Town of Lanesborough, Massachusetts



Community Resilience Building Workshop Summary of Findings

JUNE 30, 2018

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Town of Lanesborough Community Resilience Building Workshop Summary of Findings



June 30, 2018

Community Background

The need for municipalities to increase resilience and adapt to extreme weather events and natural hazards is becoming more evident among the communities of Berkshire County, Massachusetts, the western-most county in the Commonwealth. In general, the region is separated from the Pioneer Valley and the rest of the state by the Berkshire Highlands and the Hoosac Range that serve as its eastern boundary and by the Taconic Mountains that serve as its western boundary with upper New York State. Lanesborough is located in north-central Berkshire County and is bordered to north by New Ashford, to the east by Cheshire and Dalton, to the south by Pittsfield and to the west by Hancock.

The town is 18,764 acres in size, which is approximately 30 square miles. Lanesborough is situated at the headwaters of the two major river watersheds in the county: the Housatonic River, which flows southward through Connecticut to Long Island Sound, and the Hoosic River, which flows northward into the Hudson River, which ultimately flows into the Atlantic Ocean. The majority of the town (73%) is located within the Housatonic River watershed. The northern portion of Pontoosuc Lake is located in Lanesborough, and here the land along the shore and immediately upgradient is densely developed. The homes here were originally built as summer cottages, but in recent decades, have been upgraded to serve as year-round residences.

The landscape of Lanesborough is that of two valleys hemmed in by mountainous terrain, some of which is steeply graded. The relatively broad Town Brook valley is characterized by a series of wetlands that run southward and discharge into Pontoosuc Lake. The brook is located to the west of Route 7. The narrower Hoosic River/Muddy Brook/Cheshire Reservoir valley flows northward east of Route 8.

The Taconic Mountain range dominates the western portion of the town, and features several prominent high points, including Potter Mountain, the Noppet and Constitution Hill. The Hoosac Mountain Range reaches deep into the center of the town and forms the eastern-most boundary. Savage Hill is a prominent high point extending southward from the Mount Greylock complex.





Lanesborough is a bedroom community, with many of its residents commuting to Pittsfield, the commercial center of Berkshire County. The largest employer in Berkshire County is Berkshire Health Systems, while the largest employer in Lanesborough has recently been the Berkshire Mall. Other employers in the town include small businesses, restaurants, and the elementary school. According to the *Draft Open Space and Recreation Plan* Lanesborough had the largest population in Berkshire County in 1791. Today, within the regional context, Lanesborough is a small-to-medium-sized town, ranking as the 11th largest out of the 32 municipalities in Berkshire County. According to the American Communities Survey 2012-2016, the Town's population is 2,970¹, from within 1,154 households. ²

In general, the population of Lanesborough, like most of Berkshire County, is aging. In 2010 the town's population of persons age 50 or older was 40-50%, and in 2030 the population of 50+ will be 50-60% (Census data, 2015). This has several implications for natural hazard and emergency planning. In general, the risk factors for the elderly during a natural hazard or disaster are higher due a variety of factors: they are more prone to pre-existing chronic health diseases, have more mobility and cognitive issues, and may be more socially isolated.

¹ US Census 2016 Estimate

² ACS 2012-16

Community Resilience-Building Process Overview and Workshop

During the spring of 2017, the Town of Lanesborough began the planning process to update its expired Multi-Hazard Mitigation Plan, with funding from the Federal Emergency Management Agency (FEMA). The Lanesborough Emergency Management Committee (the Committee), which consists of municipal department heads and representatives from various town boards and committees from several disciplines, is serving as the Town's hazard mitigation planning committee. During 2017 the Committee met three times to discuss the natural hazards the occur in the town and the impacts those hazards have on residents, property and municipal infrastructure and services. In the winter of 2017-18, with funding from the Massachusetts Executive Office of Energy and Environmental Affairs and the Municipal Vulnerability Preparedness (MVP) Program, the Town of Lanesborough began to look more closely at natural hazards through the lens of climate change and to develop strategies to become a more resilient community.

As part of the MVP process the Committee held a day-long workshop on hazard vulnerability. The Committee developed a list of stakeholders who would be valuable at such a workshop: those who would provide information and input from a variety of perspectives, including elected town officials, town department heads, first responders, business owners, farmers, lakeshore residents and respected elders who had lived in Lanesborough for a long time and/or had served on town boards in the past. Invitations to participate were sent from the Town Manager's office.

On February 15, 2018 the Committee held an all-day Community Resilience-Building Workshop in the Lanesborough Senior Center, within the Town Hall. The workshop was facilitated by staff from the Berkshire Regional Planning Commission. The central goal of the workshop was to first understand the types of natural hazards and severe weather events that have occurred in the town, review climate change data and projections, collect additional local data from participants, and create a climate-related Natural Hazard Risk Matrix for the Town. As noted in the Workshop Agenda, the objectives for the day were to:

- 1) Understand connections between ongoing issues, hazards, and local planning and actions in Lanesborough. Define top hazards.
- 2) Identify and map vulnerabilities and strengths to develop infrastructure, societal and environmental risk profiles for the town.
- 3) Develop and prioritize actions that reduce vulnerabilities and reinforce strengths for the community local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
- 4) Identify opportunities to advance actions that further reduce the impact of hazards and increase resilience in the community.

A total of 20 people attended the Workshop, with a few key residents unexpectedly unable to attend due to illness. The Workshop opened with a presentation about natural hazards that have been identified in the region and the Town, as determined by the Committee during their initial work to update the Town's Hazard Mitigation Plan. The presentation also provided

background data on the observed changes in weather patterns in the region and future projections due to climate change. This presentation was tailored to provide a foundation upon which workshop participants could build upon. Posters were created to provide additional background data and offer potential mitigation ideas for consideration, such as low-impact development techniques. The posters were created in a scientific poster format.

After the presentation the Workshop followed the Community Resilience-Building Workshop format as described in the *Community Resilience Building Workshop Guide*. Participants were broken up into three small working groups, pre-selected to provide a variety of perspectives and experiences at each table. At each table were handouts that would help to facilitate conversations, including a set of maps to help identify vulnerabilities. Participants were encouraged to write on the maps the areas of most concern. These maps edits were incorporated into a revised Critical Facilities and Areas of Concern Map. Each of the small working groups developed a Risk Matrix, identifying in their opinions the top four hazards that face the community, the Town's strengths and weaknesses in facing those hazards, and actions to lessen the impacts and build resiliency. The small groups convened at the end of the day to report its findings to the full group and, as a full group, to choose the highest priorities for action. Materials from the Workshop are found in Appendix A.

On February 28, 2018 the Committee held an open public forum, inviting town residents and other interested parties to learn about the Committee's work to date, hear the results of the Workshop and to solicit additional public input of the major findings. The forum opened with a viewing of informational posters developed as part of the Hazard Mitigation and MVP planning processes. A short presentation of findings followed the viewing, with the evening culminating in asking participants to rank the Actions that had been developed through the two planning processes. Participants at the forum ranked the Workshop's Top Priorities by marking a star next to the Top Three that they felt are the most pressing actions that the Town of Lanesborough should pursue. The materials from the Public Forum are found in Appendix B.

Top Hazards and Vulnerable Areas of Concern

Top Hazards

During the Community Resilience Building Workshop, participants at each of the three tables were asked to name the four Top Priority Hazards that threaten the Town. The results show that Flooding was a priority for each of the tables, as was High Wind events. The results are as follows:

- Flooding (at each of the 3 tables)
- High Winds (at each of the 3 tables)
- Ice/Snow (at 2 tables)
- Fire (at 2 tables)
- Extreme Temperatures (at 1 table)
- Beavers (at 1 table)

Areas of Concern by Hazards

Each table was given a series of maps that had been developed as part of the hazard mitigation plan update process, including a large base map that showed critical facilities, floodplain areas and the areas identified by the Emergency Management Committee to be areas of concern for natural hazards, such as road crossings that chronically flood, areas that had be damaged by microbursts or forest fire, etc. Other maps included 1) floodplains, 2) population density, and 3) zoning. Participants were encouraged to refer to and draw upon the maps as necessary. The two geographic areas cited as being of most concern within Lanesborough are the watershed and recharge area for Town Brook aquifer, the Town's drinking water supply, and the densely developed area along the northern shore of Pontoosuc Lake. The Town Brook aquifer is vulnerable to contamination from hazardous materials that are transported along Main Street/Route 7, which is one of two main north-south transportation routes in the county. Protecting the Town's water supply emerged as a central theme of consensus from the Workshop. The developed properties north of the lake impact the water quality of the lake, are vulnerable to flooding, and the water lines are prone to freezing and bursting in winter.

