Middleborough, MA

Municipal Vulnerability Preparedness (MVP) and Community Resilience Building (CRB) Workshop Summary of Findings

March 2020

Submitted by:

Resilient Taunton Watershed Network (RTWN)

Overview

Middleborough, the second largest town in Massachusetts by size with over 70 square miles of land area, is a town of 23,145 residents. Centrally located in the heart of Plymouth County in southeastern Massachusetts, Middleborough is situated along interstate 495 and is just 38 miles south of Boston and 30 miles east of Providence, Rhode Island. The town's low-density land use pattern has contributed to both its image and the way of life of its citizens. Middleborough's most recent Master Plan recognizes that the town's landscape is "physically defined by its open space, rivers, bogs, forests and farms," though new residential and commercial development is occurring in some of these spaces.

The town is split across two watersheds; the Taunton River watershed in the north and the Buzzards Bay Watershed in the south. Along with Lakeville, Freetown, and Rochester, Middleborough contains a portion of the Assawompset Ponds Complex (APC), the largest natural inland body of water in the state, and the primary or emergency drinking water supply reservoir for all or portions of 13 communities including the cities of New Bedford and Taunton (but not including Middleborough itself). Aside from the APC, the Nemasket River, Tispaquin Pond, and Taunton River are among the other major important surface water resources in town. The most significant sources of groundwater for Middleborough's municipal public supply are found within the central portions of town, and are characterized by their location in glacial sand and gravel deposits. The permeable quality of these soils makes for excellent recharge, but also leaves ground water vulnerable to pollution depending upon surface soil cover.

Historically an agricultural community, Middleborough's agricultural sector has waned in recent decades, though cultivation is still relatively common in the town, including cranberry bog production. Ocean Spray has a headquarters in Middleborough. Aside from productive bogs, the town has a large and biologically complex wetland system, including the Great and Little Cedar Swamps that are regionally unique habitat areas. Middleborough's landscape has experienced increased stress in recent years from impacts of the flood/drought cycle, most notably the flood of 2010, which caused widespread flooding, followed several years later by a significant drought in 2016.

Local residents see collaborative planning as an effective way to ensure a resilient community and sustain critical shared resources, now and into the future. To support the community in considering and prioritizing actions to improve its climate resilience, the Town of Middleborough applied for and received a grant from the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) to become a Designated Municipal Vulnerability Preparedness (MVP) Community. Core members of the Resilient Taunton Watershed Network (RTWN) were tasked with coordinating the workshop, specifically the

Southeast Regional Planning and Economic Development Division (SRPEDD), who acted as Middleborough's Certified MVP Provider. Staff from The Nature Conservancy, Manomet, and Mass Audubon supported the Community Resilience Building (CRB) workshop process as Certified MVP Providers and members of RTWN. These planning workshops took place on two Fridays, January 10 and 24, 2020 at the Middleborough Town Hall.

Stakeholders from Middleborough were present as workshop participants, including representatives from many municipal boards and departments. Also in attendance were representatives from Middleborough's schools, library, local and regional community groups, and more (see *Appendix A* for a full listing). Attendees were divided into two distinct groups that remained consistent in both workshops. Each group identified features in Middleborough visually with a map (Appendix B), and verbally on a matrix (Appendices C/D). Each feature was related to hazards that the town is concerned about and participants determined whether a particular feature was considered a hazardous vulnerability or a strength that helps Middleborough mitigate potential impacts. Each item listed on a group's matrix was numbered, and corresponded to a numbered dot they placed on their map. The colors used on the maps were (red), environmental (green), and societal (blue in Group 1, yellow in Group 2)

Through facilitated discussion, workshop attendees:

- Defined top local natural and climate-related hazards of concern;
- Identified existing and future strengths and vulnerabilities;
- Developed prioritized actions for the community;
- Identified immediate opportunities to collaboratively advance actions to increase resilience

Several recurring themes emerged from the discussion, especially around the movement, availability, and treatment of water within Middleborough. Flooding has the potential to impact undersized stream crossings, brownfields, water treatment facilities, and roadway infrastructure, with the flood levels of 2010 fresh in the minds of local staff and residents. There is a need for **proactive water supply resource management** in the face of drought cycles, and an equal need for **changing approaches to stormwater management** as intensifying storms cause greater runoff and stormwater pooling in the town's urbanized areas. Some of this stormwater could be better absorbed with **ecologically-based improvements to crucial waterways** such as the Nemasket River. Participants also felt an urgency surrounding increased **threats from mosquito- and tick-borne diseases**, desiring collaboration with the state on this issue toward a holistic and proactive approach targeted at early mosquito lifecycle stages and limited spill-over effects on wildlife. Regarding wildlife, there was consensus from both groups on the need to **enhance the habitat of wildlife** unique to this area and that provide crucial services, such as herring,

pollinators, and vulnerable tree species as these organisms face increased stresses from climate change. Finally, a common theme emerged around the need to **increase sheltering capacity**, for both people and their animals, especially during extreme temperature events and during power outages caused by tree blow-downs.

Top Hazards and Vulnerable Areas

Participants discussed past impacts from natural hazards that they have experienced, and came to consensus on the top four concerns to their community, which were identified as:

- Flooding
- Severe storms/wind
- Drought/temperature extremes
- Vector borne diseases (ticks/mosquitos)

Flooding describes the threat to Middleborough's residents, roads, water management infrastructure, and environmentally sensitive areas and waterways that is posed by frequent large precipitation events. The town is experiencing increasing periods of high groundwater levels that leave little room for additional infiltration, clogged catch basins and waterways that are affected by siltation, increased nutrient-laden runoff and the presence of undersized bridges, culverts, and rail infrastructure that act as choke points that contribute to roadway flooding. Failure of certain dams would threaten municipal water treatment plants.

Severe Storms / Winds are a primary concern because during strong storm events, flooding can cut off access to major thoroughfares, and trees frequently fall, further limiting road access for residents and emergency personnel. High wind also threatens existing power infrastructure. Residents who rely on wells for drinking water are left without functioning pumps and running water, sometimes for days. With limited generator backups at some town facilities (such as town fuel pumps), extended power outages could limit initial emergency response.

Drought / Temperature Extremes represent the projected increase in the number of high-degree days that are anticipated to occur as the climate warms. With a historically cooler temperature range, many houses in New England do not yet have features like AC/Central Air. Vulnerable populations with mobility issues and income disparities may not have ready access to cooling capabilities during extreme temperatures, and may not elect to leave their homes for shelter if there is no sheltering plan for animals and livestock. Alongside heat, more intense drought periods are anticipated. Town water supplies from well fields, without a reservoir or backups in case of extended drought.

Vector Borne Diseases refers to vectors that increase the risk of exposure to disease (e.g. ticks, mosquitos), and invasive species that threaten the ecological integrity of Middleborough's abundant natural lands. There has been a dramatic increase in the severity of the threat from vector populations in recent years, particularly from mosquitos

carrying Eastern Equine Encephalitis (EEE), leading to increased risks to public health. The town is anticipating an increase in retired cranberry bogs, which require proactive management and, where possible, conversion back to natural flowing water systems to control the stagnant waters in which mosquito populations proliferate. While local officials and residents prioritize the safety of the community, there is also a concern that reactive pest management spraying techniques are damaging ecosystems and wildlife.

Areas of Concern

Several locations in town were identified as important strengths or notable vulnerabilities, and some, because of their complex nature, were considered to be both strengths *and* vulnerabilities. The top four natural hazards identified by Middleborough workshop attendees were **flooding**, **severe storms/wind**, **drought/temperature extremes**, and **vector borne diseases (ticks/mosquitos)**. Prioritization (high, medium, low) and time anticipated to complete each action is indicated in the digitized matrices (*Appendix B*).

Infrastructural concerns centered around the question "where can we put water?" The effects of flooding threaten multiple types of infrastructure in the town, as well as historic and cultural assets, with a need for better stormwater capture and elimination of waterway choke points emerging as paramount issues. MVP planning groups also cited threats to the electrical system and the town's emergency management infrastructure from storms with intense rains and wind.

Electrical and Gas System

Middleborough views its municipal electric and gas utility as a community strength, with substations and power lines located throughout the town. However, pressures from intensifying storm events, an exacerbated flood-drought cycle, and invasive diseases have led to increased tree fall in recent years. With increased rain, the understory is growing rapidly. These changes have created major issues along power corridors. Utility overhead lines are snapping during storm events. Lines cannot be undergrounded everywhere in town due to the high water table and floodplain areas.

Continued proactive trimming, homeowner tree-planting education, line-strengthening insulation, and the use of a boulevard type of roadway design (poles in this area away from the treeline) were cited as actions to mitigate the occurrence of power outages in town moving forward. The need for backup power generation is paramount at the town's fuel pumps (fire station) and water supply wells. The inability to fuel the town's vehicle fleet during a power disruption would compound the effects of any hazardous event, slowing town response and recovery.

Water Supply and Treatment

The town completed a major upgrade to its wastewater treatment plan in 2017 in order to meet EPA and DEP standards for phosphorus and nitrogen levels discharged into the Nemasket River. However, intensifying storms and rainfall alongside Middleborough's high groundwater levels, are taxing the town's treatment system. When the Nemasket floods, the river sometimes overtops the plant's effluent discharge pipes. Sump pumps are emerging as a major contributor after storm events, especially in the downtown area, where there is also a limitation in the capacity of catch basins. There may be clogs or need for relining sewer pipes in the center of town, especially near the fire station, library, and former police station.

MVP groups were supportive of grey infrastructure fixes to channeling stormwater, but were also equally enthusiastic about Green Infrastructure approaches and the restoration of natural systems to improve water movement and flow, such as clearing the Nemasket River of obstructive sandbars and vegetation. Enhanced coordination with DEP in the permitting process would aid such efforts. Grey water recapture systems were also mentioned as a potential site-specific solution at the Library

Some residences are served by private wells, while others are connected to the town's municipal water supply. Water Department infrastructure is aging and the distribution line system has few redundancies in storm event situations that would disrupt access to the lines on Wareham Street and East Grove Street and cut off water supply to south Middleborough. Town well fields scattered throughout town are the town's drinking water supply, without backup reservoirs in drought scenarios. The East Main Street water treatment plant and four wells below Stony Brook Dam would be seriously impaired if the dam fails. The East Grove Street water treatment facility is in a similarly vulnerable position below the Nemasket River Dam.

Transportation Infrastructure (roads, dams, bridges, culverts)

Finally, the discussion highlighted specific vulnerable transportation infrastructure features. Undersized dams, bridges, and culverts along the Nemasket River and other waterways are creating choke points that back up when streamflow intensifies after storm events. Specific dams include the Wareham Street aka "Bascule" Dam and the Plymouth Street Dam on the Nemasket River, Stony Brook Dam at Pratt Farm, the Woods Pond Dam on Chestnut Street, and Assawompset Pond Dam. Specific bridges include the Vernon Street Bridge north of 44 on Poquoy Brook and the Vernon Street Bridge on the Taunton River itself. Specific culverts include those under Summer Street, Thomas Street at cranberry bogs, and a Plymouth Street culvert associated with Savory Pond Cranberry bogs.

