WELLESLEY WILL
BUILD A SUSTAINABLE FUTURE

TOWN OF WELLESLEY

MUNICIPAL VULNERABILITY PREPAREDNESS PROGRAM

Community Resilience Building Workshop
Summary of Findings Report
January 2020

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

KLA | KIM LUNDGREN ASSOCIATES, INC.

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I. OVERVIEW

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 Wellesley chose to pursue certification from the Massachusetts Municipal Vulnerability Preparedness (MVP) program. In the summer 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 funding to complete vulnerability assessments and develop action-oriented resilience plans. Communities who complete the MVP program become certified as an MVP community and are eligible for action grant funding. This Summary of Findings Report presents the results from the five-month effort.

Observed and predicted changes to the climate in Wellesley 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.
- **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 proceeding section.

Wellesley has already taken steps to address climate change and ensure community resilience. In 2010, the Town formed a Sustainable Energy Committee (SEC) to work on initiatives to reduce municipal and community greenhouse gases (GHGs). The SEC completes an annual community greenhouse gas emissions inventory and promotes actions to address climate change and create a more sustainable community. The Wellesley Municipal Light Plant has also developed a set of principles to address GHGs and have taken action with their rebate programs for solar and energy efficiency and with the Voluntary Renewable Energy Program. To reduce energy use in buildings, the Town has proposed municipal sustainable building guidelines that outline criteria and processes to ensure that municipal buildings and private development on Town-owned land are highly efficient and resilient. Wellesley also has a Natural Resources Commission that manages and protects open space, trees, and wetlands. The Town is a certified Tree City, has a wetland protection bylaw, and a natural resource protection bylaw that governs subdivisions. The MVP program allows the Town to further its ability to address current and future climate impacts by proposing specific actions.

In September 2019, the Town of Wellesley partnered with 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 Wellesley's journey to a more resilient future. To complete the work outlined in this report, the Town worked with KLA to:

- Develop branding for the Town's sustainability efforts;
- 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.

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 Wellesley community.

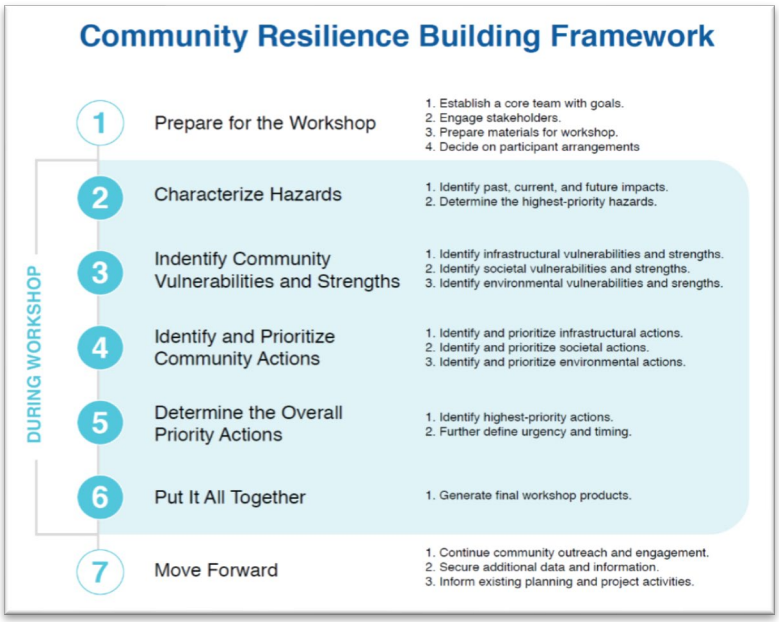
This report provides greater detail about the MVP process that Wellesley followed, and the actions identified as high priorities to enhance local and regional resilience. The Town would like to thank the Massachusetts Executive Office of Energy and Environmental Affairs for their financial and technical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

MVP PLANNING PROCESS

In October 2019, KLA worked with staff from Wellesley's Natural Resources Commission to identify individuals to serve on the MVP Core Team (see Acknowledgments for a list of the members). On October 22, 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 Wellesley can leverage the results of MVP to spark greater community conversation and action on climate change. The Core Team also discussed maps that need to be created to support the MVP workshops. Maps were generated in partnership with Planning Communities, LLC. 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, including key Town departments, schools, environmental groups, the Housing Authority, Council on Aging, faith-based organizations, and regional organizations.

Figure 1: Community Resilience Building Framework

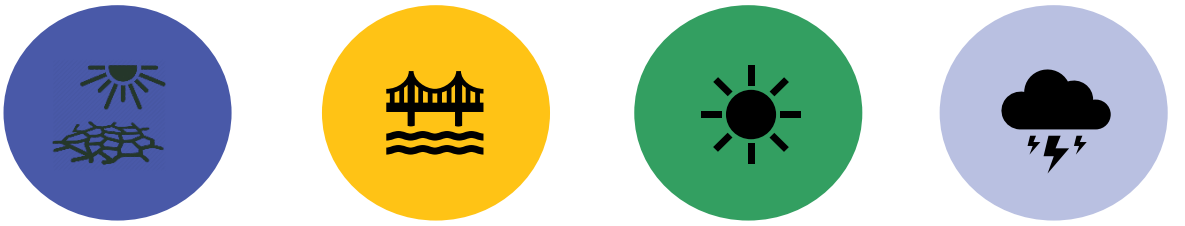


The Natural Resources Department staff sent invitations to the stakeholders for the MVP workshops for two, four-hour workshops, scheduled for November 4, 2019 and November 7, 2019 from 9:00 am to 1:00 pm. In total, 55 individuals were invited to participate in the MVP workshops (see Appendix 2 for a list of stakeholders).

To engage the larger community in the conversation, the Town hosted a public listening session on December 3rd. At this meeting, the consultant team presented the identified hazards and the results of the MVP workshops. The 30 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 confirmed at the beginning of the MVP Workshops. The four hazards identified for Wellesley are:



While Wellesley has not been as impacted by the identified hazards as some communities in Massachusetts, it is understood that the Town needs to ensure it continues to maintain and enhance its resilience given the projected increases in the frequency and severity of flooding, heat waves, and intense storm events. 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 Wellesley. 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 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:

- Communication system
- Energy system
- Fueling stations
- Municipal buildings
- Natural infrastructure
- Roadways
- Sewer and drainage
- Transportation system
- Water systems

Societal Features:

- Business community
- Communication systems
- Commuters
- ESL community
- Fixed/low-income residents
- Food insecure residents
- Housing
- Municipal staff
- Public health (mental and physical)
- Religious community
- Residents with limited technological fluency
- Seniors
- Single residents
- Students
- Those in floodplain

Environmental Features:

- Air quality
- Invasive species
- Parks and open space
- Tree canopy
- Waterways
- Wetlands
- Wildlife

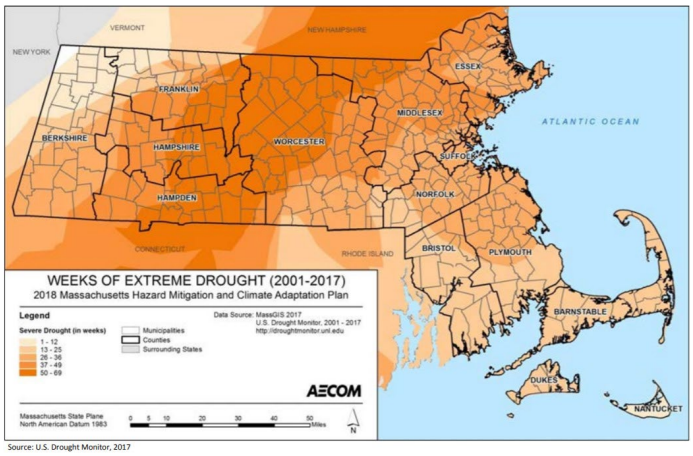
Most of these features were flagged as both strengths and vulnerabilities. As such, workshop participants discussed the specific strengths as well as vulnerabilities before identifying actions that sought to enhance strengths and mitigate vulnerabilities. Appendix 4 includes the completed matrices from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

III. CURRENT CONCERNS AND CHALLENGES PRESENTED BY HAZARDS

Residents of Wellesley are noticing changes to the climate. During the Workshops, participants raised their concerns about these impacts. For the most part, the workshop attendees reported limited disruption to their current way of life but are eager to maintain that trend. Anticipated challenges included protection of the town's vulnerable populations and the threats posed to the community's lifestyle and culture. Highlights from these discussions are captured below, along with more details on each of the four identified 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]



Source: U.S. Drought Monitor, 2017

FROM THE PUBLIC

Attendees at the public listening session were primarily concerned about:

- Diminished water supply
- Damage to tree canopy
- Loss of vegetation
- Loss of food sources
- Damage to crops

Core Team members indicated that Wellesley's lakes and wetlands were highly impacted by this drought. More of these types of events can be expected in the future.

Although drought impacts Wellesley's drinking water, 75% of which is drawn from a high-quality aquifer, the preservation of drinking water seemed somewhat less important for Wellesley compared to other communities due to the ability to draw water from the MWRA in times of shortage. Instead, the community focused heavily on the risk that drought posed

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

to the community's wetlands, which are considered an important natural resource. A general consensus was reached on the need to actively preserve and even promote the growth of the community's wetlands.

There was some exploration of turning drought into an opportunity for management of wetlands—the idea being that sufficiently low water levels could pave the way for the cultivation of drought-resistant species or the removal of invasives. There was also much discussion on the idea of promoting sustainable local landscaping in order to reduce surface water contaminants and overall water consumption. Many participants mentioned the local garden clubs as a possible avenue for achieving this, as well as opportunities for greater collaboration between Wellesley College, Babson College and the Town.

Lastly, although drinking water was not identified to be at risk, the community nevertheless proposed many measures to maintain water quality, such as working with Babson College and Wellesley College to limit the use of pesticides and creating more permeable surface area to reduce surface contamination.

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 any county in Massachusetts.[2] Flooding disrupts transportation systems, damages infrastructure and property, and exacerbates to 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.

Flooding in Wellesley is primarily concentrated around Morses Pond and along the banks of the Charles River. The first of these areas primarily impacts residential units,

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

FROM THE PUBLIC

Attendees at the public listening session were primarily concerned about:

- Blocked evacuation routes
- Increased traffic
- Flooded basements
- Property damage
- Soil damage
- Increasing mosquito populations
- Sewer overflows
- Loss of vegetation
- Erosion

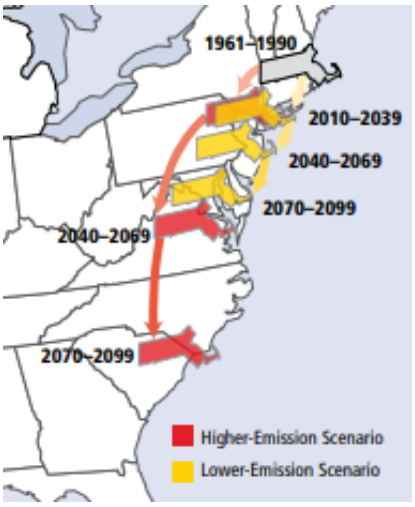
and the latter primarily impacts commercial areas. Pockets of flooding are commonly reported throughout town, however, and Wellesley High School (the town's designated emergency shelter) also sits in the 100-year floodplain.

Participants expressed concern over contamination of surface water due to terrestrial contaminants and combined sewer overflow (CSO) events. The likely increase in mosquito habitat due to more standing water was also raised as an issue, alongside potentially worsening traffic issues in an already heavily trafficked area.

Proposals on handling these issues included developing plans and initiatives to improve the resilience of at-risk homes and businesses. Other suggestions included finding ways to communicate the status of surface water body contamination to the public and finding ways to expand the town's storage capacity through landscaping and zoning.

HEAT WAVES

Extreme heat and heat waves—defined as periods of 3 or more days over 90°F—are on the rise in Wellesley. 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 could be closer to 30 days and by the end of the



[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

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 Wellesley.

FROM THE PUBLIC

Attendees at the public listening session were primarily concerned about:

- Damage to native plants and wildlife
- Increasing insect populations
- Vector-borne diseases
- Greater energy demand from A/C
- The impact on the elderly, sick, and disabled
- Commuter rail interruptions
- Higher cooling costs

Of particular concern to Wellesley's MVP participants was the impact heat could have on the area's trees and other natural resources. Wellesley is a community well known for its extensive tree canopy. Many people voiced concerns over canopy loss as the heat weakened trees are more susceptible to disease and fire, exacerbated by drought, especially among species that are better suited to colder conditions. Participants discussed possible solutions such as a sustainable landscaping program, revisions to the tree protection bylaws, and the cultivation of heat-tolerant species.

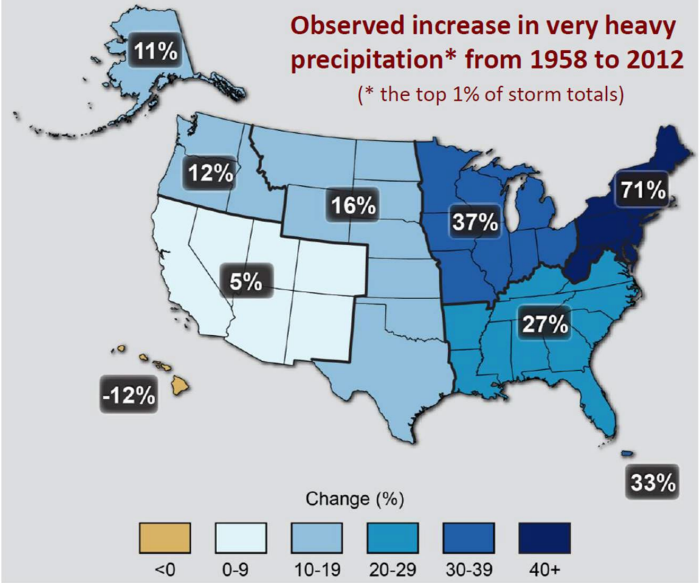
Air quality, which tends to worsen in high temperatures, was also discussed. This issue was heavily tied to existing traffic concerns, especially around schools. The community faces many issues with accessible school bussing, including laws that make it difficult for children to access buses autonomously, lack of free bussing, and a high density of idling cars around school pick-up and drop-off points. To address this issue, the participants proposed many possible improvements to Wellesley's transit infrastructure, including additional buses, better walking connections, and bikeability.

Beyond the tree canopy and air quality, participants also discussed increased mosquito and insect activity in warmer weather and explored how their existing cooling centers could function. The notion of "partial" or "daytime" cooling centers was floated as an alternative to fully stocked shelters due to current lack of use.

[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.