Current Concerns and Challenges Presented by Hazards

As part of the Hazard Mitigation Plan update, the Committee had identified these hazards as being of most concern for the Town of Lanesborough:

- Flooding and damages to the road system from undersized culverts / bridges, beaver activity and washouts, microbursts, and an increase in severe rain events
- Stability of town hall stone wall
- Potential contamination of drinking water source from Rt. 7 chemical spill
- Electricity outage for more than four days

Participants of the Workshop agreed that these hazards were of concern. However, participants believed that there were additional areas of concern, such as:

- Safety of an increasing elderly population during a severe event
- Adequate water supply for water district customers and those on private wells
- Water quality of Pontoosuc Lake (dirt roads, sedimentation), wetlands and streams

Specific Categories of Concerns & Challenges

Infrastructure and Facilities

Participants at the Workshop reinforced that flooding of key areas around Lanesborough, particularly road crossings, was a major concern, and that severe storm events seem to be more prevalent than in the past. The Town has received FEMA funding in the past to replace damaged and undersized bridges along Town Brook, but there are still several bridges and culverts across town that should be addressed. Beaver activity can acerbate flooding issues, but the Town has a program in place to install and maintain "beaver deceivers" to reduce flooding from dams and clogged pipes. Damages from microburst and severe rain storms in Lanesborough, neighboring

Cheshire and other towns in the region have become more of a concern, not only due to flooding impacts but also from high winds that knock down electric lines and trees.

The retaining wall that holds the Town Hall/Library and its upper parking lot in place is deteriorating. Town Hall is the central operations center for the municipal government and houses the Senior Center. Loss or damage to the building would have a severe impact on how the Town functions. A structural assessment of the wall needs to be done to determine potential risk of failure and potential engineering solutions.

The Lanesborough Water District provides water to approximately 80% of Lanesborough residents and to 40 non-resident customers. The District has been in search of a reliable back up water supply if either of the two existing wells were pulled out of services, with a particular concern for contamination. In the past one of the wells was temporarily closed to avoid contamination from a petroleum spill, so the District feels an urgency to secure a back-up source. The cost to develop the new sources has so far been cost prohibitive. Residential homes in the outskirts of the town are on private wells, some of which are shallow and occasionally go dry during dry or drought periods. Protection of drinking water received high priority rankings from all three small groups and are listed in both the Infrastructure and Environmental sections of matrix tables.

Emergency Preparedness

Several severe storm events can cause electricity outages, particularly those involving high winds, heavy snow or ice, or flooding. While residents in Lanesborough have not experienced a prolonged power outage in recent memory, some residents in neighboring towns in the region were without electricity for days or weeks during the Ice Storm of 2008. Participants at the Workshop noted that the elderly population is increasing in Lanesborough while the young adult population is dwindling. The children of many of the Town's senior have moved away, leaving seniors with a smaller circle of support. The increasing senior population will demand more services during a hazard event, while the number of volunteer first responders will decrease, which could lead to a reduction in response and aid to those who may need it most. There is only one senior housing complex in the town and it has relatively few units, so most seniors are scattered throughout the Town in homes or apartments. Although the Lanesborough Council on Aging (COA) and first responders are aware of some seniors who will need specific aid during a power outage, they do not have a list that is in any way complete. The resistance of many seniors to proactively self-report their needs to fire or police is an ongoing issue.

Water Quality

Protecting water quality was raised as an issue, with sedimentation of Pontoosuc Lake from dirt roads and driveways and contamination from failing septic systems being areas of ongoing concern. Stormwater runoff from roads and development, including sediment and contaminants, was also cited as a threat to drinking water quality. Also of concern was erosion and damages to stream banks during severe storms, including the loss of trees along stream banks. Beaver activity that causes streams to pond up can be impacted by increased water temperatures and reduced water clarity. Town Brook was the stream of most concern.

Current Strengths and Assets

Workshop participants focused their attentions more intently on evaluating vulnerabilities and areas of concern, rather than on strengths and assets. It is natural to do so given the nature of the Workshop. However, participants did recognize a few key strengths, both on the broader capacity of the Town and on individual project levels. A few hazard concerns were noted as both a strength and vulnerability. On a Town capacity level, these strengths were listed:

- Committed first responder community (although the struggle to maintain ambulance coverage was noted)
- An active Conservation Commission
- A proactive Department of Public Works (to address problematic sites)
- Much of the land in town is forested (a benefit to water quality)
- Sheltering capability (although a MOU needs to be updated)
- Reverse 911
- The electric company has been more proactive in trimming trees to reduce outages in recent years and has established better a communication system with the Town

One a project-specific level, these projects were listed as strengths:

- Completion of Putnam and Miner Road bridge projects
- Design and upcoming construction of Narragansett Avenue project

Those concerns that were listed as both a strength and vulnerability included:

- Homes in floodplain areas
- The Town's water systems
- Culverts and bridges continue to replace undersized ones
- Septic systems / expansion of sewer service
- Generators for assisted living housing

A set of compiled Master Matrices for Infrastructure, Societal and Environmental Vulnerabilities and Strengths is found in Appendix A. These display the concerns and recommended actions identified by the Workshop participants, listed in order of high, moderate and low priorities.

Top Recommendations to Improve Resilience

Overall, during the planning process for the update of the Lanesborough Hazard Mitigation Plan, the Lanesborough Emergency Management Committee tended to focus their concerns on two broad areas: 1) damages or failures to the municipal infrastructure systems from natural hazard events and 2) public safety during response to events. Flood impacts to infrastructure, both municipal public works (roads, sewer lines) and public drinking water (water delivery system),

have been cited as the areas of most concern for public officials. The deteriorating condition of the Town Hall retaining wall has also been an area of great concern.

Many of the concerns of the Committee were echoed by Workshop participants, but the emphasis at the Workshop was slightly different. The broad areas of focus that emerged from the Workshop planning process were 1) increased public outreach and education about emergency preparedness and response and 2) water quality protection, especially the drinking water supply. There was wide consensus within the full group that residents were probably not prepared for an emergency in which they may have to shelter in place or evacuate. The senior population, which is growing and is scattered throughout the town, is most vulnerable. Communication with all residents, especially seniors, will be key to an effective response, and although the Town's first responders feel they are prepared to act in an emergency situation, communication may not reach all residents equally. Many people will not know where the shelters are, or how or when to go there. The same would be true for warming or cooling centers during extreme temperature events.

The first responders who attended the Workshop cited a desire to be able to work more directly with local residents on public safety and emergency preparedness. For example, the fire and police departments want all residents to install formal, uniformed 911 house numbers to help first responders in answering dispatch calls. They also want to encourage all seniors and others with medical conditions that require special response or medications to self-report to the Lanesborough Police to ensure better response in an emergency. Surprisingly they are finding resistance in both house numbering and self-reporting of medical needs.

There was also wide consensus that the Town and the Water District must protect water quality, especially the quality of Town Brook and its aquifer. Runoff and sediment from roads and development can carry contaminants to streams, lakes and wetlands. Although the Town has bylaws to protect water quality, wetland resources are still vulnerable to degradation. Extreme weather events cause flooding of properties, accelerated bank erosion and subsequent sediment transport in streams, and downed trees in the waterway can cause ponding. Beaver activity all along Town Brook, particularly near wells, could degrade water quality, flood water pumps and other equipment, and threaten human health.

