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Summary of Findings

West Newbury Municipal Vulnerability Preparedness Workshop

West Newbury, Massachusetts

May 2020

Prepared for:
Town of West Newbury
Municipal Vulnerability
Preparedness Working Group
381 Main Street
West Newbury, Massachusetts 01985

Prepared by:
Horsley Witten Group, Inc.

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West Newbury Municipal Vulnerability Preparedness Workshop
Summary of Findings

Acknowledgements:

Funding to support the West Newbury Municipal Vulnerability Preparedness (MVP) Workshop was provided by the Massachusetts Executive Office of Energy and Environmental Affairs through an MVP Planning Grant, issued to the Town of West Newbury during the fiscal year of July 2019 through June 2020.

The Town of West Newbury contracted with the Horsley Witten Group, Inc. to provide MVP certified staff to support the Town in planning and facilitating the workshop.

We would like to thank Michael Morris, West Newbury resident and former Chair of Storm Surge, for his climate change presentation at the workshop that so aptly set the stage for the day's discussions.

Suggested Citation:

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West Newbury Municipal Vulnerability Preparedness Workshop
Summary of Findings

Executive Summary

On February 29, 2020, West Newbury held a Municipal Vulnerability Preparedness (MVP) workshop. The workshop's goal was to discuss hazards West Newbury faces that are being exacerbated by climate change, and to prioritize actions the Town can take to prepare for these hazards. This workshop, planned by a core team of organizers and the Horsley Witten Group, Inc. was a step towards MVP certification, which allows certified communities access to additional state grants for projects related to climate change resiliency. Forty-two community members attended the workshop, representing a wide cross section of Town officials, response partners, and other interested parties.

Prior to the workshop, the MVP Core Team considered input provided through interviews with 12 key staff, volunteer board and commission members, and local citizens, as well as information gathered through a local public survey completed by 146 individuals, to identify four key climate change hazards facing West Newbury. These hazards, which served as a basis for discussion in the workshop, were: severe storms, changing precipitation patterns, diseases and invasive species, and temperature extremes. In five small groups, participants identified features of West Newbury that may be impacted by climate change or may serve as community strengths to help the community cope with climate related hazards. These groups then identified and discussed actions that could be taken to protect these features or mitigate the impacts to these features in the face of the four climate change hazards. Each group reported out its top priority actions to the full workshop. Through a large group discussion and dot voting, and subsequent refining by the core team, the following Final Recommended Priority Actions were identified:

Final Recommendations

1. Emergency communications and communication infrastructure
    - Improve cellular wireless and radio infrastructure
    - Maintain lists of vulnerable populations for outreach and communication by citizens to Town of their needs in emergencies
    - Code Red service – evaluate what is currently in place and what is needed

2. Open Space Preservation (Open Space, Agriculture, and Forests)
    - Continue implementing OSRP
    - Encourage open space acquisition, based on criteria
    - GIS analysis, evaluate open space distribution across Town for equity of access
    - Maintain CPA as a priority
    - Green infrastructure
    - Invasive species management, including mapping problem species and areas, and working with DPW, Open Space Committee, and other civic groups to practice Best Management Practices to prevent spread and eradicate new invasions
    - Improve land use controls and bylaws/policies
        - Tree/tree canopy preservation
        - Wetland protection
        - Forests/Trees/Fields Management
    - Develop a comprehensive plan that considers development growth (conversion of open space) in relationship to available town resources and services

3. Water Supply Development and Water Supply Protection Planning
    - Including but not limited to potential dam modification
    - Reduce CSO Potential for Contamination
        - Develop/Implement notification system for downstream residents (consider possibly incorporating it into Code Red)
        - Coordinate with upstream WWTPs to reduce occurrence
        - Work with adjacent towns (e.g., Newburyport, Haverhill, Amesbury) on water quality monitoring, notification and education
        - Educate about health impacts of CSOs – including via fishing, recreational use

4. Municipal microgrid with back-up storage (green energy) for emergency shelter and senior housing

5. Improved educational communications around climate change impacts and preparedness
    - Outreach through libraries, school curriculum, senior services
    - Education on climate awareness, disease vectors, disease prevention and detection

6. Vulnerable populations (elder, disabled, etc.)
    - Conduct outreach to participate in Code Red
    - Include communications and outreach regarding emergencies/maintenance (water breaks, fire hydrant cleaning, etc.)
    - Increase functions and resources for Council on Aging

7. Stormwater and flood management, operation and maintenance
    - Develop/improve/enforce stormwater Operation and Maintenance plan
    - Map locations of all drainage/flooding issues and prioritize them to be addressed
    - Perform a culvert analysis, and map and prioritize improvements
    - Assess vulnerable neighborhoods and plan to address vulnerabilities, such as erosion and flooding
        - Priority area is River Rd. erosion
        - Other areas include: Rte. 113 Bridge, Crane Neck, River Meadow Drive, and others
8. Promote Town-owned electric vehicles and equipment, reduce waste, and increase compost

These action items will be incorporated into ongoing municipal planning efforts and will inform future Town efforts in the realm of resilience planning. Actions identified in this process are also eligible for future grant funding under the MVP Action Grants program administered by the MA Executive Office of Energy and Environmental Affairs (EEA). By undertaking the MVP workshop and preparing this report, the Town is also initiating its certification as an MVP Certified Community, which enables the Town to apply for future MVP Program grants and elevates the scoring profile for related project proposals to other state grant programs.

Table of Contents

1. Introduction

The Municipal Vulnerability Preparedness (MVP) Program is a Massachusetts state program designed to increase local municipal resilience to natural hazards that are being exacerbated by climate change. This program is designed to help municipalities identify their vulnerabilities and strengths along with opportunities to take action to reduce risk and build resilience. Workshops use the Community Resilience Building (CRB) Framework, a system of discussion and note taking developed by The Nature Conservancy and prescribed by the MVP Program. West Newbury received a grant to participate in the MVP program in order to build on its prior resiliency planning efforts and develop a list of priority actions to focus on in the immediate future.

Workshop Planning and Core Team

A group comprised of local volunteers and Town staff formed the ad-hoc MVP Committee, facilitated the MVP Planning Grant application on behalf of the Town, contracted with an MVP Provider, and served as the MVP Core Team. MVP Core Team members included the following individuals:

- Elisa Grammer, West Newbury Energy Advisory Committee (EAC), MVP Project Manager
- Liz Callahan, EAC Chair
- Rick Parker, Selectman, EAC, former Planning Board member
- Nancy Pau, Resident, Parker River National Wildlife Refuge Biologist
- Wendy Reed, Conservation Commission, Open Space, Planning Board
- Patricia Reeser, Open Space Committee Chair, former Selectman
- Paul Sevigny, Health Agent
- Chip Wallace, EAC, former Planning Board member

The MVP Core Team was assisted by Ellie Baker of the Horsley Witten Group (HW), West Newbury's MVP Provider.

The Core Team met six times between September 2019 and February 2020 and communicated via email and telephone as needed. Responsibilities of the MVP Core Team included: conducting pre-workshop interviews with targeted members of the public service community; developing and distributing a pre-workshop survey to gather information from residents; planning workshop logistics; reviewing the workshop agenda; providing reference material, context and background for the MVP effort; reviewing maps and reference materials for use in workshop discussion groups; identifying a diversity of representative stakeholders to invite to the workshop; reaching out to invitees to encourage attendance; and participating in the workshop as discussion facilitators, note takers and stakeholders.

Workshop Attendees and Materials

West Newbury's MVP workshop was held on February 29, 2020 at the Town Annex behind Town Hall. A total of 85 stakeholders were invited to the workshop and 42 stakeholders attended. Participants represented a wide cross section of the Town's stakeholders and decision-makers, including Town

Selectmen, the Superintendent of Schools, students, members of the Storm Surge interest group, an electric utility representative, local farmers, a local social worker, representatives from the Merrimack Valley Planning Commission, staff of the Massachusetts Mosquito Control and Wetlands Management District, and a wide variety of municipal department staff and volunteers from local boards and commissions, among others. In addition to municipal stakeholders, HW provided 5 staff to facilitate and support the workshop and discussion groups. See Attachment A for a full list of participants, including their organizational affiliation.

On the day of the workshop, participants were provided with a copy of the agenda for the day (see Attachment B) and assigned a discussion group table with the aim of providing a diversity of expertise and perspectives in each group. The following additional informational materials were located on each small group's table to be shared in order to encourage communication and collaboration throughout the workshop:

- Summary of climate projections for the Merrimack Basin provided by EEA and prepared by the Northeast Climate Science Center (see Attachment B)
- Summary of West Newbury demographic data (see Attachment B)
- West Newbury base map showing critical infrastructure and FEMA floodplain data (see Attachment C)

The Workshop Process

Following introductions and an overview of the MVP Program and workshop agenda, workshop participants listened to two presentations, one by local resident and former long-time Storm Surge Chair Michael Morris and one by MVP Certified facilitator Ellie Baker, HW, about the science and observations of climate change, climate change projections and their current and potential future impacts on West Newbury. The presentations discussed specific infrastructural and environmental challenges facing the Town in light of climate change. Challenges discussed included the impact of severe storms and wind, flooding after intense rain, and water supply disruptions. As part of the presentation, Ellie Baker outlined the four primary climate change hazards that would be used to frame the discussions for the remainder of the workshop. These hazards had been previously identified by the MVP Core Team, after conducting interviews with those in public service and a public survey of the general resident population.

Small Group Discussion

The next part of the workshop was conducted in five small discussion groups. Groups were made up of a facilitator (either a HW staff member or a skilled volunteer), a note taker, and about 8 workshop participants. Small group discussions began by listing environmental, societal, and infrastructural features that represent either a vulnerability or a strength of the community in the face of anticipated climate change hazards. Features were listed on the risk matrix and marked on the base maps (in some cases). Attachment F includes the maps that contain notations from each of the five discussion groups. Groups listed between 7 and 19 features for each category, along with information about their location, ownership, and if they are a strength or vulnerability for the Town.

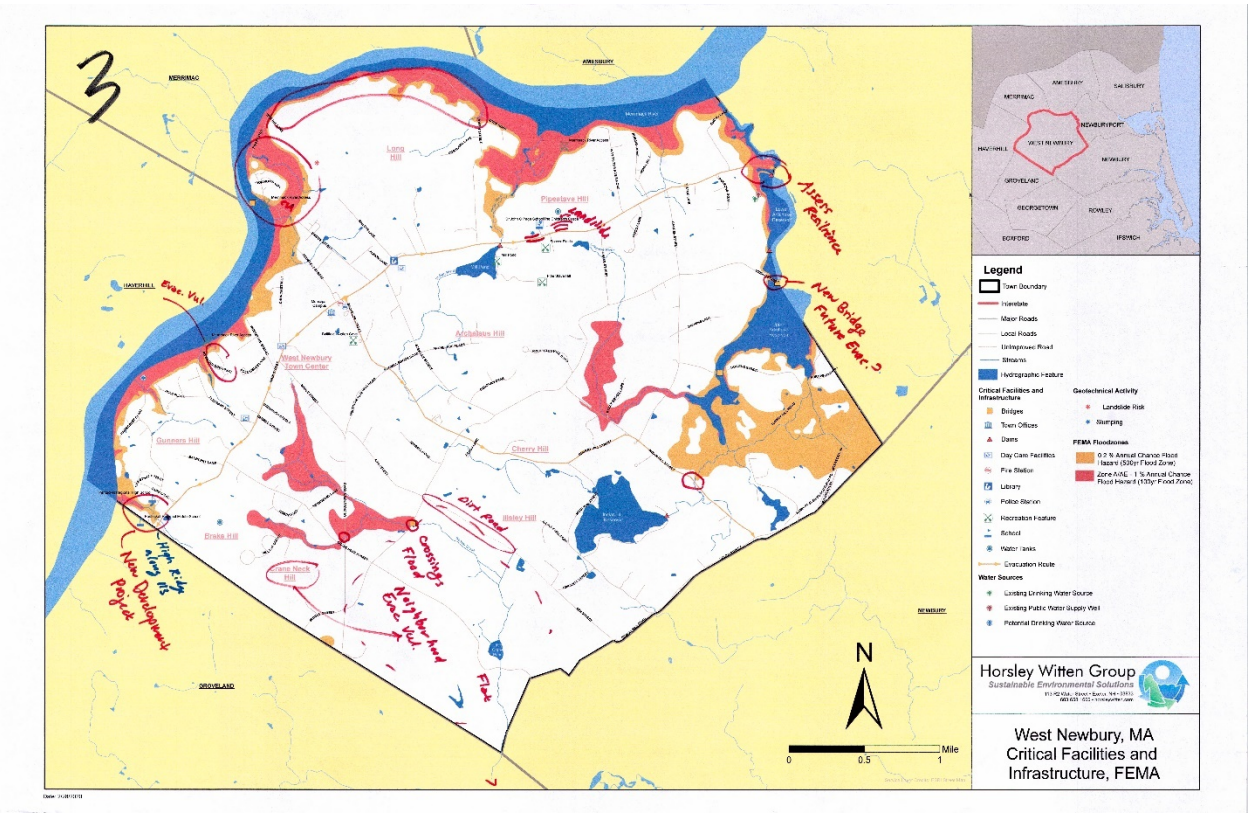


Photo 1 Groups annotated maps to highlight vulnerable infrastructure, flood zones, and community resources**.**

Following a lunch break, groups moved on to discussing action items that address the threats posed by priority hazards, or enhance the strengths identified. Action items could either be a way to protect a vulnerable feature from a negative impact or how to better utilize one of West Newbury's strengths. Common action items listed included: building resiliency into the existing power network, increasing flood protection for critical infrastructure, increasing emergency shelter capacity and preparedness, educating the public on diseases and invasive species, and enhancing existing environmental protection efforts.

Once complete lists of action items to address infrastructural, environmental, and societal vulnerabilities had been compiled, groups began the process of prioritizing actions. Groups completed this process in different ways, with some identifying the priority level for each suggested action items and others only determining which were of the highest priority. Groups prioritized items by discussion and dot voting, in which each participant was given several dot stickers, which they could place next to ideas they wished to prioritize. Attachment D includes a transcription of the summary matrices produced by each of the five discussion groups. Action items prioritized during small discussion (i.e., those which got the most dot votes) are indicated with underlined font in Attachment D. Members of the five small discussion groups then compiled their prioritized action items onto large-format note pads that could be presented to the entire workshop.