Better coordination with MassDOT is needed on multiple fronts to address stormwater effects on roadway infrastructure, including better outfall maintenance, alleviating stream choke points caused by railroad abutments and rail bridges, better maintenance of the catch basin at the Route 44/Plymouth Street intersection, and drainage issues on Routes 44 and 495 that contribute to sedimentation and sandbars in the Nemasket River. New road surface quality and road bed design standards were also discussed as an approach that may help to alleviate drainage issues and maintain roads over time. Outside of the category of transportation infrastructure, groups noted the flood damage potential at several town buildings and parklands (the library, Pratt Farm, Oliver Mill Park, and Oliver House).

Environmental concerns focused on water quality of the town's waterways, waterbodies, and wellhead protection areas, threats from vector-borne disease, and balancing Middleborough's environmental health while also accommodating additional development.

Water Quality

Water quality concerns are present for multiple different types of water resources in Middleborough. Workshop participants pointed to the interaction between increased precipitation and greater runoff causing additional nutrient deposition, more algal blooms, and lower dissolved oxygen with very negative effects on the health of streams and ponds. The Nemasket River is narrowing in many spots due to invasive species and siltation clogging the channel and stymieing the movement of water. These issues are affecting the Nemasket's ability to maintain the historical herring run, an element of local biodiversity and an ecotourist attraction that contributes to Middleborough's economic resilience. A comprehensive Assawompset Ponds Management Plan that encompasses habitat fragmentation and nutrient levels in the ponds and the Nemasket would help to address this issue.

In addition to surface water, the town's wellhead protection areas are both a strength and a potential vulnerability. The extent of Zone II's should be reevaluated to ensure that adequate protection buffers are in place, particularly under future climate conditions. Participants in both groups also noted the potential for serious impairments to occur to both land and water bodies if flooding were to extend over near-bank contaminated sites, such as the current but soon to be former DPW site and Rockland Industries Hazardous Waste Site, and contribute to the migration of contaminated materials. While the Health Department does a lot of monitoring, additional resources are needed for incorporating climate resilience into MS4 permits and for monitoring releases from the water treatment plant. The water quality monitoring program exemplified by the Taunton River Watershed Alliance could be transmitted to the Buzzards Bay watershed as a model to emulate.

Controlling Vector-Borne Disease

Towns in the southeastern region of Massachusetts were under a pronounced threat from Triple E in 2019. While everyone understands the importance of preventing EEE, participants noted that spraying could be more proactive, targeting larval stages at the beginning of the season. Additional coordination between state and local entities is essential, with a more holistic approach to the management of mosquitos and ticks, the missing link in current approaches. Spraying that minimizes spillover impacts on the rest of the town's wildlife and natural environment was very important to workshop participants, as was the need for more education and training on natural solutions to this issue for homeowners, such as the use of mosquito control donuts and reducing standing water.

Balancing Development Impacts

Workshop participants expressed concern about the location of new development in the face of climate change that will further tax environmental systems. Wetlands, so vital to storing stormwater, are being affected by the siting of residential development on nearby uplands and by the town's earth removal bylaw. This issue is very salient due to recent development projects that highlighted the town's lack of a local wetlands bylaw that would expand violation enforcement capabilities. Workshop participants expressed a desire for additional wetland regulatory measures from the state so that there is less discrepancy between towns, but also desire a sound, town adopted wetland bylaw.

Solar development is another trend in Middleborough that has positive but also problematic aspects. The retirement of cranberry farmers is on the rise and is expected to increase with a changing climate that brings fungus problems associated with more rainfall and a loss of essential chills. Retiring cranberry bog owners are exploring the option of putting solar arrays on their properties, but the public utility is not accepting any more solar into the grid at the moment. An alternative option to solar on some cranberry bogs would be restoration to true wetland habitat, further mitigating stormwater impacts by providing additional retention areas.

Societal vulnerabilities identified included the need to improve available housing resources for vulnerable populations in Middleborough, a point strongly advanced in both MVP groups. Also noted were the needs to expand and improve sheltering capacities and for a bolstered emergency communication system.

Housing for Vulnerable Populations

Middleborough's population is growing without enough options for housing that is affordable to lower income households. Participants noted a growing income gap within town. Both groups identified the need to reassess zoning and development regulations to

expand the availability of housing that can accommodate vulnerable elderly and low-income populations. Participants were seeking ways to find synergy between affordable housing, economic development, and conservation issues and to achieve housing options for vulnerable populations that are outside of areas prone to flooding or contamination.

Sheltering Capacity

As Middleborough experiences more extreme heat and storm events, adequate sheltering capacity for both power outages and cooling stations on hot days are expected to play a pivotal role in caring for residents and vulnerable populations. Workshop participants were unsure if a cooling station exists in town, though the Council on Aging does invite clients to come to the office to cool down on hot days. There is an emergency shelter available at Nichols School, where residents were also able to bring domestic animals to be housed in crates provided by Animal Control. Advertising the fact that animal caretakers are able to shelter with their pets more widely will be important to ensuring that owners will not fail to seek shelter under the mistaken impression that pets are not welcome. The need for establishing a network capable of sheltering livestock in this agricultural community is also an important asset.

Emergency Communications

While Middleborough has the technology in place for robust emergency communications, local protocols have not yet been put in place to normalize their operations. For example, the town has reverse 911 capabilities, but there is uncertainty around the circumstances in which it should be used such that important information is broadcast without bothering residents too often. DPW is working with other town departments to develop a centrally managed system. Staffing for emergency response is a point of vulnerability that might be partially addressed through regular department head meetings, which would build initial bridges between staff that are vital foundations in any emergency situation. There is a Local Emergency Planning Committee that meets semi-regularly. Regular quarterly meetings for this group should be established.

Current Strengths and Assets

Middleborough is well acquainted with the many strengths it leverages to manage the risks that natural hazards pose. Supporting and enhancing existing strengths and assets into the future will complement strategies identified to address current vulnerabilities, further helping to build local resilience. The following strengths and assets were identified as essential for adapting to the impacts of **flooding**, **severe storms/wind**, **drought/temperature extremes**, and **vector borne diseases (ticks/mosquitos)**:

Infrastructural Strengths

- The existence of the local municipal electric and gas utility is a real advantage for the community, providing centralized and local operations and support. The utility is using insulated power lines, which increase line strength and resilience.
- The new wastewater treatment plant, despite siting issues around the location and flood vulnerability of effluent discharge pipes, is a strength. It has additional available capacity and nutrient permitting is not a limiting factor at present.

Environmental Strengths

- Middleborough's rural character and abundant natural lands and open space are seen as important strengths in town. A history of effective land conservation has resulted in preserved areas that will help to mitigate climate change impacts such as floodplain and flood storage areas.
- The wellhead protection areas in town provide a level of water quality protection that is an important strength given that many residents are connected to the public water supply.
- Middleborough's location around the Assawompset Ponds can be a vulnerability from flooding risks, but it is also a very important asset tied to Middleborough's cultural identity with natural phenomena like the herring run.
- The DPW has developed programs that champion the environment, such as the free tree giveaways on Arbor Day. These existing programs could be combined with new initiatives such as giveaways of wildflower seeds to further promote pollinator habitats to proliferate in town.
- The town's Right to Farm bylaw and Agricultural Commission assist in preserving farmland and maintaining the productive aspects of farmland that also dovetail with climate mitigation efforts.

Societal Strengths

- Continued review of local bylaws for necessary updates is a strength. Staff support local boards and commissions extremely well in formulating these updates. The recent Planning Board efforts around updating rules for tree planting to avoid conflicts with electric utility infrastructure and the passage of the recent stormwater bylaw are examples.
- While it creates some challenges, workshop participants noted the town's growing population as a strength. Limited growth tied to the carrying capacity of the land can help Middleborough to remain a vibrant community.
- The town's active Council on Aging was noted as a strong community pillar that can be built upon to address the needs of senior and vulnerable populations dealing with climate change impacts.

Top Recommendations to Improve Resilience

Once climate vulnerability issues were recorded in the first workshop session, the second session challenged participants to formulate potential solutions and to form a consensus on the top three most urgent priorities for bolstering Middleborough's resilience.

Each of the two original groups generated actions related to the list of strengths and vulnerabilities, and then worked with facilitators to decide the top priority actions for each of the feature categories (infrastructural, environmental, and societal). After making these decisions in individual groups, all attendees came together to share their priority actions and discuss emergent themes. Facilitators led the group in a verbal vote to select the top three priority actions that the town should take.

Participants were encouraged to consider action items that mitigated hazards through strengthening natural systems and processes, to complement technological or constructed fixes. An action that limits the damage of natural hazards through conserving existing lands, integrating benefits of nature where they are critically needed (i.e. flood storage, water quality improvement), or restoring an ecosystem where it has been disrupted is referred to as a **Nature-based solution**. Nature-based solutions (NBS) are a category of strategies in climate adaptation and their exploration is of interest to the Commonwealth of Massachusetts as a national leader in comprehensive hazard mitigation planning. Effective implementation of NBS means designing community features where the functions of built infrastructure and the natural environment are mutually reinforcing in providing protections and benefits for residents.

The workshops' top three themes for priority actions that resulted from the discussion were: **capabilities for emergency response**, **town drainage** and **land use patterns, planning, and bylaws**.

Capabilities for Emergency Response

Enabling Continued Operations in an Emergency

- Build a new communication tower. The current tower dates to the 1950s and does not yet have backup power, leaving town radio communications vulnerable to interruption.
- Install a backup generator at the town fuel pumps, so that Middleborough staff have the vehicles necessary to respond to hazard impacts, including storm debris removal, evacuation, and others.

Expanding Communications During an Emergency Event

- Develop outreach materials for the public addressing potential hazard plans and resources that can be distributed ahead of time on the website and at town fairs and events.
- Provide information to the public on the sheltering options available during emergencies (location, timing, pets allowed, etc) and hot days, and expand sheltering availability and cooling stations to areas of existing parks (i.e. pools, sprinklers, splash pads) and library or other public facilities if necessary.
- Formulate protocols for the reverse 911 system that the town has and consider strategies that might be able to target vulnerable populations such as the elderly.
- Lay the groundwork for smooth communications between staff by implementing a monthly department head meeting.
- Establish a "good neighbor" network for residents to assist one another and look in before, during, and after hazard events.

