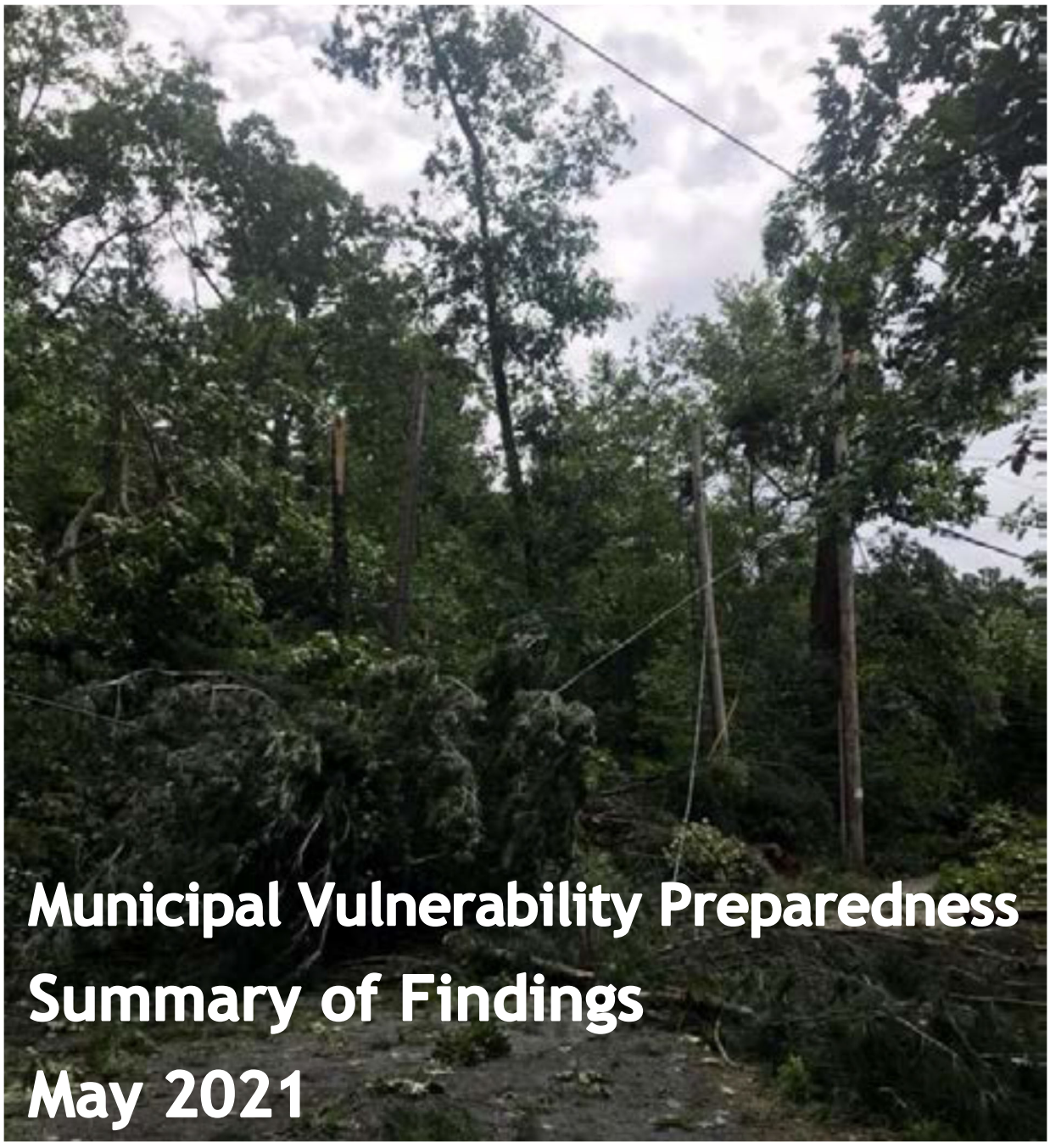
Town of Upton



Municipal Vulnerability Preparedness
Summary of Findings
May 2021

Last revised 05/01/21

CMRPC
Central Massachusetts Regional Planning Commission

Executive Office of Energy and Environmental Affairs

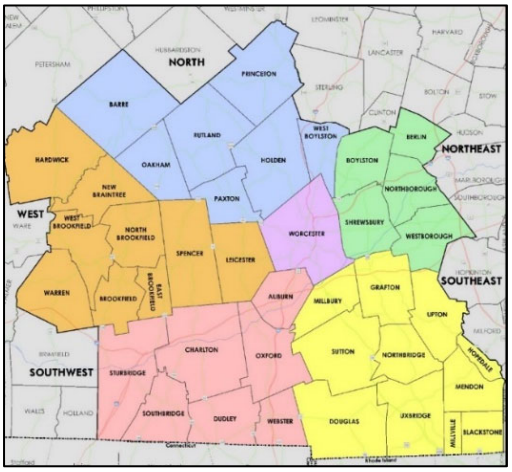
CMRPC Mission

The Central Massachusetts Regional Planning Commission is a regional partnership serving the planning and development interests of 40 member communities in southern Worcester County in Massachusetts. Our primary mission is to improve the quality of life for those who live and work in our region.

We do this by (1) addressing growth and development issues that extend beyond community boundaries; (2) maintaining the region's certification for federal transportation improvement funds; (3) providing technical knowledge and resources to assist local government in addressing specific land use, economic or environmental problems resulting from growth or decline, and (4) building strong working relationships with member communities, state and federal officials, as well as the range of area stakeholders.

Our History and Progress

Founded by the Massachusetts Legislature in 1963, the Central Massachusetts Regional Planning Commission (CMRPC) provides a variety of services to its constituencies and brings a regional perspective to planning and development. One of 13 regional planning agencies in Massachusetts, CMRPC serves the city of Worcester and 39 surrounding communities in the southern two-thirds of Worcester County. CMPRC's programs include Transportation, Regional Services, Geographic Information Systems (GIS), and Community Development & Planning.



Federal Title VI/Nondiscrimination Protections

The Central Massachusetts Metropolitan Planning Organization (CMMPO) hereby states its policy to operate its programs, services and activities in full compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related federal and state statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin, including limited English proficiency, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving Federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, the Federal Transit Administration, or both prohibit discrimination on the basis of age, sex, and disability. These protected categories are contemplated within the CMMPO's Title VI Programs consistent with federal and state interpretation and administration. Additionally, the CMMPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with US Department of Transportation policy and guidance on federal Executive Order 13166.

State Nondiscrimination Protections

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Executive Order 569 and the Massachusetts Municipal Vulnerability Preparedness program

In September 2016, Massachusetts Governor Baker signed Executive Order 569, directing multiple state agencies to develop and implement a statewide comprehensive climate adaptation plan with the best climate-change data available. Recognizing that many adaptation solutions are local in nature, a key commitment of Executive Order 569 is to assist local governments in completing their own assessments and resiliency plans. The MVP Grant and Designation Program represents the first step in fulfilling this commitment.

The MVP program provides planning grants to municipalities to complete vulnerability assessments and develop action-oriented resiliency plans. Funding is used by cities and towns to hire an MVP-certified consultant who is trained to provide technical assistance and complete a community's vulnerability assessment and resiliency plan using the Community Resilience Building Framework. Towns and cities are free to choose the consultant of their choice from a list of certified MVP providers. The Town of Upton invited the Central Massachusetts Regional Planning Commission to lead them in this planning effort.

Communities that complete the MVP planning process become certified "MVP Communities" and are eligible for Action Grant funding and other opportunities through the Commonwealth.

Figure 1 Governor Baker signing legislation H. 4835, which included $75 million for MVP program funding. Source: https://www.mass.gov/news/governor-baker-signs-legislation-directing-24-billion-to-climate-change-adaptation

ACKNOWLEDGEMENTS

The Municipal Vulnerability Preparedness (MVP) program and Community Resiliency Building Workshop was funded by the Executive Office of Energy and Environmental Affairs. This Summary of Findings and CRB Workshop were prepared for the community of Upton by the Central Massachusetts Regional Planning Commission (CMRPC). Support from the Upton Board of Selectmen and the town officials was much appreciated, especially for allowing the workshop and listening session to take place virtually.

The CMRPC would like to acknowledge the Town of Upton's Core Team for their time and hard work in participating in this project. These include, but are not limited to:

- Paul Dell'Aquila, Town Planner, Project Lead
- Mike Penko, Conservation Commission
- Derek Brindisi, Town Manager
- Janice Nowicki, Director of Elder and Social Services

The following individuals were directly and personally involved in planning and conducting the Upton Community Resilience Building Workshop:

- Sarah Adams, AICP, Principal Planner, CMRPC
- Peter Peloquin, Associate Planner, CMRPC
- Danielle Marini, Assistant Environmental Planner, CMRPC
- Matt Franz, GIS Analyst, CMRPC
- Hillary King, Regional Coordinator, EEA

Upton: A Profile

The Town of Upton, Massachusetts was incorporated in June of 1735.[1] The town covers 21.8 square miles and is located off Route MA-140 in south-central Massachusetts, on the southeastern edge of Worcester County.[2] Upton is neighbored by Westborough in the north, Grafton in the northwest, Northbridge to the southwest, and Mendon and Hopedale to the southeast.

During the 19th century, industrial activity was common in Upton Center in part due to the ready power source provided by the Mill River.[3] However, modern-day Upton is a predominantly residential community.[4] Residents enjoy the small town, suburban charm of the town, and commonly commute into nearby cities to work.[5] Upton is about 13 miles southeast of Worcester, and just 35 miles from Boston. The residents do not know who named the town, however while Upton, Massachusetts is about 13 miles from the City of Worcester, Upton in the United Kingdom is also located 13 miles from England's Worcester.[6]

The total population of Upton is 7,835 residents.[7] The Town has seen an 8.4% growth in population since 2010, when the town had an estimated 7,231 residents. A largely White community, Upton is 97.6% White, 1.1% Asian, 0.6% Hispanic or Latino, and 0.4% Native Hawaiian and Other Pacific Islander. The median age in Upton is about 41 years old, with 30.7% of residents under the age of 19, and 10.2% of residents over the age of 65. The median household income in Upton was $124,856 as of 2018, compared to $77,378 for Massachusetts as a whole, with 3.5% of Upton's population living below the poverty line.[8]

There are three schools in Upton, including Nipmuc Regional Middle/High School, and the Blackstone Valley Regional Vocational Technical High School, which hosts students from 13 towns in the region. The Town provides a full-time police department and fire department of full-time and volunteer staff. There are over 3,000 acres of protected land in Upton, which provides plentiful recreational opportunities for town residents.[9] Much of the land in North Upton is part of the Upton State Forest, which hosts public trails, historic buildings, and habitat for native plants and animals.[10] Swimming and athletic facilities are also offered at the Kiwanis Beach on Pratt Pond.

Workshop Summary

The Town of Upton contracted with the Central Massachusetts Regional Planning Commission (CMRPC) on November 16, 2020, to serve as the MVP provider, including completing the Community Resiliency Building (CRB) workshop. Through the Community Resilience Building (CRB) process, stakeholders actively engaged in an ongoing discussion to determine the top hazards related to climate change that currently impact or have the potential to impact Upton. A small group of town officials and Board Members convened on November 25, 2020, to form

[1] Town of Upton, n.d.
[2] Ibid.
[3] Upton Master Plan Sub-Committee, 2005.
[4] Upton Open Space Committee, 2020,
[5] Town of Upton, n.d.
[6] Ibid
[7] United States Census Bureau, 2018.
[8] Ibid.
[9] Upton Open Space Committee, 2020.
[10] Ibid.

the 'Core Team' that, together with CMRPC staff, organized and planned the CRB Workshop over three meetings.

The Town of Upton's CRB workshop was scheduled to be held virtually and would take place over the course of three separate meetings. Core Team and CMRPC planned the first meeting to last two hours. CMRPC's facilitator would dedicate the first quarter-hour to familiarizing participants with all of ZOOM's functions and introductions. After a brief introduction to the MVP program, the remaining time would be devoted to the CRB process – identifying town features and their locations, ownership, and classification as a vulnerability or strength. The remaining two meetings were reserved to complete the CRB matrix and develop a list of actionable items that could improve resiliency throughout the Town of Upton.

The virtual workshops were held on February 18th and 25th from 6:00 - 8:00 PM and on March 4 from 4:00-6:00 PM. The Core Team and CMRPC staff pre-recorded all presentations, allowing participants to view them in preparation for the workshop. Upon completing the Core Team introduction videos, MVP program overview presentation, Climate Projections presentation, Climate Hazards presentation, and Matrix & Nature-Based solutions presentation, the Core Team and CMRPC developed the workshop invitation. The invitation included links to each pre-recorded presentation, table maps, an excerpt from the Upton Hazard Mitigation Plan, a two-page MVP program overview, a CRB Workbook, a how-to-use-ZOOM information page, and an agenda with ZOOM log-in information for each of the three meetings. Participants were instructed to watch all presentations at their leisure before the workshop.

Core Team and Project Team

Name	Affiliation	Role
Derek Brindisi	Upton	Town Manager
Mike Penko	Upton	Conservation Commission
Paul Dell'Aquila	Upton	Town Planner, Project Lead
Janice Nowicki	Upton	Director of Elder and Social Services
Sarah Adams	CMRPC	Project Lead
Dani Marini	CMRPC	Project Assistant
Mary Hannah Smith	CMRPC	Project Assistant

Workshop Invitees and Participants

Name	Affiliation	Attended
Ellen Arnold	Friends of Upton State Forest	Y
Derek Brindisi	Town Manager	Y
Christa Collins	Land Trust – Sudbury Valley Trustees	Y
Joann Lindenmayer	Neighboring Town MVP Core Team Member	Y
Janice Nowicki	Senior Center	Y
Marcela Stasa	Land Stewardship Committee	Y
Bill Taylor	Friends of Upton State Forest / Open Space Committee	Y
Laurie Woodin	Sustainable Group – Sustainable Upton	Y
Tom Bair	Upton Historical Society	Y
Paul Dell'Aquila	Town Planner	Y
Kevin Hollenbeck	DCR	Y
Meredith Houghton	Land Trust – Sudbury Valley Trustees	Y

Hillary King	EEA MVP Regional Coordinator	Y
Grace Lam	Local Farm – Fivefork Farm CSA	Y
David Pickart	Conservation Commission	Y
Dennis Westgate	Highway Dept.	Y
Mathew Bachold	Library	Y
Dan Lazarz	Fire Captain	Y
Kelly McElreath	Town Clerk/Assistant to the Town Manager	Y
Mike Penko	Conservation Commission	Y
Chris Scott	Conservation Commission	Y
Brett Simas	Selectboard	Y
Cathy Taylor	Land Trust – Nipmuc Tribal Preservation Trust	Y
Laura Davis	Local Farm – Long Life Farm CSA	N
Mark Allen	Local Eng Firm – Allen Engineering	N
Gene Bernat	Economic Development	N
James Brochu	Community Center Building Committee	N
Paul Carey	Planning Board Member/Master Plan Co-Author	N
Margaret Carroll	Planning Board Member – Chair	N
Scott Crisafulli	Neighboring Town MVP Core Team Member	N
Tom Davidson	Golf Course – Red Acre Farm	N
Mark Difronzo	Emergency Management Director/Fire Chief	N
Paige Dolci	Mass Audubon	N
Richard Gazoorian	Recreation Commission	N
John Gelcich	Neighboring Town MVP Core Team Member	N
Al Holman	Board of Health Member	N
Kevin Lobisser	Local Construction Co. – Lobisser	N
Jody Madden	DCR – Upton State Forest	N
Anne Mazar	Neighboring Town MVP Core Team Member	N
Christopher McGoldrick	Neighboring Town MVP Core Team Member	N
Lisa Mosczynski	Land Trust – Metacomet Land Trust	N
Jen Murphy	Mendon Upton Citizens for Social Justice	N
Mary Overholt	Community Garden (LSC)	N
Rena Richards	Housing Authority	N
David Ross	Economic Development	N
Joyce Sandvik	Friends of Upton State Forest	N
Diana Schindler	Neighboring Town MVP Core Team Member	N
Chris Scott	Conservation Commission	N
Donald Spargo	Historical Commission	N
John Westerling	Rockwood Meadows Association	N
Kristi Williams	Neighboring Town MVP Core Team Member	N
Joseph Zanca	Army Corp. Engineers – West Hill Dam	N

The workshop's goal was to identify the four top natural hazards that impact Upton and develop strategies to enhance the Town's resiliency related to climate change. Following the CRB work plan, the Core Team and CMRPC facilitators and planners pre-recorded four presentations:

- Overview of the MVP program
- Overview of the CRB process
- A summary of climate change projections, impacts and mitigation strategies
- A detailed profile of natural hazards in the Town of Upton, including the top four hazards perceived by the core team.

During the first virtual workshop meeting date, the group discussed the top four hazards that affect Upton. There was an agreement between the Core Team and all participants that – in no particular order - drought, wind events, flooding, and winter storms have the most significant effects and potential impacts on the Town. After identifying these hazards, workshop attendees proceeded to work through the CRB matrix and mapping exercise in three small groups facilitated by CMRPC staff. Table facilitators guided stakeholders through examining the Town's infrastructural, societal, and environmental features to identify stakeholders' concerns regarding natural and climate-related hazards.

The group then reconvened seven days later to build upon the first day's work. The second session's goal was to continue identifying Town features and list ideas for actions that could reduce or mitigate climate change's projected impacts. One week later, the group used the final CRB meeting to complete the matrix. Once attendees had completed the matrix, a table reporter from each small group announced a summary of their group's findings.

Upon completing the three virtual workshop meetings, CMRPC compiled all information from the completed CRB matrices into a survey. The survey was then distributed to all workshop attendees from March 15, 2021, through March 19, 2021. The attendees took the survey to prioritize and vote for what they believed to be the top project in the infrastructure, society, and environmental categories. The survey results were used to prioritize action ideas and organize the Summary of Findings Report.

Twenty-three (23) stakeholders attended the virtual CRB Workshop, including representatives from the MVP Core team, town government, state government, emergency services, the Conservation Commission, agriculture, and local environmental groups.

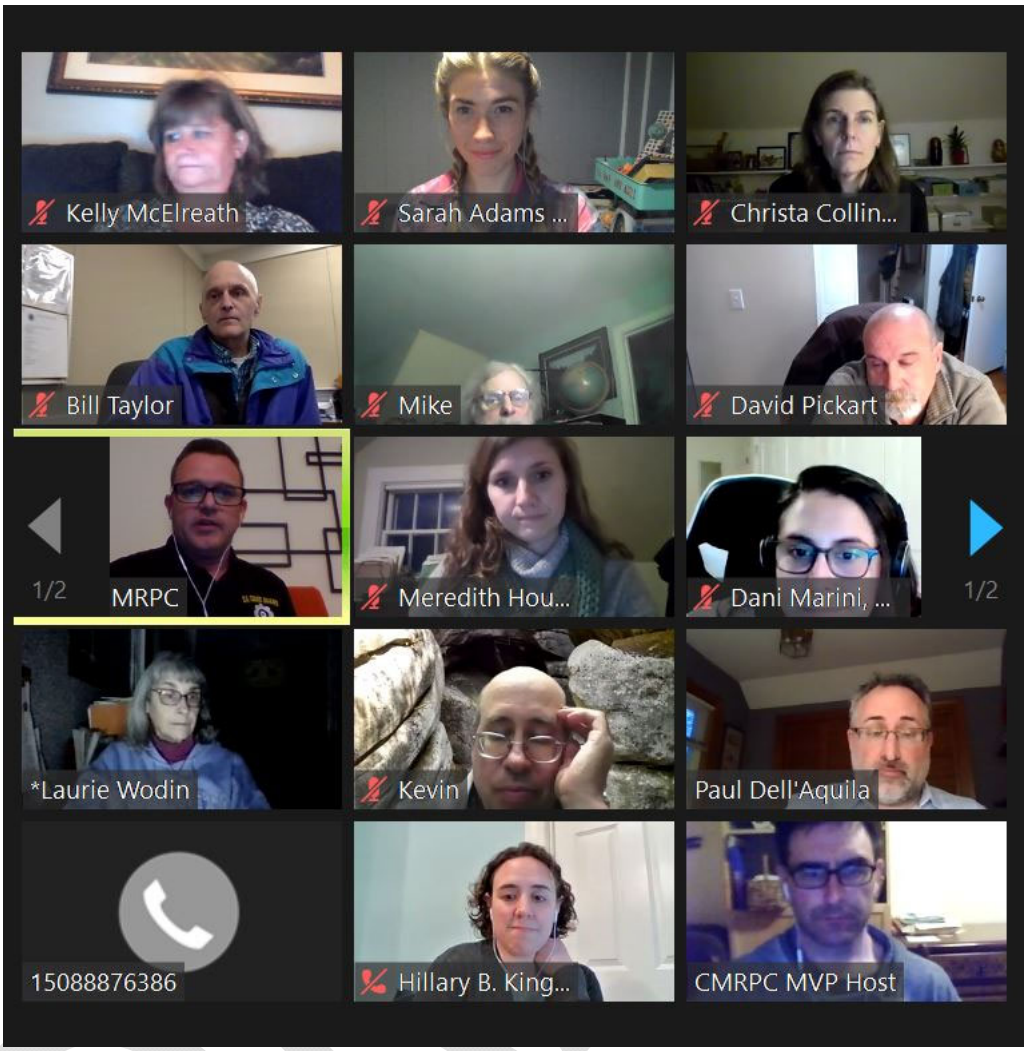


Figure 2 Screenshot from the virtual CRB workshop.

A public listening session to discuss MVP results and recommendations for future actions was held virtually on May 18, 2021. The listening session was properly promoted across several avenues, with a combined NUMBER (#) residents including all three selectmen in attendance. Between the CRB workshops and the listening session, a total of NUMBER (#) people participated in the MVP process.

Top Hazards

At the beginning of the first workshop, participants spent approximately fifteen minutes discussing Upton's top four climate-related hazards. Taking climate change projections, critical infrastructure, and other considerations into account, the Core Team and workshop participants chose to focus on the four following hazards, in no particular order: drought, wind events, flooding, and winter storms.

In 2016 and 2020, Upton experienced extreme droughts along with the majority of the state of Massachusetts. Severe storms, including high winds and intense rainfall, have been increasing in frequency and impact. These events have caused localized flooding and power outages and

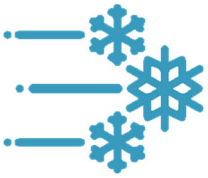
have forced Upton to call upon mutual aid agreements. With climate change, disruptive weather-related events may increase in severity and frequency.

DROUGHT

Projecting an increase of consecutive dry days, with the driest periods in the summer and fall. This leads to increased risk and stress on drinking water systems and wildfire potential.

FLOODING

Expected increase in precipitation across all seasons. Heavy rainfall will become more frequent, increasing the risk for flash floods. Also increases non-point source pollution.



WINTER STORMS

Annual days below freezing will decrease, winter precipitation falling as rain or freezing rain. This increases risk for ice storms and flash flooding when rain falls on frozen ground.

WIND STORMS

Intensity of storm events is expected to increase due to the warmer atmosphere. This will lead to increased severe thunderstorm and hurricane activity with higher wind speeds.

Flooding. In recent years, Upton has observed numerous small floods on town roadways. Two of Upton's dams are classified as significant hazards, which may compound precipitation-induced flood risk. Beaver dams are present in wetlands throughout Upton, which benefits the natural environment while contributing to local flooding. Climate change may increase the frequency of high-volume precipitation events, forcing Upton's infrastructure to handle more significant stormwater amounts than it has had to in the past.

Winter Storms.
Winter ice storms, a regional problem, are expected to be more intense and include more mixed precipitation, highly damaging to trees, power lines, and other infrastructure.

Drought.
Drought could lead to water shortages that will impact the entire town, regardless of whether residents and businesses are on town water or have private wells. Due to the impact of prolonged droughts and extreme heat, wildfires may become more frequent, and forests and wooded areas may become more combustible.

High Wind.
High wind events are a severe concern for Upton. The town and the surrounding area have experienced a recent uptick in storms with hurricane-level winds. While this phenomenon can be linked to extreme temperatures and rising precipitation rates, workshop participants felt it should be singled out as a hazard. Thus, the fourth hazard is focused primarily on the winds associated with these storms, leaving heavy rain events classified under flooding.

The workshop participants agreed that these hazards affect the town at different times of the year. Flexibility and year-round preparedness by town officials are needed to ensure citizens' safety across all the different hazard situations that climate change will exacerbate.

The hazards identified by Upton are based on data provided by the Massachusetts Climate Clearinghouse as well as watershed-specific data from the Northeast Climate Adaptation

Science Center at the University of Massachusetts at Amherst. For the Blackstone River Basin, where Upton is located, projections show an expected increase in precipitation overall, with the greatest increase during winter. The number of days with more than 2 inches of rainfall, potentially leading to inland flooding, is also expected to increase. In 2100, it is estimated that there will be close to 1.28 days with 2 inches of rainfall, compared to approximately .74 days now. Consecutive dry days and days above 90 degrees Fahrenheit are also expected to increase, leading to drought. The number of days with a minimum temperature below freezing is expected to decrease, potentially leading to less snow and a greater likelihood of rain or freezing rain in the winter. Additionally, higher wind speeds in the summer and storm severity may increase with warmer temperatures.

Current Concerns and Challenges Presented by Hazards and Climate Change

CMRPC, the MVP planning provider, had recently worked with the Town of Upton on their Hazard Mitigation Plan (HMP), which was adopted by the Town's Board of Selectmen and approved by FEMA in March 2019. The recent HMP process and pre-workshop MVP Core Team meetings helped identify past climate-related events that significantly impacted Upton. Disaster events of concern included:

- Frequent major winter storms (as in 2015 and 2018).
- Tropical storms (Irene, Sandy).
- Dam overflow.
- Heavy rain and flooding (2015).
- Tornado (2018).
- Infestations of invasive and otherwise undesirable species (Gypsy moths, aquatic invasive species, ticks).
- Extended periods of drought (2016, 2020).

Future challenges linked to climate change, which were highlighted in the presentations and breakout groups included:

- An increase in hot and warm days and a decrease in cold days could result in a greater need for cooling and less need for heating. Upton residents will need to adapt to these temperature changes and potentially invest in new equipment like air conditioning systems to cope with extreme heat.
- Increased temperatures may also impact the water cycle, leading to more intense rain events. Higher precipitation rates could lead to more frequent and severe flooding in areas outside of designated flood zones, defined using historical data.
- Intense storms with high winds and precipitation are already a problem for Upton. More frequent or more severe storms could cause tree damage leading to power outages and road closures, high peak river flows and potential flooding, and erosion of riverbanks.
- More frequent and severe droughts will challenge water supplies and increase risks from wildfire.
- Ecological changes resulting from environmental shifts like rising temperatures can challenge native species and cause non-native or invasive plant and animal species to thrive. Increasing numbers of disease-carrying pests (e.g., ticks and mosquitoes) may result from these broader environmental changes, challenging public health. Other pests may damage native tree species and compound the impact of other hazards like intense storms.

VULNERABLE AREAS

The locations in Upton identified by workshop participants during the discussion as vulnerable to climate change-related hazards include:

VULNERABLE AREAS

- Upton Center
- West River
- Wastewater treatment facility
- Dams
- Ponds

Upton Center, or Downtown Upton, is the town's most densely developed area. It includes residential and commercial properties, a federally recognized historic district, and was the focus of a recent economic development study.[11] However, Upton Center lies partially within FEMA flood zones A and X, which signify a 1% and .2% chance of annual flooding, respectively. There are few building footprints within the floodplain downtown. However, climate change models suggest future increases in precipitation. More stormwater may shift the floodplain boundaries and increase the annual chance of flooding within the established floodplain. As a result, the town's existing assets and potential redevelopment of Upton Center may be threatened by future flooding. Additionally, Upton Center contains a relatively high amount of impervious surface coverage due to its mix of commercial and residential buildings, parking lots, and roads. This concentration of impervious surfaces may prevent stormwater from being absorbed into the soil. Rather than soaking into the ground, water may drain off buildings and pavement into nearby water bodies like Center Brook, carrying pollutants and debris along with it.

West River is a tributary of the Blackstone River and is the primary drinking water source for Upton. Workshop attendees were concerned about overuse and overreliance on the river as a water source. Pollution from stormwater draining into the West River could negatively impact its water quality. Additionally, the railroad crosses the West River, and attendees expressed concern about potential contamination from chemicals carried by train. Finally, West River is a designated cold water fishery and a habitat for many plant and animal species.[12] Climate change could cause detrimental ecological changes to the river, such as warming water temperatures or creating favorable conditions for certain invasive species.

The Upton Wastewater Treatment Facility is adjacent to the West River and is located within FEMA flood zone A, indicating a 1% annual flood risk. This critical municipal facility processes household wastewater for Upton residents connected to the municipal sewage system. Future increases in precipitation or severe storm events could increase the likelihood of flooding at the facility. It could also raise the volume of water processed by the facility due to the inflow and infiltration of stormwater into the sewage system. In a worst-case scenario, if the volume of water in the system exceeds the facility's processing capacity, then untreated wastewater could back up into homes or enter Upton's water system.

Dams across Upton need maintenance or replacement. According to the Massachusetts Office of Dam Safety, the Wildwood Lake dam and Old Grist Mill Pond dam are classified as significant hazards. A workshop attendee also noted that the Taft Mill dam is also in need of inspection or maintenance. The Town of Upton owns all three dams. Dam failures are often caused by high

[11] Dodson & Flinker, 2019.
[12] Blackstone River Watershed Association, 2007.

floodwaters, which overtop dams and erode their structural integrity.[13] In the future, more frequent extreme precipitation events could increase the risk of dam failure, overtopping, flooding upstream of the dam, erosion, or other hazards.

Ponds in Upton, including Pratt Pond and Mill Pond, are currently threatened by numerous water quality problems, such as eutrophication and algae growth, high bacteria levels, water weeds, and waste from Canadian Geese. The ecological changes that the town has already observed may be due to a combination of factors like stormwater pollution or fertilizer use and may be exacerbated by climate factors like higher precipitation events and rising annual temperatures.

[13] Central Massachusetts Regional Planning Commission, 2019.

Specific Categories of Concerns and Challenges

The following topics were identified by workshop attendees as concerns or challenges related to Upton's changing climate and natural hazards.

Infrastructure Concerns:

INFRASTRUCTURE

- Drinking water
- Railroad
- Wastewater and septic management
- Dams
- Culverts
- Water towers
- Pavement

Drinking water

Upton is dependent on wells located near the West River for all its public drinking water. The public water system serves residents in Upton Center, as well as along Mechanic and North Streets. Residences elsewhere in town are reliant on private wells. Attendees of the CRB workshop expressed concern about the impact that future droughts could have on the town's water supply. They noted that private wells already had long refill times during recent periodic drought conditions. Upton is also dependent on a single aquifer for its public water supply. The aquifer's capacity is a potentially limiting factor for town growth, and the existing geographic extent of public water lines may constrain the form and density of future development. Asbestos cement pipes within Upton's water distribution system are another challenge because this type of pipe is vulnerable to failure. Industrial activity at the railyard abutting the aquifer and a community well was also perceived as a threat to town water.

Railroad

The Grafton and Upton Railroad runs through Upton. Workshop attendees were worried about the railroad's potential impact on endangered species habitat and wetlands, the lack of transparency about potential safety hazards, and sparks on the line contributing to the town's fire risk. As the railroad is known to transport hazardous materials, there was also concern about accidental leakage of toxic chemicals and the potential impact on the abutting aquifer if an accident were to occur. Additionally, Attendees noted increased truck traffic in the area related to rail development on the Hopedale line. Railroad-related hazards may compound Upton's climate vulnerabilities by adding hazard risk to the town's water supply, fire potential, and local ecology.

Wastewater and septic tank management

As mentioned in the prior section, the Upton Wastewater Treatment Facility is located in a flood zone near the West River. Inflow and infiltration issues in the town's wastewater system are another challenge for the town's Wastewater Division. When precipitation occurs, stormwater should flow into nearby waterways and bypass the Wastewater Treatment Facility. However, due to sump-pump drainage, cracks in sewer pipes, and various other reasons, stormwater also enters the wastewater system, increasing the water volume that the treatment facility must process. The treatment facility may be able to accommodate some stormwater-induced surges, but climate change may make extreme precipitation events even larger or more likely. If the treatment facility is overwhelmed by the volume of waste it must process, then untreated wastewater could back up in pipes or enter the environment. Fortunately, Upton's Wastewater Division is actively working to address this problem. Workshop attendees also noted that most of the town is not connected to the public sewer system. Instead, many residents use septic tanks, which may leach nutrients into the nearby environment if not properly

maintained.[14] The potential for untreated wastewater to enter the environment through the wastewater system or leakage from private septic tanks could create new public health hazards and add to ecological shifts that climate change may cause within the town's natural landscapes.

Dams

Dams across Upton may need inspection, maintenance, or replacement. According to the Massachusetts Office of Dam Safety, the Wildwood Lake dam and Old Grist Mill Pond dam are classified as dams with significant hazard potential. A workshop attendee also noted that the Taft Mill dam might need inspection or maintenance. The Town of Upton owns all three dams. According to Upton's 2018 Hazard Mitigation Plan Update, dam failures are frequently due to high floodwaters, which overtop dams and erode their structural integrity. More frequent extreme precipitation events due to climate change could increase the risk of failure, overtopping, flooding upstream of the dam, erosion, or other hazards.

Culverts

Attendees expressed concern over the condition of culverts across town. They noted that culverts sometimes cause erosion, flooding, or block animal passage, and specifically identified problem culverts at:

- Church Street & Warren Street
- North Street
- Hartford Ave. South
- near Taft Mill Pond
- Glenn Ave./Pleasant Street
- Station Street
- Grove Street
- Westborough Road
- Southborough Road

Water towers

Upton owns two water towers that pressurize the town's water supply - the Pratt Hill Water Storage Tank and the Pearl Street Water Storage Tank. Workshop attendees noted that these tanks are vulnerable to high winds due to their elevated and exposed locations. The tanks also have a limited storage capacity, so Upton should explore other water storage options to build water supply resiliency.

Pavement conditions

One workshop table discussed poor pavement conditions and a need for more pedestrian safety measures in certain areas of town. Climate-related disruptions to Town transportation systems (i.e. road washouts due to heavy precipitation, potholes and rutting as a result of higher temperatures causing pavement to soften and expand) can impede the ability of people to move around Town. Workshop participants expressed particular concern about the sidewalks from Coach Road to the Plaza which are challenged by property owners' lack of adequate snow clearance after storms. Elderly residents in this area may be especially affected by pavement conditions exacerbated by climate threats.

[14] Department of Public Works, n.d.

Societal Concerns:

SOCIETAL

- Town-wide emergency preparedness
- Lack of affordable housing and public transportation
- Cemeteries

Town-wide emergency preparedness

Workshop attendees would like the town to revisit its emergency preparedness plans. While Upton has designated shelters at school buildings in town, it is unclear what triggers the shelters to open. Attendees observed that the elementary school lacks a backup power source for the cafeteria and the two high schools lie within the Railroad Isolation Zone. More research may be needed to determine the schools' viability as safe spaces during some disasters. Additionally, some multi-family buildings that house vulnerable community members may not be equipped for residents to shelter in place during extreme weather or prolonged power outages. The Milhouse Apartments, an affordable housing facility for seniors and disabled individuals, lacks an emergency generator and central air conditioning, which could limit residents' resiliency to heat stress. The Upton housing authority property also lacks a backup power source. With a greater likelihood of extreme temperatures in the future, Upton will need to identify and publicize the weather conditions that open public shelters and ensure that these facilities are accessible to residents who are unable to shelter in place.

Workshop attendees were also concerned that existing emergency communication strategies might not reach all residents. Upton has some areas without reliable cell phone or internet service and must ensure that the town's Emergency Management Department can contact residents of these areas during an emergency.

Lack of affordable housing and public transportation

Upton does not have enough housing options available for senior residents who would like to age in place, and housing choices are even more limited for the low-income senior population. During the workshop, an attendee benchmarked total affordable units across the town at 6.35% of the town's total housing supply. Ensuring access to safe and affordable housing is an important way for Upton to increase residents' adaptive capacity and decrease vulnerability to climate hazards.

The town also has limited public transportation options for residents who cannot drive or afford a vehicle. An inability to drive in a car-dependent place like Upton could constrain job opportunities, social circles, and access to essential goods and services. It may also force households to rely on cars for lack of suitable alternatives, constraining Upton residents' future efforts to reduce their overall carbon emissions.

Cemeteries

Upton currently has two major cemeteries in town. Lakeview Cemetery, located next to Pratt Pond, is town-owned and managed by the Cemetery Commission. While it is presently outside of FEMA flood zones, town stakeholders expressed concern that plots may experience flooding in the future due to climate change-related precipitation increases. Cemetery flooding would negatively impact this important social and historic feature of Upton and further limit the availability of cemetery plots. Maplewood Cemetery is less vulnerable to flooding due to its topography, despite its proximity to West River wetlands. Workshop attendees also noted a

general lack of cemetery space throughout town, which may prompt Upton to purchase additional open space for cemetery use in the future.

Environmental Concerns:

Waterbody health

Bodies of water across, including Pratt Pond, Mill Pond, and the West River, face several water quality issues, as noted in this report's prior sections. Non-point source pollution, including stormwater, may be contributing to the eutrophication, algae growth, high bacteria levels, and water weeds present in Pratt Pond and Mill Pond. The waste and grazing of Canadian Geese at Pratt Pond's Kiwanis Beach present an additional ecological challenge for that pond. Climate factors, including higher temperatures and precipitation changes, may exacerbate Upton's existing water quality issues. West River's future health was also a concern for workshop attendees given the potential for railroad accidents, the town's reliance on the river for drinking water, and the increasing likelihood of future drought.

ENVIRONMENTAL

- Waterbody health
- Fire prevention and vegetation management
- Ecological changes
- Erosion

Fire prevention and vegetation management

Workshop attendees noted that Upton has a relatively high fire risk in Massachusetts due to forest proximity to structures across the town. Homeowners may lack an awareness of this risk or best practices for reducing the threat of fire. Forested areas throughout town are vulnerable to increasing pressures from heat, drought, wind events, and gypsy moths. Dead or dying trees may be more susceptible to climate-related hazards like high winds and can add to the town's fire risk by increasing the amount of fuel.

Roadside trees also present a challenge for Upton due to a lack of a proactive tree trimming, removal, and replacement program. When severe weather events damage trees across town, debris can block streets and bring down utility lines, disrupting the town's transportation and communication systems.

Ecological changes

Ecological changes, including shifts in plant and animal habitats, may naturally shift in the future due to climate change. Workshop attendees observed several environmental changes that could negatively impact the town's overall resilience. Invasive plant and animal species have been observed throughout town. Some species like gypsy moths negatively impact the town's environmental quality by damaging trees, which can contribute to hazards like downed power lines and wildfire.

Workshop residents also observed that vector-borne illnesses spread by mosquitos and ticks are a growing public health challenge for the town. Eastern Equine Encephalitis (EEE) and West Nile Virus are both threats to Upton's residents. The town has previously had to institute dawn to dusk outdoor activities bans to protect residents from EEE, a difficult adjustment for residents, especially children unable to play outside after dark. While pesticide spraying may help mitigate the public health impact of mosquitoes on the town, some workshop attendees were concerned that the widespread use of these pesticides could also cause new environmental problems for Upton.

Other observed ecological changes include a decline in cold-water fish populations. The Upton Conservation Commission is aware of this problem and has already established a program to test stream temperatures. However, restoring fish habitat may be made more complicated by rising temperatures due to climate change. Accommodating beaver populations is another known challenge for the town government. Beaver dams along Southborough Road and Mechanic Street were explicitly mentioned during the MVP workshop, although beaver dams were also observed along other waterways. While beavers are a natural feature of wetland ecosystems in New England,[15] they can complicate municipal flood prevention efforts and damage property.

Erosion

Severe storms have led to topsoil loss in some areas of Upton. This type of erosion can negatively affect soil fertility, degrade freshwater ecosystems, and decrease flood control capacity.[16] Upton stakeholders are also concerned about the potential for riverbank erosion due to sudden increases in water levels.

Current Strengths and Assets

Upton has taken some steps to address natural hazards and climate change over recent years. The following topics were identified by workshop attendees as strengths or assets that will aid in Upton's climate resilience.

Infrastructure Strengths:

Upton Center redevelopment

Upton's residents appreciate their town center. Upton Center is the most densely developed town area and consists of a cluster of commercial, residential, and civic buildings. It also includes the Upton Center Historic District, which the National Park Service recently added to the National Register of Historic Places. CRB workshop attendees noted multiple historic assets, including the Mill, Mill Housing, and historic homes along Elm and Main Streets.

INFRASTRUCTURE

- Upton Center redevelopment
- Local water supply

In 2019, Upton Center was the subject of an economic development and planning study focused on establishing a collective future vision for the area. Redevelopment within Upton Center may present opportunities for the town to incorporate resilient infrastructure into municipal projects. In the near term, Upton could consider ways to build resiliency into the future community center, which will house the town's senior center and library. The new building has been proposed for a site near the Grove and Main Street intersection, next to the town's existing VFW building. This location is adjacent to Center Brook and is surrounded by existing FEMA flood zones. MVP workshop attendees were optimistic about the future community center and hoped the building would incorporate sustainable and resilient design features, such as geothermal energy, rainwater harvesting, and green infrastructure. An early draft of the building design includes features like a commercial kitchen and an HVAC system, which could be useful the building is designated as an emergency shelter. However, other crucial resilient

[15] MassWildlife, n.d.

[16] DeLonge and Stillerman, 2020.

infrastructure features like a backup power system have not been detailed in public documentation to date.[17]

Local water supply

While workshop attendees were concerned about the impact of climate change on the town water supply, they also identified the local water supply as a town strength. West River is a reliable, clean source of drinking water for most of the town. Upton does not have to rely on its neighbors for water and has not had to deal with major contaminants. Workshop attendees recognized the value of this environmental asset, as well as the town's responsibility to protect their drinking water supply for future generations.

Societal Strengths:

SOCIETAL

- Local social services
- Community organizations
- Schools and youth

Local social services

Workshop attendees valued the existing social services within the town. The Upton Center, under the advisory of the Council on Aging, is a hub for older residents in town. Its services include transportation for medical appointments, grocery shopping trips, exercise classes, and navigation of social programs like SNAP and Medicare. Upton's library provides access to books and other media and hosts a wide variety of community events. As mentioned in the prior section, the new community center will combine the library and senior center under one roof. Upton also has three food pantries within the town boundaries, and neighboring communities host several others.

Community organizations

At the MVP workshop, attendees noted that Upton's citizens serve their community through various charitable organizations. These organizations could support the community response to climate hazards or emergencies and provide support for climate resilience-building projects within the town.

- **The Upton VFW (Post 5594)** is located in downtown Upton and provides services to town veterans, hosts community events, owns the little league fields, and works with other community organizations like the Boy Scouts.
- **The Bloomer Girls** non-profit organization has been based in Upton since 1960 and serves the community through fundraising, volunteering, food distribution, and aid to the town's low-income residents.
- **The Upton Men's Club** is a charitable organization that cares for plantings in Downtown Upton and awards scholarships to town youth.
- **The Fire and EMS organization** is a non-profit that supports the town's Fire and EMS departments as well as the town as a whole through fundraising, community organizing, and helping to offset the cost of first responder equipment.

Schools and youth

Upton is home to the Memorial Elementary School, the Nipmuc Regional High School, and the Blackstone Valley Regional Vocational Technical High School (BVT). Some of the students and

[17] The Town of Upton, Massachusetts, 2021.

the Boy and Girl Scouts in town have volunteered on past environmental projects. Other students have become involved in the Sustainable Upton volunteer organization.

Workshop attendees singled out the BVT campus as a town resilience asset. The school draws students from 13 regional towns and acts as an economic driver for Upton. The campus also provides space for town recreation nights and has a small restaurant run by the students. It also has a variety of resources that workshop attendees thought could be useful during an emergency. BVT students have occasionally completed official projects for the town at a small cost and could help implement future climate resilience-building projects.