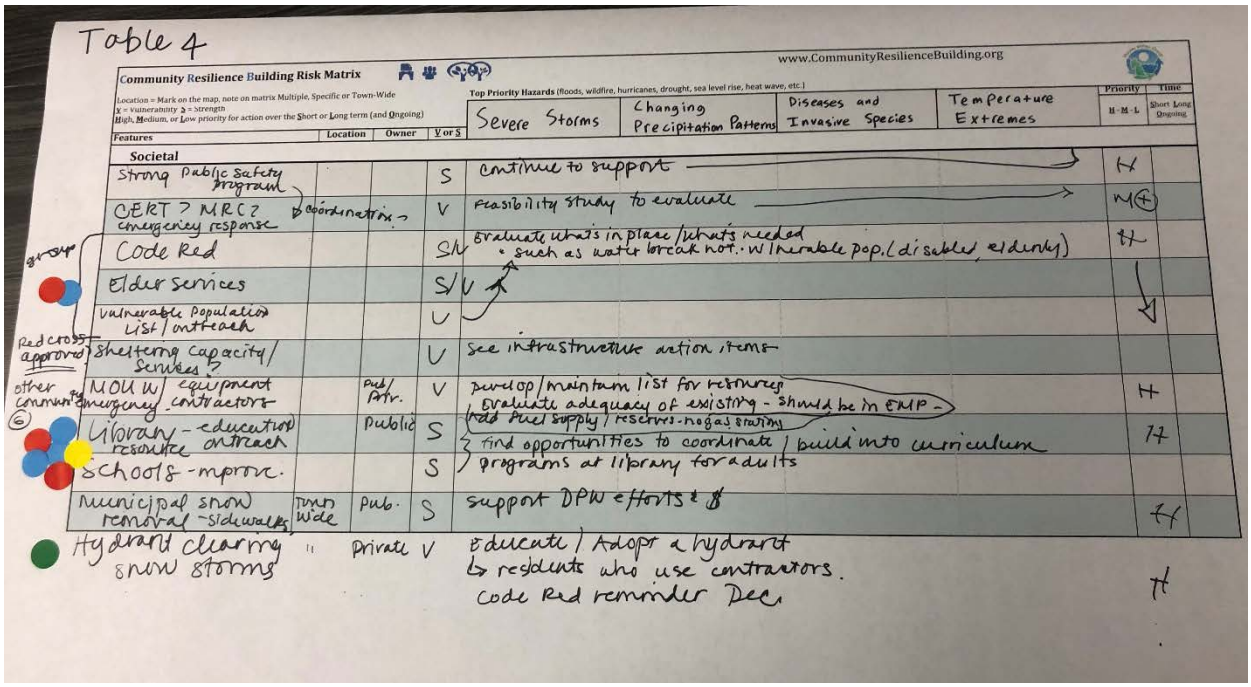


Photo 2 An example completed risk matrix. Colored dots indicate the small group member voting to prioritize each action. Colors of individual dots are not relevant.

Full Workshop Discussion

After all groups had prioritized five to seven action items, a representative of the group presented their prioritized items to the full workshop using the large-format note pads. Following the presentation of each group's priorities, workshop participants together with the workshop facilitator combined duplicative suggestions. This exercise resulted in a list 14 of unique Recommended Action Items, which are presented in Attachment E.

As a final step, following some discussion and deliberation to clarify each of the unique Recommended Action Items, all workshop participants used dot voting to indicate which of the 13 Recommended Action Items they felt were the most important. This dot voting exercise, along with subsequent discussions between the MVP Core Team members, led to the creation of a list of Final Recommended Action Items that the Town of West Newbury should embark upon to increase the resilience of the community in the face of anticipated climate change impacts.

The results of each stage of the workshop discussions are presented in the subsequent sections of this report.

2. Information Gathering

To make the workshop as efficient as possible, the MVP Core Team collected information prior to the workshop via detailed interviews with targeted members of the West Newbury community and through

a widely distributed survey. A summary of the interviews and survey are provided below, and the full results are included in Attachments G and H, respectively.

Interviews

Before the workshop, Elisa Grammer, from the MVP Core Team, and Ellie Baker, of HW, conducted interviews individually with the following people involved in providing public services to West Newbury. The purpose of these interviews was to gather detailed perspectives on climate change hazards and potential actions to address those hazards, from the varying perspectives and expertise of these different people:

- Paul Sevigny (Health Agent, MVP Core Team) and Rick Thurlow (longtime resident/farmer)
- Justin Bartholomew (School Superintendent) and Greg Hadden (School Facilities Manager)
- Angus Jennings (Town Manager)
- Dan Cena (Police Sargent) and Ben Jennell (Assistant Fire Chief)
- Patricia Reeser (MVP Core Team, Open Space Committee)
- Wayne Amaral (DPW Director) and Gary Bill (Former DPW Director)
- Mike Gootee (Water Superintendent)
- Theresa Woodbury (Council on Aging)

Interviewees indicated that the greatest hazards facing their constituents were flooding and drainage problems, drought, power outages, freeze/thaw cycles, and invasive species and pests, such as ticks and mosquitos. In addition, other problems were noted that are impacted by or related to climate change hazards including: the condition of the Page School and significant need for repair and maintenance, lack of a compost facility, fertilizer overuse on private lawns, the lack of accessibility for seniors and others throughout Town, and high groundwater levels that lead to septic system failure. Most interviewees felt that these issues were worsening over time, noting that various groups within the community (e.g., the elderly, Town water users, etc.) experience the effects of these hazards differently. Lastly, those interviewed were able to identify a variety of critical actions that can be taken to address these problems. For a full summary of the interviews, refer to Attachment G.

Survey

To complement the interviews targeting specific members of the community that provide public services, the MVP Core Team and HW designed a 10-question online survey to be widely distributed to residents of West Newbury. The MVP Core Team sent the survey to their various community distribution lists and also asked residents the survey questions in person at multiple public locations, such as outside the local grocery store. In total, 150 residents responded to the survey, the full results of which are included in Attachment H.

In summary, the surveyed residents identified power outages, severe winter storms, water contamination and insect-borne diseases as the vulnerabilities that pose the biggest challenge to West Newbury. Survey participants prioritized actions that should be taken to reduce vulnerability, such as enhancing Town-wide stormwater management and addressing flood-prone infrastructure, enhancing plans to address insect and animal-borne diseases, establishing backup power in the Town, and performing a detailed Town risk evaluation. Residents also provided information on their level of

personal preparedness for emergency situations, particularly related to having backup generators for power outages and medical contingencies for families in the event of a prolonged power outage. For example, 67% of respondents said they have a generator or alternative means to address power loss. Most people who responded said they could stay at home without power for 3 days (44%) to one week (29%). Just over half the respondents said they would benefit from backup power at the public buildings to serve as warming or cooling shelters and as a source of electricity.

3. Top Hazards of Concern

The MVP Core Team reviewed the results of the interviews and survey and came to a consensus on the following top four hazards of concern for West Newbury:

- Severe storms – increase in number and intensity of wind/nor'easters/hurricanes
- Changing precipitation patterns – changes in intensity, volume, flooding, drought
- Diseases and invasive species – increase in ticks, mosquitos, Lyme, EEE, knotweed, bittersweet, etc.
- Temperature extremes – warmer winters, warming trends, increased volatility

These four top hazards of concern were used in the workshop to frame the small group discussions and appear at the top of the risk matrices completed by each group (Attachment D).

4. Current Concerns and Challenges Presented by Hazards

West Newbury has experienced a number of climate- and weather-related challenges in recent years, and can expect to experience more severe events in the years to come due to climate change. Many areas of Town are experiencing more frequent and severe flooding, and interviewees reported that wetlands are growing larger and damaging or threatening to damage roads. There is a general narrative accepted among the MVP Core Team and many who we interviewed that the conversion of the Town from a farming community to a more residential community has changed the drainage patterns, and allowed or caused the drainage ditches that used to line agricultural fields and roadways to clog with leaf litter, lawn clippings, and general sediment and vegetative growth. This change together with changes in precipitation patterns is leading to localized flooding and enlarged wetlands. An active beaver population is exacerbating this condition. Along the banks of the Merrimack River, there is ever worsening erosion that is threatening specific locations along River Road, and has caused road closures and road repairs. Increased storm events and larger more intense rainfall are anticipated to increase the erosion along the shoreline, calling into focus the need for a more permanent solution for these eroding banks.

In addition, power outages are a relatively frequent occurrence in West Newbury. In the past few years, the Public Works Department and the electric utility have both instituted tree trimming programs to keep power line corridors clear of at-risk trees. Three winter storms in March 2018 caused severe flooding due to rainfall and heavy snow and wind that caused power outages lasting multiple days

across the Town and the region as a whole. This was a major disruption to commerce, government, schools, transportation, emergency response and life in general.

The biggest challenges, concerns and vulnerabilities that were raised in the breakout discussions at the MVP workshop included:

- *Flooding and erosion of roadways due to heavy rains:* Multiple neighborhoods are made vulnerable by repeated road flooding and erosion of roadway edges, including along River Road, at the Route 113 Bridge, Crane Neck, and River Meadow Drive. These issues highlight the need to improve the overall stormwater planning and maintenance for West Newbury.
- *Power outages:* Most of West Newbury's electrical wires are above ground, and many suffer damage from trees and limbs during storm events which leads to frequent power outages. There is a need for a coordinated plan and effort to manage trees and educate homeowners.
- *Backup power and shelters:* The repeated power outages experienced in West Newbury bring to light the need for reliable backup power for the Town and for additional shelters for warming and cooling during an outage that have access to backup power.
- *Protecting open space:* The construction of several housing developments in recent years has sparked a concern for the protection of existing open space and better planning for where future developments will be sited, and how development occurs in terms of impacts on drainage, trees, water supplies, and other factors. As part of this, there is recognition that West Newbury needs improved land controls to manage forests and wetlands.
- *Emergency preparedness:* The flooding and power outages described above further raised concern about preparations and impacts to emergency response personnel and access to vulnerable populations. The communication infrastructure in West Newbury requires improvements and lists of vulnerable populations requires maintenance. In addition, the Code Red service used to communicate to residents in an emergency needs to be evaluated for efficacy. Coupled with this is the need to educate the public on ways they can prepare for climate change impacts.
- *Insect-borne diseases:* Rates of diseases caused by insects have increased in West Newbury in recent years. In addition, recent increases in mosquitos transmitting EEE and West Nile have led to event closures and disruptions to evening activities, such as in the Fall of 2019. There is a need for education of the public on insect-borne disease prevention and detection.
- *Water quality impacts from flood events and water supply security:* During heavy rainfall events, the Merrimack River is increasingly contaminated by stormwater runoff as well as discharges of untreated sewage from overflows at upstream wastewater treatment facilities, referred to as combined sewer overflows (CSOs). The contaminated water can impact the public drinking water supply the Town purchases from Newburyport if the river overtops the Artichoke Reservoir Dam. The contaminated river water can also hinder the recreational opportunities for residents and impact the health of those who come into contact with the water. CSOs and changing land development have demonstrated the need for a water supply protection plan, including modifications of the Artichoke Reservoir Dam. In addition, West Newbury-owned water supply wells are susceptible to drought and are insufficient to supply the Town's current

needs. This threat also highlights the Town's need to identify and secure additional sources of public water supply, particularly in light of increasing residential development and increasing risk of drought due to climate change.

5. Current Strengths and Assets

Among the discussion groups at the workshop, a number of strengths were also identified among the infrastructural, societal and environmental assets of the Town. These include:

Infrastructural:

- The construction of the new Middle/High School, which could be equipped as an emergency shelter with backup power.
- The Middle Street bridge project.
- The use of private wells for water supply in Town.
- The fact that many homes have their own backup generators and/or solar power.
- The Mill Pond Dam has been found not to present hazards
- Main Street (Route 113) is generally on higher ground and does not experience flooding.
- The abundance of undeveloped land and open space.
- The drainage infrastructure that exists in town.
- Public Safety Building.
- Local food pantry.
- Emergency alerts available.

Societal:

- Senior housing (though more is needed).
- Public services, public safety, well trained fire department, and local emergency dispatch. Relatively new police and fire facilities.
- The population is generally well educated and affluent.
- Town communication is good, including emergency communication through Reverse 911 and Code Red.
- Mental health benefits from abundant nature.
- Preparedness of the community to deal with an emergency at the Seabrook Nuclear Power Plant.
- The dedicated Town volunteers and engagement of the community.
- The presence of a variety of community networks.
- The proximity of several area hospitals.
- Public education.
- Citizen awareness of climate change.
- The library as an educational resource.
- The public schools.

- Municipal snow removal, especially on sidewalks.

Environmental:

- The abundance of open space, trails, and undeveloped land.
- Agricultural land and farms.
- The Merrimack River, Mill Pond, reservoirs, and wetlands throughout Town.
- Abundance of trees.
- Open Space Committee community outreach on invasive species.
- Tree removal plan – power risk, support DPW efforts.

6. Top Recommendations to Improve Resilience

Following the presentation of each group's priorities, workshop participants, along with the workshop facilitator, combined duplicative suggestions to create a final list of unique Recommended Priority Actions. These suggestions were then further prioritized through discussion and dot voting at the workshop. Following the workshop, the Core Team reviewed the final workshop recommendations and refined the final list of Re commendations using input and information gathered through the public survey and the interviews with key stakeholders, documented in Section 3 of this report. Refinements included such things as combining similar actions together into one recommended action, removing language for an action that had already been addressed (e.g., one recommendation included ensuring that the new middle/high schools are suitable to serve as emergency shelters, and the School Facilities Manager confirmed that this was already addressed), and clarifying language and sub-bullets to more clearly articulate the recommendation.

The Final Recommended Priority Actions are listed below, including a brief discussion of which challenges, concerns and vulnerabilities are addressed by each action. Recall from Section 4 above that the individual discussion groups, interviews and surveys had identified the following list of key challenges, concerns and vulnerabilities:

- Flooding and erosion of roadways due to heavy rains,
- Power outages,
- Backup power and shelters,
- Protecting open space,
- Emergency preparedness,
- Insect-borne diseases, and
- Water quality impacts from flood events and water supply security.

Final Recommendations

1. Emergency communications and communication infrastructure
    - Improve cellular wireless and radio infrastructure

- Maintain lists of vulnerable populations for outreach and communication by citizens to Town of their needs in emergencies
- Code Red service – evaluate what is currently in place and what is needed

Vulnerabilities addressed by this action: Emergency preparedness

2. Open Space Preservation (Open Space, Agriculture, and Forests)
    - Continue implementing OSRP
    - Encourage open space acquisition, based on criteria
    - GIS analysis, evaluate open space distribution across Town for equity of access
    - Maintain CPA as a priority
    - Green infrastructure
    - Invasive species management, including mapping problem species and areas, and working with DPW, Open Space Committee, and other civic groups to practice Best Management Practices to prevent spread and eradicate new invasions
    - Improve land use controls and bylaws/policies
        - Tree/tree canopy preservation
        - Wetland protection
        - Forests/Trees/Fields Management
    - Develop a comprehensive plan that considers development growth (conversion of open space) in relationship to available town resources and services

    Vulnerabilities addressed by this action: Protecting open space, Emergency preparedness, and Insect-borne diseases, Water quality impacts from flood events and water supply security, Power outages

3. Water Supply Development and Water Supply Protection Planning
    - including but not limited to potential dam modification
    - Reduce CSO Potential for Contamination
        - Develop/Implement notification system for downstream residents (consider possibly incorporating it into Code Red)
        - Coordinate with upstream WWTPs to reduce occurrence
        - Work with adjacent towns (e.g., Newburyport, Haverhill, Amesbury) on water quality monitoring, notification and education
        - Educate about health impacts of CSOs – including via fishing, recreational use

    Vulnerabilities addressed by this action: Emergency preparedness, Water quality impacts from flood events and water supply security

4. Municipal microgrid with back-up storage (green energy) for emergency shelter and senior housing

   Vulnerabilities addressed by this action: Power outages

5. Improved educational communications around climate change impacts and preparedness
   - Outreach through libraries, school curriculum, senior services
   - Education on climate awareness, disease vectors, disease prevention and detection

   Vulnerabilities addressed by this action: Emergency preparedness, Insect-borne diseases

6. Vulnerable populations (elder, disabled, etc.)
   - Conduct outreach to participate in Code Red
   - Include communications and outreach regarding emergencies/maintenance (water breaks, fire hydrant cleaning, etc.)
   - Increase functions and resources for Council on Aging

   Vulnerabilities addressed by this action: Power outages, Backup power and shelters, Emergency preparedness

7. Stormwater and flood management, operation and maintenance
   - Develop/improve/enforce stormwater Operation and Maintenance plan
   - Map locations of all drainage/flooding issues and prioritize them to be addressed
   - Perform a culvert analysis, and map and prioritize improvements
   - Assess vulnerable neighborhoods and plan to address vulnerabilities, such as erosion and flooding
     - Priority area is River Rd. erosion
     - Other areas include: Rte. 113 Bridge, Crane Neck, River Meadow Drive, and others

   Vulnerabilities addressed by this action: Flooding and erosion of roadways due to heavy rains, and Water quality impacts from flood events and water supply security

8. Promote Town-owned electric vehicles and equipment, reduce waste, and increase compost

   Vulnerabilities addressed by this action: General environmental and public health protection and improvement. [Note that while this vulnerability was not explicitly identified in discussion as a priority concern, it serves as a common thread throughout the MVP planning and workshop process.]

