Town of Blackstone



Community Resilience Building Workshop Summary of Findings

May, 2018



Project No. 20170390.A50



Town of Blackstone Community Resilience Building Workshop Summary of Findings

Overview

Extreme weather and natural and climate-related hazards are an increasing concern for the communities of Massachusetts, and there is a clear need to involve municipalities, corporations, organizations, and the State in increasing resilience at all levels. Recent storm events affecting the region have highlighted many of the vulnerabilities that towns and cities face. Hurricane Irene and Superstorm Sandy brought intense flooding to many municipalities and threatened (or destroyed) infrastructure across the state. Extreme temperatures at both ends of the spectrum have pushed the limits of communities' preparedness to protect both infrastructure and people. In coastal communities, the impacts of sea level rise are felt daily and further exacerbate the impacts of other extreme events. Current climate modeling indicates that all of these hazards are expected to increase in frequency and scale over the coming decades. The Municipal Vulnerability Preparedness (MVP) program provides support and a prescribed process for cities and towns in Massachusetts to plan proactively for resiliency and implement key climate change adaptation actions.

In 2017, the Town of Blackstone was awarded a \$15,000 MVP grant to fund the planning stage of this process. The Town partnered with Fuss & O'Neill, a state certified MVP Provider, to complete a comprehensive, baseline climate change and natural hazard vulnerability assessment and develop a list of priority actions for the Town. This process involved the development of an MVP Core Team, which met on February 14, 2018 to determine initial concerns and worked to identify stakeholders within the municipality and set goals for the process. Those stakeholders were then invited to participate in a Community Resilience Building (CRB) workshop on May 2, 2018, engaging in a day-long, tried and tested process developed by The Nature Conservancy. The CRB methodology is an "anywhere at any scale" format that draws on stakeholders' wealth of information and experience to foster dialogue about the strengths and vulnerabilities within the Town. Workshop participants interacted at both large and small group levels, using an iterative process to gather input, synthesize ideas across groups, and ultimately develop a set of priority resilience and adaptation actions.

The CRB workshop's central objectives were to:

- · Define top local natural and climate-related hazards of concern;
- · Identify existing and future strengths and vulnerabilities;
- · Develop prioritized actions for Blackstone;
- · Identify immediate opportunities to collaboratively advance actions to increase resilience.

Top Hazards and Vulnerable Areas

During the Community Resilience Building workshop, participants were asked to identify the top four natural hazards of concern for the Town of Blackstone. Discussion of the top hazards built on earlier conversations that took place at the MVP Core Team Meeting, as well as Town conversations that formed the basis for the Town's Hazard Mitigation Planning. Flooding and increasing precipitation was identified as one of the Town's top hazards. Extreme heat, particularly the increase in days over 90 degrees F, was identified as a second major hazard. Nor'easters and associated wind impacts were identified as a third hazard. Finally, hurricanes were identified as a fourth, distinct threat, as the two types of storms bring somewhat different patterns of impacts. These four hazards have already had demonstrated impacts on the Town, and as climate change progresses, these hazards are expected to have ever greater consequences for infrastructure and environment, as well as for various societal elements. Specific areas of concern are identified below.

Top Hazards

- Flooding and Precipitation
- Heat
- Nor'easters and Wind
- Hurricanes

Areas of Concern

While many impacts are expected to be felt Town-wide, certain elements, locations, or community groups present particular concerns.

Neighborhoods/Communities Blackstone Nursing Home, High Rocks Condominiums area, Harris Pond Village, Fox Brook Manor (Housing Authority property)

Ecosystems

Areas of beaver activity in west-central Blackstone and north-central Blackstone

Infrastructure

Branch River Dam, Elm Street Bridge, Lincoln Street Bridge, Elm Street, Main Street, Rathbun Street/Elm Street connection, culverts on Lincoln Street, Blackstone Street, and Shore Drive

Facilities

Precious Blood Cemetery, Power Plant, Recycling Center, Library, Schools, Police Station



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Current Concerns and Challenges Presented by Hazards

Major storm events have been a recurring threat to Blackstone throughout its history. In recent memory, workshop participants noted that storms have been becoming more severe and more frequent. Kids can no longer play in the rain safely because of concerns over high wind and falling tree limbs. Power outages have become much more frequent as well due to wind that knocks down trees and takes out power lines.