Highest Priorities

- Bury water pipes deeper into the ground to reduce freezing, damages and loss of service (this and replacing aging water pipes around the lake was also listed by another group as a moderate action that is needed)
- Make sure town buildings and town shelters have back up power generators; pursue group purchasing
- Remove and regrade the stone retaining wall behind town hall
- Work with MassDOT to reduce runoff impacts along Rt. 7 along the lake and Town Brook; clean out ditches and catch basins to reduce contamination from sediment, salt and other road pollutants and to reduce risk of road flooding

- Protect public water pump and other equipment from flooding by raising them above the 100-year flood elevation
- Secure MOU with the Elementary School for sheltering
- Implement culvert improvement on Old State Road/Summer Street
- Create a list of vendors who can put in water lines in case of drought
- Coordinate with the utility company to do enhanced tree trimming (this was also listed by another group as a lower priority)
- Several actions involved increasing communications and preparedness with the local population:
 - o Develop a database on sensitive populations in town
 - o Create a FULL list of homebound people and create neighbor programs
 - o Better self-identification & communication between group homes and the Town
- Continue Town Manager's efforts to find a solution to lack of EMT staff for weekday shifts
- Protect water quality by tighter enforcement and limit certain types of businesses (such as gas stations) within the Water Supply Overlay District and around the Town Brook aquifer
- Educate residents: restrict use of chemicals, look into free tree programs for residents, educate them about pollution and preserving nature

Moderate Priorities

- Extend sewer around lake and other areas when funding is available; educate homeowners about maintaining septic systems
- Educate residents to monitor the storm drains on their properties for proper function
- Educate residents about fire prevention
- Continue to support the Fire Department, DPW, Conservation Commission and COA as partners in emergency preparedness and resilience
- Work with homeowners around Town Brook to protect their homes from flooding
- Publicize Reverse 911 system to include cell phones; publicize using social media
- Petition FEMA/MEMA to update the floodplain maps for more accurate delineations
- Work with MassDOT to develop some kind of filter/chemical control to reduce the potential hazard of a chemical spill on Rt. 7
- Develop a plan to remove trees and debris along streams to reduce stream bank erosion; perhaps this can be done with the Army Corps of Engineers

Lower Priorities

- Bury electrical lines in new subdivisions to reduce vulnerability
- Work with Unistress and DOT to dredge wetlands filling in with sediment from development and roads

When the small groups reconvened, they brought 14 Top Priorities to the full group for discussion and categorization. The group further tried to identify potential town departments or other agencies that should take the lead to follow through with the actions and where funding could be sought for implementation.



Table 1. Top 14 Priorities Emerging from the Workshop

Top Priority Actions Brought Forth	Category	Further Defined Action
from the Small Groups		
Remove and grade wall behind town hall	Public Safety	Town should apply for grant
Work with utilities to do enhanced tree trimming	Public Safety	Reduce Electricity Outage; town should draft letter to utility
Work with MassDOT on Rt. 7 ditches [clean/maintain to reduce road-contaminated runoff and reduce flood risk]	Public Safety / Water Quality	Letter from Town to MassDOT
Zoning to restrict more densely populated areas	Water Quality	Town takes lead
Enact stricter local regulations for stormwater management	Water Quality	Town takes lead
Tighter enforcement to limit businesses in Water Supply Overlay District	Water Quality	None
Grant for big debris removal round Town Brook [to reduce erosion/sediment]	Water Quality	Town and Water District take lead
Raise water pump motors above floodplain elevation	Water Quality	None
Education on preparedness, all issues	Emergency Preparedness	Council on Aging takes lead
Educating vulnerable populations about shelters, electrical loss, safety	Emergency Preparedness	None
Database of sensitive populations	Emergency Preparedness	Grant writer [volunteer from Town?]
Information on homebound population	Emergency Preparedness	Outreach/Education grant
Confirm MOU with Elementary School and do outreach to residents	Emergency Preparedness	West. Region Homeland Security Advisory Council [COA, Public Health?]
Generators for town buildings	Emergency Preparedness	None

At the public forum held on February 28th, Lanesborough residents provided further input on which projects the Town should prioritize for action. Residents were given colored pens and asked to place a star next to the top three actions that they believed the Town should pursue. The actions they were presented with were the Top Priorities from the MVP Workshop and the draft Action Plan that the Committee has drafted for the updated Hazard Mitigation Plan. The Top Five Actions that received the most votes at this meeting were:

Major Actions Needed		
OBJECTIVE #1: Protect Water Supply Actiens		
Protect water purs system from flooding and power outages		3
Tighter enforcement and limit busitesses with contamination risk in Water Supply Overlay District		1
Work with Mass. Dept, of Transportation to clean up / maintain their ditches and storm drains on Rt. 7		
Zoning to restrict more densely populated areas in Water Supply Overlay District		1
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Beeter energist water Buldes aner water a water Line Bleeke (DPM) & R Meeter toen Book for sait contervision for 1817		1
Continue to support the Concernation Computation		1 3
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Actions		
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Generators for town buildings – fixed generators at all buildings or at minimum wire buildings to accept mobile generators 📈 🐇 🗙 🛧		16
Serure MOU with elementary school to serve as stellar control of the serve as stellar control		Ti
Identify vulnerative populations, particularly homebound maid cans who may need special aid during compandes, and encourage their to enroll in reverse 911 and sets identify with sust that respondence encourage group homes to initial back-up power		17
Educate hemicownichs in Roodplain		
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Repair the store retaining wall behind town hall	XXY	67
		2
the second destinate outges by working with utilities to do enhanced tree trimming, especially along Rt. 7, and encourage underground lines in new development		E
Address lock of EMT coverage during addime business hours loadureer EMTs working!		0
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- Repair the stone retaining wall behind town hall (7 votes)
- Identify vulnerable populations, particularly homebound residents who may need special aid during emergencies, and encourage them to enroll in Reverse 911 and self-identify with local first responders; encourage group homes to install back-up power (7 votes)
- Address lack of EMT coverage during working daytime business hours (volunteer EMTs working) (6 votes)
- Generators for town buildings fixed generators at all buildings or, at a minimum, wire buildings to accept mobile generators (6 votes)
- Educate residents on all issues regarding preparedness: educate about and increase enrollment in town's reverse 911 system, what to do in event of electricity loss, flooding, safe evacuation routes, where shelters are (4 votes)

Post-Workshop Implementation

In May 2018 the Town of Lanesborough applied to the MVP Program for an Action Grant to assess the structural condition of the retaining wall behind the Town Hall. The building is invaluable to Lanesborough and its residents, serving as the Town's central meeting place and hosting a variety of governmental and social functions. For several decades the retaining wall has been deteriorating, with bulges and some rock displacement, possibly caused by tree roots and freeze/thaw cycles in the retained earth. The Town is concerned that future subsidence of the earth retained behind the walls will eventually cause structural damage to the Town Hall building and the adjacent parking lot, which is the handicap entrance to main floor of the building. This grant application was unsuccessful, and the Town is considering re-applying in the future.

Workshop Participants

Listed below are Lanesborough residents who were invited to participate in the Community Resilience-Building Workshop. Those who are on the Lanesborough Emergency Management Committee are noted in **Bold** type. Those who participated in the Workshop are noted with an Asterisk (*).