Town Drainage

Alleviate Flooded Roadways

- Conduct a regional study of culverts and constrictions on waterways in town to set up a schedule for fixing the bridges, culverts, and rail crossings that are undersized in this system. MassDOT would need to be involved as some of their infrastructure affects the local natural resource system.
- Expand the study above to include impacts on town water treatment facilities that are flooded by backups in the river system, including the East Grove Street Treatment Plant and the treatment plant in vicinity of Stony Brook Dam.
- Consider options for addressing the Bascule Dam.
- Conduct a study of drainage in the town center that would include identifying illegal sump pumps, current sewer pipe capabilities and degradation, and catch basin assessment. The study should include both constructed fixes and nature-based solutions such as rain gardens and grey water capture.
- Install a grey water capture system at the library as a pilot project.
- Pursue a feasibility study for the flooding issues at the discharge point at the Wastewater Treatment Plant.
- Pass needed amendments to the stormwater bylaw at Town meeting.

Enhance Nature Based Solutions to Flooding

- Remove impediments to proper stream channeling and water movement on the Nemasket and in the Assawompset Ponds Complex, including siltation between the Ponds and the Nemasket, siltation from Routes 44 and 495, and invasive vegetation.
- Develop a comprehensive management plan for the Assawompset Ponds Complex and the Nemasket River.
- Study the feasibility of designating the Assawompset Ponds as an Area of Critical Environmental Concern (ACEC).
- Conduct a vulnerability assessment for the possibility of harmful pollutants migrating from contaminated sites (such as the Rockland Industries Hazardous Waste Site) during flood events and clean these areas so that they are no longer potential toxic floodplain areas.

Land Use Patterns and Zoning

Housing that Accommodates Vulnerable Populations

- Revisit the town's Master Plan to create a strategy for studying demographic changes and accommodating population growth through smart growth techniques.
- Explore community-owned and co-housing.
- Review bylaws to allow areas of higher density housing that is more accessible to low-income households.
- Work with the state to review the standards applicable to 40B projects and advocate for restructuring the program, based on the fact that projects are being constructed with inadequate infrastructure (sewer, power, etc.) for resilience.

Build without disrupting Natural Systems

- Adopt a wetlands bylaw with additional wetlands buffer provisions.
- Amend Middleborough's zoning and subdivision bylaws to minimize the development of housing on flood-prone lands.
- Encourage the development of energy-efficient homes.
- Pursue additional funding for weatherization (grants, rebates, etc.).
- Encourage additional protected open space acquisition to support watershed management through utilization of Middleborough's CPA funding, the creation of a TDR bylaw, updated of the town's open space plan, and revisions to open space subdivision bylaw.

- Consider a bylaw review to ensure that nature-based solutions are permitted in town. MassAudubon has a system for conducting such reviews.
- Work with state agencies such as MDAR and DER to repurpose and restore cranberry and non-cranberry agricultural land to restore and protect productive or natural functions, such as conversion of retiring cranberry bogs into wetlands.
- Consider engaging with federal opportunities for buy-out programs on repetitive loss properties.

Two priorities in contention that did not make the top three but that are notable for their high importance were **decreasing carbon emissions** and **improving communication channels**.

Decreasing Carbon Emissions

- Utilize electric vehicles in town operations.
- Study geothermal energy potential in town.
- Increase the availability of renewable energy sources where appropriate.
- Pursue additional transportation options including the installation of lanes for scooters and bikes, bike rental stations, and shared use paths connected to town services and buildings.

Improving Communication Channels

- Pursue better communications with the Department of Public Health surrounding mosquito spraying to help formulate a plan that is proactive, addressing the threat at its larval stage, and that adds alternative solutions that do not require harmful spraying to address this very important public health issue.
- Pursue better communications with MassDOT on the effects of rail bridge abutments and regarding their outfall maintenance plan.

In making these recommendations, this cohort generated an array of potential actions that related back to the identified top priority hazards and how they impact Middleborough's infrastructure, environment, and society. A complete list of actions generated by the groups, along with their prioritization (high, medium, low) and time-frame (short-term, long-term, or ongoing) can be found in *Appendix D*.

Citation

Town of Middleborough (2020) Community Resilience Building Workshop Summary of Findings. Resilient Taunton Watershed Network. Middleborough, MA

Acknowledgements

The Middleborough Core Team and Facilitation Team would like to thank the following for their contributions to the MVP Workshop process: the Commonwealth of Massachusetts, EEA, Municipal Vulnerability Preparedness Program for their funding support for these workshops, and; all of those who participated in the workshops and contributed to the plan resulting from these workshops.

Appendix A *lists all the participants that attended both workshops and their respective affiliations with the town. Most participants were present for both sessions; however, some on the list were only available to attend one workshop or the other.*

Appendices B, C & D *show different methods of recording the same vulnerabilities and strengths named by workshop participants through mapping and prioritized lists. Two groups recorded infrastructural, environmental, and societal features in Middleborough and the hazard(s) to which they relate. Each feature category (infrastructure, environment, society) was documented on a separate matrix (see Appendices C and D for complete lists). On these short lists, or matrices, action items were identified corresponding to each feature that was named. Each action was then assigned a high, medium, or low priority value and expected short-term, long-term, or ongoing time frame to complete.*

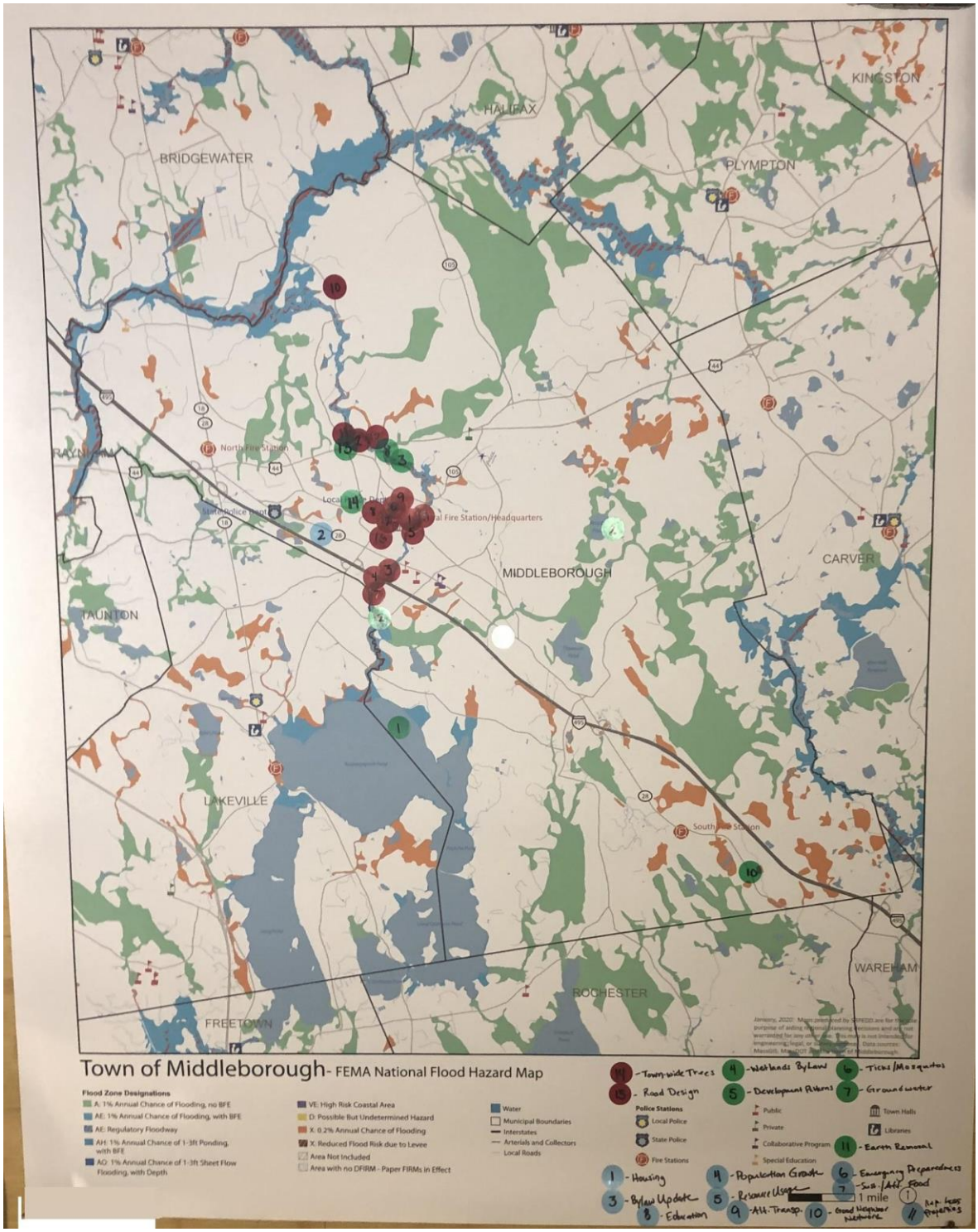
To account for spatial relationships between features, participants simultaneously placed points on a map that corresponded to items they named on the different matrices (Appendix B). Items on the map are numbered to correspond to the written list, but do not represent prioritization or associated action(s).