Flooding is also a challenge in Blackstone, and the threat from flooding has been growing with the increasing frequency of major storm events that deliver large amounts of precipitation over a short time period. The Town still remembers the impacts of the severe floods of 1955, which were caused by a series of dam failures on the Blackstone River following Hurricane Connie and Hurricane Diane. Vital town records were lost to floodwaters, and caskets from the Precious Blood Cemetery were floating down the streets of the Town. The Town's Hazard Mitigation Plan¹ notes that minor flooding frequently occurs at isolated locations due to problems with culverts and bridges, and representatives from the Department of Public Works stated that town-wide flooding is increasingly a concern, with water washing out roads and making conditions dangerous or impassable. The overall theme is that hazard events in Blackstone are becoming less predictable, with sporadic but severe impacts. There is also an expectation in Town that new areas are likely to be affected by flooding in the future as rain and runoff increase during heavy storms.

Over the past 60 years, there have been over 30 high impact snowstorms that resulted in at least 10 inches of snow in Blackstone¹. More than one third of those have occurred within the last 10 years. The Town Administrator noted that Nor'easters have become increasingly dangerous and the impacts tend to last longer than they used to. Blackstone has also been impacted by over a dozen hurricanes and tropical storms, from the Great Hurricane of 1938 to the much more recent Hurricane Irene (2011) and Superstorm Sandy (2012)¹.

Extreme temperatures at both ends of the spectrum pose challenges for Blackstone as well. Extreme cold and extreme heat can both trigger the need to open shelters (for warming or cooling) and raise concerns for vulnerable populations. Senior citizens and children are most affected by heat conditions, and in Blackstone these populations frequently lack access to air conditioning (e.g., the schools are not all air conditioned). In the past year, emergency services had to transport 5 people due to heat-induced incidents. Extreme heat also affects residents through air quality impacts, as well as via impacts on pests and disease. Workshop participants pointed out that ticks were never a concern in the past, but they are increasingly problematic for the Town's residents and there is concern about the potentially serious health risks associated with this and other climate change impacts.

¹ Central Massachusetts Regional Planning Commission & Blackstone Local Hazard Mitigation Team (2017). *Blackstone Hazard Mitigation Plan.*

CRB Workshop Summary of Findings – Town of Blackstone

Specific Categories of Concerns and Challenges

Infrastructural

Culverts and Bridges

Culverts and bridges are recognized as a potential concern town-wide. Workshop participants noted, in particular, that the Elm Street Bridge and Lincoln Street Bridge were known structures of concern. No detailed inventory has cataloged the size and condition of culverts and bridges town-wide. Regardless of condition, culvert and bridge structures were designed to accommodate historic patterns of precipitation and runoff, which are rapidly transforming as a result of climate change. As precipitation events become more intense and less predictable, undersized culverts are expected to pose a greater threat of failure and flooding.

Transportation Vulnerabilities

Blackstone is separated into two distinct sections that are not connected via transport networks within the Town's borders. Individuals, and, more importantly, emergency services, have to drive through the neighboring towns of Bellingham or Woonsocket to reach the neighborhoods in the southeast corner of Town. Workshop participants also noted that the Town does not have any public transit or taxi services, which limit mobility options, particularly for some of the Town's vulnerable populations.

Vulnerabilities to Power Outages

A number of Blackstone's facilities are vulnerable to power outages from a variety of climate change hazards. The Town's four pump stations and three wells are all potentially vulnerable to outages brought on by wind impacts or downed trees, and restoring these sites can be further complicated by flooding along nearby streets. The Recycling Center/Animal Control facility is also vulnerable to power outages.

Dams

In general, while most town-owned dams are regulated under State dam safety regulations, and are therefore known quantities, less information typically exists about many small dams, particularly private dams. In some cases, it is not even known which dams still exist, let alone their condition or risk potential. In Blackstone, the Branch River Dam is the primary dam of concern that was addressed during the CRB Workshop.

Environmental

Beavers

Concerns about beavers were discussed as both an environmental issue and an infrastructure problem. Whereas the town generally has some record of and control over man-made stream crossings or impoundments, beaver activity is often known only anecdotally, if at all, and can cause unpredictable problems during heavy precipitation, when flooding occurs in unexpected locations. There are locations on both the west-central and north-central edges of Town that are known to be areas particularly influenced by beavers, although there are additional areas of beaver activity throughout the town. Beaver activity has been known to cause standing water on railroad tracks, posing potential risks for train derailment.





Water Quality

Water supply was generally not a topic of concern during the workshop. However, participants did raise concerns about the potential for increased development to impact water quality, both for groundwater and surface water. This could, in turn, have impacts on both Town wells and private wells, as well as streams, rivers, and wetlands.