Name	Affiliation	Workshop
		Participation
Chief Tim Sorrell	Lan. Police, Recreation Committee (Rec. Com.)	*
Chief Charlie Durfee	Lan. Fire Chief, Lan. Ambulance, Lan. DPW staff	*
Dale Newberry	Emerg. Man. Dir., Lan. Police Officer	*
Bill Decelles	DPW Director, Lan. Fire Dept.	*
Paul Sieloff	Lanesborough Town Manager	*
Rev. Noreen Suriner	St. Lukes Church	*
Tom Voisin	Economic Development Committee	*
Harley Phelps	Zoning Board of Appeals (ZBA)	*
Lorna Gayle	Council on Aging (COA)	*
Julia Taylor	СОА	*
Ron Tinkham	Lan. Planning Bd., Finance Comm., ZBA, Friends of Pontoosuc	*
Tom Barrett	Lan. Water Dept.	*
Hank Sayers	Board of Selectmen	*
Mark Siegars	Baker Hill Road District, COA, Lan. Water District	*
Kevin Swail	Lan. Water Dept. staff	*
Marvin Michalak	Lan. Agricultural Commission	*
Aaron Williams	Lan. Water District	*
William Cook	Seniors Consultant	*
Donna Prendergast	Resident	*
Bill Prendergast	Former Selectman, former MA DEP staff	*
Bob Ericson	Lan. Selectman, Energy Comm.	
Jack Hickey	Conservation Commission (Cons. Com.), Friends of Pontoosuc, Energy Comm.	
Lee Hauge	Lan. Water District, Friends of Pontoosuc, Harbormaster	
Larry Spatz	Bd. of Health	
Kevin Towle	Hist. Comm., ZBA, Energy Comm., Econ. Dev. Comm.	

Mary Reilly	Ambulance, Hist. Comm.	
Rob Reilly	Town Moderator, N. Berk. Vocational School District	
Casey Westwood	Berkshire Village	
Bill Laston	Resident	
Rick Paris	Lan. Rec. Comm.	
John Goerlach	Lan. Selectman DPW Study Group	
Ron Weider	Farmer, Business Owner	
Barb Hassan	Realtor, Business Owner, Lan. Econ. Dev. Comm.	

MVP Service Provider

The Berkshire Regional Planning Commission served as Lanesborough's MVP State-Certified MVP Service Provider.

Name	Affiliation	Workshop Participant
Lauren Gaherty	Senior Planner, Project Manager and Main Workshop Facilitator	*
Allison Eagan	Senior Planner, Small Group Leader	*
Mark Maloy	GIS, Data & IT Specialist, Small Group Leader	*
Will Sikula	Planner, Small Group Leader	*

Citation

Lanesborough Emergency Management Committee, 2018. *Town of Lanesborough Community Resilience-Building Workshop Summary of Findings,* Lanesborough, MA.

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Funding for this project was provided by the EOEEA Municipal Vulnerability Preparedness Program. Many thanks to the Lanesborough Emergency Management Committee and the residents of Lanesborough for pulling together to make the MVP planning process and the Community Resilience-Building Workshop and a success.

Appendix A – February 15, 2018 Workshop Materials

Workshop Agenda

Key Terms Handout

Powerpoint Presentation

Lanesborough Topographical Map

Lanesborough Critical Facilities and Areas of Concern Map

Lanesborough Floodplain Map

Population Density Map

Lanesborough Zoning Map

Master Matrices

Climate Change Poster

Tropical Storm Irene Poster

Opportunities to Reduce Risk Poster

Opportunities to Reduce Risk – Land Development Techniques Poster

Community Resilience Building



Town of Lanesborough Community Resilience Building Workshop, February 15, 2018 ~ Workshop Objectives ~

- 1) Understand connections between ongoing issues, hazard, and local planning and actions in your Community. Define top hazards.
- 2) Identify and map vulnerabilities and strengths to develop infrastructure, societal and environmental risk profiles for your Community.
- 3) Develop and prioritize actions that reduce vulnerabilities and reinforce strengths for your community local organizations, academic institutions, businesses, private citizens, neighborhoods, and community groups.
- 4) Identify opportunities to advance actions that further reduce the impact of hazards and increase resilience in your Community.

ACTIVITIES and OBJECTIVES

10:00 a.m. -- Welcome, Workshop Overview, and Introductions

Objective: Workshop purpose

10:15 a.m. -- Overview Presentation on Hazards and Vulnerability

Objective: Identify regional risks – What has already been identified? What is the data telling us?

11:00 a.m. - Noon - Small Team Exercise

Objective: List Top 4 Hazards in the Town and List Community Vulnerabilities and Strengths

Noon - 1:00 p.m. - Lunch!

1:00 p.m. -- Small Team Exercise – List and Prioritize Actions Objective: Present findings of each small team to the full group

2:00 p.m. – Small Teams Report Out to the Full Group Objective: Present findings and Prioritization of top 4 Actions

2:30 p.m. – Top Priorities *Objective: Collectively Prioritize Action List*

3:00 p.m. -- Wrap up and Next Steps

A FEW KEY TERMS FOR TODAY

Natural Hazard – Source of harm or difficulty created by a meteorological, environmental or geological event

Risk – Potential for damage, loss, or other impacts created by the interaction of natural hazards with people, structures, facilities and systems that have value to the community

Vulnerability – Characteristics of people, structures, facilities and systems that make them susceptible to damage from a given hazard



Preparedness – Actions taken to plan, organize, equip, train and exercise to build and sustain the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats that pose the greatest risk

Mitigation – Sustained actions taken to reduce or eliminate long-term risk to life and property from hazards; <u>the work done up front to reduce the impacts of a hazard</u>

100-Year Flood Event – one that has a 1% annual chance of occurring, commonly called 100-yr flood event; this is statistical occurrence only – a town could experience two 100-yr flood events in a short period of time (or conversely not experience any within 100 years or more)

100-Year Floodplain – area of flooding associated with a 1% annual probability of occurrence; the boundary of the 100-yr floodplain is used by many agencies to assign flood risk, including FEMA and the National Flood Insurance Program

Natural Hazard Mitigation and Municipal Vulnerability Preparedness



Town of Lanesborough February 15, 2018

What is a Hazard Mitigation Plan?

A Mitigation Plan...

- Describes the natural hazards in a community
- Assesses the vulnerability of a community to the identified hazards
- Describes activities that can be done to mitigate the hazards before they occur
- Mitigation Plan is a REQUIREMENT to maintain eligibility for HMGP & PDM funds (Federal Disaster Mitigation Act of 2000)













Observed Number of Warm Nights







Change in 24-hour, 100-year Design Storms (inches)

	NOAA TP-40	NOAA Atlas 14	Change
Taunton	6.9″	7.7"	+0.8"
Boston	6.6″	7.8″	+1.2"
Worcester	6.5″	7.6″	+1.1"

Floodplain Mapping







Same building, March 2010 flood (approximately 40-year flood)



Rivers Move – Give 'em Room

Scour on the outside of meander bends.

Deposition on inside of bend





Leave that floodplain open for the Big Event



Winter Weather Changes

Cycles of cold and warm will increase, alter risks

• Warmer temps:

- Less snow pack = altered water regimes and soil moisture
- Less groundwater recharge = lower baseflow in streams, rivers, reservoirs
- Loss of snow insulation = increased risk of frozen pipes, drains
- Dryer spring soils
- More rain-on-snow events
 - Increased runoff, risk of winter flood events
- Ice Risks:
 - Ice storms = potential loss of electricity
 - Ice jams



Ice Storm December 2008

- Loss of electricity for 1+ million customers
- >500,000 lost during peak of storm, some for > 2 weeks
- FEMA obligates >\$32 million in Mass.
 - + State costs >\$7 million
 - + Municipal costs >\$5 million
 - + National Grid claims damages of >\$30 million
 - + Small businesses without electricity "lose tens of millions of dollars"*





T.S. Irene 2011

- 500,000+ MA residents without electricity
- 6 out of 8 stream gages in Deerfield & Hoosic Rivers reach highest peaks of record
- Calculated as >100-year flood but <500-year flood in Hoosic River
- 50-year storm (2% chance flood event) in central Berkshire County
- Dubbed the "costliest Category 1 storm" (\$15.8 billion in damages)
- Fed. Disaster: FEMA \$5.6 million to households, \$30 million for public assistance
- Fed. Highways: \$46 million for roads and bridges, much of it for Rt 2

T.S. Irene and the Hoosic River









Don't take Water for Granted

- Drought recurrence intervals could become shorter
- Due to increased temperatures and evaporation
- Lower groundwater recharge
- More water in summer/fall comes in extreme storm events with higher, earlier peak flows and more runoff
- Berkshires got off lightly this time



The Most Deadly Berkshire County Incidents

Hoosic River Floods

• 1938 -- Adams & North Adams - 2 deaths, many injuries

- Dam failures
 - 1886 -- Mud Pond Dam Lee 7 deaths
 - 1901 -- Basset/Dean's Dam -- Adams -- 1 death
 - 1968 -- Lee Lake Dam Lee 2 deaths

Tornadoes

- 1973 -- W. Stockbridge 4 deaths, 36 injured
- 1995 -- Great Barrington 3 killed, 24 injured

Concerns around Lanesborough

- Undersized culverts / bridges
- Beaver activity
- Dirt road erosion, washouts, sediment deposition
- · Stability of town hall stone wall
- Potential contamination of drinking water source from Rt. 7 chemical spill
- Microbursts, severe rains
- Electricity outage for
 <u>></u> 4 days



What is the most injurious or damaging incident that you have had to respond to in Lanesborough or a neighboring town?