Photo 3 Workshop participants vote on recommended action items during the small group discussion.

7. Conclusion and Next Steps

West Newbury will continue the MVP certification process by presenting and distributing this report to the public at a formal public information and listening session, the details of which will be posted on the town website. This session will provide an opportunity for any member of the interested public to learn, ask questions, and provide feedback about the February 29, 2020 MVP Workshop and the recommended highest priority actions that emerged from that workshop.

Priorities identified during the February 29, 2020 MVP Workshop will be integrated into existing and future municipal planning efforts. The Town will also consider pursuing grant funding to implement the priority actions identified through the MVP Workshop process to continue to improve the Town's resilience to climate change.

Attachment A: List of Participants

West Newbury MVP Workshop, February 29, 2020
Participants

FIRST	LAST	ROLE
David	Archibald	Selectman
Ellie	Baker	HW Staff, MVP Provider
Justin	Bartholomew	School Superintendent
Kendall	Begin	Pentucket High School Student
Gary	Bill	Former DPW
Jim	Bradley	Old Stone Wall
Brad	Buscher	Open Space Committee, Groundwork Lawrence
Liz	Callahan	MVP Core Team, WN EAC Chair
Dot	Cavanaugh	COA board member, longtime resident
Fred	Chanania	Tree Committee, Library Trustees
Raymond	Cook	Planning Board member, UNH Engineering Professor
Carol	Decker	Former MassAudubon, resident
Lee Ann	Delp	Emergency Management Agency Director
John	Dodge	Open Space Committee Chair, Journalist
Sandra	Goodrich	Pentucket High School Teacher, Environmental Club
Mike	Gootee	Water Manager/Superintendent
Elisa	Grammer	MVP Core Team, WN EAC, former Finance Committee
Hannah	Grinnell	Pentucket Student Starting Climate Cafe
Carrie	Hometh	Resident, business owner
Rod	Hometh	Resident, business owner
Jennifer	Hughes	Merrimack Valley Planning Commission
Bob	Janes	Board of Health, Water Board, mailman
Robyn	Januszewski	NE MA Mosquito Control and Wetlands Management District
Katelynn	King	NE MA Mosquito Control and Wetlands Management District
Brian	Laverriere	HW Staff
Jen	Leonard-Solis	Journalist, Pentucket school supporter

FIRST	LAST	ROLE
Annie	Madden	Working with Climate Café students
Kathy	Mandeville	Retired Public Health Official
Richard	Mandeville	Retired college administrator, former River Meadow condo president
Lenny	Mirra	State Representative
Krista	Moravec	HW Staff
Mike	Morris	Resident, Storm Surge
Joseph	Muraco	National Grid Municipal Liaison
Alice	O'Leary	Pediatrician
Rick	Parker	MVP Core Team, Selectman, EAC, Former Planning Board
Nancy	Pau	Parker River National Wildlife Refuge Biologist
Craig	Pereira	HW Staff
Jonas	Procton	HW Staff
Wendy	Reed	MVP Core Team, Conservation Commission, Open Space, Planning Board
Patricia	Reeser	MVP Core Team, Open Space Committee Chair, former Selectman
Erin	Rich	Parent Network and Farmer
Steve	Sarkissian	Congregational Church member
Linda	Schaeffer	Social worker for special needs children in WN
Paul	Sevigny	MVP Core Team, Health Agent
Paulina	Swartz	Boston University Researcher, Resident
Rick	Thurlow	Longtime resident, former nursery owner
Chip	Wallace	MVP Core Team, EAC, former Planning Board

Attachment B: Workshop Handouts

Horsley Witten Group
Sustainable Environmental Solutions

West Newbury Municipal Vulnerability Preparedness (MVP) Workshop

Saturday, February 29, 2020, 9:00 am - 4:00 pm

West Newbury Town Annex

DETAILED AGENDA

TIME	ACTIVITIES	NOTES
9:00 AM	**Registration and Refreshments**	
9:30 AM	**Welcome**	Wendy Reed, *MVP Working Group*
9:40 AM	**Introductions and Overview of the Workshop**	Ellie Baker *Horsley Witten Group*
10:00 AM	**Overview Presentation** on Science, Past Planning Efforts and Outcomes, and Data Resources 1. Review recent climate related events. 2. Present summary of anticipated climate changes. 3. Present feedback from local interviews. 4. Present prior relevant planning work and action items 5. Present survey results 6. Identify top 4 Climate Change Hazards facing West Newbury	Mike Morris *West Newbury Resident/ President, Storm Surge* Ellie Baker *Horsley Witten Group*
11:15 AM	**15 MINUTE BREAK**	
11:30 AM	**DISCUSSION #1: Small Group** Identify Features that are Vulnerabilities and Strengths	
12:40 PM	**30 MINUTE LUNCH**	
1:10 PM	**DISCUSSION #2: Small Group** Identify Actions to address Vulnerabilities/protect Strengths. Discuss timeframe, responsibility, funding $ and sources. Prioritize top 5 Actions.	
2:35 PM	**DISCUSSION #3: Small Groups Report Out and Priority Voting** Each group reports out top 5 Priority Actions Overall priority dot voting	
3:35 PM	**FINAL DISCUSSION: Large Group** Identify Priority Actions for Municipal Climate Resilience Discuss timeframe, responsibility, funding	
3:55 PM	**Wrap Up and Closing Remarks**	Rick Parker, *Selectman and MVP Working Group*
4:00 PM	**Adjourn**	

https://www.wnewbury.org/municipal-vulnerability-preparedness-working-group

Horsley Witten Group
Sustainable Environmental Solutions

West Newbury Municipal Vulnerability Preparedness (MVP) Grant Project:

CLIMATE CHANGE PROJECTIONS[1]

TEMPERATURE

HIGHLIGHTS:

- ✓ Temperature increases could make West Newbury feel like present-day New Jersey by 2050 and present-day Tennessee by 2100.[2]
- ✓ By 2050, we could have more than 5 times as many very hot days (over 90°F) than we do today. By 2100, we could have more than 11 times as many.
- ✓ We will have far fewer days with temperatures below freezing.
- ✓ We will have to expend less energy on heating in the winter, and far more on air conditioning in the summer.
- ✓ The growing season will increase by up to 50% by 2050 and could almost double by the end of the century.

Table 1: TEMPERATURE PROJECTIONS

Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Average Annual Temperature (°F)	48.1	51.1 – 54.5	52.0 – 59.0
Maximum Annual Temperature (°F)	59.1	61.8 – 65.4	62.7 – 70.0
Minimum Annual Temperature (°F)	37.0	40.2 – 43.5	41.2 – 48.0
Annual Days with Max Temp over 90°F	7	18 – 40	22 – 81
Annual Days with Min Temp below 32°F	148	106 – 129	82 – 123
Annual Heating Degree-Days (Base 65°F)	6,693	5,072 – 5,924	4,190 – 5,661
Annual Cooling Degree-Days (Base 65°F)	526	809 – 1,263	925 – 2,044
Annual Growing Degree-Days (Base 50°F)	2,466	3,015 – 3,692	3,196 – 4,879

[1] Source: Northeast Climate Science Center, 2018. *Massachusetts Climate Change Projections.* University of MA Amherst. Published by MA Executive Office of Energy and Environmental Affairs. January. 213 p. Available at: http://www.massclimatechange.org/resources/resource::2152/massachusetts-climate-change-projections-statewide-and-for-major-river-basins. Data is for the Merrimack Basin.

[2] NOAA National Centers for Environmental Information, Climate at a Glance: Statewide Mapping, Average Temperature, published March 2018, retrieved on March 22, 2018 from http://www.ncdc.noaa.gov/cag/.

PRECIPITATION

HIGHLIGHTS:

- ✓ Average annual precipitation in West Newbury will increase up to 13% by 2050 and up to 17% by 2100.
- ✓ The largest increases in precipitation will occur in winter.

Table 2: PRECIPITATION PROJECTIONS

Climate Parameter	Baseline (1971-2000)	Mid-Century (2050s)	End of Century (2090s)
Total Precipitation (inches):			
Annual	44.2	44.2 – 50.0	45.1 – 51.8
Winter	10.8	10.8 – 13.2	11.2 – 14.6
Spring	11.3	11.2 – 13.4	11.5 – 13.8
Summer	10.3	9.7 – 12.3	9.2 – 12.1
Fall	11.9	10.8 – 13.4	10.5 – 13.2
Annual Days with Precipitation over 1 inch	7	7 – 10	8 – 11
Annual Days with Precipitation over 2 inches	1	1 – 2	1 – 2
Annual Days with Precipitation over 4 inches	0	0 – 0	0 – 0
Annual Consecutive Dry Days	17	17 – 19	17 – 20

SEA LEVEL RISE

HIGHLIGHTS:

- ✓ Sea levels could rise as much as 2.6 feet by 2050 and 9.8 feet by 2100.
- ✓ The projections below present the 'most likely range' of sea level rise.

Table 3: SEA LEVEL RISE PROJECTIONS

Year	Emissions Scenario	Boston Likely Range (feet relative to mean sea level in 2000)	Seavey Island, Kittery, ME Likely Range (feet relative to mean sea level in 2000)
2050	Medium	0.8 to 1.4	0.6 to 1.2
	High	0.8 to 1.5	0.7 to 1.4
2100	Medium	1.5 to 3.1	1.2 to 2.8
	High	2.0 to 4.0	1.7 to 3.7

Horsley Witten Group
Sustainable Environmental Solutions

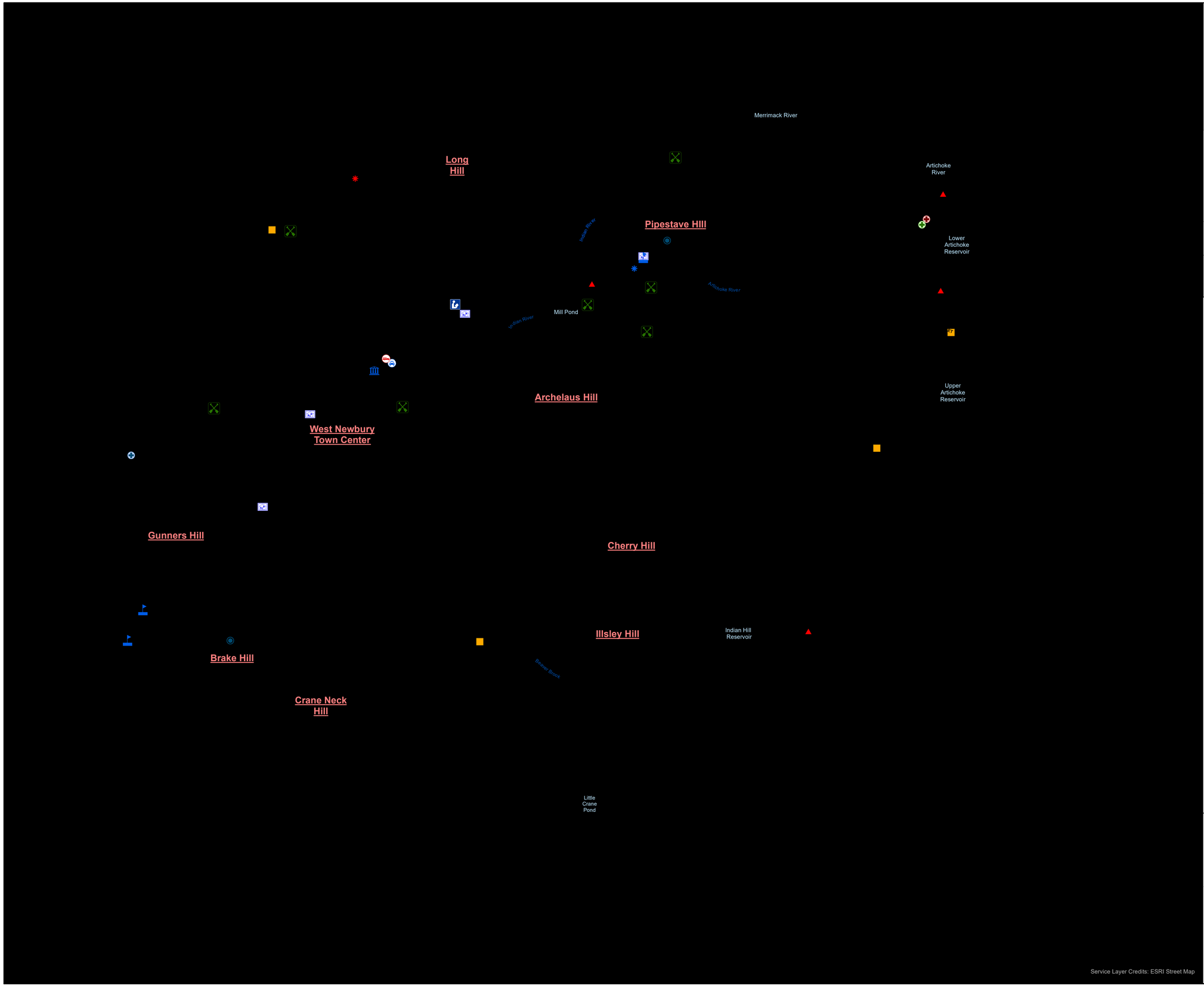
West Newbury Municipal Vulnerability Preparedness (MVP) Grant Project:

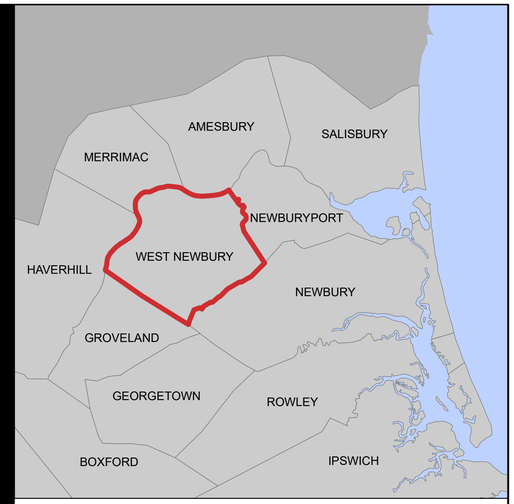
SELECTED DEMOGRAPHIC DATA[1]

Demographic Parameter	Result
Population	4,235 people
Age	0-19 = 28% 20-34= 8% 35-64 = 49% 65+ = 15%
Household Income	<$40K = 13% $40-60K = 7% $60K+ = 80%
% Below Poverty Line	5%
Race	White = 98% Black = <1% Asian = 1% Other = 1%
Ethnicity	Hispanic = 0% Not Hispanic = 100%
Environmental Justice	0%
% Population Over 65 Living Alone	2.9%
Heart Attack Hospitalizations	0 (age-adjusted rate per 10,000 people)
Asthma Emergency Department Visits	31.2 (age-adjusted rate per 10,000 people)
Pediatric Asthma Prevalence	6.7% of all children enrolled in grades K-8
Heat Stress Emergency Department Visits	0 (age-adjusted rate per 10,000 people)

[1] Source: MA Dept of Public Health, 2020. MA Environmental Public Health Tracking Community Profile for West Newbury.