Appendix A: CRB Workshop Participants

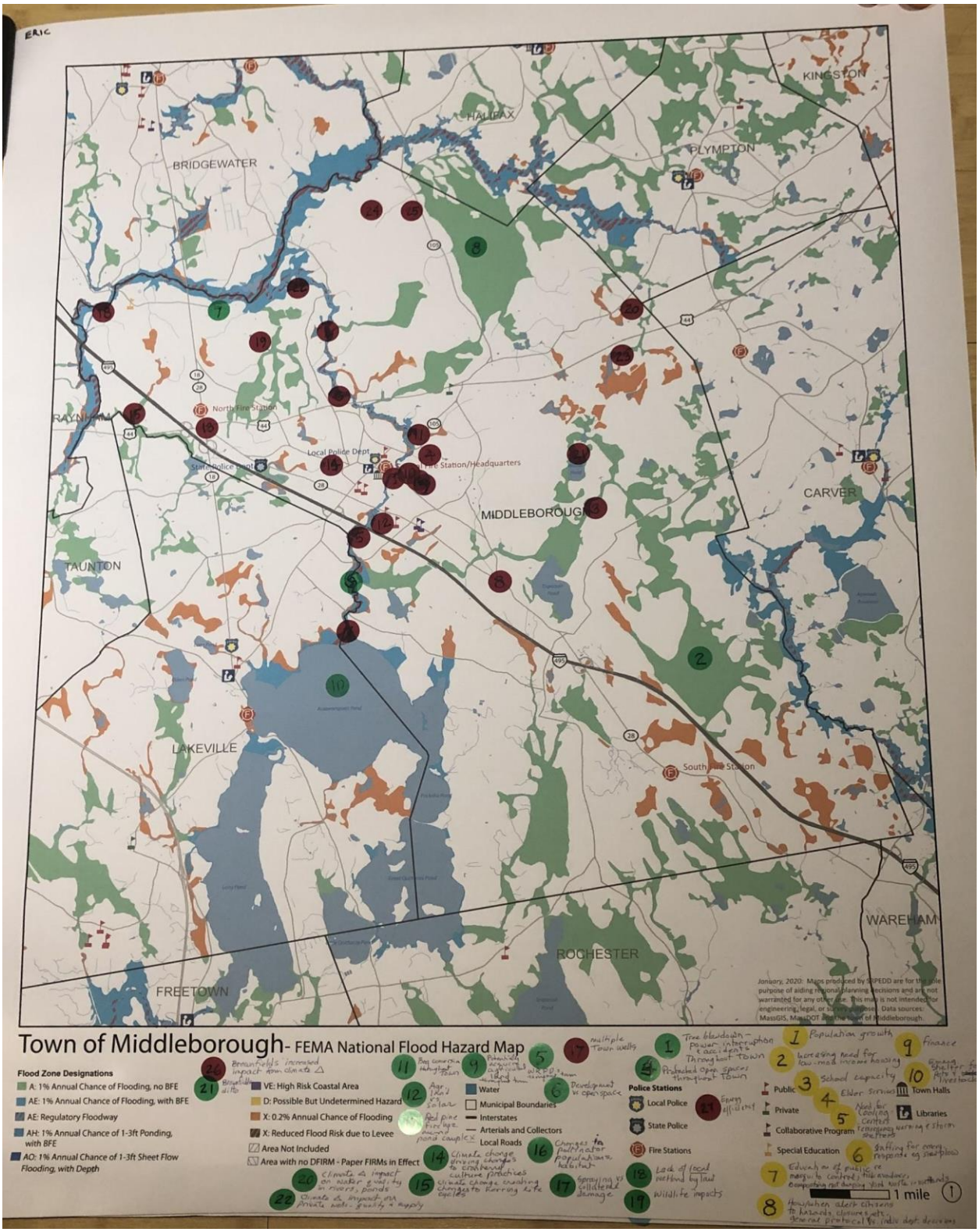
Name	**Affiliation**
Leeann Bradley	Town Planner
Patricia Cassady	Conservation Agent
Carolyn Gravelin	Commission on Disability
Joe Mandile	Planning Department
Arthur Battistini	Historical Commission / Board of Selectmen
Jack Healy	Middleborough Gas and Electric, Planning, Zoning
Dody Adkins-Perry	Sustainable Middleborough
Dave Cavanaugh	Herring Commission
Randy Gagne	Library
Kimberly French	Sustainable Middleborough
Chris Peck	DPW
Michael Bumpus	Middleborough Water
Louise Dery-Wells	Herring Commission
Andrew Sukeforth	Town Manager's Office
Sandy Richter	Middleborough Gas and Electric
Robert Buker	Health Department
Courtney Rocha	MVP Program
Meg Riley	Soule Homestead
Rich Johnson	Amory Engineers for Water Dept.
Jeff Stevens	Green Energy Committee
Scott MacFaden	Wildlands Trust

Appendix B: Strengths and Vulnerabilities Map

Map of Middleborough, Group 1. Red dots indicate infrastructural features, green dots indicate environmental features, and blue dots indicate societal features.



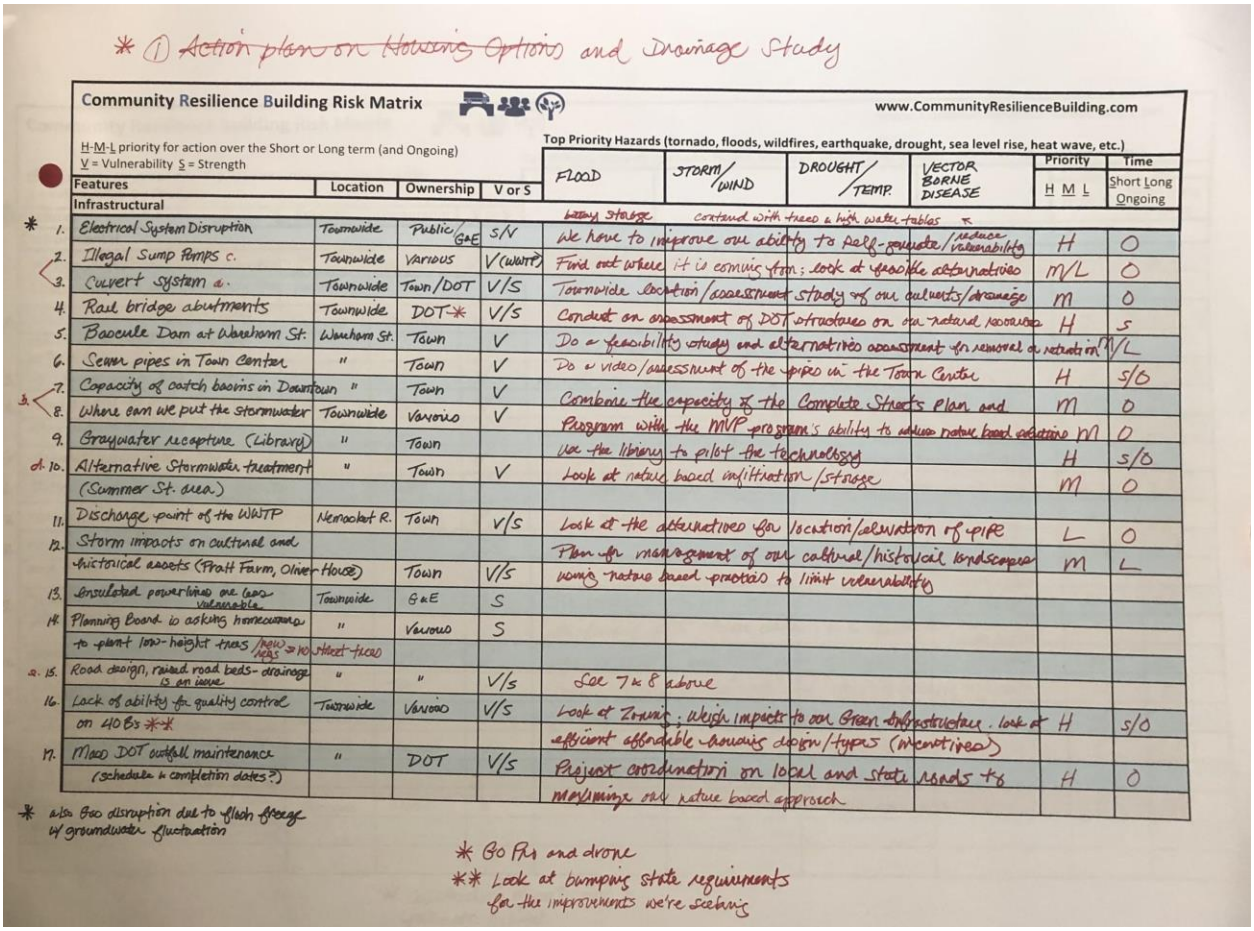
Map of Middleborough, Group 2. Red dots indicate infrastructural features, green dots indicate environmental features, and yellow dots indicate societal features.



Appendix C: Matrix Photographs

Group 1

Infrastructure



* ① ~~Action plan on Housing Options~~ and Drainage Study

Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

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

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

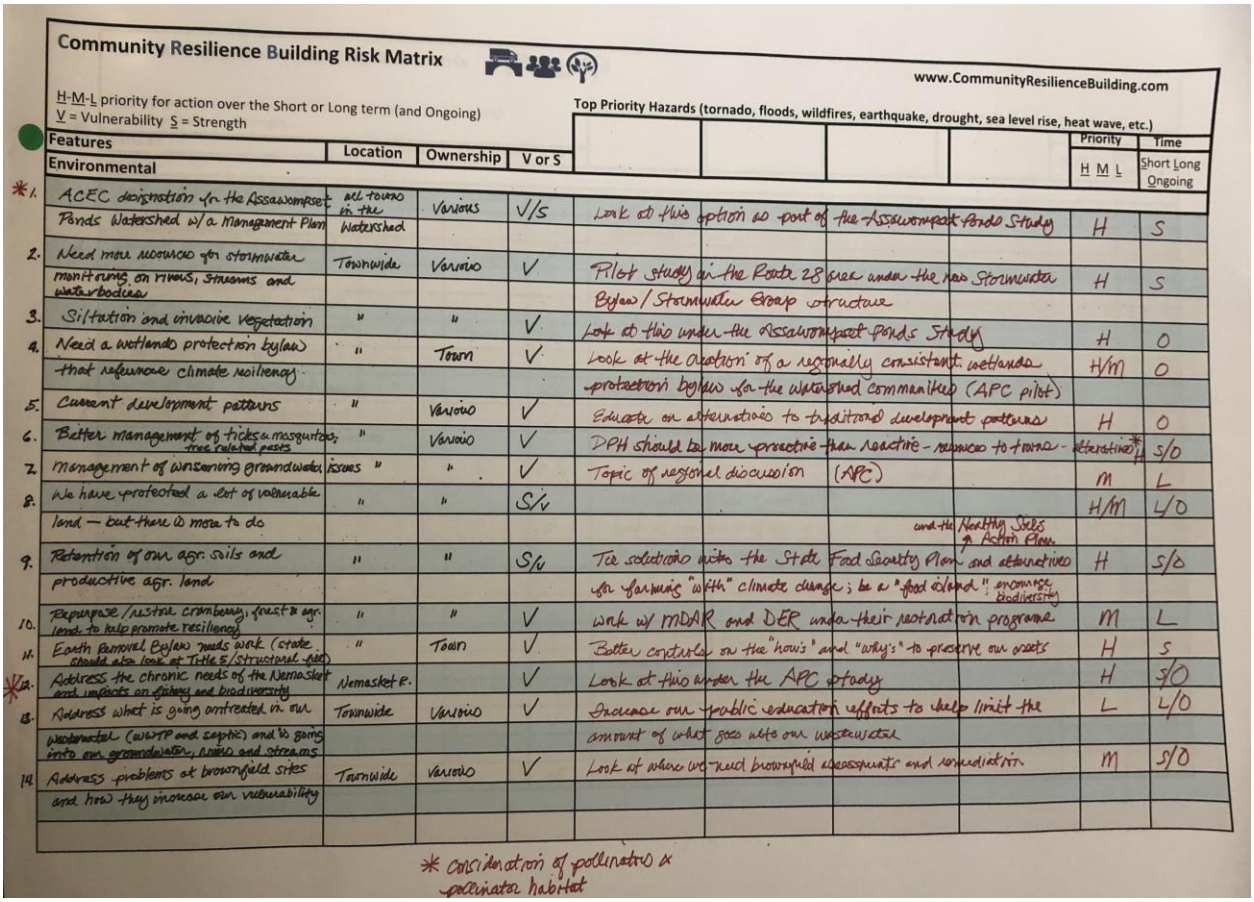
	Features	Location	Ownership	V or S	FLOOD	STORM/WIND	DROUGHT/TEMP.	VECTOR BORNE DISEASE	Priority H M L	Time Short Long Ongoing
	Infrastructural				heavy storage	contend with trees & high water tables				
* 1.	Electrical System Disruption	Townwide	Public/G&E	S/V	We have to improve our ability to self-generate/reduce vulnerability				H	O
2.	Illegal Sump Pumps c.	Townwide	various	V (WWTP)	Find out where it is coming from; look at feasible alternatives				M/L	O
3.	Culvert system a.	Townwide	Town/DOT	V/S	Townwide location/assessment study of our culverts/drainage				M	O
4.	Rail bridge abutments	Townwide	DOT*	V/S	Conduct an assessment of DOT structures on our natural resources				H	S
5.	Bascule Dam at Wareham St.	Wareham St.	Town	V	Do a feasibility study and alternatives assessment for removal or retention				M/L	
6.	Sewer pipes in Town Center	"	Town	V	Do a video/assessment of the pipes in the Town Center				H	S/O
7.	Capacity of catch basins in Downtown	"	Town	V	Combine the capacity of the Complete Streets plan and				M	O
8.	Where can we put the stormwater	Townwide	Various	V	Program with the MVP program's ability to address nature based solutions				M	O
9.	Graywater recapture (Library)	"	Town		Use the library to pilot the technology				H	S/O
d. 10.	Alternative Stormwater treatment (Summer St. area)	"	Town	V	Look at nature based infiltration/storage				M	O
11.	Discharge point of the WWTP	Nemasket R.	Town	V/S	Look at the alternatives for location/elevation of pipe				L	O
12.	Storm impacts on cultural and historical assets (Pratt Farm, Oliver House)		Town	V/S	Plan for management of our cultural/historical landscapes using nature based practices to limit vulnerability				M	L
13.	Insulated powerlines are (are vulnerable)	Townside	G&E	S						
14.	Planning Board is asking homeowners to plant low-height trees (new regs = no street trees)	"	Various	S						
a. 15.	Road design, raised road beds - drainage is an issue	"	"	V/S	See 7 & 8 above					
16.	Lack of ability for quality control on 40 Bs **	Townwide	Various	V/S	Look at Zoning; Welsh impacts to our Green Infrastructure. look at efficient affordable various design/types (incentives)				H	S/O
17.	Mass DOT outfall maintenance (schedule & completion dates?)	"	DOT	V/S	Project coordination on local and state roads to maximize and nature based approach				H	O

