementation. Below are the features identified by the teams for the three community components:

Infrastructural Features:

- Bridges
- Buildings
- Communication system
- Dams
- Power grid and lines
- Public transportation
- Roads
- Sidewalks
- Stormwater system
- Trees

- Utilities
- Water and sewer systems

Societal Features:

- Arsenal Corridor
- Businesses
- Community meeting spaces
- Employees
- ESL population
- Families
- Low-income residents
- Medically vulnerable populations
- Parks and open space
- People with limited mobility
- Pleasant Street Corridor
- Renters
- Residents without air conditioning
- Seniors
- Socially isolated
- Those depended on public transit
- Those experiencing homelessness
- Those with mental illnesses

Environmental Features:

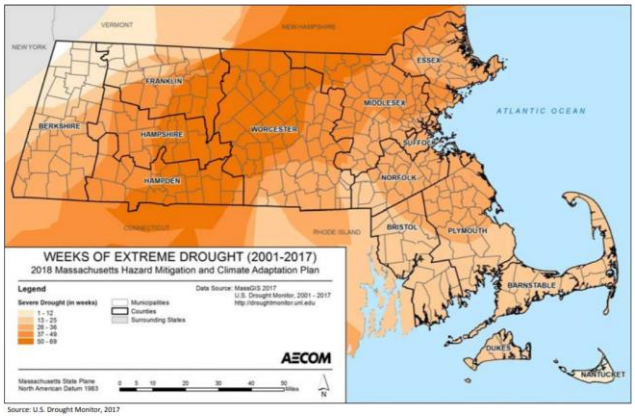
- Arsenal Yard heat island
- Charles River
- Hazardous waste
- Mt. Auburn property
- Oakley Country Club
- Parks and open space
- Rail trail
- Recreation
- Tree canopy
- Water features
- West Watertown (Pleasant St. Corridor)
- Wetlands
- Wildlife

Many 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

DROUGHT



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] Between 2001 and 2017, Watertown experienced 48 weeks of "Severe Drought" and 21 weeks of "Extreme Drought."[2]

Workshop participants were particularly concerned about the effect of drought on trees and other plants. Drought compromises trees' root systems and can have lasting effects on the health of trees. Fortunately, Watertown's water is supplied by the Massachusetts Water Resources Authority, which is not typically impacted by drought. However, workshop participants were still eager to discuss water conservation best practices and methods to maximize water retention and infiltration. They were also curious to learn more about the potential impacts of drought on the Charles River.

FROM THE PUBLIC

Top concerns from the public listening session:

- Water scarcity
- Stress on plants
- Lack of water conservation education
- Resilience of the tree canopy

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

2 United States Drought Monitor. The National Drought Mitigation Center.

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. The Commonwealth has experienced 22 flood-related disasters from 1954 to 2017. Middlesex County saw $35.2 million worth of damage from flooding in March of 2010.[3] 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 agreed that flooding was a serious hazard that warranted consideration.

Flooding came up as a significant concern in all Workshop groups. Participants have noticed an increase in flooding along the Charles River path, and on Howard and Pleasant Streets. Flooding in buildings can also be an issue. Participants noted that there has been flooding in the basement of the library and the old police station. Basements of homes are also subjected to flooding, leading to risk of mold exposure and more residents working on abatement.

FROM THE PUBLIC

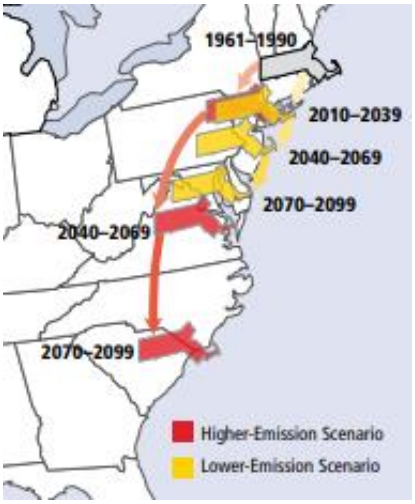
Top concerns from the public listening session:

- Vulnerability of dams
- Flooding basements
- Damage to buildings and infrastructure
- Stormwater drainage system capacity
- River pollution

As precipitation events become more severe, the capacity of the Watertown stormwater system will be tested. Currently, the drainage system is required to have enough capacity to handle a 100-year storm, but participants noted that climate change is leading to a storm of that magnitude far more often than every 100 years. The significant amount of impervious surface in Watertown also exacerbates flooding. Too much impervious surface decreases infiltration capacity and leads to harmful runoff ending up in our waterways.

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

HEAT WAVES



Extreme heat and heat waves—defined as periods of 3 or more days over 90° F—are on the rise in Watertown. 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.[4] Between 2010 and 2014, there were 11.5 days above 90° F—the highest number since 1950.[5] By mid-century, this number is expected to rise by an additional 10 to 35 days. Not only has there been an increase in hot days in the summer, but it is also predicted that there will be a decrease in the number of days under 32° F by 17 or 39 days by mid-century.[6] This information led the MVP Core Team and Workshop participants to prioritize heat waves as one of the four primary hazards in Watertown.

The majority of conversations about heat waves at the Workshops focused on addressing the cooling needs of particularly vulnerable populations. Seniors are especially susceptible to heat-related illnesses, and as a result, seniors living without air conditioning were a top concern. People who spend more time outside during the summer months, such as outdoor workers and children, were also included in the discussion. Transportation to cooling centers was noted as an important need to address.

FROM THE PUBLIC

Top concerns from the public listening session:

- Increased risk of heat stroke
- Increased energy demand
- Lack of shade trees
- Strain on flora

While keeping residents healthy during a heat wave made up the bulk of the discussions, more hot days will also lead to increased energy demand. Workshop participants brainstormed solutions, such as strategically placed shade trees and passive house building design, that would keep people cool but would not require more energy. Certain areas of town do not have enough trees, leading to far less shade coverage than desired. This disparity is something several groups hoped to address.

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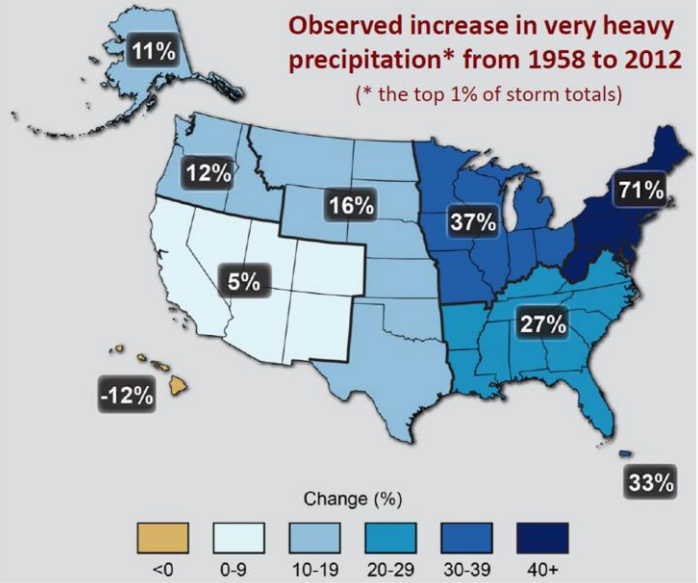
[4] Confronting Climate Change in the Northeast. 2007. Union of Concerned Scientists. Retrieved from https://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/pdf/confronting-climate-change-in-the-u-s-northeast.pdf

[5] NOAA National Centers for Environmental Information. State Climate Summaries.

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

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.[7] In New England, there has been a 70% increase in the intensity of rain events between 1958 and 2010.[8]



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.[9] Intense storms can lead to flooding, property damage, downed trees, power outages, and significant economic disruption.

1. Photo credit: Watertown Police Department

In Watertown, one of the greatest concerns with intense storms is falling trees and poles leading to power outages. Participants cited the example of the "domino effect" of utility poles falling along Arsenal Street in 2018 (see image). Damaged utility lines can lead to hours or days without power. Participants were curious about the condition of the Town's utility poles and the possibility of burying utility lines underground to increase the reliability of the power supply.

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

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

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

Intense storms can also damage Town infrastructure, disrupt communication systems, interrupt public transit routes, and cause private property damage. Not only do these effects require expensive repairs, but they also can pose a safety threat to residents if key evacuation routes are blocked or critical communications are not transmitted. Storms can also negatively impact businesses if employees are not able to commute to work or if businesses must close for several days.

FROM THE PUBLIC

Top concerns from the public listening session:

- Damage to utility infrastructure
- Damage to private property
- Runoff into the Charles River

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. Identifying current strengths helps the Town focus on assets they want to protect and maintain. Some of the most commonly discussed strengths of Watertown were Mt. Auburn Cemetery, Whitney Hill Park, and the Charles River. Beyond these larger areas for recreation, there are also a number of smaller "pocket parks" that workshop participants were grateful for. Other strengths included Arsenal Yards, the connection to the Massachusetts Water Resources Authority's water supply, and the diversity of the population, with over 25 languages spoken in Watertown schools. The Town will work to build on these strengths while addressing any identified vulnerabilities.

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 Watertown 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 160 actions. Each participant was asked to vote on their top three priorities across the three community components. The following are the top five actions that were collectively identified as top priorities for Watertown:

1. Acquire more open space for recreation and conservation
2. Encourage green infrastructure and healthy environments for shade trees
3. Develop a community sustainable energy and resilience plan.
4. Create incentives for landlords to make resiliency improvements
5. Ensure preparedness communications are accessible to all

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

<u>Infrastructure:</u>

1. Encourage green infrastructure and healthy environments for shade trees
2. Develop a sidewalk inventory which includes a drainage and condition assessment
3. Improve communication of building closures during intense storms
4. Promote Reverse 911 system
5. Coordinate with MBTA on their resilience efforts

<u>Socio-economic</u>:

1. Create incentives for landlords to make resiliency improvements
2. Ensure preparedness communication are accessible to all
3. Develop a sustainable energy and resilience plan
4. Implement a preparedness drive and preparedness kit program
5. Create emergency preparedness kits and implement an emergency preparedness drive

<u>Environmental:</u>

1. Acquire more open space for recreation and conservation
2. Develop and improve tree species planting lists and “Right Tree, Right Place” education to ensure planting of absorbent and climate-adaptable trees
3. Develop education materials for tree maintenance and fix gas leaks to keep them healthy
4. Conduct a regional flooding study for Charles River with surrounding communities

5. Research creative open space protection and acquisition opportunities

BLUEPRINTS

In order to elevate this Summary of Findings to a tool that can be used by the Town, KLA worked with Watertown staff to complete action implementation blueprints for three of the identified actions. These blueprints serve as a first step in moving the conversations from the workshops into action.

Action: Acquire more open space for recreation and conservation

DESCRIPTION OF ACTION	*Increase the amount of open space available for recreation and conservation in Watertown.*
CHAMPION	Community Development & Planning

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Inventory existing open space used for recreation and conservation	1 month	• Community Preservation Committee • Conservation Commission • Recreation Department • Charles River Watershed Association	Staff time MVP action grant
2. Use mapping software and supplemental interviews with key stakeholders to identify potential parcels for open space expansion or protection	3-6 months	• Community Preservation Committee • Conservation Commission • Historical Commission	Community Preservation Act Funds MVP action grant

3. Prioritize and explore options for formally purchasing or protecting the identified parcels	1 year	• Community Preservation Committee • Conservation Commission • Massachusetts Department of Conservation and Recreation	Community Preservation Act Fund MVP action grant
4. Explore informal opportunities to increase the amount of open space available for recreation and conservation: • Provide best practices for developers and property owners on how to maximize open space • Maximize the sharing of open spaces for multiple uses (i.e., sports fields and community events)	3 – 6 months/ ongoing	• Local property owners • Landlords • Recreation Department • Conservation Commission • Community Preservation Committee	Staff time MVP action grant

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to other Town goals/actions and other MVP actions? • Create more wetlands along the river • Increase natural infiltration • Work with volunteer to help maintain open space • Promote active lifestyles and acquire more space for recreation • Work with developers to incorporate upgrades to pocket parks, wetland mitigation, protect open space, and pocket parks	*How can the community incorporate equity into the implementation of this action?* • Consider if there are neighborhoods with significantly less access to open space and prioritize maximizing open space in those areas • Ensure any communications about the effort or publicization about open space resources are available in multiple languages and accessible to the visually impaired
MEASURING SUCCESS	ENGAGING THE COMMUNITY

How can we measure the progress and success of this action? Outputs: • Additional acres of protected open space • Additional facilities available for recreation Outcomes: • Healthier and more connected habitats and ecosystems • Improved resident health through increased active recreation opportunities • Increased carbon sequestration potential	*How can we engage the populations that benefit from implementing this action?* • Partner with community organizations, clubs, youth groups, etc. to advertise open space resources to ensure they are well utilized • Organize public volunteer events to maintain Watertown open spaces (i.e. litter pick up, invasive species removal)

Action: Encourage green infrastructure and healthy environments for shade trees

DESCRIPTION OF ACTION	*Promote the use of green infrastructure to help manage stormwater and develop a concerted strategy to foster a healthy environment for Watertown's shade trees.*
CHAMPION	Department of Public Works

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Consider assembling a tree advisory committee, at the discretion of the tree warden	1 month	• Department of Conservation and Recreation • Trees for Watertown/Teens for Trees • Conservation Commission • Department of Public Works • Community Development & Planning • Mount Auburn Cemetery	Staff time MVP Action Grant

2. Build off of the work done in the street tree inventory to identify weaknesses in existing street trees, such as damaged root systems, drought stress, and disease	1 month	• Tree Warden • Trees for Watertown • Conservation Commission • Tree nurseries	Staff time MVP Action Grant
3. Host a training for residents to present findings and resulting best practice recommendations with a focus on actionable steps to improve tree health and incorporate green infrastructure into private property	2 months	• Trees for Watertown • Community Development & Planning • Sustainable landscaping companies	Staff time MVP Action Grant
4. Identify key areas of town that are in need of more trees and greening, that suffer from increased flooding or will in the future, and that most need water quality improvements	1 month	• Charles River Watershed Association • Community Development & Planning • Watertown Environment & Energy Efficiency Commitee	Staff time MVP Action Grant
5. Develop a comprehensive green infrastructure implementation and funding strategy for priority projects and execute preliminary designs for top sites	2 months	• Community Development & Planning	Staff time MVP Action Grant