Attachment C: Base Map





Legend

- Town Boundary
- Interstate
- Major Roads
- Local Roads
- Unimproved Road
- Streams
- Hydrographic Feature

Critical Facilities and Infrastructure

- Bridges
- Town Offices
- Dams
- Day Care Facilities
- Fire Station
- Library
- Police Station
- Recreation Feature
- School
- Water Tanks
- Evacuation Route

Water Sources

- Existing Drinking Water Source
- Existing Public Water Supply Well
- Potential Drinking Water Source

Geotechnical Activity

- Landslide Risk
- Slumping

FEMA Floodzones

- 0.2 % Annual Chance Flood Hazard (500yr Flood Zone)
- Zone A/AE - 1 % Annual Chance Flood Hazard (100yr Flood Zone)

West Newbury, MA Critical Facilities and Infrastructure, FEMA

Date: 2/28/2020

Attachment D: Discussion Matrices from the Five Discussion Groups

Community Resilience Building Risk Matrix

Group 1: West Newbury

www.CommunityResilienceBuilding.org

Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide
V = Vulnerability **S** = Strength
Type of Feature = **I**nfrastructural, **S**ocietal, or **E**nvironmental
High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
River Road	Along Merrimack	public	V	Address/planning vulnerability due to erosion and flooding (access)					
New school		public	S	Equip school to be an emergency structure with solar power					
Well field	Pole Pl.	private	V/S	Should more homes be built that require use of well/acquire land to purchase for well					
Wells near Artichoke	Artichoke	public		Protect/purchase land for well use and work with Newburyport to solve, (multiple redundancies)					
Bridges		public	V	Study and prioritize/ensure bridges/crossings are sound and resilient to future conditions					
Middle St. Bridge		public	S	Complete project. Establish higher priority with Newburyport for final 1.5M					
Evacuation routes, Ash/Main/Artichoke		public	V	Establish what routes and transportation are appropriate for vulnerable citizens; add communication					
Electrical system	Town-wide	private	V	Invest in solar homes. Invest in community solar. Bury lines. Cut trees that make lines vulnerable. Municipal power grid with solar/green energy. Solar/battery/gener.					
Private wells	Town-wide	private	S	Purchase community well for public use. Establish system for sharing water					
Senior housing with poor back up power		public	V	Municipal micro grid with green energy source					
Private homes with back up generators			S	Study- neighbor communication - part of emergency planning					
Mill Pond Dam			S	Maintain					
Private homes with solar power			S	Programs for funding					
Culverts and drainage			V	Establish bylaws to protect, study and prioritize most significant concerns. Incentive program. Education program on drainage, landscaping.					
Page School			V/S						

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O ngoing
Societal									
Senior Resources	Town-wide	public	V	Budget for communication to community					
SS and housing	Town-wide	private	V	Comprehensive plan					
Affordable housing	Town-wide	private	V	Comprehensive plan					
Limited senior housing	Town-wide	public	S	Comprehensive plan, more is needed					
Public services	Town-wide	public	S						
Emergency shelters (warming/cooling)	Town-wide	public	V	Identify location(s), fund, deliver supplies to "at risk"					
Structurally not a senior friendly town	Town-wide	public	V	Buses, transportation					
Public transportation	Town-wide	public	V	Increase availability MVRTA), bike racks in town					
Health issues (related to climate)	Town-wide	private	V						
Strong evacuation plan	Town-wide	public	V	Development plan					
Emergency management plan	Town-wide	public	V	Development plan					
Reverse 911	Town-wide	public	V					L	
Mental health issues/nature			S						
Fragile Citizens	Town-wide	public	V						
Rise in special needs children									
Town communication (those not on internet or when internet is down)	Town-wide	public	V						
Council on Aging	Town-wide	public	V/S	More functions, resources					
Youth									
Hospital		private	V					L	

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time Short Long Ongoing
Environmental									
Open Space	Town-wide	public/private	S	Investigate feasibility of transitioning "at risk" to prepare priority list for funding, continue to update open space plan, continue funding to purchase land and keep CPA as priority					
Artichoke	Newburyport	public	V	Establish plan with Newburyport to protect					
Trees	Town-wide	public/private	V/S	Funding for tree inventory, tree protection, encourage tree diversity, tree maintenance, bad tree removal with good tree planting					
Agricultural Farms	Town-wide	public/private	S	Continue funding to purchase land and keep CPA as priority					
Loss of pollinators	Town-wide	public/private	V	Keep fields, patch mowing, building resiliency in our wetlands, species management					
Loss of land to development (school)	School	public/private	V	Comprehensive plan to match development to resource availability					
Invasive species	Town-wide	public/private	V						
Bird migration	Town-wide	public/private	V	Eradicate non-native plants, educate home owners on bird-friendly yards					
Local food sustainability	Town-wide	public/private	V/S	West Newbury tax credit on bird-friendly/pollinator/gardens yards, tax reduction on vegetable gardens in private homes, plans to encourage local farm use					
Tick population	Town-wide	public/private	V	Related to pollinator friendly back yard town resources, new resident communication					
West Nile/EEE	Town-wide	public/private	V	Education					
Trails	Town-wide	public/private	S	Maintenance, funding for, guided walks					
Drought	Town-wide	private	V	Water conservation education, planting items that don't require high water					
Merrimack River	Town-wide	public/private	S	Purchase recreation land/access to river, bank stabilization through planting					
Wetlands	Town-wide	public/private	S	Building resiliency, eradicate phragmites					
Mill Pond	Mill Pond	public	V/S						
Brake Hill	Brake Hill	public	V/S						
Town Owned Land	Town-wide	public	V/S						

Note: Underlined action items are those that were prioritized during small group discussions.

Community Resilience Building Risk Matrix

Group 2: West Newbury

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time Short Long Ongoing
Infrastructural									
River Road		public	V	Bank stabilize					
Crane Neck/Georgetown Road		public	V	Improve drainage					
Main St - 113		public (state)	S	Improve walk/bike					
Indian Hill/Kelly Brook		public	V	Improve drainage					
Ash St - swamp		public	V	Improve drainage and infrastructure					
New high school		public	V	Review plan for flood					
Undeveloped land (GI)		public/private	S	Manage/acquire land					
Power lines (now/future)		public (utility)	V/S	Coordinate with utilities and local rep, vegetation management (local)					
Power - lack of redundancy		public		Determine back up options					
Dole Place wellhead		private	V/S	Impact fee - revenue, acquire land					
River Road ped. bridge		public	V	Look at options to acquire supplies					
Communication infrastructure		public/private	V	Improve wireless/radio infrastructure					
Seabrook				Raise awareness, calendar!					
Societal									
Preparedness (Seabrook)			S	Get better data					
Energy Comm			S	Work with MVPC					
Volunteers			S						
Lack of public trans			V	Regional partnerships					
Hospitals		public	S						
Lack of full time fire department		public	V						
Rural landscape			V/S						
Local food production			V						

Community Resilience Building Risk Matrix

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O ngoing
Environmental									
Forest management		public/private	V/S	Management plan,					
Development, tree removal		private	V/S	Improve controls					
Purchase open space		public	S	Update OS plan					
Vector management		public/private	V/S	Education					
Merrimack River			S	Support regional efforts					
Reservoirs		public (NBPT)	S	Protect land, encourage repair					
Water supply		public	V						
Air quality - wood heat			V	Promote new stoves					

Note: Underlined action items are those that were prioritized during small group discussions.

Community Resilience Building Risk Matrix

Group 3: West Newbury

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High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O ngoing
Infrastructural									
Rt 113 bridge	East at Artichoke	State	V unknown	Assessment of bridge and dam (for water supply)					
Rt 113 (high ground)	Whole road (except landslide area)	State	S						
Middle St new bridge (if designed for secondary evacuation route)		Town (WN and NBPT)	S	Ensure design takes into account flooding vulnerability					
Dam at 113	Rt 113	NBPT?	V						
Seabrook - relicensing nuclear power	Evac. Rts.		V						
High school wastewater	To Groveland	PRSD	V/S	Assess whether Haverhill WWTP is resilient and can handle new high school					
New middle/high school, equipped as emergency shelter?		PRSD	V						
Communications-backup emergency systems			V	Increase participation in Code Red/reverse 911					
Local food pantry			S						
Emergency alerts available			S	Maintain/enhance use of social media on emergency					
Getting to non-participants in emerg. systems			V						

Community Resilience Building Risk Matrix

Group 3: West Newbury

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time Short Long Ongoing
Societal									
Low lying evacuation routes (River Road)	Along Merrimack, Crane Neck, and Indian Hill?	Town	V	Public education for residents in those areas of town and assessment of eng. improvements of roads					S (education)
Communication WIFI in municipal campus		Town	V	Determine whether WIFI is available to public during emergency, make location available					
Public education			S						
Town not water supply independent			V	Emergency reverse osmosis in event of contamination, bring new wellfield online					
Flood prone land			V	River Road, Crane Neck, River Meadow					
Septic system waste disposal			V	Education on maintenance					
Community engagement			S	Promote existing groups. Consider forums					
Access to food/grocery and hospitals/medicine	Newburyport/ Haverhill		V						
Inadequate emergency shelter			V	Identify, prepare, upgrade, equip shelters; 3 locations? (muni campus, middle/high, Page), municipal campus has additional benefit of elderly housing protection					
Relatively new police/fire		Town	S						
Town office complex and elderly housing - inadequate backup power	Town office complex	Town	V	Move forward with microgrid project and muni-campus shelter					
Citizens awareness of climate change			S						
Local emergency dispatch		Town	S						
Environmental									
Rt 113 near DPW - deep cut landslide risk	Rt 113 near Page School and DPW	State	V	Assess vulnerability of roadcut to erosion; identify option to address if found vulnerable (MassDOT?)					
Amount of wetlands	All over	Town/private	S						
Tree canopy	All over	Town/private	S	Protect potential bylaw to maintain trees during development					
Cutting trees	All over	Town/private	V	Modify OSPD bylaw, native tree plantings, disease resistant plants					
Wetlands alteration/filling	All over	Town/private	V	Education, encourage maintaining swales, stump dump, town facility composting					
Invasive pests	All over	Town/private	V	Education (library as resource), direct people to resources/info					
Invasive plants	All over	Town/private	V	Best management practices, education, town plan, encourage natives, invasive app					
DPW equipment for response to down trees				Inventory, needs assessment					

Note: Underlined action items are those that were prioritized during small group discussions.

Community Resilience Building Risk Matrix

Group 4: West Newbury

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High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O ngoing
Infrastructural									
Flooding streets	River Rd, Ash St, Rock Village	public	V	Elevate roadways				M	
Flooding - dam		public	V	GAP?, community education residents in zone				H	
Proximity to Seabrook Nuc. inundation	Evac zones	public	V	Under emerg. evac. Routes/impact from storms				M+	
Drainage/maintenance	Town-wide	public	V	Develop/improve/enforce O&M Plan, map locations, culvert analysis				M/H	
Sheltering	Town-wide	public	V	Evaluate existing capacity services for sheltering needs: sleeping, capacity, generator, food service, POD				H	
Open space	Town-wide	public	S	Encourage open space protection acquisition, GIS analysis/model				M	
Power outages	Town-wide		V	Tree management plan, coordination with multiple providers				H	
Siting of new HS	500yr flood zone	public	V	Protocol oversight, stormwater				H	
Societal									
Strong public safety program			S	Continue to support				H	
CERT? MRC? Emergency response, coordination?			V	Feasibility study to evaluate				M+	
Code Red, elder services, vulnerable population list/outreach			S/V	Evaluate what is in place/what's needed, such as water break notification, with vulnerable population (disabled, elderly)				H	
Red Cross approved sheltering capacity/services			V	See infrastructure action items					
MOU with equipment, other communications emergency contractors		public/private	V	Develop/maintain list for resources, evaluate adequacy of existing - should be in EMP - add fuel supply/reserves - no gas stations				H	
Library -education outreach resource		public	S	Find opportunities to coordinate/build into curriculum, programs at library for adults				H	
Schools -improve			S	Find opportunities to coordinate/build into curriculum					
Municipal snow removal - sidewalks	Town-wide	public	S	Support DPW efforts and $				H	
Hydrant clearing snow storms	Town-wide	private	V	Educate/Adopt-A-Hydrant, residents who use contractors, Code Red reminder Dec.				H	

Community Resilience Building Risk Matrix

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High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O ngoing
Environmental									
Policy around maintenance of ditches	Town-wide	public/private	V	See infrastructure action items					
Ditches increasing temp, vol, southern species/dis	Town-wide		V			Public education program		M	
OSC invasives Com outreach	Town-wide		S			Continue education		L	
CSO potential contamination	River	public/private	V	Notification system, coordination with upstream polluters				H	
Lack of awareness of BMP - Surface water protection	Reservoirs	private	V	SWPP				M	
Federal farming programs - WQ protection, lack of awareness/use	Farms	private	S/V						
Lack of policy/enforcement		public	V	Education, awareness, ACES partnership					
Tree removal plan, power risk	Town-wide	public	S	Support DPW efforts				M+	
Lack of control over state road	Rt 113	State	V	Coordination with state/National Grid				H	
Use of fertilizer on laws, WQ	Town-wide	private	V	ACES, awareness, education				H	
Education on recycling in town, trash in wetlands	Town-wide	private	V	ACES, awareness, education					
Beaver population, 6 places control	Town-wide	public/private	V	Continue to implement/enforce				L	

Note: Underlined action items are those that were prioritized during small group discussions.