* also Geo disruption due to flash freeze & groundwater fluctuation

* Go Pro and drone

** Look at bumping state requirements for the improvements we're seeking

Environment



Community Resilience Building Risk Matrix www.CommunityResilienceBuilding.com

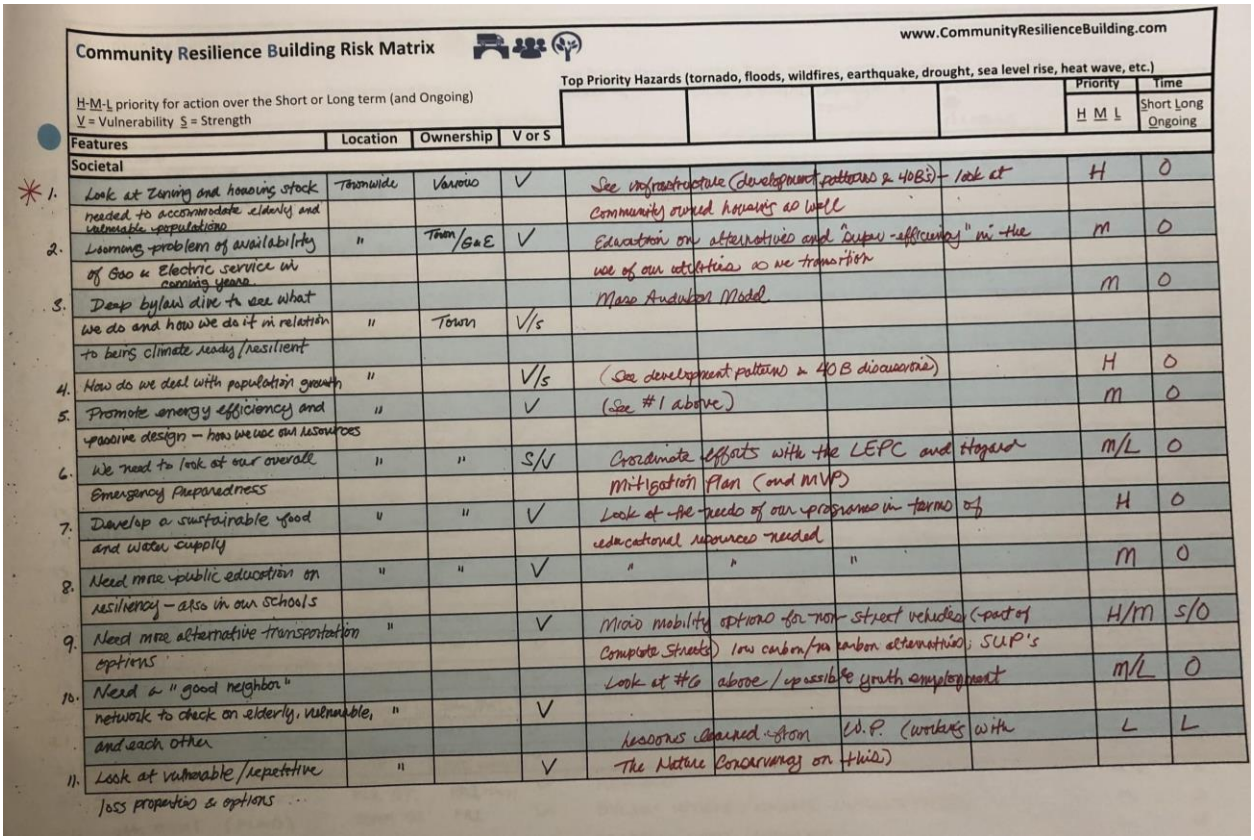
H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

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

Features	Location	Ownership	V or S					Priority H M L	Time Short Long Ongoing
Environmental									
*1. ACEC designation for the Assawompset Ponds Watershed w/a Management Plan	all towns in the Watershed	Various	V/S	Look at this option as part of the Assawompset Ponds Study				H	S
2. Need more resources for stormwater monitoring on rivers, streams and waterbodies	Townwide	Various	V	Pilot study in the Route 28 area under the new Stormwater Bylaw / Stormwater Group structure				H	S
3. Siltation and invasive vegetation	"	"	V	Look at this under the Assawompset Ponds Study				H	O
4. Need a wetlands protection bylaw that references climate resiliency	"	Town	V	Look at the creation of a regionally consistent wetlands protection bylaw for the watershed communities (APC pilot)				H/M	O
5. Current development patterns	"	Various	V	Educate on alternatives to traditional development patterns				H	O
6. Better management of ticks & mosquitoes, tree related pests	"	Various	V	DPH should be more proactive than reactive - resources to towns - alternatives*				M	S/O
7. Management of worsening groundwater issues	"	"	V	Topic of regional discussion (APC)				M	L
8. We have protected a lot of vulnerable land — but there is more to do	"	"	S/V					H/M	L/O
9. Retention of our agr. soils and productive agr. land	"	"	S/V	Tie solutions into the State Food Security Plan and alternatives for farming "with" climate change; be a "food island." and the Healthy Soils Action Plan encourage biodiversity				H	S/O
10. Repurpose / restore cranberry, forest & agr. land to help promote resiliency	"	"	V	work w/ NRCS and DER under their restoration programs				M	L
11. Earth Removal Bylaw needs work (state should also look at Title 5/structural rule)	"	Town	V	Better controls on the "how's" and "why's" to preserve our assets				H	S
*12. Address the chronic needs of the Nemasket and impacts on fishery and biodiversity	Nemasket R.		V	Look at this under the APC study				H	S/O
13. Address what is going untreated in our wastewater (WWTP and septic) and is going into our groundwater, ponds and streams	Townwide	Various	V	Increase our public education efforts to help limit the amount of what goes into our wastewater				L	L/O
14. Address problems at brownfield sites and how they increase our vulnerability	Townwide	Various	V	Look at where we need brownfield assessments and remediation				M	S/O

* consideration of pollinators & pollinator habitat

Society



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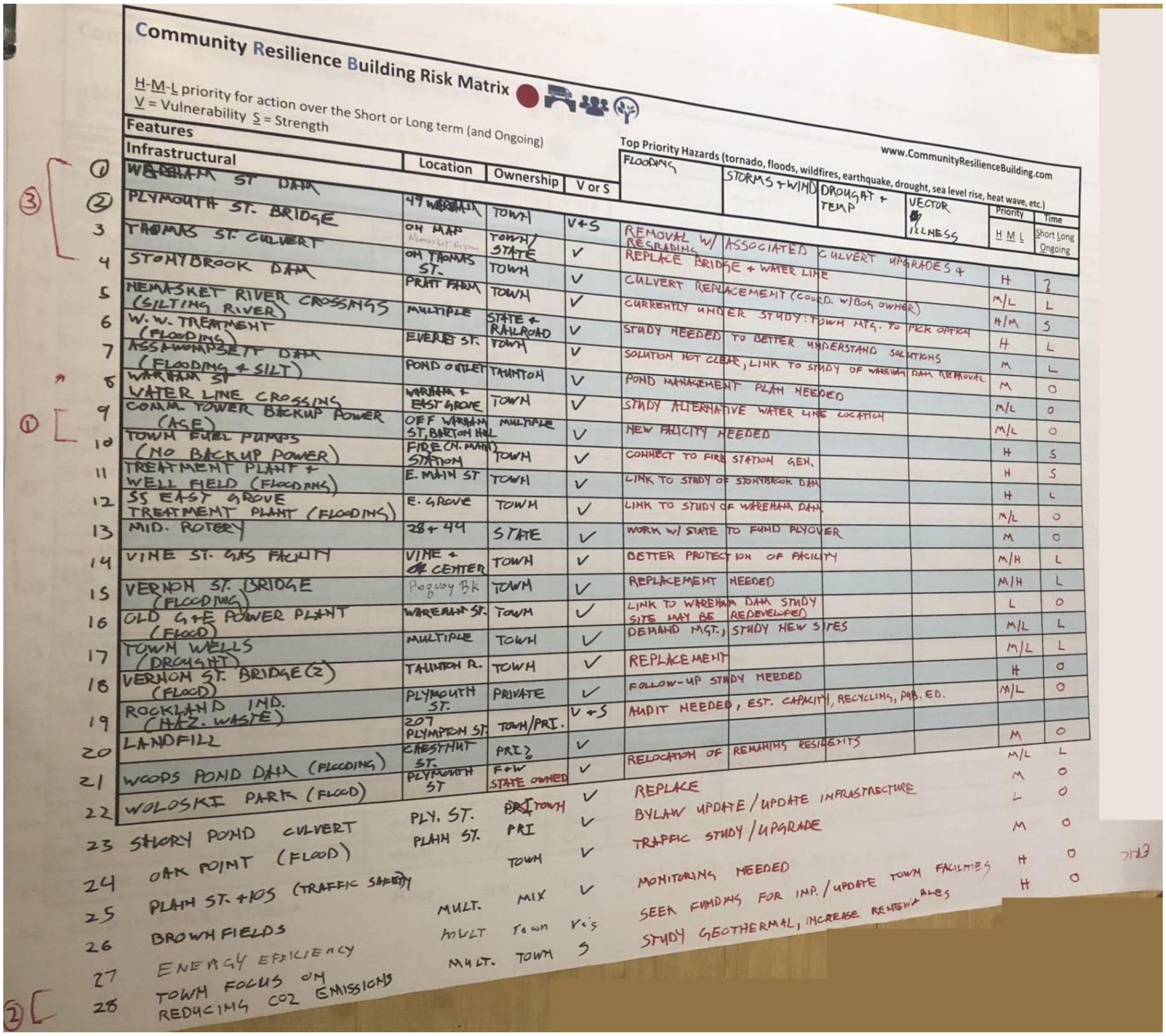
H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