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to existing Town goals/actions and other MVP actions? • Increase pervious surface • Promote drought-tolerant trees • Increase rainwater capture • Increase tree canopy cover • Increase smart planting in parks (bioswales, rain gardens, wildflowers for pollinators) • Account for value of tree loss and mitigate/discourage	*How can the community incorporate equity into the implementation of this action?* • Focus efforts to improve tree health and incorporate green infrastructure in areas with fewer trees and open space • Include non-traditional, or often excluded, stakeholders on the Tree Advisory Committee

• Find opportunities for tree line pedestrian areas and water features	
MEASURING SUCCESS	ENGAGING THE COMMUNITY
How can we measure the progress and success of this action? Outputs: • Decrease loss of street trees • Number of new green infrastructure projects • % reduction of impervious surface Outcomes: • Street trees that are more resilient to climate hazards • Improved natural infiltration capacity	*How can we engage the populations that benefit from implementing this action?* • Start an "adopt-a-tree" program where residents take ownership over taking care of a certain street tree • Include signage and public art at new and existing green infrastructure projects with information to the public

Action: Create incentives for landlords to make resiliency improvements

DESCRIPTION OF ACTION	*Develop informational resources and incentives through which landlords and property owners are encouraged to make upgrades that improve the resilience of their buildings.*
CHAMPION	• Community Development & Planning

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	TIMEFRAME	KEY PARTNERS	FUNDING RESOURCES
1. Assemble a focus group of Watertown renters to gather information about what kind of upgrades they are most eager to see in their homes/businesses (i.e. weatherization, energy efficient appliances and HVAC systems, flood mitigation).	1-2 months	• Watertown Housing Authority • Watertown Housing Partnership	Massachusetts Clean Energy Center (MassCEC) Clean Energy and Resiliency (CLEAR) Grant Program
2. Assemble a focus group of landlords and property owners to gather information on the barriers and opportunities they see to making upgrades to their buildings.	1-2 months	• Watertown Housing Authority • Watertown Housing Partnership	CLEAR Grant Program

		• Small Property Owners Association • MassLandlords, Inc.	
3. Seek funding to establish a program or incentive system to help overcome the most significant identified barriers to making resiliency upgrades.	6 months	• Watertown Housing Partnership • Massachusetts Executive Office of Energy and Environmental Affairs • FEMA/MEMA	CLEAR Grant Program MassSave
4. Create paper and online materials with a complete set of resources available to renters and landlords for making resiliency upgrades to their buildings.	2-3 months	• FEMA/MEMA • Environment and Energy Efficiency Committee • Watertown Housing Authority	CLEAR Grant Program MassSave

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to other MVP actions? • Provide education for dealing with flooded basements safely • Install generators in public housing and assisted living facilities • Education/incentives for energy reduction and renewable energy • Improve communication of existing energy efficiency programs • Create a stipend program for severe storm recovery assistance	*How can the community incorporate equity into the implementation of this action?* • The focus on landlords prioritizes renters—a population that is more likely to be students or low/ moderate-income residents • Focus groups will help ensure solutions meet the needs of the intended populations • Make all communications available in multiple languages and accessible to the visually impaired.
MEASURING SUCCESS	**ENGAGING THE COMMUNITY**
How can we measure the progress and success of this action? Outputs: • Number of MassSave energy audits in rental homes/businesses	*How can we engage the populations that benefit from implementing this action?* • Publicize the opportunity to participate in the focus group through multiple channels (local organizations, etc.)

• Grant money awarded or money budgeted for resilience upgrades in rental homes/businesses Outcomes: • More energy efficient homes/businesses • Savings on property damage recovery for landlords and property owners	• Publicize the handbook/resources widely, using local organizations and institutions to get the word out

VI. CONCLUSION AND NEXT STEPS

Ultimately, the MVP process was only the first step in starting a conversation about climate change in Watertown. The Town is eager to keep the conversation going, while diving into action. This includes pursuing identified goals and implementing prioritized actions for each of the four hazards, as well as integrating these efforts with other Town initiatives and plans. Further, Watertown will be working alongside Kim Lundgren Associates, Inc. to enhance the Town's reach by extending its community engagement efforts (both in-person and online) to deepen conversation around the Town's climate change efforts, developing branding for the community's work, introducing a climate resilience framework for the Town, and updating residents on the progress of the community's climate change work through an online dashboard. These strategies, combined with an application for further funding from the MVP Program, will be key to transition from planning into action.

ACKNOWLEDGEMENTS

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

Core Team Members	Affiliation
Kevin Duffy	Department of Public Works
Michael Lawn	Police Department
Ed Lewis	Department of Public Buildings
Steve Magoon	Community Development and Planning
Jesse Myott	Department of Public Works
Robert Quinn	Fire Department
Laurel Schwab	Planning Department
Matt Shuman	Department of Public Works
Laura Wiener	Planning Department

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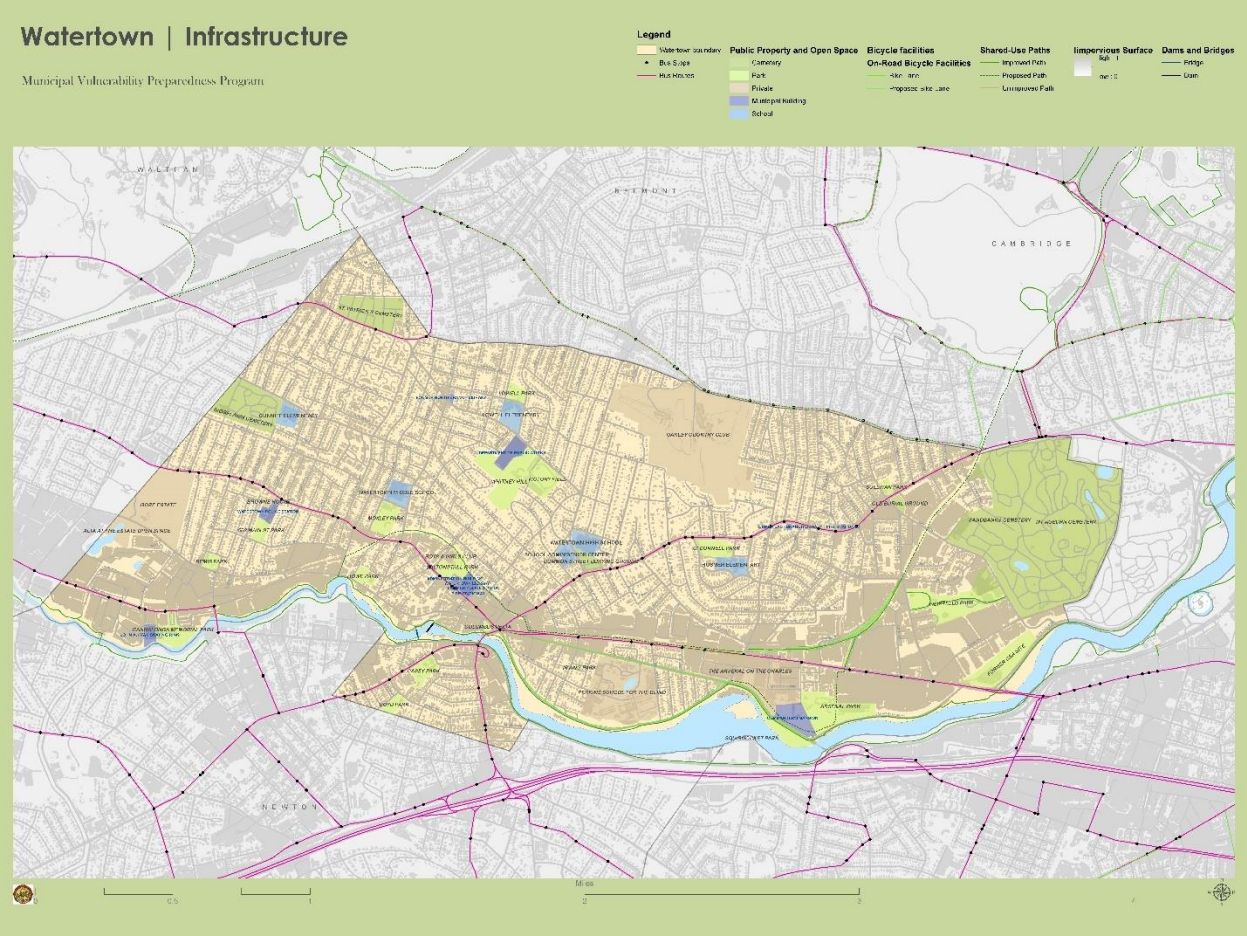
COMMUNITY RESILIENCE BUILDING PROJECT TEAM

Name	Title	Affiliation
Laurel Schwab	Senior Environmental Planner	Planning Department
Steve Magoon	Director	Community Development and Planning
Angela Cleveland	Lead Facilitator	Kim Lundgren Associates, Inc.
Kari Hewitt	Lead Facilitator	Kim Lundgren Associates, Inc.
Mike Steinhoff	Facilitator	Kim Lundgren Associates, Inc.
Angela Cleveland	Facilitator	Kim Lundgren Associates, Inc.
Maggie Peard	Facilitator	Kim Lundgren Associates, Inc.
Robert Meyer	Facilitator	Kim Lundgren Associates, Inc.