Environmental Strengths:

ENVIRONMENTAL

- Agriculture
- Open Space and Recreation

Agriculture

Upton has several active farms, including Town Line Dairy Farm, Kelly's Farm, Fivefork Farms, and Long Life Farm. These farms provide town residents with access to locally grown food, which is increasingly in demand in Upton. Most existing farmland in the town is classified as agricultural land under Massachusetts Chapter 61A, which impedes future land-use changes in exchange for tax benefits.

The community garden at Stefan's Farm was designated as another town strength. The town holds around 120-acres of land, referred to as Stefan's Farm, in northern Upton.[18] A portion of this land is used as a pesticide-free community garden, where town residents can garden for a nominal fee. There is high demand for garden plots and limited availability at the current site. Elsewhere on Stefan's Farm, hikers, horseback riders, and hunters use the open space for recreation.

Open Space and Recreation

Workshop attendees valued Upton's plentiful protected open space, consisting of over 3000 acres, including the Upton State Forest.[19] Residents appreciate these areas for their recreational value and role in preserving the town's ecology, natural resources, and scenic character. Attendees mentioned the following features at the workshop:

- Upton State Forest covers 16% of the town's total area, primarily in North Upton.[20] The state owns the forest land, and workshop attendees noted that the town does not benefit from tax revenue on this land. However, Upton state forest provides the town with valuable recreational resources, including an extensive trail system and historic sites like a Civilian Conservation Corps building dating to the 1930s.[21]
- Kiwani's Beach is the town swimming beach at Pratt Pond. Workshop attendees want to address the water quality issues that have negatively impacted swimming and the pond and beach's recreational use.
- Upton's residents value the farms in Upton for their agricultural production and their protection of land from development.

[18] Upton Open Space Committee, 2020.
[19] Ibid.
[20] Ibid.
[21] Ibid.

- Many of Upton's protected areas include trail systems, which provide town residents with extensive access to nature.

Workshop attendees also mentioned several organizations that are active in Upton and play an essential role in preserving and protecting the town's open space:

- The Narragansett Indian Tribal Historic Preservation Trust owns around 100 acres of land in town. However, trees on this land have been vulnerable to damage during recent storms.
- The Metacomet Land Trust and Sudbury Valley Trustees have partnered with the town on past open space projects and can provide professional staff to assist with conservation projects.
- Friends of Upton State Forest is a very active group in Upton. The group hosts environmental and historical education programs for the public, including programs for children. Its volunteers maintain trails, remove downed trees, and preserve historic features within the forest.
- The Baystate Trail Riders help maintain trails that are accessible for equestrian use within Upton's open space.
- The Nipmuc Rod and Gun Club owns over 100 acres of land held as open space for hunting, fishing, and target practice, though its grounds are only accessible to club members. This land is held under Chapter 61 and is not permanently protected.

Recommendations to Improve Resilience

On Days 2 and 3 of the workshop, attendees took the next step in completing the CRB Matrix by suggesting actions that would address vulnerabilities or further bolster strengths they identified. The following actions are summarized from the matrix, which can be found in Appendix B of this document.

Infrastructure Actions

Assessing vulnerability to flooding across town will be critical to Upton's climate resilience efforts. Workshop participants noted several culverts might need replacements in the near term to alleviate flooding and allow wildlife to cross roads safely. Participants also proposed dredging Mill Pond or returning it to a stream to deal with flooding at that dam. Along Southborough Road, the Massachusetts Department of Conservation and Recreation needs to rebuild berms to protect bog ecosystems. Culverts, dams, bridges, and stormwater drainage across Upton will have to accommodate future changes to precipitation patterns, so the town should proactively evaluate these assets and their likelihood of failure or flooding. In the future, the town should ensure that staff considers nature-based solutions when evaluating alternatives for replacing or installing new water-control infrastructure. For example, when repaving streets, the town should consider incorporating green infrastructure to absorb stormwater in areas with significant impervious surface coverage, like Downtown Upton. When proceeding with any water-control infrastructure projects, the town should also consider the impact of the change on upstream

INFRASTRUCTURE

- Assessing flood vulnerability
- Protecting water supply
- Proactive tree trimming
- Railroad safety

and downstream waterways to avoid future flooding problems. To this end, the town should actively pursue watershed-level collaboration opportunities on flood management planning. Other town infrastructure components, including roadways, sidewalks, and gravesites, should be assessed by the town for their vulnerability to future flooding. The condition of roads and sidewalks should be evaluated through all four seasons, as they may be subject to flooding, damaged by flooding, or rendered unusable for other weather-related reasons like lack of snow clearance.

Protecting the future supply and quality of the town's water was a high priority for workshop participants. The town's water distribution system currently experiences leakage and problems, so pipelines will need to be evaluated and replaced if necessary. Another known issue is the water towers' vulnerability to high winds. In addition to preventing future damage to these structures, the town should evaluate the possibility of constructing a town reservoir to store a greater volume of water. Other ideas for making the town's water supply more resilient include:

- Education about the cost of increased water usage.
- Encouragement of methods for collecting and storing stormwater (e.g., rain barrels).
- Creating a drought-tolerant demonstration garden.

It was suggested that the town should also study the impact of drought on local farmers and identify options for ensuring their water supply during droughts. To protect water quality, the town should consider more frequent monitoring of wells and establish a Blue Space committee to oversee public water bodies like Pratt Pond. The risk of flooding at Upton's wastewater treatment plant could also endanger local water quality. The town should evaluate the applicability of low-impact development interventions on the treatment plant grounds, stormwater storage opportunities, and other flood control measures.

Downed trees are a frequent cause of power outages in Upton, so the town could focus on **proactive tree trimming** as a strategy to prevent future outages. The town could hire an official town tree warden to plant and trim trees along streets and on town property. Upton should ensure that any new plantings are resilient to droughts and severe storms. A new Street Tree Committee could work with the tree warden to conduct a town tree census and identify areas that would benefit from trimming or tree removal and replacement. The Street Tree Committee could also help develop regulations that would maintain the town's overall tree count and mandate trimming near public infrastructure.

The possibility of a railroad accident was a significant concern for some workshop participants. Although Upton is unlikely to remove the railroad from town, they can prioritize **railroad safety and emergency response planning** to mitigate any risks that the railway and storage yard poses to the surrounding community. Participants proposed that the town develop regulations requiring the railroad company to publicly disclose a list of materials transported through or stored in Upton. The town could also research other means to mitigate potential rail disasters and pursue regional collaboration among towns along the rail line, potentially leading to greater cooperation from the rail company.

Societal Actions

Workshop participants would like to see Upton **improve emergency preparedness** capacity by reevaluating existing plans and investing in supplies. Workshop participants were concerned about the lack of generators, or other backup power sources, at the existing emergency shelters, public housing, and senior housing facilities. The town should verify that designated public shelters, and facilities where residents may shelter-in-place, have adequate equipment and understand their role in emergency scenarios. If Upton lacks any emergency equipment, the town should develop a plan and budget to acquire necessary items. Upton should also verify that emergency plans include all types of climate-related disasters, including extreme heat, drought, and extreme cold. Additionally, the Office of Emergency management should ensure that institutions like schools, public and senior housing have up-to-date emergency plans and are included in the town's disaster mitigation planning process.

SOCIETAL

- Emergency preparedness capacity
- Emergency preparedness education and communication
- Housing and transportation options

While Upton has an Emergency Preparedness Plan listed on the town website, workshop participants were concerned that town residents would be unaware of what they should do or how they could help during a weather-related emergency. Better **emergency preparedness education and communication** could ensure the town's overall resilience to climate change hazards. In addition to raising general awareness, the town should register more people for the town's emergency alert system and ensure a communication strategy for scenarios when phone or internet service is not available. One idea highlighted at the CRB workshop was formalizing a neighbor-to-neighbor communication system to ensure that the town's emergency coordinators can reach every resident town resident with important information. Another idea was to use the Upton's Council on Aging as a resource for contacting senior citizens when preparing for or managing emergencies if the town is not doing this already.

Upton should also focus on **expanding housing and transportation options** for climate-vulnerable residents. There are limited affordable residential units in town, but workshop participants noted that the town could use Community Preservation Act funds for affordable housing projects. A site on Westborough Road was identified at the workshop as a potentially suitable location for a new housing project. The town should also explore new ways to incorporate affordable units into mixed-use projects and market-rate housing development, to expand the variety of affordable housing options. There are also minimal transportation options for residents who are unable to afford or drive a car. The Council on Aging provided medical transportation for senior citizens, but that is the only form of public transit in Upton. Workshop participants want to see the Council on Aging expand their transportation service and the town to serve residents without personal vehicles better

Environmental Actions

Incorporating climate hazards into development regulations was recommended to prevent future development from exacerbating known environmental challenges. One option for Upton could be a new floodplain overlay district to regulate new construction in current and future floodplains. Upton would also benefit from a development impact analysis, which might include an evaluation of:

- Whether existing town bylaws and permit review requirements undermine or prevent building local climate resilience
- Existing provisions for open space development
- Future development potential and its impacts (environmental, traffic, town infrastructure, etc.) in the context of climate hazards

ENVIRONMENTAL

- Update development regulations
- Protect new open space
- Environmental education
- Prioritize green infrastructure and

Workshop participants also discussed directing future development away from forested areas, which could mitigate future fire risk, and adding a bylaw to restrict soil removal, which would address erosion problems. The town is already updating its Stormwater Bylaws to prevent adverse impacts on water quality in the broader environment.

Upton is fortunate to have nearly 3000 acres of protected open space within town limits.[22] Stakeholders at the CRB workshop valued this land's recreational, scenic and environmental benefits and wanted to **protect additional open space from future development**. Expanding access to land for agriculture and formally protecting existing farmland is a crucial way for the town to develop its local food system and economy. One idea to create new opportunities for local agriculture in Upton was to create a community farm at the Stefans Farm property. This community farm could follow Grafton's Community Harvest Project model, where volunteers cultivate produce that is later donated to community members experiencing food insecurity. Workshop participants also wanted to evaluate the town's existing land use and see Upton develop a plan to preserve additional open space and wetlands, in addition to agricultural land. To increase the likelihood of future conservation in Upton, the town should proactively reach out to landowners about conservation benefits for their community and the broader environment. The town should also consider creating an ongoing education program on the many advantages of Upton's plentiful open space.

Upton is lucky to have so much open space and natural environments spread across town but must **educate citizens on how to maintain ecosystems** in the face of climate change. Education and outreach ideas from the workshop were as follows:

- To preserve the West River and mitigate the impacts of future drought, Upton residents could benefit from education and public outreach about water conservation. In addition to spreading awareness of this issue, the town could add drought-resilient landscaping to a town-owned building. This demonstration garden would educate residents and reduce the town's water use.

[22] Upton Open Space Committee, 2020.

- Workshop participants also commented on Upton's high fire risk relative to other municipalities in the Commonwealth. The town should also proactively educate citizens on behaviors that can cause, spread, or exacerbate wildfires. This education program could include a list of climate-resilient plant species and landscaping best practices to reduce fire risk to dwellings, among other fire mitigation topics.
- As in many Massachusetts areas, invasive plant and animal species have been observed in Upton ecosystems, and climate change may induce further ecological disruptions in the town. The town should conduct additional outreach on vector-borne disease awareness and prevention.
- Workshop participants saw value in public education on invasive plant species. They would like Town Bylaws to require climate-resilient native plant species anytime they regulate vegetation, landscaping, or tree-planting.
- A campaign to improve local waterways' health and restore native fish populations across the Blackstone River Watershed could galvanize local involvement in environmental preservation and serve as an educational platform for future climate change impacts on local ecosystems.
- Workshop participants also saw an opportunity to incorporate climate change's local impacts into the three local schools' curriculum. They felt that the town should facilitate students' opportunities to get involved in local resilience-building activities and use those activities as a learning exercise.

Workshop participants would like the town to **prioritize green infrastructure and renewable energy** to improve town property. The new Community Center could include several "green" features such as thermal energy, rain gardens, and permeable pavement. Town buildings that are already constructed, such as the Department of Public Works building, could invest in roof-top solar panels, saving the town money, reducing carbon emissions, and serving as a positive example to the community. Workshop participants would also like Upton to demonstrate the town's commitment to climate mitigation and develop a clear strategy for reducing carbon emissions. To this end, Upton could develop a Climate Action Plan to quantify greenhouse gas emissions and develop a strategy to reduce emissions that aligns with the town's land use, transportation, and economic development goals.

Top Recommendations

Following the three-day virtual workshop, CMRPC placed these actions in an online survey so that participants could prioritize their top recommendations. Some priority actions were grouped with similar ideas to streamline the survey process. A total of six workshop participants answered survey questions on:

1. What hazards they were most concerned with
2. Whether an action was high, medium, or low priority
3. Whether an action was a short, long, or ongoing project
4. Which actions they would like to see Upton complete.

Readers can find a copy of the survey questions and the survey results in the Appendix at the end of this document.

Respondents were relatively evenly divided on the hazard of most concern for Upton. The greatest share of survey participants, 50%, selected **drought** as the town's top hazard. However, this was closely followed by **flooding**, **wind,** and **winter storms**.

Participants elected that the following actions are high priorities for Upton:

- **Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds**: This action idea addressed multiple water supply vulnerabilities in Upton and was selected as a high priority by 83.33% of respondents.
- **Railroad safety and emergency response planning**: Workshop participants expressed concern over the environmental and public safety risks that the railroad could have on the town. 66.67% of survey respondents felt that addressing these risks through better emergency planning was a high priority for the town. 66.67% of survey respondents also selected this idea as the highest priority infrastructure-related action idea.
- **Climate change vulnerability assessment focused on water infrastructure and flooding (culverts, dams, bridges, stormwater drainage, etc.) AND/OR stream overflow and localized flooding mitigation using nature-based solutions**: 66.67% of MVP survey respondents voted that this option was a high priority, which targets the potential for stormwater-induced flooding in Upton.
- **Investments in generators for emergency shelters, public housing AND/OR senior housing**: 66.67% of survey respondents voted that generator purchases for buildings where community members can shelter during emergencies is a high priority for Upton.
- **Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings)**: 66.67% of survey respondents selected this action as a high priority, indicating that Upton stakeholders want to see the town prioritize climate mitigation activities along with climate resilience-building.
- **Evaluate disaster response plans, evacuation routes and public communication strategies**; AND/OR include groups like schools and senior centers in disaster mitigation planning process; AND/OR develop capacity of the existing neighbor-to-neighbor program as the town's highest priority: 50% of survey respondents thought that this action was the highest priority society-focused action idea for Upton.
- **Development impact analysis, which includes evaluating existing development bylaws and permit review requirements, evaluating existing provisions for open space development, and determining whether development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered in the context of climate change**: 33% of survey respondents selected this idea as the highest priority environmental action for the town.
- **Evaluate town land use and plan to preserve additional open space, wetlands, and agricultural land AND/OR recreational land planning, conservation, and outreach to landowners AND/OR develop opportunities for local agriculture and community farming on conservation land**: 33% of survey respondents also selected this idea as the highest priority environmental action for the town.

At the end of the three-day virtual workshop, Peter Peloquin thanked attendees for giving their time and attention, and commended the town for their willingness and flexibility to utilize a virtual platform giving the current public health conditions. The top recommendations on the

following pages were compiled based on those actions reported out voted on by participants. Actions are organized by priority and project type. The key below describes the Category and Hazard types found in the top priority action table.

Category	Key
Infrastructural	
Societal	
Environmental	

Hazard	Key
Severe Storms/Flooding	
Winter Storms	
Wind	
Drought	
Wildfires	

Project Type	Category	Issue	Recommended Action	Hazard
High Priority				
Water Supply Protection		**Water Conservation / Water Quality**	Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds.	
Emergency Response		**Railroad Safety / Emergency Response Planning**	Increase local awareness of potential hazards related to materials stored at the railroad depot, develop or publicize railroad emergency response plan	
Stormwater Management		**Watershed**	Perform a town-wide watershed assessment, identifying causes of flooding and problem areas, expanding the water system, and prioritizing dams and culverts to be repaired	
		Culverts	Repair and replace existing culverts with nature-friendly designs or day-light culverts	
Power/Energy		**Power Outages**	Bolster Power Redundancy by investing in generators for emergency shelters, public housing AND/OR senior housing.	
		Alternative Energy	Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings)	
Medium Priority				
Education and Outreach		**Community Education**	Public outreach campaign to educate residents on tree management for fire prevention and climate resilience.	
Roadways		**Pavement Conditions**	Pavement (sidewalks, roadways) conditions assessment.	
Water Supply Protection		**Water Quality**	Evaluate and improve the resiliency of wastewater treatment plant to climate hazards.	
Low Priority				
Policy Updates		**Natural Resource Protection**	Enact a town bylaw regulating soil removal.	
Education and Outreach		**Biodiversity**	Environmental campaign to restore native fish populations in town and across watershed.	
		Biodiversity + Tree/Forest Management	Public outreach campaign to educate residents on invasive plant species; AND/OR review town bylaws to recommend native species planting; AND/OR develop regulations that maintain town tree count but controls tree growth in hazardous areas near infrastructure.	
		Vector-borne Illness	Public education on vector-borne diseases and prevention.	

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APPENDIX

I. Agendas
II. Workshop Meeting Materials
    a. Invitation
    b. Maps
    c. Table Matrix
    d. Survey
III. Workshop Presentations
IV. Listening Session Presentation

AGENDAS

Community Resiliency Building Workshop

Town of Upton

Municipal Vulnerability Preparedness

Day 1- Thursday, February 18, 2021

6:00 pm – 8:00 pm; Check-in at 5:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09

Meeting ID: 820 3531 5333
Passcode: 066525

Call in Number (if unable to join online): +1 646 558 8656

Workshop Materials:
https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoII8Xw2ng3p1PP4a?dl=0

Workshop Agenda

5:45 pm – 6:00 pm:
- Login & Familiarize with Zoom

6:00 pm – 6:15 pm:
- Welcome & Overview
- Questions & Answers

6:15 pm – 7:40 pm:
- Breakout Groups
  - Identify Hazards & Local Features
  - Discuss Strengths & Vulnerabilities

7:40 pm – 8:00 pm:
- Reconvene as Large Group
- Quick Table Summary
- Closing Remarks & Wrap Up

Day 1: Workshop Objectives

- Define extreme weather and climate related hazards;
- Identify current and future vulnerabilities and strengths;
- Edit online map with important hazards and features

Homework

- Review hazards, vulnerabilities, and strengths in matrix
- Brainstorm actions to address vulnerabilities

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

Community Resiliency Building Workshop

Town of Upton
Municipal Vulnerability Preparedness
Day 2- Thursday, February 25, 2021
6:00 pm – 8:00 pm; Check-in at 5:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09

Meeting ID: 820 3531 5333
Passcode: 066525

Call in Number (if unable to join online): +1 646 558 8656

Workshop Materials:
https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkolI8Xw2ng3p1PP4a?dl=0

Workshop Agenda

5:45 *pm – 6:00 pm:*
- Login & Familiarize with Zoom

6:00 pm – 6:15 pm:
- Welcome & Recap from Day 1
- Questions & Answers

6:15 pm – 7:40 pm:
- Breakout Groups
  - Identify Actions to Reduce Risks and Build Resilience
  - Prioritize Actions by Urgency and Timing

7:40 pm – 8:00 pm
- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Brainstorm additional actions to address vulnerabilities
- Attend Day 3 Workshop

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

Community Resiliency Building Workshop

Town of Upton

Municipal Vulnerability Preparedness

Day 3 - Thursday, March 4, 2021

4:00 pm – 6:00 pm; Check-in at 3:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/88968050853?pwd=bDJFZmx6SFcwNnBXVEFQWXdUWkJnZz09

Meeting ID: 889 6805 0853
Passcode: 146987

Call in Number (if unable to join online): +1 646 558 8656

Workshop Materials:
https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoll8Xw2ng3p1PP4a?dl=0

Workshop Agenda

3:45 pm – 4:00 pm:
- Login & Familiarize with Zoom

4:00 pm – 4:15 pm:
- Welcome & Recap from Day 1 & 2
- Questions & Answers

4:15 pm – 5:40 pm:
- Breakout Groups
  - Identify Additional Strengths & Vulnerabilities
  - Identify Additional Actions to Reduce Risks and Build Resilience

5:40 pm – 6:00 pm:
- Reconvene as Large Group
- Table Remarks
- Closing Remarks & Wrap Up

Day 3: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Review potential actions identified on Day 2
- Develop and prioritize additional opportunities for the Town to reduce risks

Homework

- Review actions to reduce risks and build resilience
- Vote for top priority actions via survey (link to be emailed)
- Attend Listening Session

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

WORKSHOP INVITATION

Participate in Upton's Virtual Municipal Vulnerability Preparedness (MVP) Program

Given events like the Springfield tornado in 2011, the snowstorms of 2015, the extreme drought of 2016 and recent Hurricanes Harvey and Irma, we find ourselves in a new era of more unpredictable and severe weather that can potentially cause damage to our community.

To be as proactive as possible, I would like to personally invite you to participate in a, three-part, virtual Community Resilience Building Workshops focused on preparing and protecting the Town of Upton.

The MA Executive Office of Energy and Environmental Affairs' (EOEEA)

Municipal Vulnerability Preparedness (MVP) Program Workshops

Thursday, February 18th from 6 – 8PM
Thursday, February 25th from 6 – 8PM
Thursday, March 4th from 4 – 6PM

All meeting will be held virtually on ZOOM.

The Town of Upton is collaborating with EOEEA and CMRPC to offer this timely virtual workshop which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Upton. This workshop will help develop and advance comprehensive community resilience planning, hazard mitigation, and adaptation efforts.

The workshops' objectives are to:

- Define extreme weather and climate related hazards;
- Identify current and future vulnerabilities and strengths;
- Develop and prioritize actions; and
- Identify opportunities for the Town to advance actions and reduce risks to build resilience.

To learn more about the workshop, please visit the following websites:

- Community Resilience Building: https://www.communityresiliencebuilding.com/crbworkshopguide
- Municipal Vulnerability Program: https://www.mass.gov/guides/home-mvp
- Resilient MA, Climate Change Clearinghouse for the Commonwealth: https://www.resilientma.org/

Log-in information and meeting material's for Upton's MVP workshop will be sent out on February 12th to those who RSVP. We would appreciate your participation in this timely workshop.

Please RSVP by February 11, 2020.

If you have any questions about the program, please contact Paul Dell'Aquila, Town Planner, PDellAquila@uptonma.gov, or Sarah Adams, CMRPC, sadams@cmrpc.org.

We look forward to seeing you or a designee at our virtual workshop. Thank you for your assistance with this important project!

Sincerely,

Derek S. Brindisi
Town Manager

Thank You for Your Participation in Upton's Municipal Vulnerability Preparedness (MVP) Program!

The Town of Upton is collaborating with EOEEA and CMRPC to offer a three-day virtual workshop on ***Thursday, February 18th and 25th from 6 – 8PM, and Thursday, March 4th from 4 – 6PM*** which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Upton. Follow the instructions below in order to help make your community more climate resilient! If you have any questions about the program, please contact Upton Town Planner Paul Dell'Aquila at PDellAquila@uptonma.gov. We look forward to seeing you virtually at our workshop!

Step 1. Discover Upton's MVP Dropbox

The resources included in this invitation will help you learn more about the MVP program and prepare you for the upcoming workshop. All of these resources and more can be found in the following Dropbox link. If possible, you will want to have this Dropbox link open during the workshop so that you can easily access this information.

Workshop Dropbox: https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoII8Xw2ng3p1PP4a?dl=0

Step 2. Review the Program Overview and Workshop Guide

The following two documents will give you an overview of the MVP program and will describe a typical Community Resiliency Building (CRB) workshop.

MVP Program Overview: https://www.dropbox.com/s/n2ounjr2di1mhot/MVP%20Program%20Info_Updated%202019.pdf?dl=0

CRB Workbook: https://www.dropbox.com/s/n2r0xkza3xd3uj8/CRB%20Workshop%20Guide.pdf?dl=0

Step 3. Watch the MVP Presentations Prior to Workshop

The following link contains pre-recorded presentations that will help you be better prepared for the MVP workshop. The presentations include an overview of the program and the MVP process, climate projections and hazards that Upton may face in the future, and instructions on how to use the CRB Matrix. Please take some time to **review each of these presentations before February 18th**.

Presentations: https://www.dropbox.com/sh/7afmbw2ytqy3wvy/AAAfW4BM62rOH7VMVSmpxHk7a?dl=0

Step 4. Familiarize Yourself with the Matrix and Maps

During the virtual workshop, we will divide up into breakout groups to discuss strengths, vulnerabilities, and possible actions that the town can take. During this process, we will be filling out a matrix and marking up maps with our ideas. The following links will show you an example of a completed matrix, and will give you a set of pre-made maps that already display various features, hazards, and resources in Upton.

Complete Matrix Example:
https://www.dropbox.com/s/qkfuc9f518yfna8/Completed%20Matrix%20Example.pdf?dl=0

Maps: https://www.dropbox.com/sh/r8szf7v700k0fd4/AAAIpCz7mVb-xeTyptvPbVzGa?dl=0

Step 5. Attend the Workshop!

The 3-day workshop will be held on ***Thursday, February 18th and 25th from 6 – 8PM, and Thursday, March 4th from 4 – 6PM***. The agenda for each day as well as the Zoom meeting links are listed below. Please review the agenda for each day and use the meeting links to join the Zoom.

Agenda Day 1: https://www.dropbox.com/s/9ut2fapfn94f8u2/Workshop%20%231%20Agenda.pdf?dl=0
Zoom Link Day 1: https://us02web.zoom.us/j/82288750894?pwd=RHFsa3E2amZQMHhPRGtDVkovU2ViZz09
Agenda Day 2: https://www.dropbox.com/s/22hvrukn1sgyxo7/Workshop%20%232%20Agenda.pdf?dl=0
Zoom Link Day 2: https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09
Agenda Day 3: https://www.dropbox.com/s/tez7vghdn7y6le2/Workshop%20%233%20Agenda.pdf?dl=0
Zoom Link Day 3: https://us02web.zoom.us/j/88968050853?pwd=bDJFZmx6SFcwNnBXVEFQWXdUWkJnZz09

Learn How to Zoom

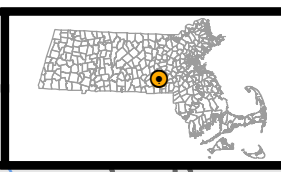
New to Zoom? The following document contains a series of instructional videos to help guide you through Zoom from downloading the app to joining a meeting for the first time.

https://www.dropbox.com/s/z7sks13hjk0rz84/How%20To%20Zoom.pdf?dl=0

MAPS

Reference Map: Dams (2012)

Town of Upton, Massachusetts



Miles
0.4 0.2 0 0.4

WESTBOROUGH
GRAFTON
NORTHBRIDGE
HOPKINTON
MILFORD
HOPEDALE
MENDON

Whitehall Reservoir
North Pond
Pratt Pond
Dean Pond

Cider Mill Pond Dam
Silver Lake Dam
Davidson Pond Dam
Wildwood Lake Dam
Old Box Shop Dam
Pratt Pond Dam
Lake Maspenock Dam
Fiske Mill Pond Dam
Fish Pond Dam
Mill Pond Dam
Electric Pond Dam
Rockdale Pond Dam
Riverdale Dam
Robida Pond Dam
Taft Pond Dam
Storage Pond Dam
Old Farm Pond Dam
Hopedale Pond Dam
Duck Pond Dam

WEST MAIN ST
MAIN ST
HIGH ST
CHURCH ST
MILFORD ST
PLEASANT ST
PROSPECT ST
CHRISTIAN HILL RD
PEARL ST
WALNUT ST
HOPKINTON RD
GRAFTON RD
WESTBORO RD
RIDGE RD
NORTH ST
SOUTHBORO RD
ORCHARD ST
EAMES LANE
THAYER ST
FOREST ST
EAST ST
CROCKETT RD
JAMES RD
GORE RD
CIDER MILL LANE
ELM ST
TAFT ST
KNOLLWOOD DR
SCHOOL ST
RIVER ST
NORTH MAIN ST
KNOWLES BEACH RD
OLD GRAFTON RD
FOWLER ST
MEADOW DR
MECHANIC ST
JONATHANS WAY
MERRIAM WAY
WARREN ST
HARTFORD AVE
FISKE AVE
SCHOOL ST
GROVE ST
BROOKS ST
STATION ST
PLAIN ST
FISKE MILL RD
POND ST
TYLER RD
WOOD ST
GABLE RD
GLENVIEW ST
WILLIAMS ST
FARM ST
DEPOT ST
ROCKDALE HILL CIRCLE
HARTFORD AVE SOUTH
GLEN AVE
MAPLE AVE
FLORENCE CIRCLE
MENDON ST
HENRYS PATH
JOSIAH DR
WEST RIVER ST
SOUTH ST
SADLER RD
CHESTNUT ST
GOSS POND RD
GREEN LANE
OAK DR

135
495
140
122

N W E S

Dams

Legend

- Town Boundary
- Water Bodies
- Major Road
- Local Road
- High Hazard
- Significant Hazard
- Low Hazard
- Not Rated, Too Small

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

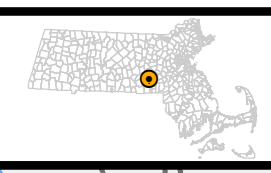
CMRPC Central Massachusetts Regional Planning Commission
One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/18/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Dams_11x17.mxd

Reference Map: Evacuation Routes & Shelters

Town of Upton, Massachusetts



Miles
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WESTBOROUGH
GRAFTON
NORTHBRIDGE
HOPKINTON
MILFORD
HOPEDALE
MENDON

Whitehall Reservoir
Pratt Pond
North Pond

135
495
140
122

WESTBORO RD
RIDGE RD
NORTH ST
SOUTHBORO RD
GRAFTON RD
ORCHARD ST
EAMES LANE
THAYER ST
HOPKINTON RD
FOREST ST
WALNUT ST
EAST ST
CROCKETT RD
JAMES RD
GORE RD
CIDER MILL LANE
ELM ST
TAFT ST
KWANIS BEACH RD
OLD GRAFTON RD
FOWLER ST
ME A DOW DR
MECHANIC ST
WARREN ST
JONATHANS WAY
MERRIAM WAY
WEST MAIN ST
HIGH ST
RIVER ST
NORTH MAIN ST
CHURCH ST
SCHOOL ST
MAIN ST
HARTFORD AVE
FISKE AVE
MILFORD ST
CHRISTIAN HILL RD
PEARL ST
WILLIAMS ST
FARM ST
DEPOT ST
GROVE ST
BROOKS ST
PLEASANT ST
STATION ST
PLAIN ST
FISKE MILL RD
TYLER RD
POND ST
ROCKDALE HILL CIRCLE
HARTFORD AVE SOUTH
FLORENCE CIRCLE
MENDON ST
PROSPECT ST
WOOD ST
GABLE ST
GLENVIEW ST
GLEN AVE
MAPLE AVE
HENRYS PATH
JOSIAH DR
MENDON ST
MILFORD ST
PLEASANT ST
WEST RIVER ST
SOUTH ST
CHESTNUT ST
SADLER RD
GOSS POND RD
GREEN LANE
OAK DR
HOPEDALE
MILFORD
HOPEDALE
MENDON
HOPEDALE
MENDON

Nipmuc Regional Middle/hs
St. Peter's Parish Hall
Henry P Clough

Legend

Town Boundary
Water Bodies
Major Road
Local Road
Shelter

Evacuation Routes
Highway
Primary
Secondary
Tertiary

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

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CMRPC Central Massachusetts Regional Planning Commission
One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/18/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Evac_Routes_11x17.mxd

Reference Map: Land Use (2016)

Town of Upton, Massachusetts

Miles
0.45 0.225 0 0.45

WESTBOROUGH
WESTBORO RD
RIDGE RD
SOUTHBORO RD
NORTH ST
GRAFTON RD
WESTBORO RD
HOPKINTON
ORCHARD ST
GRAFTON
FOWLER ST
MECHANIC ST
OLD GRAFTON RD
WEST MAIN ST
MEADOW DR
JONATHANS WAY
MERRIAM WAY
JAMES RD
GORE RD
HOPKINTON RD
THAYER ST
FOREST ST
WALNUT ST
CROCKETT RD
HOPKINTON
MILFORD
CIDER MILL LANE
ELM ST
EAST ST
KIMANIS BEACH RD
HIGH ST
SCHOOL ST
RIVER ST
TAFT ST
CHURCH ST
WARREN ST
MAIN ST
NORTH MAIN ST
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WILLIAMS ST
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FISKE MILL RD
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NORTHBRIDGE
HARTFORD AVE SOUTH
MAPLE AVE
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JOSIAH DR
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GOSS POND RD
GREEN LANE
OAK DR
MENDON
HOPEDALE
MENDON
Whitehall Reservoir
North Pond
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Residential
Residential - Multi-Family
Commercial
Industrial
Mixed Use - Other
Urban Public/Instit...
Pasture/Hay
Cultivated
Forest
Scrub/Shrub
Bare Land
Forested Wetland
Non-forested Wetland
Saltwater Wetland
Water
Unconsolida... Shore
Aquatic Bed
Other Impervious
Developed Open Space
Right-of-way
Cranberry bog
Orchard
Nursery
Misc

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

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Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/27/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Landuse_2016_11x17.mxd

Reference Map: Orthophoto (2019)

Town of Upton, Massachusetts

Miles
0.4 0.2 0 0.4

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WESTBOROUGH
HOPKINTON
GRAFTON
NORTHBRIDGE
MILFORD
HOPEDALE
MENDON

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WESTBORO RD
NORTH ST
RIDGE RD
SOUTHBORO RD
GRAFTON RD
ORCHARD ST
EAMES LANE
THAYER ST
FOREST ST
HOPKINTON RD
WALNUT ST
EAST ST
CROCKETT RD
JAMES RD
CORE RD
CIDER MILL LANE
KIWANIS BEACH RD
ELM ST
TAFT ST
RIVER ST
CHRISTIAN HILL RD
PEARL ST
FISKE MILL RD
POND ST
TYLER RD
PROSPECT ST
WOOD ST
CABLE ST
GLENVIEW ST
OLD GRAFTON RD
WEST MAIN ST
FOWLER ST
MEADOW DR
MECHANIC ST
MERRIAM WAY
EPHRAIMS WAY
HIGH ST
SCHOOL ST
CHURCH ST
WARREN ST
NORTH MAIN ST
MILFORD ST
MAIN ST
HARTFORD AVE
FISKE AVE
HAZELTINE RD
SCHOOL ST
BROOKS ST
WILLIAMS ST
FARM ST
DEPOT ST
PLEASANT ST
GROVE ST
STATION ST
ROCKDALE HILL CIRCLE
HARTFORD AVE SOUTH
FLORENCE CIRCLE
MENDON ST
PLAIN ST
GLEN AVE
MAPLE AVE
HENRY'S PATH
JOSIAH DR
MENDON ST
WEST RIVER ST
SOUTH ST
SADLER RD
CHESTNUT ST
GOSS POND RD
GREEN LANE
OAK DR

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS, Imagery from MassGIS.

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Central Massachusetts Regional Planning Commission

One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/27/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Ortho_11x17.mxd

Reference Map: Water Resources

Town of Upton, Massachusetts

Miles
0.45 0.225 0 0.45

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WESTBOROUGH
WESTBORO RD
Whitehall Reservoir
135
495
RIDGE RD
NORTH ST
SOUTHBORO RD
GRAFTON RD
ORCHARD ST
WESTBORO RD
HOPKINTON
North Pond
140
GRAFTON
JAMES RD
GORE RD
HOPKINTON RD
FOREST ST
THAYER ST
WALNUT ST
CROCKETT RD
HOPKINTON
MILFORD
MECHANIC ST
FOWLER ST
WARREN ST
OLD GRAFTON RD
WEST MAIN ST
MEADOW DR
JONATHANS WAY
MERRIAM WAY
HIGH ST
SCHOOL ST
CIDER MILL LANE
KIWANIS BEACH RD
ELM ST
EAST ST
TAFT ST
RIVER ST
CHURCH ST
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NORTH MAIN ST
MILFORD ST
CHRISTIAN HILL RD
PEARL ST
MILFORD
WILLIAMS ST
HARTFORD AVE
FISKE AVE
SCHOOL ST
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BROOKS ST
FISKE MILL RD
TYLER RD
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NORTHBRIDGE
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MILFORD ST
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HARTFORD AVE SOUTH
PLEASANT ST
HENRYS PATH
JOSIAH DR
MENDON ST
MENDON ST
GLEN AVE
PLEASANT ST
WEST RIVER ST
SOUTH ST
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HOPEDALE
MILFORD
HOPEDALE
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CHESTNUT ST
SADLER RD
MENDON ST
122
NORTHBRIDGE
GOSS POND RD
GREEN LANE
OAK DR
MENDON
HOPEDALE
MENDON
16

massDEP Public Water Supplies

- Community Groundwater Source
- Non-Community Groundwater Source
- Surface Water Intake
- Emergency Surface Water

Note > Public Water Supply, IWPA, Zone I and Zone II data current as of 12/2020.

- DEP Approved Zone I
- Approved Wellhead Protection Areas (Zone II)
- Interim Wellhead Protection Areas
- Aquifer

FEMA National Flood Hazard Layer (DFIRM Data) or FEMA Q3 Flood Zones (Pre-DFIRM)

- 100-year Flood Area
- 500-year Flood Area

Surface Water Supply Protection Area

- Zone A
- Zone B
- Zone C

- Water Line

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

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C M R P C
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One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/30/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Water_Res_11x17.mxd

Reference Map: Utility Infrastructure

Town of Upton, Massachusetts

Miles
0.4 0.2 0 0.4

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WESTBOROUGH
GRAFTON
NORTHBRIDGE
HOPKINTON
MILFORD
HOPEDALE
MENDON

Whitehall Reservoir
Pratt Pond
North Pond

90
495
135
140
122

WESTBORO RD
NORTH ST
RIDGE RD
SOUTHBORO RD
GRAFTON RD
WESTBORO RD
ORCHARD ST
EAMES LANE
THAYER ST
HOPKINTON RD
FOREST ST
WALNUT ST
EAST ST
GORE RD
JAMES RD
CIDER MILL LANE
CROCKETT RD
OLD GRAFTON RD
FOWLER ST
MEADOW DR
MECHANIC ST
WARREN ST
JONATHANS WAY
MERRIAM WAY
WEST MAIN ST
WILLIAMS ST
HIGH ST
SCHOOL ST
KWANIS BEACH RD
ELM ST
TAFT ST
RIVER ST
NORTH MAIN ST
CHURCH ST
MILFORD ST
CHRISTIAN HILL RD
PEARL ST
FISKE MILL RD
POND ST
TYLER RD
PROSPECT ST
WOOD ST
GABLE LN
GLENVIEW ST
MAIN ST
HARTFORD AVE
FISKE AVE
SCHOOL ST
GROVE ST
BROOKSTS
FARM ST
DEPOT ST
PLEASANT ST
STATION ST
PLAIN ST
ROCKDALE HILL CIRCLE
HARTFORD AVE SOUTH
FLORENCE CIRCLE
MENDON ST
MARLE AVE
GLEN AVE
HENRYS PATH
JOSIAH DR
MENDON ST
PLEASANT ST
WEST RIVER ST
SOUTH ST
CHESTNUT ST
SADLER RD
GOSS POND RD
GREEN LANE
OAK DR

Town Boundary
Water Bodies
Major Road
Local Road
Water Line

Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

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CMRPC Central Massachusetts Regional Planning Commission
One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/30/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Water_Sewer_11x17.mxd

Reference Map: Zoning

Town of Upton, Massachusetts

Miles
0.4 0.2 0 0.4

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WESTBOROUGH
GRAFTON
NORTHBRIDGE
HOPKINTON
MILFORD
HOPEDALE
MENDON

Whitehall Reservoir
North Pond
Pratt Pond

90 495 135 140 122

WESTBORO RD
RIDGE RD
NORTH ST
SOUTHBORO RD
GRAFTON RD
ORCHARD ST
EAMES LANE
JAMES RD
GORE RD
HOPKINTON RD
THAYER ST
FOREST ST
WALNUT ST
CROCKETT RD
CIDER MILL LANE
EAST ST
TAFT ST
KNAPS BEACH RD
RIVER ST
OLD GRAFTON RD
WEST MAIN ST
MECHANIC ST
FOWLER ST
MEADOW DR
JONATHANS WAY
MERRIAM WAY
WARREN ST
HIGH ST
SCHOOL ST
MAIN ST
NORTH MAIN ST
CHURCH ST
ELM ST
MILFORD ST
CHRISTIAN HILL RD
PEARL ST
WILLIAMS ST
HARTFORD AVE
FISKE AVE
GROVE ST
BROOKS ST
FISKE MILL RD
POND ST
TYLER RD
PROSPECT ST
GABLE ST
GLENVIEW ST
FARM ST
DEPOT ST
STATION ST
PLEASANT ST
PLAIN ST
ROCKDALE HILL CIRCLE
FLORENCE CIRCLE
MENDON ST
HENRYS PATH
JOSIAH DR
MAPLE AVE
GLEN AVE
WEST RIVER ST
SOUTH ST
SADLER RD
CHESTNUT ST
GOSS POND RD
GREEN LANE
OAK DR

Zoning Districts

- Agricultural Residential (AR)
- Commercial & Industrial (C&I)
- General Business (GB)
- Upton Center Business District
- Municipal Government Facilities (MGF)
- Single Residential A (SRA)
- Single Residential B (SRB)
- Single Residential C (SRC)
- Single Residential D (SRD)

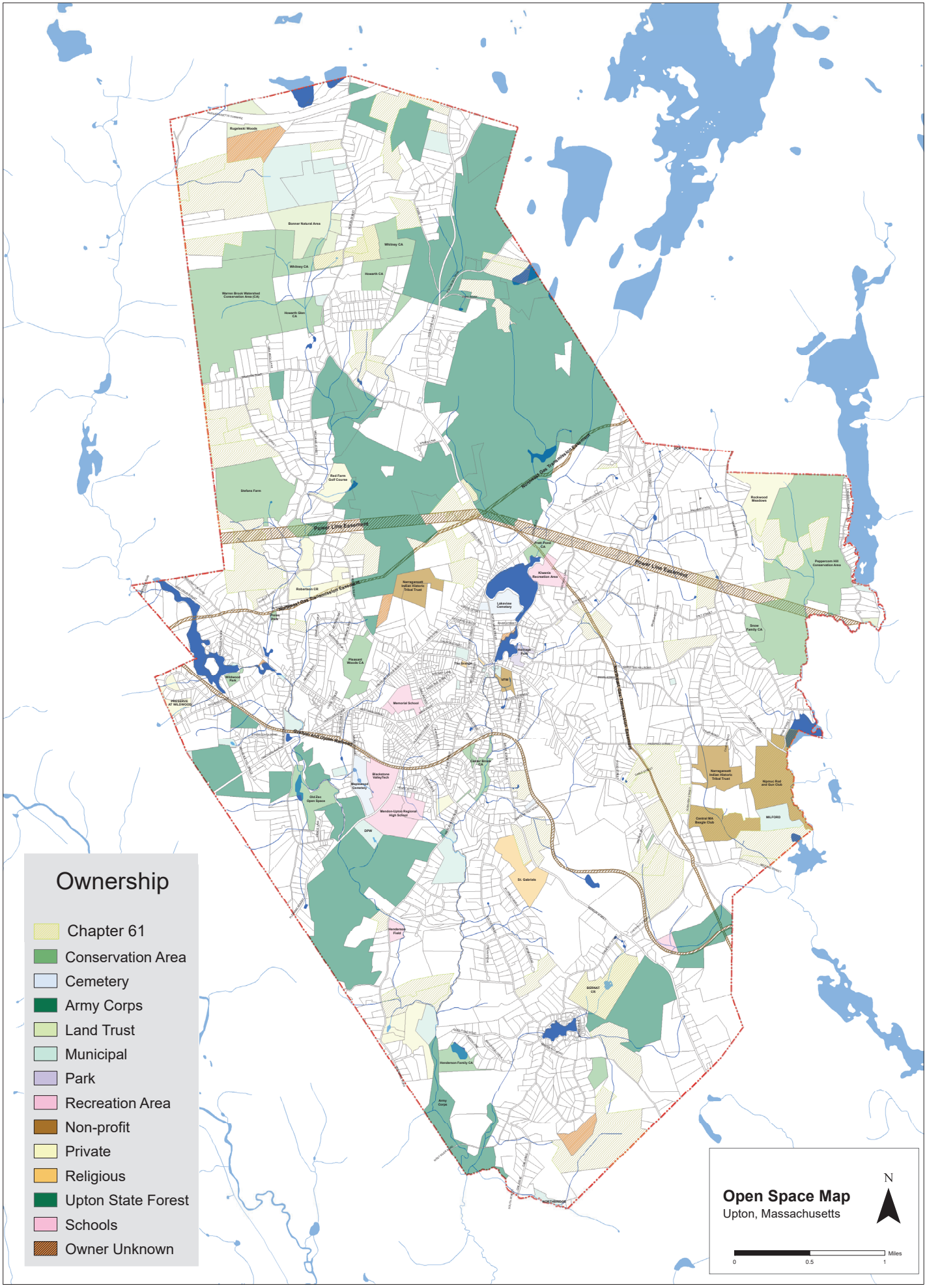
Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS.