FROM THE PUBLIC

Attendees at the public listening session were primarily concerned about:

- Power outages
- Property damage
- Vulnerability of seniors and disabled residents
- Compromised communication systems
- Rising water table
- Impact on transportation

The MVP workshop participants expressed particular concern over the ability of the town to evacuate in case of a serious storm event. This is due to a combination of local stormwater and flooding control issues, a lack of a clearly defined evacuation plan, and perceived vulnerability of communications systems. To address these issues, there was much discussion around creating a unified communications strategy, developing options to create and disseminate an effective evacuation procedure and to implementing solutions to increase stormwater capacity, such as gabion baskets, culvert improvements, and adjustments to existing ponds. The culvert

[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

under Rt. 9 was identified as an area of particular concern. However, Wellesley does not operate nor have the authority to improve that culvert, as it is owned by MassDOT.

The topic of power outages came up in many of the small groups. While Wellesley has a municipal light plant that allows it to recover from power loss more quickly than many neighboring communities, participants nevertheless stressed the need for improvements to power infrastructure. Common suggestions on this topic included the development of micro-grids, the expansion of solar installations with battery storage, and repair of the leaky gas lines throughout town, which are not owned or operated by the municipal utility.

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, the Town's open space and educational institutions came to the forefront as the biggest strengths. Tree canopy management was seen as a strength relative to neighboring towns, but workshop participants noted that there is still work to be done to maintain the tree canopy as a strength. Additionally, while perhaps underutilized, the transportation network to get in and out of Wellesley was an asset to commuters. Finally, the Town's electric grid resilience was also identified as a strength because of the municipal light plant and the number of underground power lines.

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 Wellesley 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 over 160 actions. Each participant was asked to vote on their top three priorities across the three community components. With a four-way tie, the following are the top five actions that were collectively identified as top priorities for Wellesley:

- Transit improvements around school and rail stations (13)

- Develop an emergency preparedness campaign that leverages preexisting communication channels, ensures web accessibility, and includes low-tech strategies to maximize reach to all populations. (9)
- Work with various partners to identify, prioritize, and address stormwater management needs, such as the Route 9 culvert (9)
- Conduct a feasibility assessment for microgrids (9)
- Install more solar panels with battery back-up (9)

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

Infrastructure:

- Work with various partners to identify, prioritize, and address stormwater management needs, such as the Route 9 culverts
- Install more solar panels with battery back-up
- Conduct a feasibility assessment for microgrids
- Identify locations of gas shut off valves and improve maintenance

Societal:

- Develop an emergency preparedness campaign that leverages preexisting communication channels, ensures web accessibility, and includes low-tech strategies to maximize reach to all populations.
- Unified communication strategy that leverages diverse channels and existing organizations
- Improve commuter and walking connections to schools

Environmental:

- Transit improvements around school and rail
- Implement a sustainable landscaping program
- Promote pocket parks/"parklets"/popup parks with built in education (e.g. tree nursery)
- Refine Tree Protection Bylaw to incentivize further protection

BLUEPRINTS

To increase the lasting value of this report, KLA worked with the Natural Resources Commission 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 and were not already covered by another planning process. After identifying the three actions, the KLA Team met with the proposed champion of each action to develop and refine the steps, timeframe, partners and funding mechanisms. Below are the results of those conversations.

Action: Develop and implement an emergency preparedness campaign with a robust communication plan

DESCRIPTION OF ACTION	*Develop an emergency preparedness campaign that leverages preexisting communication channels, ensures web accessibility, and includes low-tech strategies to maximize reach to all populations.*		
CHAMPION	Stephanie Hawkinson, Selectman's Office		
IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	Timeframe	Key Partners	Funding Resources
1. Create an online and print emergency preparedness resource center to include: • Links to alert and communications systems like Reverse 911 and Mass #211 • Information about current emergencies and air quality • A place to sign up to be on the list of individuals to be checked on during emergency events • Preparedness tips and resources (i.e. FEMA, MEMA) • Provide translated resources	1-2 month	• Board of Health • Neighboring Towns • Police/Fire • CERT • Schools	Staff time Hazard Mitigation Fund Grant Fund for Wellesley (Foundation for MetroWest)
2. Create a plan to increase emergency management coordination (i.e. evacuation plans) among City departments, community groups, institutional facilities, and residents	1 year	• Board of Health • Housing Authority • Council on Aging • Library • Fire/Police • Colleges • Schools • Local organizations • Places of worship • CERT • MBTA	Staff time Hazard Mitigation Fund Grant Fund for Wellesley (Foundation for MetroWest)

3. Assess existing outreach at the neighborhood scale. Leverage PTOs at elementary schools, the neighborhood leads on the Next Door app, and other neighborhood leaders to form a "Neighborhood Liaisons" program that can help set up alert systems and share resources	1 year	• Housing Authority • CERT • Elementary School PTOs • Friends of [Neighborhoods]	Staff time Hazard Mitigation Fund Grant Fund for Wellesley (Foundation for MetroWest)
4. Leverage existing town communications systems to expand the reach of emergency preparedness education • 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	• Board of Health • Housing Authority • Council on Aging • Library • Fire/Police • Colleges • Schools • Local organizations • Places of worship • CERT • Merchants Association • Neighboring towns	Staff time Hazard Mitigation Fund Grant Fund for Wellesley (Foundation for MetroWest)

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to the Unified Plan Goals/Actions and other MVP actions? Supported Unified Plan goals/actions: • Work through the Council on Aging to develop a plan for aging in place • Wellesley fosters formal and informal connections among neighbors and peers to strengthen social capital and intergenerational ties. Other supported MVP proposed actions: • Create and distribute preparedness kits • Promote CERT	*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 • Complete town-wide emergency preparedness plan • Ensure communication systems are redundant and resilient to address impacts	*How can we engage the populations that benefit from implementing this action?* • Partnering with the groups listed in Step 4 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 • Include request to sign up for reverse 911 in census mailing and mailing sent prior to Town Meeting • Work with Key Club/National Honor Society to help recruit sign-ups for reverse 911 at the RDF, Roche Bros or other high traffic areas

Action: Inventory, prioritize, and address stormwater management maintenance needs

DESCRIPTION OF ACTION	*Work with various partners to identify, prioritize, and address stormwater management needs, such as the Route 9 culvert.*
CHAMPION	• Department of Public Works, Engineering Division

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	Timeframe	Key Partners	Funding Resources
1. Finalize the systematic inventory of all stormwater infrastructure.	6 months	• MassDOT • GIS Manager	General Fund State grants
2. Affirm existing evaluation criteria and integrate MS4 components to create a formalized evaluation criteria to prioritize infrastructure upgrades	6 months (annual basis)	• Natural Resources Commission • Board of Health • Charles River Watershed Association • Massachusetts Stormwater Coalition (BlueDot)	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	• Natural Resources Commission • MassDEP • Planning Board	State grants
4. Continue water quality monitoring.	Ongoing	• MassDEP • Charles River Watershed Association	State grants

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to the Unified Plan Goals/Actions and other MVP actions? Supported Unified Plan goals/actions: • Wellesley's stormwater management system incorporates best practices that promote infiltration and improve water quality. • Promote and/or require the use of Low Impact Development (LID) and green infrastructure approaches to stormwater management in public and private development • Identify impervious areas that can be removed for stormwater benefits, especially near natural resources and recreation areas, and include in project planning. Other supported MVP proposed actions: • Mitigate NaCl infiltration and install bioswales • Conduct a study on vulnerabilities from stormwater infiltration	*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: Implement a Sustainable Landscape Program

DESCRIPTION OF ACTION	*Create a program that engages residents, businesses, and partners to build a network of support for implementing sustainable landscape design, installation, and maintenance principals.*
CHAMPION	● Natural Resource Commission (NRC)

IMPLEMENTATION STEPS	PLANNING CONSIDERATIONS		
	Timeframe	Key Partners	Funding Resources
1. Establish a baseline assessment of landscaping in Wellesley (tree canopy baseline, etc.) and compile a list of sustainable landscape best practices and resources through interviews with experts in the field.	1 month	• Landscaping companies • Nurseries • Community Preservation Committee • Wetlands Protection Committee • Trails Committee • NOFA	MVP action grant/staff time Toxic Use Reduction Institute Grants
2. Host a series of public events with guest speakers who can speak to implementable design, installation, and maintenance principles.	1-2 years	• Experts listed above • Department of Public Works • Garden Club	MVP action grant/staff time
3. Develop sustainable landscape guidelines for capital projects	1-2 years	• DPW (Park and tree) • Schools • Library	MVP action grant/staff time Toxic Use Reduction Institute Grants
4. Expand distribution of the existing NOFA handout and any additional best practices through social media, hosting public landscaping work parties, tabling at existing events, and partnering with local businesses and organizations.	Ongoing	• Partners in neighboring towns • Wetlands Protection Committee	MVP action grant/staff time

		• Trails Committee • NOFA • Sustainable Wellesley • Wellesley Green Schools • Wellesley Conservation Council	

LINKS TO OTHER PLANS & ACTIONS	EQUITY CONSIDERATIONS
How does this action connect to the Unified Plan Goals/Actions and other MVP actions? Supported Unified Plan actions: • Provide nonpoint source pollution education to residential and nonresidential private property owners. • Promote the use of green infrastructure best management practices (BMPs) on public and private properties to manage stormwater • Continue to implement the organic integrated pest management program. Other supported MVP proposed actions: • Education to residents on benefits of trees and native species • Plant hardier, storm-resistant trees • Promote rain barrels • Promote green infrastructure • Enhance education around pesticide use, water use, and organic lawn care • Improve soil quality and biodiversity • Baseline assessment of tree canopy	*How can the community incorporate equity into the implementation of this action?* • Ensure communications are reaching beyond the normal "choir" • Provide translated resources • Take affordability into account: "Sustainable landscapes on a budget"

MEASURING SUCCESS	ENGAGING THE COMMUNITY
How can we measure the progress and success of this action? Outputs: • Attendance at public workshops • Completion of a robust, resource-filled handbook • Visits to handbook webpage Outcomes: • Reduction in pesticide/herbicide use • Improvement in water quality in local waterways • Increase in native species and pollinator habitats	*How can we engage the populations that benefit from implementing this action?* • Reach everyone with a flyer in utility bills • Partner with Planning and DPW to ensure the Town is using sustainable landscape practices throughout Wellesley • Host a workshop with businesses that is adapted for how businesses can incorporate sustainable landscapes into their operations • Partner with the Housing Authority and Housing Development Corporation to connect with interested residents

VI. CONCLUSION AND NEXT STEPS

Ultimately, the MVP process was only the first step in starting a conversation about climate change impacts in Wellesley. 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 Wellesley as a leader in the field. As part of the MVP process, KLA helped create a brand including a logo, tag line, colors, and fonts. The following logo was selected as the face of future sustainability and resiliency initiatives, along with the tagline: Wellesley Will Build A Sustainable Future. Wellesley is ready to charge forward into the next phase.

WELLESLEY WILL
BUILD A SUSTAINABLE FUTURE

ACKNOWLEDGEMENTS

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

Core Team Members	Affiliation
Bill Shaughnessy	Water/Sewer
Brian Dupont	Information Technology
Chief Jack Pilecki	Police Department
Dave Cohen	Department of Public Works
Dave Hickey	Engineering Department
Cheryl Leffman	Health Department
Don Newell	Municipal Light Plant
Jamie Jurgensen	Libraries
Julie Meyer	Wetlands Protection Committee
Kevin Kennedy	Facilities Management
Marybeth Martello	Sustainable Energy Committee
Meghan Jop	Board of Selectmen
Scott Whittemore	Police Department

Report Citation

Town of Wellesley (2019). Community Resilience Building Workshop Summary of Findings. Wellesley, Massachusetts.

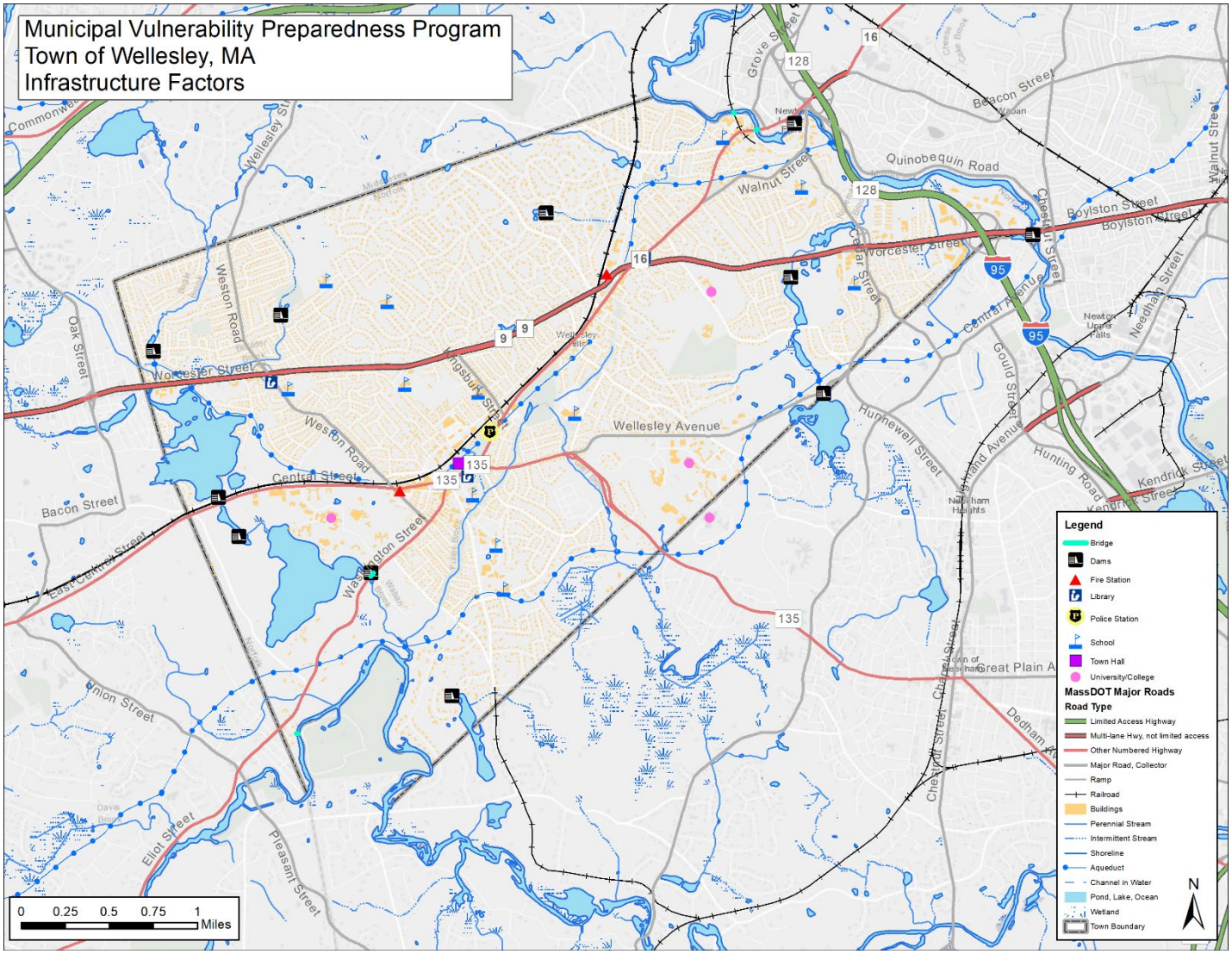
Community Resilience Building Project Team