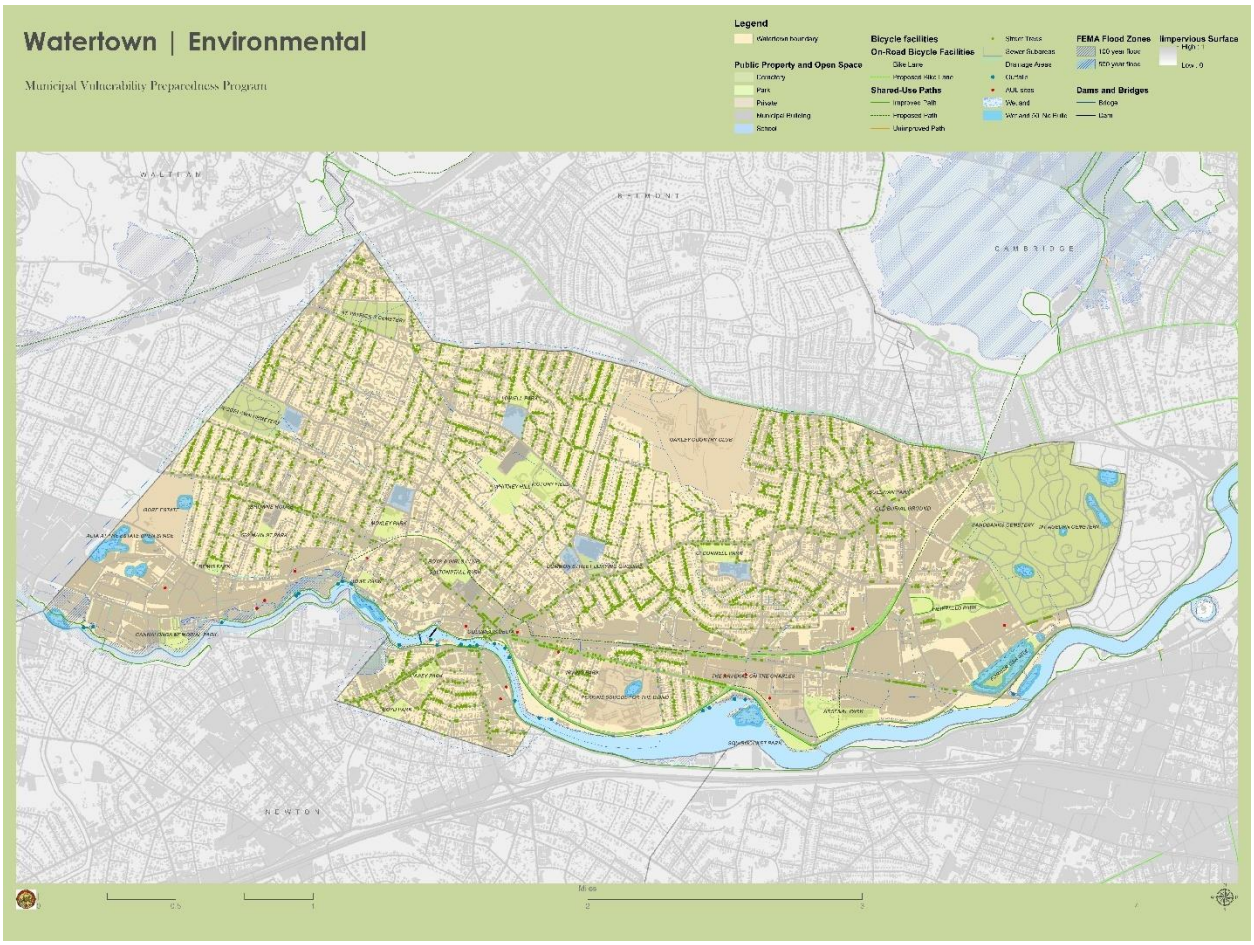
APPENDICES

APPENDIX 1: MAPS FOR MVP WORKSHOPS

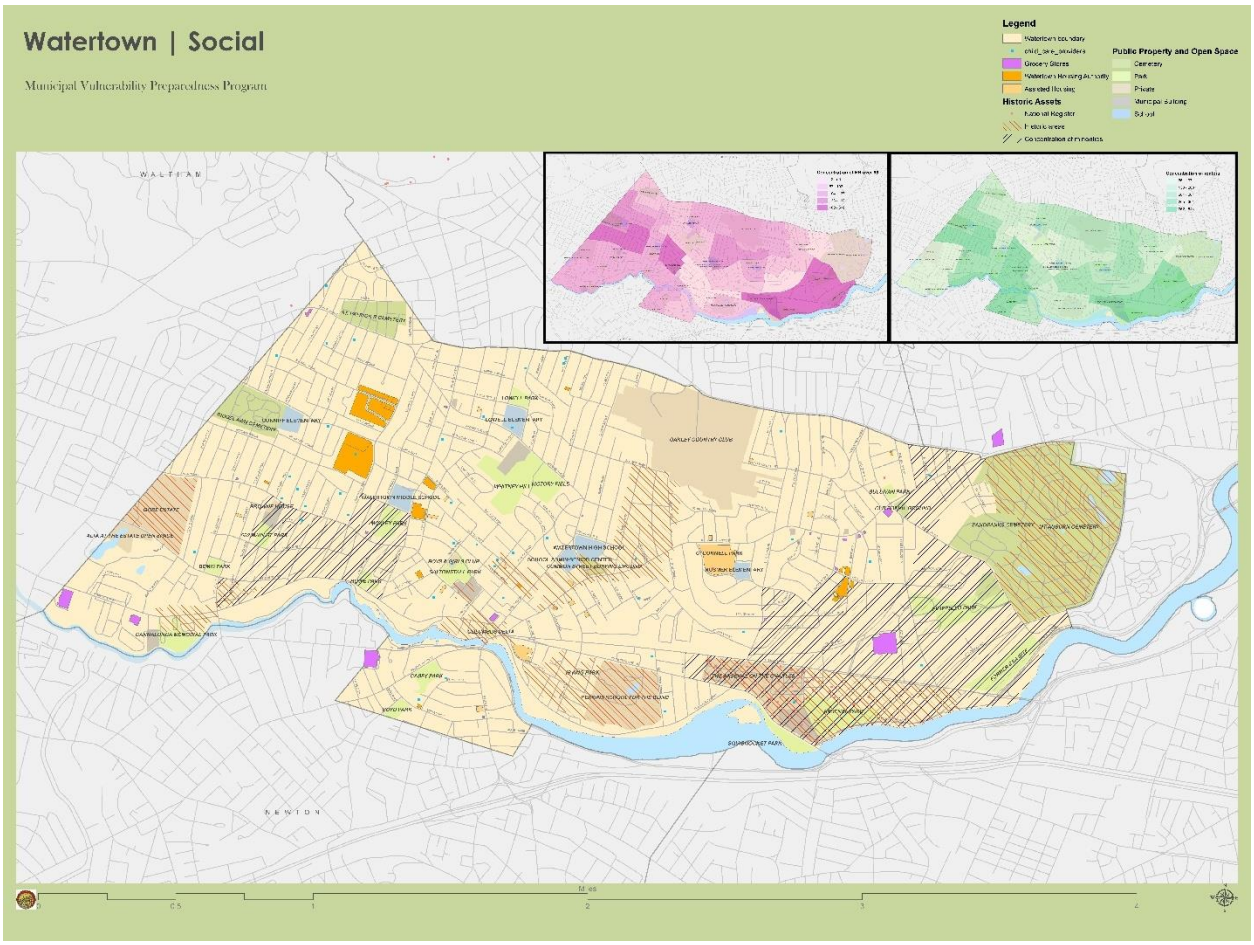
Infrastructure



Environmental



Socio-economic



APPENDIX 2: MVP WORKSHOP ATTENDEES

Name	Title	Affiliation
Town Leads		
Laurel Schwab	Senior Environmental Planner	Planning Department
Steve Magoon	Director	Community Development and Planning
Consultant Team		
Angela Cleveland	Lead Facilitator	Kim Lundgren Associates, Inc.
Kari Hewitt	Lead Facilitator	Kim Lundgren Associates, Inc.
Mike Steinhoff	Facilitator	Kim Lundgren Associates, Inc.
Angela Cleveland	Facilitator	Kim Lundgren Associates, Inc.
Maggie Peard	Facilitator	Kim Lundgren Associates, Inc.
Workshop Attendees		
Andrew Copelotti	Principal	Boylston Properties
Anne-Marie Gagnon	Director of Senior Services	Council on Aging
Anthony Pigionni		Housing Authority
Caitlin Browne	Assistant Director	Library
Cameron Bechmann	Watershed Intern	Charles River Watershed Association
Ed Lewis	Energy Manager	Facilities
Greg Reibman	President	Newton Chamber of Commerce
Hillary Monahan	Environmental Planner	Massachusetts Water Resources Authority
Jennifer Gonzalez	Treasurer	Town of Watertown
John Flynn	Town Clerk	Town of Watertown
Julie Wormser	Deputy Director	Mystic River Watershed Association
Karen O'Reilly	Officer	Animal Control
Kim Charlson	Chair	Commission on Disability
Larry Ramdin	Director	Health Department
Laura Wiener	Senior Transportation Planner	Planning Department
Leo Martin	Chair	Conservation Commission
Libby Shaw	President	Trees for Watertown
Lissa Gifford		Watertown Faces Climate Change
Lori Kabel		Watertown Public Schools

Matt Shuman	Town Engineer	Public Works
Meredith Fields	Chair	WE3C
Michael Lara	Executive Director	Housing Authority
Michael Lawn	Chief	Police Department
Nancy Hammett	Board Member	Massachusetts River Alliance
Pallavi Kalia Mande	Director of Watershed Resilience	Charles River Watershed Association
Peter Centola	Director	Recreation Department
Renee Gaudette	Executive Director	Boys and Girls Club
Robert Quinn	Chief	Fire Department/Emergency Management
Roberta Miller	Executive Director	Mosesian Center for the Arts
Sophia Galimore		Watertown Transportation Management Association
Tammy Saporito		National Grid
Will Brownsberger	Senator	Commonwealth of Massachusetts

APPENDIX 3: CLIMATE CHANGE SUMMARY

RESILIENT WATERTOWN

TAKING ACTION TOGETHER FOR A BETTER FUTURE

Like most Massachusetts communities, Watertown 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.

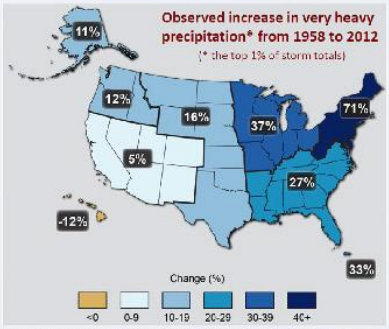
Trends

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. Overall, annual precipitation is expected to increase between **6% and 9%.**

[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

Middlesex County saw **$35.2 million** worth of damage from flooding in March of 2010. [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

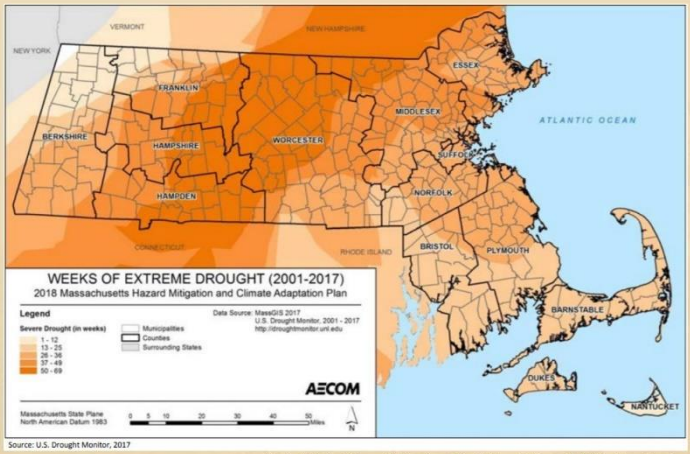
Precipitation will be concentrated in fewer storm events. This can lead to water supply shortages, crop damage, and habitat stress.

Trends

Between 2001 and 2017, Watertown saw 48 weeks of **severe drought** (water restrictions) and 21 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.

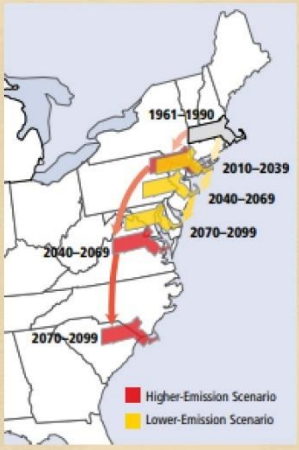
Trends

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!

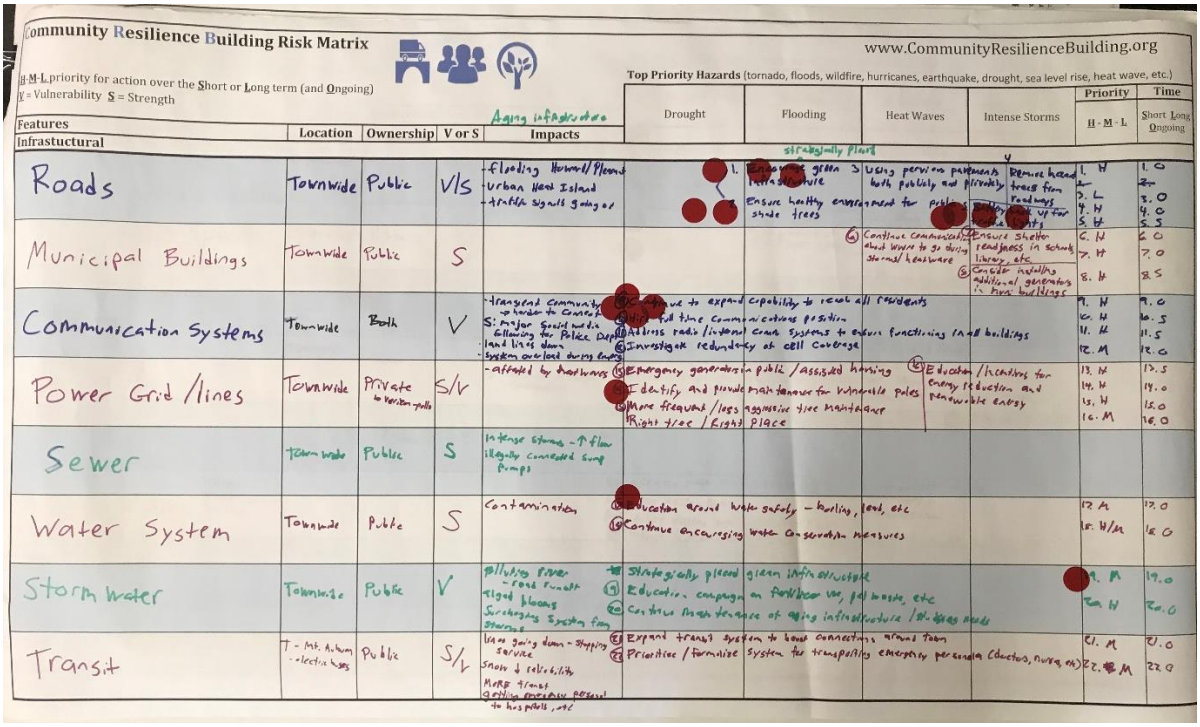
Submit questions, comments, or ideas to Laurel Schwab, Senior Environmental Planner:

lschwab@watertown-ma.gov

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

This summary was prepared for the Town of Watertown, 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 THE WORKSHOPS



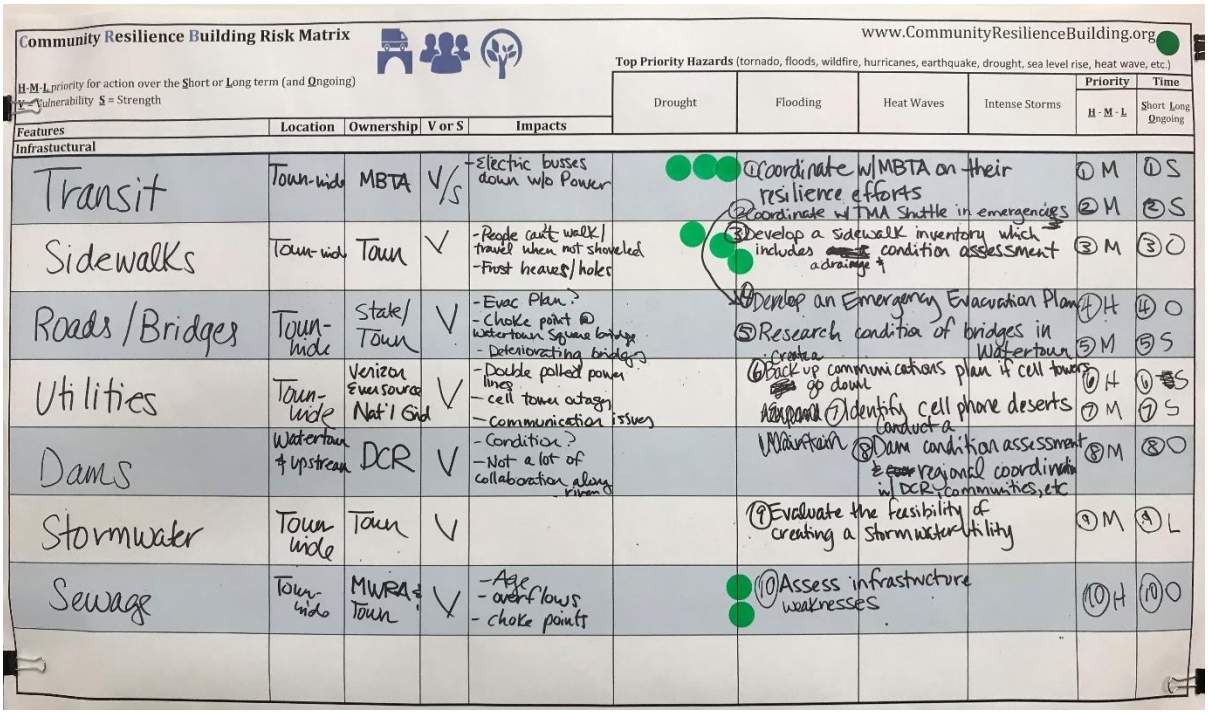
Community Resilience Building Risk Matrix