Information depicted on this map is for planning purposes only. This information is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analysis. Use caution intrepreting positional accuracy.

CMRPC
Central Massachusetts Regional Planning Commission
One Mercantile Street, Suite 520 - Worcester, MA 01608

Municipal Vulnerability Preparedness (MVP) Workshop

Date: 12/30/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_ref_Zoning_11x17.mxd


Ownership
Chapter 61
Conservation Area
Cemetery
Army Corps
Land Trust
Municipal
Park
Recreation Area
Non-profit
Private
Religious
Upton State Forest
Schools
Owner Unknown
Open Space Map
Upton, Massachusetts
N
Miles
0
0.5
1
Prepared by: Upton Conservation Commission, May 2020

MATRIX

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Table 1

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	Drought	Wind Events	Flooding	Winter Storms	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
Railroad	Maple Ave	Grafton and Upton Railroad	V	Impacts on hazard materials, wildlife connections, runoff, traffic; Residents would appreciate transparency on activities being conducted at the depot, potential safety issues, and emergency response plans. Could materials being stored / plans be made publicly available? Evaluations on toxic chemicals. Regional collaborations(share informations, having conversations...) by towns with railroads. 495 partnership group? shared conservation agency with surrounding towns. Have environmentall-ooriented people talk to town managers. Opporunity with CMRPC. Ownership of parcels near railroads to be used as buffer?(if owned by the town?) How is the land managed by railroad company and federal agency? Raise awarness/ Education!					
Dams	Town-wide	Town, State							
Culverts - need to inventory	Grove Street	Town	V	A study on existing water infrastructure in Town. Study should also evaluate opportunities to create channels for animals to cross roadways safely.					
Vegetative Management (Utility ROW)									
Pavement Conditions - (DPW's Pavement Mgmt Plan)			V						
Sidewalks Conditions (seniors safety, winter clearing by residents)	Specifically Coach Road to the Plaza	Town	V	TIP project may addressing these. Public hearing action?					
Pedestrian Signage / Safety	Specifically crosswalk near Holy Angels	Town	V	TIP project may addressing these. Public hearing action?					
Water Tower	Warren St		V	Addressing on the past wind-related issues. Opportunity on taking advantage of fast wind speed at the Water Tower. Flood condition: better way to store rainwater around water tower (use MVP grant!) Looking into neighboring towns that have reseviors.					
Schools (proximity to the RR, may be potential shelter)		Town/School District							
Water System, pipeline conditions		Town		Public + private water supply, monitoring on aquafers. Effort on managing consumption. Make compost available again.Educating people on the cost of					
Wells	Shallow wells in some areas	Private		Public + private water supply, monitoring on aquafers. Effort on managing consumption. Make compost available again.Educating people on the cost of increasing water usage. (like signage.) Utilize MVP grant on demonstration garden. Town needs to monitor on well water quality regularly. Shallow wells that at greatest risks? Monitoror on well quality for minerals, aquafers... Potential vulneraility for doughts.					
Replacing and Lining Sewer									
Development Impact Study Requirements									
Solar farms	Grafton Street	Private							
Railroad	Hopedale Upton Line?								
Truck traffic (related to railroad development)	Hopedale line & 495								
Groundwater	Single Aquifer								
Civillian Conservation Corps (CCC) Building	Upton State Forest								
Emergency Management - Evacuation (Senior center for cooling, Town Hall for warming, school?)	Town-wide								
Rrecreation	Town-wide			Proactive outreach to landowners of large parcels / rec land					
Indoor recreational opportunities (school-gym, town hall-gym)									
Communication Bylaws for wireless (5G?)									
Development impact analysis for town	Town-wide			Town should evaluate existing development bylaws and permit review requirements and determine whetehr development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered. Should also evaluate exisiting provisions for open space development.					
Community Center (Planned)				Evaluation on Thermal Energy					
Clean Energy				Develop strategy on clean energy. Climate Action Plan? Cost-benefit analysis, feasibility analysis.					
Societal									
Senior living facilities - Milhouse Apartments	Coach Road	Private		Inventory on evacuation plan, resiliency assets (like AC for drought weather...) and plans on getting the lacking assets. Investigating the guidline gaps.					
55 plus communities		Private		Inventory on evacuation plan, resiliency assets (like AC for drought weather...) and plans on getting the lacking assets. Investigating the guidline gaps.					
Dispatch System*-action item?			S	Inventory on evacuation plan, resiliency assets (like AC for drought weather...) and plans on getting the lacking assets. Investigating the guidline gaps.					
Increased Insects - children unable to play outside after dark									
Wells - Residents with wells, refresh long tong time during dry season.									
Girl Scout, Eagle Scouts, students (involved with sustainable Upton, have some experience with water crossing projects)				School system is regional and we need to know if there is evacuation plans. Opportunity on creating curriculums for students interested in resiliency.					
Town Center Redevelopment (how could MVP tie into the existing plans)	Town Center								
Railroad Neighbors									
Students									

Community Resilience Building Risk Matrix

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Table 1

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	Drought	Wind Events	Flooding	Winter Storms	Priority H - M - L	Time Short Long Ongoing
Environmental									
Railroad (hazardous materials storage)	Mapel			Could materials being stored / plans be made publicly available on the Town site?					
Floodplain	Town Center			Town should incorporate green infrastructure into the redesign of Town center. Develop regulations like Floodplain overlay district, to target floodplain for preservation and conservation.					
Vegetative Management - Forest proximity to residents				Public outreach campaign on different plant species for fire prevention, and on how to address hazard trees in a way that preserves forest, but protects property.					
Wild Fires	Town-wide	Town, State, Private		Public outreach efforts to help residents understand the risk, suggest plants that might help with fire prevention, increase public awareness on behaviours that could cause fires.					
Rivers - Center Brook									
West River - flood storage									
Invasive Plants				Provide education on invasive species, utility line clearing practices, native species benefits, recommendations for mature plants that would not be so tall and require as much veg management. Best Planting Species Suggestions (town). Town reviews development bylaws to recommend native plantings					
Increased Vector-borne Illness	Red Maple Swamp / cattails near Station Street			Public education on the influence by mosquitos and ticks. Influence on outdoor activities. Reminders on changing species.					
Beaver Dams	Town-wide, specifically Southborough Road, Mechanic Street								
Kiwanis Beach	Kiwanis Beach Rd			Existing water quality report; Restoration efforts on Kiwanis Beach, look at other town's case as example. Goose Reduction Efforts!					
Kiwanis Beach (High bacteria levels-E.coli levels last summer)	Kiwanis Beach Rd								
Trail System	Town-wide		S	Constant maintenance for trails. Ongoing education on the benefits of open spaces in town.					
Conservation Lands	Town-wide		S	Ongoing education on the benefits of open spaces in town.					
Working Farms (Town line Diary Farm, Callies, fivefork Farms, community-support agricultural farm,long life farm)	Town-wide		S						
Pond Water Quality - Mill Pond, Pratt Pond, (private group on water quality**)	Town-wide								
Blackstone River Valley Watershed? Heritage Corridor? (Larger collaboration)									
Riverfronts				Inventory on the future influences by erosion and damages brought by Climate Change (rising river-level). Regional collaboration on river-related issues-Blackston Watershed.					
Stormwater Management Bylaw				Ongoing effort by CMRPC. Going through the bylaws now.					

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Upton Table 2

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

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

Features	Location	Ownership	V or S	Drought	Wind	Flood	Winter Storms	Priority H - M - L	Time S Long O
Infrastructural									
Dams	Town-wide (focus on 2 dams at center of town)	2 dams in center owned by town	S/V	inspect condition of dams					O
Upstream/Downstream Infrastructure	Town	n/a	V	Develop ability to mitigate flood and stream overflows.					L
2 Watertowers			V/S	support project to make watertowers able to fill to full capacity (only at 70% currently due to pressuring restraints) - no capital capacity to undertake this yet; incorporate into townwebsite ('Sustainable Upton' page);				H	S
Wastewater Treatment Plant	Maple Ave			LID applicability analysis; flood control around treatment plant (includes a crossing); flood storage; on top of wetland areas; limit overall vulnerability to natural hazards				M	O
Private wells/town wells				how to protect residents if wells and water resources fail; tie residents into a homogenous system?; stormwater/surplus water storage and education at all levels, townhall, etc.				M	O
Grafton-Upton Railroad	through-Town		V	travels through endangered species habitat and wetlands, by the wastewater treastment plant; come up with Coordinate system to tie railroads into local bylaws				L	L
Water pump stations	intersection of Hartford Ave. South and Glen Ave		V	located near 55+ housing developments; prioritizing I & I phases (Phase 3);					S/L
Wastewater pump locations									
Evacuation Routes	Route 140, etc.		V/S	maintain/develop Evacuation Plan;					
Culverts	Town-wide (specific: Church St/Warren St; North St)			Prioritization of Vulnerable/Poorly Designed Culverts (review applicability of other methods)					
Bridges	Grove Street								
Asbestos Cement Pipe (water distribution lines)	6 miles remaining amonst water lines		V	Replacement of water distribution lines that are vulnerable and sensitive to failure/damage					
INI (inflow-inflitration issues in wastewater)			V						
Communication/Education				"dead spots" solutions; encourage residents/business oweners to sign up to RAV Smart911					
Societal									
senior population	55+ communities (Upton Ridge - Hartford Ave South; another off East St; Mill House Apartments; a couple other developments in planning)			expand service to transport;					
Assisted Living Facilities	some related facilities in town								
Schools				include schools for expertise, education, help; school alerts system;					
Fire/Police stations									
Downtown Revitalization Plan			S	Support this plan					
DPW building		Town							
Town Hall									
Senior Center/Population				improve or expand upon transportation services; use as a source to understand where most vulnerable elderly are to communicate during emergency					
Communication/Education				community education to help residents understand what their role is and how to reach out to emergency servies/DPW during an natural emergency; develop ways to communicate needs during an emergency where phone and internet service are not active; neighbor-to-neighbor system					
Library									
private medical facilities									

cemetary			V	protect plots and future plots from flood events		
shelter resources or heat/dry assistance	n/a - potentially schools		V	ID shelters or develop these services		
Environmental						
Floodplains/openspace/wetlands	Town-Wide	DCR/Local Involvement/Private	V/S	restoration/protection; expand open space inventory and other purchasing methods; sustain forested area; refine language Open Space Central Design Provision bylaws; protect Upton State Forest; look into expanding food/farming resources in cases of geographic disaster		
Kelly Property	Peppercorn Hill	private (SVT oversight for conservation)				
5 Fork Farm (or Sweet William Farm in past)	off of North ST	private (SVT oversight for conservation)	V			
Rec Facility	by Pratt Farm		V			
Water Bodies and quality	Lake Wildwood; Taft; Pratt "great" pond/ Kiwanis Beach		V/S	beach BMP to protect vs. stormwater; develop 'bluespace' committee; inventory of pollution and other waste running down-stream and affecting town beach		
Invasive Plants		n/a	V			
Communication/Education						
stormwater mgmt				refine stormwater bylaws to be more robust; work w/ CMRPC?		
agriculture				Locally Grown Initiative;		
Tree Management	n/a	n/a	V	come up with system or capacity to identify and manage or repalce trees vulnerable to falling on electric lines and telephone poles; develop method to replace these trees elsewhere to maintain biodiversity and not have ability to destroy essential infrastructure; beaver control methods; create a buffer zone and assess bylaws (i.e. not developing in high-wind vulnerability area); improve permits to protect trees	H	

Community Resilience Building Risk Matrix

www.Commu

Table 3

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.)

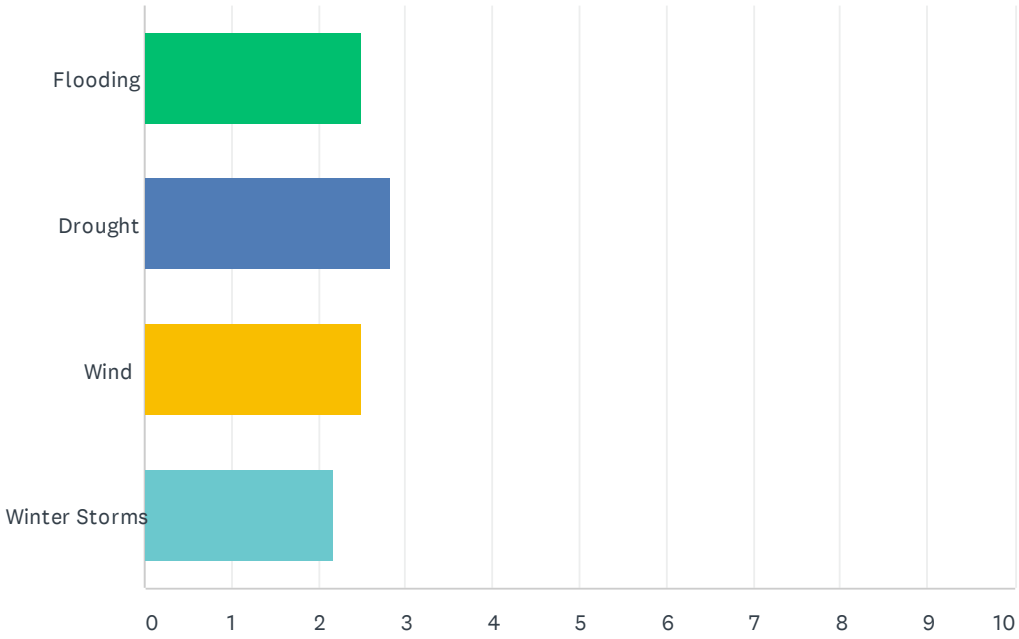
Features	Location	Ownership	V or S	Drought/Fire/Extreme Heat	Wind Events	Flooding	Winter Storms/Extreme Cold	Priority	Time
								H - M - L	Short Long Ongoing
Infrastructural									
Dams - 1 High Hazard and 2 significant hazard, Wildwood Dam. Berms, Southborough Rd. Bogs. In bad shape.	Lake Maspeno, Mill River. Fiskemill Pond, Gristmill Pond, West River	Town of Hopkinton, Town, State	V	Dams in most need of attention are Gristmill and Taft Mill. Taft Mill is capital project. Gristmill needs upgrades or replacement (needs to be assessed). Mill Pond is most eutrophic, either needs to be dredged or remove dam and return to stream. Both possibilities would need to be assessed with engineering study. Southborough Rd. bogs - Need DCR to rebuild berms. Important wildlife habitat there. Possibility to partner with state on this? Or CPA project.					
Culverts - causing erosion, need to inventory and assess	Church Street, Hartford Ave S., by Taft Mill Pond, Glenn Ave and Pleasant St., Station St.	Town	V	Heritage Park Culvert - Replace with open culvert. Now a raised pipe. Town wide inventory needed. Perched culvert on West River road. Westborough Rd and Southborough Rd - culvert that gets clogged. Beaver activity, flooding. Add green infrastructure in town center locations such as bioswales to help control flooding. Possible permeable paving in VFW parking lot. Flooding in West Upton and along 140 that would benefit from natural stormwater management.					
School Buildings - ES Possibly could be used as shelter		Town	S/V	Memorial Elementary has AC in cafeteria but no generator. Nipmuc Regional High School has AC in auditorium and generator. Blackstone Valley Tech. has a kitchen and generator, and could possibly be used a shelter. Both HS in railroad isolation zone.					
Grafton Upton Railroad	25 Maple Ave	Grafton and Upton RR	V	Transport of Liquid Hazards. Increase in traffic and risk of derailment as become more active. Sparking hazard. Railroad right of way management necessary. Hazard of non-guarded crossing - needs to be improved. Aquifer risk - abutting railroad. Establish coalition with other towns railroad runs through. Already collaboration on fire safety.					
Senior Housing - Millhouse Apts, 100+ units, COA located there but may move	Main Street	P - Harbor Mngmt	V	No generator, vulnerable to losing power. No AC.					
Housing Authority - 48 units, old facility	Hartford Ave N.	State	V	No generator, vulnerable to losing power					
Group Homes									
Over 55 Housing	Various	Private	S	New, in good shape					
Future Community Center and Library	Town Center	Town	S	Design for resiliency, energy efficiency. Install geothermal energy? Possibly solar? Rainwater collection system? Community Center could be used as an emergency shelter/cooling center. Possibly add raingardens, bioswales, permeable paving.					
Solar Energy on Rooftops - Add more to Town buildings				Go after on DPW building.					
Town Water - Add along 140 and other targeted areas to allow more dense devlpt									
Town Sewer - Add along 140 to allow more dense devlpt									
Town Drinking Water	Shallow wells along West River, Single Aquifer		S/V	Vulnerability to depend on one source? Environmental concern of overuse of West River water, some water quality concerns					
Private Wells			V	Vulnerable to drought. Encourage use of rainbarrels					
Sewer and Septic Systems - majority of town septic (80%)	Town wide		V	Large amount of private septic - water contamination issues					
Downtown Area				Add more green infrastructure to manage stormwater					
Societal									
Seniors, Aging Popluation			S/V	Need for more senior housing, especially for lower income seniors. CPA funds available for affordable housing. The funds have not been spent for that purpose yet. Good communication from COA to senior population.					
Cemeteries - more space needed, Historical			S/V	Plan in works for Town taking over Maplewood Cemetery which will provide a lot more space for plots. Possible spot on Westborough Rd for another cemetery.					
Downtown- National Historic District			S	Could get into national historic district tax credit program. Possibility of getting the mill and mill housing a separate designation. CCC camp is also an historic district. Ceremonial stone landscape is a discontinuous historic district. Many historic homes on Elm Street and Main Street. Preservation bylaw is also a strength.					
Farms/Agriculture. Five Forks Farm, Long Life Farm, Community Harvest Farm, Kelly's Farm and Town Line Dairy	Various locations	Private	S/V	Existing farms are a strength. Most are protected land. Long Life Farm is not. Challenging for farmers to get access to land. Increased demand for local food. Community Harvest Farm is a good example of using conservation land for community purpose. Stefan's Farm could be used in this way in Upton - could reach out to land trusts to partner with to turn into community farm.					
Affordable Housing - Need for more			V	Need for more affordable housing in general in the town. Still at only 6.35%. CPA funds available for affordable housing. The funds have not been spent for that purpose yet. Westborough Rd parcel would be a good site for affordable housing. Would help if affordable housing committee would be more active. Try to incorporate into other housing, mixed use development.					
Community Garden	Mechanic Street	Conservation Comm	S	Install Resilient water system - drill well and add solar irrigation and pump, rather than connecting to town water. Add more rainwater collection. Increase number of plots- there is a lot of interest. Once there is a connected water source could support more gardeners especially seniors. Could add another community garden in Town if necessary.					
Council on Aging, including food pantry		Town	S	If Community Center is built the COA will be located there, and that would expand their resources.					
Food Pantries run by churches St Gabriel, United Parish		Private	S	Well funded and well supplied.					
Boy and Girl Scouts			S	Involved with town projects such as with open space and with churches.					

Blackstone Valley Tech			S	Police normally use space there for recreation nights, and there is a restaurant the students run. Occasionally do projects for Town for small cost. Have students there from 13 towns so that brings in economic activity. Have a lot of resources that could be utilized in an emergency. Running track is very popular.		
Friends of Upton State Forest			S	Very active group, many public programs including for children. Work with state on removing downed trees.		
Baystate Trail Riders			S	Do a lot of trail mainenance for horseback riding.		
Running organizations			S	Run a lot of 5ks.		
Regional Land Trusts - Metacomet, Sudbury Valley Trustees			S	Partner on open space projects. Provide professional staff (SVT mostly).		
Narragansett Indian Tribal Historic Preservation Trust			S/V	Strength, but vulnerable from trees downed on land and from development destroying sites. Preserving open space in Town. Own 100 acres total.		
Upton Garden Club			S	Not currently very active.		
Nipmuc Rod and Gun Club			S	Own over 100 acres of land. In Chapter 61, not permanently protected.		
Fire and EMS Association			S	Non Profit that does community organizing, fundraisers.		
Upton VFW			S	Located downtown. Hold community events. Work with scouts, own little league fields.		
Bloomer Girls			S	Organization that raises funds, helps low income residents. Food distribution, other aid.		
Upton Mens Club			S	Take care of plantings in town center, took over from garden club. Also charitable org.		
Environmental						
Wetlands			S/V	There is a wetlands protection bylaw that applies to structures built after 2004. This and state regs are pretty effective in protecting wetlands.		
West River			S/V	Vulnerable to possible contamination from nearby railroad. Also vulnerable in case of drought. All municipal wells draw from this source and could be overused.		
Pratt Pond and Kiwanis Beach		Town	S/V	Water quality concerns, blue green algae, non-point source/internal pollution? Need to look at water quality, form a blue team or blue spaces committee. There is weed control every few years.		
Conservation Land and Open Space, A lot of protected land	Town Wide		S	About 800 acres of protected land. Open Space plan identifies other areas to target for land protection. Possible need to make more open space accessible to the public with trails and other recreation. There are many trails already with parking and kiosks. Small green spaces are important in denser neighborhoods that people can walk to, and should protect more areas in southern part of town and/or improve them, provide more recreational opportunities. Miscoe Hill is an open space in the southern part of Town that could be preserved.		
Ponds	Town wide		S/V	Eutrophication is an issue. Aquatic weed control is necessary. Constant management issue and need to ensure funding. Important to have as part of operating budget. Geese are a problem at the Pratt Pond and Town Beach.		
Narragansett Indian Tribal Historic Preservation Trust			S/V	Strength, but vulnerable from trees downed on land and from development destroying sites. Preserving open space in Town. Own 100 acres total.		
Stephans Farm Open Space			S	Could be used for agriculture		
Upton State Forest		State	S/V	2400 acres? Resource Mngmt Plan coming out, Upton State Forest.There are parcels all over town. Downside is lack of tax revenue from land.		
forests townwide - wildfire concen	Town wide	Most private	V	In top 10% in state for homes being at risk for fire. Not a lot of understanding of fire risk and best practices. Make education part of community risk reduction program. Should focus development away from forested areas.		
Street Trees	Town Wide		S/V	No utility cutting, Town needs an independent tree warden to manage town trees. Form a street tree committee, more tree planting. Currently very reactive, deal with isues as they arise. Make the program more proactive, have regular trimming. Make sure new trees planted in new developments are climate resilient. Drought resistant, pollinator species.		
Invasive species, gypsy moths - affect trees	Town Wide		V	More tree mngmt needed		
Soil	Town Wide		S/V	Topsoil lost during storms. Increase amount of organic matter in soil. Bylaw about soil removal.		
Pesticide Use for Insects/ Mosquitoes						
Fish - Pickerel, Shad, Alewife, Eel	Rivers, Ponds			Decline in fish populations. Restoring anadromous fish to Blackstone River. Dam removal possible. Would need to be multi town effort. Culvert improvement. Heritage Park Culvert		
Protect cold and cool water streams	Warren Brook, Mill River Tribs.			Conservation Commission has program to monitor stream temperature.		
Beaver activity						
Trail Building - Civilian Conservation Corps						

SURVEY RESULTS

Q1 Please rank the following hazards in order from most concern (1) to least concern (4):

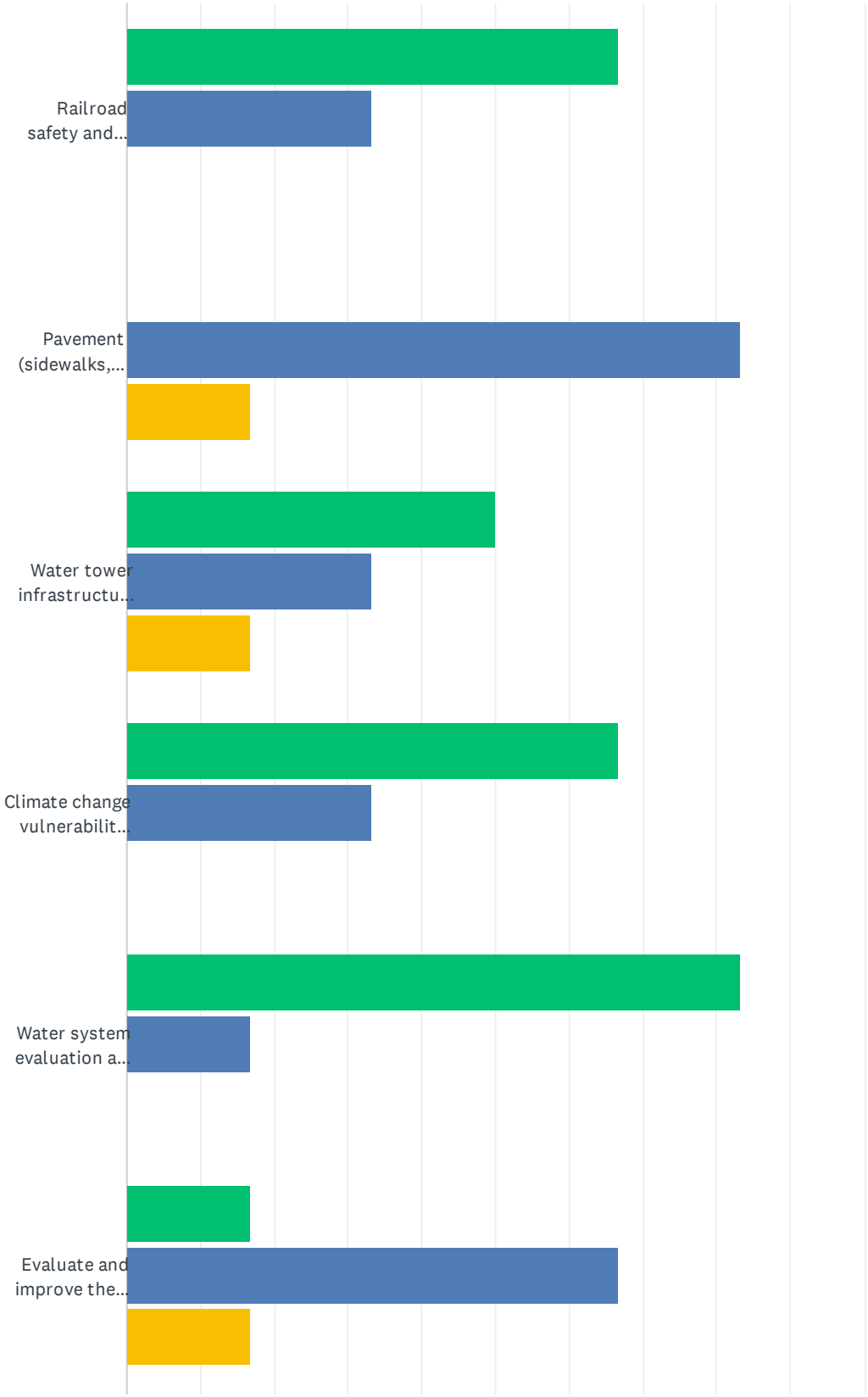
Answered: 6 Skipped: 0

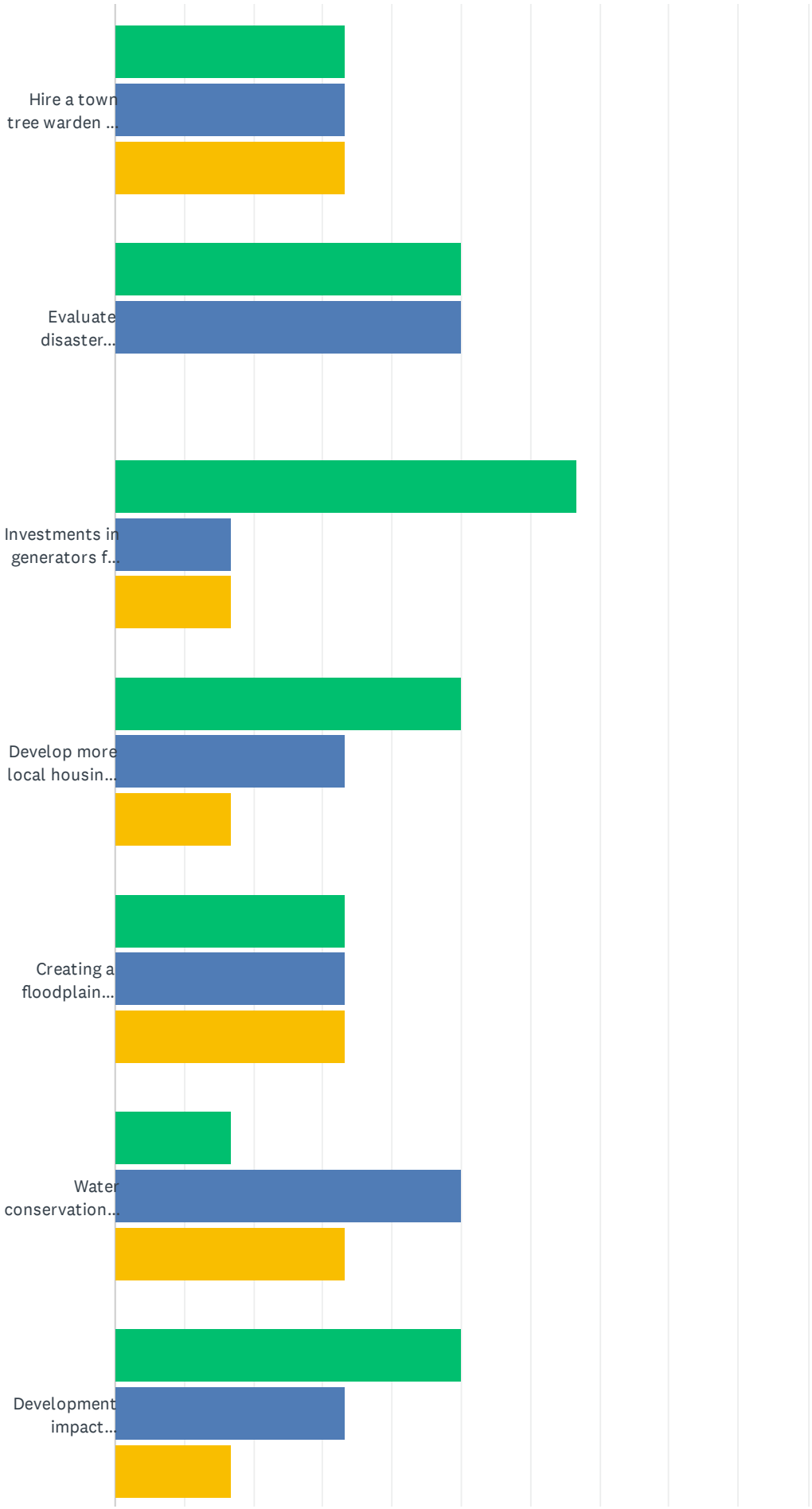


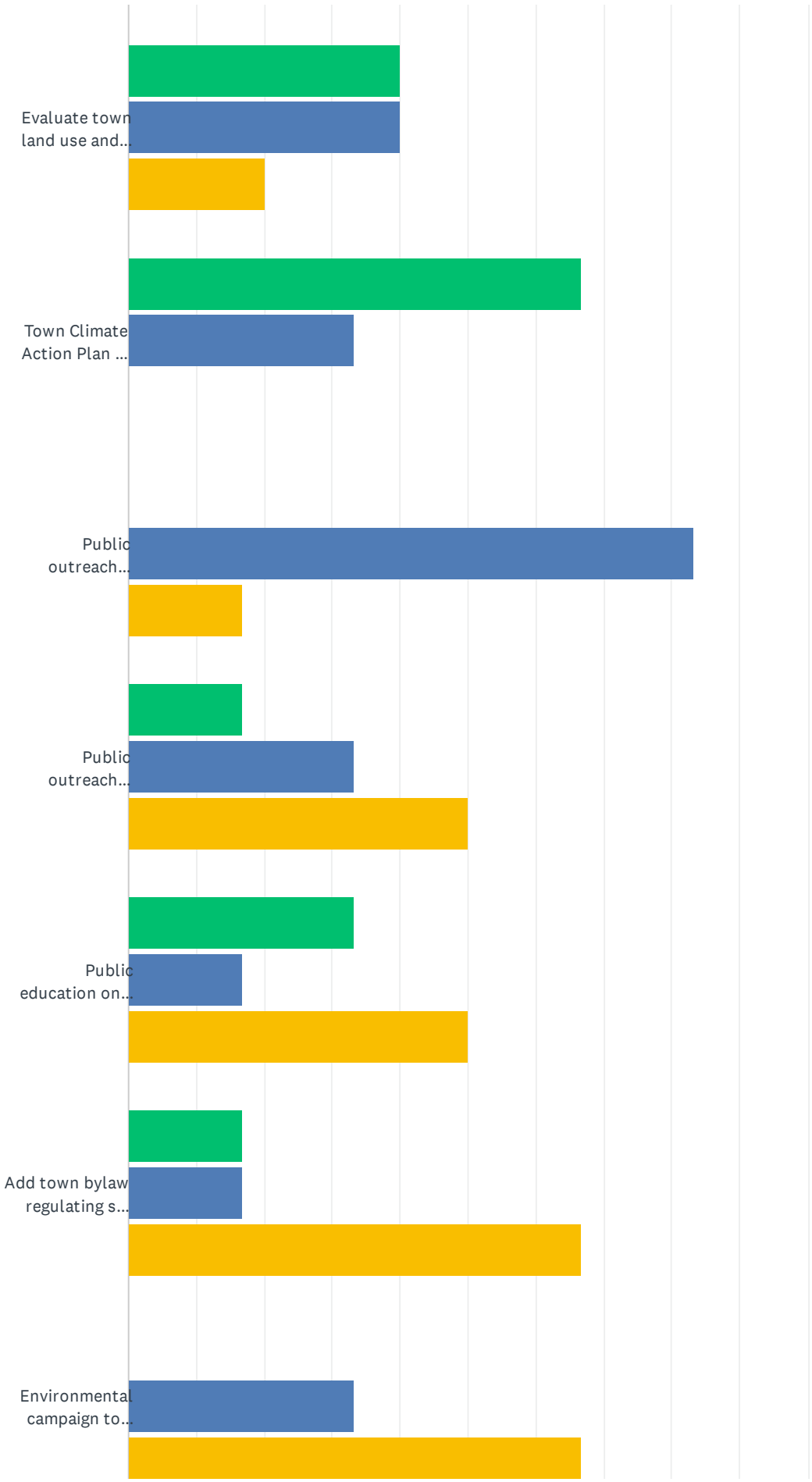
	1	2	3	4	TOTAL	SCORE
Flooding	16.67% 1	50.00% 3	0.00% 0	33.33% 2	6	2.50
Drought	50.00% 3	0.00% 0	33.33% 2	16.67% 1	6	2.83
Wind	16.67% 1	33.33% 2	33.33% 2	16.67% 1	6	2.50
Winter Storms	16.67% 1	16.67% 1	33.33% 2	33.33% 2	6	2.17

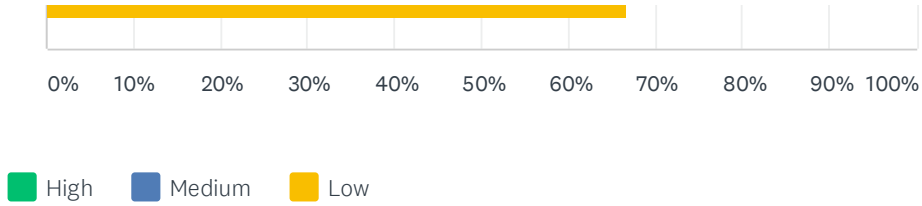
Q2 Please vote on whether the following actions should be High, Medium, or Low priorities for the town.

Answered: 6 Skipped: 0




Hire a town tree warden ...
Evaluate disaster...
Investments in generators f...
Develop more local housin...
Creating a floodplain...
Water conservation...
Development impact...

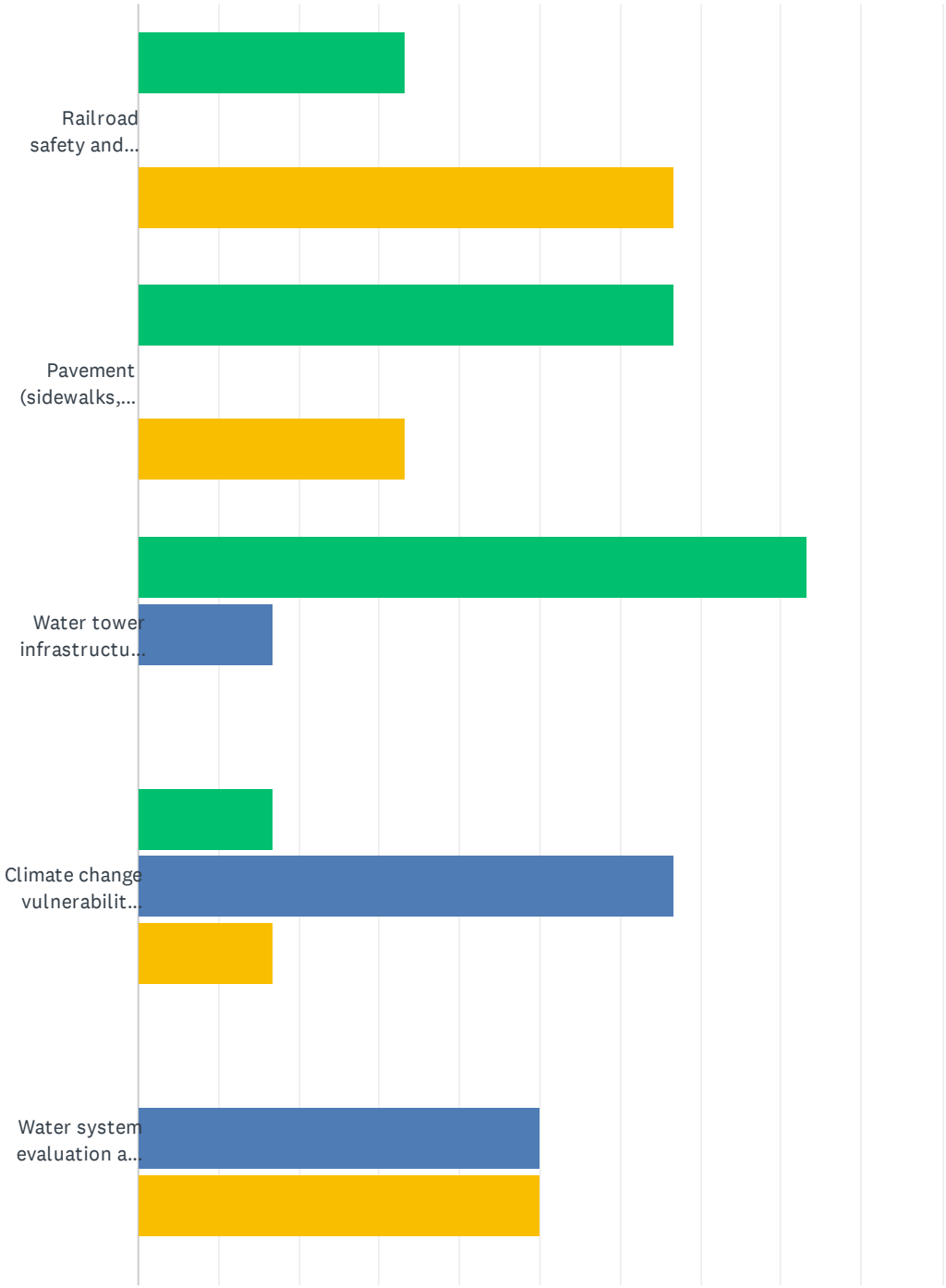

Evaluate town land use and...
Town Climate Action Plan ...
Public outreach...
Public outreach...
Public education on...
Add town bylaw regulating s...
Environmental campaign to...