Natural Hazards Evaluated

Hazards Evaluated							
Flood	Tornado						
Dam Failure	Extreme Temperature						
Hurricane / Tropical Storm	Drought						
Nor'easter	Wildland Fire						
Snow & Blizzard	Major Urban Fire						
Ice Storm	Earthquake						
Thunderstorm	Landslide						
High Winds	Ice Jam						
Beaver Activity							

Assessing Vulnerability in Lanesborough

- Approx. 4 miles of roadway travel through floodplain
- 76 Buildings in the Town are in the 100-yr floodplain (BRPC 2018)
 - 74 are residential homes, many of which are along north shore of Pontoosuc Lake
 - Been only 3 flood insurance claims in town since 1978
 - Only 6 properties have active flood insurance policies

	Buildings in the 100-year Floodplain 1% Annual Chance of Occurring								
Residential		Commercial		Industrial					
Number of	Percent Res.	Number of	Percent Com.		Percent Ind.				
Bldgs.	Bldgs.	Bldgs.	Bldgs.	Number of Bldgs.	Bldgs.				
74	5.5%	1	1.6%	1	3.8%				

Assessing Vulnerability in Lanesborough

• HAZUS-MH Modeling

- Scenario: 100-year flood event
- 8 buildings are at least moderately damaged
- 51 households will be displaced due to being within or very near the inundation area
- 27 people would seek shelter
- \$6 million in potential losses (structural only - not including losses for down time for town or businesses)

HAZUS-MH Estin (HAZUS-MH Estimates of Losses in 1% Annual Chance of Occurrence (commonly called 100-Yr storm event) Losses in Millions of Dollars									
	Res. Bldgs.	Com. Bldgs.	Ind. Bidgs.	Other Bldgs.	Total					
Building Losses	\$2.04	\$0.42	\$0.12	\$0.08	\$2.66					
Content & Inventory Losses	\$0.95	\$1.51	\$0.18	\$0.59	\$3.22					
Total Losses	\$2.99	\$1.93	\$0.30	\$0.67	\$5.88					

Where can we reasonably focus our Mitigation Efforts?

- Flooding is our prime target
 - Several hazards result in flooding (hurricanes, thunderstorms, snow, ice jams, dam failure)
 - Severe rain events cause localized flooding
 - Predictable boundaries (but needs adjustment)
 - Relative ease of implementing mitigation measure
 - Focus of grant programs
 - Local bylaws and zoning offer local control



Bronson Brook, Worthington



2- 10 foot box culverts washed out in 2003. Road was closed to all traffic.
 Culvert had a history of clogging with debris

Bronson Brook Post Irene



 A channel spanning tree located upstream of this culvert prior to the storm was mobilized and easily passed through this crossing.

Road remained open and passable.

Examples of Mitigation Activities

Structural Projects

- Flood-proof, elevate or relocate buildings and infrastructure in floodplain or in flood zones
- Armor infrastructure on bridges
- Reduce road pavement widths (narrowing 2 miles of road by 4' per lane can save \$500,000 in reconstruction)
- Stream Crossing Standards = 1.2 X bank width
- Maintain and/or improve drainage systems
 Can we disconnect or re-route the pipe?



Examples of Mitigation Activities

- Structural Improvements Disconnect the Pipe
 - · Bioretention cells, swales, rain gardens, pervious pavers



Permeable Pavement

Redevelopment: The Mall. Other sites?

- Higher initial cost (\$12/sf vs \$5-7/sf)
- Reduces the amount of land needed for stormwater management
- Can infiltrate as much as 70-80% of annual rainfall
- Can reduce salt use by as much as 75%



Examples of Mitigation Activities

- Maintain Natural Cover on Building Lots
 - Minimize disturbance of natural vegetation and soils
 - Maintain natural tree and shrub cover
 - A mature evergreen intercepts up to 4,000 gal. of water per year
 - A mature deciduous tree intercepts 500-2,000 gal/yr
 - Natural cover especially important in water supply overlay district



Mitigation Policies

Guide Future Development –

- Strictly enforce floodplain bylaws
- Revisit zoning does the town:
- Require that stormwater runoff be retained on site
- Encourage Low Impact Development techniques
- Restrict development on steep slopes
- Have strong water protection overlay

Ongoing Monitoring

Incorporate New Data for Mitigation, Resilience, Adaptation

- Incorporate new floodplain data and boundaries when available
- Monitor data and climate change projections for infrastructure improvement projects



Are you Ready for Electricity Outages?

The energy sector's three major climate change concerns:

- 1. Flooding (increased precipitation, flooding)
- 2. Extreme events (hurricanes, snow, ice storms),
- 3. Increased temperature (demand surge, heat damage to distribution system)

One projection: household summer peak demands increase 3 fold from that of 1960-2000

Are you Ready for Electricity Outages?

- Do you know where vulnerable populations are that need electricity?
 - Elderly, disabled
 - Medical needs like oxygen, dialysis
- Do you know where to bring them for their needed services?



Are you prepared to shelter residents in extreme cold and heat?

We can Adapt

Snowshoe Hare (Lepus americanus)

Centuries ago, even decades ago, there would likely be some snow cover in December to provide camouflage for this species.



Now It's Your Turn Identify the 4 Priority Hazards

- Infrastructural: municipal infrastructure, housing, utilities, commercial bldgs., municipal bldgs. and operations
- <u>Societal:</u> collective ability to respond – first responders, health services, goods and services
- Environmental: natural systems that protect, provide services or pose risk

Community Resilience Building	kisk Matri:	x 📰	10.0	2		www.Comma	nityResilienceB	luilding	arg
				Ton Printity Hapards	Terrado Dech. widfr	n hurdianes earlbest	ter shissafti, sealinvel	the heat we	ve elsi l
 204_priority for action over the Short or Long to v Valuevability 3 = Strength 	eres (and gegei							Friendy	Time Dart Loss
Features	Location	Ownership	VarS					8.8.1	Degring
Infrastructural									
Societal									
Environmental									
			_	I				L	L

Actions and Priorities List and Prioritize Actions to Address your vulnerabilities

- 1. Develop Your Actions
- 2. Prioritize them H-M-L and Time
- 3. Choose the Top 4 Priorities that your think are the greatest risks and should be addressed
- 4. Bring your Top 4 to the Full Group

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Town of Lanesborough - Topographic Map



This map was created by the Berkshire Regional Planning Commission and is intended for general planning purposes only. This map shall not be used for engineering, survey, legal, or regulatory purposes. MassGIS, MassDOT, BRPC or the municipality may have supplied portions of this data.