Societal

Vulnerable Populations

Workshop participants acknowledged the challenges of identifying and reaching vulnerable individuals, especially those who may no longer have a land-line telephone, or who may not self-identify as vulnerable. Certain populations, especially seniors, are known to be at higher risk during hazard events and may require support beyond emergency notifications. Workshop participants expressed concerns about seniors' ability to obtain food and medical supplies during hazard events, the impacts of power outages for individuals on oxygen or needing refrigeration for medicines, as well as the challenges involved in getting seniors to leave their homes (and sometimes their pets) in order to seek shelter elsewhere. Better understanding what these needs are and how the Town can best prepare to proactively support its entire population are areas that require more exploration.

Vulnerability of Senior Housing Units

In addition to senior residents living on their own in single family homes, Blackstone's Council on Aging noted that senior housing units do not have back-up generators, making them vulnerable to power outages in the case of a storm. This is particularly critical for individuals who rely on equipment powered by electricity, such as dialysis machines, CPAP machines, and oxygen machines.

Vital Records

Blackstone lost vital public records to flooding in 1955, and there are concerns that records are still vulnerable to flooding or other hazards. Voter registration information and equipment could also be vulnerable to climate impacts. Existing storage facilities are inadequate to protect these important documents.

Pests and Disease Control

Climate change is affecting pests and disease vectors both through changing precipitation conditions and changing temperature conditions. Warmer, wetter conditions lead to increased mosquito populations, while the absence of sufficient periods of cold means that pest populations that would historically have been killed off or reduced are able to survive the winter and emerge in greater numbers the following season. Further, as the Massachusetts climate begins to look more like the climate of the mid-Atlantic and southern states, we are seeing new types of diseases show up in existing pests (e.g. mosquitoes carrying West Nile Virus or Zika and ticks carrying Rocky Mountain Spotted Fever). These changes present a major public and animal health challenge in terms of education, prevention, and treatment.

Stress on Emergency Services

Blackstone's Fire and Police departments bear much of the burden of responding to the increased human threats that result from climate-induced hazards. An ever larger percentage of the departments' time and resources are being devoted to handling things like heat stress, traffic accidents and injuries that result from ice or other dangerous conditions, and activities to protect property and maintain traffic flows during storm events.

Current Strengths and Assets

While the Town recognized a number of vulnerabilities, workshop participants identified key strengths as well. Blackstone completed its Hazard Mitigation Plan in 2017 and benefits from a number of existing relationships and services that increase the Town's resiliency to climate change impacts.

- The Town has invested in a Smart 911 program that will allow residents to input personal data that will provide first responders with critical information to assist them in responding to emergency calls.
- The Town library serves as a point of distribution for information and can be used for outreach and education about climate change impacts as well as assisting in signing up residents for SMART 911.
- Blackstone recently completed its Hazard Mitigation Plan with the assistance of Central Massachusetts Regional Planning Commission.
- The Town benefits from being part of a mosquito control district.
- The Blackstone Town Hall is seen as a strength for the community.
- The Town has an existing emergency center/ community center, although there is a need for a second facility on the other side of Town.
- The Town's Middle School, Administration Building, and High School all serve as cooling stations to help residents cope with extreme heat.
- Risks to the Precious Blood Cemetery have been reduced through improvements to a dam and retaining wall.

Top Recommendations to Improve Resilience in Blackstone

Participants at the CRB workshop identified a number of recommendations to address vulnerabilities and increase resiliency in three main topic areas: infrastructure, environment, and society. Management of water, primarily dealing with excesses of water due to flooding, was a primary concern that emerged in both the small and large group discussions. A second theme centered around providing services to the Town's residents during hazard events, with particular attention to vulnerable populations.

Highest Priority

 Conduct field inventory of culverts, and bridges to rank and prioritize projects for increased flooding resiliency and storm-hardening, followed by design and implementation of priority resizing or replacement projects. Green infrastructure, Low-Impact Design, and other nature-based

solutions will be integrated with hard-infrastructure improvements to establish approaches that will be robust in the face of natural hazards and climate-change scenarios. Known problem areas should be areas of focus, including: Elm Street Bridge, Lincoln Street Bridge, culverts on Lincoln Street, Blackstone Street, and Shore Drive.

 Review communications regarding downstream management of Blackstone River, especially in coordination with neighboring Woonsocket. Ensure that both Towns are anticipating the impacts of development on water wells and flood storage area.