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 Infrastructural	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Roads	Townwide	Public	V/S	+flooding Howard/Pleasant +Urban Heat Island +traffic signals going out		1. Expand green infrastructure 2. Ensure healthy environment for public shade trees	3. Using pervious pavements both publicly and privately	Remove hazard trees from roadways	1. H 2. M 3. L 4. H 5. H	1. O 2. O 3. O 4. O 5. S
Municipal Buildings	Townwide	Public	S				6. Continue Commercial Chat Where to go during storms/heatwave	7. Ensure Shelter readiness in schools, library, etc 8. Consider installing additional generators in town buildings	6. M 7. H 8. H	6. O 7. O 8. S
Communication Systems	Townwide	Both	V	-transient community - no reason to evacuate S: major Social media following the Police Dept -land lines down -system overload during events	1. Continue to expand capability to reach all residents 2. Hire full time communications position 3. Address radio/incident comm systems to ensure functioning in all buildings 4. Investigate redundancy at cell coverage				9. H 10. M 11. H 12. M	9. O 10. S 11. S 12. O
Power Grid/lines	Townwide	Private w/ Verizon poles	S/V	-affected by heatwaves	1. Emergency generators in public/assisted housing 2. Identify and provide maintenance for vulnerable poles 3. More frequent/less aggressive tree maintenance Right tree/Right place	4. Education/incentives for energy reduction and renewable energy			13. M 14. M 15. M 16. M	13. S 14. O 15. O 16. O
Sewer	Town wide	Public	S	Intense storms - I/I flow illegally connected sump pumps						
Water System	Townwide	Public	S	Contamination	1. Education around water safety - boiling, lead, etc 2. Continue encouraging water conservation measures				17. M 18. H/M	17. O 18. O
Storm water	Townwide	Public	V	-pollution from road runoff -flood plains -Surcharging System flow Storms	1. Strategically placed 2. Education campaign 3. Continue maintenance of aging infrastructure/address needs	green infrastructure on fertilizer use, pet waste, etc			19. M 20. M	19. O 20. O
Transit	T - Mt. Auburn - electric buses	Public	S/V	-bus going down - stopping service -snow & reliability MBTA transit getting everyone person to bus points, etc	1. Expand transit system to have connections around Town 2. Prioritize/formalize System for transporting emergency personnel (doctors, nurses, etc)				21. M 22. M	21. O 22. O



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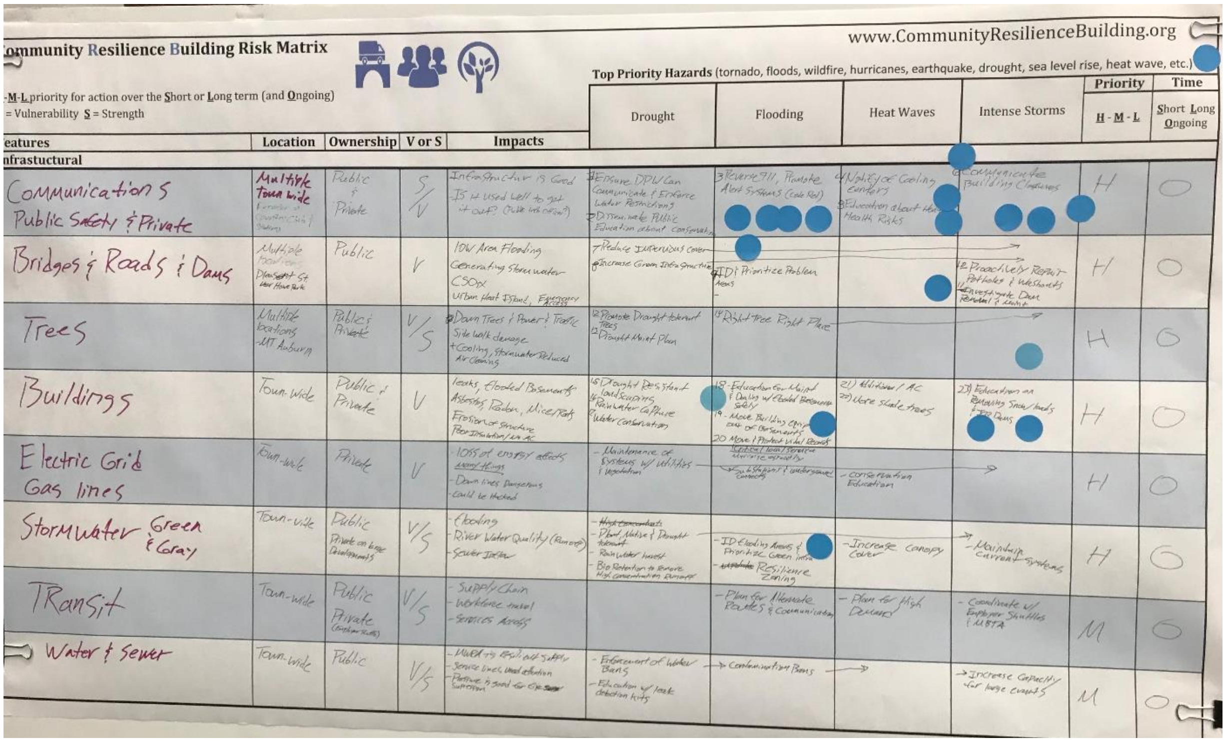
Transit	Town-wide	MBTA	V/S	+Electric busses down w/o Power		1. Coordinate w/ MBTA on their resilience efforts 2. Coordinate w/ TMA Shuttle in emergencies			1. M 2. M	1. S 2. S
Sidewalks	Town-wide	Town	V	-People can't walk/travel when not shoveled -Frost heaves/holes		3. Develop a sidewalk inventory which includes condition assessment & drainage			3. M	3. O
Roads/Bridges	Town-wide	State/Town	V	-Evac Plan? -Choke point @ Watertown Square bridge -Deteriorating bridges		4. Develop an Emergency Evacuation Plan 5. Research condition of bridges in Watertown			4. H 5. M	4. O 5. S
Utilities	Town-wide	Verizon Eversource Nat'l Grid	V	-Double polled power lines -cell tower outages -communication issues		6. Back up communications plan if cell towers go down 7. Identify cell phone deserts			6. H 7. M	6. S 7. S
Dams	Watertown & upstream	DCR	V	-Condition? -Not a lot of collaboration along river		8. Dam condition assessment & regional coordination w/ DCR, communities, etc			8. M	8. O
Stormwater	Town-wide	Town	V			9. Evaluate the feasibility of creating a stormwater utility			9. M	9. L
Sewage	Town-wide	MWRA & Town	V	-Age -overflows -choke points		10. Assess infrastructure weaknesses			10. H	10. O



Community Resilience Building Risk Matrix
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Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)
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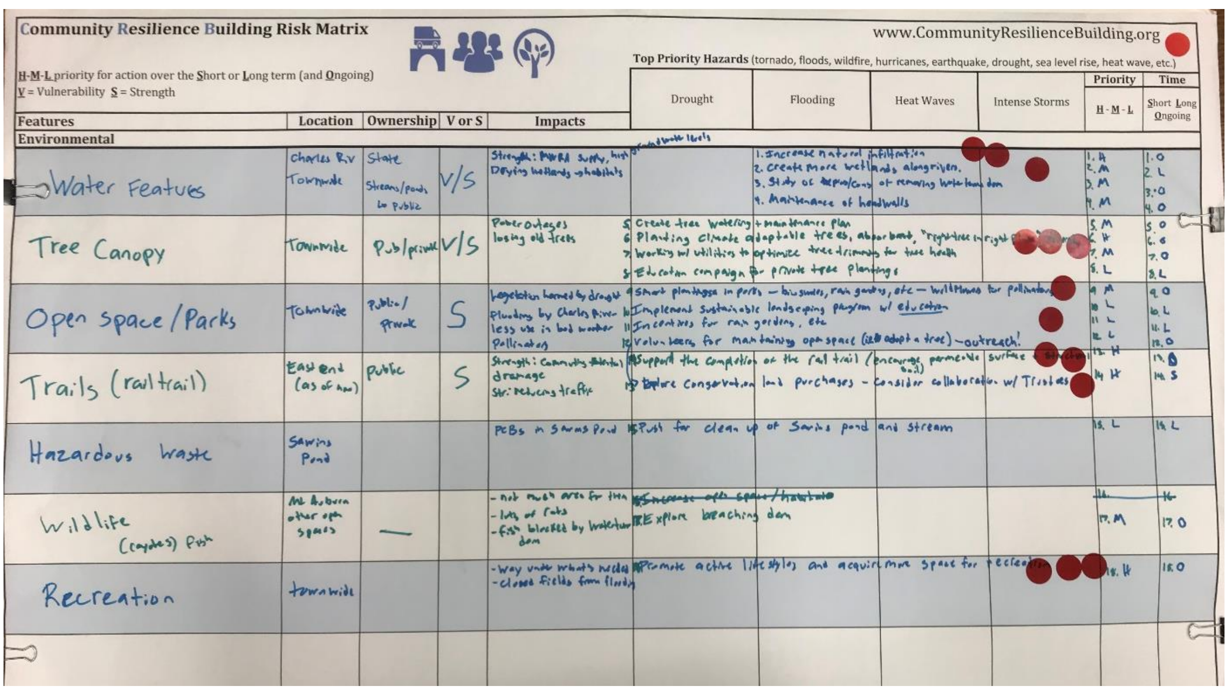
Features
Location
Ownership
V or S
Impacts
Drought
Flooding
Heat Waves
Intense Storms
Priority
H-M-L
Time
Short Long Ongoing
Infrastructural
Communications Public Safety & Private
Bridges & Roads & Dams
Trees
Buildings
Electric Grid Gas lines
Stormwater Green & Gray
Transit
Water & Sewer