Name	Title	Affiliation
Brandon Schmitt	Director	Natural Resources Commission
Kim Lundgren	Lead Facilitator	KLA
Mike Steinhoff	Facilitator	KLA
Maggie Peard	Facilitator	KLA
Robert Meyer	Facilitator	KLA

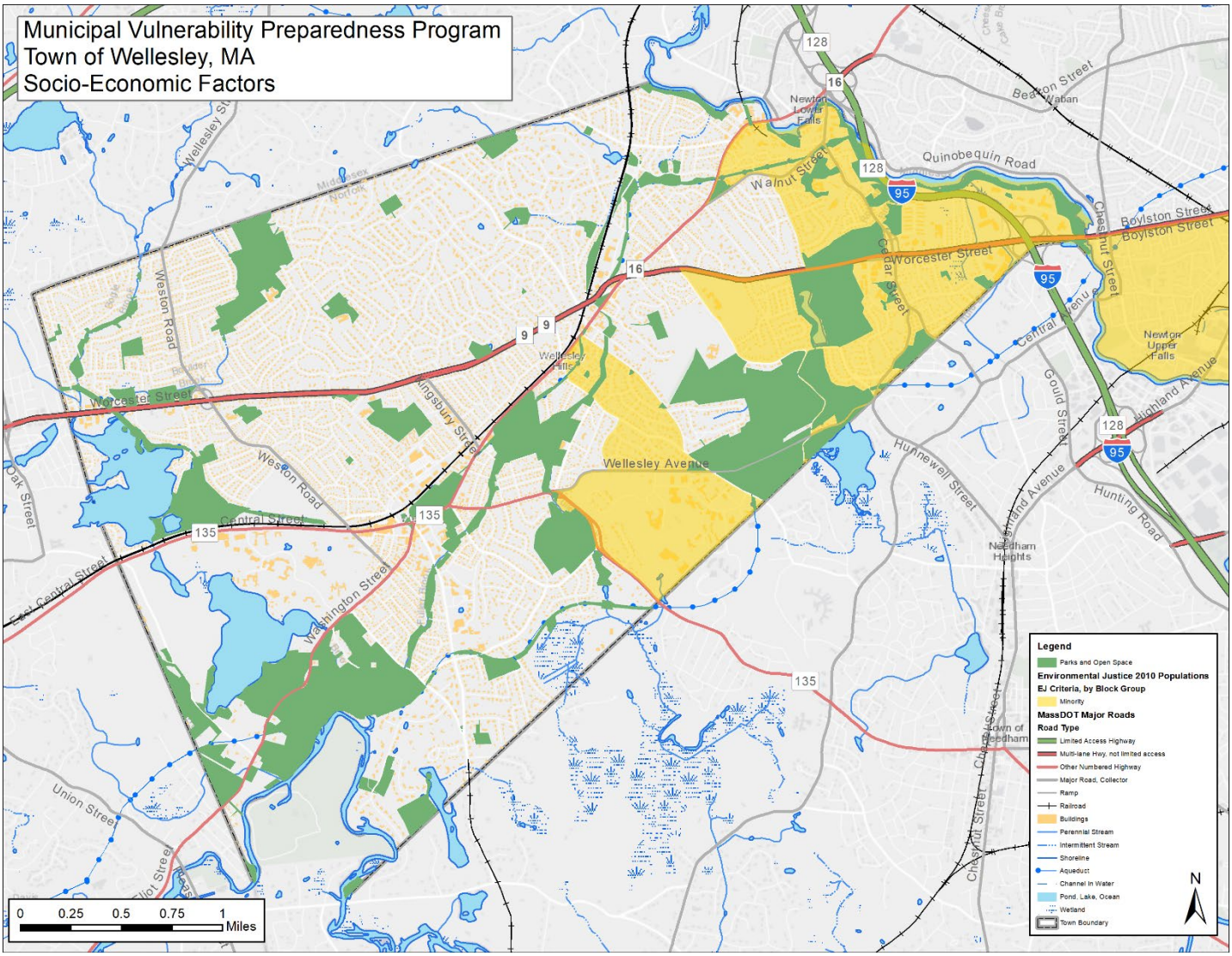
APPENDICES

APPENDIX 1: MAPS FOR MVP WORKSHOPS

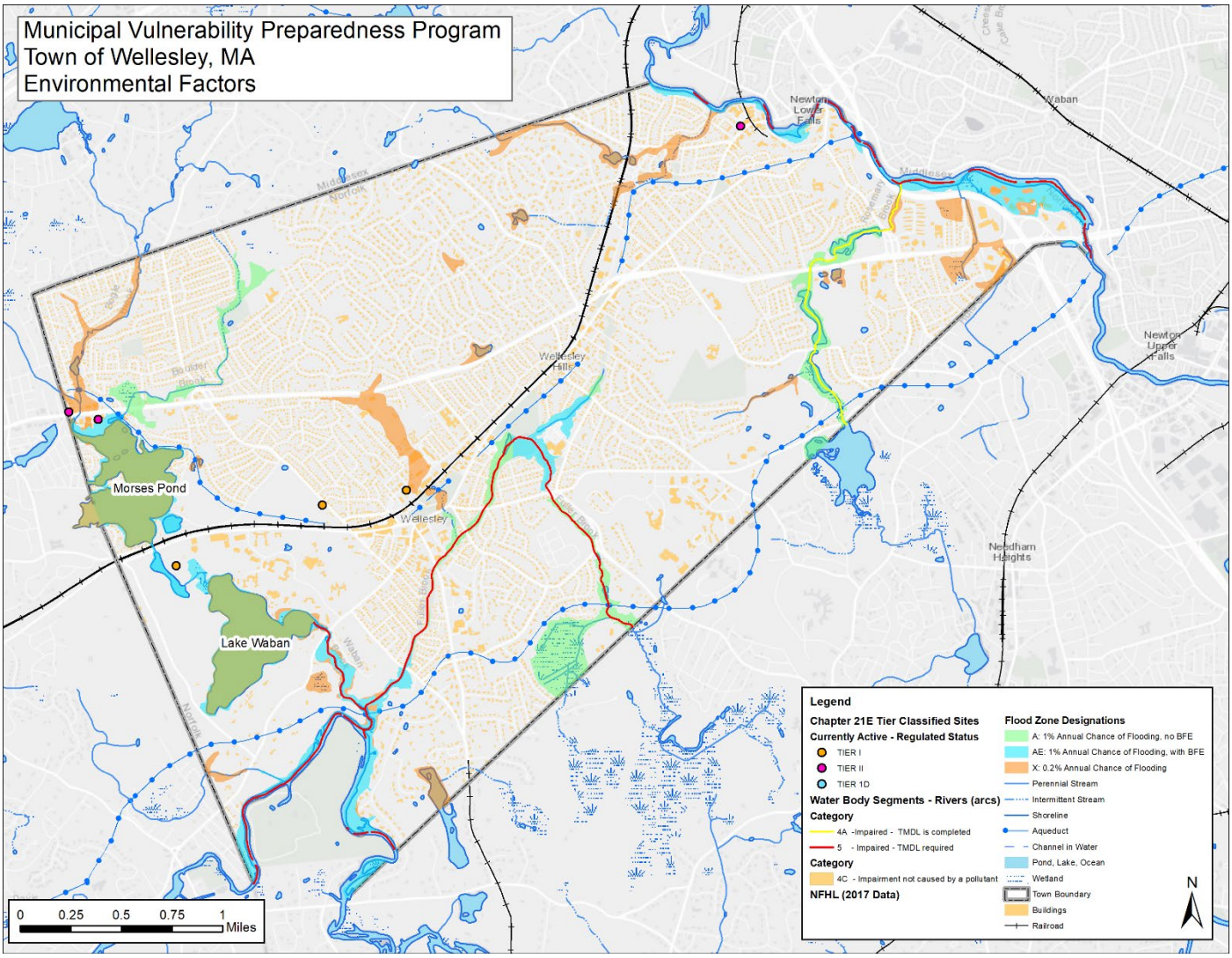
Infrastructure



Societal


Municipal Vulnerability Preparedness Program
Town of Wellesley, MA
Socio-Economic Factors
Wellesley Avenue
Worcester Street
Central Street
Weston Road
Washington Street
Kingsbury Street
Walnut Street
Quinobequin Road
Boylston Street
Hunnewell Street
Highland Avenue
Hunting Road
Gould Street
Cedar Street
Chestnut Street
Union Street
Oak Street
Needham Heights
Newton Upper Falls
Newton Lower Falls
Wellesley Hills
Legend
Parks and Open Space
Environmental Justice 2010 Populations
EJ Criteria, by Block Group
Minority
MassDOT Major Roads
Road Type
Limited Access Highway
Multi-lane Hwy, not limited access
Other Numbered Highway
Major Road, Collector
Ramp
Railroad
Buildings
Perennial Stream
Intermittent Stream
Shoreline
Aqueduct
Channel in Water
Pond, Lake, Ocean
Wetland
Town Boundary
0 0.25 0.5 0.75 1 Miles
N

Environmental



APPENDIX 2: MVP WORKSHOP ATTENDEES

Name	Title	Affiliation
Town Lead		
Brandon Schmitt	Director	Natural Resources Commission
Consultant Team		
Kim Lundgren	Lead Facilitator	Kim Lundgren Associates, Inc. (KLA)
Mike Steinhoff	Facilitator	Kim Lundgren Associates, Inc. (KLA)
Maggie Peard	Facilitator	Kim Lundgren Associates, Inc. (KLA)
Robert Meyers	Facilitator	Kim Lundgren Associates, Inc. (KLA)
Workshop Attendees		
Asheen Phansey	Director of Sustainability	Babson College
Bill Shaughnessy	Superintendent	Water & Sewer
Brandon Fitts	Assistant Director	Recreation Department
Brian Dupont	Director	Information Systems
Carolyn Meklenburg	Greater Boston Regional Coordinator	MVP Program
Cheryl Lefman	Public Heath Outreach	Board of Health
Dave Cohen	Director	Department of Public Works
Dave Hickey	Engineer	Department of Public Works
Don Newell	Director	Municipal Light Plant
Don McCauley	Director	Planning Board
Fred Bunger	Vice Chair	Sustainable Energy Committee
Jack Pilecki	Chief	Police Department
Jeff Peterson	Deputy Chief	Fire Department
Jillian Wilson Martin	Sustainability Coordinator	Town of Natick
Jim McLaren	Member	Wetlands Protection Committee
John Adams		Rotary Club
Julie Meyer	Wetlands Admin	Wetlands Protection Committee
Julie Wood	Director Projects	Charles River Watershed Association
K.C. Kato	Town Clerk	Town of Wellesley

Katie Griffith	Chair	Natural Resources Commission
Kevin Kennedy	Project Manager	Facilities
Lenny Izzo	Director	Board of Health
Lisa Arm	Acquisitions	Library
Lise Olney	Selectwoman	Board of Selectmen
Marybeth Martello	Sustainability Coordinator	Sustainable Energy Committee
Meghan Jop	Executive Director	Board of Selectmen
Morgan Dwinell	Analyst	Finance
Phyllis Theerman	Chair	Sustainable Wellesley
Raina McManus	Vice Chair	Natural Resources Commission Board
Scott Whittemore	Deputy Chief	Police Department
Stephanie Hawkinson	Communications Manager	Communications
Susan Griffin	Principal Project Manager	National Grid
Tucker Beckett	Planner	Planning Department

APPENDIX 3: CLIMATE CHANGE SUMMARY

Like most Massachusetts communities, Wellesley 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.

WELLESLEY WILL
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Intense Storms

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

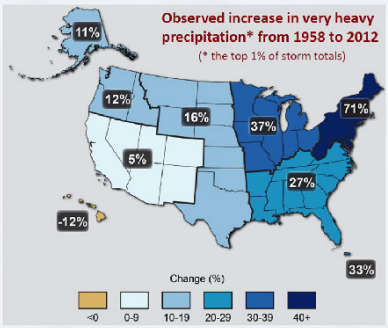
Trends

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

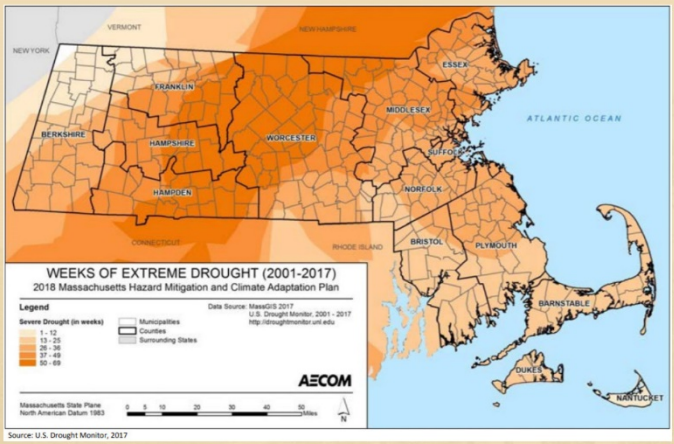
Precipitation will be concentrated in fewer storm events. This can lead to water supply shortages, crop damage, and habitat stress.

Trends

Between 2001 and 2017, Norfolk County saw **11 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.