- Extend Rathbun Street to develop a connector that links the existing Rathbun Street to Elm Street and provides a more direct route for emergency access to the southeast portion of Town.
- Establish a comprehensive emergency awareness plan, incorporating a robust education and outreach strategy to build awareness of town resources and make Town residents aware of the many planning efforts, agreements, shelters, etc. which are focused on making the Town more resilient to climate change impacts. Ensure that all residents know how to access these resources when they are needed. Focus special attention on outreach to new residents and others that includes contact numbers and emergency information, including shelter details, SAFE Routes, emergency procedures, etc.
- Develop evacuation plans for senior residents, children, and other at-risk populations, including those in need of critical medical equipment or care that may be unavailable during hazard events.
- Provide more resilient storage facilities for vital information, including birth, death, and marriage records, voter registration data, and associated equipment. Coordinate with the Town Clerk, Treasurer, Assessor, and Planning Board to assess all vulnerable records information and ensure that the Town protects critical data.

- Complete a Town-wide dam assessment of all public, private, and beaver dams, focusing on reducing the risk of flooding from dam failures during intense storm events and protection of critical ecosystems that provide flood storage and other climate resilience benefits. Technical study should include town-wide survey to update information on ownership and condition, determine risks from each dam, and prioritize projects.
- Develop a comprehensive plan for beaver management to mitigate against unpredictable flooding/impoundment impacts and investigate expanded beaver control options.

Moderate Priority

- Assess green infrastructure opportunities for stormwater management to develop a list of specific priorities, assess feasibility and cost, rank priority projects in terms of climate resilience potential, and develop concept designs for key projects. Review Town regulations and update as necessary to support green infrastructure and low-impact development and encourage green infrastructure to be incorporated into all roadway projects. Consider projects in areas that are prone to flooding, such as the the Harris Pond Village neighborhood, including Shore Drive and the Precious Blood Cemetery.
- Pursue public facilities upgrades that would increase resiliency, including purchasing generators for the Recycling Center/Animal Control facility, library, Senior Center, Town Hall, and Fox Brook Manor (a housing authority property).
- Include resilient record keeping and storage facilities in any new construction at public buildings.
- Install central air conditioning in the Town's schools to protect children from the impacts of increasing heat as seasonal weather patterns become more unpredictable and average temperatures and days over 90 degrees F increase.
- Purchase an improved communications system to support Police, Fire, and the Department of Public Works staff in providing emergency response during hazard events.
- Establish a second community center that would double as an emergency center to serve residents on the other side of Town and provide easier access to services for all residents.

Lower Priority

- Develop transportation planning for vulnerable populations during hazard events to ensure that vulnerable groups, notably seniors, will be able to get to shelters, obtain food and medications, or receive emergency services. Focus should be on identifying vulnerable populations and providing aid during all types of climate-induced risks, such as extreme temperatures, increasingly intense storms which may make travel difficult, or flooding and storm events that may leave residents unprepared, stranded, or cut off from supplies.
- Notify residents of mosquito control plans, especially planned spraying by the mosquito control district.

- Encourage Worcester Regional Transit Authority to extend service area to provide transportation options for Blackstone residents, particularly vulnerable populations.
- Continue to monitor potential funding sources for alternative energy sources that would support the library and schools and alleviate the need to rely on fossil fuel burning generators during hazard events.
- Continue to pursue funding for SMART 911 and related citizen education, especially focused on outreach designed to teach seniors how to use the system and enter their information.
- Purchase four new sign boards for use in dispersing emergency information to Town residents.

CRB Workshop Participants

All workshop invitees are listed below; attendees are indicated with an asterisk.

Name	Position/Organization
Patricia Salamone*	Assistant Assessor
Erin Medeiros*	Outreach Coordinator, Council on Aging
Laurie Keefe*	Director, Council on Aging
Ross Atstupenas*	Police Chief
Michael Sweeney*	Fire Chief, Emergency Management Director
Lisa Cheever*	Library Director
Claudette Dolinski*	Town Clerk
Donna Bik*	Assistant Town Clerk
Lauren Zahorsky*	Acting Town Accountant
Daniel Keyes*	Town Administrator
Jimmy Sullivan*	Superintendent, Department of Public Works
Amy Sutherland*	Water and Sewer Commission
Catherine Muller*	Collector/Treasurer
Kevin Sullivan	Animal Shelter
Bob Morse	Parks Department
Tony Lackey	Blackstone Nursing Home
Wojik Farm	Business Owner
Bear's Christmas Tree Farm	Business Owner
Robert Kimball	Business Owner, Kimball Sand
Joseph D. Early Village	Town Housing Authority
Bob Greenhalgh	Veterans' Service Officer
Angel Maclure	Dean Bank
Kim Briggs	Unibank
Trish Settles	Central Massachusetts Regional Planning Commission
Erik Eckman	Park and Shop
Saint Paul Cemetery	Local Organization
St Charles Cemetery	Local Organization

* indicates attendees

Citation

Fuss & O'Neill (2018). Community Resilience Building Workshop Summary of Findings. Town of Blackstone, Fuss & O'Neill,Inc. Blackstone, Massachusetts.