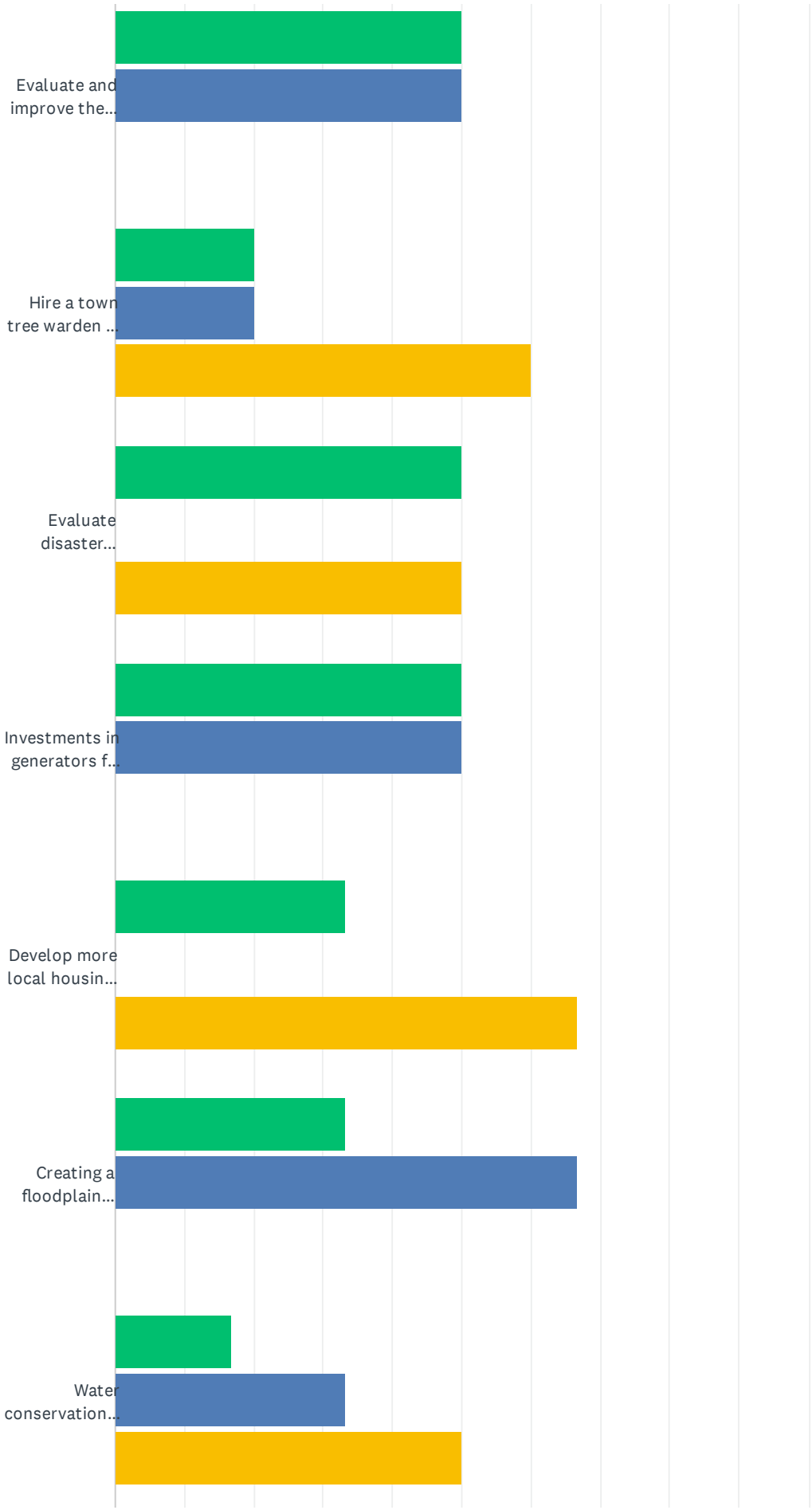

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
High
Medium
Low

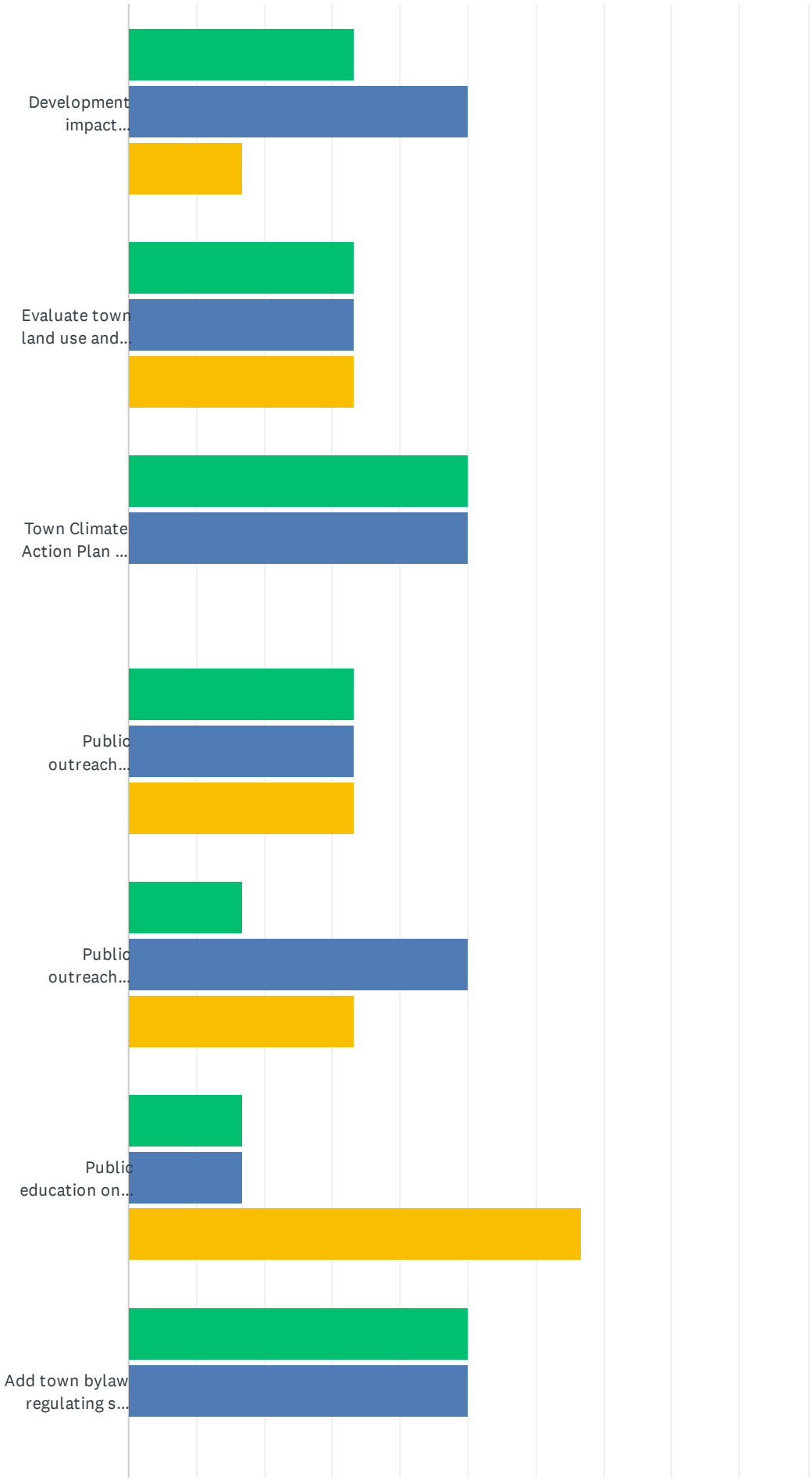
	HIGH	MEDIUM	LOW	TOTAL
Railroad safety and emergency response planning.	66.67% 4	33.33% 2	0.00% 0	6
Pavement (sidewalks, roadways) conditions assessment.	0.00% 0	83.33% 5	16.67% 1	6
Water tower infrastructure improvements including to address wind speed vulnerability AND/OR to allow towers to fill to capacity.	50.00% 3	33.33% 2	16.67% 1	6
Climate change vulnerability assessment focused on water infrastructure and flooding (culverts, dams, bridges, storm water drainage, etc.) AND/OR stream overflow and localized flooding mitigation using nature-based solutions.	66.67% 4	33.33% 2	0.00% 0	6
Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds.	83.33% 5	16.67% 1	0.00% 0	6
Evaluate and improve the resiliency of wastewater treatment plant to climate hazards.	16.67% 1	66.67% 4	16.67% 1	6
Hire a town tree warden to manage trees on town property and conduct proactive trimming.	33.33% 2	33.33% 2	33.33% 2	6
Evaluate disaster response plans, evacuation routes and public communication strategies; AND/OR include groups like schools and senior centers in disaster mitigation planning process; AND/OR develop capacity of the existing neighbor-to-neighbor program.	50.00% 3	50.00% 3	0.00% 0	6
Investments in generators for emergency shelters, public housing AND/OR senior housing.	66.67% 4	16.67% 1	16.67% 1	6
Develop more local housing for low-income households and low-income seniors.	50.00% 3	33.33% 2	16.67% 1	6
Creating a floodplain overlay district to regulate new development in current and future floodplains AND/OR watershed regional collaboration on flood management.	33.33% 2	33.33% 2	33.33% 2	6
Water conservation public engagement including usage and drought prevention education campaign AND/OR a water conservation demonstration garden.	16.67% 1	50.00% 3	33.33% 2	6
Development impact analysis, which includes evaluating existing development bylaws and permit review requirements, evaluating existing provisions for open space development, and determining whether development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered in the context of climate change.	50.00% 3	33.33% 2	16.67% 1	6
Evaluate town land use and plan to preserve additional open space, wetlands, and agricultural land AND/OR recreational land planning, conservation and outreach to landowners AND/OR develop opportunities for local agriculture and community farming on conservation land.	40.00% 2	40.00% 2	20.00% 1	5
Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings).	66.67% 4	33.33% 2	0.00% 0	6
Public outreach campaign to educate residents on tree management for fire prevention and climate resilience.	0.00% 0	83.33% 5	16.67% 1	6
Public outreach campaign to educate residents on invasive plant species; AND/OR review town bylaws to recommend native species planting; AND/OR develop regulations that maintain town tree count but controls tree growth in hazardous areas near infrastructure.	16.67% 1	33.33% 2	50.00% 3	6
Public education on vector-borne diseases and prevention.	33.33% 2	16.67% 1	50.00% 3	6
Add town bylaw regulating soil removal.	16.67% 1	16.67% 1	66.67% 4	6
Environmental campaign to restore native fish populations in town and across watershed.	0.00% 0	33.33% 2	66.67% 4	6

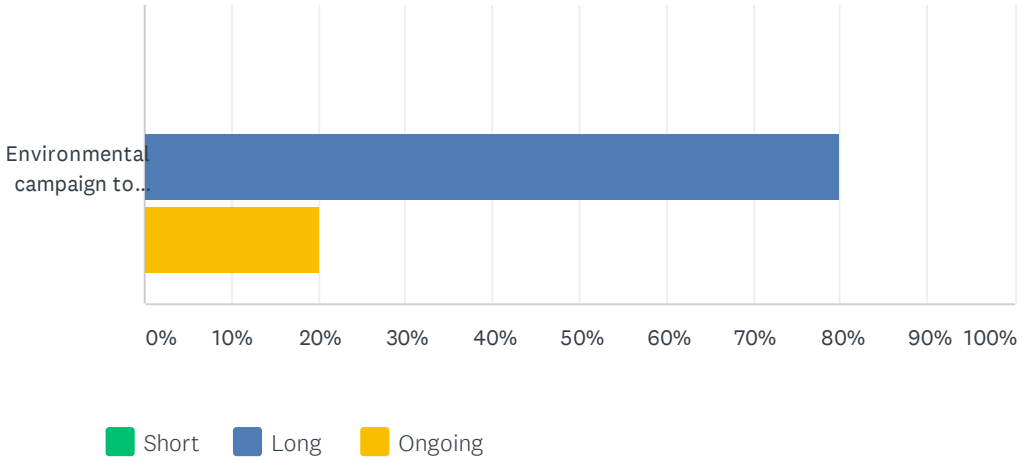
Q3 Please vote on whether the following actions are Short, Long, or Ongoing projects. Short-term projects are straightforward and can be completed within two years. Long-term projects take a longer time to complete, may require initial studies or public engagement strategies, and tend to be more complex. Ongoing projects are never truly completed. They require continuous action from year to year in order to maintain resilience.

Answered: 6 Skipped: 0




Evaluate and improve the...
Hire a town tree warden ...
Evaluate disaster...
Investments in generators f...
Develop more local housin...
Creating a floodplain...
Water conservation...

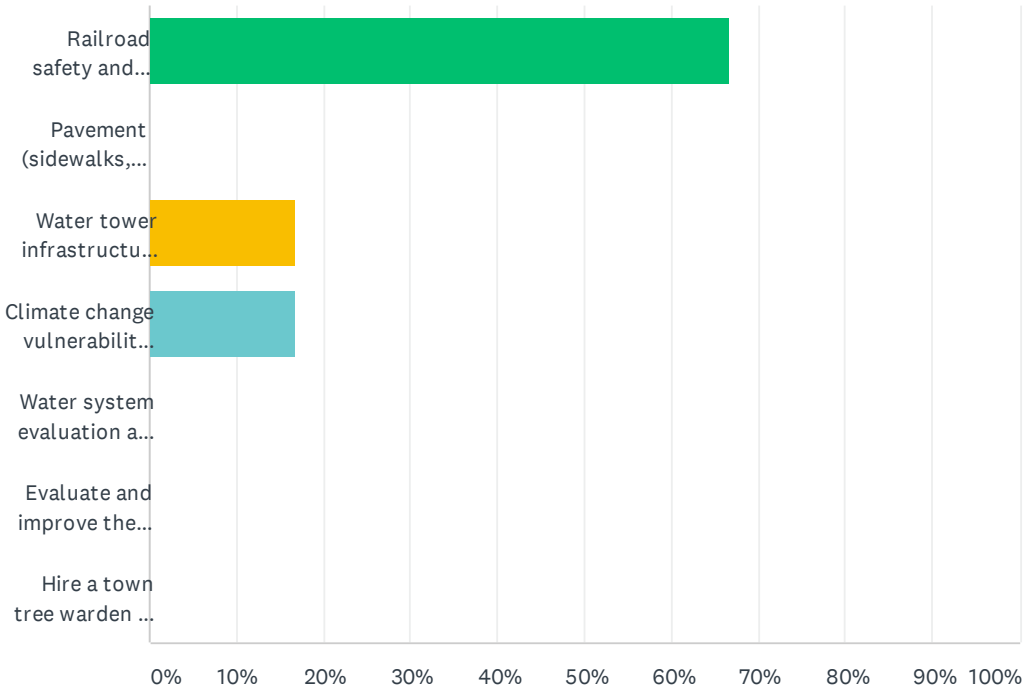

Development impact...
Evaluate town land use and...
Town Climate Action Plan ...
Public outreach...
Public outreach...
Public education on...
Add town bylaw regulating s...


Environmental campaign to...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Short
Long
Ongoing

	SHORT	LONG	ONGOING	TOTAL
Railroad safety and emergency response planning.	33.33% 2	0.00% 0	66.67% 4	6
Pavement (sidewalks, roadways) conditions assessment.	66.67% 4	0.00% 0	33.33% 2	6
Water tower infrastructure improvements including to address wind speed vulnerability AND/OR to allow towers to fill to capacity.	83.33% 5	16.67% 1	0.00% 0	6
Climate change vulnerability assessment focused on water infrastructure and flooding (culverts, dams, bridges, storm water drainage, etc.) AND/OR stream overflow and localized flooding mitigation using nature-based solutions.	16.67% 1	66.67% 4	16.67% 1	6
Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds.	0.00% 0	50.00% 3	50.00% 3	6
Evaluate and improve the resiliency of wastewater treatment plant to climate hazards.	50.00% 3	50.00% 3	0.00% 0	6
Hire a town tree warden to manage trees on town property and conduct proactive trimming.	20.00% 1	20.00% 1	60.00% 3	5
Evaluate disaster response plans, evacuation routes and public communication strategies; AND/OR include groups like schools and senior centers in disaster mitigation planning process; AND/OR develop capacity of the existing neighbor-to-neighbor program.	50.00% 3	0.00% 0	50.00% 3	6
Investments in generators for emergency shelters, public housing AND/OR senior housing.	50.00% 3	50.00% 3	0.00% 0	6
Develop more local housing for low-income households and low-income seniors.	33.33% 2	0.00% 0	66.67% 4	6
Creating a floodplain overlay district to regulate new development in current and future floodplains AND/OR watershed regional collaboration on flood management.	33.33% 2	66.67% 4	0.00% 0	6
Water conservation public engagement including usage and drought prevention education campaign AND/OR a water conservation demonstration garden.	16.67% 1	33.33% 2	50.00% 3	6
Development impact analysis, which includes evaluating existing development bylaws and permit review requirements, evaluating existing provisions for open space development, and determining whether development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered in the context of climate change.	33.33% 2	50.00% 3	16.67% 1	6
Evaluate town land use and plan to preserve additional open space, wetlands, and agricultural land AND/OR recreational land planning, conservation and outreach to landowners AND/OR develop opportunities for local agriculture and community farming on conservation land.	33.33% 2	33.33% 2	33.33% 2	6
Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings).	50.00% 3	50.00% 3	0.00% 0	6
Public outreach campaign to educate residents on tree management for fire prevention and climate resilience.	33.33% 2	33.33% 2	33.33% 2	6
Public outreach campaign to educate residents on invasive plant species; AND/OR review town bylaws to recommend native species planting; AND/OR develop regulations that maintain town tree count but controls tree growth in hazardous areas near infrastructure.	16.67% 1	50.00% 3	33.33% 2	6
Public education on vector-borne diseases and prevention.	16.67% 1	16.67% 1	66.67% 4	6
Add town bylaw regulating soil removal.	50.00% 2	50.00% 2	0.00% 0	4
Environmental campaign to restore native fish populations in town and across watershed.	0.00% 0	80.00% 4	20.00% 1	5

Q4 Please vote for what you believe is the top priority INFRASTRUCTURAL action from the list below.

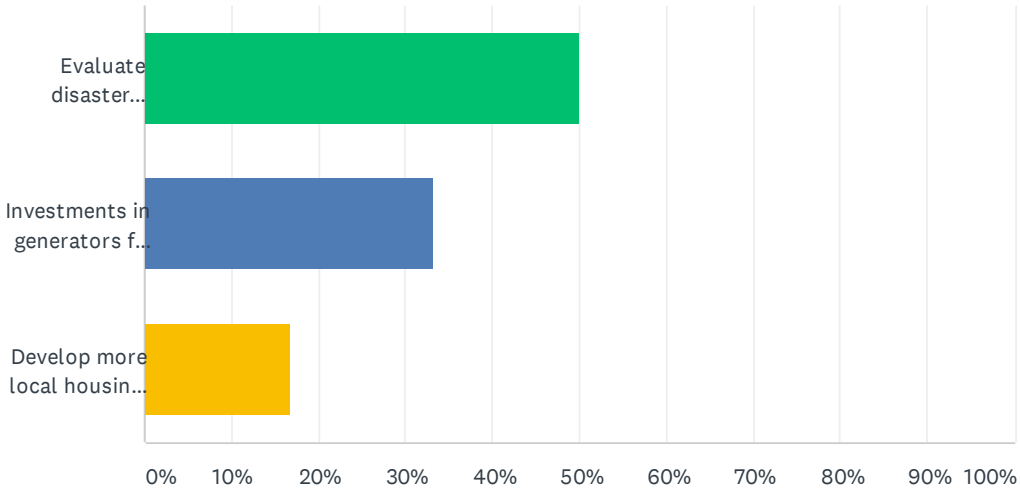
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Railroad safety and emergency response planning.	66.67%	4
Pavement (sidewalks, roadways) conditions assessment.	0.00%	0
Water tower infrastructure improvements including to address wind speed vulnerability AND/OR to allow towers to fill to capacity.	16.67%	1
Climate change vulnerability assessment focused on water infrastructure and flooding (culverts, dams, bridges, storm water drainage, etc.) AND/OR stream overflow and localized flooding mitigation using nature-based solutions.	16.67%	1
Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds.	0.00%	0
Evaluate and improve the resiliency of wastewater treatment plant to climate hazards.	0.00%	0
Hire a town tree warden to manage trees on town property and conduct proactive trimming.	0.00%	0
TOTAL		6

Q5 Please vote for what you believe is the top priority SOCIETAL action from the list below:

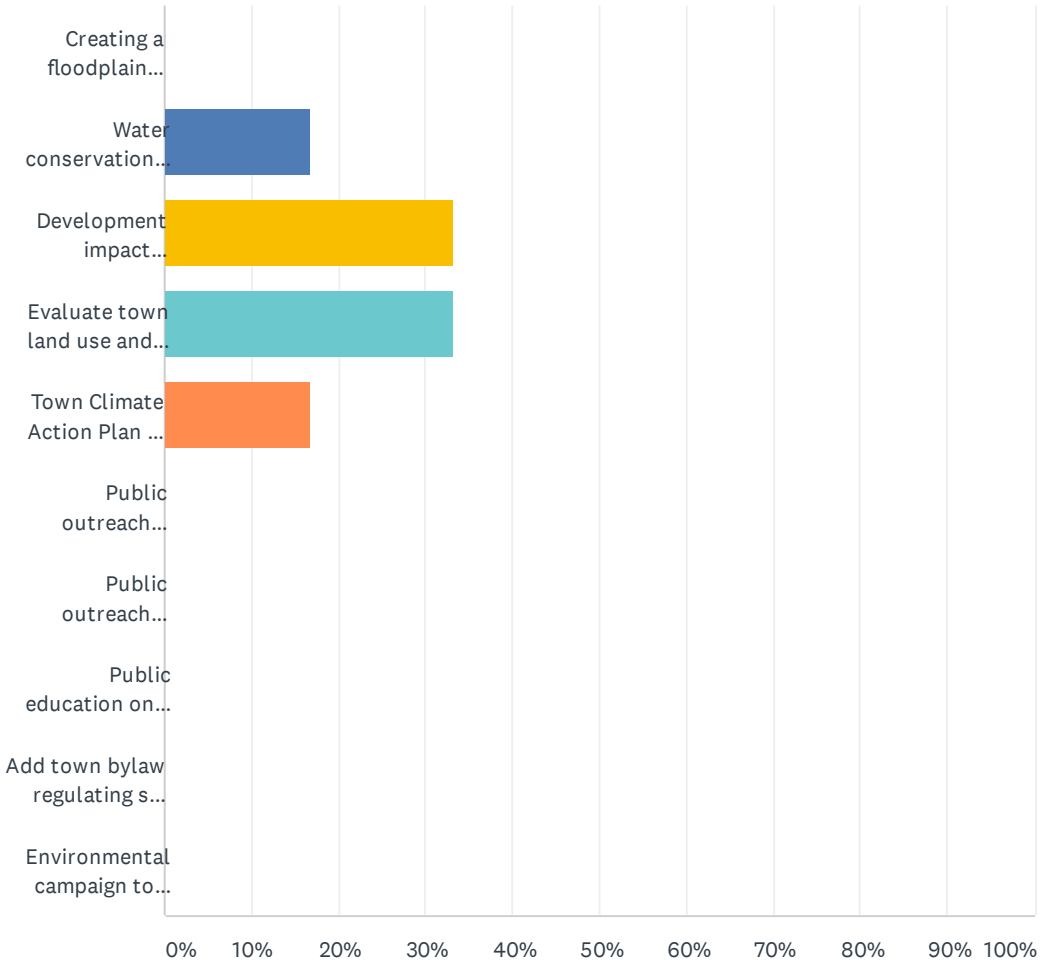
Answered: 6 Skipped: 0



ANSWER CHOICES	RESPONSES	
Evaluate disaster response plans, evacuation routes and public communication strategies; AND/OR include groups like schools and senior centers in disaster mitigation planning process; AND/OR develop capacity of the existing neighbor-to-neighbor program.	50.00%	3
Investments in generators for emergency shelters, public housing AND/OR senior housing.	33.33%	2
Develop more local housing for low-income households and low-income seniors.	16.67%	1
TOTAL		6

Q6 Please vote for what you believe is the top priority ENVIRONMENTAL action from the list below:

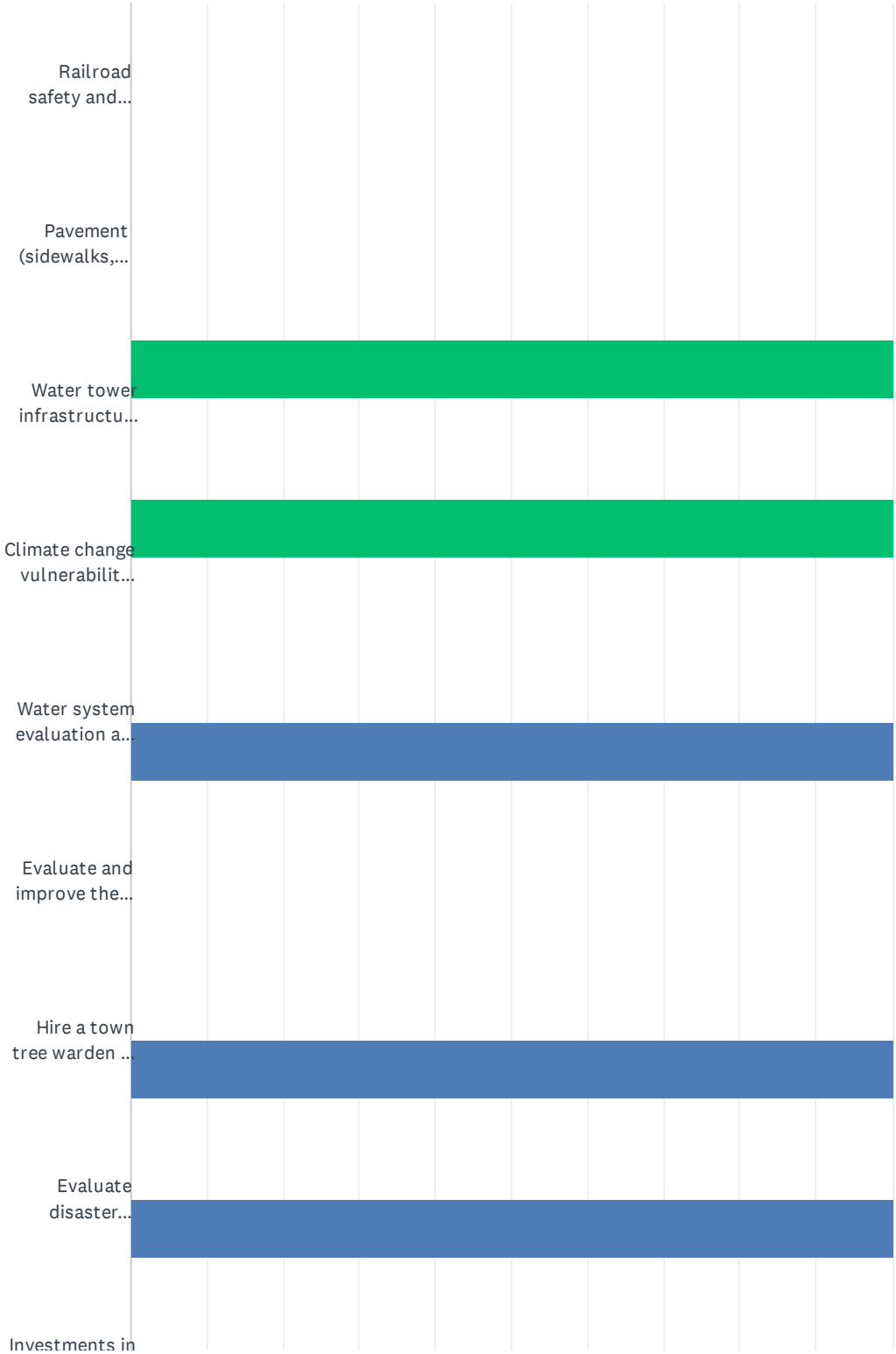
Answered: 6 Skipped: 0

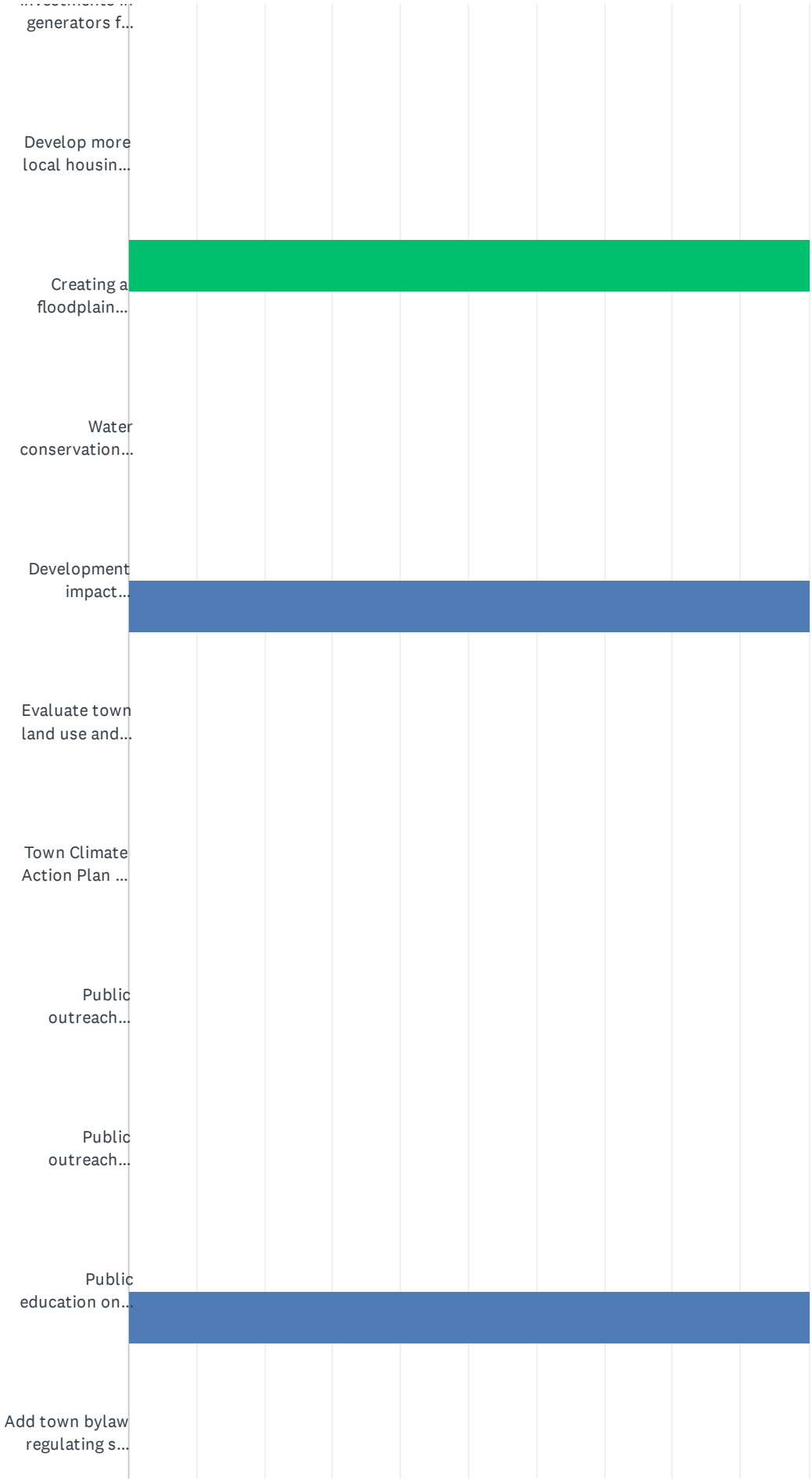


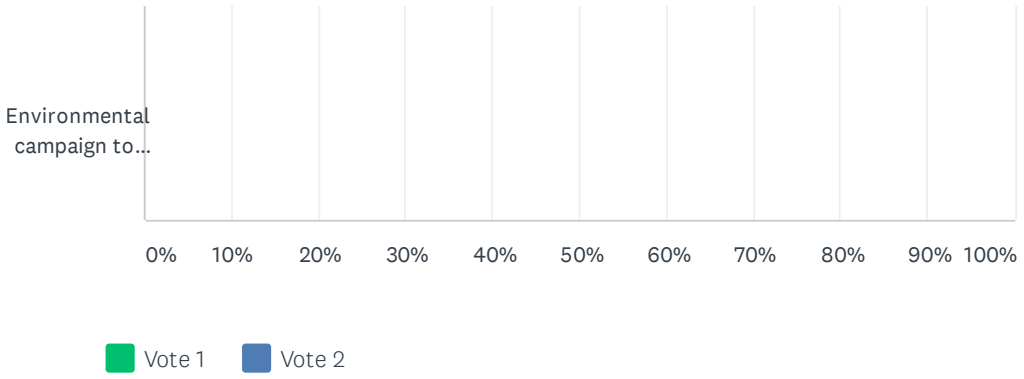
ANSWER CHOICES	RESPONSES	
Creating a floodplain overlay district to regulate new development in current and future floodplains AND/OR watershed regional collaboration on flood management.	0.00%	0
Water conservation public engagement including usage and drought prevention education campaign AND/OR a water conservation demonstration garden.	16.67%	1
Development impact analysis, which includes evaluating existing development bylaws and permit review requirements, evaluating existing provisions for open space development, and determining whether development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered in the context of climate change.	33.33%	2
Evaluate town land use and plan to preserve additional open space, wetlands, and agricultural land AND/OR recreational land planning, conservation and outreach to landowners AND/OR develop opportunities for local agriculture and community farming on conservation land.	33.33%	2
Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings).	16.67%	1
Public outreach campaign to educate residents on tree management for fire prevention and climate resilience.	0.00%	0
Public outreach campaign to educate residents on invasive plant species; AND/OR review town bylaws to recommend native species planting; AND/OR develop regulations that maintain town tree count but controls tree growth in hazardous areas near infrastructure.	0.00%	0
Public education on vector-borne diseases and prevention.	0.00%	0
Add town bylaw regulating soil removal.	0.00%	0
Environmental campaign to restore native fish populations in town and across watershed.	0.00%	0
TOTAL		6

Q7 Please vote for TWO additional top priority actions that you believe Upton should complete in order to build resilience. You may select actions from any category (Infrastructural, Societal, and Environmental), but do not select any actions that you already selected in the previous questions.

Answered: 6 Skipped: 0




generators f...
Develop more local housin...
Creating a floodplain...
Water conservation...
Development impact...
Evaluate town land use and...
Town Climate Action Plan ...
Public outreach...
Public outreach...
Public education on...
Add town bylaw regulating s...


Environmental campaign to...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Vote 1
Vote 2

	VOTE 1	VOTE 2	TOTAL	WEIGHTED AVERAGE
Railroad safety and emergency response planning.	0.00% 0	0.00% 0	0	0.00
Pavement (sidewalks, roadways) conditions assessment.	0.00% 0	0.00% 0	0	0.00
Water tower infrastructure improvements including to address wind speed vulnerability AND/OR to allow towers to fill to capacity.	100.00% 2	0.00% 0	2	1.00
Climate change vulnerability assessment focused on water infrastructure and flooding (culverts, dams, bridges, storm water drainage, etc.) AND/OR stream overflow and localized flooding mitigation using nature-based solutions.	100.00% 3	0.00% 0	3	1.00
Water system evaluation and planning including residential water pipeline conditions and leakage AND/OR water quantity and quality in local aquifers, wells and public ponds.	0.00% 0	100.00% 1	1	2.00
Evaluate and improve the resiliency of wastewater treatment plant to climate hazards.	0.00% 0	0.00% 0	0	0.00
Hire a town tree warden to manage trees on town property and conduct proactive trimming.	0.00% 0	100.00% 1	1	2.00
Evaluate disaster response plans, evacuation routes and public communication strategies; AND/OR include groups like schools and senior centers in disaster mitigation planning process; AND/OR develop capacity of the existing neighbor-to-neighbor program.	0.00% 0	100.00% 1	1	2.00
Investments in generators for emergency shelters, public housing AND/OR senior housing.	0.00% 0	0.00% 0	0	0.00
Develop more local housing for low-income households and low-income seniors.	0.00% 0	0.00% 0	0	0.00
Creating a floodplain overlay district to regulate new development in current and future floodplains AND/OR watershed regional collaboration on flood management.	100.00% 1	0.00% 0	1	1.00
Water conservation public engagement including usage and drought prevention education campaign AND/OR a water conservation demonstration garden.	0.00% 0	0.00% 0	0	0.00
Development impact analysis, which includes evaluating existing development bylaws and permit review requirements, evaluating existing provisions for open space development, and determining whether development impacts (environmental, traffic, town infrastructure, etc.) are being adequately considered in the context of climate change.	0.00% 0	100.00% 2	2	2.00
Evaluate town land use and plan to preserve additional open space, wetlands, and agricultural land AND/OR recreational land planning, conservation and outreach to landowners AND/OR develop opportunities for local agriculture and community farming on conservation land.	0.00% 0	0.00% 0	0	0.00
Town Climate Action Plan and green energy investments (thermal energy at the Community Center, solar panels on town buildings).	0.00% 0	0.00% 0	0	0.00
Public outreach campaign to educate residents on tree management for fire prevention and climate resilience.	0.00% 0	0.00% 0	0	0.00
Public outreach campaign to educate residents on invasive plant species; AND/OR review town bylaws to recommend native species planting; AND/OR develop regulations that maintain town tree count but controls tree growth in hazardous areas near infrastructure.	0.00% 0	0.00% 0	0	0.00
Public education on vector-borne diseases and prevention.	0.00% 0	100.00% 1	1	2.00
Add town bylaw regulating soil removal.	0.00% 0	0.00% 0	0	0.00

Environmental campaign to restore native fish populations in town and across watershed.	0.00% 0	0.00% 0	0	0.00

Q8 Please describe any other actions that were not listed in this survey that the town should take to improve resilience.

Answered: 2 Skipped: 4

#	RESPONSES	DATE
1	Improvements in areas where stormwater management can be improved upon specifically with natural solutions such as bioswales and pervious pavement.	3/11/2021 6:18 PM
2	Form "Blue Spaces Committee" to study and protect surface water quality. Form "Shade Tree Committee" to advise DPW (tree warden) Work with DCR, Conservation Commission, and Planning Board to improve resiliency to wildfires.	3/11/2021 5:37 PM

MVP PROGRAM OVERVIEW PRESENTATION

TOWN OF UPTON

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building

Virtual Workshop

February 18th , 25th 6 – 8 PM

March 4th 4 – 6PM

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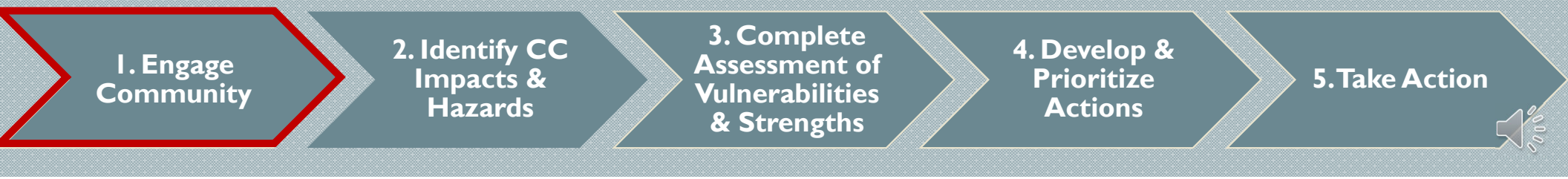
Central Massachusetts Regional Planning Commission

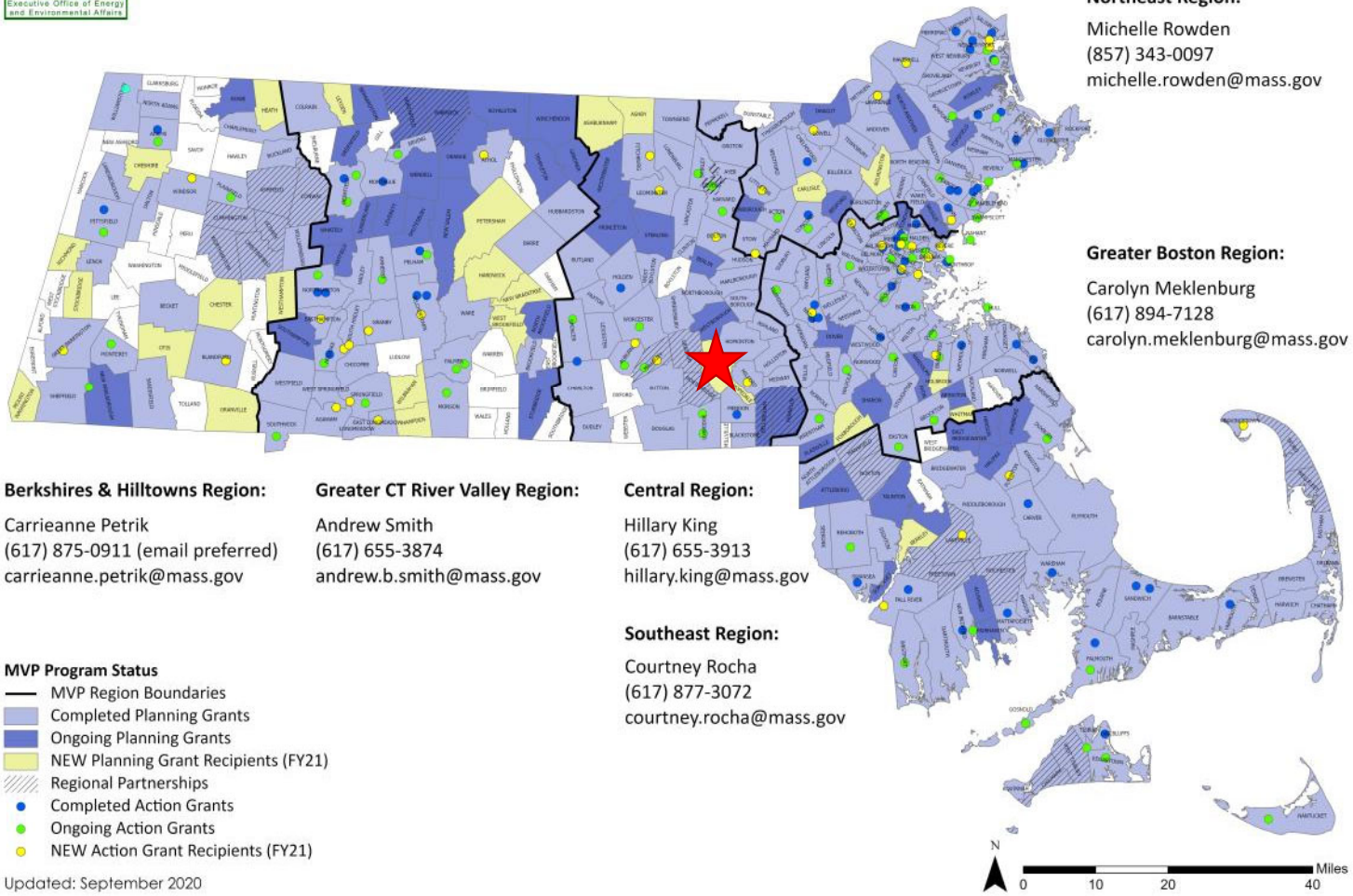
MUNICIPAL VULNERABILITY PREPAREDNESS (MVP)

- State grant program to support cities and towns to begin the process of planning for climate resiliency.
- MVP Planning Process includes CRB Workshop, Report, Listening Session and Annual Reporting
- Communities who complete the MVP Planning Process become certified as an MVP Community
- Designated communities become eligible for MVP Action Grant funding



Municipal Vulnerability Preparedness (MVP) Program

Program Manager: Kara Runsten, (617) 312-1594, kara.runsten@mass.gov



Northeast Region:

Michelle Rowden
(857) 343-0097
michelle.rowden@mass.gov

Greater Boston Region:

Carolyn Meklenburg
(617) 894-7128
carolyn.meklenburg@mass.gov

Berkshires & Hilltowns Region:

Carrieanne Petrik
(617) 875-0911 (email preferred)
carrieanne.petrik@mass.gov

Greater CT River Valley Region:

Andrew Smith
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andrew.b.smith@mass.gov

Central Region:

Hillary King
(617) 655-3913
hillary.king@mass.gov

Southeast Region:

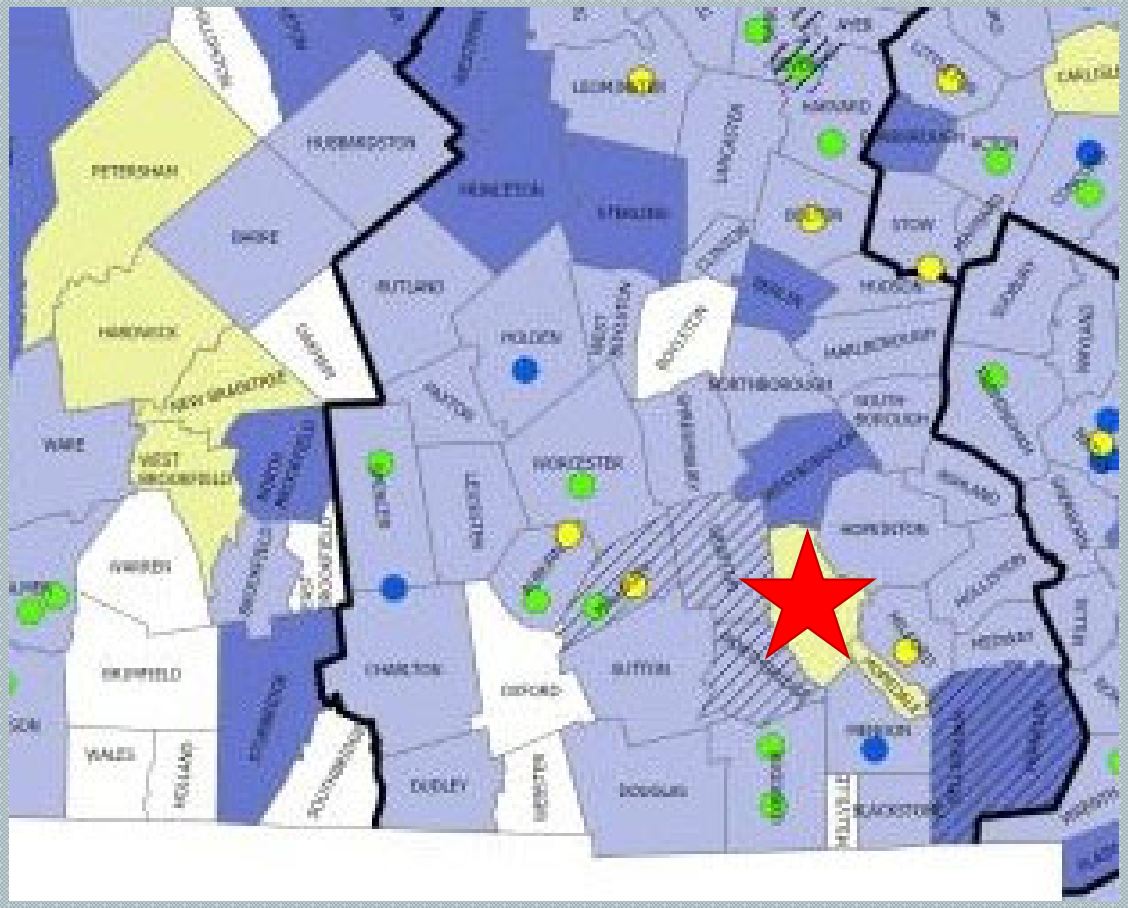
Courtney Rocha
(617) 877-3072
courtney.rocha@mass.gov

MVP Program Status

- MVP Region Boundaries
- Completed Planning Grants
- Ongoing Planning Grants
- NEW Planning Grant Recipients (FY21)
- Regional Partnerships
- Completed Action Grants
- Ongoing Action Grants
- NEW Action Grant Recipients (FY21)

Updated: September 2020

CMRPC
Central Massachusetts Regional Planning Commission



MVP Program Status

- MVP Region Boundaries
- Completed Planning Grants
- Ongoing Planning Grants
- NEW Planning Grant Recipients (FY21)
- Regional Partnerships
- Completed Action Grants
- Ongoing Action Grants
- NEW Action Grant Recipients (FY21)

Updated: September 2020

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HOW THE TOWN GOT HERE?