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

Features	Location	Ownership	V or S					Priority H M L	Time Short Long Ongoing
Societal									
* 1. Look at Zoning and housing stock needed to accommodate elderly and vulnerable populations	Townwide	Various	V	See Infrastructure (development patterns & 40B's) + look at Community owned housing as well				H	O
2. Looming problem of availability of Gas & Electric service in coming years	"	Town/G&E	V	Education on alternatives and "super-efficiency" in the use of our utilities as we transition				M	O
3. Deep bylaw dive to see what we do and how we do it in relation to being climate ready/resilient	"	Town	V/S	Mass Audubon Model				M	O
4. How do we deal with population growth	"		V/S	(See development patterns & 40B discussions)				H	O
5. Promote energy efficiency and passive design – how we use our resources	"		V	(See #1 above)				M	O
6. We need to look at our overall Emergency Preparedness	"	"	S/V	Coordinate efforts with the LEPC and Hazard Mitigation Plan (and MVP)				M/L	O
7. Develop a sustainable food and water supply	"	"	V	Look at the needs of our programs in terms of educational resources needed				H	O
8. Need more public education on resiliency – also in our schools	"	"	V	"	"	"		M	O
9. Need more alternative transportation options	"		V	Micro mobility options for non-street vehicles (part of Complete Streets) low carbon/no carbon alternatives, SUP's				H/M	S/O
10. Need a "good neighbor" network to check on elderly, vulnerable, and each other	"		V	Look at #6 above / possible youth employment				M/L	O
11. Look at vulnerable/repetitive loss properties & options	"		V	lessons learned from U.P. (working with The Nature Conservancy on this)				L	L

Group 2

Infrastructure



Community Resilience Building Risk Matrix

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

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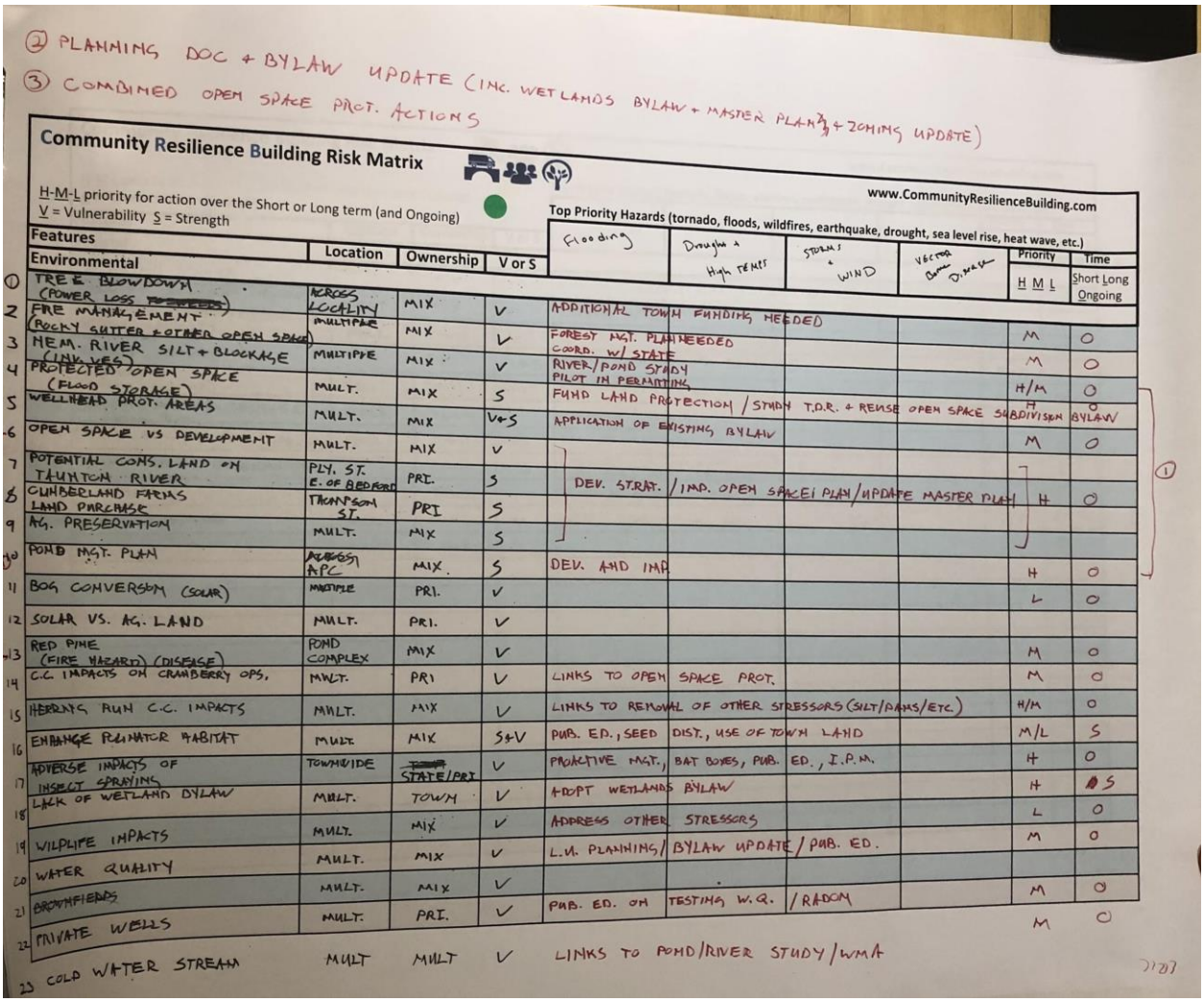
#	Features: Infrastructural	Location	Ownership	V or S	Top Priority Hazards: Flooding / Storms + Wind / Drought + Temp / Vector Illness	Priority (H M L)	Time (Short Long Ongoing)
1	Wareham St Dam	49 Wareham	Town	V+S	Removal w/ regrading w/ associated culvert upgrades &	H	?
2	Plymouth St. Bridge	On map (Nemasket River)	Town/State	V	Replace bridge + water line	M/L	L
3	Thomas St. Culvert	On Thomas St.	Town	V	Culvert replacement (coord. w/ bog owner)	H/M	S
4	Stonybrook Dam	Pratt Farm	Town	V	Currently under study: town mtg. to pick option	H	L
5	Nemasket River crossings (silting river)	Multiple	State + Railroad	V	Study needed to better understand solutions	M	L
6	W.W. Treatment (flooding)	Everett St.	Town	V	Solution not clear, link to study of Wareham Dam removal	M	O
7	Assawompsett Dam (flooding + silt)	Pond outlet	Taunton	V	Pond management plan needed	M/L	O
8	Wareham St water line crossing	Wareham + East Grove	Town	V	Study alternative water line location	M/L	O
9	Comm. tower backup power (ASE)	Off Wareham St, Barton Hall	Multiple	V	New facility needed	H	S
10	Town fuel pumps (no backup power)	Fire (N. Main) Station	Town	V	Connect to fire station gen.	H	S
11	Treatment plant + well field (flooding)	E. Main St	Town	V	Link to study of Stonybrook Dam	H	L
12	SS East Grove treatment plant (flooding)	E. Grove	Town	V	Link to study of Wareham Dam	M/L	O
13	Mid. Rotery	28 + 44	State	V	Work w/ state to fund flyover	M	O
14	Vine St. Gas Facility	Vine + Center	Town	V	Better protection of facility	M/H	L
15	Vernon St. Bridge (flooding)	Poquoy Bk	Town	V	Replacement needed	M/H	L
16	Old G+E Power Plant (flood)	Wareham St.	Town	V	Link to Wareham Dam study, site may be redeveloped	L	O
17	Town Wells (drought)	Multiple	Town	V	Demand mgt., study new sites	M/L	L
18	Vernon St. Bridge (2) (flood)	Taunton R.	Town	V	Replacement	M/L	L
19	Rockland Ind. (haz. waste)	Plymouth St.	Private	V	Follow-up study needed	H	O
20	Landfill	207 Plympton St.	Town/Pri.	V+S	Audit needed, est. capacity, recycling, pub. ed.	M/L	O
21	Woods Pond Dam (flooding)	Chestnut St.	Pri?	V			
22	Woloski Park (flood)	Plymouth St	F+W State owned	V	Relocation of remaining residents	M	O
23	Shoory Pond culvert	Ply. St.	Pri/Town	V	Replace	M/L	L
24	Oak Point (flood)	Plain St.	Pri	V	Bylaw update / update infrastructure	M	O
25	Plain St. + 105 (traffic safety)		Town	V	Traffic study / upgrade	L	O
26	Brownfields	Mult.	Mix	V	Monitoring needed	M	O
27	Energy efficiency	Mult	Town	V's	Seek funding for imp. / update town facilities	H	O
28	Town focus on reducing CO2 emissions	Mult.	Town	S	Study geothermal, increase renewables	H	O

Environment



② PLANNING DOC + BYLAW UPDATE (INC. WETLANDS BYLAW + MASTER PLAN + ZONING UPDATE)