CRB Workshop Project Team: Organization, Name, Role

Name	Organization	Role
Amy Sutherland	Water and Sewer Commission	Project Coordinator/Core Team
		Member
Claudette Dolinski	Town Clerk	Core Team Member
Laurie Keefe	Director, Council on Aging	Core Team Member
Lauren Zahorsky	Acting Town Accountant	Core Team Member
Cathy Muller	Collector/Treasurer	Core Team Member
Michael Sweeney	Fire Chief, Emergency Management Director	Core Team Member
Jimmy Sullivan	Superintendent, Department of Public Works	Core Team Member
Bill Walsh	Code Enforcement Officer	Core Team Member
Lisa Cheever	Library Director	Core Team Member
Daniel Keyes	Town Administrator	Core Team Member
Patricia Salamone	Assistant Assessor	Core Team Member
Mary Monahan	Fuss & O'Neill	MVP Lead Facilitator
Diane Hayes	Fuss & O'Neill	Facilitator

Acknowledgements

Many thanks to the MVP Core Team members, CRB workshop participants, and to Amy Sutherland who acted as the local Project Coordinator. Thanks to the Town of Blackstone for providing a meeting space for the Core Team Meeting and CRB Workshop and coordinating the CRB Workshop.

Funding for the CRB Workshop was provided through a Massachusetts MVP grant.

Appendix A

CRB Workshop Base Map

Appendix B

CRB Workshop Outputs: Participatory Mapping Exercise & Risk Matrices

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Appendix C

CRB Workshop Presentation Materials

Fuss & O'Neill Overview

At Fuss & O'Neill, we place great emphasis on collaboration; both within the company and with our clients. We are guided by what is best for the client and the project – in identifying client champions, naming project leaders, building project teams, and providing responsive service and quality deliverables.

We strive to partner with our clients to understand their businesses and to be stewards of their resources as if they were our own, and aim to develop services and solutions that anticipate evolution of their unique business needs.

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Terminology

Town of Blackstone – Blackstone River Basin

Blackstone Basin	Observed Baseline 1971-2000	Proje i	cted Ch n 2030s	ange S	Projec in	ted Ch 2050	ange S	Proj	ected Cl in 2070	hange)s	Proje i	ected C in 2090	hange)s
Average Annual Temperature (°F)	48.2	2.17	to	4.23	2.88	to	6.29	3.52	to	9.05	3.78	to	11.00
Annual Days with Maximum Temperature over 90°F (Days)	4.69	5.41	to	15.55	7.80	to	28.89	9.95	to	51.17	12.23	to	70.30
Annual Days with Minimum Temperature below 0°F (Days)	5.96	-1.95	to	-3.7	-2.34	to	-4.31	-2.59	to	-4.87	-2.68	to	-5.06

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Total Annual Precipitation (Inches)	47.13	0.26	to	5.53	1.35	to	6.79	2.49	to	8.67	1.62	to	8.71
Annual Consecutive Dry Days (Days)	16.63	-0.36	to	1.48	-0.34	to	2.05	-1	to	2.42	59	to	2.92

Climate Change Impacts - Temperature

- Economic
 - Winter Recreation - Snow and Ice
- Agricultural - Longer Growing Season
- Health

 Increased Pests
 Heat Stroke
- Infrastructure

 Road Buckling
 More Potholes
 - Power Outages
- Environment - Change in Habitat

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Climate Change Impacts - Precipitation

- Economic - Dangerous Floods
- Agricultural

 Excessively Wet Spring
 Drought
- Health
 - Flood/High Water-related Deaths
 Emergency Response Delays

• Infrastructure

- Road Washout
- Environment
- Sewer System Overflows Compromised Bridges
- Changes in Habitat

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MVP Program Identify Top Four Hazards Review MVP Sectors Maps as tool List infrastructure, societal, environmental feature Determine whether a vulnerability or strength Identify actions to reduce vulnerability or reinforce strength Prioritize actions Report Out Finalize Prioritization Plan

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MVP Sectors

Infrastructure

- Evacuation routes
- Schools
- Roads, bridges, dams
- Water and wastewater
- Septic systems
- Hospitals
- Commercial Buildings, churches
- Utilities: electric, gas
- Factories

- Other

- Emergency management facilities

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