Community Resilience Building Risk Matrix

Group 5: West Newbury

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time S Long O
Infrastructural									
Roadways	Town-wide, specific	public	V/S	Inventory drainage, assess culvert capacity, abandon Ash St, enhance roadway maintenance plan					
Drainage	Town-wide	public	S	Infrastructure					
Seabrook Power Plant	Seabrook	public	V	Continue engaging with Feds, plan evacuation routes, (E.M.A.)					
Power infrastructure	Town, Stewart St.	private (Nat. Grid)	V/S	Creation of microgrids with battery backup, develop solar on town and commercial buildings					
Power infrastructure - transmission to residences	Town-wide	private (Nat. Grid)	V	Putting power lines underground, explore viability of Smart Grid					
Water supply and backup supply	Artichoke and wells	Town	V	Water supply protection plan with Newburyport, long term and emergencies					
Public safety building	Town	public	S	Microgrid for town complex					
Tree trimming for National Grid	Town	public	V	Putting power lines underground, explore viability of Smart Grid					
Spotty cell service	Town	private	V						
Societal									
Community networks	Town	N/A	S						
Aging population	Town	N/A	V	Develop elder check program, improve global senior services (i.e., AC in Sr. Center)					
Fire Dept response to senior emergencies	Town	public	S						
Well trained fire dept	Town	public	S						
Affluent and educated population	Town	N/A	S						
Library as educational resource	Town	public	S						
Communication	Town	N/A	S						
Communication of climate awareness	Town	N/A	S/V	School curriculum about climate					
Town website (short comings)	Town	public	V						
Personal preparedness	Town	N/A	V	Develop and promote community program and outreach					
Code Red System	Town	Public	S	Ensure 100% enrollment					

Community Resilience Building Risk Matrix

Group 5: West Newbury

www.CommunityResilienceBuilding.org

Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide
V = Vulnerability **S** = Strength
Type of Feature = **I**nfrastructural, **S**ocietal, or **E**nvironmental
High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Priority H - M - L	Time Short Long Ongoing
Environmental									
Open space resources, trails, agricultural land	Town	public/private	S	Continue investment in open space and prime agricultural land, heat management/food supply/carbon sink					
Wetland resources	Town	public	S/V	Local wetlands bylaw					
Beaver dams/activity	Town	public	V						
Disease vectors	Town	public	V	Education on disease prevention and detection, explore management for deer and rodents, bug spray station at trails					
Changing ecosystems	Town	public	V	Education on disease prevention and detection, explore management for deer and rodents, bug spray station at trails					
Pollinator losses	Town	public	V	Preservation of open space and fields, change mowing schedule on state highways, mowing schedules and public education on pesticide use					
Air quality and heat, public health impacts	Town	public	V	Promote electric vehicles for town vehicles/equipment, reduce waste going to incinerator, composting					

Note: Underlined action items are those that were prioritized during small group discussions.

Attachment E: Unique Recommended Action Items from All Groups

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide
V = Vulnerability **S** = Strength
Type of Feature = **I**nfrastructural, **S**ocietal, or **E**nvironmental
High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

All Unique Recommended Action Items - Original Wording: West Newbury

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Group	Priority	Time
								1-5	H - M - L	Short Long Ongoing
Infrastructural										
Emergency communication/ infrastructure	Town-wide	public	V	Improve cellular wireless and radio infrastructure Maintain lists of vulnerable populations for outreach Code Red service – evaluate what is currently in place and what is needed				2		
Open space preservation (Open Space, Agriculture, and Forests)	Town-wide	public	S	Continue implementing OSRP Encourage open space acquisition, based on criteria GIS analysis, evaluate open space distribution across town for equity of access Maintain CPA as a priority Green infrastructure Invasive species management Improve land use controls (Tree/tree canopy preservation, Wetland protection, Forests/Trees/Fields Management)				4	M	
Backup power and sheltering	Town-wide	public/private	V	Municipal microgrid with backup storage (green energy) for emergency shelter and senior housing Upgrade schools as shelters				1		
Water supply and backup supply	Artichoke and wells	Town	V	Water supply protection plan, including dam modifications				5		
Vulnerable neighborhoods	Town-wide	public	V	Assess vulnerable neighborhoods and plan to address vulnerabilities, such as erosion and flooding Priority area is River Rd. erosion Other areas include: Rte. 113 Bridge, Crane Neck, Meadow River Drive, and others				1		
Power outages	Town-wide		V	Develop forest/tree management plan: Coordinate with state to remove high hazard trees Continue identifying diseased/declining trees - DPW Replanting/reforestation plan (migrating species due to climate change) Homeowner education (what, where, native species)				4	H	
Drainage maintenance	Town-wide	public	V	Develop/improve enforce Operation and Maintenance plan Map locations of all issues and prioritize Culvert analysis, map and prioritize improvements				4	M/H	

Community Resilience Building Risk Matrix

www.CommunityResilienceBuilding.org

Location = Mark on the map, note on matrix Multiple, Specific or Town-Wide
V = Vulnerability **S** = Strength
Type of Feature = **I**nfrastructural, **S**ocietal, or **E**nvironmental
High, **M**edium, or **L**ow priority for action over the **S**hort or **L**ong term (and **O**ngoing)

All Unique Recommended Action Items - Original Wording: West Newbury

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

Features	Location	Owner	V or S	Severe Storms	Changing Precipitation Patterns	Disease and Invasive Species	Temperature Extremes	Group	Priority	Time
								1-5	H - M - L	Short Long Ongoing
Societal										
Communication of climate awareness	Town	N/A	S/V	Improved educational communications around climate change impacts and preparedness Outreach through libraries, school curriculum, senior services				5		
Vulnerable populations (elderly, disabled, etc.)	Town-wide	public	V/S	Conduct outreach to participate Water main breaks Fire hydrant cleaning				4	H	
Council on Aging	Town-wide	public	V/S	More functions and resources for Council on Aging				1		
Environmental										
Loss of land to development	School	public/private	V	Comprehensive plan to match development to available resources to address loss of land to development				1		
Disease vectors	Town	public	V	Education on disease prevention and detection				5		
CSO potential contamination	River	public/private	V	Develop/Implement notification system for downstream residents (consider possibly incorporating it into Code Red) Coordinate with upstream WWTPs to reduce occurrence Educate about health impacts – including fishing, recreational use				4	H	
Air quality and heat, public health impacts	Town	public	V	Promote electric vehicles for town-owned vehicles and equipment				5		

Attachment F. Annotated Maps from Discussion Groups

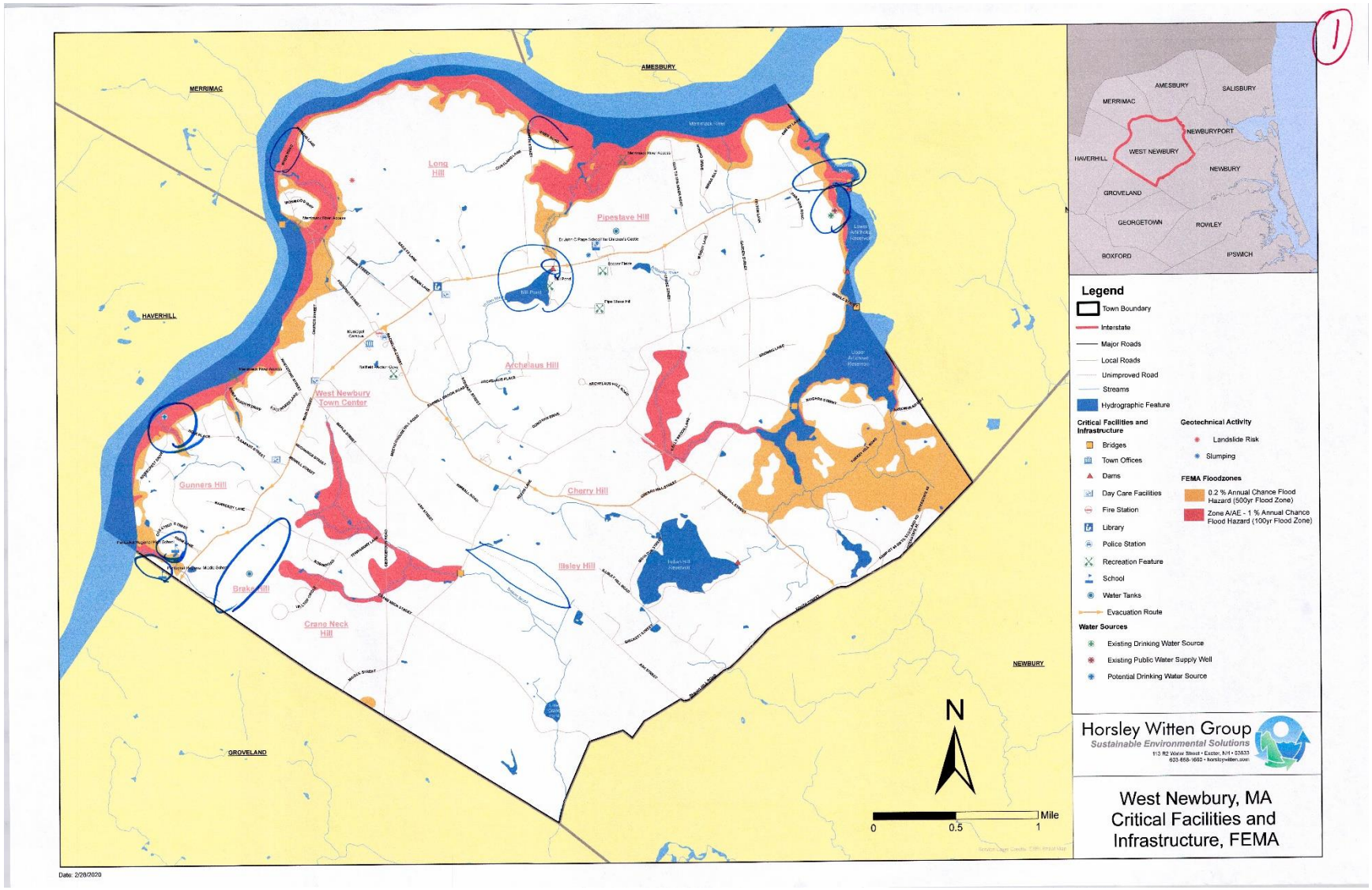


Photo 1 Map annotated by small Group 1 highlighting vulnerable infrastructure, flood zones, and other community resources.

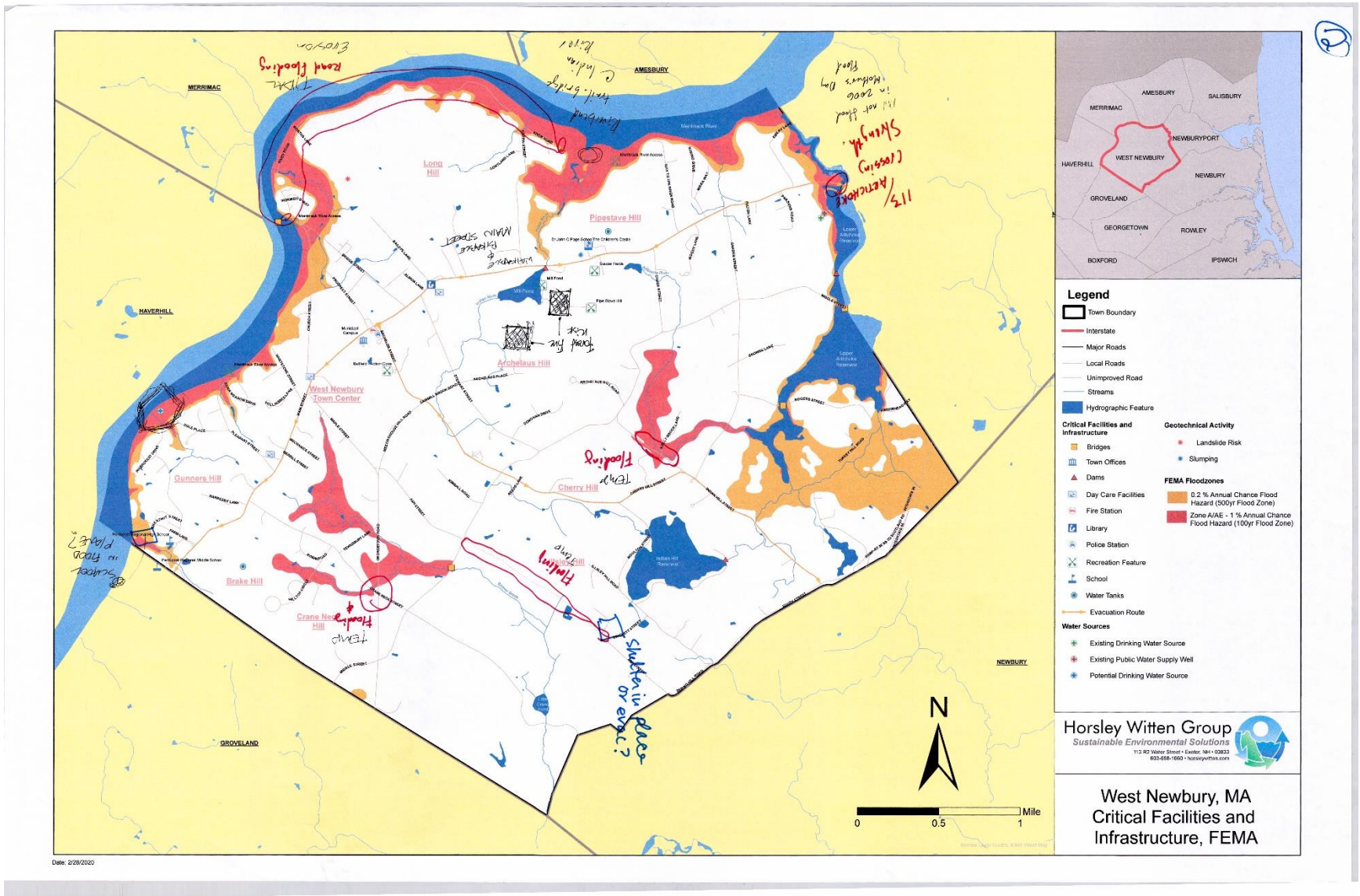


Photo 2 Map annotated by small Group 2 highlighting vulnerable infrastructure, flood zones, and other community resources**.**