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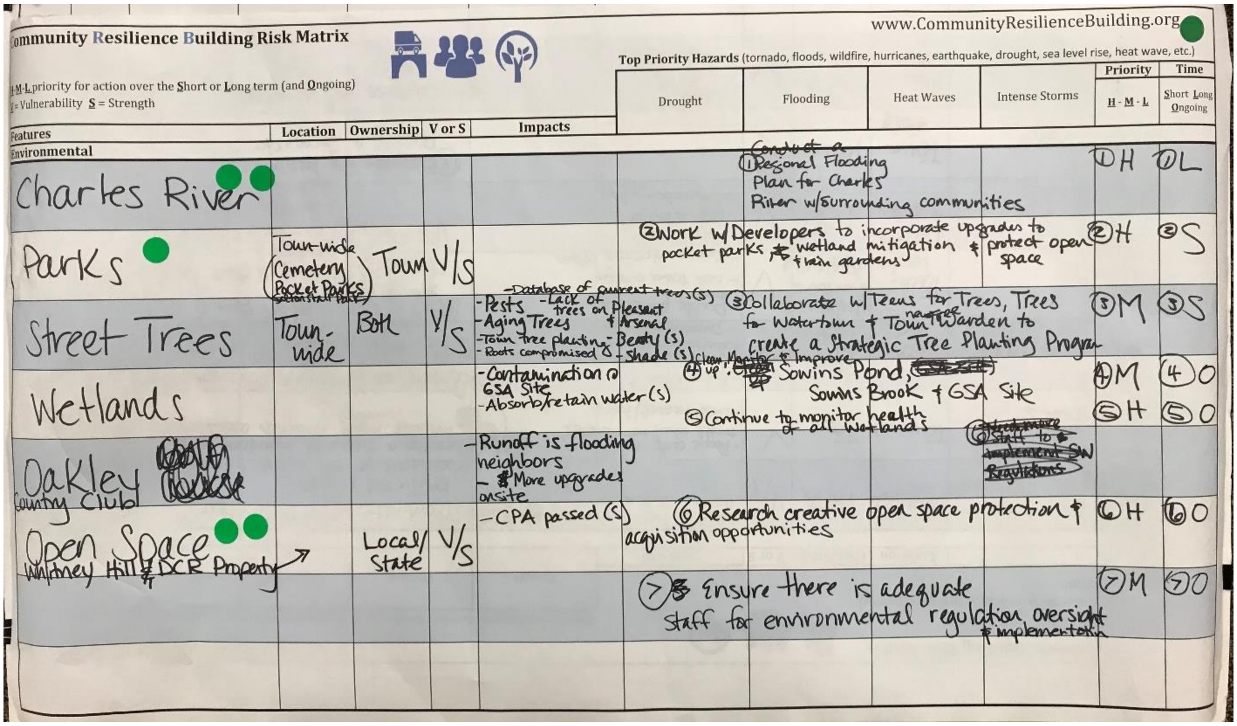
Features
Location
Ownership
V or S
Impacts
Drought
Flooding
Heat Waves
Intense Storms
Priority
H-M-L
Time
Short Long Ongoing
Environmental
Water Features
Tree Canopy
Open space / Parks
Trails (rail trail)
Hazardous waste
Wildlife
Recreation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Environmental
Location
Ownership
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Impacts
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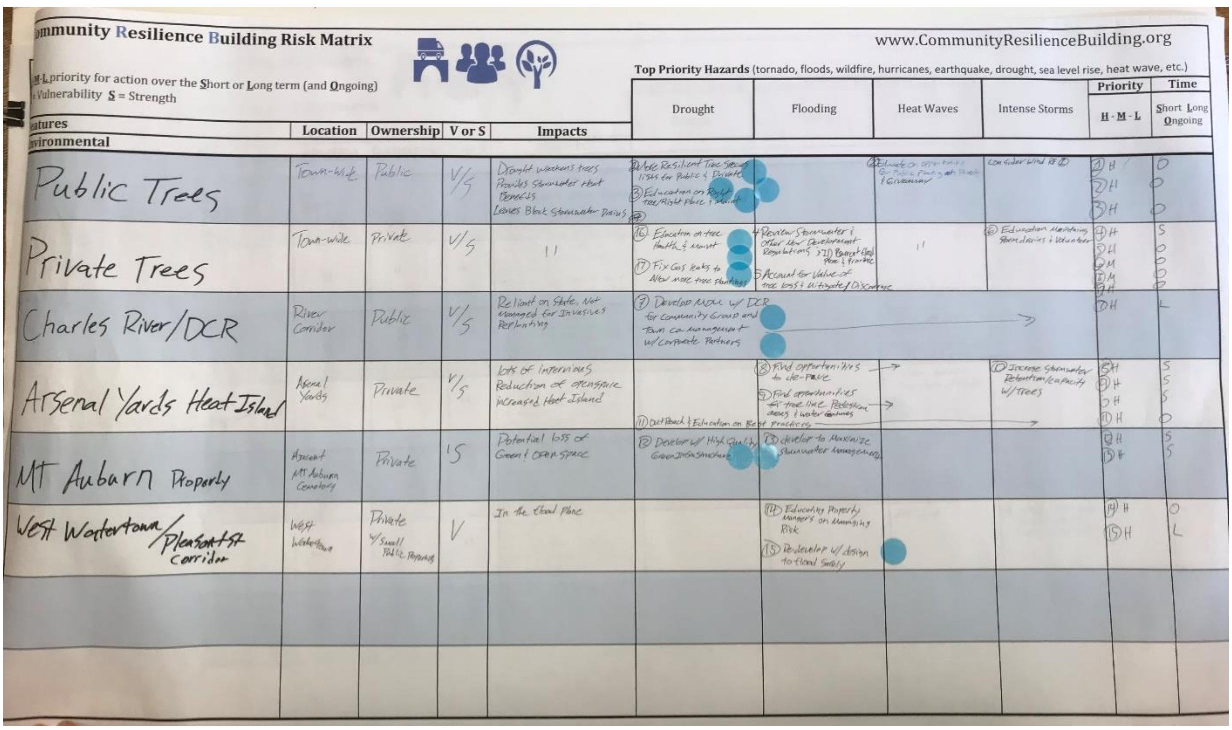
Drought
Flooding
Heat Waves
Intense Storms
Priority
H - M - L
Time
Short Long Ongoing
Charles River
① Regional Flooding Plan for Charles River w/surrounding communities
① H
① L
Parks
Town-wide (Cemetery) (Pocket Parks)
Town
V/S
② Work w/Developers to incorporate upgrades to pocket parks & wetland mitigation & protect open space
② H
② S
Street Trees
Town-wide
Both
V/S
-Pests -Lack of trees on Pleasant
-Aging Trees & Arsenal
-Town tree planting
-Roots compromised
-Beauty (S)
-Shade (S)
-Database of current trees (S)
③ Collaborate w/Trees for Trees, Trees for Watertown & Town Tree Warden to create a Strategic Tree Planting Program
③ M
③ S
Wetlands
-Contamination @ GSA Site
-Absorb/retain water (S)
④ Clean, Monitor & Improve Sowins Pond, Sowins Brook & GSA Site
⑤ Continue to monitor health of all Wetlands
④ M
④ O
⑤ H
⑤ O
Oakley Country Club
-Runoff is flooding neighbors
-& More upgrades onsite
Open Space
Whitney Hill & DCR Property
Local/State
V/S
-CPA passed (S)
⑥ Research creative open space protection & acquisition opportunities
⑥ H
⑥ O
⑦ Ensure there is adequate staff for environmental regulation oversight & implementation
⑦ M
⑦ O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Environmental
Location
Ownership
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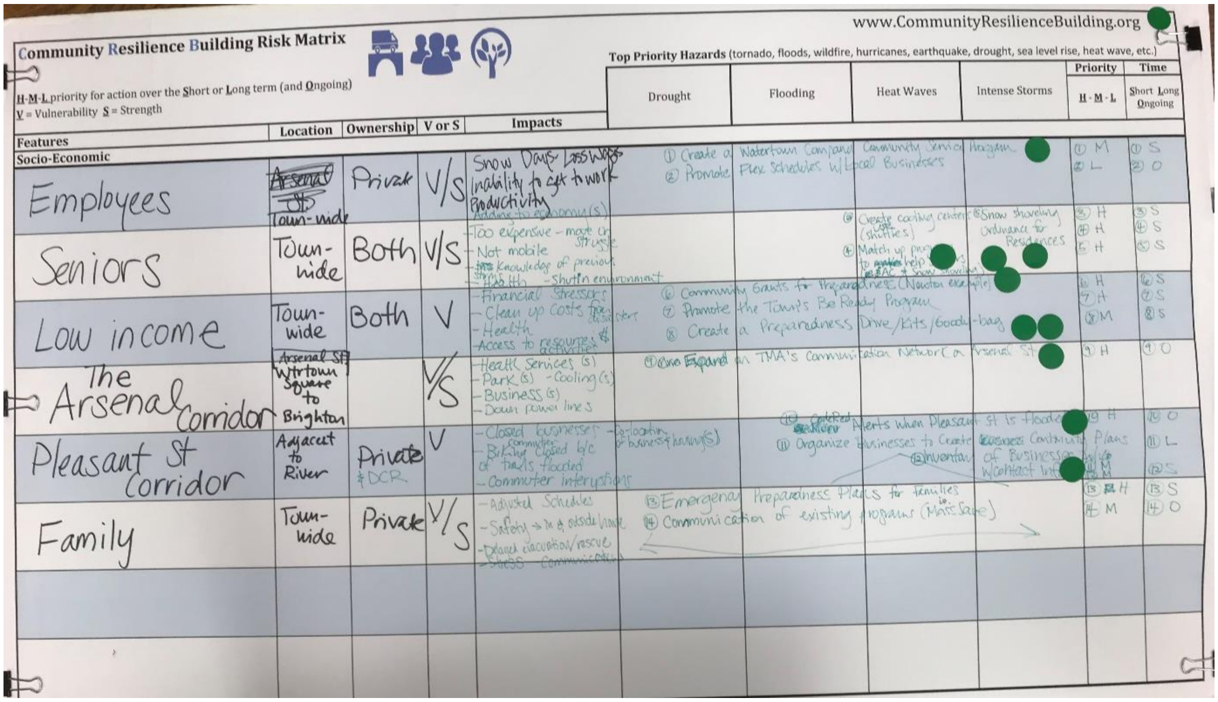
Impacts
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)
Drought
Flooding
Heat Waves
Intense Storms
Priority
H - M - L
Time
Short Long Ongoing
Public Trees
Town-wide
Public
V/S
Drought weakens trees
Provides Stormwater Heat Benefits
Leaves Block Stormwater Drains
① More Resilient Tree Species lists for Public & Private
③ Education on Right tree/Right Place & Maint
Consider Wind RF
① H
② H
③ H
Private Trees
Town-wide
Private
V/S
⑯ Education on tree Health & Maint
⑰ Fix Gas leaks to Allow more tree plantings
Review Stormwater & Other New Development Regulations
Account for Value of tree loss & Mitigate/Discourage
④ H
⑤ H
S
Charles River/DCR
River Corridor
Public
V/S
Reliant on State, Not Managed for Invasives Replanting
⑦ Develop MOU w/ DCR for Community Group and Town co-management w/Corporate Partners
⑦ H
L
Arsenal Yards Heat Island
Arsenal Yards
Private
V/S
lots of impervious
Reduction of openspace
increased Heat Island
⑧ Find opportunities to de-pave
⑨ Find opportunities to tree line Pedestrian areas & water features
⑩ Increase Stormwater Retention/capacity w/Trees
⑪ Outreach & Education on Best practices
⑪ H
Mt Auburn Property
Adjacent Mt Auburn Cemetery
Private
S
Potential loss of Green & Open Space
⑫ Develop w/ High Quality Green Infrastructure
⑬ develop to Maximize Stormwater Management
⑬ H
West Watertown/Pleasant St Corridor
West Watertown
Private w/Small Public Property
V
In the Flood Plane
⑭ Educating Property Managers on Managing Risk
⑮ Redevelop w/ design to flood Safely
⑭ H
⑮ H
O
L



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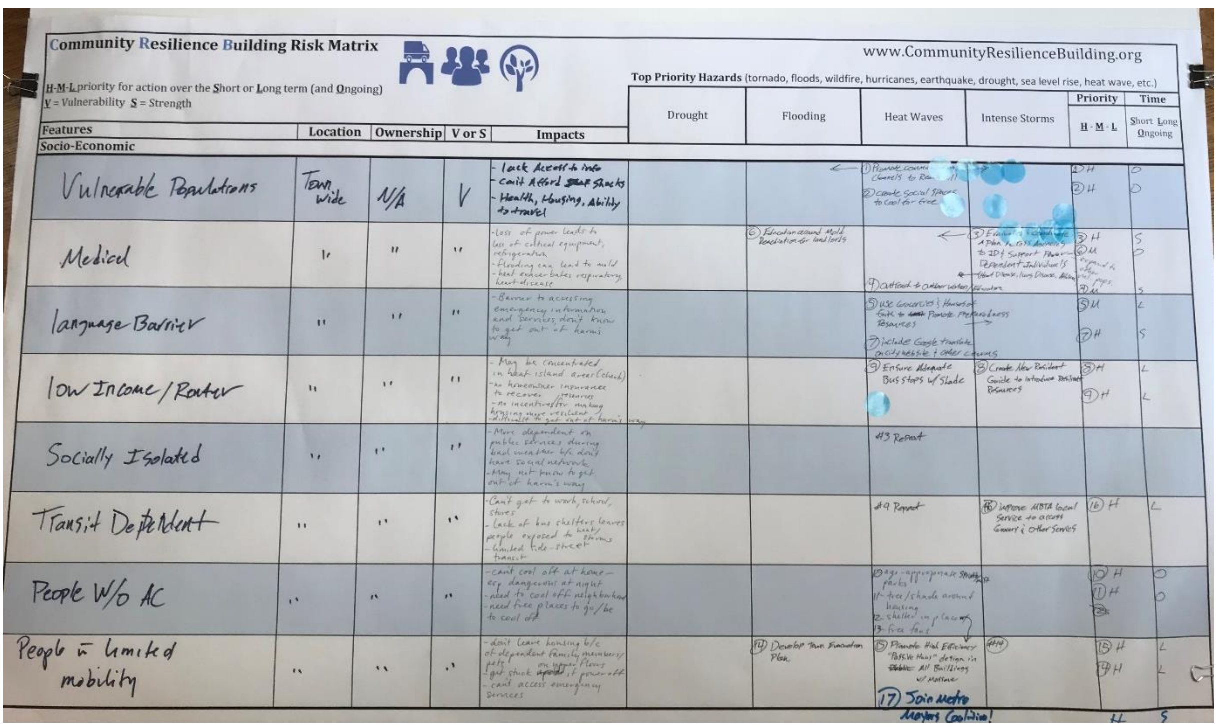
Features: Socio-Economic	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Employees	~~Arsenal St~~ Town-wide	Private	V/S	Snow Days- Loss Wages; Inability to get to work; Productivity; Adding to economy (S)	① Create a Watertown Company Community Service Program; ② Promote Flex Schedules w/ Local Businesses				① M ② L	① S ② O
Seniors	Town-wide	Both	V/S	- Too expensive - move or struggle; - Not mobile; - Knowledge of previous storms; - Health - Shut in environment			③ Create cooling centers (use shuttles); ④ Match up programs to help seniors (e.g. AC + snow shoveling)	⑤ Snow shoveling Ordinance for Residences	③ H ④ H ⑤ H	③ S ④ S ⑤ S
Low income	Town-wide	Both	V	- Financial Stressors; - Clean up costs from disasters; - Health; - Access to resources & activities	⑥ Community Grants for Preparedness (Newton example); ⑦ Promote the Town's Be Ready Program; ⑧ Create a Preparedness Drive/Kits/Goody-bag				⑥ H ⑦ H ⑧ M	⑥ S ⑦ S ⑧ S
The Arsenal Corridor	Arsenal St Wtrtown Square to Brighton		V/S	- Health Services (S); - Park (S) - Cooling (S); - Business (S); - Down power lines	⑨ Expand on TMA's Communication Network on Arsenal St				⑨ H	⑨ O
Pleasant St Corridor	Adjacent to River	Private & DCR	V	- Closed businesses - Co-location of business & housing (S); - Commuter Biking Closed b/c of trails flooded; - Commuter interruptions		⑩ CodeRed Alerts when Pleasant St is flooded; ⑪ Organize Businesses to Create Business Continuity Plans; ⑫ Inventory of Businesses w/ Contact Info			⑩ H ⑪ M ⑫ M	⑩ O ⑪ L ⑫ S
Family	Town-wide	Private	V/S	- Adjusted Schedules; - Safety → in & outside home; - Delayed evacuation/rescue; - Stress - Communication	⑬ Emergency Preparedness Plans for families; ⑭ Communication of existing programs (Mass Safe)				⑬ H ⑭ M	⑬ S ⑭ O