- Awarded Planning Grant
- Core Team Meeting
- COVID-19 Adaptation
- Invitation from Core Team

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COMMUNITY RESILIENCE BUILDING WORKSHOP OBJECTIVES

- Define extreme weather and climate-related hazards
- Identify current and future vulnerabilities and strengths
- Develop and prioritize actions for the community and broader stakeholder networks, and
- Identify opportunities for the community to advance actions to reduce risks and build resilience

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THE MATRIX

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S					Priority H·M·L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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BREAKOUT GROUPS

- 4 tables of 6 to 8 individuals
- Each table will discuss
  - Societal,
  - Infrastructure, and
  - Environmental
- Tools and Resources
  - Matrix, Maps, & Each Other

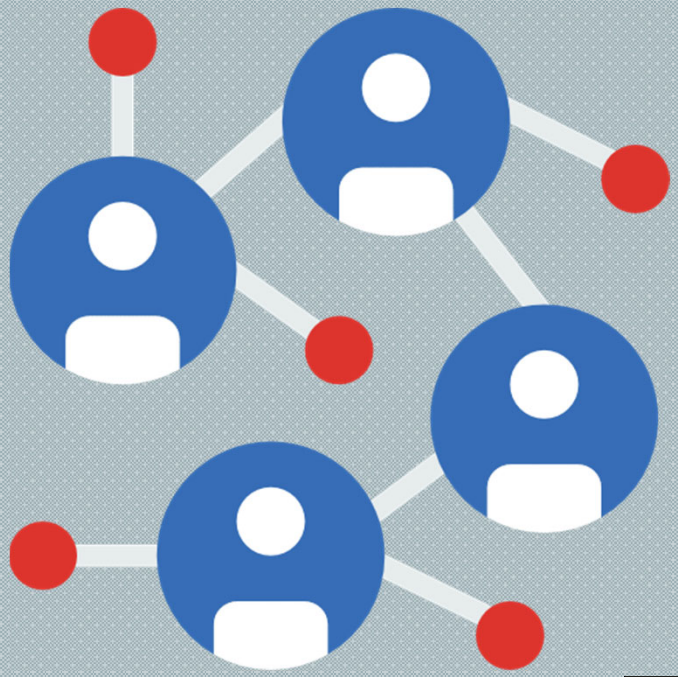

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TABLE ROLES AND RESPONSIBILITIES

- Table Facilitator directs the discussion and keeps the dialogue moving
- Scribes filling in matrix
- Participants- All of you
- CMRPC resource person
- Table spokesperson for Report Out (Day 3)

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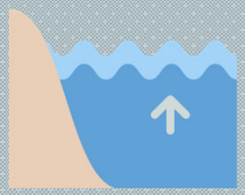
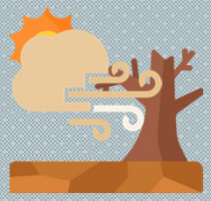
HAZARD IDENTIFICATION



- **Flooding**
  - Riverine
  - Street

- **Landslides**
- **Mudslides**

- **Tornadoes**



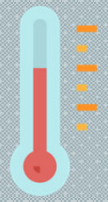
- **Drought**
- **Dust Storms**

- **Tsunami**

- **Hurricanes/ Nor'easters**

- **Wild Fires**

- **Winter Storms**
  - **Snow**
  - **Ice**



- **Extreme Temperatures**
  - **Heat**
  - **Cold**

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PRIMARY TOPIC AREAS

- Infrastructure
- Society
- Environment

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NEXT STEPS

- Complete the survey
- Report development
- Public "Listening" session with Members of the Public and Board of Selectmen May 2021
- Develop resources and Implement actions.

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

ACTION GRANTS

- Next round expected in spring 2021
- Up to $2 million for an individual community
- Up to $5 million for regional projects
- One year grant cycle (typically) July 1st- June 30th
- 25% Match - Cash or In-kind (Non-State Funds)

www.mass.gov/municipal-vulnerability-preparedness-mvp-program

www.communityresiliencebuilding.com

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Central Massachusetts Regional Planning Commission

QUESTIONS OR COMMENTS

CMRPC
Central Massachusetts Regional Planning Commission

CONTACT US

- Upton Core Team Leader –
  - Paul Dell'Aquila, PDellAquila@uptonma.gov
  - CMRPC Project Leaders –
  - Sarah Adams, sadams@cmrpc.org
- Executive Office of Energy and Environmental Affairs –
  - Hillary King, hillary.king@state.ma.us

CMRPC
Central Massachusetts Regional Planning Commission

THANK YOU

CMRPC
Central Massachusetts Regional Planning Commission

CRB MATRIX PRESENTATION

TOWN OF UPTON

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building Workshop

February 18th , 25th 6 – 8 PM

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

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

Features	Location	Ownership	V or S					Priority H·M·L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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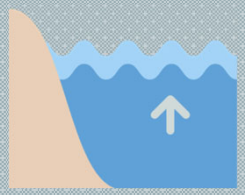
STEP ONE: HAZARD IDENTIFICATION

What are the Top Four Natural Hazards in Upton?

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

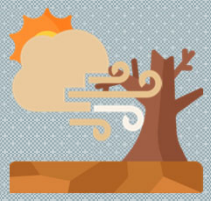
STEP ONE: HAZARD IDENTIFICATION



- **Flooding**
  - Riverine
  - Street

- **Landslides**
- **Mudslides**

- **Tornadoes**



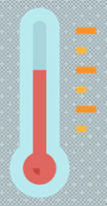
- **Drought**
- **Dust Storms**

- **Tsunami**

- **Hurricanes/ Nor'easters**

- **Wild Fires**

- **Winter Storms**
  - **Snow**
  - **Ice**



- **Extreme Temperatures**
  - **Heat**
  - **Cold**

Icons made by freepik, goodware, smashicons, those icons, icongeek26 and iconicar from Flaticon.com

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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PRIMARY TOPIC AREAS

- Infrastructure
- Society
- Environment

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

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Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam									
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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

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Dam									
Societal									
Senior Housing									
Environmental									

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

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Senior Housing									
Environmental									
Wetlands									

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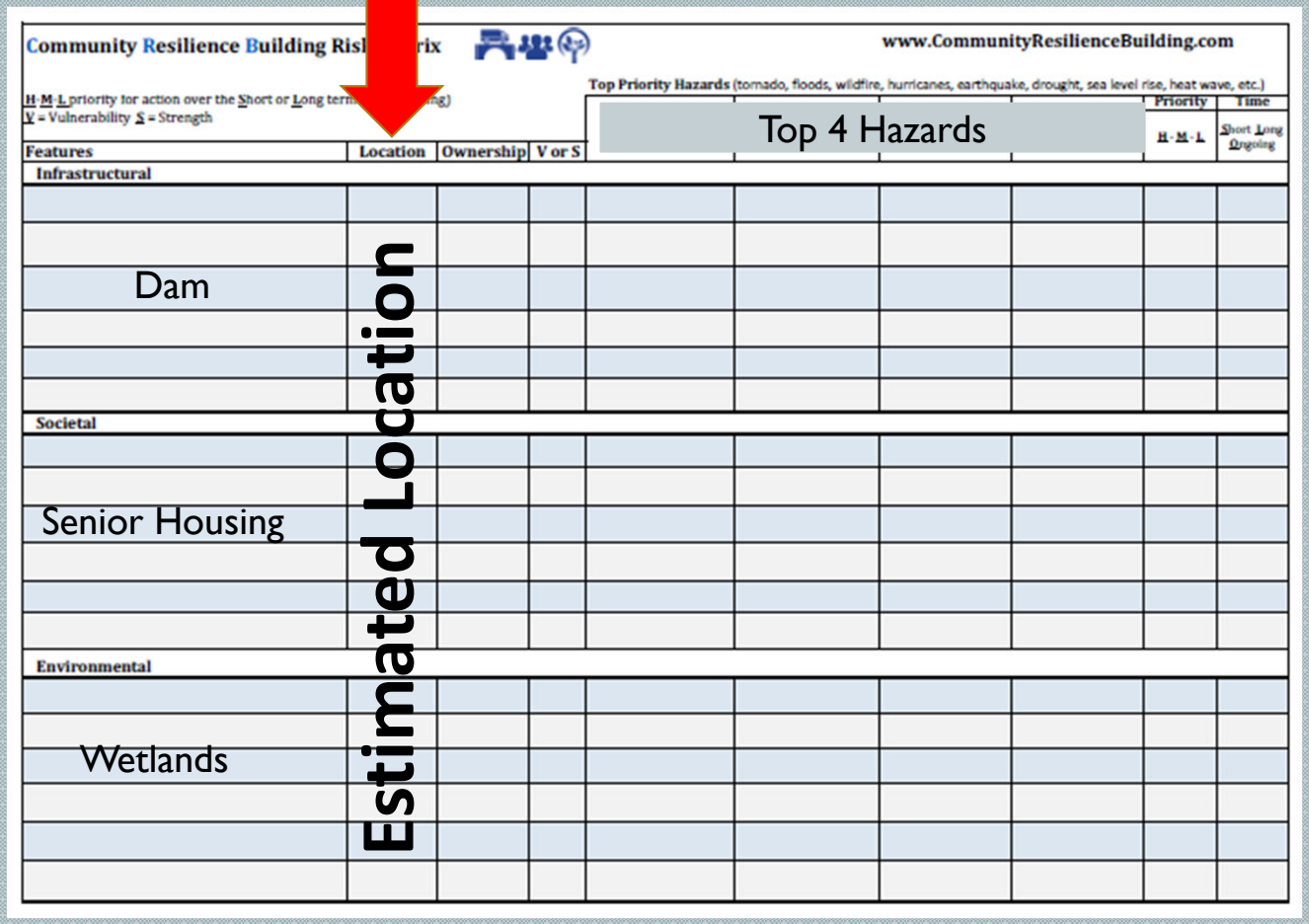
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



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Wetlands									

Estimated Location

Public? Private? State?

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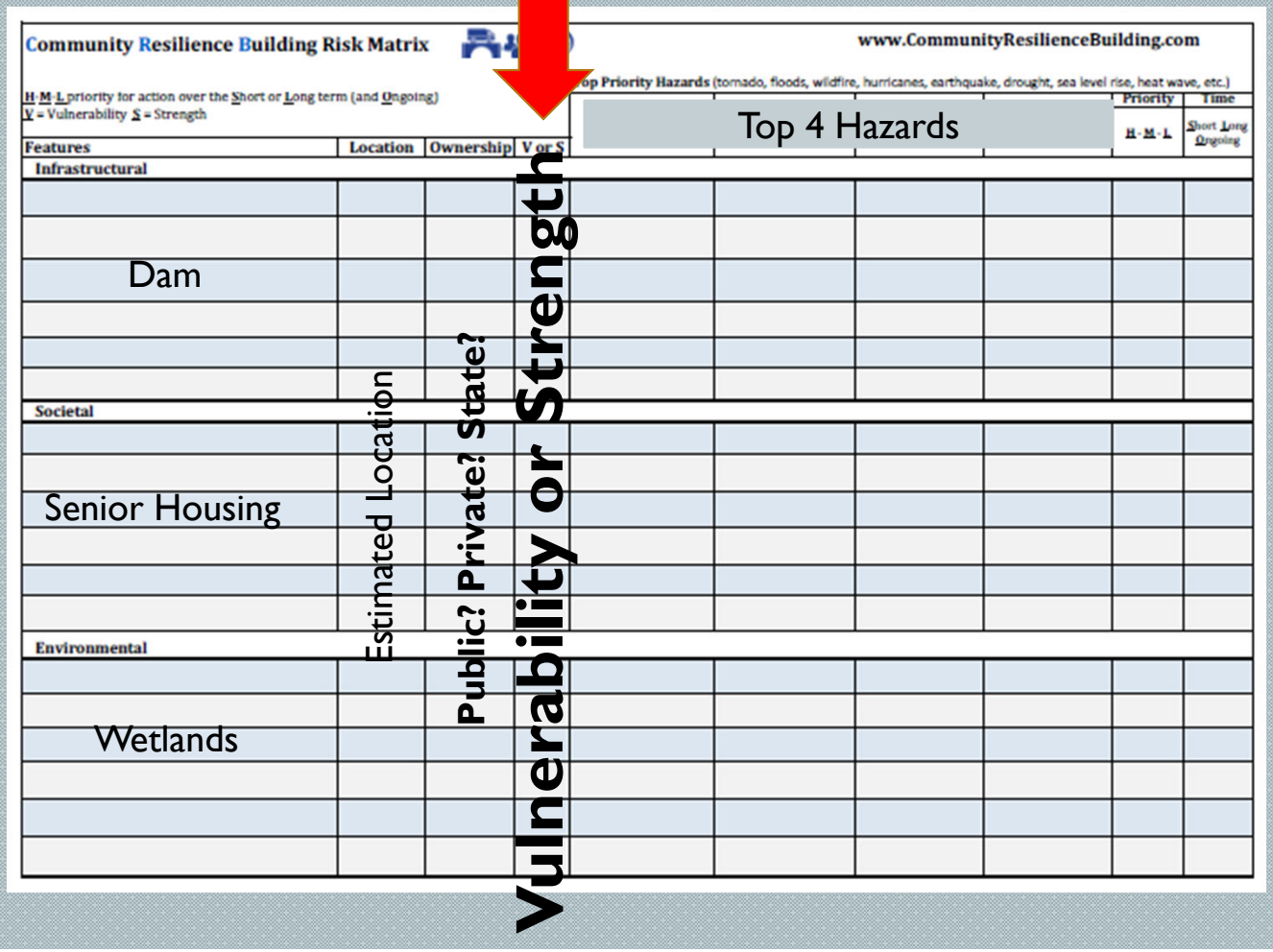
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



DAY 1 COMPLETE

STEP TWO: COMPLETED

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

Public? Private? State?

Vulnerability or Strength

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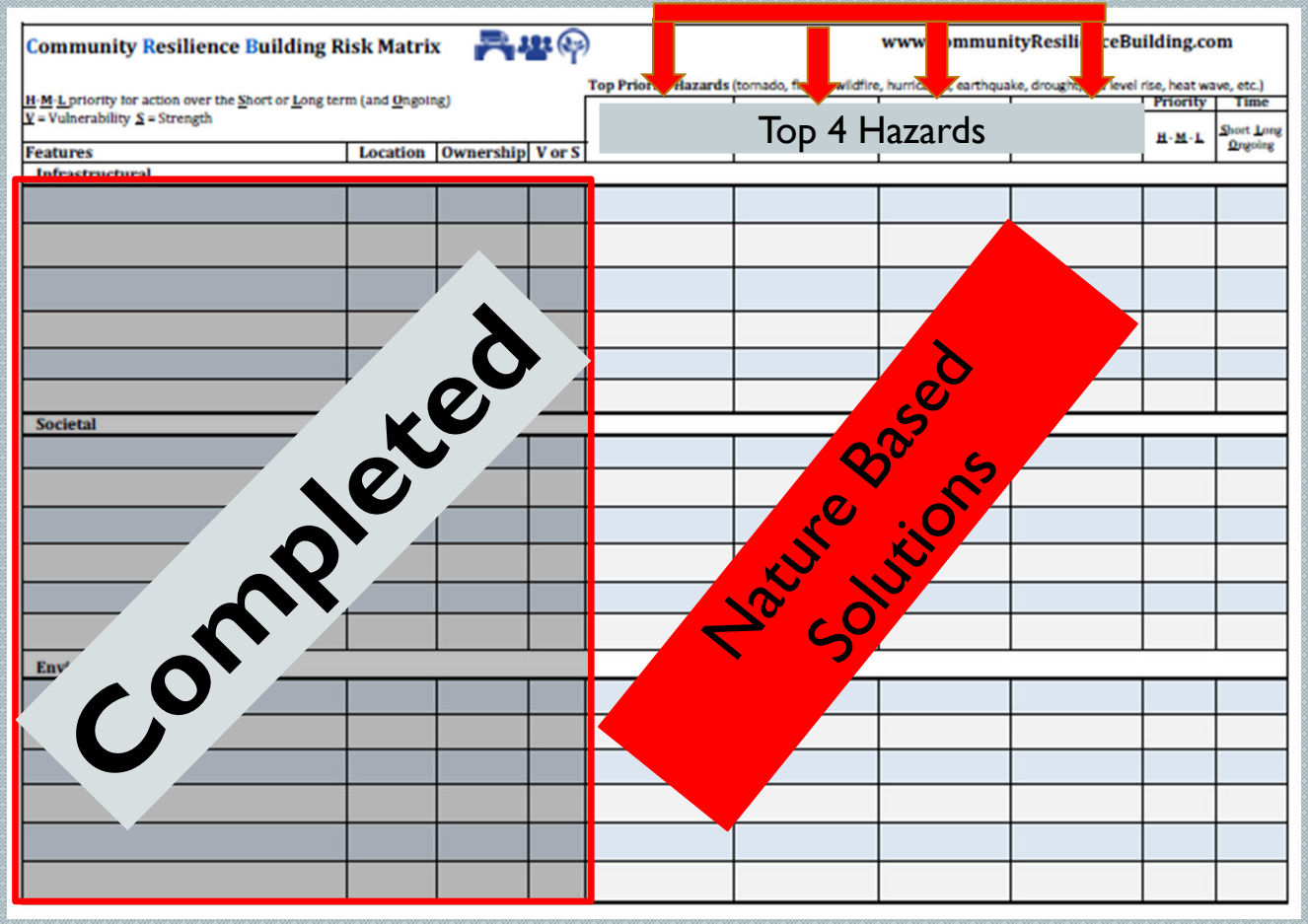
STEP THREE: ACTIONS, PRIORITY AND TIMELINE



NATURE BASED SOLUTIONS

- Make use of natural systems
- Mimic the natural processes
- Actions to protect, sustainably manage and restore ecosystems
- Simultaneously providing well-being and biodiversity

International Union for Conservation of Nature (IUCN)

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NATURE BASED SOLUTIONS (LID)

- Natural systems mimic natural processes to absorb and slow runoff and stormwater, and also reduce heat islands.

- Low impact development (LID) designs can be integrated into new development at neighborhood scales and work with traditional approaches

Bioswale between sidewalk and street

Contained bioswale or planter box

Mass Audubon
Shaping the Future of Your Community
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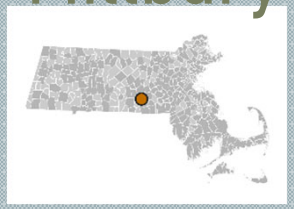
Example Action Grant Projects

Nature-Based Flood Protection, Drought Prevention, Water Quality, and Water Infiltration Techniques

Millbury



Designing green infrastructure like stormwater planters, bioretention bump outs, rain gardens, and other measures like porous pavers and pervious pavement to reduce heat island effects and stormwater runoff into the Blackstone River.

Nature-based solutions

MORE EXAMPLES OF LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE

Green Parking Lots

Permeable Paving

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Example Action Grant Projects

Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques

Belchertown

Designing and permitting for a replacement water storage tank that would increase storage capacity and resiliency to drought, and completing a feasibility/ concept design of a rainwater harvesting system at Belchertown High School to irrigate the athletic fields.

Nature-based solutions

Pilot potential

ECONOMIC BENEFITS OF LID AND GREEN INFRASTRUCTURE PROJECTS

Aquatic restoration projects in MA, like these natural culverts, are contributing to a growing "restoration economy" by providing jobs and economic output.

Traditional Culvert

Nature Based Culvert

Mass Audubon

Shaping the Future of Your Community

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Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett

Purchasing 120 acres of forest, streams, freshwater wetlands and coastal salt marsh as conservation land to prevent development in vulnerable areas

Data Utilization

Proactive

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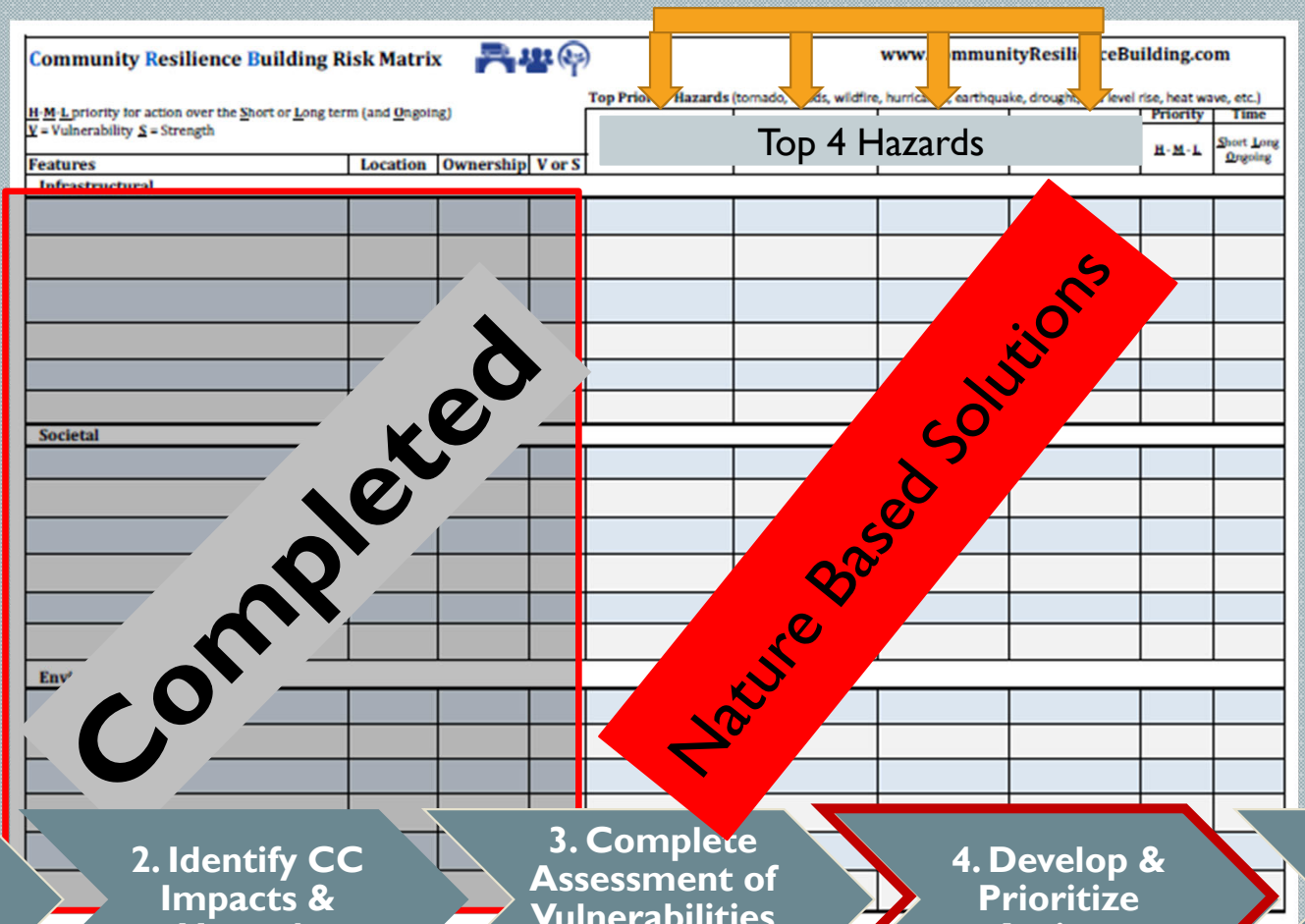
BENEFITS OF GREEN INFRASTRUCTURE AND LID

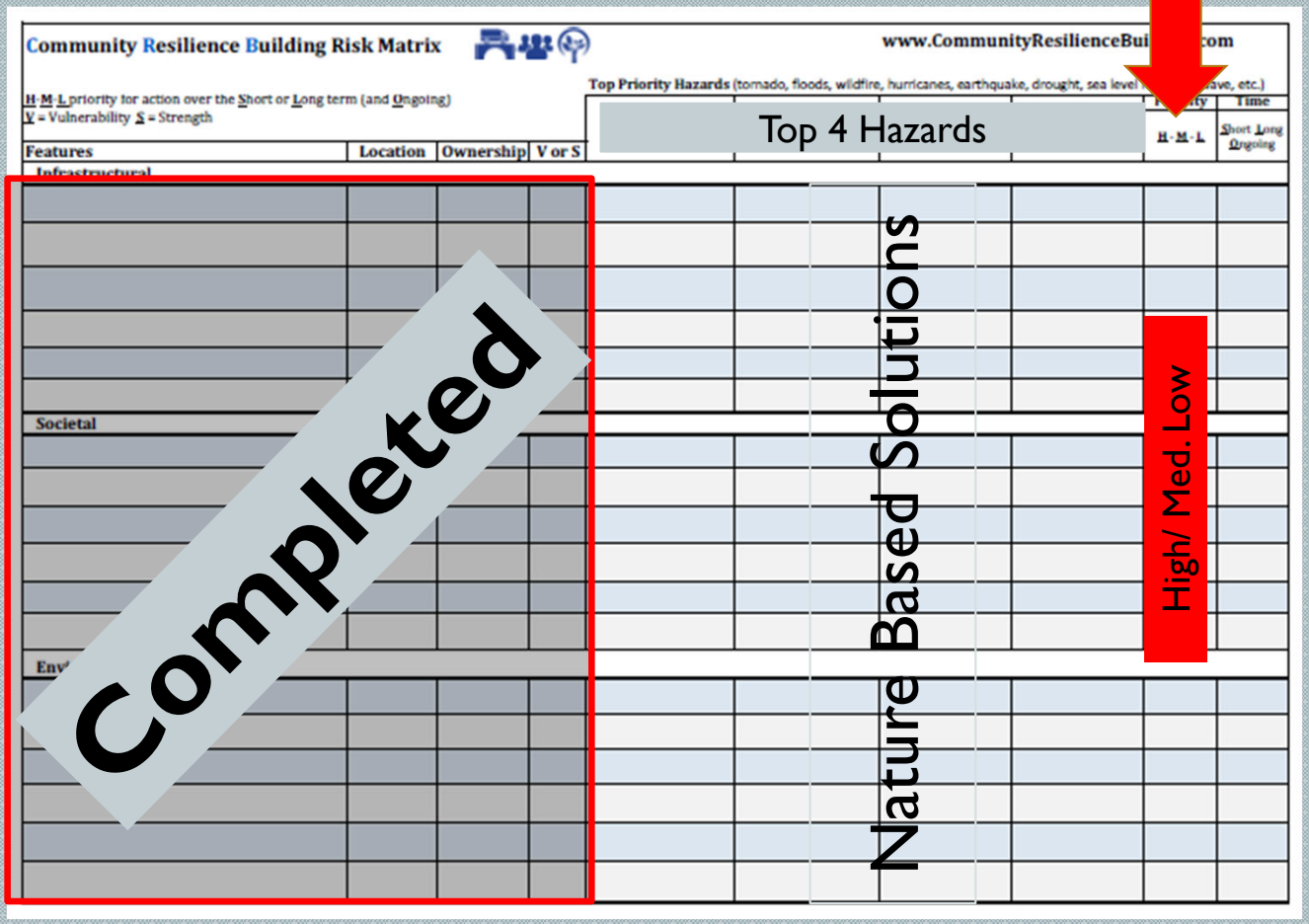
- Cost Savings
  - Reduced development costs for infrastructure and maintenance
  - Reduced energy costs for residents
- Public Safety
  - Reduced flooding
  - Improved water quality
  - Increased climate change resiliency
  - Reduced urban heat island effect
- Quality of Life
  - Protect and restore natural features for improved aesthetics
- Value
  - Increased property values
- Regulatory
  - Assistance in meeting regulatory requirements

STEP THREE: ACTIONS

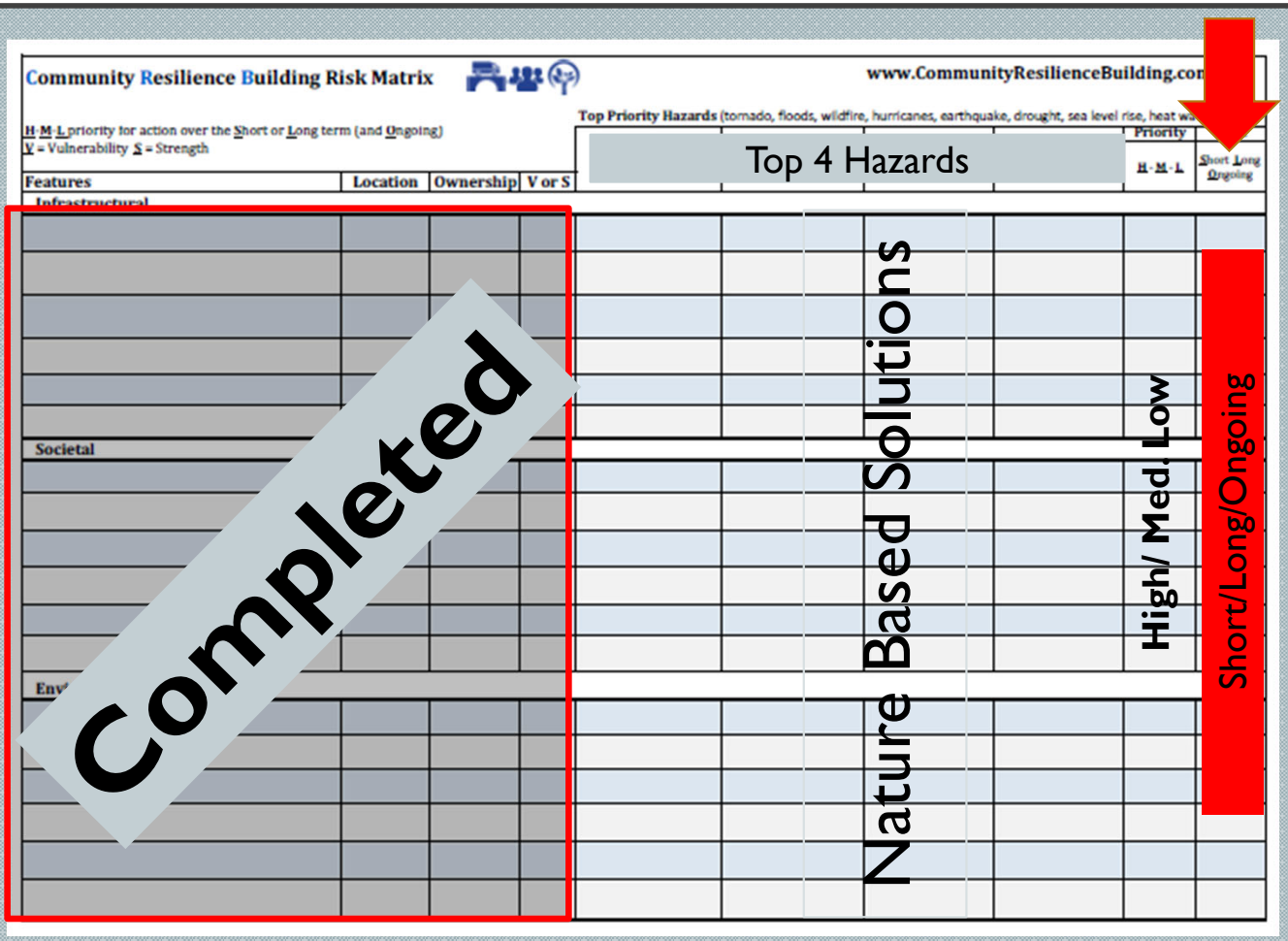


1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

STEP THREE: PRIORITIES



STEP THREE: TIMELINE



REPORT OUTS

What did your table find?

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SUMMARY DISCUSSION

- Areas of agreement
- Areas of unique perspectives

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PROJECT PRIORITIZATION

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TIME TO VOTE

- A survey will be created from all information listed in the matrix
- Prioritize each project
- Vote for your projects of interest

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NEXT STEPS

- Complete the survey
- Report development
- Public "Listening" session with Members of the Public and Board of Selectmen May 2021
- Develop resources and Implement actions
- Apply for Action Grants

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

QUESTIONS OR COMMENTS

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CONTACT US

- Upton Core Team Leader –
  - Paul Dell'Aquila, PDellAquila@uptonma.gov
  - CMRPC Project Leaders –
  - Sarah Adams, sadams@cmrpc.org
- Executive Office of Energy and Environmental Affairs –
  - Hillary King, hillary.king@state.ma.us

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THANK YOU

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UPTON CLIMATE HAZARDS PRESENTATION

TOWN OF UPTON

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building Workshop

February 18, 25, March 04, 2021

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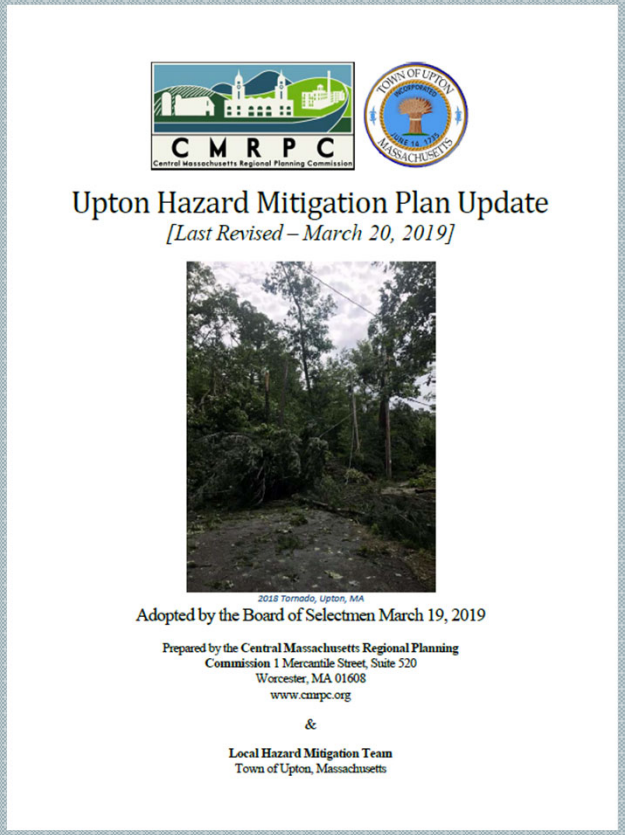
HAZARD MITIGATION PLANNING

- Overlaps somewhat with Hazard Mitigation Planning, but MVP is more focused on climate change in the long term
- Upton's Hazard Mitigation received Final FEMA Approval in March 2019.
- 5-year plans



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TOWN OF UPTON INCORPORATED JUNE 16, 1735 MASSACHUSETTS

Upton Hazard Mitigation Plan Update

[Last Revised – March 20, 2019]

2018 Tornado, Upton, MA

Adopted by the Board of Selectmen March 19, 2019

Prepared by the **Central Massachusetts Regional Planning Commission** 1 Mercantile Street, Suite 520
Worcester, MA 01608
www.cmrpc.org

&

Local Hazard Mitigation Team
Town of Upton, Massachusetts

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BE PREPARED, MITIGATE THE COSTS

US Natural Disasters in 2017 cost $306 Billion, the most expensive year since NOAA started keeping track in 1980

National Benefit-Cost Ratio Per Peril *BCR numbers in this study have been rounded	Exceed common code requirements	Meet common code requirements	Utilities and transportation	Federally funded
Overall Hazard Benefit-Cost Ratio	4:1	11:1	4:1	6:1
Savings ($billion)	$16/year	$13/year	$2.5	$160
Riverine Flood	5:1	6:1	8:1	7:1
Hurricane Surge	7:1	Not applicable	Not applicable	Too few grants
Wind	5:1	10:1	7:1	5:1
Earthquake	4:1	12:1	3:1	3:1
Wildland-Urban Interface Fire	4:1	Not applicable	Not applicable	3:1

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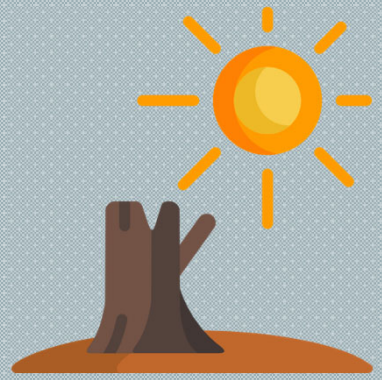
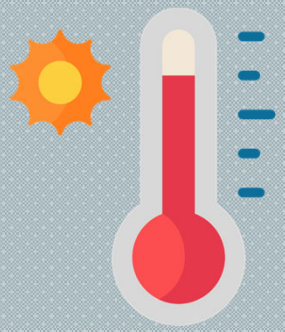
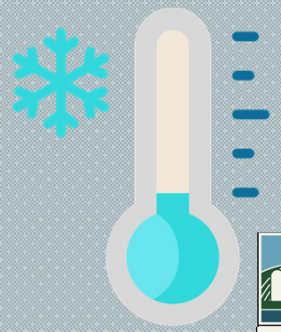
NATURAL HAZARDS

- Flooding (all types)
- Droughts and wildfires
- Winter storms
- Severe thunderstorms
- Hurricanes
- Wind and tornadoes
- Extreme temperatures
- Landslides
- Earthquakes







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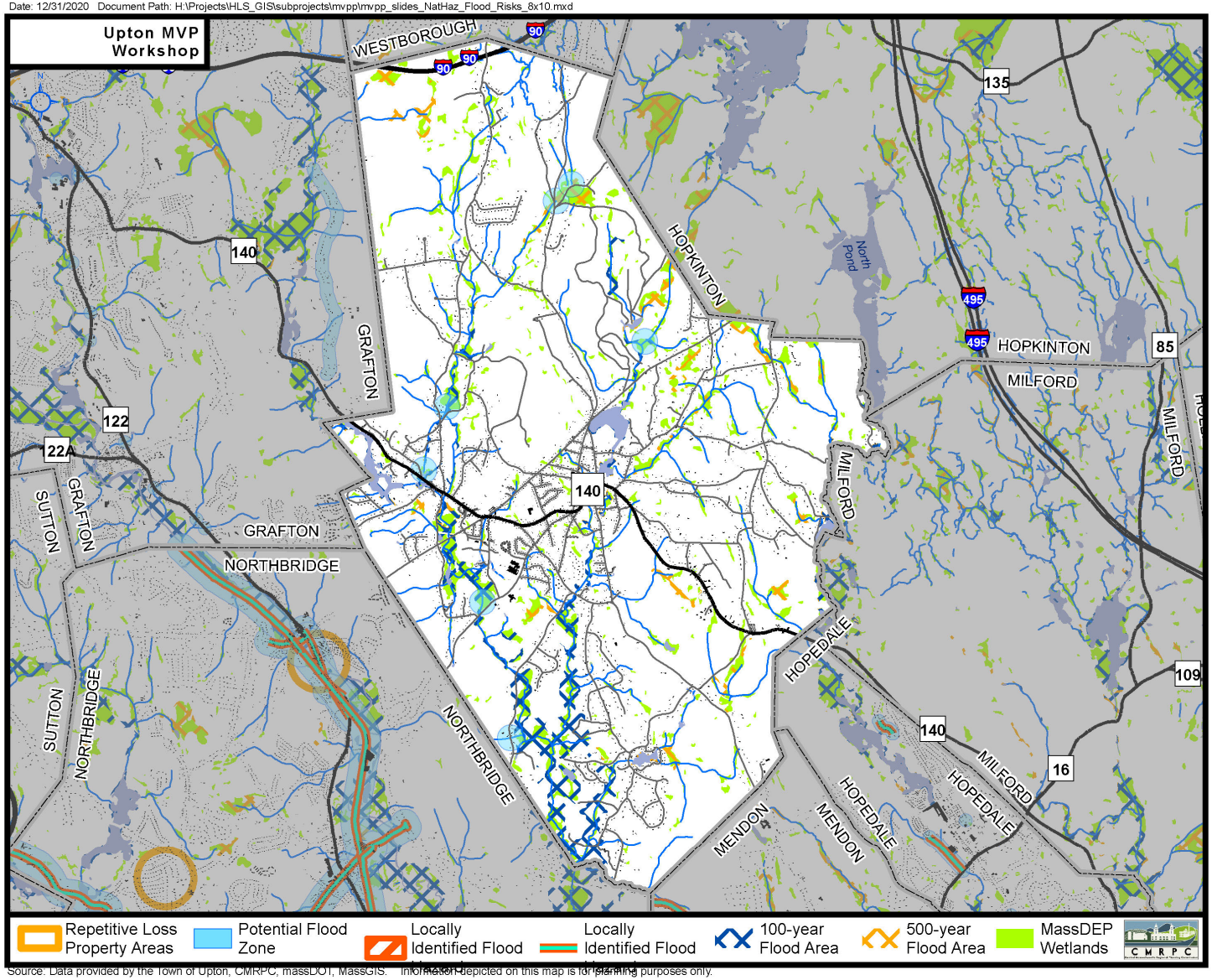
FLOOD RISKS



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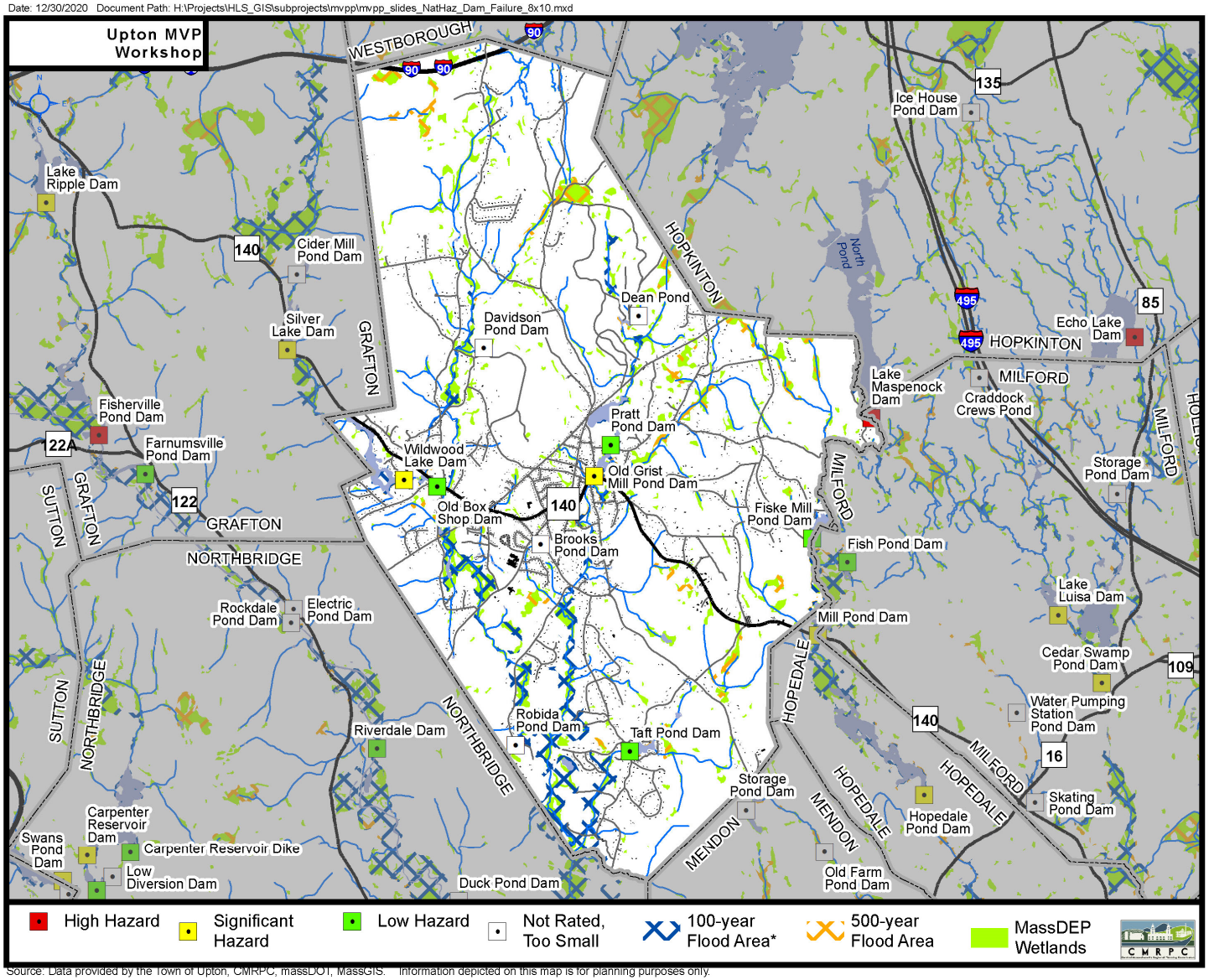
DAM FAILURE RISK



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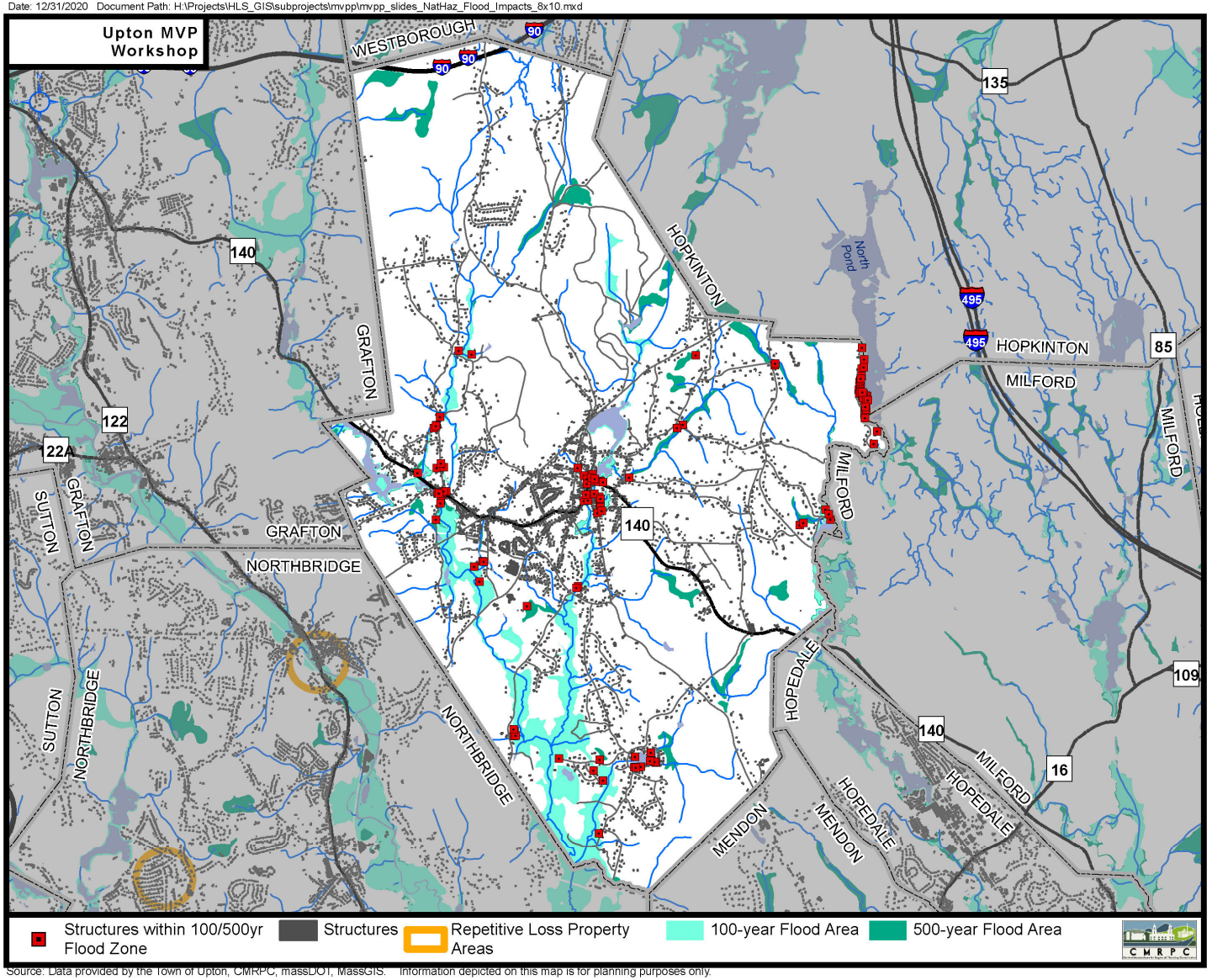
FLOODING IMPACTS



Source: Data provided by the Town of Upton, CMRPC, massDOT, MassGIS. Information depicted on this map is for planning purposes only.