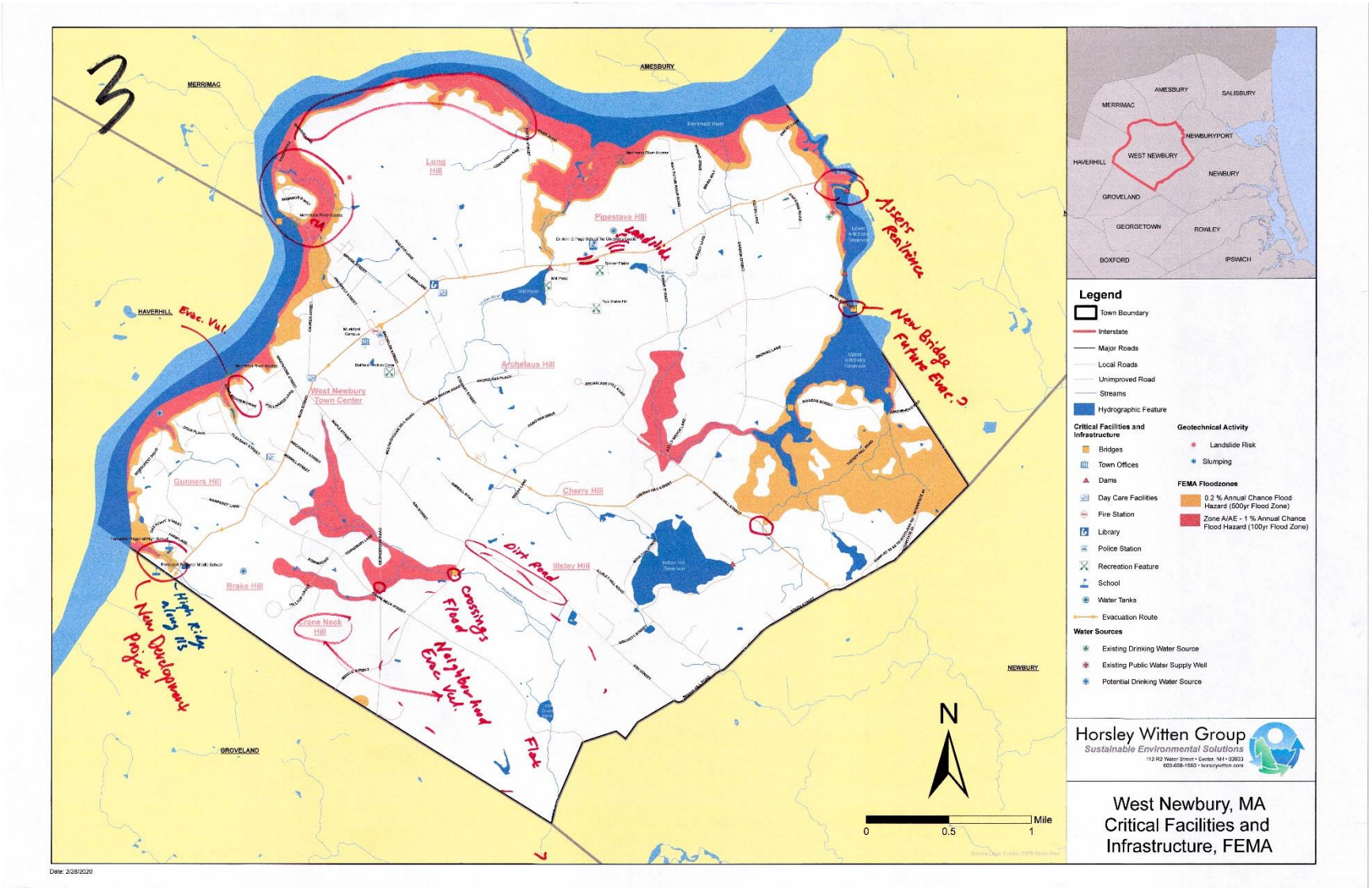


Photo 3 Map annotated by small Group 3 highlighting vulnerable infrastructure, flood zones, and other community resources**.**

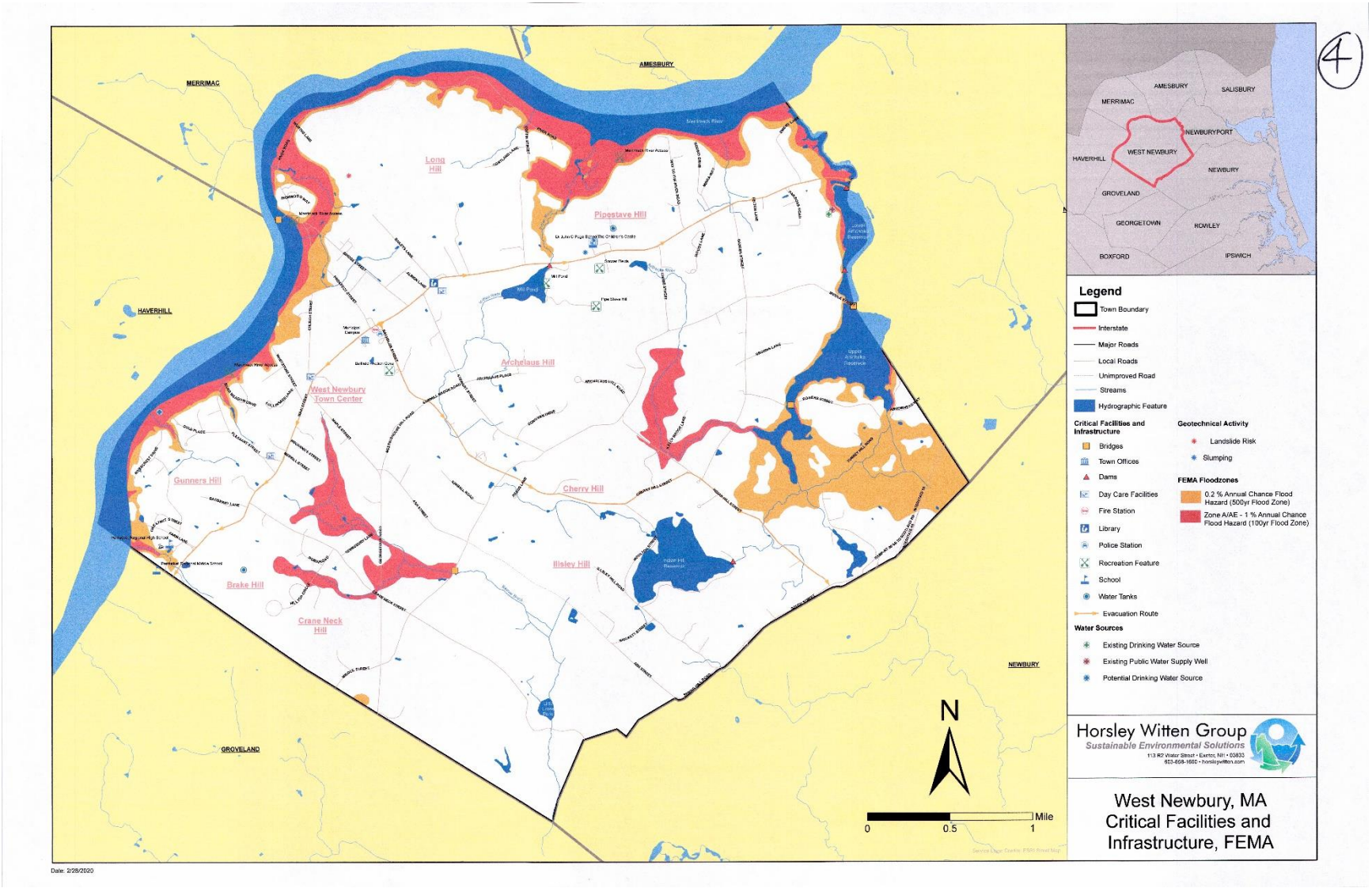


Photo 4 Map annotated by small Group 4 highlighting vulnerable infrastructure, flood zones, and other community resources**.**

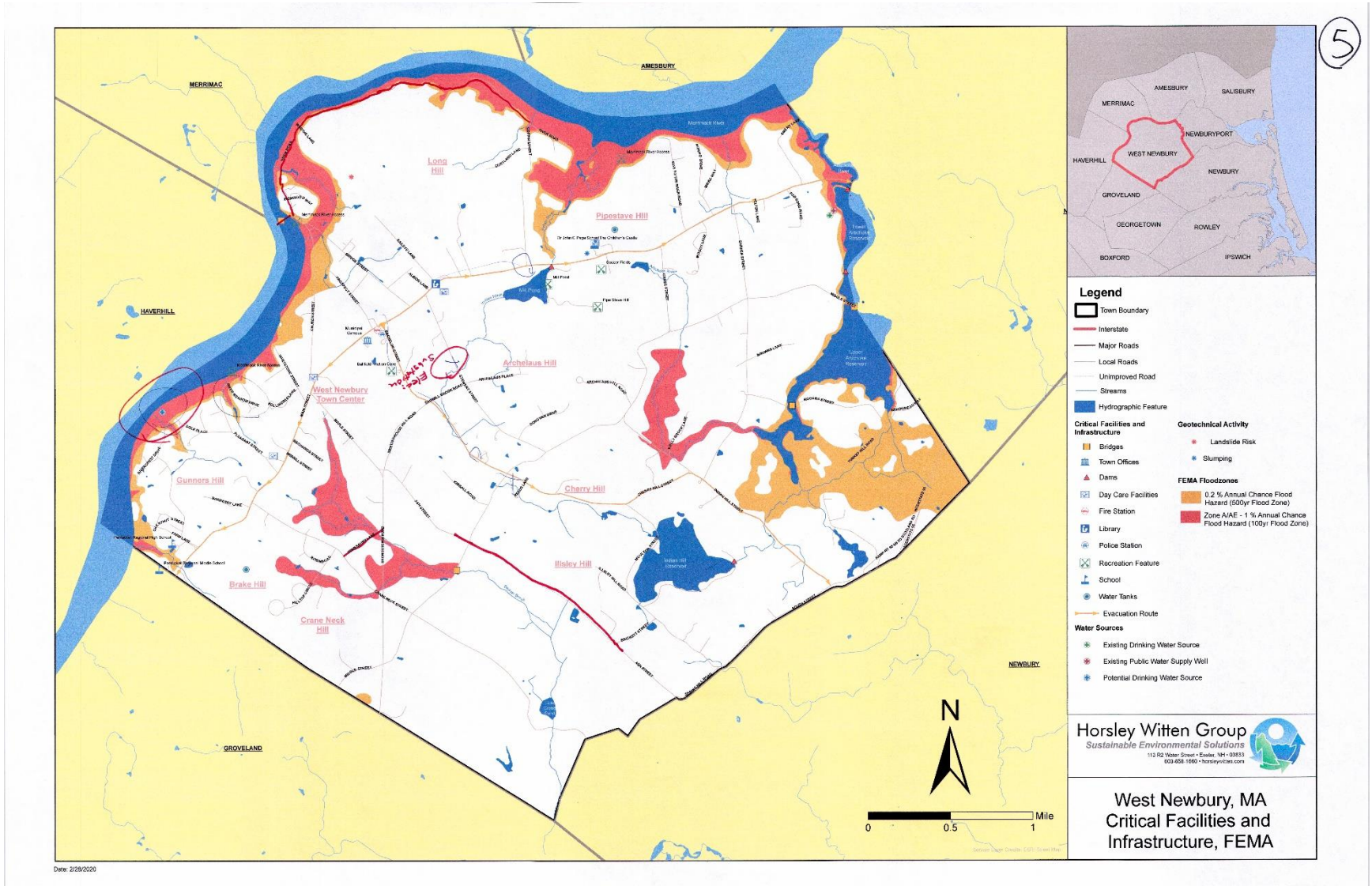


Photo 5 Map annotated by small Group 4 highlighting vulnerable infrastructure, flood zones, and other community resources**.**

Attachment G: Summary of Interviews with Select Town Services Providers

West Newbury Municipal Vulnerability Preparedness
Interview Summary

Interviews conducted individually by Ellie Baker, Horsley Witten Group, and Elisa Grammer, MVP Core Team.

Interviewees:

- Paul Sevigny (Health Agent) and Rick Thurlow (longtime resident/farmer)
- Justin Bartholomew (Superintendent) and Greg Hadden (Facilities Manager)
- Angus Jennings (Town Manager)
- Dan Cena (Police Sargent) and Ben Jennell (Assistant Fire Chief)
- Patricia Reeser (MVP Working Group, Open Space Committee)
- Wayne Amaral (DPW Director) and Gary Bill (Former DPW Director)
- Mike Gootee (Water Superintendent)
- Theresa Woodbury (Council on Aging)

What do you see as the greatest hazards facing your constituents?

- Flooding – Interviewees pointed to flooding as a hazard resulting in impassable roads, possible contamination of wellfields, damage to water infrastructure such as wellfields or the Artichoke reservoir, and erosion of roadways.
- Drought – Interviewees noted that West Newbury is dependent on Newburyport for about 30% of water supplied to the Town. Future water shortages and increases in population and development could result in more dependence on Newburyport's water supply.
- Power outages – Large storms the led to widespread loss of power were repeatedly identified as one of the greatest hazards experienced in West Newbury. Power outages affect provision of heating/cooling, medical devices, operation of public facilities such as schools, water supply from wells, and emergency management.
- Freeze/Thaw Cycles – Some interviewees noted that freeze/thaw cycles regularly damage public infrastructure, such as aging water mains.
- Invasive Species/Pests – Ticks in particular, along with mosquitos and Oriental bittersweet, were mentioned as worsening concerns for public health.

What are some problems you have observed?

- Flooding
    - River Road frequently floods in two locations, due to both rainfall and river overtopping. The river is eroding the roadway, and often leaves debris that must be cleared for River Road to be navigable.
    - Drainage ditches (a remnant of the agrarian history of many properties in Town) are often poorly maintained. Drainage systems are less effective when ditches are clogged, worsening their flood control capabilities.
    - Clogged drainage ditches also create wet areas that provide breeding habitat for ticks and mosquitos.

    - Beaver activity has resulted in flooding and less storage capacity along Kelly and Beaver Brooks. The culvert at Garden Street washed out 10-15 years ago, possibly related to this.
    - Concern of the Artichoke Reservoir overtopping[1]
    - The new Middle/High school building may be built in a floodplain.
    - Along Merrill Street, the swale between Knapp's and Merrill is becoming more densely vegetated, and is widening as a result of its congestion.
    - On Bachelor Street, a driveway culvert regularly backed up, although the highway department recently lowered the culvert to fix the issue
    - Job Swamp along Crane Neck Rd is flooding more, getting larger.
    - Ash Swamp has a dirt road that often floods, becoming impassable, repairs needed constantly
- Drought
    - Town obtains approximately 30% of water from Newburyport
    - If the Artichoke Reservoir water level is lowered for the Middle Street Bridge construction, West Newbury (via Newburyport) could be more vulnerable in droughts
- Power Outages
    - Town loses power several times per year.
    - Page School often must close during power outages. Much of the electric system is brittle.
    - National Grid and DPW are both vigilant in trimming trees that present possible power outage hazards.
    - The Police Station has no battery backup, and must manually set up a generator and space heater when power outages occur to allow the repeater to continue to work. (Police radios do not function without the repeater)
    - Many homes lose phone service entirely during power outages, which presents a risk if an emergency occurs.
    - Wells water cannot be used during power outages, since the well pumps are not operational.
    - Power lines in West Newbury are not insulated.
    - The Water Department cannot operate during power outages without access to refills of propane.
    - Those with medical issues that require power face major health risks during power outages. This particularly affects elderly communities and those with disabilities.
- Invasive Species/Pests
    - Bittersweet is spreading in many locations throughout Town, and is time consuming to manage.
    - Conversion of farmland to residential may have caused an increase in ticks and mosquitos, since wet areas are no longer maintained.

[1] During the 2006 Mother's Day Storm, the Artichoke Reservoir came within inches of the top of the Artichoke dam. During the same event, the Artichoke River nearly overtopped the dike/roadway that protects the Bartlett Spring Pond. Following maintenance work in 2014, the dam has been rated *low risk* in terms of the hazard of a failure.

- Other
    - Page School – Much of the Page School infrastructure is aging, including brittle wiring and lead pipes. The structure itself is crumbling. The school is on septic, and may be experiencing groundwater seepage into the system.
      Waste Disposal – No compost facility in Town. Storm damage material pickup by the Town is time consuming.
    - Fertilizer – Fertilizer is overused on private lawns.
    - Accessibility – West Newbury is not an Age Friendly Town, and lacks accessibility features like public transportation or sidewalks. In general, many public facilities and parks/playgrounds are not ADA compliant.
    - Groundwater – The groundwater level in the Town is very high, and some septic systems are below the water table.

Are issues worsening?