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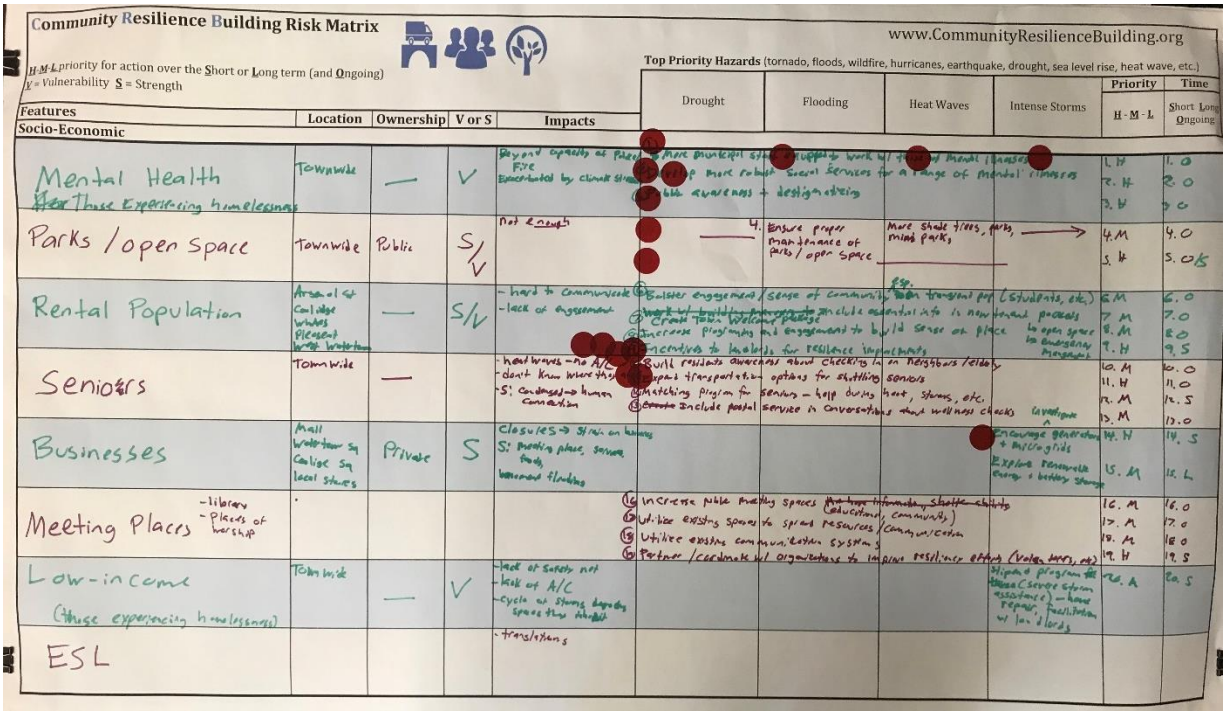
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features: Socio-Economic	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Vulnerable Populations	Town wide	N/A	V	- lack Access to info; - can't Afford Shocks; - Health, Housing, Ability to travel			① Promote communication Channels to Reach all; ② Create Social Spaces to Cool for free		① H ② H	① O ② O
Medical	"	"	"	- Loss of power leads to loss of critical equipment, refrigeration; - Flooding can lead to mold; - heat exacerbates respiratory, heart disease		⑥ Education around Mold Remediation for landlords	④ Outreach to caretakers/Education	③ Evaluate & Coordinate A Plan Across Agencies to ID & Support Power-Dependent Individuals (Heart Disease, lung Disease, Allergies)	③ H ⑥ M (expand to other vul. pops.) ④ M	③ S ⑥ O ④ S
language Barrier	"	"	"	- Barrier to accessing emergency information and services, don't know to get out of harm's way			⑤ Use Groceries & Houses of Faith to Promote Preparedness Resources; ⑦ Include Google translate on city website & other channels		⑤ M ⑦ H	⑤ L ⑦ S
low Income/Renter	"	"	"	- May be concentrated in heat island areas (check); - no homeowner insurance to recover resources; - no incentives for making housing more resilient; - difficult to get out of harm's way			⑨ Ensure Adequate Bus Stops w/ Shade	⑧ Create New Resident Guide to Introduce Resilient Resources	⑧ H ⑨ H	⑧ L ⑨ L
Socially Isolated	"	"	"	- More dependent on public services during bad weather b/c don't have social network; - May not know to get out of harm's way			#3 Repeat			
Transit Dependent	"	"	"	- Can't get to work, school, stores; - lack of bus shelters leaves people exposed to heat/storms; - limited tide-street transit			#9 Repeat	⑯ Improve MBTA local Service to access Grocery & Other Services	⑯ H	L
People W/o AC	"	"	"	- can't cool off at home - esp. dangerous at night; - need to cool off neighborhood; - need free places to go/be to cool off			⑩ age-appropriate shade parks; 11- tree/shade around housing; 12- shelter in place; 13- free fans		⑩ H ⑪ H	⑩ O ⑪ O
People w/ limited mobility	"	"	"	- don't leave housing b/c of dependent family members/pets; - get stuck on upper floors if power off; - can't access emergency services		⑭ Develop Town Evacuation Plan	⑮ Promote High Efficiency "Passive Haus" design in All Buildings w/ Massave; ⑰ Join Metro Mayors Coalition!	#14	⑮ H ⑭ H; H	⑮ L ⑭ L; 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										
Mental Health ~~(for Those Experiencing Homelessness)~~	Townwide	—	V	Beyond capacity at Police, Fire Exacerbated by climate stress					L. H 2. H 3. H	1. O 2. O 3. O
Parks / open Space	Townwide	Public	S/V	Not enough	4. —	Ensure proper maintenance of parks / open space	More shade trees, parks, mini parks		4. M 5. H	4. O 5. O/S
Rental Population	Areas of Carlisle where Pleasant Street Watertown	—	S/V	- hard to communicate - lack of engagement	Bolster engagement / sense of community (non transient pop (students, etc.) Include essential info in new tenant packets Increase programming and engagement to build sense of place Incentives to landlords for resilience improvements			to open space to Budgeting Management	6. M 7. M 8. M 9. H	6. O 7. O 8. O 9. S
Seniors	Townwide	—		- heat waves - no A/C - don't know where this is - S: contagion → human connection	Build residents awareness about checking in on neighbors/elderly Explore transportation options for shuttling seniors Matching Program for seniors - help during heat, storms, etc. Include postal service in conversations about wellness checks			Investigate	10. M 11. H 12. M 13. M	10. O 11. O 12. S 13. O
Businesses	Mall Watertown Sq Carlisle Sq local stores	Private	S	Closures → stress on business S: meeting place, serves food, increased flooding				Encourage generators + Batteries/grids Explore renewable energy + battery storage	14. H 15. M	14. S 15. L
Meeting Places - Library - Places of Worship					Increase public meeting spaces ~~(that have information, Shuttle shuttle)~~ (Educational, community) Utilize existing spaces to spread resources (Community/Education) Utilize existing communication systems Partner / coordinate w/ organizations to improve resiliency efforts (Voter, ~~HHS~~), etc)				16. M 17. M 18. M 19. H	16. O 17. O 18. O 19. S
Low-income (those experiencing homelessness)	Town wide	—	V	- lack of safety net - risk of A/C - cycle of staying together, space they should				Stipend program for those (severe storm assistance) - home repair, facilitation w/ landlords	20. A	20. S
ESL				- translations						

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 S Long O ngoing
Infrastructure										
Communications (public safety and private)	Mutiple Townwide Repeater at country club and stations	Public & private	S/V	Infrastructure is good It is used well to get it out? (public info officer?)	1. Ensure DPW can communicate and enforce water restrictions 2. Disseminate public information about conservation	3. Reverse 911, promote alert systems (CodeRed)	4. Notify of cooling centers 5. Education about heat health risks	6. Communicate building closures	H	O
Bridges, Roads, Dams	Multiple locations Pleasant St near Howe Park	Public	V	Low area flooding Generating stormwater CSOs Urban Heat Island Emergency access	7. Reduce impervious cover 8. Increase green infrastructure	9. ID and prioritize problem areas		10. Proactively repair potholes and washouts 11. Investigate dam removal and maintenance		
Trees	Townwide Mt. Auburn	Public & private	V/S	Down trees, power, traffic Sidewalk damage Cooling, stormwater, air cleaning	12. Promote drought tolerant trees 13. Drought maintenance plan	14. Right tree, right place			H	O
Buildings	Townwide	Public & private	V	Leaks, flooded basements, asbestos, Radon, mice/rats Erosion of structure Poor Insulation/no A/C	15. Drought resistant landscaping 16. Rainwater capture 17. Water conservation	18. Education for maintenance and dealing with flooded basements safely 19. Move building equipment out of basements 20. Move and protect vital records	21. Additional A/C 22. More shade trees	23. Education on removing snow loads and ice dams	H	O
Electric grid/gas lines	Townwide	Private	V	Loss of energy affects many things Down lines--danger could be hacked	24. Maintenance of systems with utilities and vegetation (substations and underground connects)		25. Conservation education		H	O
Stormwater (green and grey)	Townwide	Public Private on large developments	V/S	Flooding River Water Quality (run off) Sewer Inflow	26. Plant native and drought tolerant plants 27. Rainwater harvest 28. Bioretention to remove high concentration runoff	29. ID flooding areas and prioritze green infrastructure 30. Resilience zoning	31. Increase canopy cover	32. Maintain current systems	H	O
Transit	Townwide	Public Private for employer shuttle	V/S	Supply chain Workforce travel Service access		33. Plan for alternative routes and communication	34. Plan for high demand	35. Coordinate with employer shuttles and MBTA	M	O
Water and Sewer	Townwide	Public	V/S	MWRA is resilient supply Service lines need attention Pressure is good for fire suppression	36. Enforcement of water bans and contamination bans 37. Education with leak detection kits			38. Increase capacity for large events	M	O

Transit	Townwide	MBTA	V/S	Electric buses down without power		1. Coordinate with MBTA on their resilience efforts 2. Coordinate with TMA shuttle in emergencies			1. M 2. H	1. S 2. S
Sidewalks	Townwide	Town	V	People can't walk/travel when not shoveled Frost heaves/holes		3. Develop a sidewalk inventory which includes condition assessment and drainage			3. M	3. O
Roads/bridges	Townwide	State/Town	V	Evacuation plan? Choke point at Watertown Square Bridge Deteriorating bridges		4. Develop an Emergency evacuation plan 5. Research condition of bridges in Watertown			4. H 5. M	4. O 5. S
Utilities	Townwide	Verizon Eversource National Grid	V	Double polled power lines Cell tower outages Communication issues		6. Create a back up communications plan if cell towers go down 7. Identify cell phone deserts			6. H 7. M	6. S 7. S
Dams	Watertown & upstream	DCR	V	Condition Not a lot of collaboration along river		8. Conduct a dam condition assessment and regional coordination with DCR, communities, etc			8. M	8. O
Stormwater	Townwide	Town	V			9. Evaluate the feasibility of creating a stormwater utility			9. M	9. L
Sewage	Townwide	MWRA and Town	V	Age Overflows Choke points		Assess infrastructure weaknesses			10. H	10. O

Roads	Townwide	Public	V/S	Flooding Howard/Pleasant Urban Heat Island Traffic signals going out		1. Encourge strategically placed green infrastructure and ensure a healthy environment for shade trees	3. Use pervious pavements both publically and privately	4. Remove hazard trees from roadways 5. Battery back up for traffic lights	1. H 3. L 4. H 5. H	1. O 3. O 4. O 5. S
Municipal building	Townwide	Public	S				6. Continue communicating about where to go during storms and heatwaves	7. Ensure shelter readiness in schools, library, etc 8. Consider installing additional generators in municipal buildings	6. H 7. H 8. H	6. O 7. O 8. S
Communication systems	Townwide	Both	V	Transient community harder to connect Major social media following for Police Dept (S) Landlines down System overload during emergencies	9. Continue to expand capability to reach all residents 10. Hire a full time communications positions 11. Address radio/internal communication systems to ensure functioning in all buildings 12. Investigate redundancy of cell coverage				9. H 10. H 1. H 12. M	9. O 10. S 11. S 12. O
Power grid/lines	Townwide	Private Verizon polls	S/V	Affected by heatwaves	13. Emergency generators in public/assisten housing 14. Identify and provide maintenance for vulnerable poles 15. More frequent and less aggressive tree maintenace (Right tree, right place) 16. Education/incentives for energy reduction and renewable energy				13. H 14. H 15. H 16. M	13. S 14. O 15. O 16. O
Sewer	Townwide	Public	S	Intense storms lead to higher flows Illegally connected sump pumps						
Water system	Townwide	Public	S	Contamination	17. Education around water safety (boiling, lead, etc) 18. Continue encouraging water conservation measures				17. M 18. H/M	17. O 18. O
Stormwater	Townwide	Public	V	Pollution river (road runoff) Algae blooms Surcharging system from storms	19. Education campaign on fertilizer use, pet waste, etc 20. Continue maintenance of aging infrastructure and studying needs				19. M 20. H	19. O 20. O
Transit	T-Mt. Auburn (electric buses	Public	S/V	Lines going down, stopping service Snow decreases reliability MORE transit Getting emergency personal to hospitals, etc.	21. Expand transit system to boost connections around town 22. Prioritize/formalize system for transporting emergency personel (doctors, nurses, etc.) during emergencies				21. M 22. M	21. O 22. O

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 S Long O ngoing
Socio-Economic										
Employees	Townwide	Private	V/S	Snow days--lost wages Inability to get to work Productivity Adding to economy (S)	1. Create a Watertown company community service program 2. Promote flexible schedules with local businesses				1. M 2. L	1. S 2. O
Seniors	Townwide	Both	V/S	Too expensive (move or struggle) Not mobile Knowledge of previous storms Health Shut in environment			3. Create cooling centers (use shuttles) 4. Match up programs to help seniors (e.g. snow shoveling and AC)	5. Snow shoveling ordinance for residences	3. H 4. H 5. H	3. S 4. S 5. S
Low-income	Townwide	Both	V	Financial stressors Clean up costs from disasters Health Access to resources and activities	6. Community grants for preparedness (Newton example) 7. Promote the Town's Be Ready program 8. Create a preparedness drive/kits				6. H 7. H 8. M	6. S 7. S 8. S
The Arsenal Corridor	Watertown Square to Brighton		V/S	Health services (S) Park (S) Cooling (S) Businesses (S) Down power lines	9. Expand on TMAs communicaiton network on Arsenal St				9. H	9. O
Pleasant St. Corridor	Adjacent to River	Private and DCR	V	Closed business Co-location of business and housing (S) Bike commuting closed because of trails flooded Commuter interuptions		10. CodeRed alerts when Pleasant St is flooded		11. Organize businesses to create continuity plans 12. Inventory of businesses with contact information	10. H 11. M 12. M	10. O 11. L 12. S
Family	Townwide	Private	V/S	Adjusted schedules Safety (in and outside home)Delayed evacuation and rescue Stress Communication	13. Emergency Preparedness plans for families 14. Communication of existing programs (i.e. MassSave)				13. H 14. M	13. S 14. O

Vulnerable populations	Townwide		V	Lack access to info Can't afford shocks Health, housing, ability to travel			1. Promote communications channels to reach all 2. Create social spaces to cool for free		1. H 2. H	1. O 2. O
Medical	Townwide		V	Loss of power leads to loss of critical equipment, refrigeration Flooding can lead to mold Heat exacerbates respiratory, heart disease		6. Education around mold remediation for land lords	4. Outreach/education to outdoor workers	3. Evaluate and coordinate a plan across agencies to ID and support power-dependent individuals (heart disease, lung disease, asthma)	3. H 6. M 4. M	3. S 6. O 4. S
Language barrier	Townwide		V	Barrier to accessing emergency information and services, don't know how to get out of harms way			5. Use groceries and houses of faith to promote preparedness resources 7. Include google translate on city website and other communities		5. H 7. H	5. L 7. S
Low income/renter	Townwide		V	May be concentrated in heat island areas No homeowner insurance to recover resources No incentives for making housing more resilient Difficult to get out fo harm's way			9. Ensure adequate bus stops with shade	8. Create new resident guide to introduce resilient resources	8. H 9. H	8. L 9. L
Socially isolated	Townwide		V	More dependent on public services during bad weather because they don't have a social network May not know how to get out of harm's way						
Transit dependent	Townwide		V	Can't get to work, school, stores Lack of bus shelters leaves people exposed to heat/storms Limited side-street transit				16. Improve MBTA local service to access grocery and other services	16. H	16. L
People without A/C	Townwide		V	Can't cool off at home, esp dangerous at night Need to cool off neighborhood Need free places to go to cool off			10. Age-appropriate sprinklers/mist in parks 11. Tree/shade around housing 12. Shelter in place 13. Free fans		10. H 11. H	10. O 11. O
People with limited mobility	Townwide		V	Don't leave housing because of dependent family members/pets Get stuck on upper floors if power is off Can't access emergency services		14. Develop Town evacuation plan	15. Promote high efficiency "passive haus" design in all buidings with MassSave 17. Join metro mayors coalition		15. H 14. H 17. H	15. L 14. L 17. S