③ COMBINED OPEN SPACE PROT. ACTIONS

Community Resilience Building Risk Matrix

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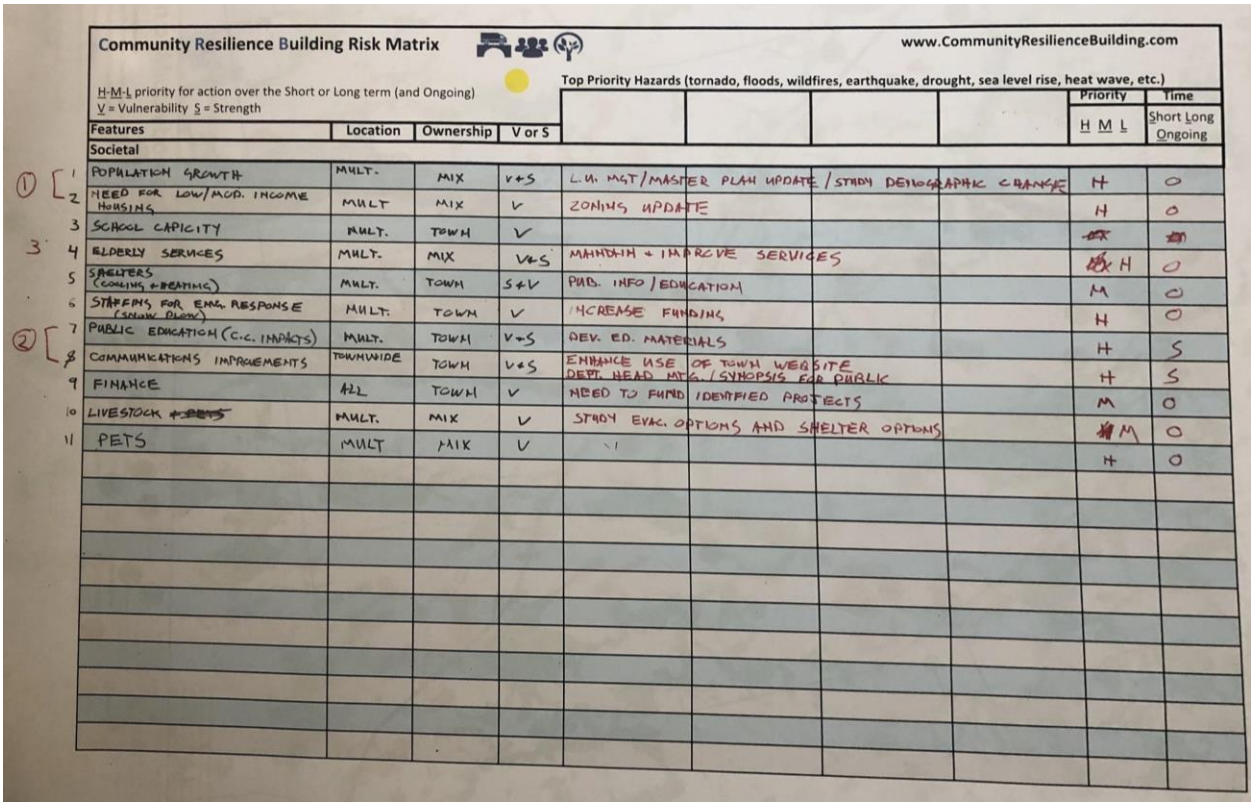
H-M-L priority for action over the Short or Long term (and Ongoing)
V = Vulnerability S = Strength

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

	Features					Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time	
	Environmental	Location	Ownership	V or S						H M L	Short Long Ongoing	
1	TREE BLOWDOWN (POWER LOSS)	ACROSS LOCALITY	MIX	V	ADDITIONAL TOWN FUNDING NEEDED							
2	FIRE MANAGEMENT (ROCKY SUTTER + OTHER OPEN SPACE)	MULTIPLE	MIX	V	FOREST MGT. PLAN NEEDED COORD. W/ STATE					M	O	
3	HEM. RIVER SILT + BLOCKAGE (INC. VES)	MULTIPLE	MIX	V	RIVER/POND STUDY PILOT IN PERMITTING					M	O	
4	PROTECTED OPEN SPACE (FLOOD STORAGE)	MULT.	MIX	S	FUND LAND PROTECTION / STUDY T.D.R. + REUSE OPEN SPACE SUBDIVISION					H/M	O	
5	WELLHEAD PROT. AREAS	MULT.	MIX	V+S	APPLICATION OF EXISTING BYLAW					H	O	BYLAW
6	OPEN SPACE VS DEVELOPMENT	MULT.	MIX	V						M	O	
7	POTENTIAL CONS. LAND ON TAUNTON RIVER	PLY. ST. E. OF BEDFORD	PRI.	S	DEV. STRAT. / IMP. OPEN SPACE PLAN / UPDATE MASTER PLAN					H	O	
8	CUMBERLAND FARMS LAND PURCHASE	THOMPSON ST.	PRI	S								
9	AG. PRESERVATION	MULT.	MIX	S								
10	POND MGT. PLAN	ACROSS APC	MIX	S	DEV. AND IMP.					H	O	
11	BOG CONVERSION (SOLAR)	MULTIPLE	PRI.	V						L	O	
12	SOLAR VS. AG. LAND	MULT.	PRI.	V								
13	RED PINE (FIRE HAZARD) (DISEASE)	POND COMPLEX	MIX	V						M	O	
14	C.C. IMPACTS ON CRANBERRY OPS.	MULT.	PRI	V	LINKS TO OPEN SPACE PROT.					M	O	
15	HERRING RUN C.C. IMPACTS	MULT.	MIX	V	LINKS TO REMOVAL OF OTHER STRESSORS (SILT/DAMS/ETC.)					H/M	O	
16	ENHANCE POLLINATOR HABITAT	MULT	MIX	S+V	PUB. ED., SEED DIST., USE OF TOWN LAND					M/L	S	
17	ADVERSE IMPACTS OF INSECT SPRAYING	TOWNWIDE	~~TOWN~~ STATE/PRI	V	PROACTIVE MGT., BAT BOXES, PUB. ED., I.P.M.					H	O	
18	LACK OF WETLAND BYLAW	MULT.	TOWN	V	ADOPT WETLANDS BYLAW					H	O S	
19	WILDLIFE IMPACTS	MULT.	MIX	V	ADDRESS OTHER STRESSORS					L	O	
20	WATER QUALITY	MULT.	MIX	V	L.U. PLANNING / BYLAW UPDATE / PUB. ED.					M	O	
21	BROWNFIELDS	MULT.	MIX	V								
22	PRIVATE WELLS	MULT.	PRI.	V	PUB. ED. ON TESTING W.Q. / RADON					M	O	
23	COLD WATER STREAM	MULT	MULT	V	LINKS TO POND/RIVER STUDY / WMA					M	O	

(1)

Society



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V = Vulnerability S = Strength

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

		Features	Location	Ownership	V or S					Priority H M L	Time Short Long Ongoing
		Societal									
①	1	POPULATION GROWTH	MULT.	MIX	V+S	L.U. MGT/MASTER PLAN UPDATE / STUDY DEMOGRAPHIC CHANGE				H	O
	2	NEED FOR LOW/MOD. INCOME HOUSING	MULT	MIX	V	ZONING UPDATE				H	O
	3	SCHOOL CAPICITY	MULT.	TOWN	V					~~H~~	~~O~~
3	4	ELDERLY SERVICES	MULT.	MIX	V+S	MAINTAIN + IMPROVE SERVICES				~~H~~ H	O
	5	SHELTERS (COOLING + HEATING)	MULT.	TOWN	S+V	PUB. INFO / EDUCATION				M	O
	6	STAFFING FOR EMG. RESPONSE (SNOW PLOW)	MULT.	TOWN	V	INCREASE FUNDING				H	O
②	7	PUBLIC EDUCATION (C.C. IMPACTS)	MULT.	TOWN	V+S	DEV. ED. MATERIALS				H	S
	8	COMMUNICATIONS IMPROVEMENTS	TOWNWIDE	TOWN	V+S	ENHANCE USE OF TOWN WEBSITE DEPT. HEAD MTG. / SYNOPSIS FOR PUBLIC				H	S
	9	FINANCE	ALL	TOWN	V	NEED TO FUND IDENTIFIED PROJECTS				M	O
	10	LIVESTOCK ~~+PETS~~	MULT.	MIX	V	STUDY EVAC. OPTIONS AND SHELTER OPTIONS				~~H~~ M	O
	11	PETS	MULT	MIX	V					H	O

Appendix D: Digitized Matrices – Group 1 followed by Group 2

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

Action ID (no order)	Features	Location	Ownership	V or S	Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time
Infrastructural									HML (high, med, low)	SLO (short, long, ongoing)
1	Electrical system disruption / also gas disruption due to flash freeze w/ groundwater fluctuation	Townwide	Public/G+E	S/V	We have to improve our ability to self-generate/reduce vulnerability; better storage; contend with trees & high water tables				H	O
2*	Illegal sump pumps	Townwide	various	V (WWTP)	Find out where it is coming from; look at feasible alternatives				M/L	O
3*	Culvert system	Townwide	Town/DOT	V/S	Townwide location/assessment study of our culverts/drainage				M	O
4	Rail bridge abutments	Townwide	DOT*	V/S	Conduct an assessment of DOT structures on our natural resources				H	S
5*	Bascule dam at Wareham St.	Wareham St.	Town	V	Do a feasibility study and alternatives assessment for removal or restoration				M/L	
6*	Sewer pipes in Town Center	Townwide	Town	V	Do a video/assessment of the pipes in the Town Center				H	S/O
7*	Capacity of catch basins in Downtown	Townwide	Town	V	Combine the capacity of the Complete Streets Plan and Program with the MVP program's ability to address				M	O
8	Where can we put the stormwater	Townwide	various	V					M	O
9*	Graywater recapture (library)	Townwide	Town		Use the library to pilot the technology				H	S/O
10*	Alternative stormwater treatment (Summer St. area)	Townwide	Town	V	Look at nature based infilitration/storage				M	O
11	Discharge point of the WWTP	Nemasket R.	Town	V/S	Look at the alternatives for location/elevation of pipe				L	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

12	Storm impacts on cultural and historical assets (Pratt Farm, Oliver House)		Town	V/S	Plan for management of our cultural/historical landscapes using nature based practices to limit vulnerability				M	L
13	Insulated power lines are less vulnerable	Townwide	G+E	S						
14	Planning Board is asking homeowners to plant low-height trees/new regs no street trees	Townwide	various	S						
15	Road design, raised road beds - drainage is an issue	Townwide	various	V/S	See 7&8 above					
16*	Lack of ability for quality control on 40Bs**	Townwide	various	V/S	Look at zoning; weigh impacts to our Green Infrastructure; look at efficient affordable housing design/types (incentives). **Look at advocating for changes to state requirements for the improvements we're seeking				H	S/O
17	Mass DOT outfall maintenance (schedule + completion dates?)	Townwide	DOT	V/S	Project coordination on local and state roads to maximize our nature based approach				H	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