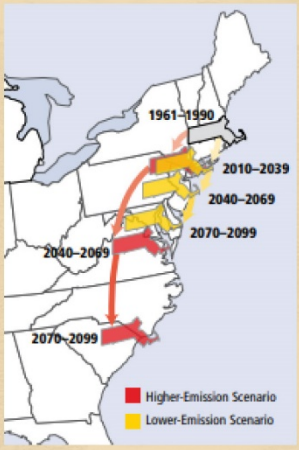
Trends

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 Brandon Schmitt, Natural Resource Commission Director:

bschmitt@wellesleyma.gov

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

This summary was prepared for the Town of Wellesley, 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 **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
Infrastructure										
Power -Small generation resources currently -no battery systems	Town Wellesley College	Public/Private	V/S	Algonquin emergency--> black out Algonquin line ejector stations, community centers out, local failure			1. Add solar with battery back up 2. Geothermal 3. Expanding back up coverage	4. Micro grid feasibility 5. Undergrounding 6. Building code update	M	O
Communications -weak cell coverage -fiber network (light plant owned)	Townwide	Public/Private		Lack ability to contact residents				7. Internet-based emergency comms 8. Repeaters 9. Expand MLP	H	O
Natural Infrastructure -Open space -farms & gardens -trees	Townwide	Public/Private	V	Weak trees, fire EEE and insects Encroachment biodiversity loss Tree canopy and cooling	10. Diversify tree species 11. IPM committee with colleges, etc.		12. Stop clear cutting 13. Boost Tree Protection Bylaw 14. Better local composting		H	O
Fueling Stations (Evs, fossil)		Public/Private	V	Gas shortage Lack of EV infrastructure 2 day supply if disrupted				15. EV fleet	M	L
Roadway -drainage systems, snow removal -not all maintained by the Town	Townwide Rt 9 specific	Public		Leaves, clogged Freezing, snow DPW maintenance schedule Road closure salt runoff		16. Review maintenance schedule and coordination with state 17. Boosting stormwater bylay		18. Evaluate ice melt alternatives 19. Low impact development	H	O
Water systems -local wells -MWRA connection -sewer back ups where ejector Station	MWRA connect, ponds, Paintshop Pond, Waban	Public	S	NACL-Rt 9 state usage Ejectors Contamination events	20. Redundant MWRA conn	21. Mitigate NaCl infiltration, bioswales			H	O
Community centers/municipal buildings -Assets, but high power users -University facilities-Babson secondary shelter (plans outdated)	High schools Rec centers Babson	Public/Private	V/S	Sustainability of shelters Power consumption		23. Standardizing interop	24. Efficiency standards	22. Expand charging or partia	M	L
Public Transportation -lack regular service, schools very limited -bad pedestrian connections, evacuation of students	Route 9	Public	V	Evacuation and traffic Student Absorbing Boston traffic shut pike bus use	25. Congestion pricing 26. Drop-off/pick-up laws		27. Bus shelter	28. Research shcool bussing a	L	O
Energy Supply	Townwide	National Grid-gas Oil - private tanks	S/V	Greater demand with heat/cool, fragmentation, outages, increasing costs, gas leaks, pipes leak in freezing temps	1. Pilot for geothermal micro district 2. Reduce peak demand through resident education and battery storage 3. Transition to more renewable energy sources 4. Energy efficiency: heat pump incentives, passive house standards, transition from oil/gas, municipal building guidelines, net-zero buildings 5. IDing location of gas shut off valves and maintenance			1. H 2. H 3. H 4. H 5. H	1. S 2. H 3. O 4. O/S 5. S
Transportation (public and roads)	Townwide	State, Town, priv	V/S	Flooding, snow removal, tree bl	6. Advocate for bus stop along Rt. 9 7. Collaboration with the Ride and hospital to expand transportation to Wellness visits 8. Prioritize evacuation routes for maintenance (snow plan) 9. Incorporate solar and EVCSs into public parking 10. Make pedestrian and bike plan (Complete Streets policy) 11. Car-free days/anti-idling/walk-bike-to-school days/reduce car travel				6. H 7. H 8. H 9. H 10. H 11. H	6. O 7. O 8. O 9. O 10. O 11. S
Sewer/Drainage	regional sewer Townwide	Town	V/S	Flooding, potential break, stormwater infiltration, improper use of sump pumps	12. Education around sump pump drainage 13. Green infrastructure plan, wetland restoration 14. Reduce impervious surfaces through "depaving parties," zoning, and stormwater regulations				12. M 13. H 14. H	12. O 13. O 14. O
Water system (dams, reservoir, wells, aquaducts)	Townwide			Dam breaks	15. Develop drought management plan (water bans, etc) 16. Study on reservoir vulnerability from stormwater infiltration 17. Investigate Longfellow Dam (feasibility of green infrastructure solutions) 18. Evaluate/rate needs/risks of all Town dams				15. H 16. H 17. H 18. H	15. S 16. S 17. S 18. S
Communication systems (cell towers, telephone)	Townwide				19. Improve reliability of cell service, dead zones				19. H	19. S
Municipal buildings	Throughout	Public	S	Flooding at Townhall, GW + sewage Branch libraries, town hall = historic No generators or back up supply in most buildings	1. Promote h20 efficiency t	2. Establishing a more robust diasaster data/network in town		3. Identify priority bldgs for backup generators	1. M 2. H 3. H	1. L 2. S/O 3.
RDF	Specific	Public	S	Surrounded by wetlands in floodplain - access is limited						
Water system (Wellesley college has own system) Groundwater from townw/ MWRA support in summer	throughout	Public	S	Very few private wells Two aquifers - succeptible to drought Outside meters encourage Lawn watering Automated metering is useful if wanted to enforce	4. Investigate the willingness of community to consider going beyond voluntary measures for water conservation				4. M	4. S
Electrical system	Throughout	Public	S	Overhead infrastructure Affected by trees Some underground Low power supply - comes in From Newton AMI system	5. Implement AMI for electrical system			6. Investigate smart micro grids 7. Evaluate opportunities for renewable energy power backup - storage. Educate EV drivers + find opportunities to support Evs in limited power stations. Integrate with comms strategy	5. H 6. H 7. H	5. L 6. S 7. S
Stormwater system	Throughout	Public+Private	S/V	Designed to handle a 10 yr storm Avg age: 70 years old Culvert below rt 9 undersized		9. Support at-risk homes in resiliency hardening + investigate grant opportunities 10. Work w/ MDOT to address R. 9 culvert + regular SW maintenance			9. M 10. H	9. L 10. L/O
Communication system	Throughout	Public/Private	S/V	S= residents have choices v=cellular dead zones IT's role is the strength and regular replacement + upgrade		11. Feasibility study to expand town's fiber optic system to residents	13. Offer town-wide wifi	12. Engage neighboring communities to create network of data hubs	11. H 12. M 13. H	11. L 12. S 13. 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	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time S Long O ngoing
Socio-Economic										
Seniors+9-11	Throughout		V/S	Isolation, financial, mobility, health, food accessibility, power dependance, mental health	1. Create and distrubute preparedness kits 2. Unified communications strategy (promote resources of Council on Aging, diversify outlets, engage places of worship, welcoming groups, and Wellesley at Home) 4. Promote CERT			3. Create a clean up crew with high school students and scouts	1. H 2. H 3. L 4. M	1. S 2. O 3. O 4. O
Commercial buildings/areas	Throughout	Private	S	Most are in floodplains Used to have major flooding of Linden Lower Falls area Williams st--new development: no net new runoff Town has minimal control here	5. Partner with Merchants Association to develop preparedness plan				5. M	5. O
Commuters (including college commuters)				Transportation network is solid but vulnerable to a shock 30% of people work in town	6. Access opportunity to promote more connected and coordinated transportation system between schools 7. Ensure commuters have safe access to get to their jobs inside or outside Wellesley with a focus on connected, multimodal systems				6. M 7. H	6. S 7. L
Communication Systems	Throughout	Public		90+% do not live in town--might be hard to get here, too expensive to live here	8. Ensure communication systems are redundant and resilient to address impacts				8. H	8. O
Municipal Staff					9. Support Housing Production Plan for subsidized municipal housing				9. M	9. L
New Housing--market and affordable -450 units over next 3-5 years -40R--Williams St electric units solar and heat pumps										
Food Insecure -seniors -K-12 students MetCo -Mas Bay Comm College	Pockets through town		V	Food pantry run by volunteers can't get delivery of food Drought increases cost of food Town camps have grants for transportation and food Mass Bay provides free food for students	10. Increase food rescue program and develop food security plan				10. H	10. S
Public Health				High heat	11. Strengthen tree preservation bylaw 12. Investigate opportunities to develop a resilience fund/utility				11. H 12. H	11. O 12. L
Chinese/ESL community	Throughout	--	V/S	Emergency outreach issues Communication bylaws	1. Use schools to distrib+F: 2. Assess translation need: 3. Connect with universities on outreach				1. H 2. L 3. M	
Single/Elderly	Throughout	--	V	Temperature threats House bound	4. Connect with COA	5. Expanding COA reach	6. Staffing COA		4. H 5. H 6. H	
Fixed/Low-income	Throughout or h	--	V	Lack on transit Temperature threats		7. Improve walkability	8. Cooling assistance program 9. Wellness checks 17. Cooling centers	10. Study transit option 11. Sidewalk clearance	7. H 8. M 9. L 10. H 11. L 17. M	
Business community	Throughout	--	V/S	Continuity Emergency mobilization Loss/damage	12. Outreach to Chamber and Merchant Association				12. M	
Student population	Throughout	--	V/S	Mobility/Transit issues Mobilization	13. Create volunteer opportunity			14. Commuter and walk	13. M 14. H	
Religious Community	Throughout	--	S	Access/service demand		15. Outreach to community			15. L	
Medically vulnerable	Throughout	--	V	Medical outages						
Partial/non-residents	Throughout	--	V	Non-compliance						
Limited tech	Town wide	--	V		1. Emergency prep campaign--ability to reach everyone (emergency info distribution) 2. Leveraging COA, HA, schools, library, etc communication channels for unified communications 3. Ensuring tech accessability (mobile apps, visual impairment, those without email) 4. Utilize low tech communication strategies				H	S