Mental health (and those experiencing homelessness)	Townwide		V	Beyond capacity of police/fire Exacerbated by climate stressors	1. More municipal staff equipped to work with those with mental illnesses 2. Develop more robust social services for a range of mental illnesses 3. Public awareness and destigmatization				1. H 2. H 3. H	1. O 2. O 3. O
Parks and open space	Townwide	Public	S/V	Not enough		4. Ensure proper maintenance of parks/open space	5. More shade trees, parks and mini parks		4. M 5. H	4. O 5. O/S
Rental population	Arsenal St Coolidge Whites Pleasant St West Watertown		S/V	Hard to communicate with Lack of engagement	6. Bolster engagement/sense of community especially with transient population (students, renters, etc) 7. Create a town welcome package that inclules essential info, such as emergency management and open space info 8. Increase programming and engagement to build sense of place 9. Incentives to landlords for resilience improvements				6. M 7. M 8. M 9. H	6. O 7. O 8. O 9. S
Seniors	Townwide			Heatwaves (no A/C) Don't know where they are S: Condensed--human connection	10. Build resident awareness about checking in on neighbors/elderly 11. Expand transportation options for shuttling seniors 12. Matching programs for seniors--help during heat, storms, etc 13. Include postal services in conversations about wellness checks				10. H 11. H 12. M 13. H	10. O 11. O 12. S 13. O
Businesses	Mall Watertown Sq Coolidge Sq Local stores	Private	S	Closures (strain on business) S: meeting place, services, food Basement flooding				14. Investigate and encourage generators and microgrids 15. Explore renewable energy and battery storage	14. H 15. M	14. S 15. L
Meeting places (library, places of worship, etc)					16. Increase public meetings spaces for community and educational uses 17. Utilize existing spaces to spread resources/communication 18. Utilize existing communication systems 19. Partner/coordinate with organizations to improve resilience effors (volunteers, etc)				16. M 17. M 18. M 19. H	16. O 17. O 18. O 19. S
Low-income (and those experiencing homelessness)	Townwide		V	Lack of safety net Lack of A/C Cycle of storms degrading spaces they inhabit				20. Stipend program for severe storm assistance. Include repair and facilitation with landlords	20. M	20. S
ESL population				Translations						

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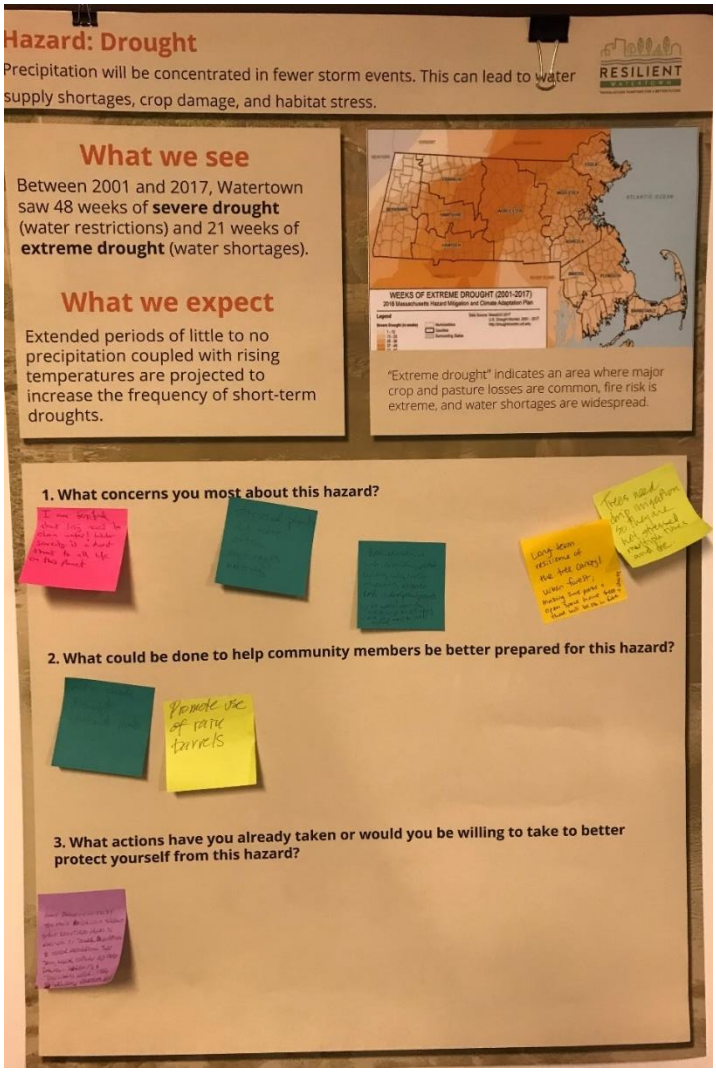
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H - M - L	Time Short Long Ongoing
Environmental										
Water features	Charles River Townwide	State Some streams/ponds are private	V/S	MWRA supply (S) High ground water levels (S) Drying wetlands and habitats		1. Increase natural infiltration 2. Create more wetlands along the river 3. Study of the pros/cons of removing Watertown Dam 4. Maintenance of headwals			1. H 2. M 3. M 4. M	1. O 2. L 3. O 4. O
Tree canopy	Townwide	Both	V/S	Power outages Losing old trees	5. Create tree watering and maintenance plan 6. Right Tree, Right Place (planting a diversity of absorbant, and climate adaptable trees) 7. Work with utilities to optimize tree trimming for tree health 8. Education campaign for private tree plantings				5. M 6. H 7. M 8. L	5. O 6. O 7. O 8. L
Open Space/parks	Townwide	Both	S	Vegetation harmed by drought Flooding by Charles River Less use in bad weather Pollinators	9. Smart planting in parks (bioswales, rain gardens, wildflowers for pollinators) 10. Implement sustainable landscaping program with education 11. Incentives for rain gardens and other sustainable landscape projects 12. Volunteers for maintaining open speace (i.e. Adopt a Tree), partnered with outreach 13. Explore conservation land purchases, consider collaboration with Trustees				9. M 10. L 11. L 12. L 13. H	9. O 10. L 11. L 12. O 13. O
Rail Trail	East end	Public	S	Commuting potential (S) Drainage Reducing traffic (S)	14. Support the completion fo the rail trail				14. H	14. S
Hazardous waste	Sawins Pond		V	PCBs in Sawins Pond		15. Push for the clean up of Sawins Pond and Stream			15. L	15. L
Wildlife	Mt. Auburn and other open spaces		V/S	Not much area for them Lots of rats Fish blocked by Watertown Dam		16. Explore breaching dam			16. L	16. O
Recreation	Townwide		S/V	Way under what's needed Fields closed from flooding	17. Promote active lifestyles and aquire more space for recreation				17. H	17. O

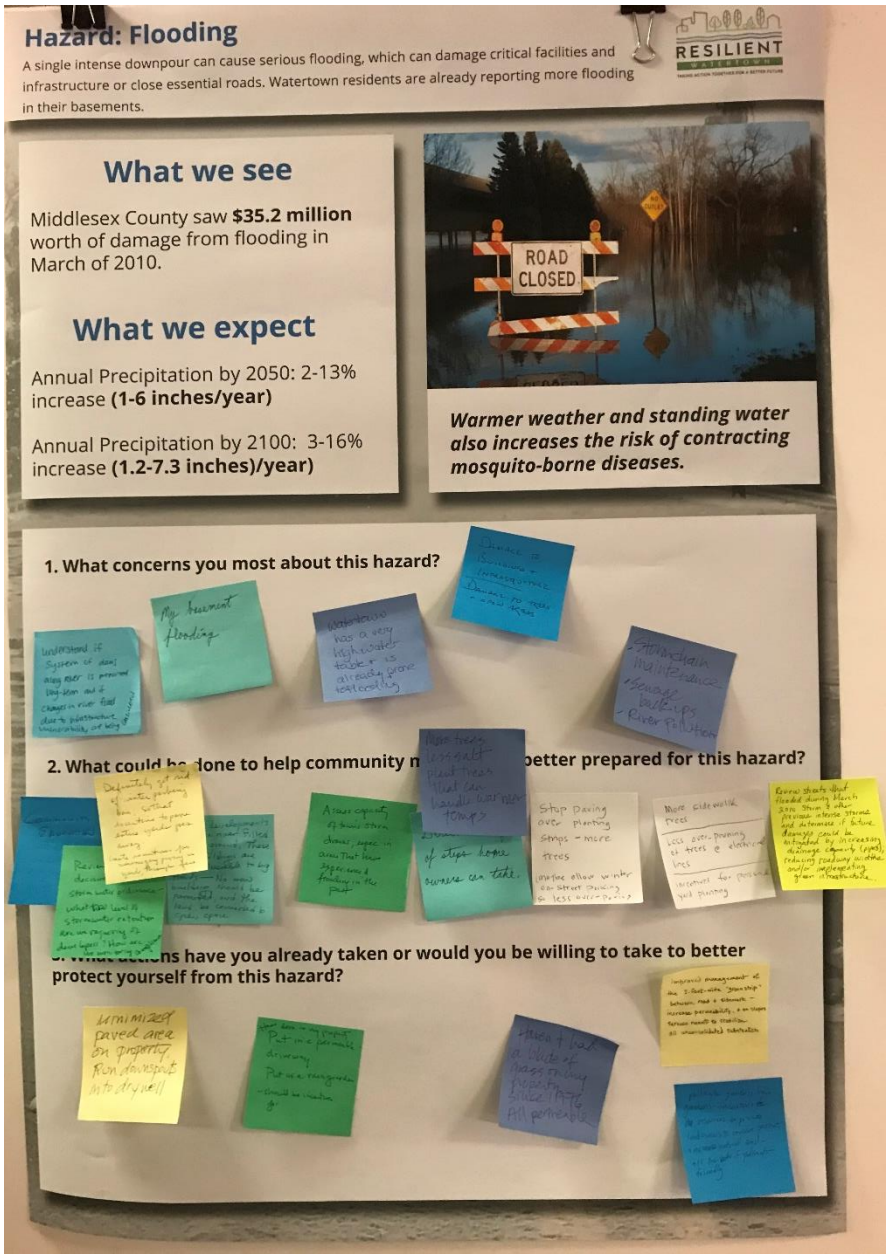
Public Trees	Townwide	Public	V/S	Drought weakens trees Provides stormwater heat benefits Leaves block stormwater drains	1. More resilent tree species lists for public and private 3. Education on right tree/right place and maintenance		2. Educate on opportunity for public planting on private land and giveaways	Consider wind re: action 1	1. H 2. H 3. H	1. O 2. O 3. O
Private trees	Townwide	Private	V/S	Drought weakens trees Provides stormwater heat benefits Leaves block stormwater drains	16. Education on tree health and maintenance 17. Fix gas leaks to allow more tree plantings	4. Review stormwater and other new development regulations and ID current flood prone and prioritize 5. Account for value of tree loss and mitigate/discourage		6. Education maintaining storm drains and volunteer	4. H 5. H 6. M 16. M 17. H	4. S 5. O 6. O 16. O 7. O
Charles River/DCR	River Corridor	Public	V/S	Reliant on state Not managed for Invasives replanting	7. Develop MOU with DCR for community group and town co-management with corporate partners				7. H	7. L
Arsenal Yards Heat Island	Arsenal Yards	Private	V/S	Lots of impervious reduction of open space Increased heat island	11. Outreach and education on best practices	8. Find opportunites to depave 9. Find opportunities for tree line pedestrian area and water features		10. Increas stormwater retention/capacity with trees	8. H 9. H 10. H 11. H	8. S 9. S 10. S 11. O
Mt. Auburn Property	Adjacent Mt Auburn Cemetary	Private	S	Potential loss of green and open space	12. Develop with high quality green infrastructure	13. Develop to maximixe stormwater management			12. H 13. H	12. S 13. S
West Watertown/Pleasant St Corridor	West Watertown	Private with small public properties	V	In the floodplain		14. Educating property managers on managing risk 15. Redevelop with design to flood safety			14. H 15. H	14. O 15. L

Charles River						1. Conduct a regional flooding plan for Charles River with surrounding communities			1. H	1. L
Parks	Townwide (cemetery, pocket parks)	Town	V/S		2. Work with developers to incorporate upgrades to pocket parks, wetland mitigation, protect open space, and pocket parks				2. H	2. S
Street Trees	Townwide (cemetery, pocket parks)	Both	V/S	Database of current trees (S) Pests, aging trees Town tree planting Roots compromised Lack of trees on pleasant and Arsenal Beauty (S) Shade (S)	3. Collaborate with Teens for Trees, Trees for Watertown and tree warden to create a strategic tree planting program				3. M	3. S
Wetlands				Contamination @ GSA site Absorb/retain water (S)	4. Clean up , monitor, and improve Sawins Pond, Sawins brook and GSA site 5. Continue to monitor health of all wetlands				4. M 5. H	4. O 5. O
Oakley Country Club		Private		Runoff is flooding neighbors More upgrades on site						
Open Space	Whitney Hill and DCR property	Local/State	V/S	CPA passed (S)	6. Research creative open space protection and acquisition opportunites 7. Ensure there is adequate staff for environmental regulation oversite and implementation				6. H 7. M	6. O 7. O