Town of Lanesborough - Critical Facilities and Areas of Concern







Berkshire

Regional

Planning

Commission

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Town of Lanesborough - Floodplain



Local Road

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Town of Lanesborough - Population Density



<0.5 people/acre
0.5-0.9 people/acre
1.0 - 1.9 people/acre
2.0 - 4.9 people acre
> 5.0 people/acre



0.5

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2 Miles

Zoning Map of Lanesborough, Massachusetts

Approved at Town Meeting: November 13, 2012





Community Resilience Building Risk Matrix			www.CommunityResilienceBuilding.org					
				Top Priority Hazards (tornado, floods, wildfire, hurric	anes, earthquake, drought,	, sea level rise, heat wave,	etc.)	
<u>H-M-L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>N</u> -N be sublifted S - Strength	<u>D</u> ngoing)						Priority	Time
$\mathbf{\underline{v}}$ = vulnerability $\mathbf{\underline{s}}$ = strength				Flooding; High Winds; Snow/Ice Storms; Fire; Extreme Temperatures		<u>H</u> - <u>M</u> - <u>L</u>	Short Long Ongoing	
Features	Location	Ownership	V or S					<u>v</u> 606
Infrastructural								
Power Lines on Route 7	Route 7	DOT / Utilities	v	Coordinate with utilities to do enhanced tree trimming			Н	S
Freezing water lines	Lake	Town	v	Existing water lines need to be buried deeper			Н	L
Personal well failures from drought	Town-Wide	Individuals	v	Add list of vendors who can put in emergency water lines ir	n case of drought in the Town	n Emergency Plan	Н	L
Narrangansett Bridge	Narrangansett Bridge	Town	S	Design Complete, Construction beginning			Н	0
Electrical loss due to damage - private wells / restricting water access to resevoir	Primarily Town, private property	Town Gov't	v	Backup generator for town buldings, state grants for/group	purchasing, personal prepa	redness education, educati	Н	S
Elementary School for sheltering	Town	Emergency Management	v	Confirm Memorandum of Understanding and promote outr	each		Н	S
Culvert on corner of Old State and Summer St.	Town	Town	v	Work with engineer to do assessment, find funding and sch	edule project		Н	S
Berkshire Village tied into old spring infrastructure, lacking water	Private	Water Dist.	v	Currently pursuing grant to get piping for residents			Н	0
Freezing water hydrants in winter limiting ability to respond to fires	Town	Water Dept.	v	Bury pipes deeper in ground, education to residents about a	allowing faucets to drip, add	dry hydrant	Н	0
Wall behind town hall	Town Hall	Public	v	Remove the wall and regrade			Н	0
Flooding of water supply pumps	Town Brook	Public	v	Raise pump motors above the floodplain elevation			Н	L
Maintenance of ditches on Route 7	Route 7 (downtown)	Public	v	Work with MassDOT to clean out the ditches that go under	Route 7		Н	S
Excess Debris Along Town Brook	Town Brook	Multiple	v	Grant for a large debris removal process			М	
Flooding causing property damage	Town + private	Private residences / some town	v	Education/awareness to residents to check storm drains or maintenance from state, continue beaver control program,	n properties (self/private mi bring this to Conservation T	tigation), increase own Comm. MTG	М	0
Putnam Road culvert / Miner Road bridge	Town	Town	S	Replacement and repair work done recently, continue regular maintenance		М	0	
Wild land fires	Town/State	Fire Dept.	v	Fire education to prevent future fires with residents, Find o maintained.	out if it's worth getting fire ro	oads fixed, created,	М	0
Septic systems leaching, freezing	private/town	Health Dept, Priv. residents / sewer district	V/S	continue current sewer expansion progress, educate homeo	owners about maintaining se	eptic systems	М	S/0
Homes in floodplain	Town - mostly around Pontoosuc Lake and Town Brook	Private	V or S	Work with home owners around Town Brook to protect ho	mes		М	L
Proactive DPW	Town	Public	S	Continue to support the DPW			М	0
Water System	Town	Public	S & V	Proactive replacement of shallow lines that freeze			М	0
Bridges and culverts	Town	Public	S & V	Replace bridges that are too small			М	0
Fire Department	Town	Public	S	Continue to support the Fire Department			М	0
Lack of sewer around part of lake	Pontoosuc Lake	Public	v	Expanding sewer system when funding is available			М	L
Aging water infrastructure	Town	Public	v	Proactively replace around Pontoosuc and expand northwa	rd along Route 7		М	0
Electrical Lines	Town	Private	v	Bury electrical lines for new subdivisions			L	L
Electrical Lines	Town	Private	S	Continue working with electric company to proactively trin	n trees		L	0

Community Resilience Building Risk Matrix				www.CommunityResilienceBuilding.org			
				Top Priority Hazards (tornado, floods, wildfire, hurric	anes, earthquake, drought, sea level rise, heat wave,	etc.)	
<u>H</u> - <u>M</u> - <u>L</u> priority for action over the <u>S</u> hort or <u>L</u> ong term (and <u>V</u> = <u>V</u> <u>u</u> <u>b</u> <u>orability</u> <u>S</u> = <u>Strongth</u>	<u>O</u> ngoing)					Priority	Time
\mathbf{y} = vulnerability \mathbf{z} = strength	Location	Ownershin	VorS	Flooding; High Winds; Snow/Ice Stor	rms; Fire; Extreme Temperatures	<u>H</u> - <u>M</u> - <u>L</u>	<u>S</u> hort <u>L</u> ong <u>O</u> ngoing
Societal	Location	onneromp	1015	4			
Contamination from flooding	Town Brook, Lake	DPW	V	Drinking water extension Beaver Traps		Н	0
Elderly population, homebound	Town	СОА	v	Take measures to get FULL list of homebound people, explo	ore safe house and neighbor programs (more detail in v	н	0
High Elderly Population	Town	Private	V	Develop database on sensitive populations		Н	S
Trust with group homes and seniors	Town	Town, owners, COA	v	Better self identification & communitycation between home	es & Town / Establish Triad	Н	S
Generator power at all shelter facilities	Town	Town Gov't / EMD	v	Check if converter box exists, purchase generators		Н	S
Reduced school enrollment and less tax revenue	Town	Schools/Town Gov't	v	Explore increased state aid for schools to alleviate some tex	t burden on town	Н	0
Lack of paid EMT service Mon-Fri daytime shift	Town	Town Gov't / Tn Man.	v	Continue Town Manager's current efforts to find a solution		Н	0
Generators for assisted living housing	Town	Private	S / V	Work with Sullivan to get generators at their facilities		М	0
High Elderly Population	Town	Private	v	Continue to support Senior Director		М	0
Reverse 911	Town	Public	S	Further publicize Reverse 911 system to include social mee	lia and cell phones	М	0
Lack of senior housing	Town	COA / Town Gov't / ZBA / Plan. Bd.	v	Use already developed land use design, seek additional fun for modified apartments, senior specific group homes	ding to bolster old program, promote co-living, zoning	М	L
Regional Coordination	Town	Multiple	v	Improve town environmental review process		М	L
Outdated FEMA data	Town	Town	V	Petition FEMA to update maps		М	S
Sheltering capability	Town	Town Gov't/EMD	S	Maintain shelter plans and educate			

Community Resilience Building R	isk Matrix	K				www.Commur	nityResilienceB	uilding.c	org
				Top Priority Hazards (torr	nado, floods, wildfire, hurrica	anes, earthquake, drought	, sea level rise, heat wave,	etc.)	
H-M-L priority for action over the S hort or L ong term (and C) ngoing)							Priority	Time
$\underline{\mathbf{v}}$ = Vulnerability $\underline{\mathbf{s}}$ = Strength				Flooding; High V	Winds; Snow/Ice Stor	ms; Fire; Extreme	Femperatures	<u>H - M - L</u>	<u>Short</u> Long
Features	Location	Ownership	V or S		•		-		<u>U</u> ngoing
Environmental									
Contamination at lake from salt	Town Brook, Lake	Multiple	v	Call MassDOT to do catch basis	ng cleaning / determine if sal	t is a problem		Н	S
Dense development around the lake area / footprint of properties affecting natural surroundings	Town/State	Plan. Bd/ ZBA / Residents	v	Restrict use of chemicals, look nature, restrict more developm	into free tree program for res nent and permitting	sidents, education about po	llution and preserving	Н	0
Stormwater runoff	Town Brook, Lake	Plan. Bd., Con. Com.	v	Stricter standards (keep storm	nwater on lots)			Н	S
Water supply aquifer is not protected	Town Brk. Aquifer	Public	v	Tighter enforcement of develo	pment within the Water Supp	oly Overlay District		Н	0
Water supply aquifer is not protected	Town Brook Aquifer	Public	v	Limit certain types of business	ses around the aquifer (no gas	s stations)		Н	0
Water supply off of Route 7/potential hazard/contamination	Town	DPW / Town / DOT	v	Pursue DOT to do some kind o	f filter/chemical control			М	0
Erosion of stream banks	Town	Public/Private	v	Work with Army Corp of Engin	neers on plan to remove trees	and debris		М	L
Active Conservation Commission	Town	Public	S	Continue to support the conse	rvation commission			М	0
Manure Management Contained	Farms	Multiple	S	Has been contained for severa	l years			L	0
Wetland storage capacity reduced	Multiple	DOT/Unistress	v	Unistress & DOT cleanup (dree	dging)			L	L
Water quality of lake from development	Town/private	Town Gov't / DPW / Health Dept.	S	Expanded sewer line to Narag	ansett St./conduct setptic insj	pections upon sale of home			
Large amount of land is forest	Town	Private & Public	S						