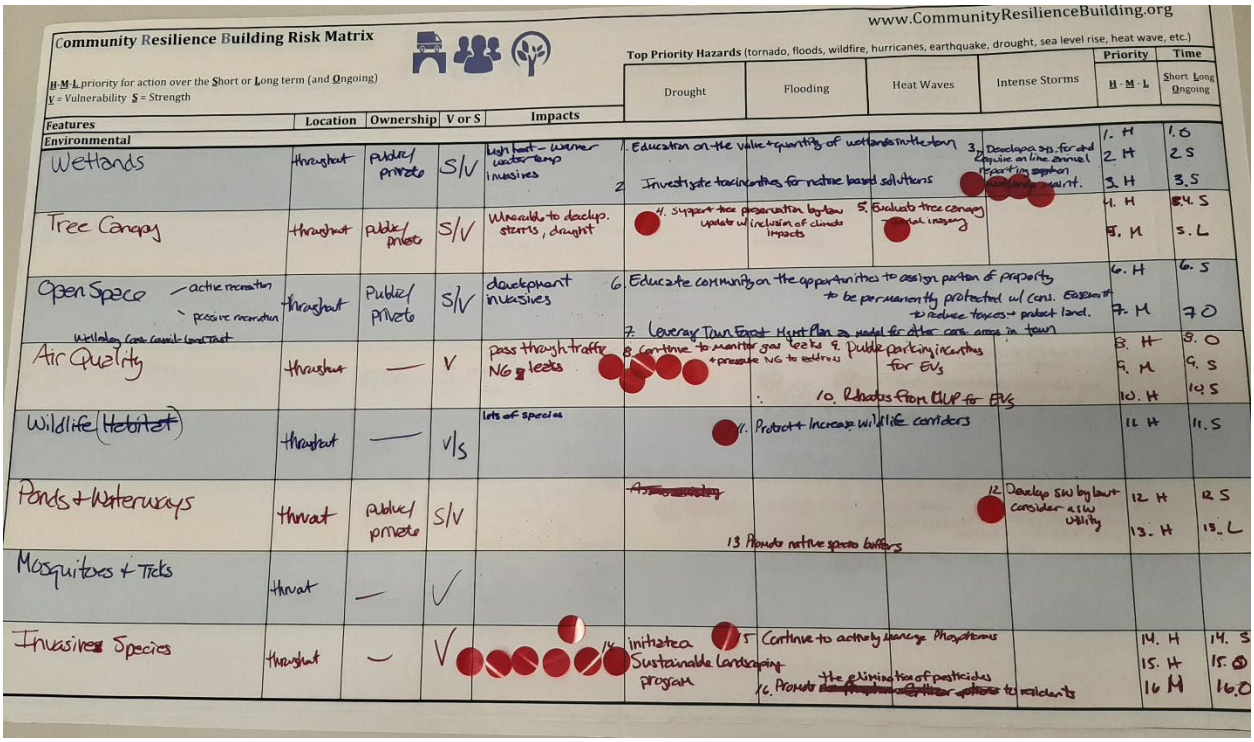
Those in floodplain	Wellesley Center	Town, private	V	Food vulnerability	5. Ensuring businesses/institutions have communicated evacuation plans 6. Create voluntary checklists ffor developers that takes climate projections into account 7. Advocate to state for climate considerations for 40Bs	5. H 6. H 7. H	5. S 6. S 7.S
Vulnerability to heat/cold	Town wide	--	V		8. Increasing available heating and cooling centers, providing staffing 9. Cooling shelter protocols (extended library hours, transportation, colleges)	8. H 9. H	8. S 9. S
Limited English speakers	Town wide	--	V/S		10. Protocol on translation for critical communications (partering with ESL program at library, language program ant universites, Chinese schools) 11. Formalize town language priorities across schools, Town, etc	10. H 11. H	10. O 11. S
Elderly/medically vulnerable	Town wide	--	V/S		12. Outreach to create more robust inventory of medically vulnerable 13. Collaboration with medical reserve, COA, CERT, volunteers to check on this population after emergency 14. Continue emergency preparation, home safety and expand COA's climate change workshops and make them available in multiple languages and locations	12. H 13. H 14. H	12. O 13. S 14. S
Mental health	Town wide	--	V		15. Keep communication about climate change in perspective and solution-oriented. Communication with wellness providers to reach out to patients during/after shocks	15. H	15. O
Businesses	Town wide	Private	S/V	Loss of business Loss of access for employees S: MLP able to supply power, so people come from other towns	16. Outreach to businesses on back up power, emergency prep, mitigation strategies, heating/cooling, childcare for employees	16. H	16. S
Low income	Town wide	--	V	Food security, transportation	17. Continue to expand food waste/recovery efforts 18. Inclued access to food in emergency prep plans 20. Advocate to MBTA for preparedness planning, improving emergency access to public transportation	17.H 18. H 19. H	17. O 18. S 19. O
Students	Town wide	--	S/V		21. Planning for MetCo students' transportation/lodging during weather events	20. H	20. 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
Environmental										
Tree Canopy	Townwide	Public and priva	V/S		1. Refine Tree Protection Bylaw to further incentivize protection 2. Education to residents on benefits of trees and natives vs. invasives 3. Add tree protection to design review of Large House Review 4. Protect the North 40 5. Include carb on sequestration (trees/soil) in climate plan 6. Plant hardier, storm resistant trees				1. H 2. M 3. L 4. H 5. H 6. L	1. S/O 2. O 3. S 4. S 5. S 6. O
Watershed	Townwide	Mix: some privat	V/S		7. Create a stormwater bylay 8. Financial incentives to reduce outdoor waste 9. Water education linked with new water meters (rebates, efficiency) 10. Promote rain barrels through installation assistance and education 11. Replicate Fuller Brook restoration program 12. Promote green infrastructure to reduce flooding along Washington street 13. Continue and enhance education around lawn use, pesicides, and water use 14. Continue lake management (algae blooms, invasives, etc)				7. M 8. H 9. H 10. L 11. H 12. H 13. M 14. H	7. S 8. S 9. S 10. L 11. L 12. L 13. O 14. O
Biodiversity/wildlife (soil health)	Townwide		S		15. Promote native species on private lands, outreach and education for pollinator friendly plantings, climate beneficial landscaping 16. Promote organic lawn care (leave the leaves campaign) 17. Collaborate with landscapers to improve soil health and biodiversity				15. H 16. H 17. H	15. S 16. O 17. S
Air quality	Townwide		V		18. Continue anti-idling campaign/education 19. Require more electric charging stations in parking lots and encourage installation in heavily trafficed areas 20. Accessibility of commuter rail, bike lines, increased density, access of public transit				18. M/H 19. H 20. H	18. O 19. L 20. S/L/O
Darkness	Townwide		S		21. Convert existing lighting to shielded, non light-polluting lighting				21. H	21. S
Parks/Open Space	Townwide	Public	S		22. Integrating healthy ecosystems, mitigation, stormwater management, into recreational facilities 23. Natural shade structures around parks/schools 24. Promote benefits of kids gettign outside/being active (get outside campaign with programming) 25. Multimodal connectivity between parks 26. Promote pocket parks/"parklets"/pop up parks with built in education (e.g. tree nursury) 27. Streamlining park permitting 28. Prioritization of envi benefits over costs in RFPs				22. H 23. H 24. H 25. H 26. H 27. H 28. H	22. O 23. S 24. O 25. O 26. S 27. S 28. O
Wetlands	Townwide	Public	V		29. Protect current wetlands and explore creating new ones 30. Consider charging for stormwater utility (Newton as example)				29. H 30. H	29. S/O 30. S
Wetlands	Townwide	Public/Private	S/V	Encroachment Biodiversity Loss Fire buffer loss Water supply & quality degradation	1 - Study how to maintain during dry periods	2 - Expand flood storage capacity, opportunites with development process 3. Education for homeowners to protect & expand 4 - Land buyback program 5 - Fund for private green infrastructure	6. Maintain areas of heat relief naturally 7. Evaluate water pumping near wetlands 8. Evaluate heat impact on insects		1. L 2. M 3. H 4. L 5. L 6. L 7. L 8. L	1. S 2. L 3. S 4. L 5. L 6. O 7. L 8. S
Air Quality	Townwide	Public/Private	V	Fire Risk Wood Stove Smoke Dust & Leaf Blowers Gas Leaks	8. Evaluate Air quality alerts for smoke or spraying 10. URC education on leaf blowers vs mulching into lawn 11. Evaluate license for lawn care companies & incentives to electrify	13. Public transit solutions around schools & college 14. EV school buses 16. Morning only busing	12. Evaluate public idle reduction technologies 15. Educate woodstove retrofits		9. M 10. L 11. M 12. M 13. H 14. L 15. L	9. S 10. S 11. L 12. S 13. O 14. L 15. L 16. S
Ponds and Streams	West side	Public/Private	V/S	Invasives Runoff from pond Runoff from lawns	17. Highlight the importance of ponds during events & with art 18. Water conservation through smart irrigation 19. Promote xeriscaping	20. Highlight good stewards 21. Share best management practices among area institutions 22. Garden Club competition to reduce pesticides/chemicals 23. Educate the youth	24. Aerate the ponds	25. Morses Pond erosion control	17. M 18. H 19. H 20. H 21. H 22. H 23. H 24. M 25. M	17 - S 18 - L 19 - S 20 - S 21 - S 22 - S 23 - S 24 - L 25 - O
Charles River	East/west	Public/Private	V/S	See wetlands	See wetlands	See wetlands	See wetlands	See wetlands		
Trees	Townwide	Public/Private	V/S	Pests Drought stress	26. Evaluate species list & drought tolerance 27. Education for landscapers 28.Community/Neighborhood tree health study		29. Maintain/Enahnce wildlife refuge connectivity	30. Re-use carbon from debris 31. Educate on hazard trees	26. H 27. M 28. M 29. M 30. L 31. M	26. S 27. S 28. S 29. O 30. L 31. S
Solar Resources	Townwide									
Wetlands	Throughout	Public/private	S/V	High heat - warmer water temp Invasives	1. Education on the value and quantity of wetlands in the town 2. Investigate incentives for nature based solutions				1. H 2. H 3. H	1. O 2. S 3. S
Tree Canopy	Throughout	Public/private	S/V	Vulnerable to development, storms, drought	4. Support tree preservation bylaw, update with inclusion of climate impacts.		5. Evaluate tree canopy with aerial imagery		4. H 5. H	4. S 5. L
Open Space (Active & Passive Recreation, Wellesley Cons. Co	Throughout	Public/Private	S/V	Development Invasives	6. Educate community on the opportunities to assign portion of property to be permanently prtected with conservation easements to reduce taxes & protect land. 7. Leverage town forest management plan as a model for other conservation areas in town.				6. H 7. M	6.S 7. O
Air quality	Throughout	-	V	Passthrough traffic Natural gas leaks	8. Continue to monitor gas leaks and pressure National Grid to address. 9. Public parking incentives for Evs 10. Rebates from MVP for EVS				8. H 9. M 10. H	8. O 9. S 10. S
Wildlife (Habitat)	throughout	-	V/S	Lots of species	11. Protect + Increase wildlife corridors				11. H	11. S
Ponds and waterways	throughout	Public/Private	S/V		13. Promote native species buffers			12. Develop stormwater bylaw, consider a stormwater utility	12. H 13. H	12. S 13. L
Mosquitoes and ticks										
Invasive species					14. Initiate a sustainable landscaping program	15. Continue to actively manage phosphorous 16. Promote the elimination of pesticides			14. H 15. H 16. M	14. S 15. O 16. O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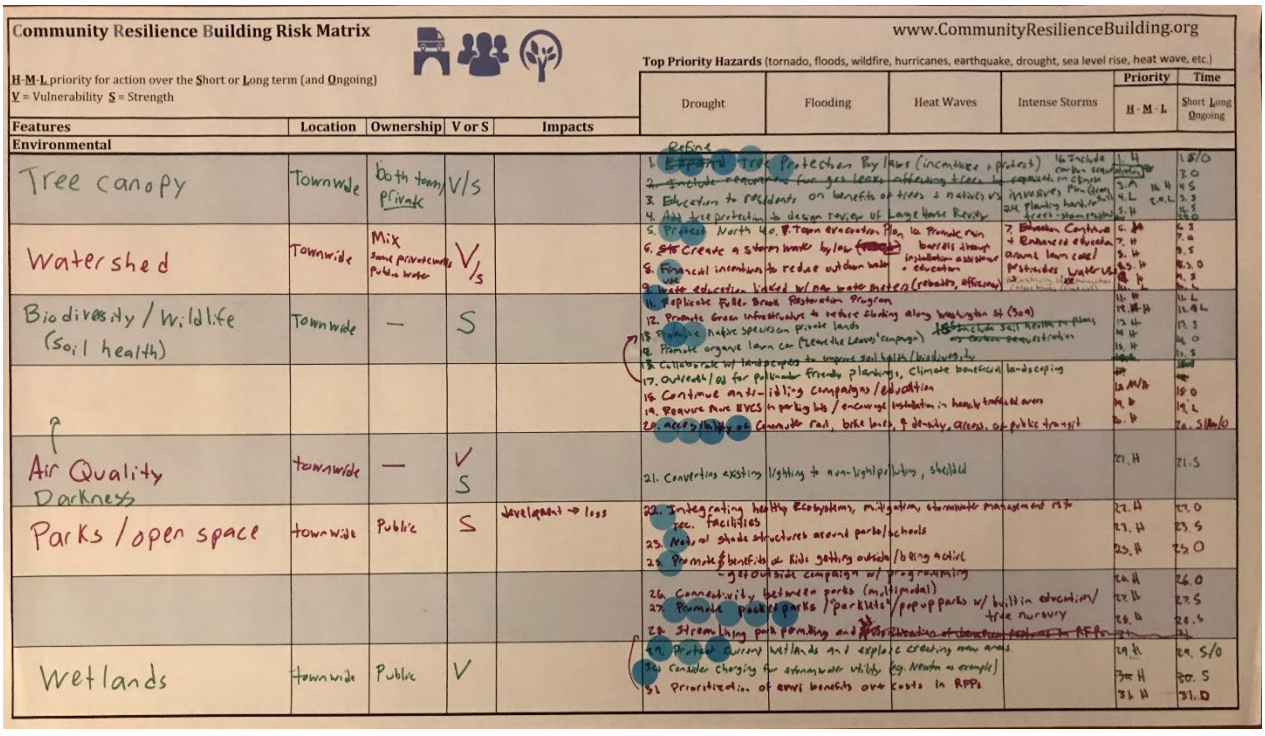
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)
Drought
Flooding
Heat Waves
Intense Storms
Priority
Time
Features
Location
Ownership
V or S
Impacts
Environmental
Wetlands
Tree Canopy
Open Space
Air Quality
Wildlife (Habitat)
Ponds + Waterways
Mosquitoes + Ticks
Invasives Species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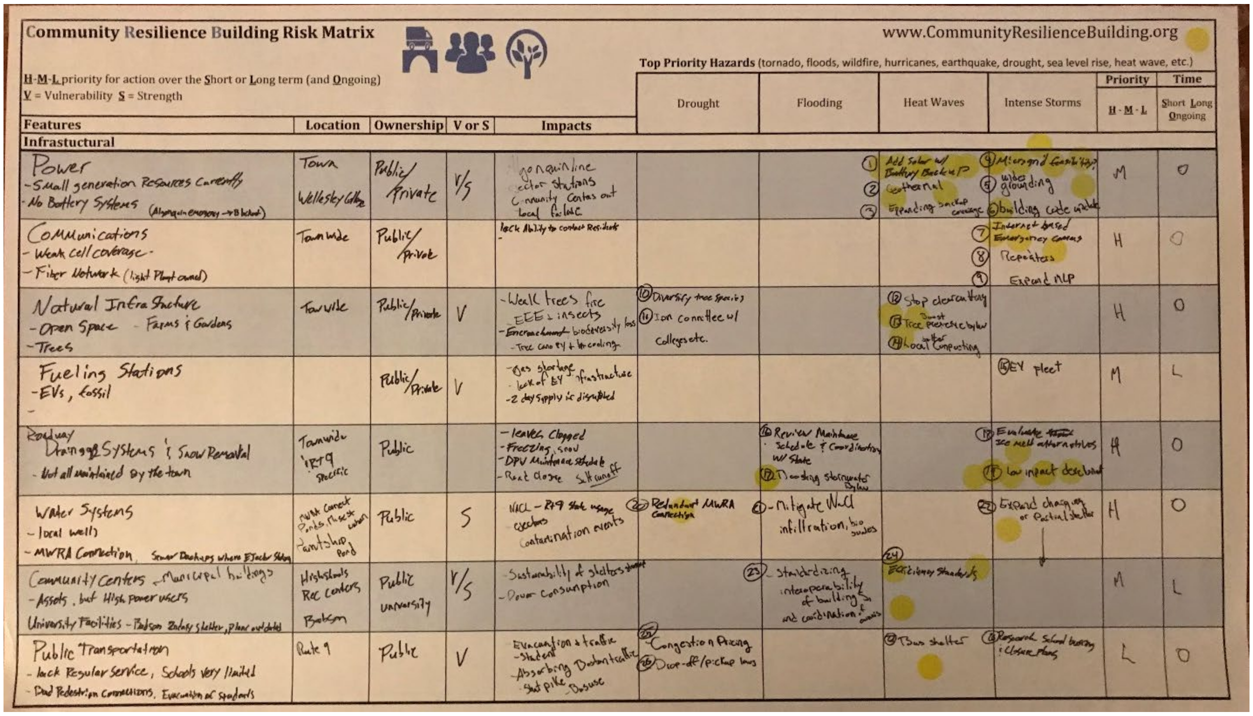
Flooding
Heat Waves
Intense Storms
Priority
Time
Features
Location
Ownership
V or S
Impacts
Environmental
Tree canopy
Watershed
Biodiversity / Wildlife (Soil health)
Air Quality
Darkness
Parks / open space
Wetlands