Most respondents say yes:

- Elderly population have increasing complex medical needs, and the elderly population in West Newbury is increasing.
- Demand for water is gradually increasing, although the only recent development in recent years is a new groundwater well at the existing wellfield. Long term supply issues will also compete with resource limitations within the Water Department required to treat potentially worsening water quality.
- The Town's water distribution system is more susceptible to freeze/thaw cycles as it ages. Increased fluctuations in temperature may lead to an increase in freeze/thaw cycling, resulting in more damage over time.
- The Page School is in deteriorating shape. Despite upgrades, the school's infrastructure is aging.
- As the Town shifts from using land for agrarian to residential purposes, property management that does not account for water drainage and pest management has proliferated. This came up in several interviews in different contexts.
- Flooding is increasing in numerous locations around Town and bank erosion along River Rd is increasing.

Are certain groups in town especially at risk?

- Elderly communities and those with disabilities – Those who are dependent on electricity for medical services are especially vulnerable during power outages. Older populations may be less likely to have cell phones, creating a risk if an emergency occurs during a power outage. Lack of public transportation makes it difficult for these populations to reach help when power outages occur. The elderly are also more vulnerable to the harmful effects of insect-borne disease.
- Town water users – Those who use municipal water for residences (roughly 65% of the Town) or fire suppression are impacted by concerns related to drought/water supply shortages.
- Low-lying homes – Many homes are at low elevations, and periodically experience basement flooding. During power outages, sump pumps do not work, and the Fire Department must help pump water from basements.

- Young children and their parents – Because the Page School is particularly susceptible to power outages, the school's students and their parents are likely to be impacted by large storms.

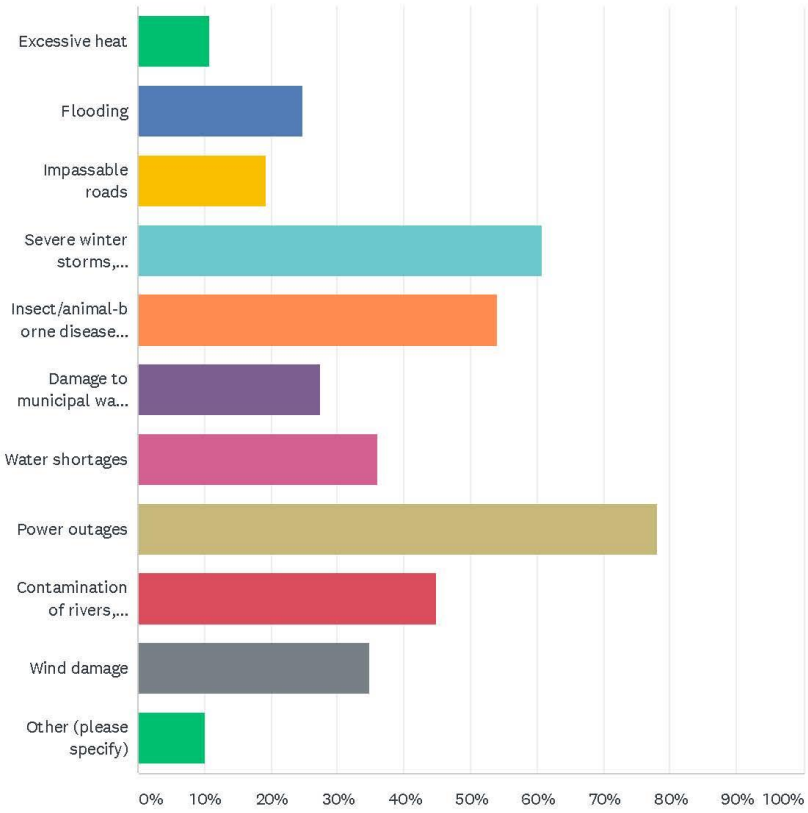
What critical actions could the town take?

- Allocate time toward a comprehensive planning effort such as a Master Plan update. Incorporate climate adaptation and other aspects of Town planning.
- Shore up the power grid.
- Design drainage infrastructure based on future rainfall projections.
- Enhance backup power for municipal service such as the police and fire departments, as well as senior housing.
- Diversify and increase water supply sources. Reinforce existing water supplies.
- Provide public education on topics such as landscaping to improve drainage and fertilizer issues that occur on private property.
- Pave any unpaved roads in areas prone to flooding.
- Update tools for individual emergency preparedness.
- Become an age-friendly Town.
- Complete overhaul of Page School, or construct a new Page School.
- Revise regulations and regulatory processes to allow Town to perform tree and land management and drainage management for public safety and resilience.

Attachment H: Results of Public Survey

Q1 Which of the following vulnerabilities do you think poses the biggest challenge to West Newbury right now?Choose 4:

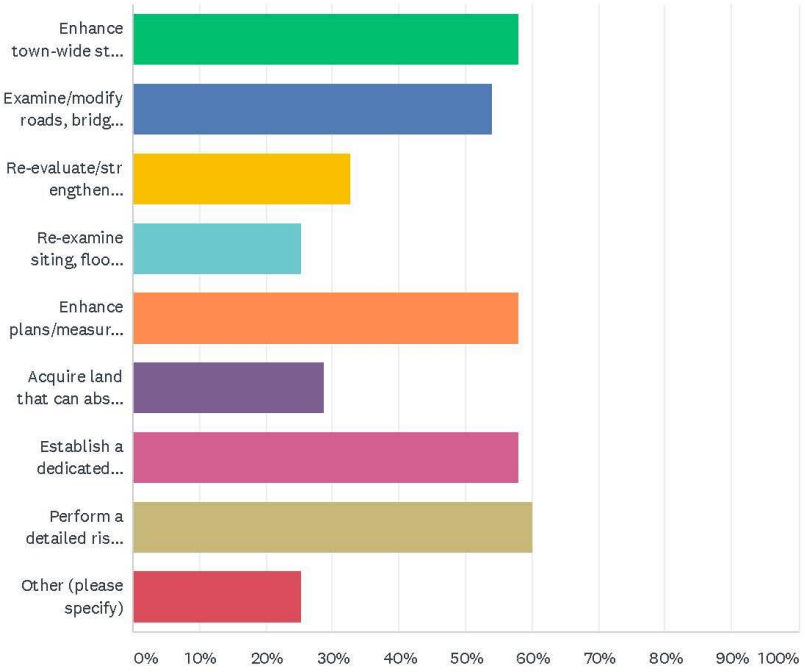
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
Excessive heat	10.67%	16
Flooding	24.67%	37
Impassable roads	19.33%	29
Severe winter storms, Nor'easters	60.67%	91
Insect/animal-borne diseases affecting humans (e.g. Lyme, EEE)	54.00%	81
Damage to municipal water supply wells, reservoirs, etc.	27.33%	41
Water shortages	36.00%	54
Power outages	78.00%	117
Contamination of rivers, streams, ponds (e.g. combined sewer overflows, stormwater, cyanobacteria)	44.67%	67
Wind damage	34.67%	52
Other (please specify)	10.00%	15
Total Respondents: 150		

Q2 Which of the following actions should West Newbury be focused on to reduce our vulnerabilities?Choose 4:

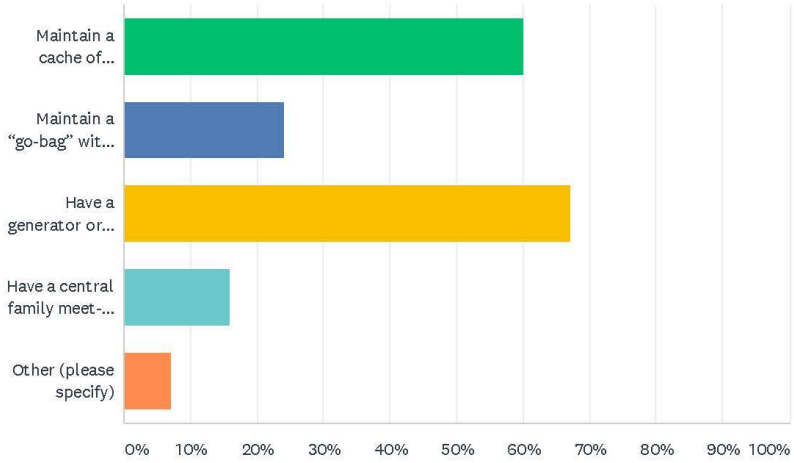
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
Enhance town-wide storm water management	58.00%	87
Examine/modify roads, bridges, and culverts to reduce flooding and flood damage	54.00%	81
Re-evaluate/strengthen wetlands protection regulation	32.67%	49
Re-examine siting, flood protection and other regulations for new structures	25.33%	38
Enhance plans/measures to address insect/animal-borne disease	58.00%	87
Acquire land that can absorb rain and reduce flood damage elsewhere	28.67%	43
Establish a dedicated backup power supply for the municipal campus (Town Offices, Fire and Police Departments, and Senior Housing)	58.00%	87
Perform a detailed risk evaluation and vulnerability assessment in town	60.00%	90
Other (please specify)	25.33%	38
Total Respondents: 150		

Q3 What steps have you taken in anticipation of severe weather events? Choose all that apply:

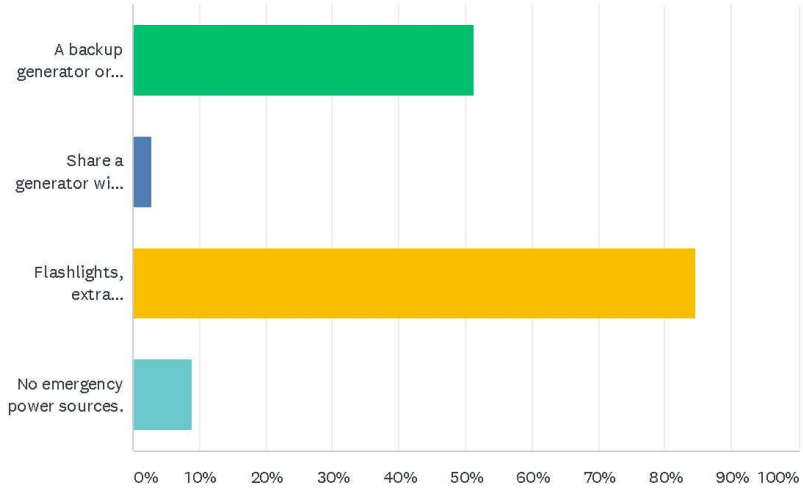
Answered: 125 Skipped: 25



ANSWER CHOICES	RESPONSES	
Maintain a cache of critical information, stored food, medicine, water, etc. for sheltering in place.	60.00%	75
Maintain a "go-bag" with medicine, important documents, essentials in case of evacuation.	24.00%	30
Have a generator or alternative means to address power loss.	67.20%	84
Have a central family meet-up place in the event of evacuation or blocked access to home.	16.00%	20
Other (please specify)	7.20%	9
Total Respondents: 125		

Q4 What back-up power sources do you have in case of a power outage? Choose all that apply:

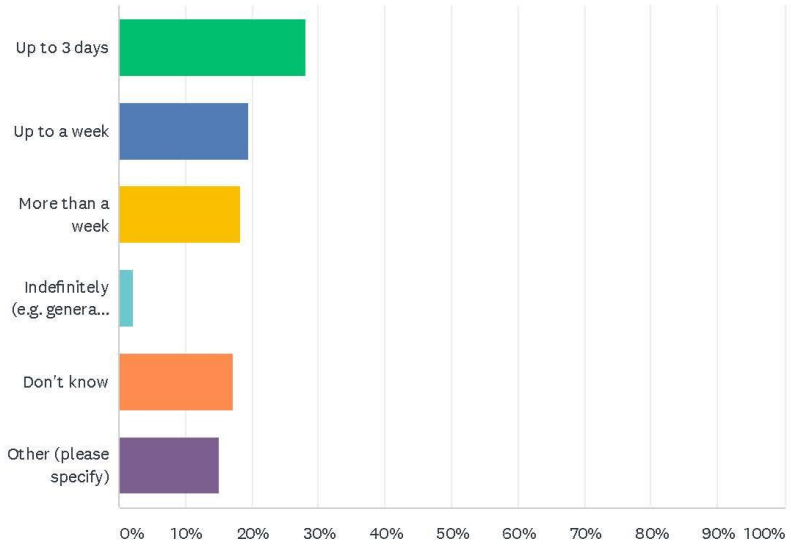
Answered: 148 Skipped: 2



ANSWER CHOICES	RESPONSES	
A backup generator or alternate source of electricity at home.	51.35%	76
Share a generator with my neighbor.	2.70%	4
Flashlights, extra batteries, or portable chargers at home.	84.46%	125
No emergency power sources.	8.78%	13
Total Respondents: 148		

Q5 If you have a backup generator/alternate source of electricity, how long would it operate with the fuel supply that you have on hand?Select one:

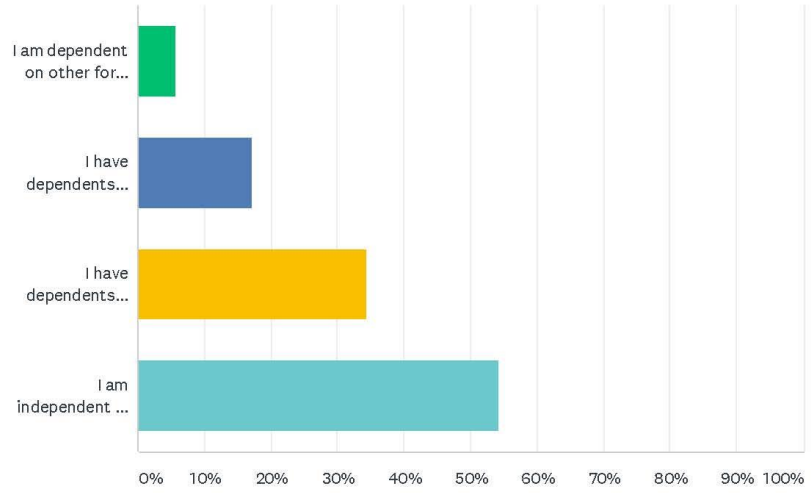
Answered: 93 Skipped: 57



ANSWER CHOICES	RESPONSES	
Up to 3 days	27.96%	26
Up to a week	19.35%	18
More than a week	18.28%	17
Indefinitely (e.g. generator with solar + battery, or generator fueled by natural gas assuming uninterrupted supplies)	2.15%	2
Don't know	17.20%	16
Other (please specify)	15.05%	14
TOTAL		93

Q6 Taking into consideration any backup power you may have, in the case of a severe weather event, which of these statements best describes you?Choose all that apply:

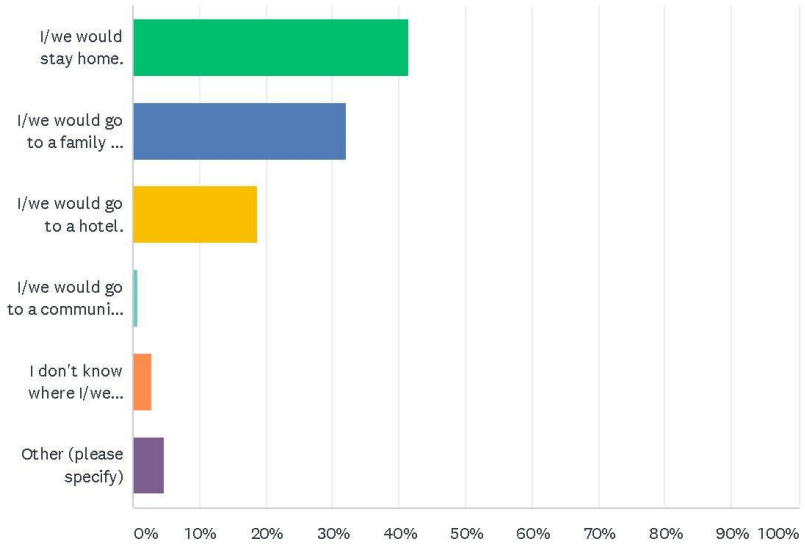
Answered: 140 Skipped: 10



ANSWER CHOICES	RESPONSES	
I am dependent on other for care or assistance.	5.71%	8
I have dependents outside my household who would require care or assistance from me.	17.14%	24
I have dependents inside my household who would require care or assistance from me.	34.29%	48
I am independent and do not need to check on anyone outside of my household.	54.29%	76
Total Respondents: 140		

Q7 Where would you and members of your household go in the event of a prolonged (e.g., 3+ days) power outage (assuming that roads were passable and there was no other damage to your home)?