Action ID (no order)	Features	Location	Ownership	V or S	Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time
Environmental									HML (high, med, low)	SLO (short, long, ongoing)
1*	ACEC designation for the Assawompset Ponds Watershed w/ a management plan	all the towns in the watershed	various	V/S	Look at this option as part of the Assawompset Ponds Study				H	S
2	Need more resources for stormwater monitoring on rivers, streams, and waterbodies	Townwide	various	V	Pilot study in the Route 28 area under the new Stormwater Bylaw/Stormwater Group structure				H	S
3*	Siltation and invasive vegetation	"	"	V	Look at this under the Assawompset Ponds Study				H	O
4	Need a wetlands protection bylaw that references climate resiliency	"	Town	V	Look at the creation of a regionally consistent wetlands protection bylaw for the watershed communities (APC pilot)				H/M	O
5	Current development patterns	"	various	V	Educate on alternatives to traditional development patterns				H	O
6	Better management of ticks & mosquitoes; tree related pests	"	various	V	DPH should be more proactive than reactive - resources to towns - alternatives*				H	S/O
7*	Management of worsening groundwater issues	"	"	V	Topic of regional discussion (APC)				M	L
8	We have protected a lot of valuable land - but there is more to do	"	"	S/V						

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

9	Retention of our agr. soils and productive agr. Land	"	"	S/V	Tie solutions with the State Food Security Plan and the Healthy Soils Action Plan and alternatives for farming "with" climate change; be a "food island"; encourage biodiversity	H	S/O
10	Repurpose/restore cranberry, forest & agr. land to help promote resiliency	"	"	V	Work w/ MDAR and DER under their restoration programs	M	L
11	Earth removal bylaw needs work (state should also look at Title 5/structural fill)	"	Town	V	Better controls on the "how's" and "why's" to preserve our assets	H	S
12*	Address the chronic needs of the Nemasket and impacts on fishery and biodiversity *consideration of pollinators and pollinator habitat	Nemasket R.		V	Look at this under the APC study	H	S/O
13	Address what is going untreated in our wastewater (WWTP and septic) and is going into our groundwater, rivers and streams	Townwide	various	V	Increase our public education efforts to help limit the amount of what goes into our wastewater	L	L/O
14	Address problems at brownfield sites and how they increase our vulnerability	Townwide	various	V	Look at where we need brownfield assessments and remediation	M	S/O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

Action ID (no order)	Features	Location	Ownership	V or S	Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time
Societal									HML (high, med, low)	SLO (short, long, ongoing)
1*	Look at zoning and housing stock needed to accomodate elderly and vulnerable populations	Townwide	various	V	See Infrastructure (development patterns & 40Bs) - look at community owned housing as well				H	O
2	Looming problem of availiability of Gas + Electric service in coming years	"	Town/G+E	V	Education on alternatives and "super-efficiency" in the use of our utilities as we transition				M	O
3	Deep bylaw dive to see what we do and how we do it in relation to being climate ready/resilient	"	Town	V/S	Mass Audubon model				M	O
4	How do we deal with population growth	"		V/S	see development patterns & 40B discussions)				H	O
5	Promote energy efficiency and passive design - how we use our resources	"		V	see #1 above)				M	O
6	We need to look at our overall emergency preparedness	"	"	S/V	Coordinate efforts with the LEPC and Hazard Mitigation Plan (and MVP)				M/L	O
7	Develop a sustainable food and water supply	"	"	V	Look at the needs of our programs in terms of educational resources needed				H	O
8	Need more public education on resiliency - also in our schools	"	"	V	"				M	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 1
Middleborough, MA

9	Need more alternative transportation options	"		V	Micro mobility options for non-street vehicles (part of Complete Streets); low carbon/no carbon alternatives; SUPs	H/M	S/O
10	Need a "good neighbor" network to check on elderly, vulnerable, and each other	"		V	Look at #6 above/possible youth employment	M/L	O
11	Look at vulnerable/repetitive loss properties & options	"		V	Lessons learned from W.P (working with The Nature Conservancy on this)	L	L

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 2
Middleborough, MA

Action ID (no order)	Features	Location	Ownership	V or S	Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time
Infrastructural									HML (high, med, low)	SLO (short, long, ongoing)
1*	Wareham St. Dam	49 Wareham	Town	V+S	Removal w/ associated culvert upgrades + regrading				H	?
2*	Plymouth St. Bridge	On map (Nemasket River)	Town/State	V	Replace bridge + water line				M/L	L
3*	Thomas St. Culvert	on Thomas St.	Town	V	Culvert replacement (coord. w/ bog owner)				H/M	S
4*	Stonybrook Dam	Pratt Farm	Town	V	Currently under study: Town Mtf to pick option				H	L
5	Nemasket River Crossings (silting river)	Multiple	State & Railroad	V	Study needed to better understand solutions				M	L
6	W.W. treatment (flooding)	Everett St.	Town	V	Solution not clear, link to study of Wareham Dam removal				M	O
7	Assawompset Dam (flooding + silt)	Pond outlet	Taunton	V	Pond management plan needed				M/L	O
8	Wareham St. water line crossing	Wareham + East Grove	Town	V	Study alternative water line location				M/L	O
9*	Comm. tower backup power (age)	Off Wareham St, Barton Hill	Multiple	V	New facility needed				H	S
10*	Town fuel pumps (no backup power)	Fire Station (N. Main)	Town	V	Connect to fire station gen.				H	S
11	Treatment plant + well field (flooding)	E. Main St.	Town	V	Link to study of Stonybrook Dam				H	L
12	SS East Grove Treatment Plant (flooding)	E. Grove	Town	V	Link to study of Wareham Dam				M/L	O
13	Mid. rotary	28+44	State	V	Work w/ state to fund flyover				M	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 2
Middleborough, MA

14	Vine St. gas facility	Vine + Center	Town	V	Better protection of facility	M/H	L
15	Vernon St. bridge (flooding)	Poquoy Bk	Town	V	Replacement needed	M/H	L
16	Old G+E power plant (flood)	Wareham St.	Town	V	Link to Wareham Dam study; site may be redeveloped	L	O
17	Town wells (drought)	Multiple	Town	V	Demand mgt., study new sites	M/L	L
18	Vernon St. bridge(s)(flood)	Taunton R.	Town	V	Replacement	M/L	L
19	Rockland Ind. (haz. waste)	Plymouth St.	Private	V	Follow-up study needed	H	O
20	Landfill	207 Plympton St.	Town/pri	V+S	Audit needed, est. capacity, recycling, pub. ed.	M/L	O
21	Woods Pond Dam (flooding)	Chestnut St.	Private?	V			
22	Woloski Park (flood)	Plymouth St.	F+W State owned	V	Relocation of remaining residents	M	O
23	Savery Pond culvert	Ply. St.	Town	V	Replace	M/L	L
24	Oak Point (flood)	Plain St.	Pri.	V	Bylaw update/update infrastructure	M	O
25	Plain St. + 105 (traffic study)		Town	V	Traffic study/upgrade	L	O
26	Brownfields	Multiple	Mix	V	Monitoring needed	M	O
27*	Energy efficiency	Multiple	Town	V&S	Seek funding for imp./update town facilities	H	O
28*	Town focus on reducing CO2 emissions	Multiple	Town	S	Study geothermal, increase renewables	H	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 2
Middleborough, MA

Action ID (no order)	Features	Location	Ownership	V or S	Flooding	Drought + High Temps	Storms + Wind	Vector Borne Disease	Priority	Time
Environmental									HML (high, med, low)	SLO (short, long, ongoing)
1	Tree blowdown (power loss)	Across locality	Mix	V	Additional town funding needed				M	O
2	Fire management (Rocky Gutter + other open space)	Multiple	Mix	V	Forest mgt. plan needed; coord. w/ state				M	O
3*	Nem. River silt + blockage (inv. veg.)	Multiple	Mix	V	River/pond study; pilot in permitting				H/M	O
4*	Protected open space (flood storage)	Multiple	Mix	S	Fund land protection/study T.D.R. + reuse open space subdivision bylaw				H	O
5*	Wellhead prot. areas	Multiple	Mix	V+S	Application of existing bylaw				M	O
6*	Open space vs development	Multiple	Mix	V						
7*	Potential cons. land on Taunton River	Ply. St. E. of Bedford	Pri.	S	Dev. strat./imp. Open Space Plan/update Master Plan				H	O
8*	Cumberland Farms land purchase	Thompson St.	Pri.	S						
9*	Ag. preservation	Multiple	Mix	S						
10	Pond mgt. plan	APC	Mix	S	Dev. and imp.				H	O
11	Bog conversion (solar)	Multiple	Pri.	V					L	O
12	Solar vs. ag. land	Multiple	Pri.	V						
13	Red Pine (fire hazard) (disease)	Pond complex	Mix	V					M	O

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MVP Planning Process Matrix: GROUP 2
Middleborough, MA

14	C.C. impacts on cranberry ops	Multiple	Pri.	V	Links to open space prot.	M	O
15	Herring Run C.C. impacts	Multiple	Mix	V	Links to removal of other stressors (silt/dams/etc.)	H/M	O
16	Enhance pollinator habitat	Multiple	Mix	S+V	Pub. ed., seed dist., use of town land	M/L	S
17	Adverse impacts of insect spraying	Townwide	State/pri	V	Proactive mgt., bat boxes, pub. ed., I.P.M.	H	O
18*	Lack of wetland bylaw	Multiple	Town	V	Adopt wetlands bylaw	H	S
19	Wildlife impacts	Multiple	Mix	V	Address other stressors	L	O
20*	Water quality	Multiple	Mix	V	L.U. planning/bylaw update/pub. ed.	M	O
21	Brownfields	Multiple	Mix	V			
22	Private wells	Multiple	Pri.	V	Pub. ed. on testing W.Q./Radon	M	O
23	Cold water streams	Multiple	Mult.	V	Links to pond/river study/WMA	M	O

Action ID (no order)	**Features**	**Location**	**Ownership**	**V or S**	**Flooding**	**Drought + High Temps**	**Storms + Wind**	**Vector Borne Disease**	**Priority**	**Time**
Societal									HML (high, med, low)	SLO (short, long, ongoing)
1*	Population growth	Multiple	Mix	V+S	L.U. mgt/master plan update/study demographic change				H	O
2*	Need for low/mod. income housing	Multiple	Mix	V	Zoning update				H/M	O
3	School capacity	Multiple	Town	V						
4*	Elderly services	Multiple	Mix	V+S	Maintain + improve services				H	O
5	Shelters (cooling + heating)	Multiple	Town	S+V	Pub. info/education				M	O
6	Staffing for emg. response (snow plow)	Multiple	Town	V	Increase funding				H	O

**Top Priorities in Group*

MVP Planning Process Matrix: GROUP 2
Middleborough, MA

7*	Public education (C.C. impacts)	Multiple	Town	V+S	Dev. ed. materials	H	S
8*	Communications improvements	Townwide	Town	V+S	Enhance use of town website; dept. head mtg./ synopsis	H	S
9	Finance	All	Town	V	Need to fund identified projects	M	O
10	Livestock - shelter need	Mult.	Mix	V	Study evac. options and shelter options	M	O
11	Pets - shelter need	Mult	Mix	V	"	H	O

**Top Priorities in Group*