CLIMATE CHANGE OBSERVATIONS

The Basics for the Berkshires



Warmer Temperatures –

- More evaporation, less soil moisture, increased risk for fire, drought, human health risks (particularly for elderly, other vulnerable pops.)
- Greater temp. increases in winter
 - Less snow, but still cycles of freezing temperatures = infrastructure vulnerability
- Rain-on-Snow = more overland winter flooding, ice jams
- Increased temps. = increased heat stress for people, livestock, wildlife
- Great evening temps. = inability for people and homes to cool down and "catch up" to normal temps.
- Increased risk of thunderstorms and other severe rain events
- New and expanding pests: ticks, mosquitos, forest and crops
- Increased growing season
- Pros: new farming opportunities
- Cons: increased allergen season and increased potency

Observed Number of Warm Nights



Precipitation Trends

- Increase in Extreme Rain Events = increased risks and damages to municipal infrastructure
- Engineering Standards -- engineers now directed to use new data sets that include post-1970s precipitation data

Observed No. Extreme Precip. Events

• Number of Events w/ Precip. > 2" in 1 day







MA Energy Reduction – Success

MA GHG Emissions dropped 21% while Gross State Product increased 70% in same time period



Reconsider Floodplain Development

Berkshire County floodplain maps are from the 1980s

 Urban Infill Example new residential building on corner lot, outside of 100-yr floodplain

New FEMA floodplain

floodplain recharge

new building now inside

Study





Same building March 2010 flood (approx. 40-year flood)





A Last Thought

Pity the Snowshoe Hare December 2012

Its instinct is to sit still when danger approaches. thinking it blends in with its surroundings .

Centuries ago, even decades ago, there would likely be some snow cover to provide camouflage for this species.

Humans have the ability to adapt, unlike our hare.



The Basics

- Tropical Storm (39-73 mph) hit the Berkshires August 28-29
- Eye of the storm travels over Berkshires approx. winds of ~50 mph
- "Catastrophic floods" in NYS and New England, with rain totals of 5"-10" in Western Mass., 7"-10"+ in VT and NYS: this rain fell on already saturated soils from previous rainstorm events
- Devastating flash flooding across mountain valleys ranking second worst in history; entire villages in Catskills uninhabitable and VT residents stranded for days by washed out bridges and roads; 500,000+ MA residents without electricity
- 6 out of 8 stream gages in Deerfield & Hoosic Rivers reach highest peaks of record
- Calculated as >100-year but <500-year flood in Hoosic River
- 50-year storm (2% chance flood event) in central Berkshire County
- Roads washed out, bridges damaged or washed out across many towns in Berkshire County; Rt. 2 is closed for 3 1/2 months for repairs
- Dubbed the "costliest Category 1 storm" (\$15.8 billion in damages)
- Fed. Disaster DR 4028: FEMA \$5.6 million to households. \$30 million for public assistance
- Fed. Highways: \$46 million for roads and bridges, cost \$23 million o repair 6 miles of Rt 2

Rain Totals

Tropical Storm Irene Flood of August 2011 in Northwestern Massac



Figure 1. Distribution of rainfall and path of tropical storm Irene across western Massachusetts on August 28-29, 2011 mation on the rainfall data collection points and the path of tropical storm Irene is from the National Oceanic and opheric Administration (2011) and National Weather Service (2011).

Raging Rivers and Streams



T.S. Irene estimated to be near or more than the 100-yr storm along the Hoosic River



Shelburne Falls





Deerfield River in Shelburne Falls flowed at 30.000 cubic feet per second -

40 times normal flow Left – Bridge of Flowers during storm and under

normal conditions

Below – Bridge Street bridge – critical link to tow



The Spruces, Williamstown

- Building and health inspectors declare 75% of homes uninhabitable
- If >50% of home value is damaged, current building codes must be met
- If FEMA funds used to repair or replace homes it must be elevated 6'-10' above floodplain elevation + additional 2' clearance: this requires that some homes to be placed 12' above ground level
- Residents in all 225 mobile home units permanently displaced





Route 2 and Green River Dam

along Cold River in Florida & Charlemon







Dalton – 50-year storm





Evacuations at Pomeroy Manor and risks to water, sewer, gas lines on Main St Bridge

OPPORTUNITIES TO REDUCE RISK

Water Movement





<u>Above:</u> Housatonic River at New Lenox Rd, Lenox





Water Movement Altered

Impervious surfaces like buildings, road and parking lots = increased surface runoff and less ground infiltration



More Frequent Flood Impacts and Less Groundwater Recharge

Greater surface runoff leads to accelerated and higher peak stream and river flows = more severe flooding.

It can also lead to stream base flow and groundwater recharge.

This could lead to more frequent well failures, especially during drought conditions – see below.



Why Focus on Flood Risks?

- Flood events and recurrence intervals calculated (even if they need to be adjusted)
- Floodplain boundaries delineated (even if they need to be adjusted)
- Benefits of keeping development out of floodplains well documented
- Predicting large storm events and warning times are fairly reliable
- Mitigation techniques are feasible and benefits tangible
- Engineering standards can adapt see below.

Change in 24-hour, 100-year Design Storms (inches)					
	NOAA TP-40	NOAA Atlas 14	Change		
Boston	6.6	7.8	+1.2"		
Worcester	6.5	7.6	+1.1"		

Bridges and Culvert Improvements





Bronson Brook, Worthington

Left:

- Box culvert washed out in 2003, closing road to all traffic.
- Had a history of clogging with debris.
- Left:
- Post-T.S. Irene
- Channel-spanning tree was mobilized above this bridge, but passed through this upgraded design.
- Road remained open and passable.

OPPORTUNITIES TO REDUCE RISK – LAND DEVELOPMENT TECHNIQUES

Land Use Policies

Guide Future Development

- Strictly enforce floodplain bylaws and wetlands protection to maintain flood storage resiliency
- Revisit zoning does the town:
- Require that stormwater runoff be retained on site
- Encourage Low Impact Development techniques that minimize land disturbance and maximizes the site's natural landscape
- Concentrate development and maintain open natural landscapes for connectivity
- Restrict development on steep slopes

Incorporate New Data for Mitigation, Resilience, Adaptation

- Incorporate new floodplain boundaries when available new floodplain data is available for the Hoosic River
- Monitor data and climate change projections

Develop Carefully

Maintain the Natural Landscape

- A mature deciduous tree intercepts 500-2,000 gallons of water per year.
- A mature evergreen intercepts up to 4,000 gallons / yr.
- Root systems of trees and understory hold soil in place.
- Natural cover is particularly important on steep slopes, such as those that surround the town center.



precipitatio



Disconnect the Pipe

- Reduce the amount of hard, impervious surface areas like homes, parking lots and buildings
- Capture the runoff that IS created rather than pipe it into a storm drain system which discharges into the nearest waterway (accelerated, higher peak flows)



Pavers allow

for cars

infiltration while

providing structure



<u>Left:</u> Reduce pavement, capture runoff in rain gardens, biorentention cells

<u>Below:</u> Capture roof runoff in rain gardens





Infiltrate More - Pervious Pavers and Pavement







Pervious Pavement for Parking and Walkways

- Higher initial cost, but:
- Reduces land needed for retention ponds and other management
- Can infiltrate as much at 70-80% of rainfall
- Can reduce salt use by up to 75%
- Not for use where sand is applied in winter

Appendix B – February 28, 2018 Public Forum Materials

Powerpoint Presentation

MVP Top Actions Poster with Voting Results

Hazard Mitigation Plan Action Table Update

TONIGHT'S AGENDA

- 1. View posters to learn about Natural Hazards 6:00-6:20 pm
- 2. Presentation on findings 6:20-6:45 pm
- 3. Public feedback and suggestions 6:45-?