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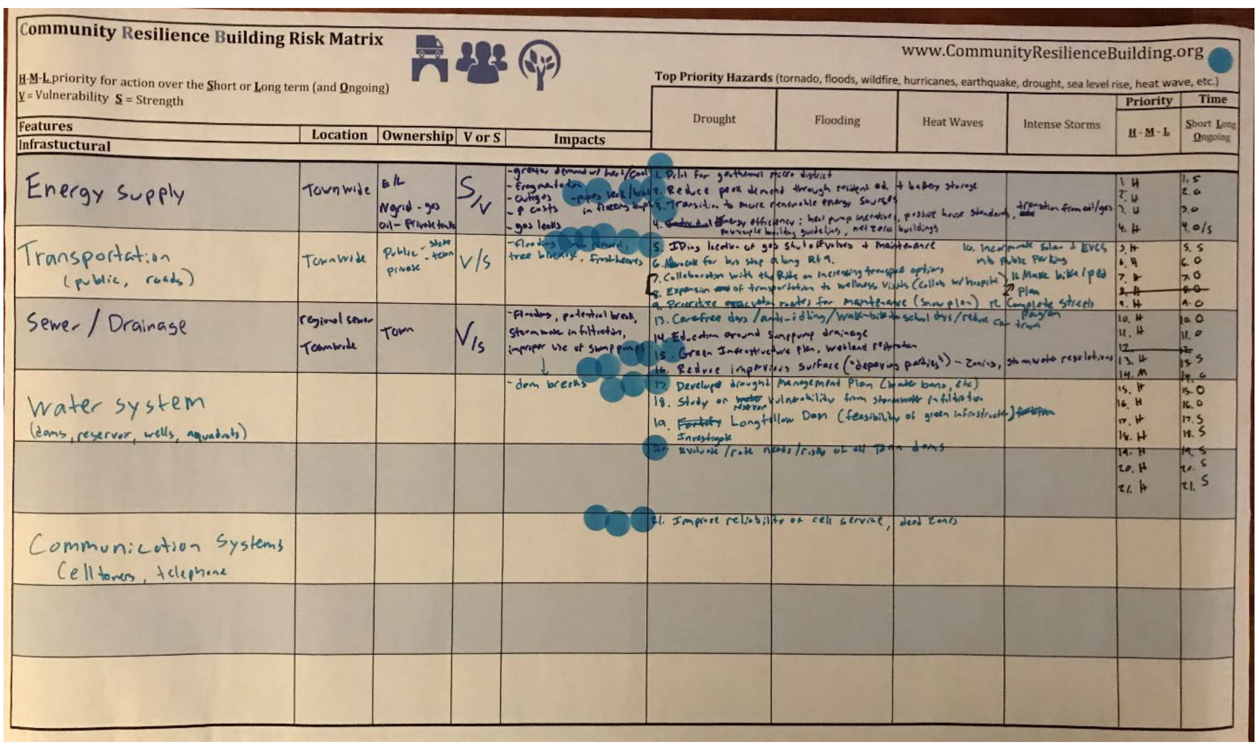
Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastuctural										
Power -Small generation Resources currently -No Battery Systems (Algonquin emergency → Blackout)	Town Wellesley College	Public/Private	V/S	Algonquin line -ector stations Community Centers out Local failure			(1) Add Solar w/ Battery Backup (2) Geothermal (3) Expanding backup coverage	(4) Microgrid feasibility (5) under grounding (6) building code update	M	O
Communications -Weak cell coverage- -Fiber Network (light Plant owned)	Town wide	Public/Private		lack Ability to contact Residents				(7) Internet based Emergency comms (8) Repeaters (9) Expand MLP	H	O
Natural Infrastructure -Open Space -Farms & Gardens -Trees	Townwide	Public/Private	V	-Weak trees fire EEE & insects -Encroachment biodiversity loss -Tree canopy + tree cooling	(10) Diversify tree species (11) Ion committee w/ Colleges etc.		(12) Stop clear cutting (13) Tree protection bylaw (14) Local better Composting		H	O
Fueling Stations -EVs, fossil		Public/Private	V	-Gas shortage -lack of EV infrastructure -2 day supply if disrupted				(15) EV fleet	M	L
Roadway Drainage Systems & Snow Removal -Not all maintained by the town	Townwide & Rt 9 specific	Public		-leaves clogged -Freezing, snow -DPW Maintenance schedule -Road closure Salt runoff		(16) Review Maintenance Schedule & Coordination w/ State (17) Flooding stormwater Bylaw		(18) Evaluate ice melt alternatives (19) low impact development	H	O
Water Systems -local wells -MWRA Connection Sewer Discharges where Ejector Station	MWRA Connect Ponds, Morses Paintshop Pond	Public	S	NaCl – Rt 9 State usage ejectors Contamination events	(20) Redundant MWRA Connection	(21) -Mitigate Wall infiltration, bio swales		(22) Expand charging or Partial shelter	H	O
Community Centers -Municipal buildings -Assets, but High power users University Facilities – Babson 2nd day shelter, plan outdated	Highschools Rec centers Babson	Public University	V/S	-Sustainability of shelters -Power consumption		(23) Standardizing interoperability of buildings and coordination of owners	(24) Efficiency Standards		M	L
Public Transportation -lack Regular service, Schools very limited -Bad Pedestrian connections, Evacuation of Students	Route 9	Public	V	Evacuation & traffic -Student -Absorbing Boston traffic Stat pike Bus use	(25) Congestion Pricing (26) Drop-off/pickup lanes		(27) Bus shelter	(28) Research School busing & Closure plans	L	O



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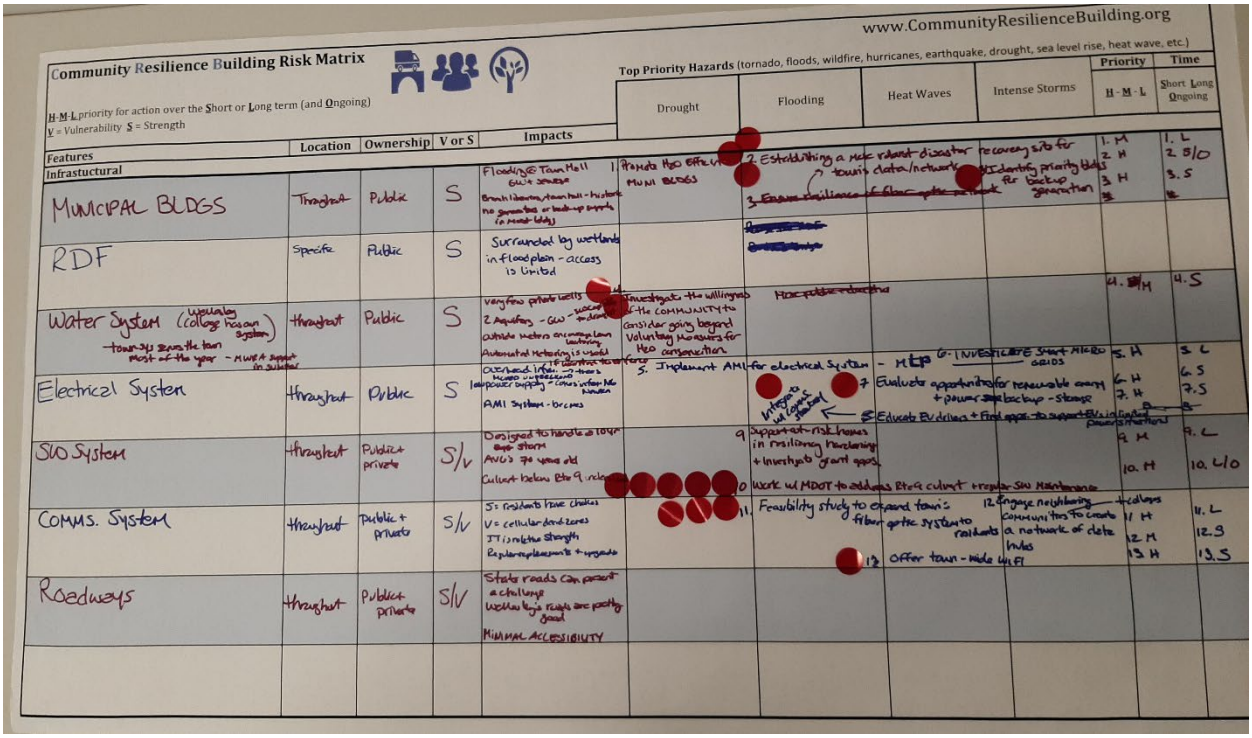
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought / Flooding / Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Infrastuctural								
Energy Supply	Townwide	E/L Ngrid - gas Oil – Private tanks	S/V	-greater demand w/ heat/cool -fragmentation -outages -pipes leak/break in freezing temps -↑ costs -gas leaks	1. Pilot for geothermal micro district 2. Reduce peak demand through resident ed. + battery storage 3. Transition to more renewable energy sources 4. Energy efficiency: heat pump incentives, passive house standards, transition from oil/gas, municipal building guidelines, net zero buildings		1. H 2. H 3. H 4. H	1. S 2. O 3. O 4. O/S
Transportation (public, roads)	Townwide	Public – State – town private	V/S	-Flooding, snow removal, tree blockage, frost heaves	5. IDing location of gas shutoff valves + maintenance 6. Advocate for bus stop along Rt 9. 7. Collaboration with the Ride on increasing transport options 8. Expansion of transportation to wellness visits (Collab w/ hospital) 9. Prioritize evacuation routes for maintenance (snow plan) 13. Carefree days / anti-idling / walk-bike to school days / reduce car trips	10. Incorporate Solar & EVCS into public parking 11. Make bike/ped Plan 12. Complete streets Program	5. H 6. H 7. H ~~8. H~~ 9. H 10. H 11. H ~~12.~~	5. S 6. O 7. O ~~8. O~~ 9. O 10. O 11. O ~~12.~~
Sewer / Drainage	regional sewer Townwide	Town	V/S	-Flooding, potential break, Stormwater infiltration, improper use of sump pumps	14. Education around Sumppump drainage 15. Green Infrastructure plan, wetland restoration 16. Reduce impervious surface ("depaving parties") – Zoning, stormwater regulations		13. H 14. M	13. S 14. O
Water system (dams, reservoir, wells, aquaducts)				-dam breaks	17. Develop drought Management Plan (water bans, etc) 18. Study on reservoir vulnerability from stormwater infiltration 19. Investigate Longfellow Dam (feasibility of green infrastructure) 20. Evaluate/rate needs/risks of all Town dams		15. H 16. H 17. H 18. H 19. H 20. H 21. H	15. O 16. O 17. S 18. S 19. S 20. S 21. S
Communication Systems Cell towers, telephone					21. Improve reliability of cell service, dead zones			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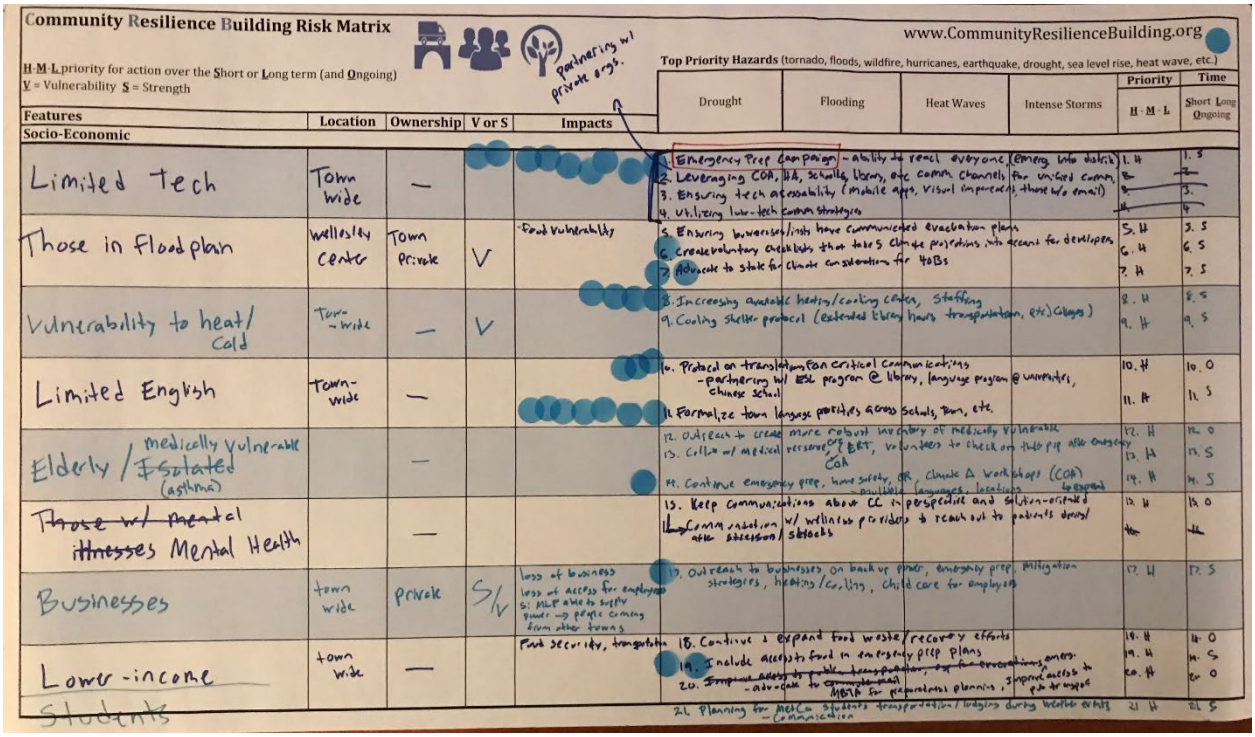
Flooding
Heat Waves
Intense Storms
Priority
Time
Features
Location
Ownership
V or S
Impacts
Infrastuctural
MUNICIPAL BLDGS
RDF
Water System
Electrical System
SW System
COMMS. System
Roadways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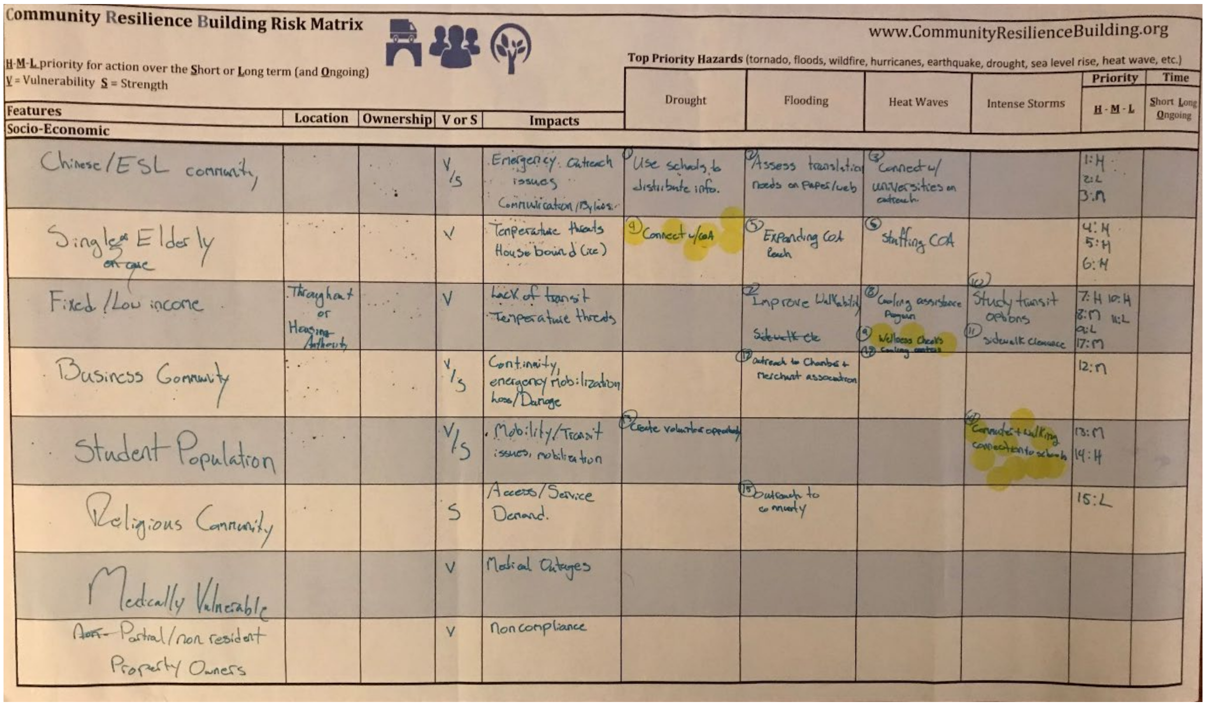
Flooding
Heat Waves
Intense Storms
Priority
Time
Features
Location
Ownership
V or S
Impacts
Socio-Economic
Limited Tech
Those in Floodplain
Vulnerability to heat/ Cold
Limited English
Elderly / Medically Vulnerable
Businesses
Lower-income Students