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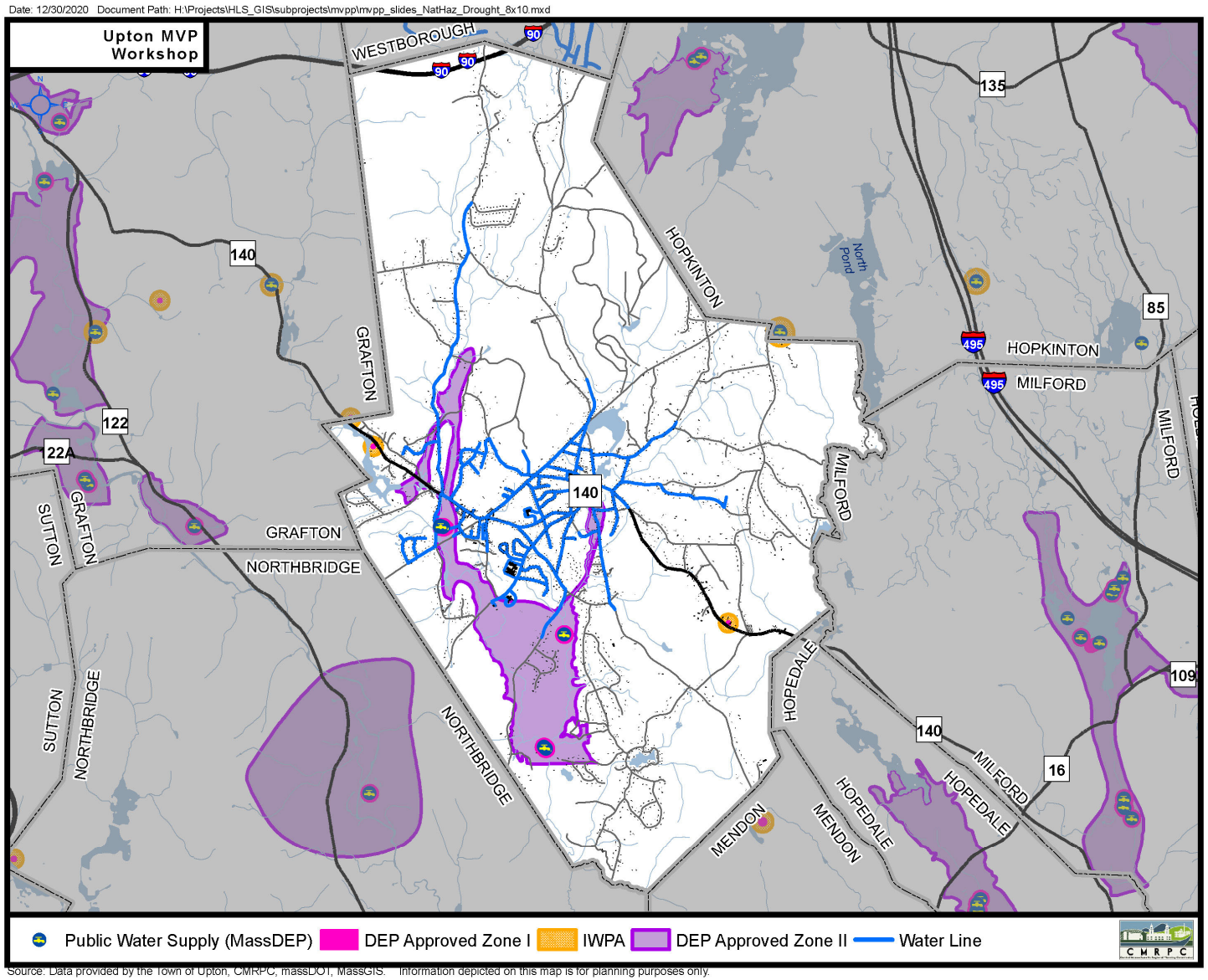
DROUGHT IMPACTS



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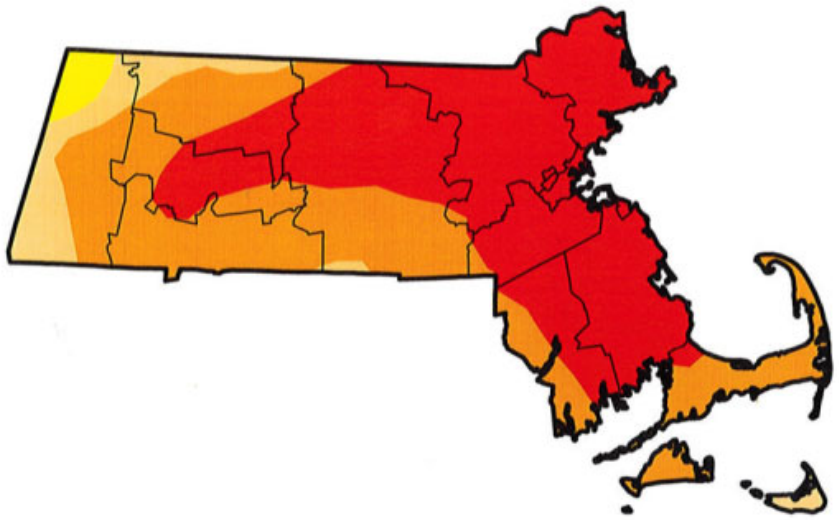
DROUGHT IMPACTS

U.S. Drought Monitor
Massachusetts



September 13, 2016
(Released Thursday, Sep. 15, 2016)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	98.15	89.95	52.13	0.00
Last Week 9/6/2016	0.00	100.00	94.38	77.38	22.67	0.00
3 Months Ago 6/14/2016	20.09	79.91	13.56	0.00	0.00	0.00
Start of Calendar Year 12/29/2015	22.85	77.15	26.34	0.00	0.00	0.00
Start of Water Year 9/29/2015	12.90	87.10	30.43	0.00	0.00	0.00
One Year Ago 9/15/2015	34.81	65.19	0.23	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Eric Luebehusen
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/

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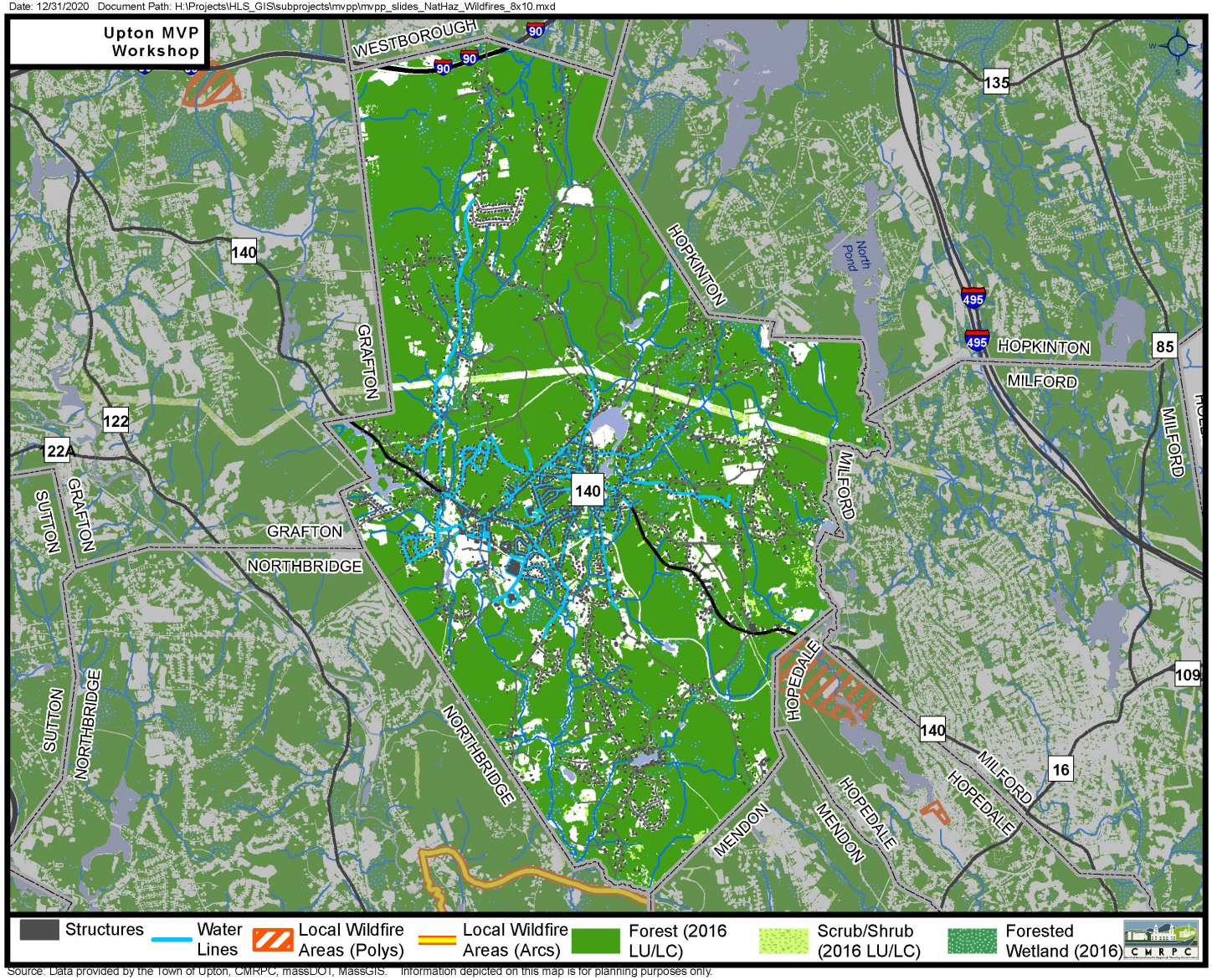
WILDFIRE

Date: 12/31/2020 Document Path: H:\Projects\HLS_GIS\subprojects\mvpp\mvpp_slides_NatHaz_Wildfires_8x10.mxd



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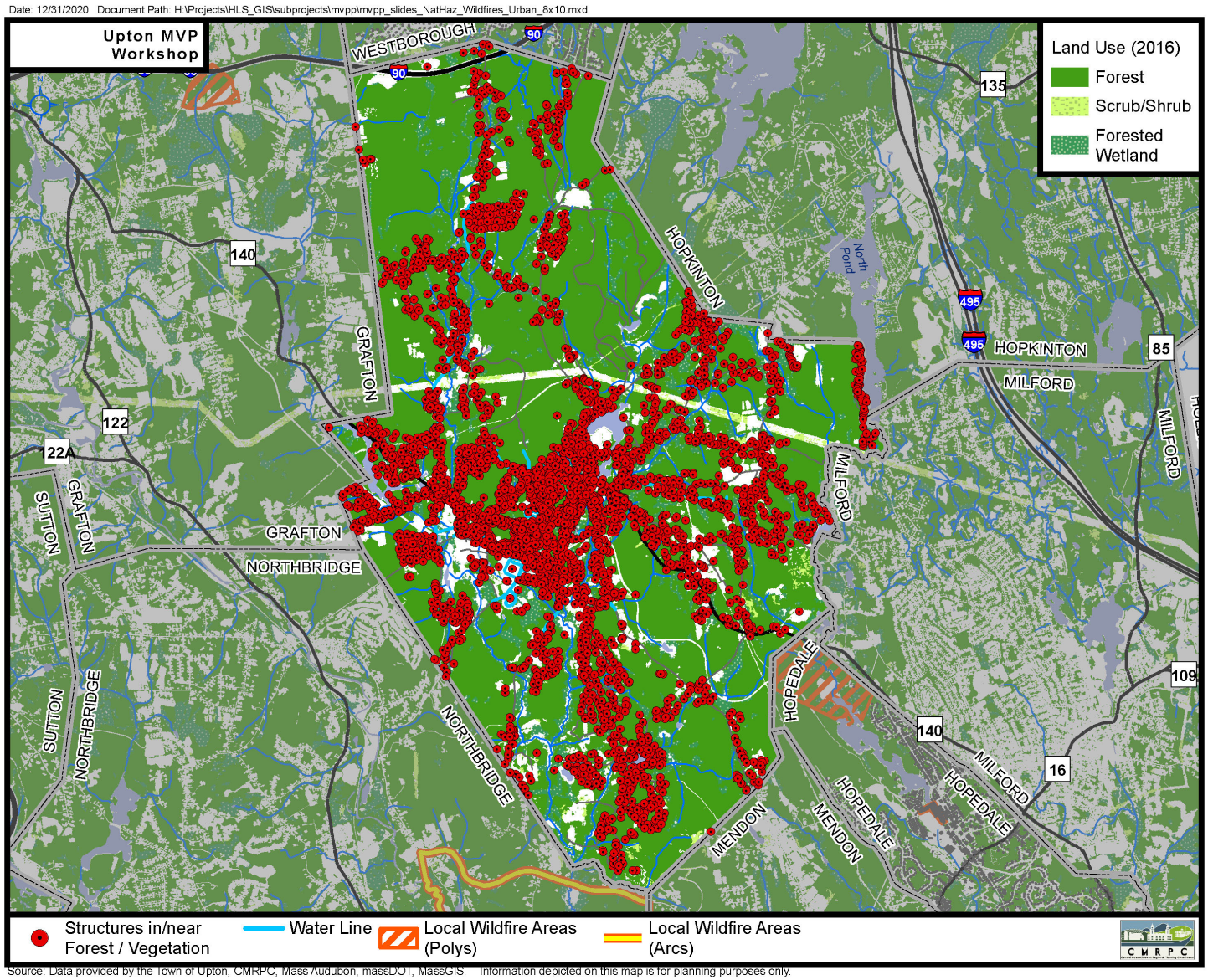
WILDLAND/URBAN INTERFACE



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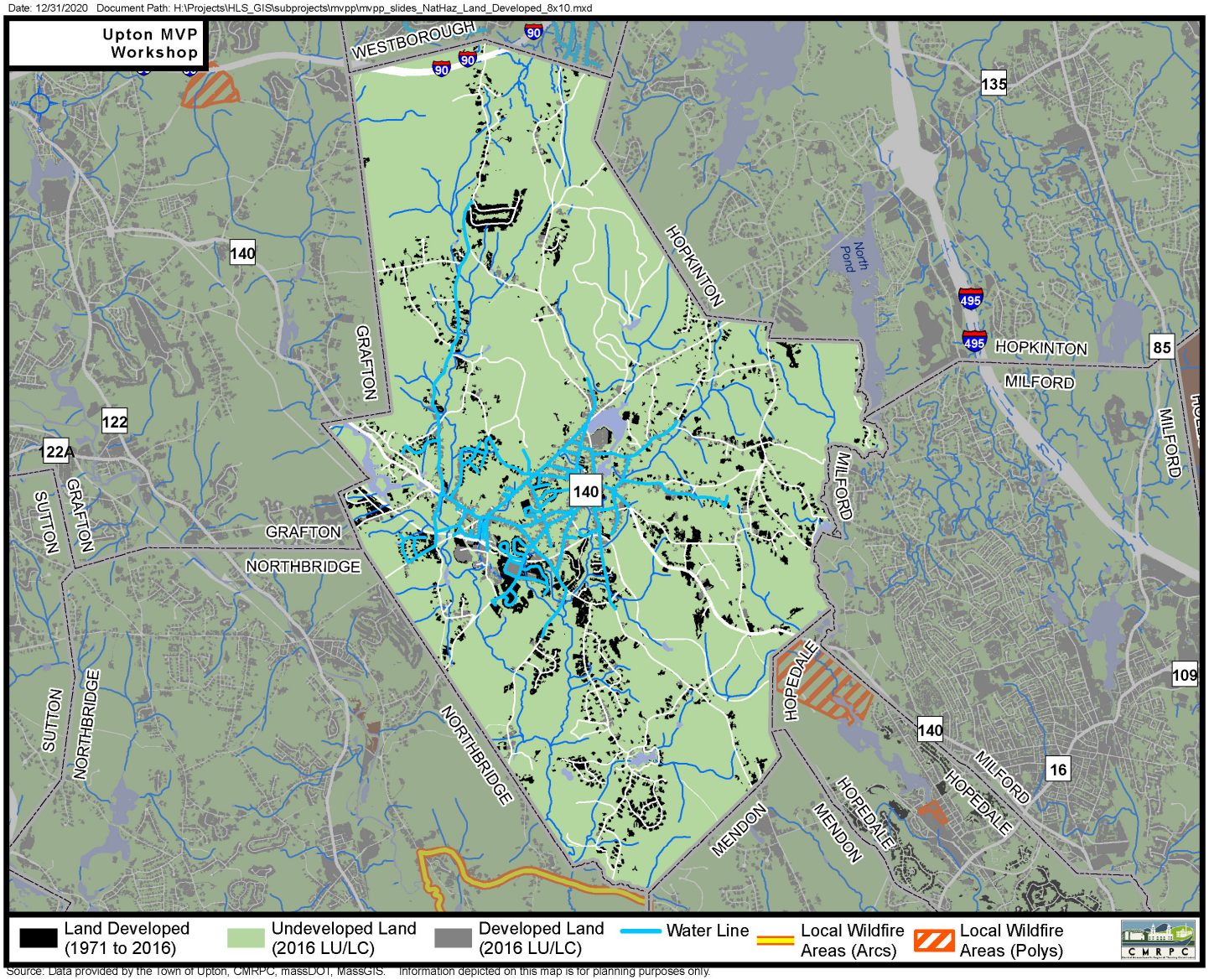
FIRE & NEW DEVELOPMENT



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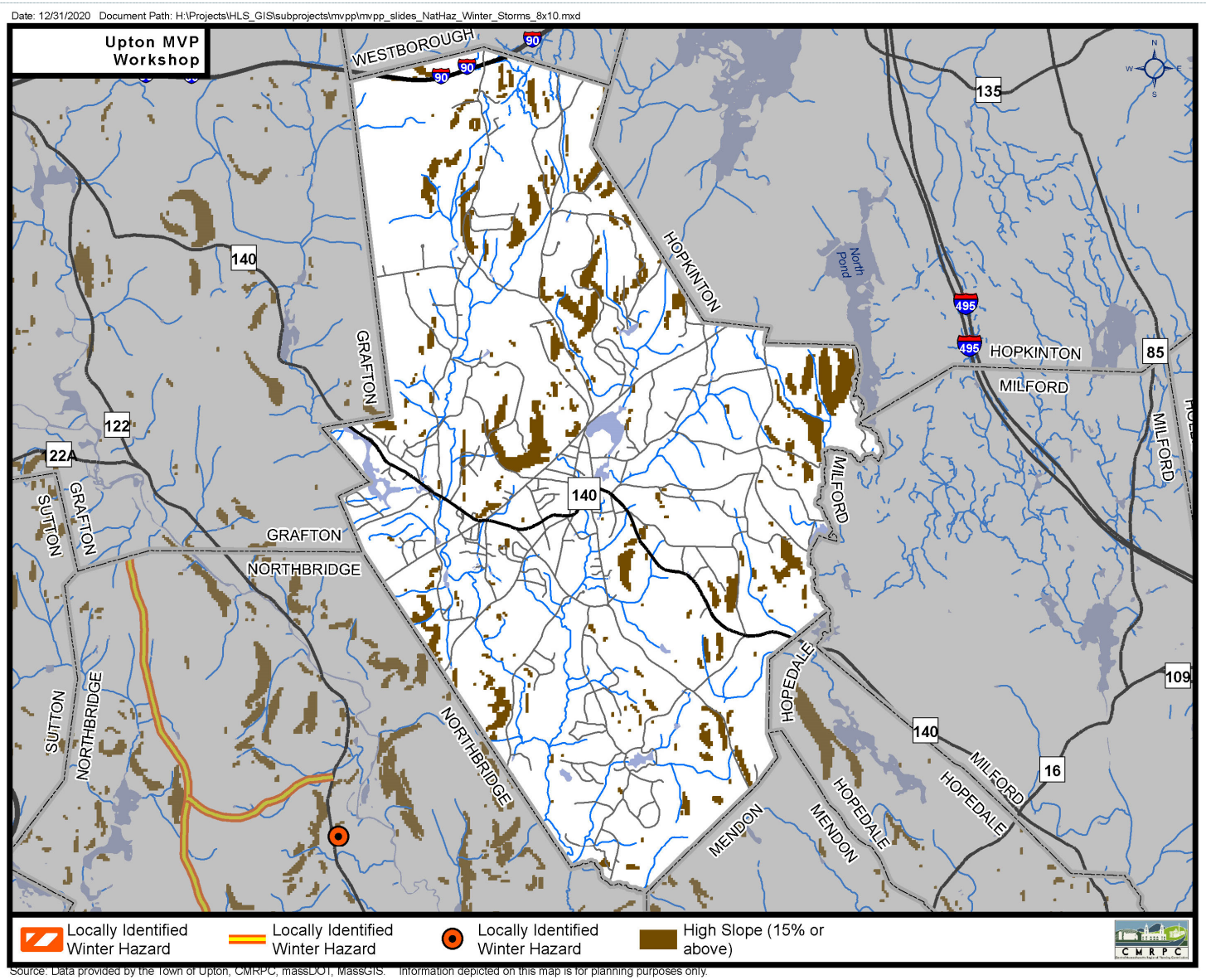
WINTER STORMS



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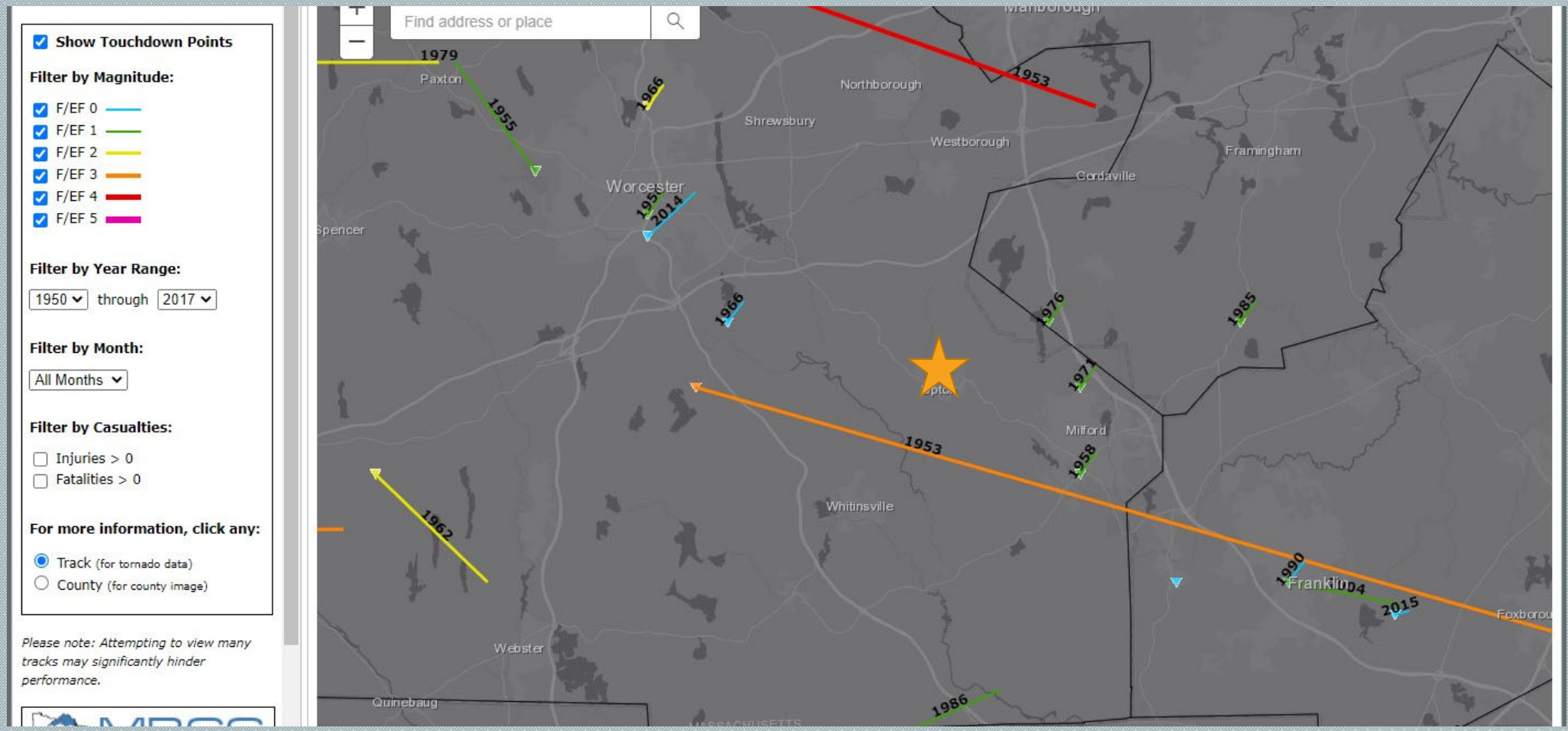
EXTREME STORMS



CRITICAL INFRASTRUCTURE & FACILITIES

- What infrastructure and facilities are critical to the region and its residents? Which do we most need or desire to protect from hazards?

  - Those needed to respond to hazard events or which would exacerbate hazard scenarios, if affected
  - Those needed to perform day-to-day municipal operations and to support basic services and economic activity
  - Major employers and institutions, natural and cultural resources, recreational and historic sites, etc…

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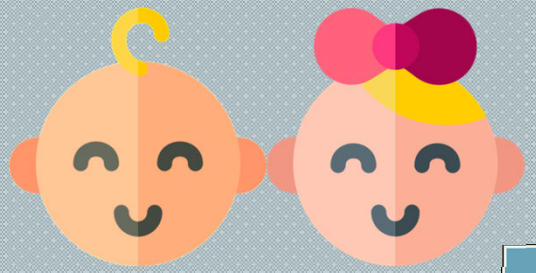
VULNERABLE POPULATIONS

- Vulnerability is not just about utilities, facilities, or businesses
  - Disproportionate populations of potentially vulnerable demographic groups (elderly, children, etc.) or socioeconomic groups (low income households, etc.) living/working in high-risk areas
  - Can be on neighborhood scale, or at specific locations
  - Cultural vulnerability (cultural or language isolation)
  - These will evolve over time, as climate and populations change



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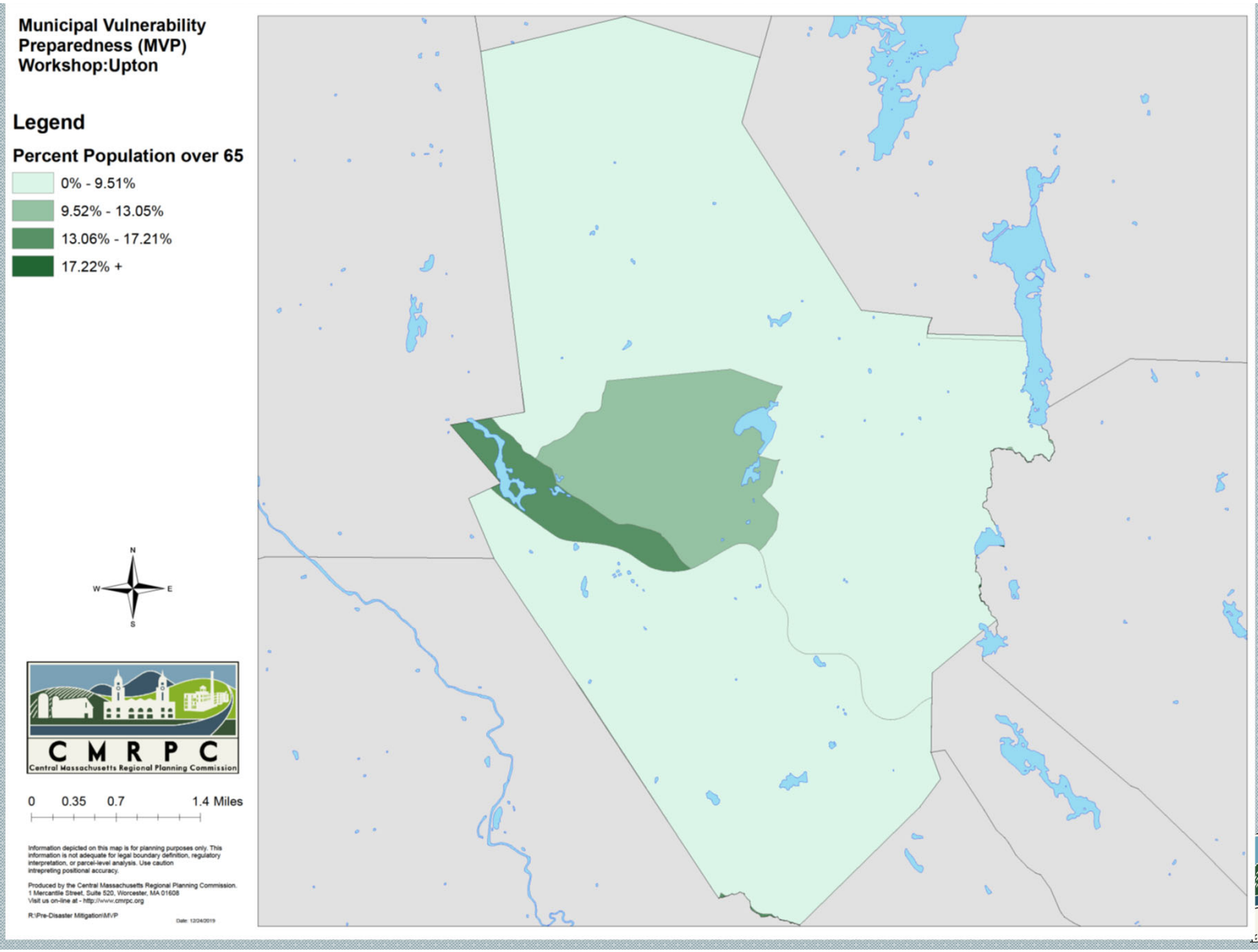
VULNERABLE POPULATIONS: SENIORS (65+)

Municipal Vulnerability Preparedness (MVP) Workshop:Upton



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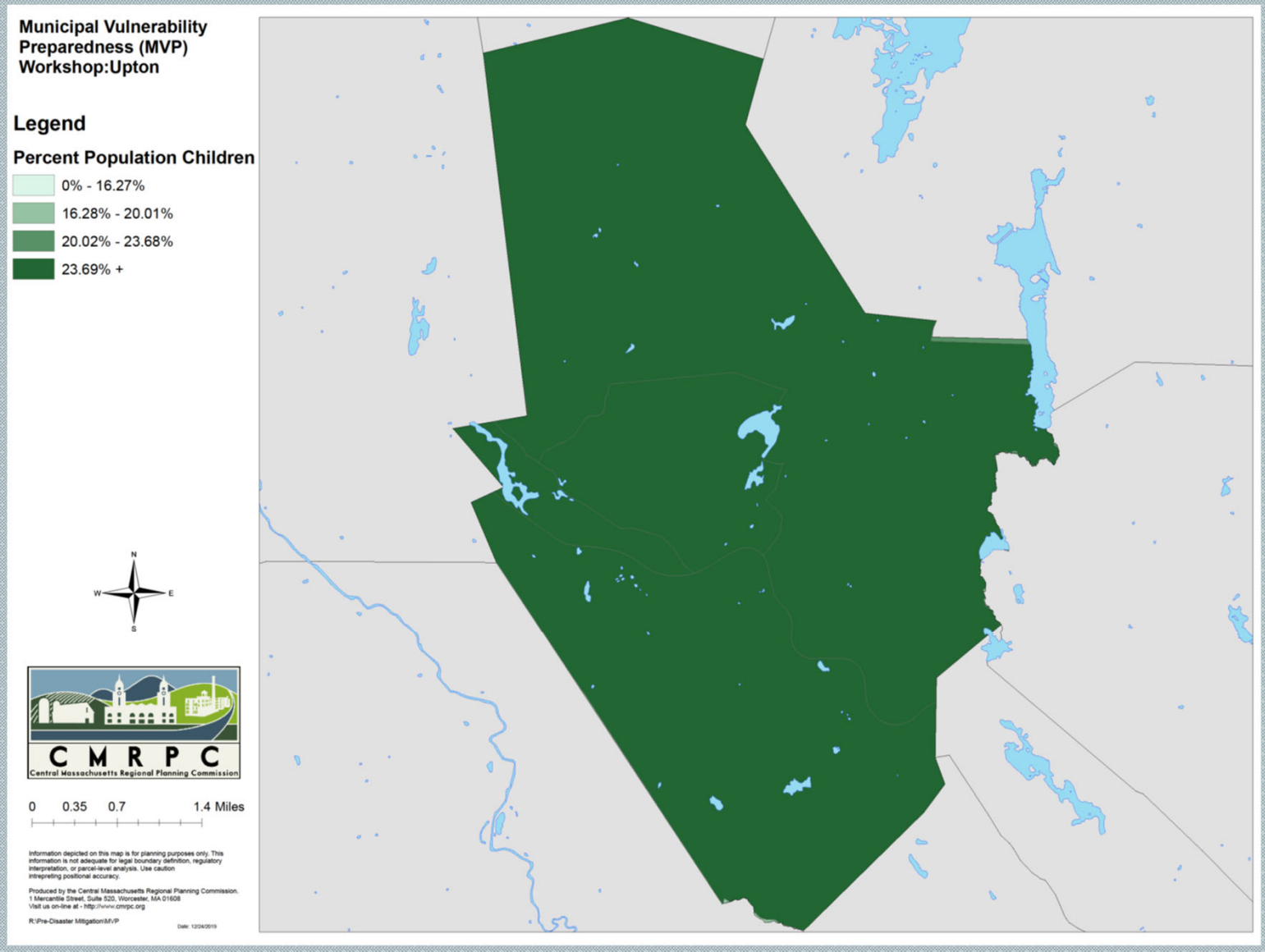
VULNERABLE POPULATIONS: UNDER AGE 18



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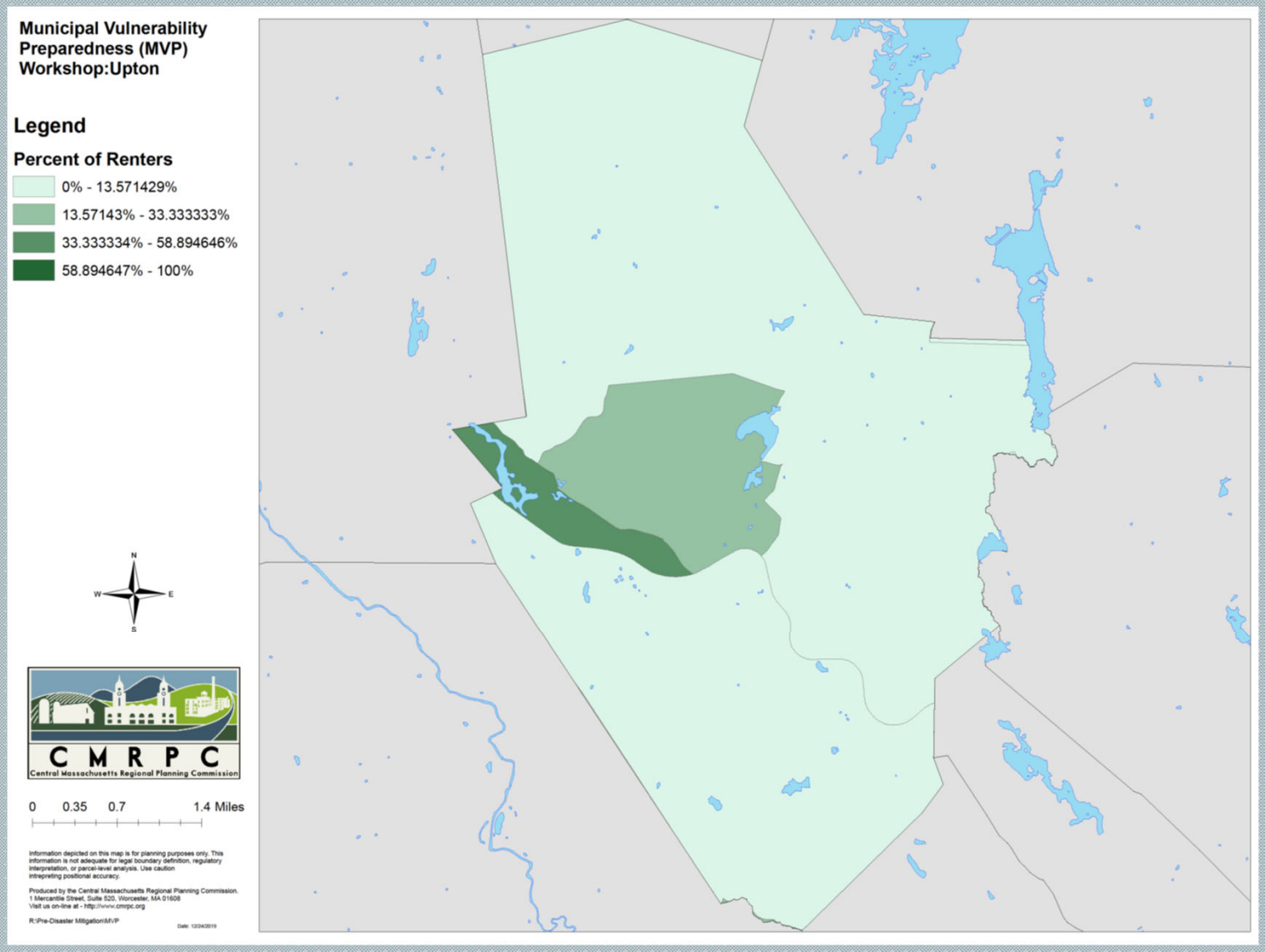
VULNERABLE POPULATIONS: RENTER OCCUPIED



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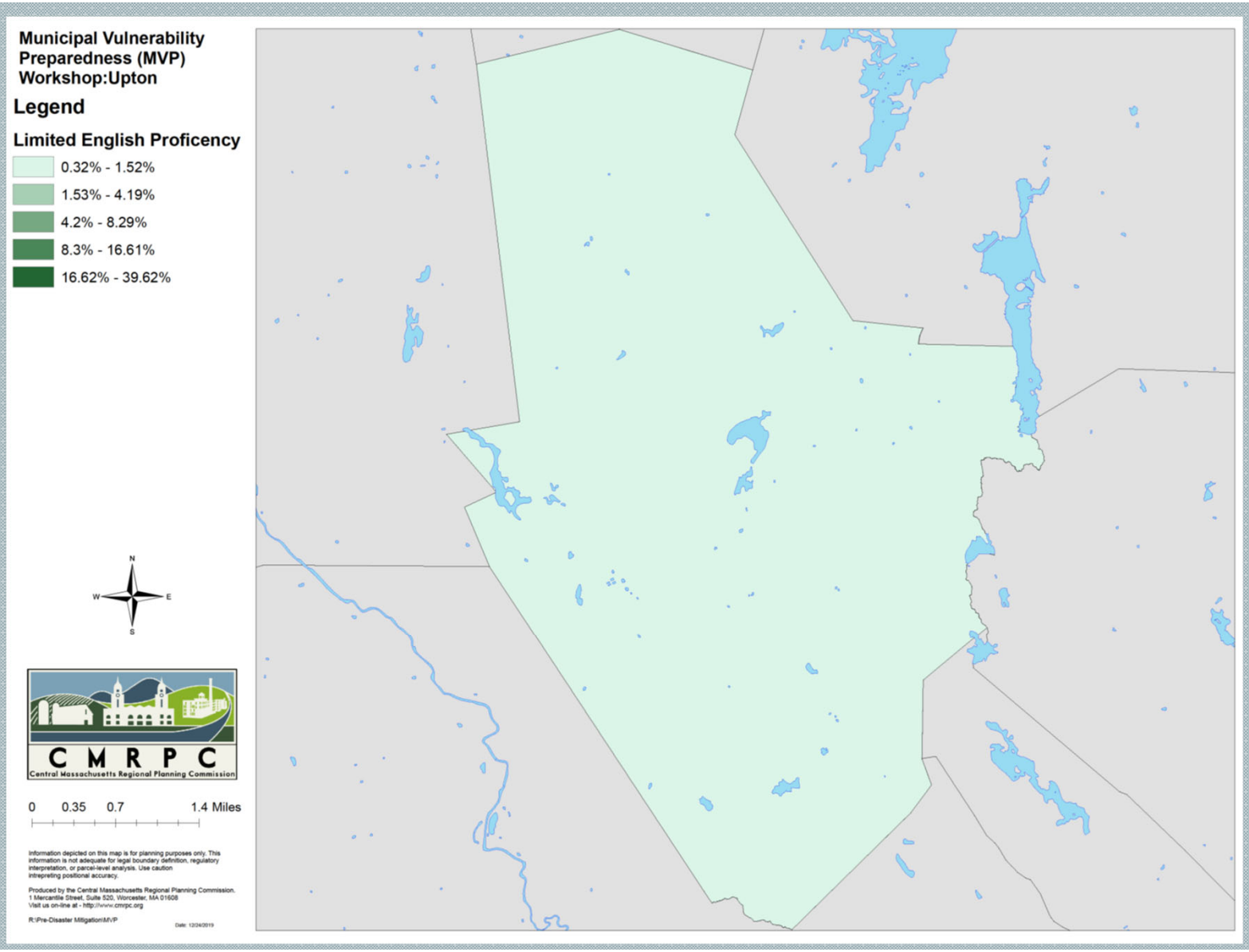
VULNERABLE POPULATIONS: LATINO/HISPANIC



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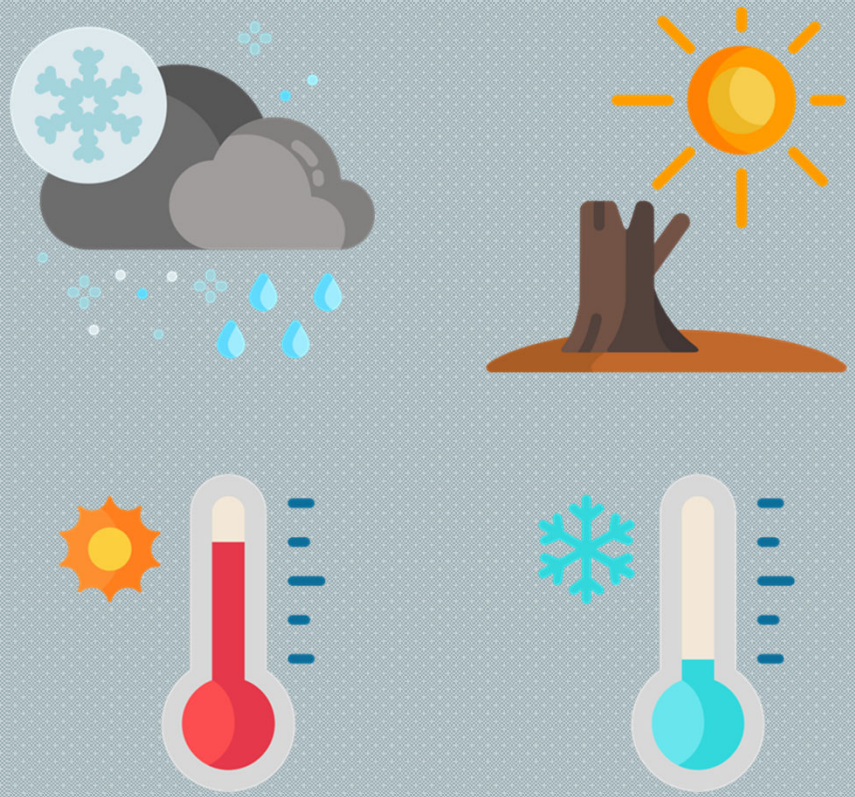
QUESTIONS



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UPTON CLIMATE IMPACTS PRESENTATION

CLIMATE PROJECTIONS AND IMPACTS

1. Engage Community
2. Identify CC Impacts & Hazards
3. Complete Assessment of Vulnerabilities & Strengths
4. Develop & Prioritize Actions
5. Take Action

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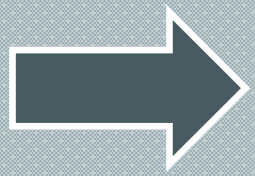
CLIMATE CHANGE PROJECTIONS

Climate projections

- Precipitation
  - Annual
  - Large events
  - Changes in "___ year storms"
  - Consecutive dry days
- Temperature



Natural Hazards

- Winter Storms
- Heavy Rainfall and Flooding
- Drought, Wildfire, and Heat

EXAMPLES OF IMPACTS OF CLIMATE CHANGE

Infrastructure

- **Transportation -** Increased precipitation and flooding can disrupt traffic, delay construction, and wash out soil and culverts that support roads, tunnels, and bridges.
- **Energy -** Increase in summer peak electricity demand in most regions of the United States.