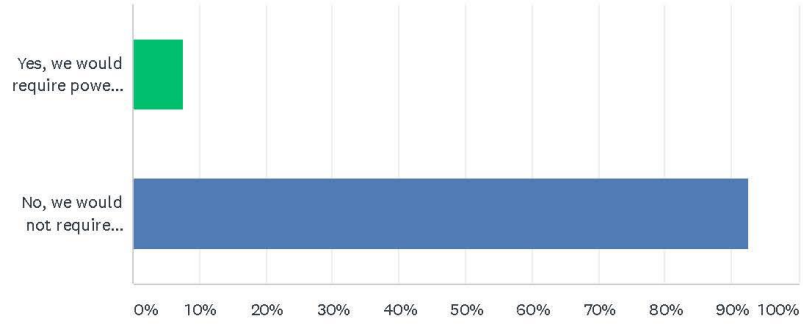
Answered: 150 Skipped: 0



ANSWER CHOICES	RESPONSES	
I/we would stay home.	41.33%	62
I/we would go to a family or friend's home.	32.00%	48
I/we would go to a hotel.	18.67%	28
I/we would go to a community shelter.	0.67%	1
I don't know where I/we would go.	2.67%	4
Other (please specify)	4.67%	7
TOTAL		150

Q8 Does anyone in your household require power for medical reasons (e.g., for special medical equipment, air conditioning, heat) or other reasons that would create a medical emergency in the event of a power outage of more than 24 hours?Select one:

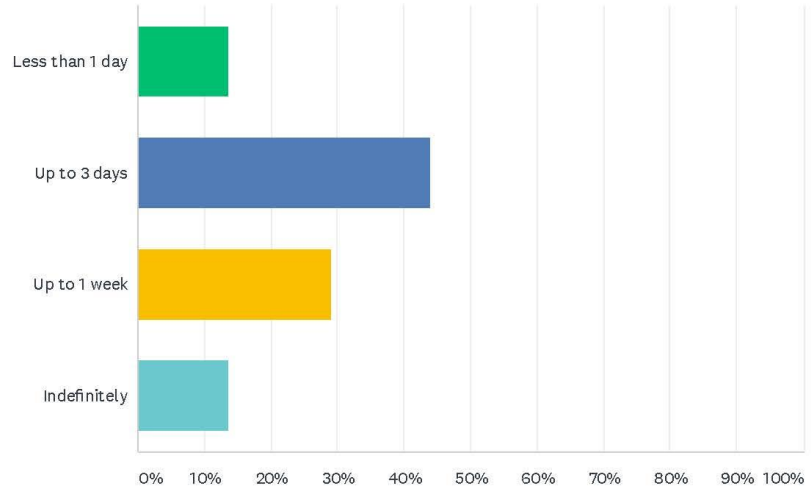
Answered: 147 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes, we would require power to avoid a medical emergency.	7.48%	11
No, we would not require power to avoid a medical emergency.	92.52%	136
TOTAL		147

Q9 Consider a disastrous event like Hurricane Sandy (with weeks of power outages and limited if any gasoline/propane availability) and the medical or other needs in your household. Taking into consideration any backup power you may have, how long are you and your household prepared to stay at home without power?Select one:

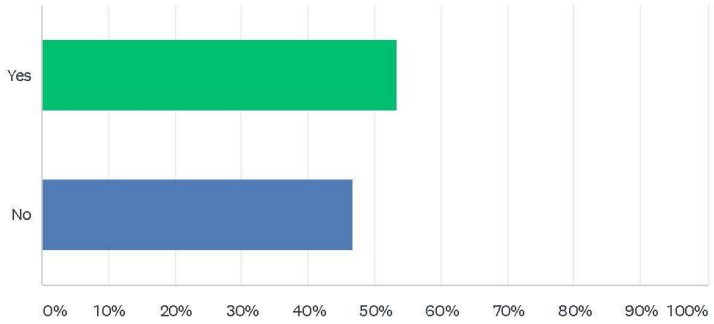
Answered: 148 Skipped: 2



ANSWER CHOICES	RESPONSES	
Less than 1 day	13.51%	20
Up to 3 days	43.92%	65
Up to 1 week	29.05%	43
Indefinitely	13.51%	20
TOTAL		148

Q10 Do you believe you would personally benefit from backup power at Town Offices, Fire and Police Department, and Senior Housing to serve as a warming and cooling shelter and as a source of electricity?

Answered: 148 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	53.38%	79
No	46.62%	69
TOTAL		148

"Other" responses:

Question 1.

- Power outage is BY FAR my biggest concern
- Can we have data on "severe" and "frequent" natural hazards compared to past decades.
- Communication to residents
- Over development
- Overuse of salt on roads and environmental impact on freshwater streams/ponds
- Too much power consumption from new development
- More crooks in our Town government

Question 2.

- ?
- Water source so we don't buy water from Newburyport
- Test ground water regularly for sewage contamination from Merrimack River
- Prohibit the use of garden non-organic chemicals to protect homes with well water
- Find better ways to prevent or address power outages
- Curb new construction until public water supply is increased
- Strengthen power lines
- Regularly assess trees and limbs near wires and cut back as needed.
- Develop water source(s) to reduce dependence on Newburyport
- Put utilities underground.
- Reduce taxes by termination of anyone who has worked for the Town for more than one year.
- Move all power lines from poles and bury underground
- The survey requires I pick four items above, but I don't believe any of them should be the focus. Participate in advocacy for the updating of upstream water/waste systems to eliminate the frequent overflows from waste treatment plants into the Merrimac
- Slow down destruction of forests and land by development
- Address too frequent power outages in certain Town areas, like River Rd.
- Land conservation
- Evaluate electric grid for households for risks
- Stop contamination of Merrimack River from upriver
- Demand that municipalities that are dumping treatment plant sewage into the Merrimack River cease and desist doing so!
- Remove trees in close proximity to overhead lines, 30 year chronic problem.
- Town-wide tree pruning around power lines
- Power lines underground
- Consider alternative sources of energy
- Limit new construction
- Work with national grid to strengthen power grid resilience in Town
- Don't spend money on a community shelter. Residents will not use it.
- A generator for power outages
- Backup power supply for the elderly complex during power outages.

Question 3.

- Severe weather events have become less frequent over the 35 years in residence thanks to increased efficiency of energy company
- Have other places I can retreat to south and north if I have to.
- have a chain saw, have heat pumps for summer cooling
- Charge cell phones
- We haven't done anything
- Store water. Have a emergency radio that can be continually hand cranked for updated news. Have a small propane burner to heat water
- I live in the elderly complex and we need a generator to supply heat and lighting for each unit.
- Just pray!
- Have a plan for a place to go if we lose power.

Question 5.

- Do not have generator.
- Not applicable
- Don't have one
- Less than one day
- 12-24 hours
- 6-8 hours
- Do not have a generator
- No backup
- Don't have any backup.
- The elderly complex in Town has no back up source.
- NA
- Don't have one
- We rely on burning wood when the power goes out

Question 7.

- Has happened before
- We could /would go to any of the above destinations depending on the event
- I would go to a family members house who has a generator unless it was below freezing for a long period of time, then I would feel I need to stay home to watch for freezing pipes has happened before
- It would depend on the time of year. During the Summer I would more likely stay at home
- Wheelchair bound
- I am not mobile, and without a generator, I could be a serious danger. Also selected "I don't know where I/we would go."
- Selected both "I/we would stay home" and "I don't know where I/we would go"

Attachment I: Summary of the Listening Session

MVP Listening Session 6/25/2020, 7-8 pm, via GoToMeeting
(Video available here)

Participants:
Ellie Baker, MVP Consultant, Horsley Whitten
Judy Bloomgarden, West Newbury Resident (by phone)
Brad Buschur, West Newbury Open Space Committee, Park & Recreation Board, MVP Workshop Participant
Fred Chanania, West Newbury Tree Committee Chair, MVP Workshop Participant
Liz Callahan, West Newbury Energy Advisory Committee Chair, MVP Core Team Member
Jack Duggan, West Newbury Resident
Lisa Forbush-Umholtz, West Newbury Resident
Elisa Grammer, West Newbury Energy Advisory Committee Member, MVP Project Manager
Hannah Grinnell (appearing as Michelle in chatbox), Pentucket High School Environmental Club Member, MVP Workshop Participant
Jennifer Hughes, Merrimack Valley Planning Council, MVP Workshop Participant
Angus Jennings, West Newbury Town Manager
Jean Lambert, West Newbury Open Space Committee Member
Michael McCarron, West Newbury Town Counsel & Town Clerk
Rick Parker, West Newbury Selectman, Energy Advisory Committee Member, MVP Core Team Member
Nancy Pau, West Newbury Resident, Parker River Wildlife Refuge Executive, MVP Core Team Member
Wendy Reed, West Newbury Conservation Commission Member, Open Space Committee Member, Planning Board Associate Member, MVP Core Team Member
Patricia Reeser, West Newbury Open Space Committee Member, MVP Core Team Member
Erin Rich, West Newbury Farmer, School Parent Network, MVP Workshop Participant
Arthur Wallace, West Newbury Energy Advisory Committee Member

Slideshow Presentations:
After Ellie Baker presented information on local impacts of climate change, the Municipal Vulnerability Preparedness program, and the February 29 MVP workshop, and Rick Parker gave an overview of West Newbury's strengths and vulnerabilities and key climate change concerns, as well as the action items identified in the February 29 workshop (available **here**), Wendy Reed then invited comments and questions from attendees of the listening session.

Questions and Comments:
Preserving Tree Canopy, Open Space, etc. Jean Lambert mentioned the value of preserving the tree canopy, preserving open space and dealing with invasive species. Should we be thinking about how large-scale land development will impact our tree cover and carbon storage? Wendy Reed and Rick Parker responded in agreement. We will need sound documentation to substantiate what we will try to protect. Land development is a legal process. We need documents to guide us that will hold up under close inspection. Fred Chanania expressed support for an improved program to maintain our tree cover.

Cell Towers. Mike McCarron asked whether the town has the will to address the need for cell towers. Rick Parker noted that the town currently has a cell tower bylaw that may be so strict it precludes our ability to improve communications in town. Maybe the town can revisit the bylaw and encourage improved communication systems. Cell towers are treated as infrastructure. Local regulation has limited ability to control cell towers. Federal Communications Commission regulations set the rules.

Angus Jennings also noted that under federal rules there is limited local ability to limit cell tower developments.

Comprehensive Plan. A future update to the comprehensive plan could also address communication improvements, as well as preservation of trees, open space, and the like. Angus Jennings mentioned the possibility of a more condensed "strategic planning retreat" to align various competing priorities including open space, housing production, MVP and others.

Flooding. Jean Lambert recalled that River Road was singled out as a vulnerable area for flooding. Wendy Reed responded that in addition, we also identified several other areas in town that are similarly impacted.

Coordinated Regional Efforts. Jennifer Hughes asked whether we will be looking at what other towns are doing, and will we consider coordinating with them to improve effectiveness? Responders expressed the opinion that the more that we can team up with other towns the better. Climate change doesn't respect town boundaries, and with its limited resources, West Newbury would benefit from a shared approach. Jennifer agreed to provide information about other town's priority actions. MVP Core Team members said that the Merrimack Valley Planning Commission is welcome to be part of the process.

Ellie Baker stated that regional proposals get extra points for Action Grants from the state. Larger amounts of money can be available. Working with schools can also be beneficial. Ellie worked with Newbury and Newburyport on their MVP processes. They considered ideas like water supply, Combined Sewer Overflows and water quality.

Working with Students, Education. Nancy Pau mentioned recent efforts working with students in the three Pentucket district towns. Jack Duggan asked whether an education campaign could be a component of a future state funding proposal. Elisa Grammer reminded that we have had a cadre of interested high school students who attended our workshop. It will be important to maintain contact with the schools.

Angus Jennings mentioned that collaboration among schools is happening now with respect to the MS4 program (municipal separate storm sewer system permits)

Hannah Grinnell asked about teaming up with people in the Ipswich schools who are working on projects related to climate vulnerability preparedness. Nancy Pau related that Pentucket hosted one climate café in early 2020. Ipswich and some other towns have been more active. Students can be really persuasive voices in the community. Jennifer Hughes lives in Ipswich and can help us connect with the group there. Hannah offered some contact names for student engagement. Elisa suggested she email the information to her.

Additional Opportunities to Comment. Wendy Reed invited people to continue submitting comments by voice mail or email, until July 9. Thanks to all for attending, good night.

Angus Jennings 7:40 PM

Under FCC regulation cell towers are treated more as infrastructure than as commercial development. Local regulation has far less jurisdiction than they did pre-2010 (when the new FCC Regs took effect).

Angus Jennings 7:41 PM

I didn't

Jean lambert 7:42 PM

I have one more question re River Rd.

Jennifer Hughes (MVPC) 7:42 PM

Will you be looking to the priority actions of neighboring communities to see if any align with West Newbury's for a possible regional action grant proposal?

Jack Duggan 7:45 PM

Can an education campaign, promoting the benefits of MVP to the community (that includes outreach to the general public and schools) be a component of a future State funding proposal?

Angus Jennings 7:45 PM

I for one would greatly favor a comprehensive planning effort. In the near term, a full Master Plan process (per MGL and best practices) isn't in the cards, but a more condensed "strategic planning retreat" to prioritize among the many competing priorities could add a lot to prospects for plan implementation (OSRP, Housing Production Plan, MVP and otherwise).

Enter your message

Angus Jennings 7:45 PM

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Angus Jennings 7:47 PM

Jack under the Town's work implementing our MS4 Stormwater Management Permit we have pretty active collaboration / engagement among the schools as part of our Public Education & Outreach section of our permit. Expanding to climate change awareness would be a natural.

Nancy Pau 7:49 PM

Ellie: multi-town grants and including schools/outreach compete better in State grants.

Nancy Pau 7:49 PM

Ellie: Newburyport/Newbury had similar themes; specifically water supply in Newburyport.

Erin Rich 7:50 PM

I amhere with a student/recent PRSD grad who attended the workshop in February and she reminded me that Ipswich has a very active student E-Club that has hosted climate change cafes.

Enter your message

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Jennifer Hughes (MVPC) 7:54 PM

I live in Ipswich and can help make contacts if you would like.

Michelle 7:55 PM

Hi! My name is Hannah Grinnell and I attended the mvp meeting. We actually hosted a climate cafe here!

Michelle 7:58 PM

I can definitely give you their contacts!