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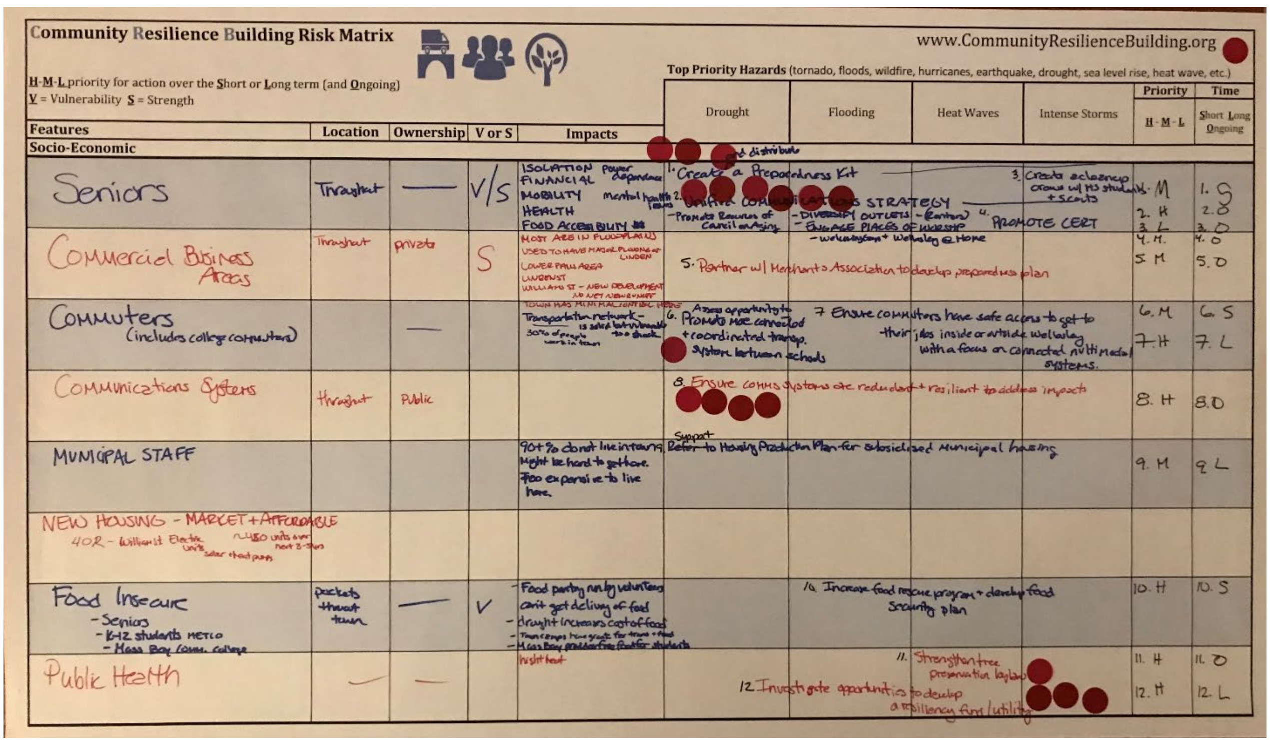
Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Chinese/ESL community			V/S	Emergency Outreach issues Communication/Bylaws	1 Use schools to distribute info.	2 Assess translation needs on Papers/web	3 Connect w/ universities on outreach		1:H 2:L 3:M	
Single Elderly on one			V	Temperature threats House bound (ice)	4 Connect w/CoA	5 Expanding CoA Reach	6 Staffing CoA		4:M 5:H 6:M	
Fixed/Low income	Throughout or Housing Authority		V	Lack of transit Temperature threats		7 Improve Walkability Sidewalk etc	8 Cooling assistance Program 9 Wellness Checks 17 Cooling centers	10 Study transit options 11 sidewalk clearance	7:H 8:M 9:L 10:H 11:L 17:M	
Business Community			V/S	Continuity, emergency mobilization Loss/Damage		12 Outreach to Chamber + merchant association			12:M	
Student Population			V/S	Mobility/Transit issues, mobilization	13 Create volunteer opportunity			14 Commuter + walking connection to schools	13:M 14:H	
Religious Community			S	Access/Service Demand.		15 Outreach to community			15:L	
Medically Vulnerable			V	Medical Outages						
Partial/non resident Property Owners			V	Noncompliance						



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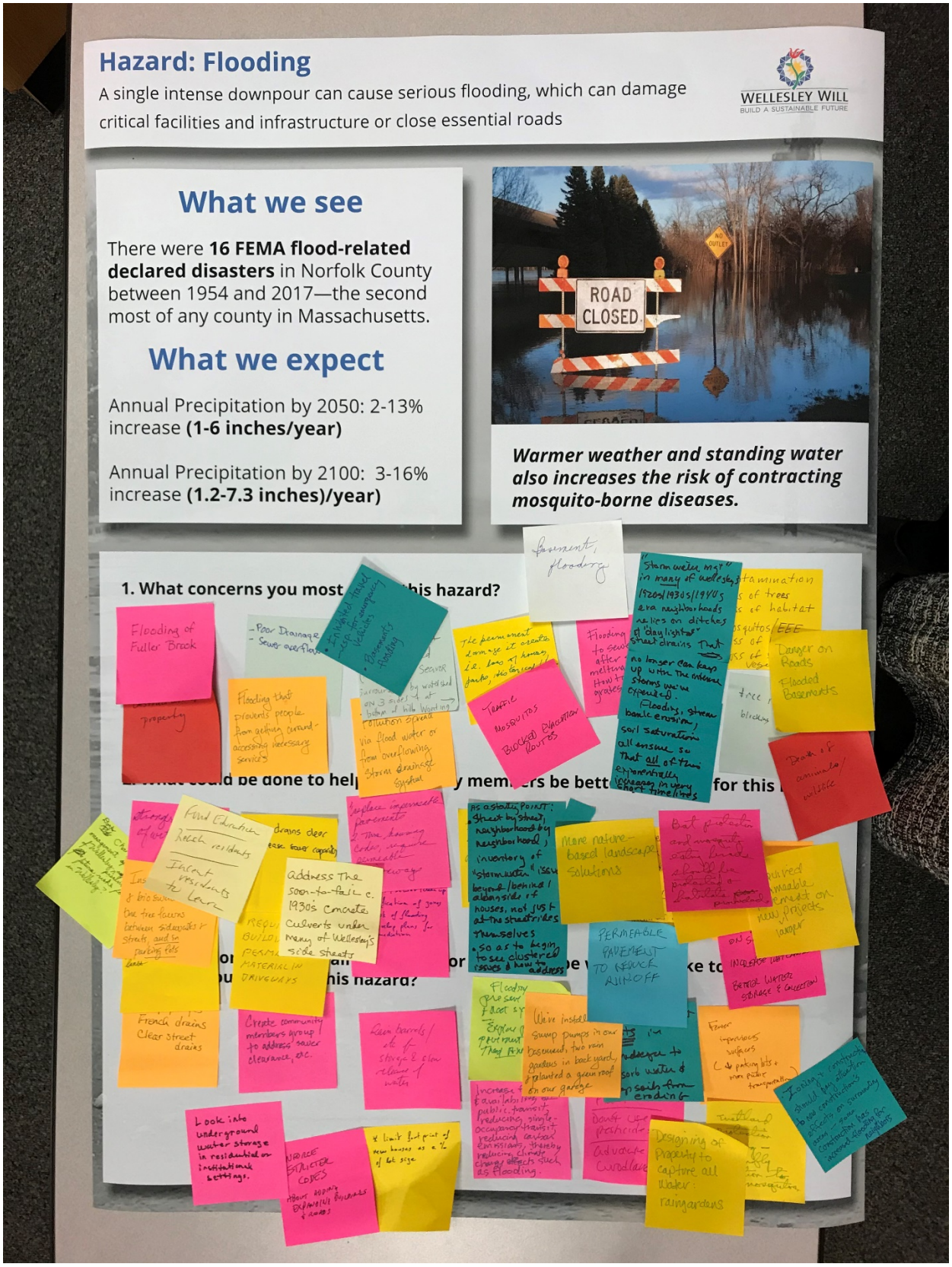
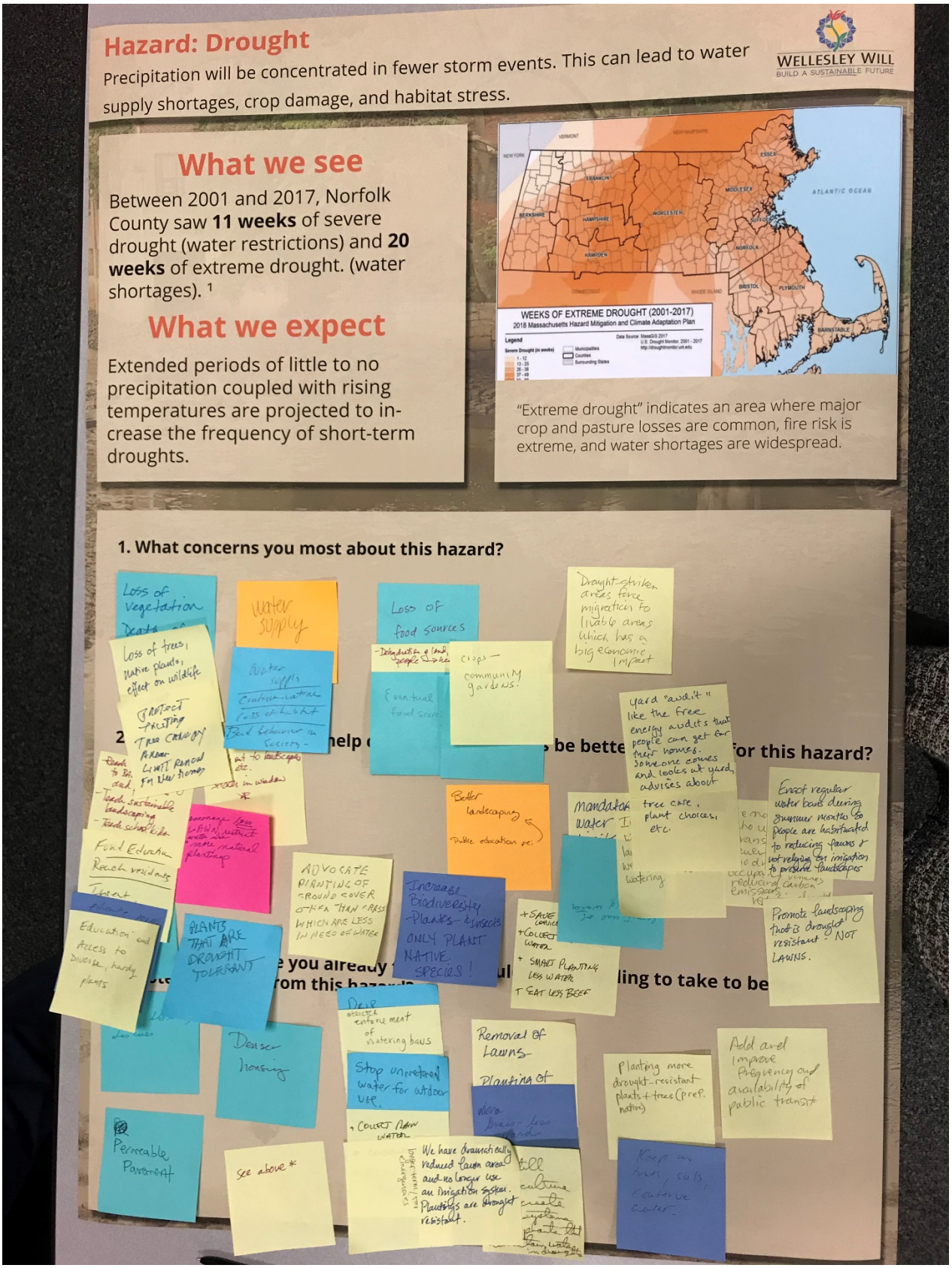
Top Priority Hazards (tornado, floods, wildfire, hurricanes, earthquake, drought, sea level rise, heat wave, etc.)

Features	Location	Ownership	V or S	Impacts	Drought	Flooding	Heat Waves	Intense Storms	Priority H-M-L	Time Short Long Ongoing
Socio-Economic										
Seniors	Throughout	—	V/S	ISOLATION, power dependence, FINANCIAL, MOBILITY, mental health issues, HEALTH, FOOD ACCESSIBILITY	1. Create a Preparedness Kit and distribute; 2. Unified Communications Strategy – Promote Resources of Council on Aging	– Diversify outlets – (Lantern) – Engage places of worship – Welcome + Wellesley @ Home	4. Promote CERT	3. Create cleanup crews w/ HS students + Scouts	1. M 2. H 3. L	1. S 2. O 3. O
Commercial Business Areas	Throughout	private	S	Most are in floodplains; used to have major flooding at Linden; Lower Falls area; Linden St; William St – new development, no net new runoff; Town has minimal control here	5. Partner w/ Merchants Association to develop preparedness plan				4. M 5. M	4. O 5. O
Commuters (includes college commuters)		—		Transportation network – is solid but vulnerable to a shock; 30% of people work in town	6. Assess opportunity to promote more connected + coordinated transp. system between schools	7. Ensure commuters have safe access to get to their jobs inside or outside Wellesley with a focus on connected multimodal systems.			6. M 7. H	6. S 7. L
Communications Systems	Throughout	Public			8. Ensure comms systems are redundant + resilient to address impacts				8. H	8. O
MUNICIPAL STAFF				90+% do not live in town; Might be hard to get here. Too expensive to live here.	Support Refer to Housing Production Plan for subsidized Municipal housing				9. M	9. L
NEW HOUSING – MARKET + AFFORDABLE 40R – William St, Electric Units, solar + heat pumps, ~450 units over next 3-5 yrs										
Food Insecure – Seniors – K-12 students METCO – Mass Bay Comm. College	pockets throughout town	—	V	– Food pantry run by volunteers, can't get delivery of food – drought increases cost of food – Town comps + grants for trans + food – Mass Bay provides free food for students		10. Increase food rescue program + develop food security plan			10. H	10. S
Public Health	—	—		high heat		12. Investigate opportunities to develop a resiliency fund/utility	11. Strengthen tree preservation bylaw		11. H 12. H	11. O 12. L