Societal

- **Agriculture -** Impact on crops from more extreme temperature and precipitation
- **Human Health -** More frequent, extreme and longer heat waves will impact vulnerable populations.

Environment

- **Ecosystems -** Impacts such as range shifts, habitat loss, more pests and more invasive species

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OUR CLIMATE IS ALREADY CHANGING

Temperature:		**3° F Since 1895**
Growing Season:		**11 Days Since 1895**
Sea Level Rise:		**8 inches Since 1900**
Strong Storms:		**55% Since 1958**

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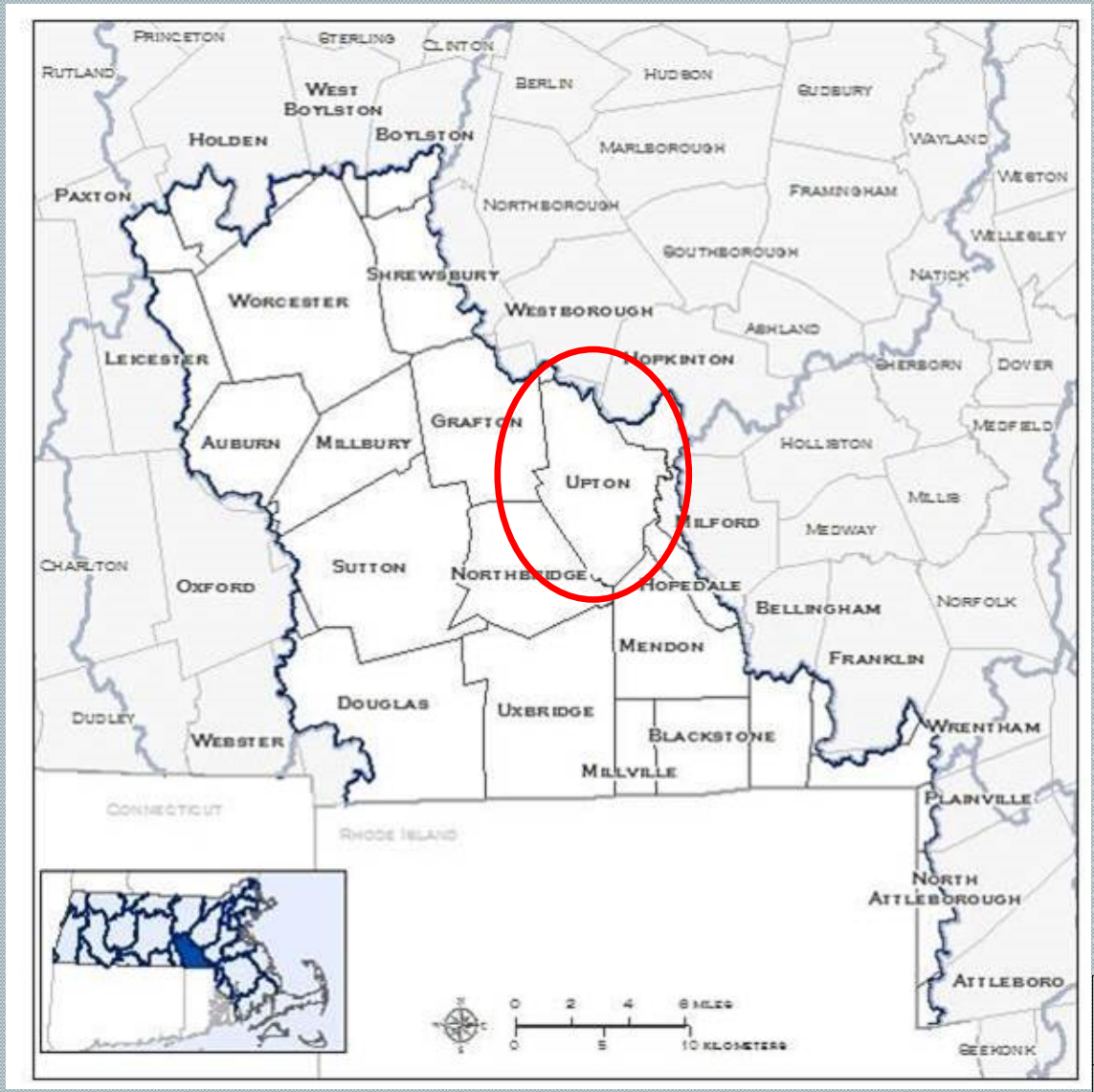
NORTHEAST CLIMATE SCIENCE CENTER UMASS AMHERST

NECASC
Northeast Climate Adaptation Science Center

- NECASC downscaled climate projections for major drainage basins
- Climate Models from the IPCC Fifth Assessment Report
- Historical Data 1971-2000
- Medium and High Emission Scenarios were Chosen (RCP 4.5 and 8.5)
  - Medium Scenario Assumes Emissions Peak at Mid-Century
  - High Scenario Assumes a Continuing Emission Trajectory

BLACKSTONE RIVER BASIN



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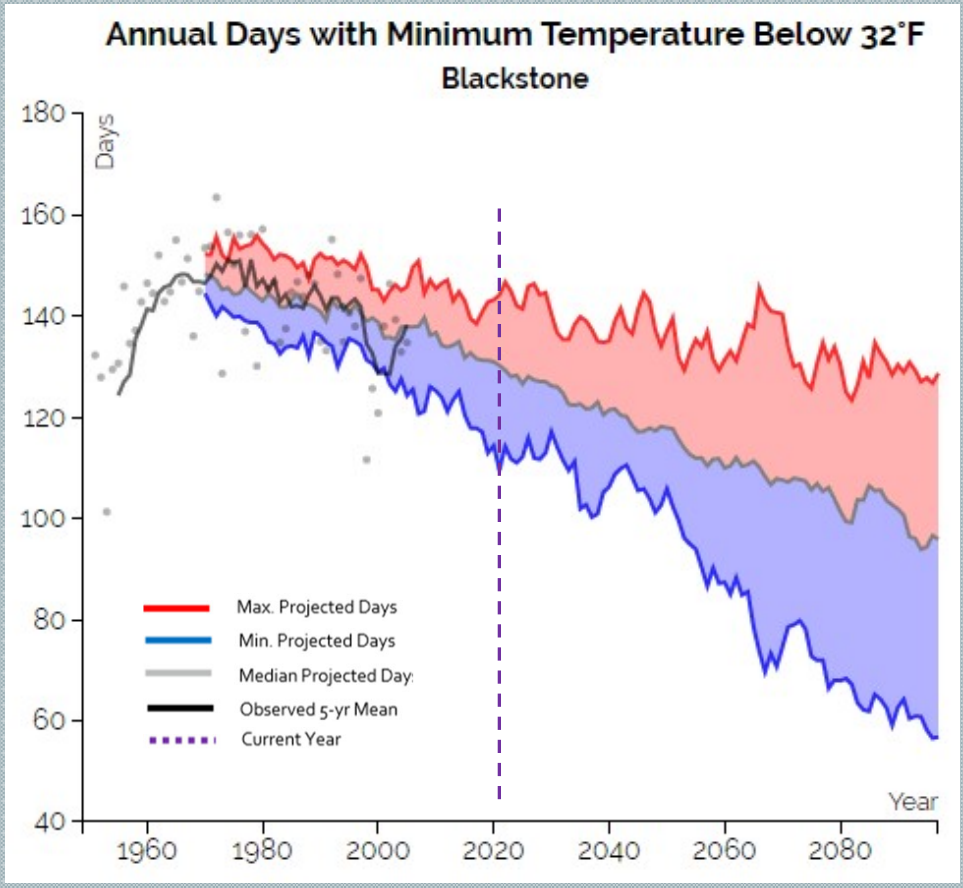
WINTER STORMS

- Annual days below freezing will decrease
- Rising temps → more winter precipitation to fall as rain or freezing rain
- Lower snowfall accumulation
- Winter - Highest projected increase in precipitation
- Storms that do occur may be worse - proximity to Atlantic Ocean increases risk of large storm events



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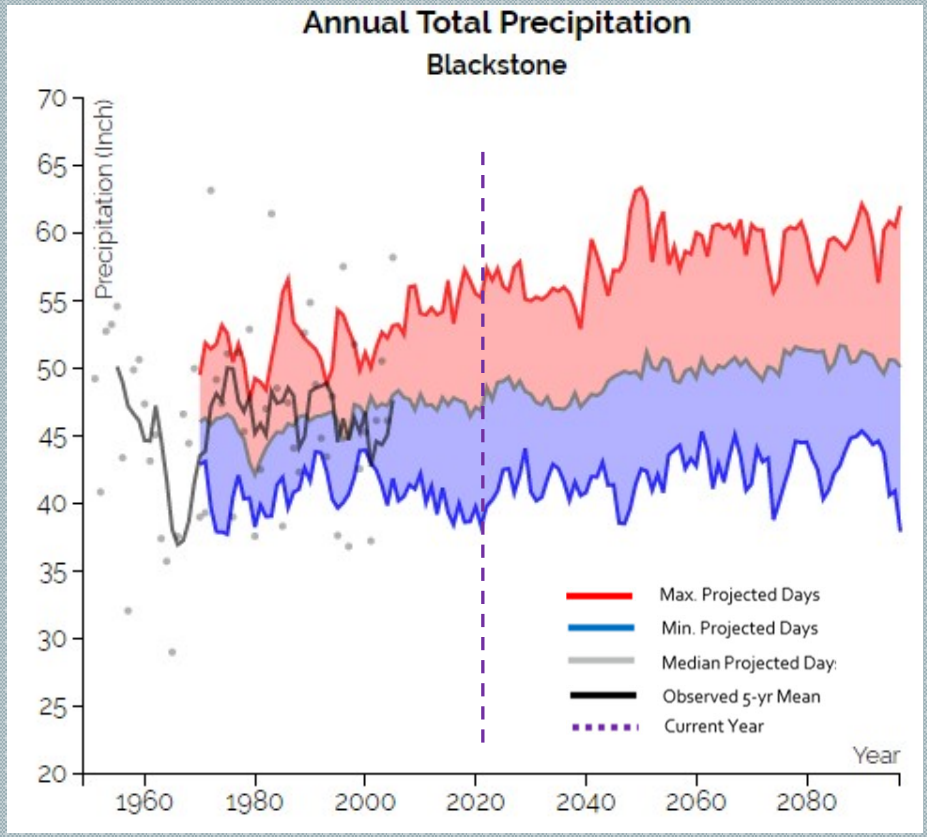
HEAVY RAINFALL AND FLOODING

Seasonal

- **Winter** – Largest increase expected, up to .6 to 3.9 inches by end of century
- **Spring** – Expected increase of .2 to 2.8 inches by end of century
- **Summer** – Possible decrease of 1.2 inches to increase of 2.0 inches by end of century
- **Fall** – Possible decrease of 1.7 inches to increase of 1.5 inches by end of century



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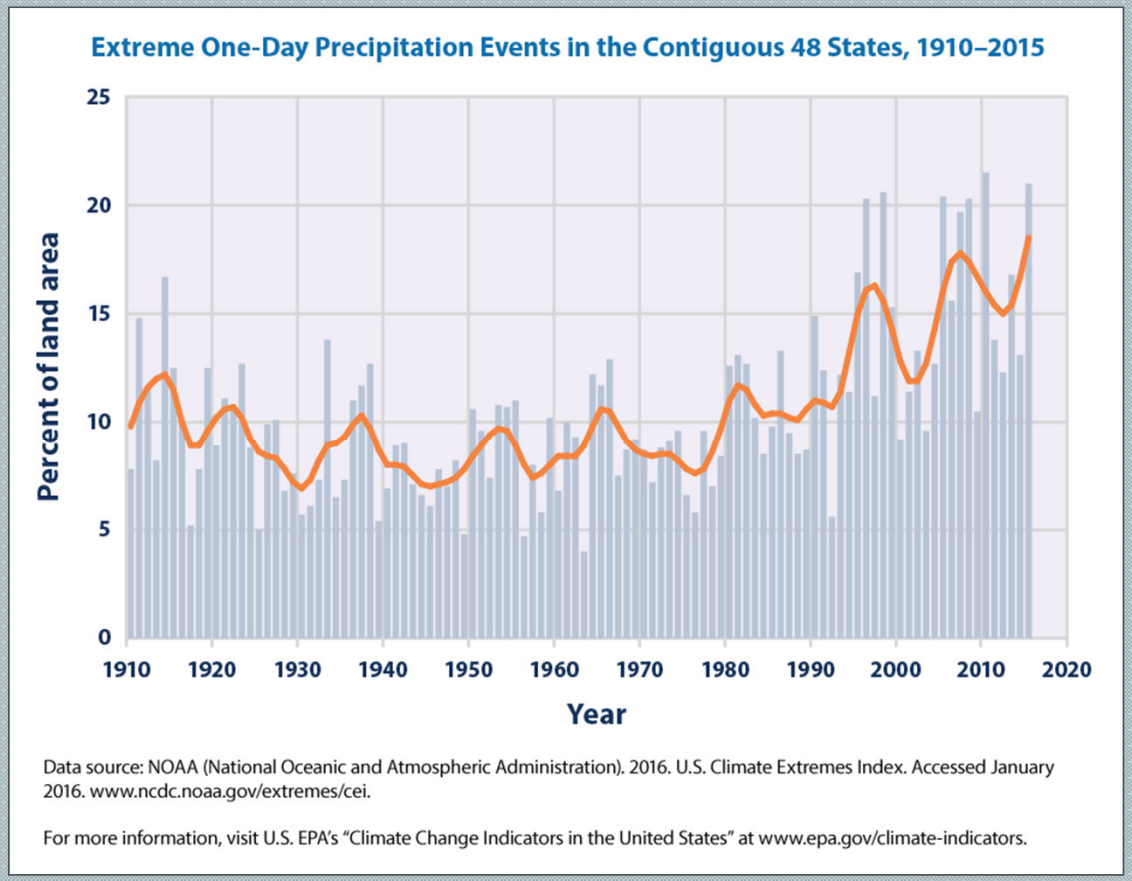
HEAVY RAINFALL AND FLOODING

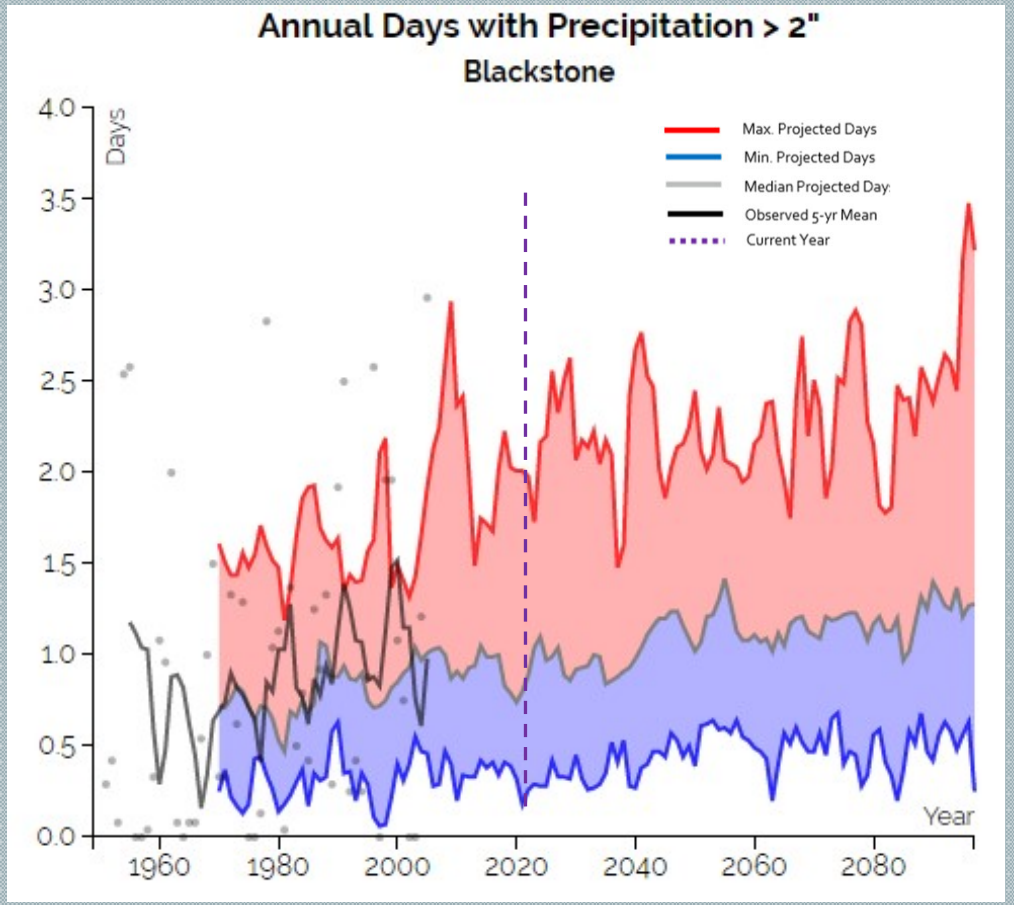
- Precipitation will increase across all seasons
- Total annual rainfall will increase
- Heavy rainfall events will become more frequent
  - Overbank flooding from rainfall and snowmelt
  - Piped Infrastructure backup and or failure
- Water quality impact from flooding
  - Erosion
  - Nonpoint source pollution



HEAVY RAINFALL AND FLOODING

Extreme Precipitation

- The number of days each year with more than 2 inches of precipitation will increase.



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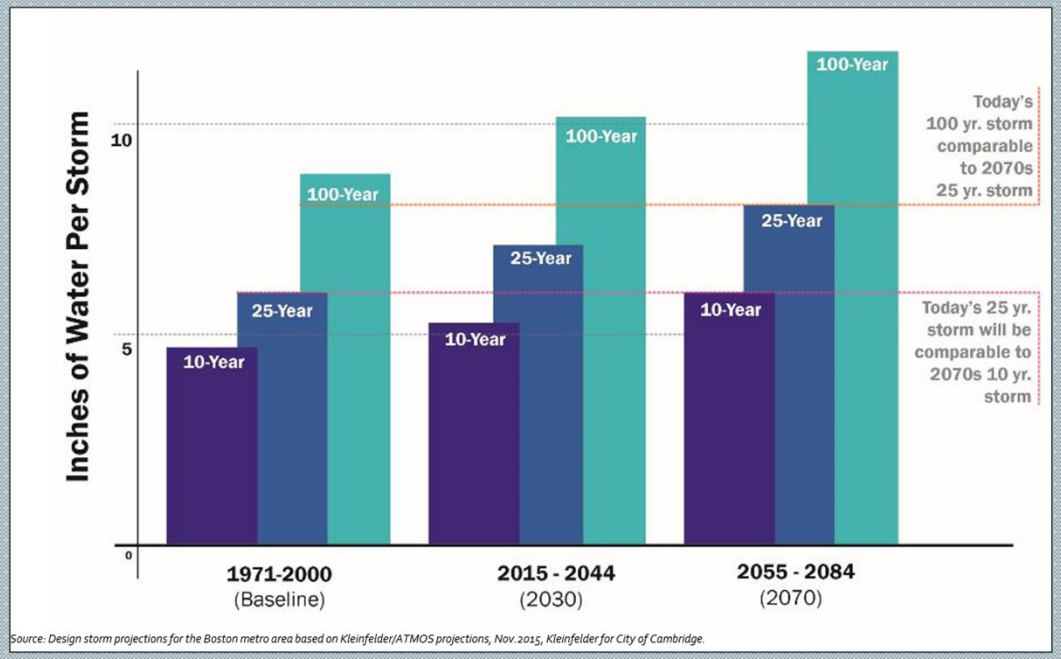
HEAVY RAINFALL AND FLOODING



Source: Design storm projections for the Boston metro area based on Kleinfelder/ATMOS projections, Nov.2015, Kleinfelder for City of Cambridge.

Icon made by photo3idea_studio from Flaticon.com

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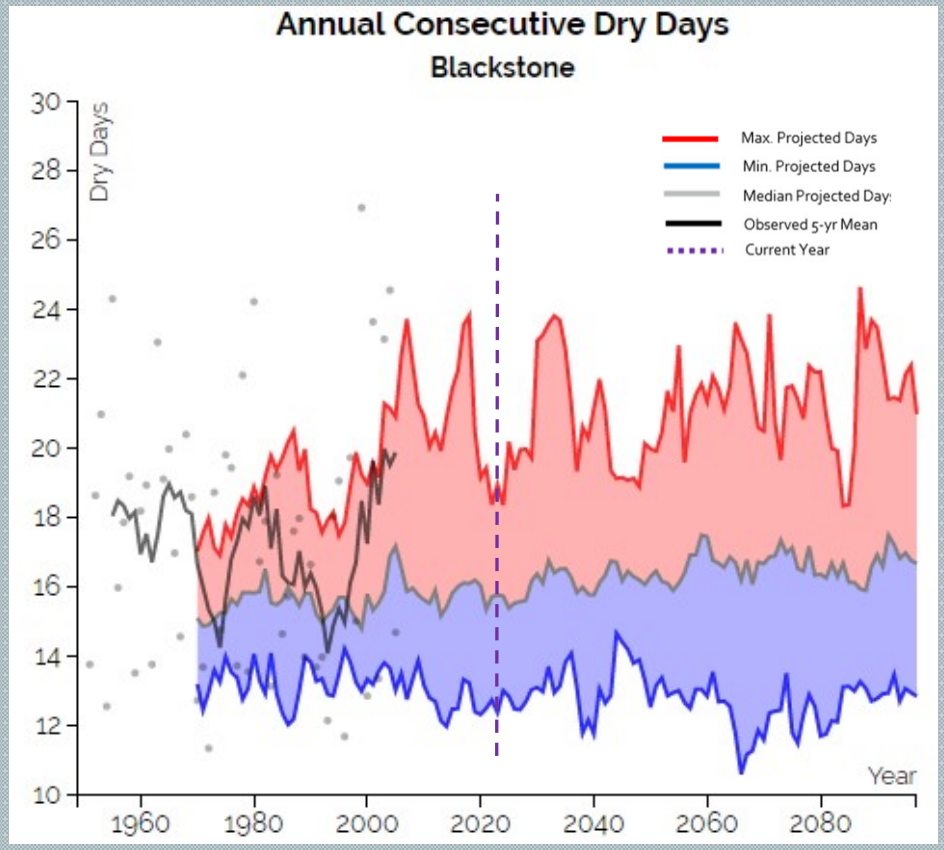
IMPACTS OF INCREASED PRECIPITATION

- More disruptive flooding events, especially with undersize stormwater infrastructure
  - Increased inland flooding
  - Soils become saturated
  - River flows rise
  - Capacity of urban SW infrastructure is exceeded
  - Impacts to property and critical infrastructure
- Increased non-point source pollution
  - Ecological damage to nearby waterbodies

DROUGHT IMPACTS

- More consecutive dry days
- Highest number of consecutive dry days in summer and fall.
- Increase of up to 3 additional consecutive dry days by the end of the century



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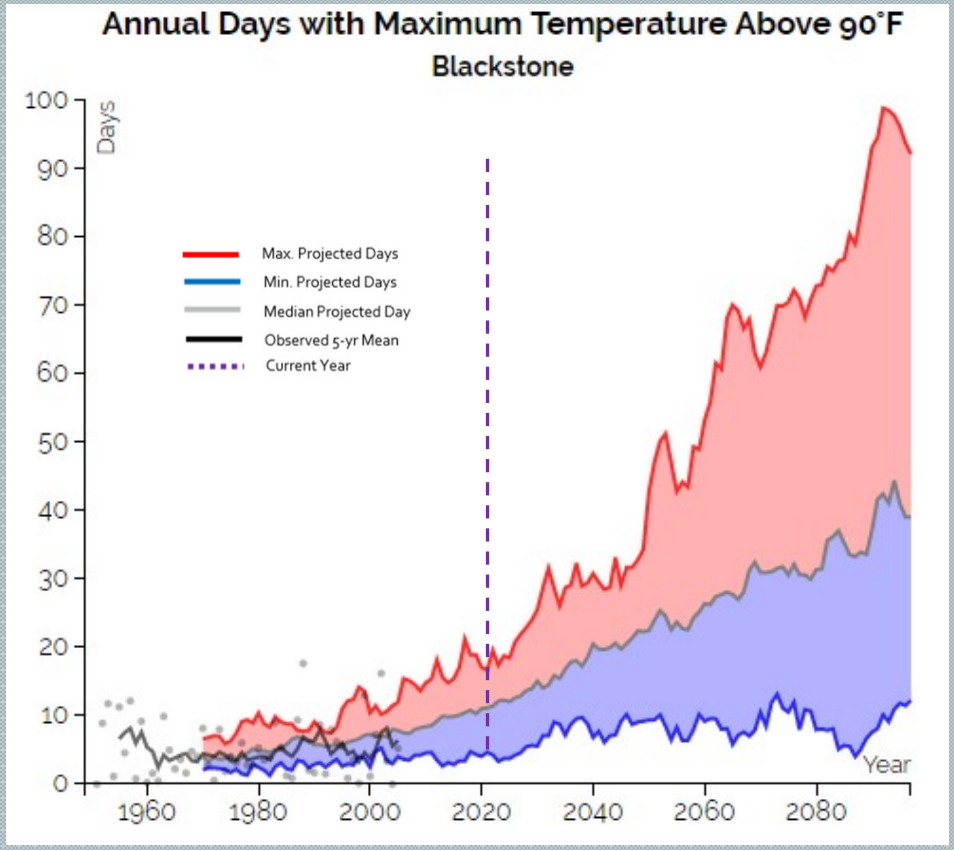
HEAT PROJECTIONS

- Projected increase of 8 to 29 days annually over 90°F by mid century
- Projected increase of 11 to 69 days annually over 90°F by end of century



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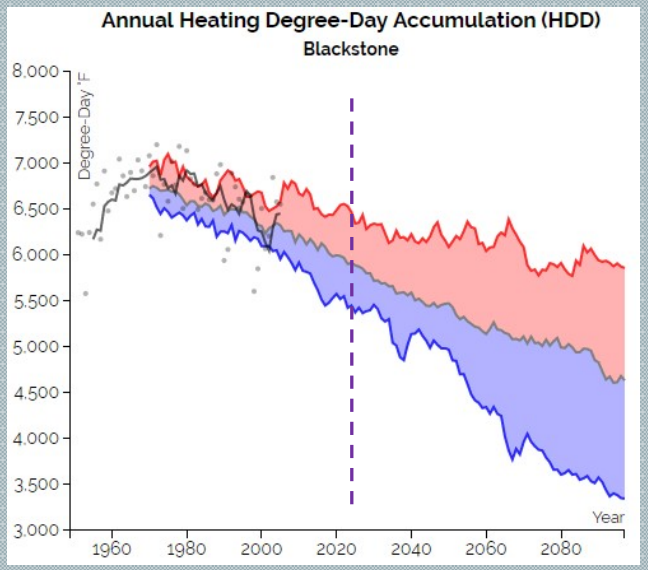
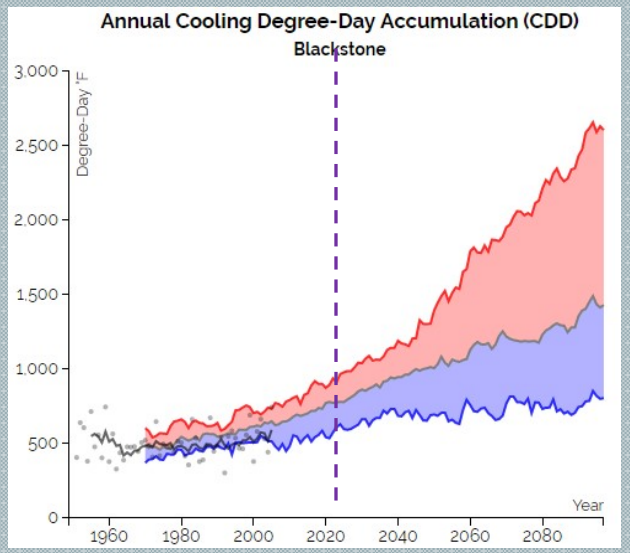
HEAT PROJECTIONS

- Projected decrease in heating degree-days and increase in cooling-degree days
- More days above 65˚F means fewer days needed to heat buildings and more days needed to cool buildings.
- Winter
  - 7-19% decrease in HDD by mid century
- Spring
  - 10-24% decrease in HDD by mid century
- Fall
  - 20-33% decrease in HDD by mid century





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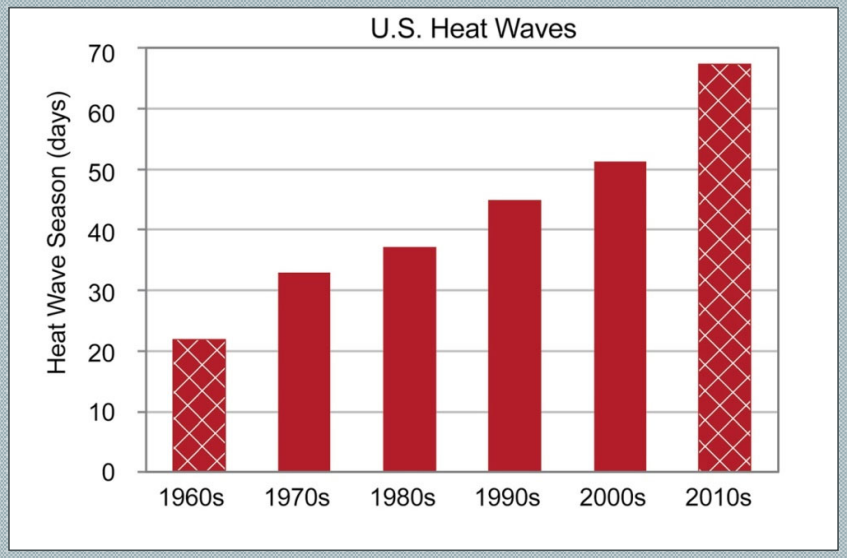
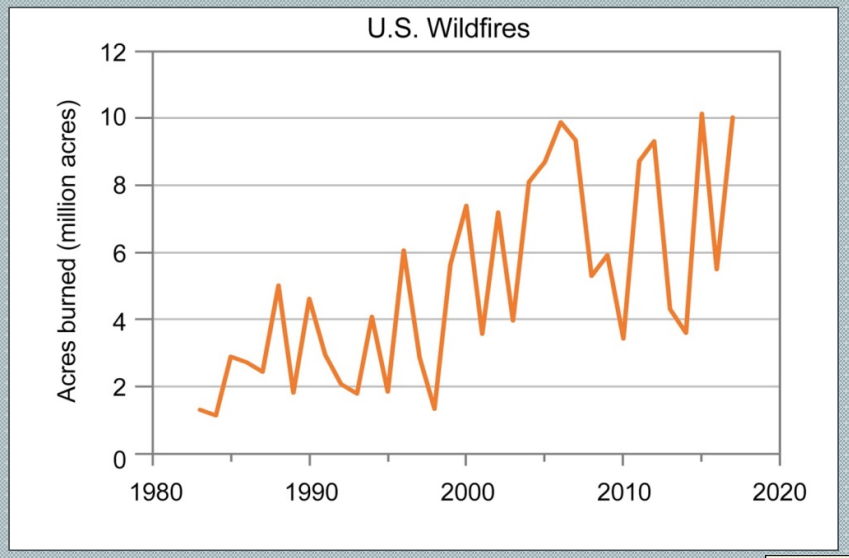
HEAT AND WILDFIRE

Nation-Wide Data

As the number and length of heat waves increase, so will the incidence of wildfires.





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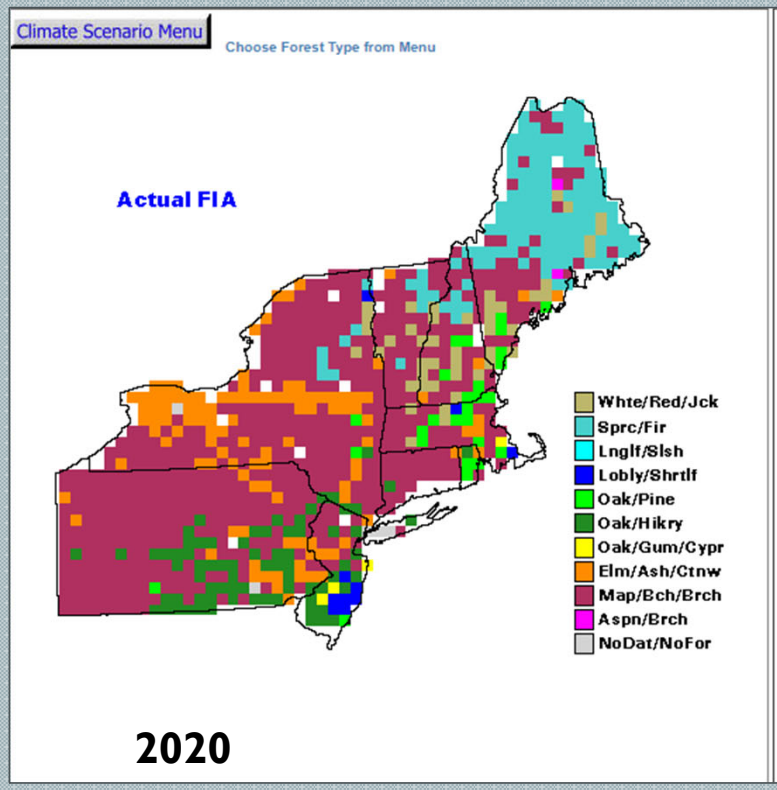
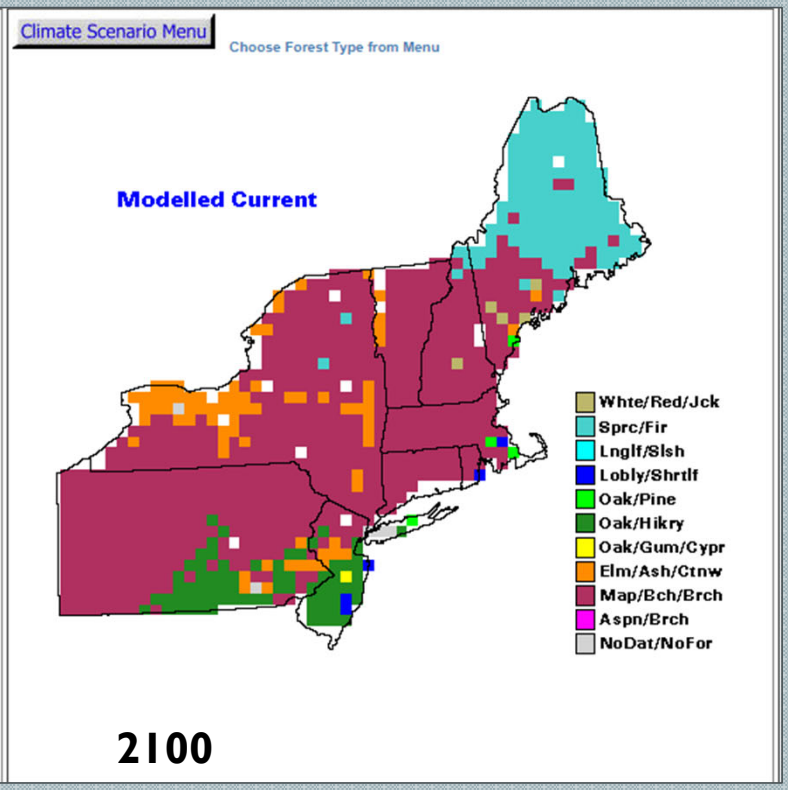
HEAT IMPACTS ON THE ENVIRONMENT

- Ranges of tree species are expected to move north
- Diversity of species will decrease
- Increases of invasive species are likely





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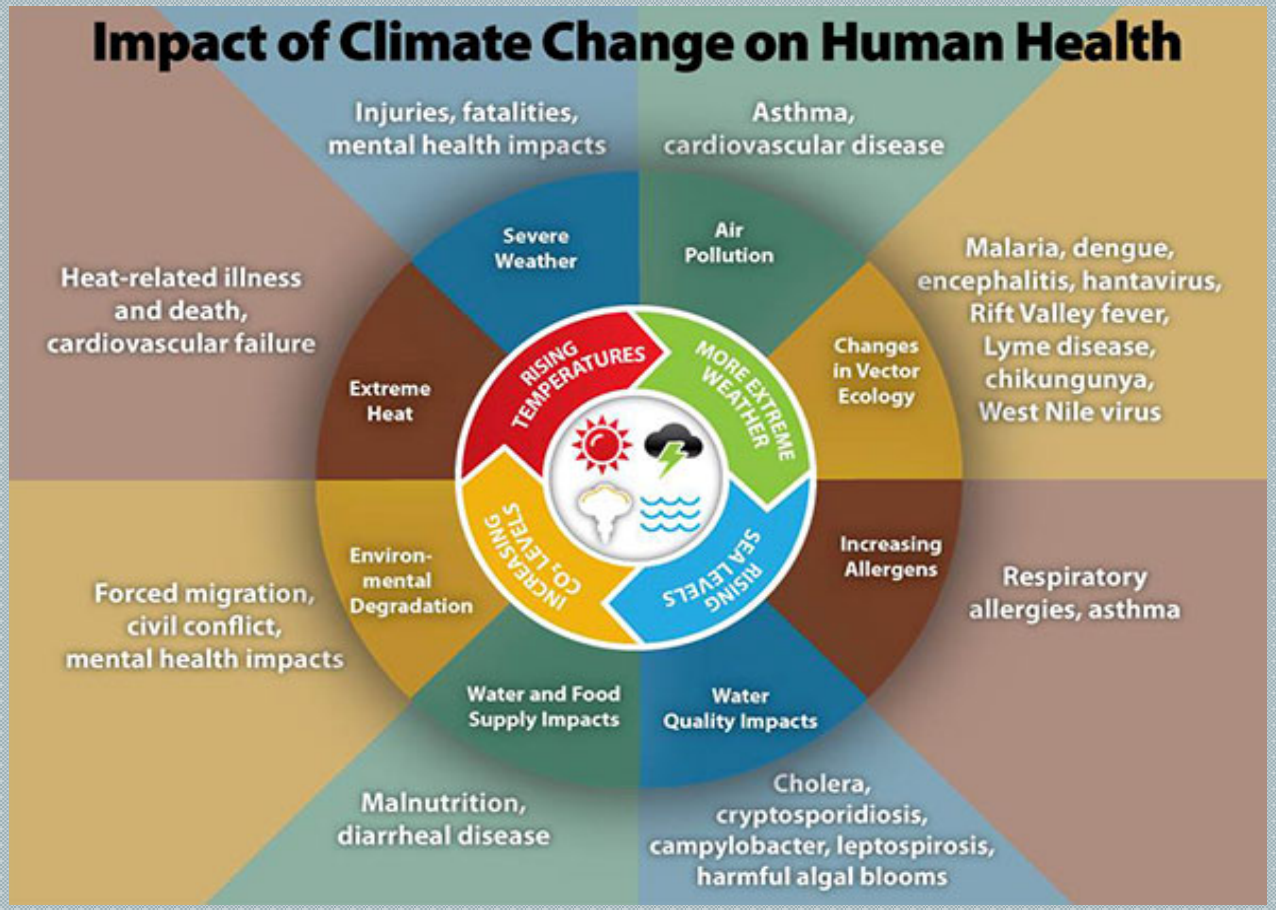
HEAT IMPACTS ON SOCIETY



https://www.cdc.gov/climateandhealth/effects/default.htm

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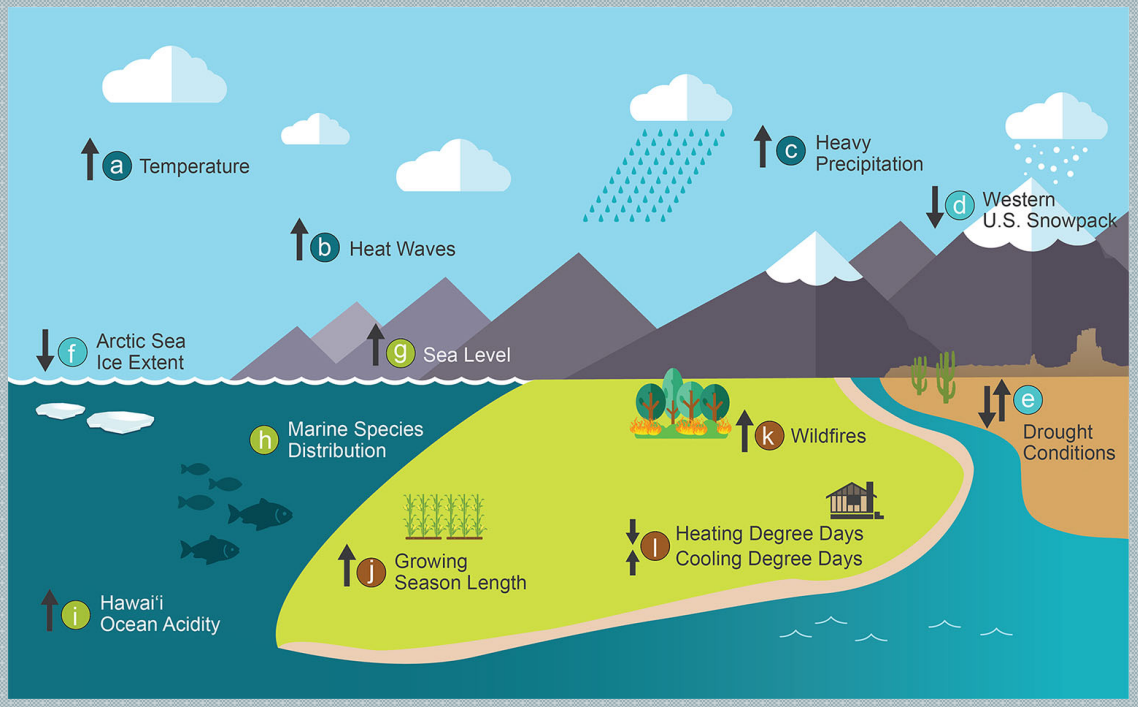
QUESTIONS OR COMMENTS?



mkaplan@cmprc.org

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MVP WORKSHOP DAY #1 PRESENTATION

TOWN OF UPTON

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building

Virtual Workshop

February 18th , 25th 6 – 8 PM
March 4th 4 – 6PM

Day 1 – February 18th

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Thank You for Your Participation in Upton's Municipal Vulnerability Preparedness (MVP) Program!