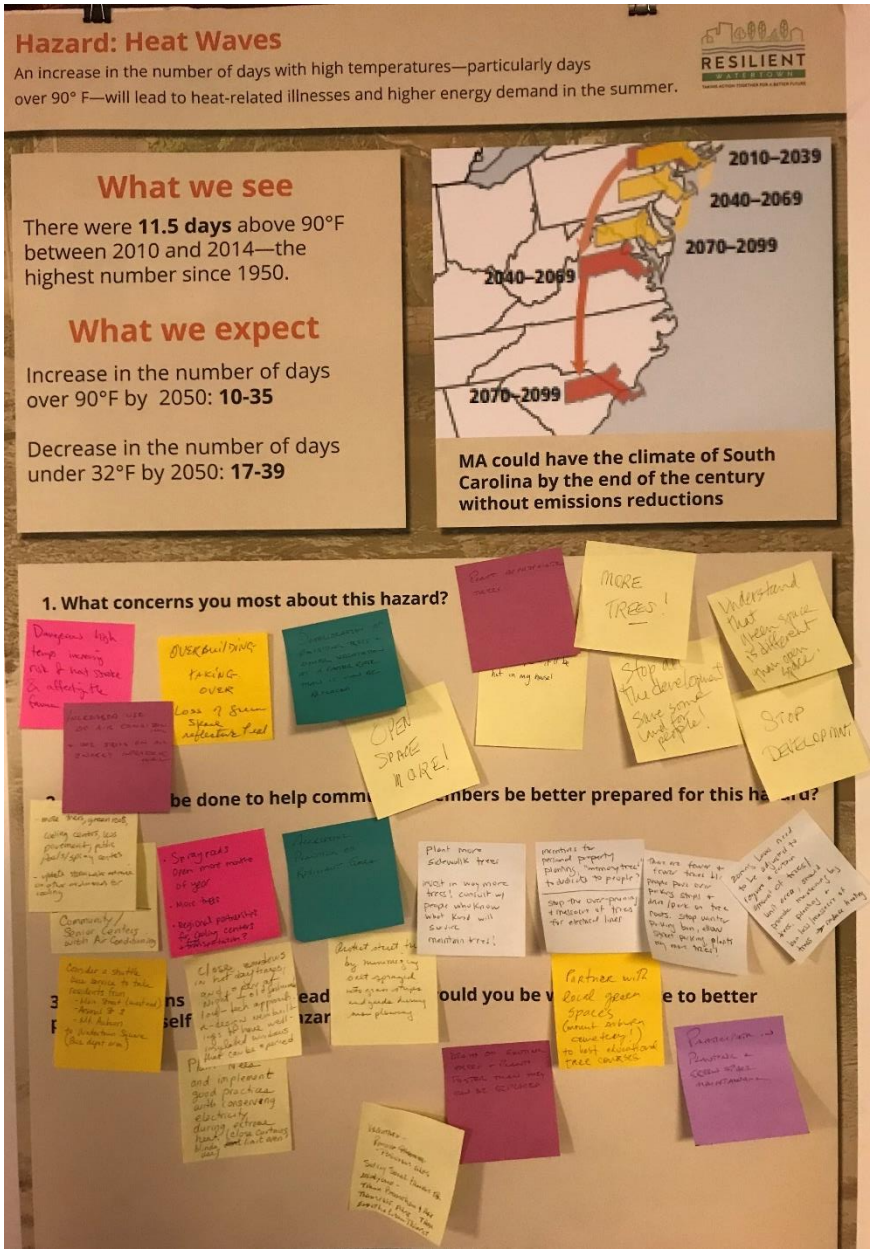
APPENDIX 5: COMMUNITY INPUT FROM LISTENING SESSION



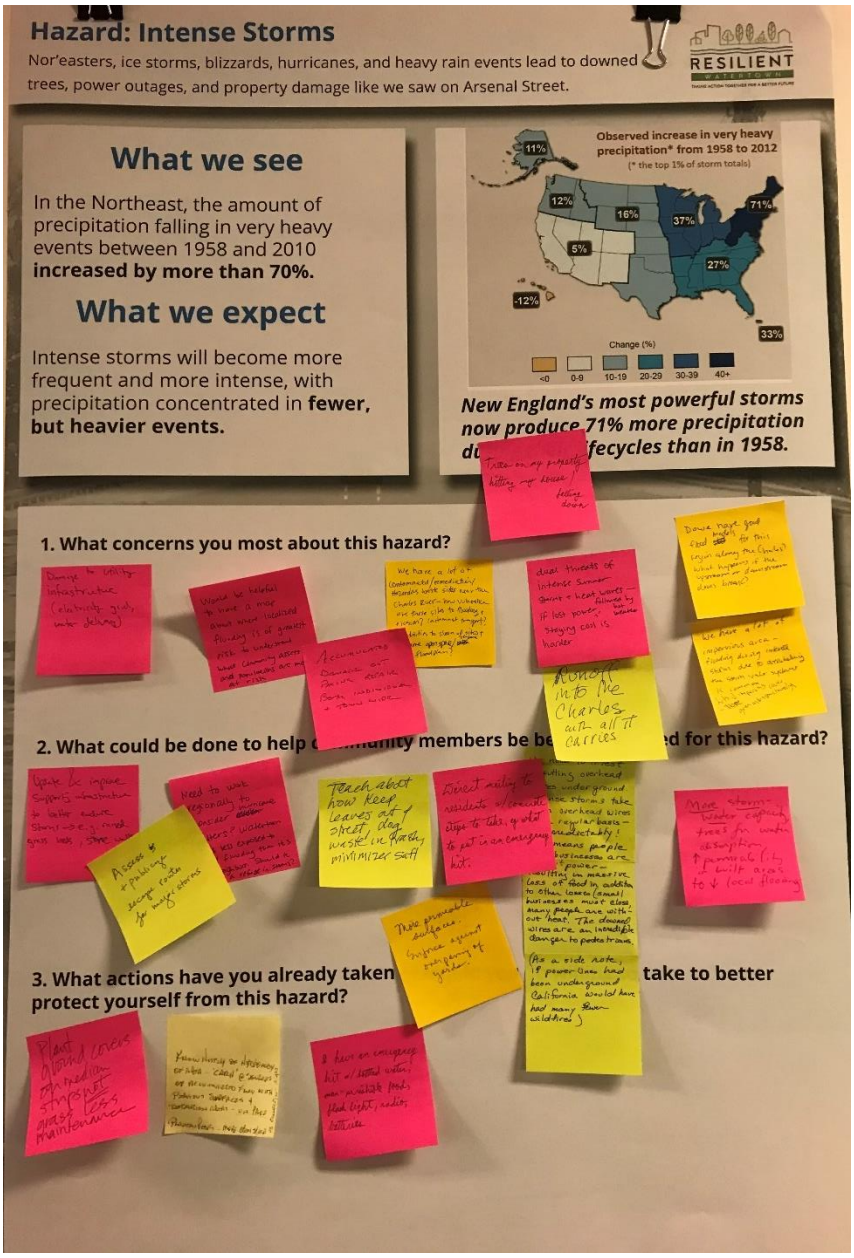
Concerns	What can be done?	Action taken or willing to take
I am terrified about losing access to clean water! Water scarcity is a direct threat to all life on this planet	Making sure parks and open space have trees that will be ok in future climate	
Stressed plants die more often--encourages watering	Trees need drip irrigation so they are not stressed multiple times and die	
Public education water conservation, updated building codes, low flow incentives, infilration BMPs in development projects		
Less worried about this because of the MWRA water supply	More shade and drought-tolerant plants	
Mostly concerned for plants/wildlife	Promote use of rain barrels	
Long-term resilience of the tree canopy/urban forest		


Hazard: Flooding
A single intense downpour can cause serious flooding, which can damage critical facilities and infrastructure or close essential roads. Watertown residents are already reporting more flooding in their basements.
RESILIENT
What we see
Middlesex County saw $35.2 million worth of damage from flooding in March of 2010.
What we expect
Annual Precipitation by 2050: 2-13% increase (1-6 inches/year)
Annual Precipitation by 2100: 3-16% increase (1.2-7.3 inches)/year)
ROAD CLOSED
Warmer weather and standing water also increases the risk of contracting mosquito-borne diseases.
1. What concerns you most about this hazard?
My basement flooding
2. What could be done to help community
better prepared for this hazard?
Stop Paving over Planting Strips - more trees
Where sidewalk trees
Less over-paving at trees & electrical lines
Increase tree planting
Minimize paved area on property
Run downspout into dry well

Concerns	What can be done?	Action taken or willing to take
Understand if system of dams along river is prepared long-term and if changes in river flood due to infrastructure vulnerability are being considered	Community education	Minimized paved area on property
My basement flooding	Definitely get rid of winter parking ban so that the incentive to pave entire yards goes away. Create incentives for impervious paving on yards through fees	Run downspouts into drywell
Watertown has a very high water table and is already prone to flooding	Assess capacity of town's storm drains, especially in areas that have experienced flooding in the past	Put in a permeable driveway
Damage to building and infrastructre	Review stormwater ordinance--what level of stormwater retention are we requiring of developers? How are we maintaining compliance?	Put in a raingarden. Should be incentives
Damage to trees and open areas	No new building should be permitted and the land should be converted to open space	Haven't had a blade of grass on my property since 1976--all permeable
Stormdrain maintenance	More trees, less salt, plant trees that can handle warmer temps	Improved management of the 2-foot-wide "greenstrip" between road and sidewalk--increase permeability and on slopes terrace runoff to stabilize all unconsolidated substrates
Sewage back ups	Develop a list of steps homeowners can take	Pollinator gardens. Incentivize resources for private landowners to remove pavement and increase natural and pollinator-friendly plantings
River pollution	Stop paving over planting strips--more trees. Maybe allow winter on-street parking so less over paving	
	More sidewalk trees	
	Less over-pruning of trees at electric lines	
	Incentives for personal yard planting	
	review streets that flooded during March 2010 storm and other previous intense storms and determine if future damages could be mitigated by increasing drainage capacity (pipes), reducing roadway widths and/or implementing green infrastructure	


Hazard: 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.
RESILIENT WATERTOWN
What we see
There were 11.5 days above 90°F between 2010 and 2014—the highest number since 1950.
What we expect
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
2010–2039
2040–2069
2070–2099
2040–2069
2070–2099
MA could have the climate of South Carolina by the end of the century without emissions reductions
1. What concerns you most about this hazard?
MORE TREES!
OVERBUILDING
TAKING OVER
OPEN SPACE MORE!
STOP DEVELOPMENT
be done to help comm
mbers be better prepared for this ha rd?
Plant more sidewalk trees
Partner with local green spaces
ould you be v
e to better
self

Concerns	What can be done?	Action taken or willing to take
Dangerous high temps increasing risk of heat stroke and affecting the fauna	More open space	Close windows in hot days times and open at night --old-fashioned, low-tech approach. Re-design new buildings to have well-insulated windows that can by opened
Increasing use of air conditioning and the stress on our energy infrastructure	Plant appropriate trees	Participating in planting and green space maintenance
Overbuilding taking over	More trees	Plant trees and implement good practices with conserving electricity during extreme during extreme heat (close curtains/blinds, limit oven use)
Loss of green space	Stop all the development--save some land for the people	
Deterioation of existing trees and other vegetation at a faster rate than can be replaces	Understand that green space is different than open space	
It will be very hot in my house	Stop development	
There are fewer and fewer trees because people pave over parking strips and drive/park on tree roots	More trees, green roofs, cooling centers, less pavement, public pools/spray centers	
Strain on existing trees--harmed faster than they can be replaced	Update stormwater ordinance or other ordinances for cooling	
	Community/senior centers with air conditioning	
	Spray pads open more months of the year	
	Regional partnerships for cooling centers and free transportation	
	Aggressive planting of resilient flora	
	Consider a shuttle bus service to take residents from Main Street (West end), Arsenal street, Mt Auburn to Watertown Square (bus depot area)	
	Protect street trees by minimizing salt sprayed into green strips and yards during snow plowing	
	Plant more sidewalk trees	
	Invest in way more trees! Consult with people who know what kind with survive. Maintain them!	
	Incentives for personal property planting, "memory trees" to dedicate to people?	
	Stop the over-prunning and massacre of trees for electric lines	
	Stop winter parking ban, allow street parking, plant mor trees	
	Zoning laws need to be adjusted to require a certain amount of trees/unit area. Should promote maintenance of trees	
	Partner with local green spaces (Mount Auburn cemetary) to host educational tree courses	


Hazard: Intense Storms
Nor'easters, ice storms, blizzards, hurricanes, and heavy rain events lead to downed trees, power outages, and property damage like we saw on Arsenal Street.
RESILIENT WATERTOWN
What we see
In the Northeast, the amount of precipitation falling in very heavy events between 1958 and 2010 increased by more than 70%.
What we expect
Intense storms will become more frequent and more intense, with precipitation concentrated in fewer, but heavier events.
Observed increase in very heavy precipitation* from 1958 to 2012
(* the top 1% of storm totals)
11%
12%
16%
37%
71%
5%
27%
-12%
33%
Change (%)
<0
0-9
10-19
20-29
30-39
40+
New England's most powerful storms now produce 71% more precipitation
1. What concerns you most about this hazard?
2. What could be done to help
ed for this hazard?
3. What actions have you already taken
take to better protect yourself from this hazard?

Concerns	What can be done?	Action taken or willing to take
Damage to utility infrastructure (electricity grid, water delivery)	Green infrastructure	Plant ground covers on median strips not grassless maintenance
Accumulated damage outpacing repair both individ	Would be helpful to have a map about where localized flooding is of greates risk to understand what community assets and populations are most at risk	I have an emergency kit with bottled water, non-perishable food, flashlight, radio, batteries
We have a lot of contaminated/remediation/hazard waste sites near the Charles River--how vulnerable are these sites to flooding and erosion? Contaminant transport?	Decrease impervious surface	
Trees on my property hitting my house falling down	Update and improve supporting infrastructure to better endure storms (e.g. raised grass beds, stone walls)	
Dual threats of intense summer storms and heat waves. If lost power, followed by hot weather, staying cool is harder	Assess and publicize escape routes for major storms	
Runoff into the Charles with all it carries	Need to work regionally ot consider huriccane shelters? Watertown is less exposed to flooding than its neighbors. Should it serve as a refuse in storms?	
Do we have good models for this region along the Charles? What happens if the upstream or downstream dams break?	Teach about how to keep leaves out of street, dog waste in trash, minimize salt	
We have a lot of impervious area--flooding during intense storm due to overwhelming the stormwater system is common	More permeable surfaces. Education to prevent overpaving of yards	
	Direct mailing to residents with concrete steps to take, such as what to put in an emergency kit	
	More storm water capacity. Trees for water absorption, increase permeability in built areas to decrease local flooding	
	We need to invest in putting overhead wires underground. Intense storms take down overhead wires on a regular basis. It means people and businesses are without power resulting in a massive loss of food in addition to other losses (small businesses must close, many people are without heat). The downed wires are an incredible danger to pedestrians. (As a side note, if power lines had been underground, Californial would have had many fewer wildfires)	