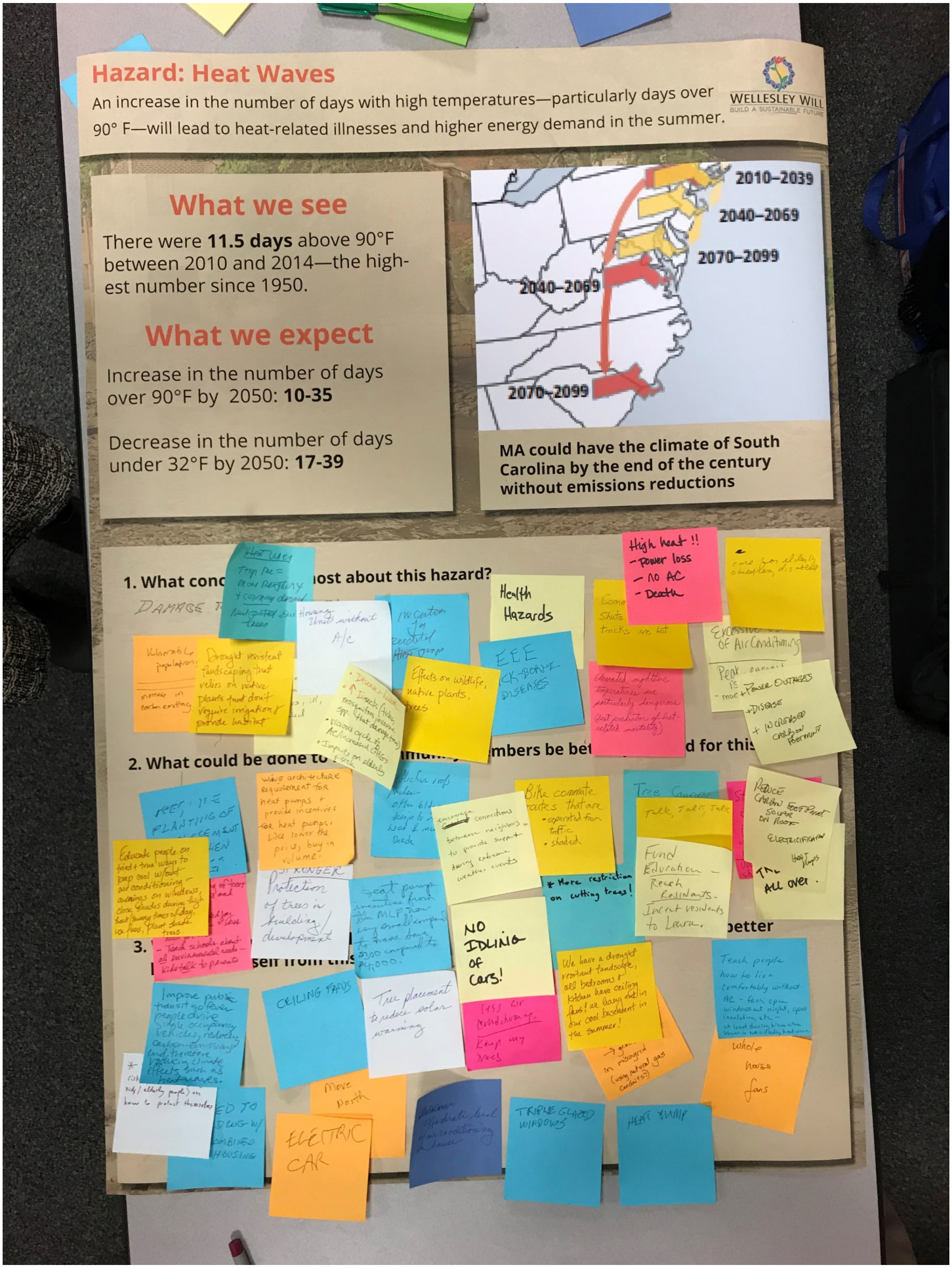
APPENDIX 5: COMMUNITY INPUT FROM LISTENING SESSION



Concerns	What can be done?	Action taken or willing to take
Traffic	Wetlands "management" needs to be done vs. a haul off thinking that currently exists Street by street, neighborhood by neighborhood inventory of stormwater issues beyond/behind/alongside of houses, not just at the sidestreets themselves, so as to begin to see	Sump pump
Mosquitos	clustered issues and how to address	Freach drain
Blocked evacuation routes	Fund education	Clear street drain
Basement flooding	Reach residents	Create community members group to address sewer clearance, etc
Pollution spread via flood water or from overflowing storm drainage system	Install rain gardens and bioswales in the tree lawns between sidewalks and streets and in parking lots	Look into underground water storage in residential or institutional settings
Destruction of property	Stronger protection of wetlands	Enforce stricter codes about adding expanding buildings and roads
Flooding that prevents people from getting around--assessing necessary services	Road flooding is particularly dangerous for road and shoulder bike lanes	Rain barrels, etc for storage and slow release of water
Poor drainage	Address the soon-to-fail 1930s concrete culverts under many of Wellesley side streets	Limite footprint of new houses as a % of lot size
Sewer overflow	Keep drains clear	We've installed sump pumps in our basement, two rain gardens in backyard, planted a green roof on our garage
Inhibited travel, especially for emergency vehicles	Increase sewer capacity	Flooding preserve trees and root system
Basement flooding	Require new buildings to use permeable material in driveways	Explore porous pavement in flood areas
Flooding of homes at bottom of hills and near watershed (example--I live at 27 Seaver surrounded by watershed on 3 sides and at bottom of hill. I want funds to build runoff protection)	Replace impermeable pavements	Increase frequency and availability of public transit, reducing single-occupancy transit, reduce carbon emissions, thereby reducing climate change effects such as flooding
Flooding of Fuller Brook	Through housing codes, require permeable driveways	Designin of property to capture all water: raingardens
Stormwater management in many of Wellesleys 1920s/1030s/1940s ere neighborhoods relies on ditches and daylighted street drains that no longer can keep up with the intense storms we've expected. Flooding, stream bank erosion, soil saturation all ensue so that all of this exponentially increases in very short timelines	Regular drain/sewer clean up	Zoning and construction should pay attention to new construction effects on surrounding areas--some construction has increased flooding for neighbors
Tree roots blocking drains	Identification of zones at risk of flooding and develop plans for remediation	Wetland protection zoning --dragonfly protection to eat mosquitos
Death of animals/wildlife	Stricter wetland enforcement bylaws	Fewer impervious surfaces (decrease parking lots and more public transportation)
Contamination	Educate residents to maintain woodlands and not disrupt soil	Increase frequency and availability of public transit, reducing single-occupancy transit, reduce carbon emissions, thereby reducing climate change effects such as flooding
Loss of trees and habitat	Stop using pesticides	Incresed trees and roots in landscapes to absorb water and keep soils from eroding
Mosquitos/EEE	Flood sensors on smart poles	Plant
Loss of water	Increase wetlands	Don't use pesticides
Loss of soil and vegetation	Better water storage and collection	
Danger on roads	Better landscaping	
Flooded basements	More natura-based landscape solutions	
Flooding related to sewer access after storms or melting snow. How to be sure grates are clear?	Increase awareness thorugh programs like this	
The permanent dramage it creates (i.e. loss of houses, parks, historical buildings)	Permeable pavement to reduce runoff	
Does Charles River management upstream of Wellesley present a potential or future risks for flooding in Wellesley?	Bat protection and mosquito-eating birds shoule be protected and habitats preserved	
	Require permeable pavement on new larger projects	


Hazard: Drought
Precipitation will be concentrated in fewer storm events. This can lead to water supply shortages, crop damage, and habitat stress.
WELLESLEY WILL
BUILD A SUSTAINABLE FUTURE
What we see
Between 2001 and 2017, Norfolk County saw 11 weeks of severe drought (water restrictions) and 20 weeks of extreme drought. (water shortages). 1
What we expect
Extended periods of little to no precipitation coupled with rising temperatures are projected to increase the frequency of short-term droughts.
WEEKS OF EXTREME DROUGHT (2001-2017)
2018 Massachusetts Hazard Mitigation and Climate Adaptation Plan
"Extreme drought" indicates an area where major crop and pasture losses are common, fire risk is extreme, and water shortages are widespread.
1. What concerns you most about this hazard?
be bette
or this hazard?
you already
ling to take to be

Concerns	What can be done?	Action taken or willing to take
Death of trees	Education on and access to diverse, hardy plants	Limit use of household water
Loss of vegetation	Protect existing tree canopy	Not watering lawn
	Prevent their removal during house sales or	
Loss of water supply	construction	Eat less beef
Damage to gardens	Free yard "audits" to give advice to homeowners	Adopt permeable pavement
	Enact regular water bans duringsummer mounts so people are habituated to reducing lawns & not relying	
Loss of habitat	on irrigation to preserve landscapes.	Live in denser housing
	Promote landscaping that is drought resistant, not	
Bad behavior in society	lawns	Stricter enforcement of waterig bans
Loss of food sources	Implement lawn watering bans	Stop unmetered water for outdoor use
	Promote hardy plants	
Loss of crops/community gardens		Collect rain water
Drought-stricken areas force migration to livable areas,	Promote use of public transit and limit single occupancy	
which has an economic impact.	vehicles to reduce emissions	Conserve household use
Bad sanitation	Collect rain water	Reduce lawn area
Lossof native plants	Smart planting with less water	Plant drought-resistant plants
	Increase biodiversity of plants and insects, but prioritize native species	Take public transit
	Educate the public on sustainable landscaping	Stop using pesticides
	Advocate planting of ground cover that is not grass, which needs lots of water	No till agriculture
	Promote sustainable landscaping with local landscapers	
	Eliminate pesticides	
	Stop dumping	
	Eat less meat	


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.
WELLESLEY WILL
BUILD A SUSTAINABLE FUTURE
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 conc
ost about this hazard?
2. What could be done to
mbers be bet
d for this
3.
better
High heat !!
- Power loss
- no AC
- Death
Health Hazards
NO IDLING OF Cars!
CEILING FANS
ELECTRIC CAR
TRIPLE GLAZED WINDOWS

Concerns	What can be done?	Action taken or willing to take
		Improve public transit so fewer people drive single occupancy vehicles, reducing carbon-emissions and therefore reducing climate effects such as heat waves
Damage to native plants	Drought resistant landscaping that relies on native plants that don't require irrigation and provide habitat	
Disease health	Incentives for heat pumps	Ceiling fans
	Educate people on tried and true ways to keep cook without air conditioning--awnings on windows, close shades during high heat and sunny times of day, use fans, plant shade trees	
Insects (ticks, mosquitoes)		Educate people at risk (parents with young kids/elderly people) on how to protect themselves
	Require planting of replacement trees when trees are	
Invasive species that damage trees	removed	Tree placement to reduce solar warming
Vicious cycle of AC/increased GHGs	Ban mass felling of trees by homeowners and developers	Moved to a building with AC combined housing
Impact on elderly and sick	Teach public need for shade trees-->less need for AC	Electric car
	Teach school about all environmental needs--kids talk to	
Housing units without A/C	parents	Moderate use of AC in house
	Waive architecture require for heat pumps and provide incentives for heat pumps. Like lower the price, buy in	
Vulnerable populations	volume	Move North
	Heat pump incentives from the MLP are very small	
Increase in carbon emitting AC	compared to MassSave: $300 compared to $4000	Triple glazed windows
Impact on vulnerable populations: seniors,		
ill, disabled	Stronger protection of trees in building/development	Heat pump
	Encourage connections between neighbors to provide	
Effects on wildlife, native plants, trees	support during extreme weather events	Live with less air conditioning
EEE	No idling of cars	Keep my trees
		We have a drought resistant landscape, all bedrooms and kitchen have ceiling fans and we hang out in our cool
Tick-borne diseases	Reflective roofs	basement in the summer
		Better system of cooling. Geothermal in microgrid (using
Health hazards	Buildings designed to reduce heat and increase shade	natural gas conduits)
Elevated nighttime temperatures are		Teach people how to live comfortably without AC--fans
particularly dangerous (best prediction fo	Bike commute routes that are separated from traffic and	open windows at night, good insulation, etc.--at least
heat-related mortality)	shaded	during times when there is not a deadly heat wave
Commuter rail shuts down when tracks are		
hot	Talk, talk, talk	Heat pump
	Reduce carbon footprint with solar on roofs,	
Power loss, no AC, death	electricification, roof fans, heat pumps	Reduce energy usage
Care for elderly, children, disabled	Shade trees all over	Whole house fans
Power outages	Stop cutting doen trees	
Disease	Don't build more than you need	
Increased carbon footprint	Don't buy more stuff than you need	
Excessive use of air conditioning	Tree canopy	
Peak energy issue (more emissions, more		
money)	Fund education	
	Reach residents	
	Incent residents to learn	


Hazard: Intense Storms
Nor'easters, ice storms, blizzards, hurricanes, and heavy rain events lead to downed trees, power outages, and property damage.
WELLESLEY WILL
BUILD A SUSTAINABLE FUTURE
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%
5%
37%
71%
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 during their lifecycles than in 1958.
1. What concerns you most about this hazard?

Concerns	What can be done?	Action taken or willing to take
Lack of communication	Reduce "mowing" of public space to increase stormwater capacity	Increase public transitto reduce single occupancy vehicles, therefore reducing climate impact
Downed trees	Gambion baskets to retain water	Denser housing, which promotes more supportive communiti in times ofneed
Economic impact	Bioswales	Install solar panels on houses
Damage to homes, schools and power supply	Drought tolerant + native landscape	Trim trees near houses
Lack of hurricane evacuation and recovery planning	Education of kids, teens	Establish regional or town levelmicro-grids.
Higher water table with saturated soil, leading to loss of tree canopy	Coordinate with town garden clubs and civic groups to plant adaptive species that can manage water	Establish solarpannels & batteries on private houses
Trees are spread out, not clustered, leading to reduced resilience to climate	Town communication re: resources/actions for home flooding	Reduceenergy demand
Understory trees no longer adapted to new climate	Reverse 911 calls to alert peopleof hazards and actions	Solarhot water/stored water
Being cold due to power outages	Identify evacuation routes & place signage	Plan aheadfor food, water, supplis
Unclear evacuation routes	Checklist of actions + supplies to boost preparation	Publiceducation to encourage food/supplies for several days
Loss of trees	Combine water management infrastructure with parks/greenspace	Explore solarheating
Loss of resources	Establish post-hurricane recovery protocols	Electric cars
Vulnerability of seniors & disabled in a storm event	Conduct tree inspections to prevent catastrophic damge Strategically plant shade + understory trees adaptable to climate change and storms.	Tree trimming
Impact on communications	Establish solar battery and backup	Prioritize trees that do well in high winds
Power line issues	Create safe stored water solutions	Check on vulnerable people, such as the sick or elderly
Develop micogrids for electricity for storm resilience	Text alerts	Create work-from-home systems for local government.
Water tablerising	Establish shelter plan in case of hurricane	Emergency transportation for low-income populations
Downed powerlines	Place power lines underground	
Rt 9 flooding	Cluster woodland to increase resilience	
Local flooding	Establish backup power generatiion	
Travel impacts	Training sessions for community to stay safe	
Destruction of property	Fund education	
Streambank erosion	Smart poles with sensors to collect live emergency data	
Water supply contamination from runoff	Improve commuter rail reliability	
Centennial Park's Bezanson's Pond ineffective due to watershed-to-pond ratio	Better public transportation	
	Battery wall for town backup (see: Green Mountain Power)	
	Bury power lines	
	Engage the trailscommittee to reviewall the known trails they've catelogued for existence of unintentionally created sluiceways. There is a big one on the southside of Magus Hill.	
	Expand the size of Bezanson's Pond	