The Town of Upton is collaborating with EOEEA and CMRPC to offer a three-day virtual workshop on ***Thursday, February 18th and 25th from 6 – 8PM, and Thursday, March 4th from 4 – 6PM*** which will bring together community members to comprehensively identify and prioritize steps to reduce risk and improve resilience across Upton. Follow the instructions below in order to help make your community more climate resilient! If you have any questions about the program, please contact Upton Town Planner Paul Dell'Aquila at PDellAquila@uptonma.gov. We look forward to seeing you virtually at our workshop!

Step 1. Discover Upton's MVP Dropbox

The resources included in this invitation will help you learn more about the MVP program and prepare you for the upcoming workshop. All of these resources and more can be found in the following Dropbox link. If possible, you will want to have this Dropbox link open during the workshop so that you can easily access this information.

Workshop Dropbox: https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoll8Xw2ng3p1PP4a?dl=0

Step 2. Review the Program Overview and Workshop Guide

The following two documents will give you an overview of the MVP program and will describe a typical Community Resiliency Building (CRB) workshop.

MVP Program Overview: https://www.dropbox.com/s/n2ounjr2di1mhot/MVP%20Program%20Info_Updated%202019.pdf?dl=0

CRB Workbook: https://www.dropbox.com/s/n2r0xkza3xd3uj8/CRB%20Workshop%20Guide.pdf?dl=0

Step 3. Watch the MVP Presentations Prior to Workshop

The following link contains pre-recorded presentations that will help you be better prepared for the MVP workshop. The presentations include an overview of the program and the MVP process, climate projections and hazards that Upton may face in the future, and instructions on how to use the CRB Matrix. Please take some time to **review each of these presentations before February 18th**.

Presentations: https://www.dropbox.com/sh/7afmbw2ytqy3wvy/AAAfW4BM62rOH7VMVSmpxHk7a?dl=0

Step 4. Familiarize Yourself with the Matrix and Maps

During the virtual workshop, we will divide up into breakout groups to discuss strengths, vulnerabilities, and possible actions that the town can take. During this process, we will be filling out a matrix and marking up maps with our ideas. The following links will show you an example of a completed matrix, and will give you a set of pre-made maps that already display various features, hazards, and resources in Upton.

Complete Matrix Example:
https://www.dropbox.com/s/qkfuc9f518yfna8/Completed%20Matrix%20Example.pdf?dl=0

Maps: https://www.dropbox.com/sh/r8szf7v700k0fd4/AAAlpCz7mVb-xeTyptvPbVzGa?dl=0

Step 5. Attend the Workshop!

The 3-day workshop will be held on ***Thursday, February 18th and 25th from 6 – 8PM, and Thursday, March 4th from 4 – 6PM***. The agenda for each day as well as the Zoom meeting links are listed below. Please review the agenda for each day and use the meeting links to join the Zoom.

Agenda Day 1: https://www.dropbox.com/s/9ut2fapfn94f8u2/Workshop%20%231%20Agenda.pdf?dl=0
Zoom Link Day 1: https://us02web.zoom.us/j/82288750894?pwd=RHFsa3E2amZQMHhPRGtDVkovU2ViZz09
Agenda Day 2: https://www.dropbox.com/s/22hvrukn1sqyxo7/Workshop%20%232%20Agenda.pdf?dl=0
Zoom Link Day 2: https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09
Agenda Day 3: https://www.dropbox.com/s/tez7vqhdn7y6le2/Workshop%20%233%20Agenda.pdf?dl=0
Zoom Link Day 3: https://us02web.zoom.us/j/88968050853?pwd=bDJFZmx6SFcwNnBXVEFQWXdUWkJnZz09

Learn How to Zoom

New to Zoom? The following document contains a series of instructional videos to help guide you through Zoom from downloading the app to joining a meeting for the first time.

https://www.dropbox.com/s/z7sks13hjk0rz84/How%20To%20Zoom.pdf?dl=0

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Community Resiliency Building Workshop

Town of Upton
Municipal Vulnerability Preparedness
Day 1- Thursday, February 18, 2021
6:00 pm – 8:00 pm; Check-in at 5:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09

Meeting ID: 820 3531 5333
Passcode: 066525

Call in Number (if unable to join online): +1 646 558 8656

Workshop Materials:
https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoll8Xw2ng3p1PP4a?dl=0

Workshop Agenda

5:45 pm – 6:00 pm:
- Login & Familiarize with Zoom

6:00 pm – 6:15 pm:
- Welcome & Overview
- Questions & Answers

6:15 pm – 7:40 pm:
- Breakout Groups
  - Identify Hazards & Local Features
  - Discuss Strengths & Vulnerabilities

7:40 pm – 8:00 pm:
- Reconvene as Large Group
- Quick Table Summary
- Closing Remarks & Wrap Up

Day 1: Workshop Objectives

- Define extreme weather and climate related hazards;
- Identify current and future vulnerabilities and strengths;
- Edit online map with important hazards and features

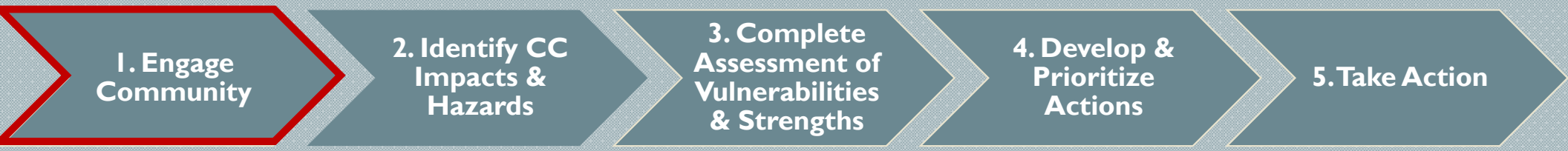
Homework

- Review hazards, vulnerabilities, and strengths in matrix
- Brainstorm actions to address vulnerabilities

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

MUNICIPAL VULNERABILITY PREPAREDNESS (MVP)

- State grant program to support cities and towns to begin the process of planning for climate resiliency.
- MVP Planning Process includes CRB Workshop, Report, Listening Session and Annual Reporting
- Communities who complete the MVP Planning Process become certified as an MVP Community
- Designated communities become eligible for MVP Action Grant funding



CLIMATE RESILIENCE

- is defined as the ability of a community to address the needs of its built, social, and natural environment in order to anticipate, cope with, and rebound stronger from events and trends related to climate change hazards, including temperature changes, extreme weather, sea level rise, coastal and inland flooding, changes in precipitation, and other impacts.

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TABLE ROLES AND RESPONSIBILITIES

- Table Facilitator directs the discussion and keeps the dialogue moving
- Scribes filling in matrix
- Participants- All of you
- CMRPC resource person
- Table spokesperson for Report Out

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THE MATRIX

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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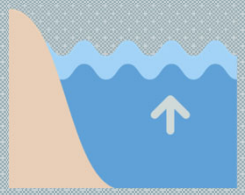
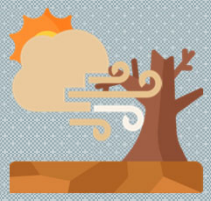
STEP ONE: HAZARD IDENTIFICATION



- **Flooding**
  - Riverine
  - Street

- **Landslides**
- **Mudslides**

- **Tornadoes**



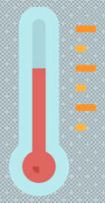
- **Drought**
- **Dust Storms**

- **Tsunami**

- **Hurricanes/ Nor'easters**

- **Wild Fires**

- **Winter Storms**
  - **Snow**
  - **Ice**



- **Extreme Temperatures**
  - **Heat**
  - **Cold**

Icons made by freepik, goodware, smashicons, those icons, icongeek26 and iconicar from Flaticon.com

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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PRIMARY TOPIC AREAS

- Infrastructure
- Society
- Environment

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STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

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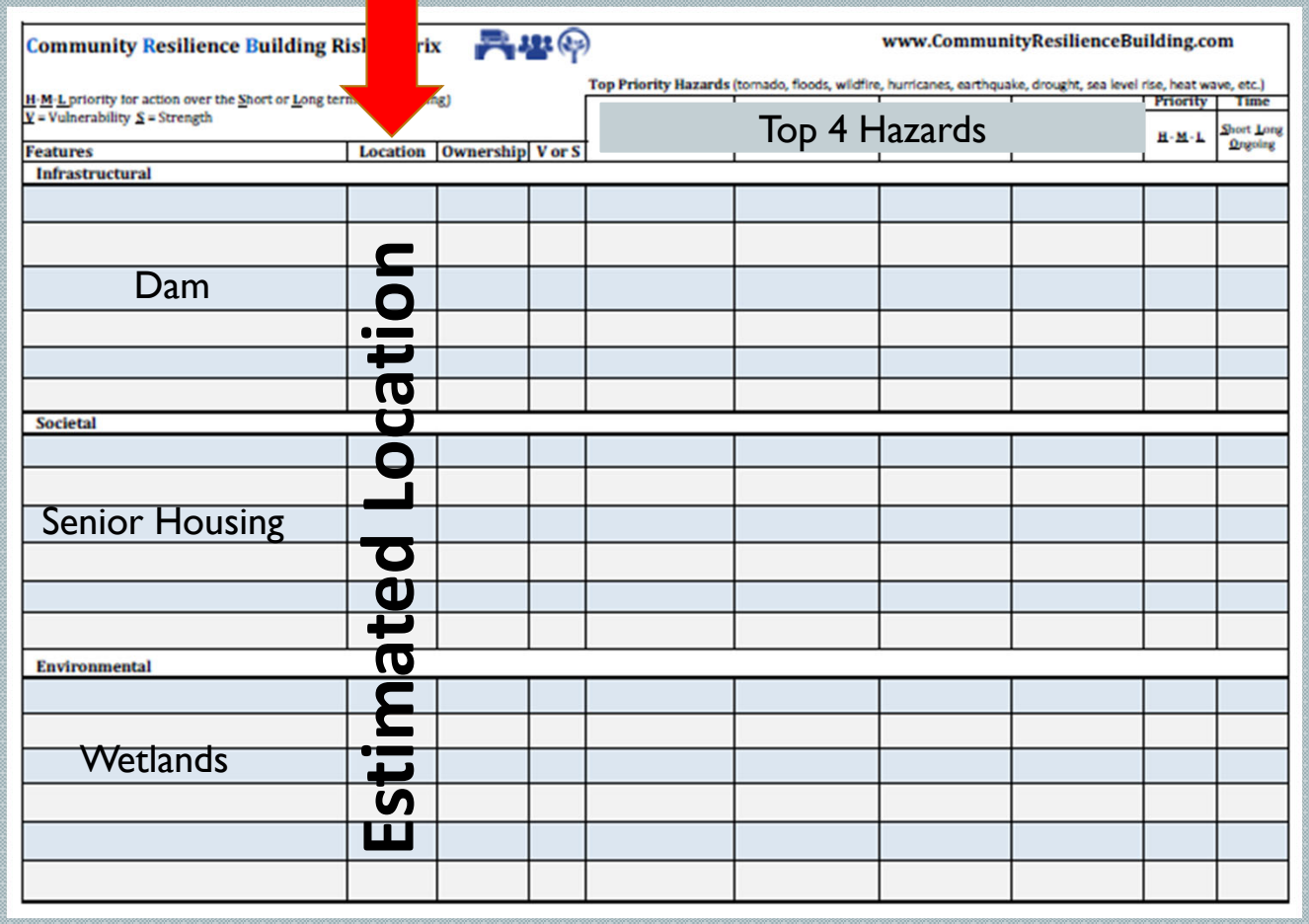
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES

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Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

Public? Private? State?

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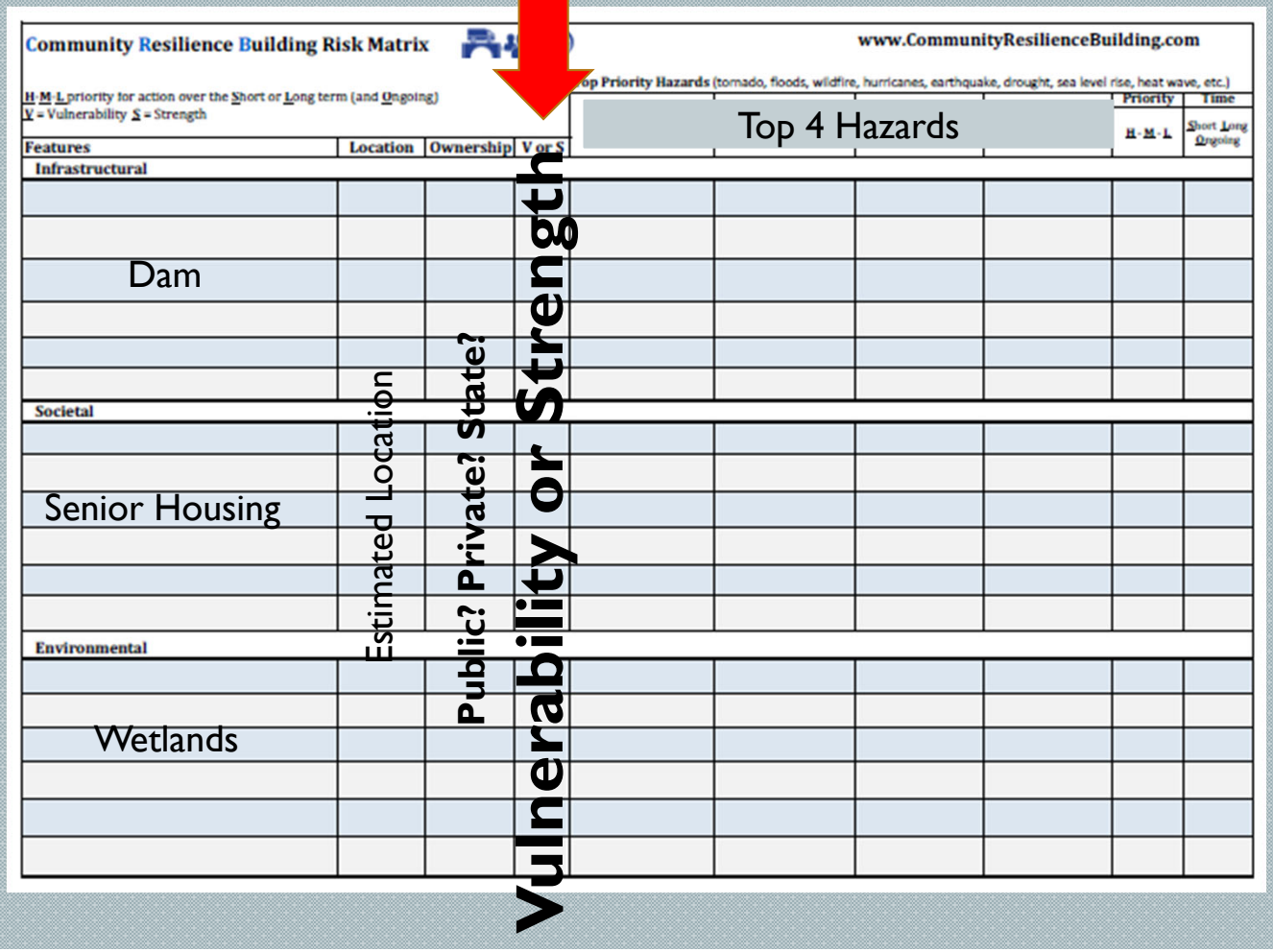
STEP TWO: WHAT, WHERE, WHO AND VULNERABILITIES



Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Dam									
Societal									
Senior Housing									
Environmental									
Wetlands									

Estimated Location

Public? Private? State?

Vulnerability or Strength

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BREAK OUT GROUP: FIRST MEETING

- Step 1- Fill in top 4 Natural Hazards
  - *Drought/ Wind Events/ Flooding/Winter Storms*
- Step 2- Identify key features
    - Infrastructure- Dams
    - Societal- Senior Housing
    - Environmental- Wetlands
  - Where is the Feature Located
  - Identify ownership (Public, Private…)
  - Identify vulnerability, strength or both

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QUESTIONS

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TIME TO GET TO WORK

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NEXT STEPS

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Community Resiliency Building Workshop

Town of Upton
Municipal Vulnerability Preparedness
Day 2- Thursday, February 25, 2021
6:00 pm – 8:00 pm; Check-in at 5:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09

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- Welcome & Recap from Day 1
- Questions & Answers

6:15 pm – 7:40 pm:
- Breakout Groups
  - Identify Actions to Reduce Risks and Build Resilience
  - Prioritize Actions by Urgency and Timing

7:40 pm – 8:00 pm
- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Brainstorm additional actions to address vulnerabilities
- Attend Day 3 Workshop

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

QUESTIONS

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sadams@cmrpc.org

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MVP WORKSHOP DAY #2 PRESENTATION

TOWN OF UPTON

Municipal Vulnerability Preparedness (MVP)

Community Resilience Building

Virtual Workshop

February 18th , 25th 6 – 8 PM
March 4th 4 – 6PM

Day 2 – February 25th

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Community Resiliency Building Workshop

Town of Upton
Municipal Vulnerability Preparedness
Day 2- Thursday, February 25, 2021
6:00 pm – 8:00 pm; Check-in at 5:45 pm

Meeting Link (Click to Join):
https://us02web.zoom.us/j/82035315333?pwd=V0tQeCsxU3B2dk43SUYxYS90MVdHQT09

Meeting ID: 820 3531 5333
Passcode: 066525

Call in Number (if unable to join online): +1 646 558 8656

Workshop Materials:
https://www.dropbox.com/sh/gv5ob1t732zad99/AABjqOipkoll8Xw2ng3p1PP4a?dl=0

Workshop Agenda

5:45 pm – 6:00 pm:
- Login & Familiarize with Zoom

6:00 pm – 6:15 pm:
- Welcome & Recap from Day 1
- Questions & Answers

6:15 pm – 7:40 pm:
- Breakout Groups
  - Identify Actions to Reduce Risks and Build Resilience
  - Prioritize Actions by Urgency and Timing

7:40 pm – 8:00 pm
- Reconvene as Large Group
- Table Reports
- Closing Remarks & Wrap Up

Day 2: Workshop Objectives

- Review vulnerabilities and strengths identified on Day 1
- Develop and prioritize actions;
- Identify opportunities for the Town to advance actions and reduce risks to build resilience

Homework

- Review actions to reduce risks and build resilience
- Brainstorm additional actions to address vulnerabilities
- Attend Day 3 Workshop

Thank you for participating in Upton's Virtual Community Resilience Building Workshop!

THE MATRIX

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

Features	Location	Ownership	V or S					Priority H·M·L	Time Short Long Ongoing
Infrastructural									
Societal									
Environmental									

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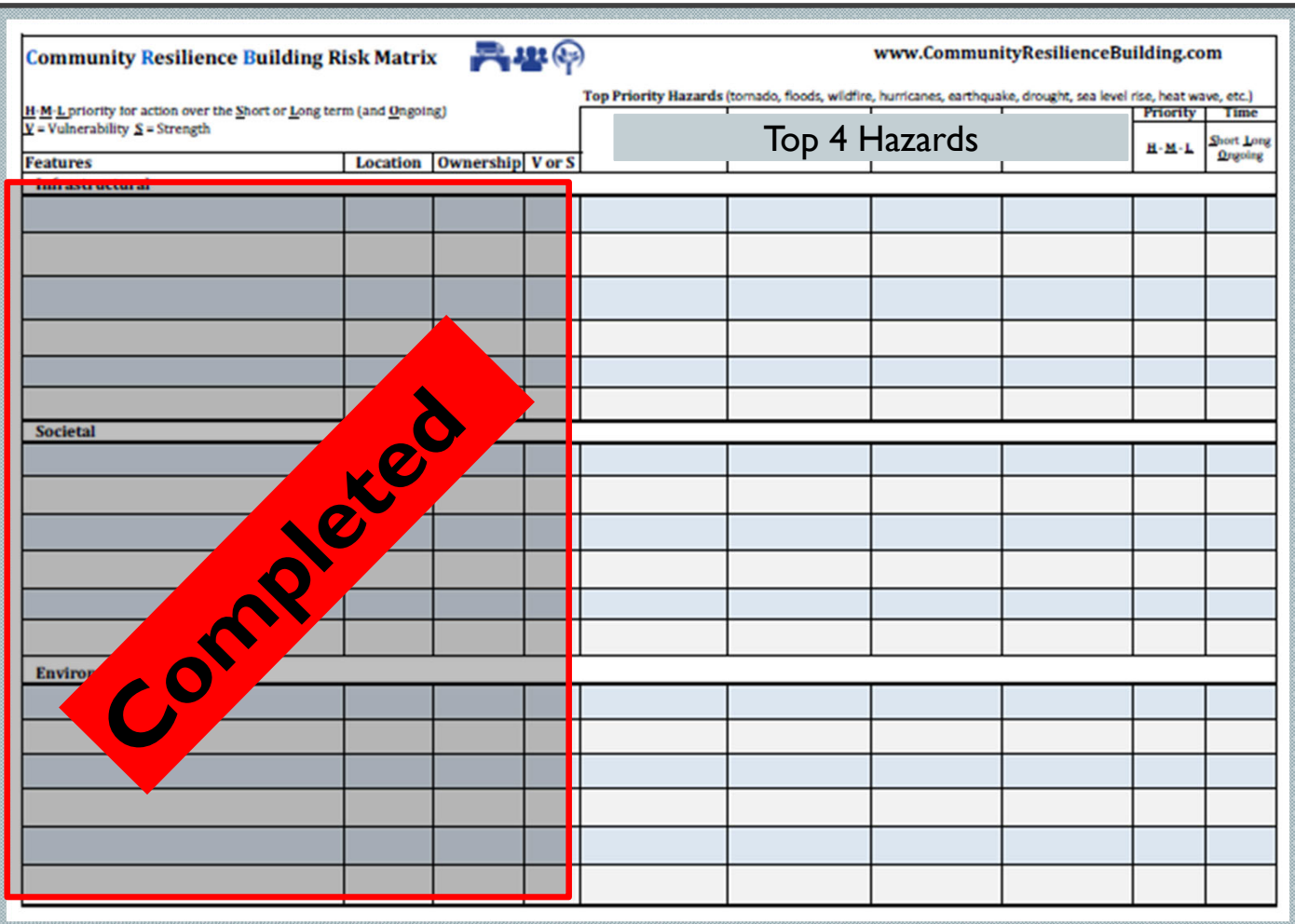
STEP THREE: ACTIONS, PRIORITY AND TIMELINE



Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.com

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

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

Top 4 Hazards

Features	Location	Ownership	V or S					Priority H-M-L	Time Short Long Ongoing
Infrastructural									
Societal									
Environ									

Completed

NATURE BASED SOLUTIONS

- Make use of natural systems
- Mimic the natural processes
- Actions to protect, sustainably manage and restore ecosystems
- Simultaneously providing well-being and biodiversity

International Union for Conservation of Nature (IUCN)

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NATURE BASED SOLUTIONS (LID)

- Natural systems mimic natural processes to absorb and slow runoff and stormwater, and also reduce heat islands.

- Low impact development (LID) designs can be integrated into new development at neighborhood scales and work with traditional approaches

Bioswale between sidewalk and street

Contained bioswale or planter box

Mass Audubon
Shaping the Future of Your Community
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MORE EXAMPLES OF LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE

Green Parking Lots

Permeable Paving

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Example Action Grant Projects

Nature-Based Flood Protection, Drought Mitigation, Water Quality, and Water Infiltration Techniques

Belchertown

Designing and permitting for a replacement water storage tank that would increase storage capacity and resiliency to drought, and completing a feasibility/ concept design of a rainwater harvesting system at Belchertown High School to irrigate the athletic fields.

Nature-based solutions

Pilot potential

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INFRASTRUCTURE PROJECTS

Traditional Culvert

Nature Based Culvert

Mass Audubon

Shaping the Future of Your Community

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Example Action Grant Projects

Land Acquisition for Resilience

Mattapoisett

Purchasing 120 acres of forest, streams, freshwater wetlands and coastal salt marsh as conservation land to prevent development in vulnerable areas

Data Utilization

Proactive

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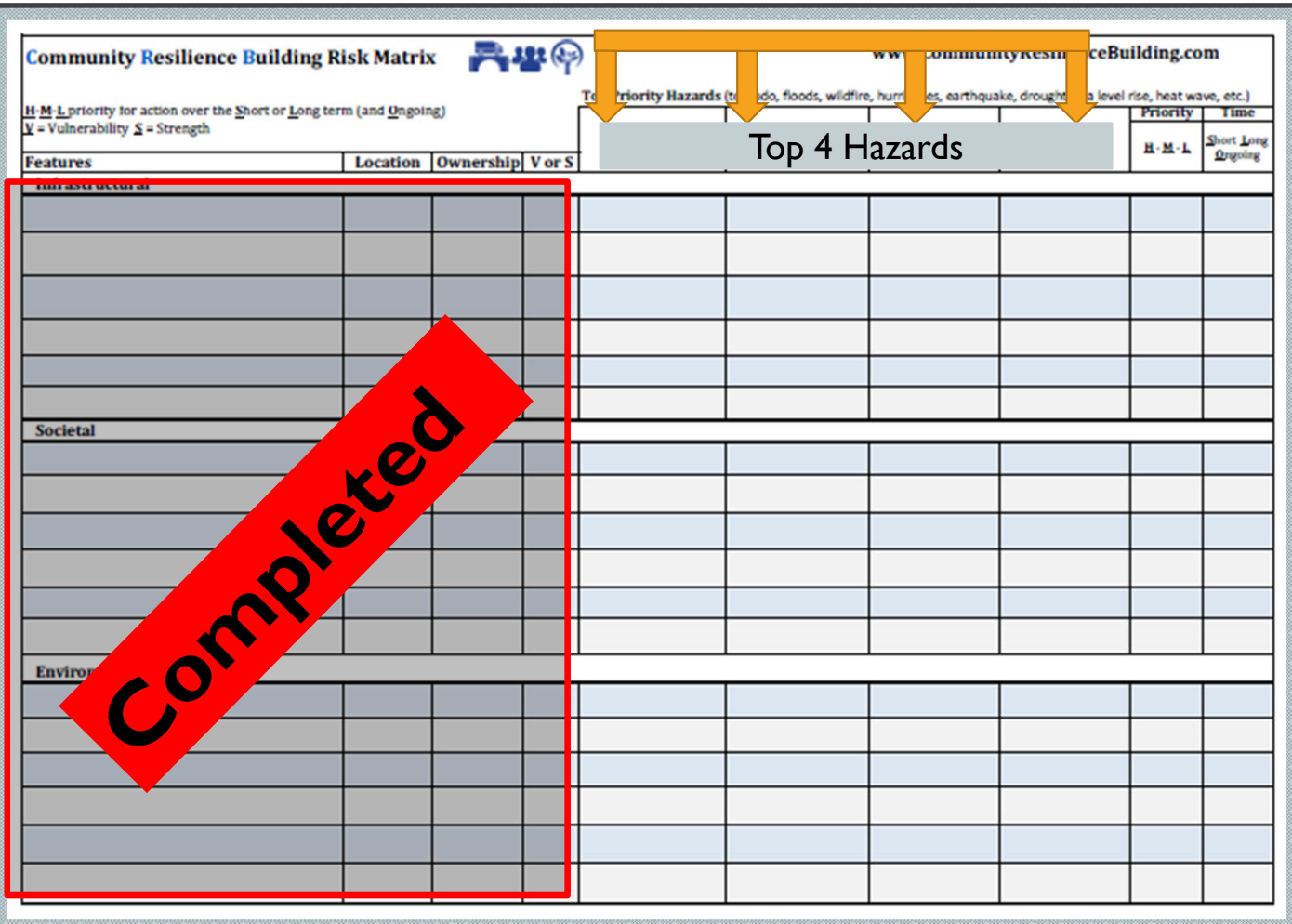
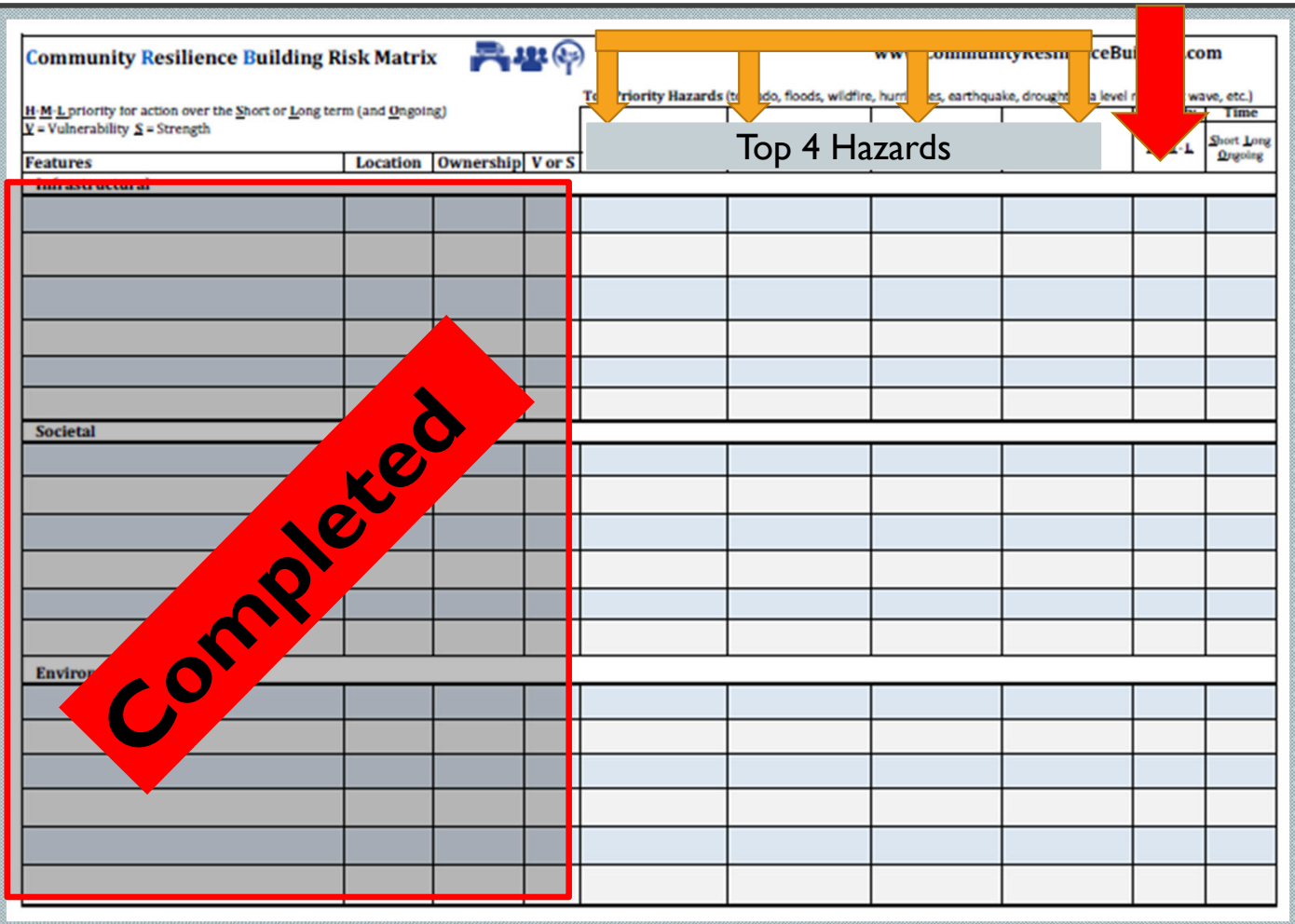
BENEFITS OF GREEN INFRASTRUCTURE AND LID

- Cost Savings
  - Reduced development costs for infrastructure and maintenance
  - Reduced energy costs for residents
- Public Safety
  - Reduced flooding
  - Improved water quality
  - Increased climate change resiliency
  - Reduced urban heat island effect
- Quality of Life
  - Protect and restore natural features for improved aesthetics
- Value
  - Increased property values
- Regulatory
  - Assistance in meeting regulatory requirements

STEP THREE: ACTIONS, PRIORITY AND TIMELINE



STEP THREE: ACTIONS, PRIORITY AND TIMELINE



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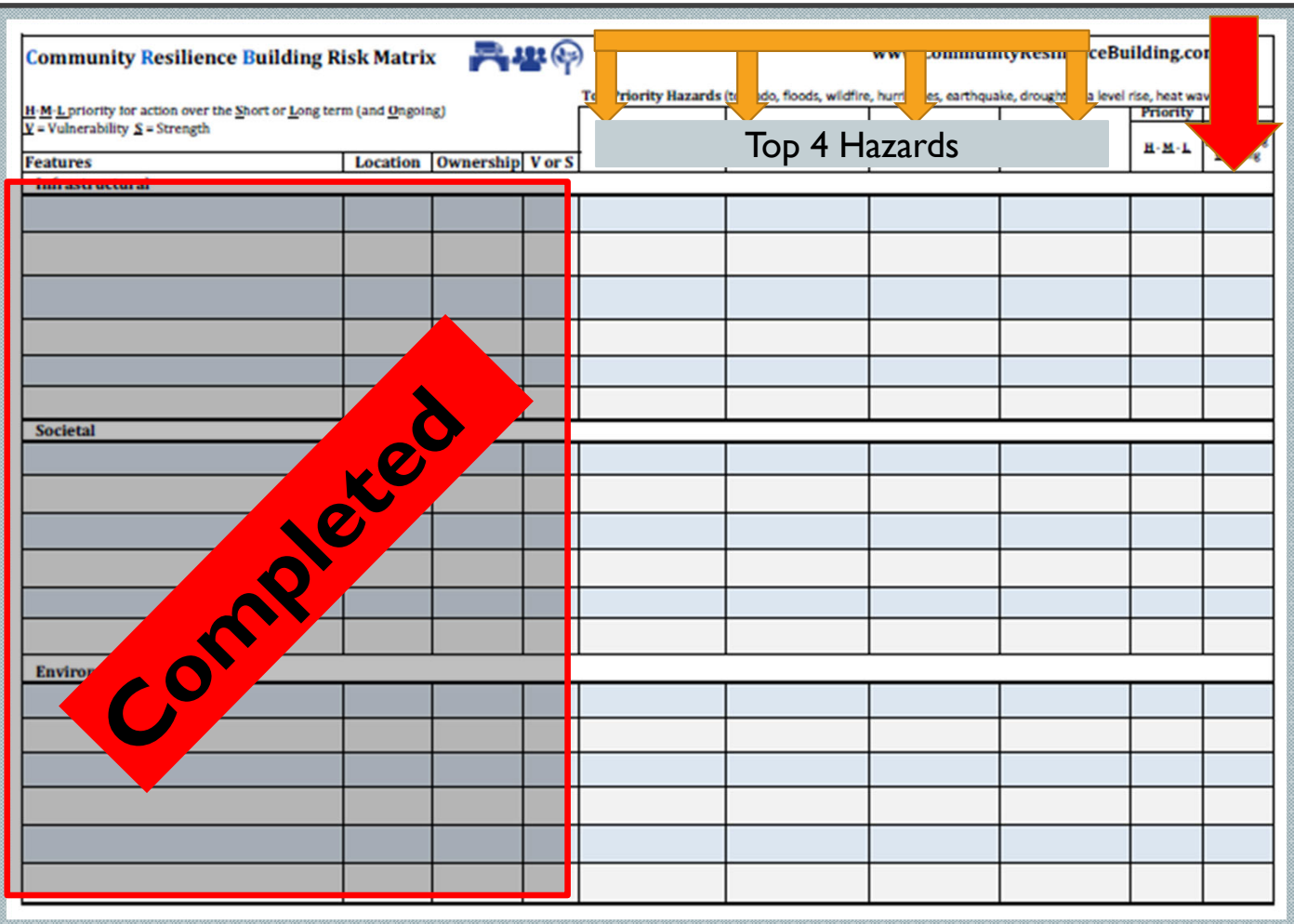
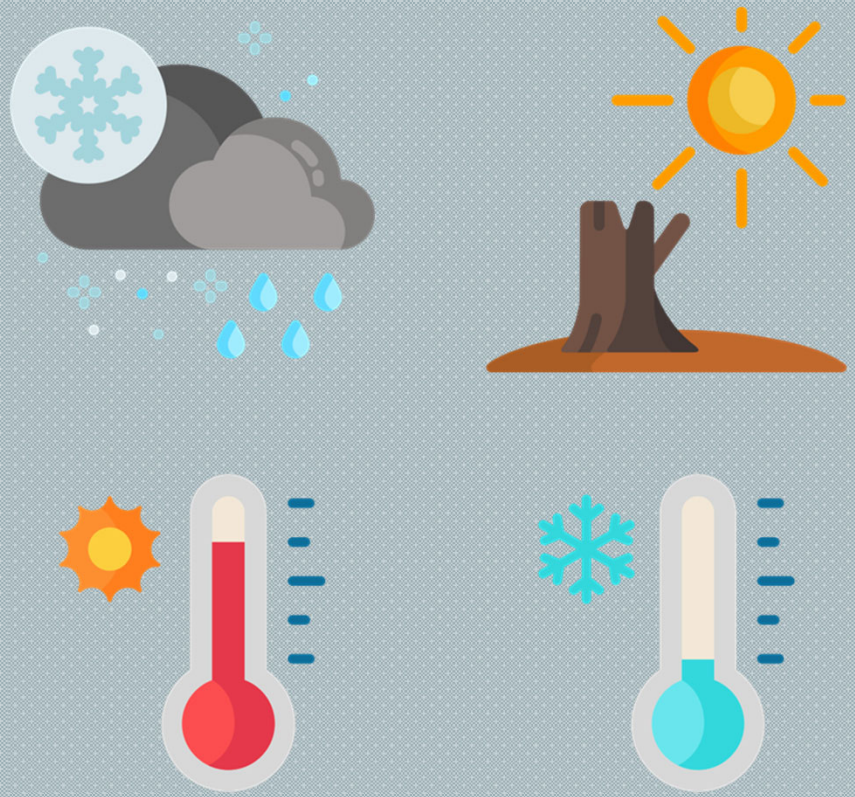
STEP THREE: ACTIONS, PRIORITY AND TIMELINE



QUESTIONS



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TIME TO GET TO WORK

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THANK YOU

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MVP WORKSHOP DAY #3 PRESENTATION

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REPORT OUTS

What did your table find?

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SUMMARY DISCUSSION

- Areas of agreement
- Areas of unique perspectives

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TIME TO VOTE

- A survey will be created after this meeting
- Vote for your top five projects
- Prioritize Project

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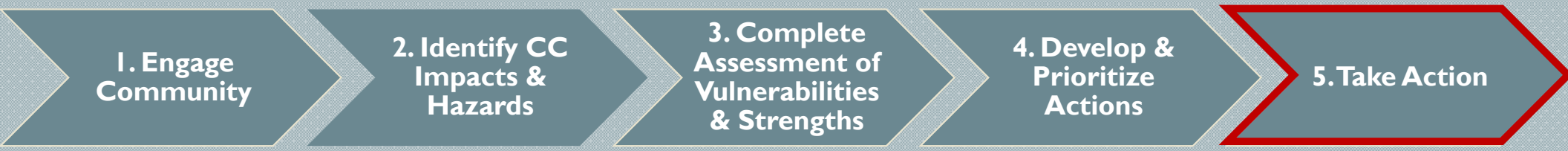
NEXT STEPS

- Vote in survey
- Report development
- Public "Listening" session with Members of the Public and Board of Selectmen Date TBD
- Develop resources and Implement actions through Action Grants



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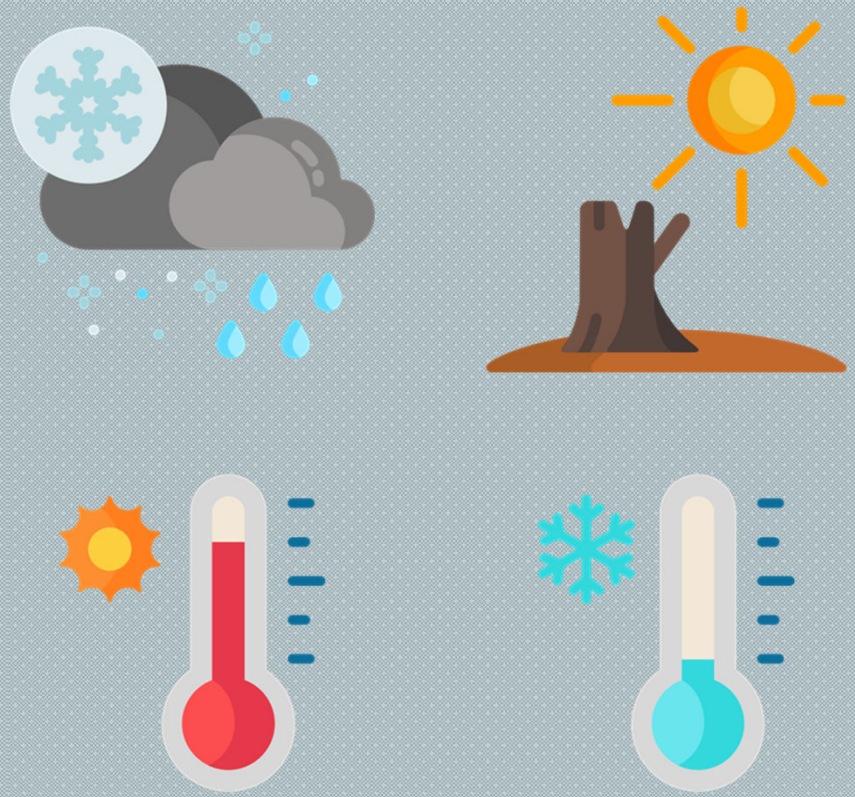

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CONTACT US

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- Executive Office of Energy and Environmental Affairs –
  - Hillary King, hillary.king@state.ma.us

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THANK YOU

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