Natural Hazard Mitigation and Municipal Vulnerability Preparedness



Town of Lanesborough February 28, 2018

What Are We Evaluating?

Hazard Mitigation Plan – Emergency Management Committee

- Assesses the vulnerability of a community to the natural hazards / disasters
- Describes activities that can be done to mitigate the hazards before they occur
- Mitigation Plan is a REQUIREMENT to maintain eligibility for some FEMA funds

Municipal Vulnerability Preparedness -- Workshop

- Consider weather pattern observations and climate change projections
- MVP certified communities will have priority status for some state grants



Natural Hazards Evaluated for Lanesborough

Hazards Evaluated				
Flood	Tornado			
Dam Failure	Extreme Temperature			
Hurricane / Tropical Storm	Drought			
Nor'easter	Wildland Fire			
Snow & Blizzard	Major Urban Fire			
Ice Storm	Earthquake			
Thunderstorm	Landslide			
High Winds	Ice Jam			
Beaver Activity				



Key Observed Climate Changes in MA Image: Constraint of the state of t

Observed Number of Warm Nights



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Ice Storm December 2008

- Loss of electricity for 1+ million customers
- >500,000 lost power during peak of storm, some for > 2 weeks
- FEMA obligates >\$32 million in Mass.
 - + State costs >\$7 million
 - + Municipal costs >\$5 million
 - + National Grid claims damages of >\$30 million
 - + Small businesses without electricity "lose tens of millions of dollars"*





T.S. Irene 2011

- 500,000+ MA residents without electricity
- 6 out of 8 stream gages in Deerfield & Hoosic Rivers reach highest peaks of record
- >100-year flood but <500-year flood in Hoosic River
- 50-year storm (2% chance flood event) in central Berkshire County
- Dubbed the "costliest Category 1 storm" (\$15.8 billion in damages)
- Fed. Disaster in MA: FEMA \$5.6 million to households, \$30 million for public assistance
- Fed. Highways: \$46 million for roads and bridges, much of it for Rt 2

Irene and Shelburne Falls





Don't take Water for Granted

- Drought cycles due to increased temperatures and evaporation
- Lower groundwater recharge
- More water in summer/fall comes in extreme storm events with higher, earlier peak flows and more runoff
- Berkshires got off lightly this time



Assessing Vulnerability in Lanesborough

- Approx. 4 miles of roadway travel through floodplain
- 76 Buildings in the Town are in the 100-yr floodplain (BRPC 2018)
- 74 are residential homes, many of which are along north shore of Pontoosuc Lake
- Been only 3 flood insurance claims in town since 1978
- Only 6 properties have active flood insurance policies



Assessing Vulnerability in Lanesborough

HAZUS-MH Modeling

- Scenario: 100-year flood event
- 8 buildings are at least moderately damaged
- 51 households displaced due to being within or very near inundation area
- 27 people would seek shelter
- \$6 million in potential losses
- (structural only not including losses for down time for town or businesses)



HAZUS-MH Est. of Losses in 1% Annual Chance of Occurrence (commonly called 100-Yr storm event) Losses in Millions of Dollars					
	Res. Bidgs.	Com. Bldgs.	Ind. & Other Bidgs.	Total	
Building Losses	\$2.04	\$0.42	\$0.20	\$2.66	
Content & Inventory Losses	\$0.95	\$1.51	\$0.77	\$3.23	
Total Losses	\$2.99	\$1.93	\$0.97	\$5.89	

Concerns around Lanesborough (Emerg. Management Committee and MVP Workshop)

- Protection of drinking water (supply, potential contamination)
- Undersized culverts / bridges
- Beaver activity (flooding, public health)
- Dirt road erosion, washouts, sediment deposition
- Stability of town hall stone retaining wall
- Microbursts, severe rains
- Electricity outage for \geq 4 days
- Educating residents about preparedness



Where are Greatest Risks?





Now it's Your Turn!

Help town officials, first responders and fellow residents prioritize the most important actions





LANESBOROUGH MUNICIPAL VULNERABILITY PREPAREDNESS WORKSHOP

Major Actions Needed

OBJECTIVE #1: Protect Water Supply		
Actions		
Protect water pump system from flooding and power outages	3	
Tighter enforcement and limit businesses with contamination risk in Water Supply Overlay District		
Work with Mass. Dept. of Transportation to clean up / maintain their ditches and storm drains on Rt. 7		
Zoning to restrict more densely populated areas in Water Supply Overlay District	1	
Upgrade water lines, particularly shallow lines in Pontoosuc Lake neighborhoods	0	
Monitor Town Brook for salt contamination from Rt 7	0	
Continue to support the Conservation Commission	0	

OBJECTIVE #2: Preparedness Education

Actions	
Educate residents on all issues regarding preparedness: educate about and increase enrollment in town's reverse 911 system, what to do in event of electricity loss, flooding, safe evacuation routes, where shelters are	1
Generators for town buildings – fixed generators at all buildings or at minimum wire buildings to accept mobile generators	6
Secure MOU with elementary school to serve as shelter	1
Identify vulnerable populations, particularly homebound residents who may need special aid during emergencies, and encourage them to enroll in reverse 911 and self-identify with local first responders; encourage group homes to install back-up power	7
Educate homeowners in floodplain	0

OBJECTIVE #3: Increase Public Safety	
Actions	
Repair the stone retaining wall behind town hall	7
Reduce risk of electricity outages by working with utilities to do enhanced tree trimming, especially along Rt. 7, and encourage underground lines in new development	2
Address lack of EMT coverage during daytime business hours (volunteer EMTs working)	6
Remove debris along town brook to reduce local flooding; search for grant funding to do this	2
Address sedimentation in wetlands and at lake to restore flood storage capacity	1
Investigate extending sewer to those neighborhoods around Ponstoosuc Lake that don't have it	3
Facilitate senior housing through zoning to allow senior-specific group housing or modified apartments	2

LANESBOROUGH HAZARD MITIGATION PLAN UPDATE

Existing Action Plan with Action Status

OBJECTIVE #1: Reduce the risk of flood damage. Actions Secure funds for design and construction of a permanent solution to Putnam Road crossing Completed; new bridge constructed w/ FEMA funds Advocate for the repair of the Miner Road bridge Completed Pursue commencement of Narragansett Rd project Scheduled in TIP for FY 16 construction Continue to pursue stormwater management controls in new and redevelopment projects, including Low Impact Development techniques Consider storm drain improvements in all road repair and construction projects to reduce the volume of stormwater discharges to Ongoing – installation of sump catch basins now standard; recently installed at lake roads and Putnam local waterways and Meadow roads to reduce flooding and ice buildup Insure the integrity of large beaver dams or breach them in a controlled manner Continue to employ beaver controls where necessary Installed "beaver deceiver" flow device at Swamp Road; contractor cleans out as needed Pursue right-of-way easements along chronic washout sites along Kessler Road Work with Friends of Pontoosuc to continue to identify and mitigate stormwater inputs into the lake Town allocates funds and staff to maintain 3 stormwater BMPs upslope of the lake Investigate and mitigate stormwater runoff into Pontoosuc Lake in the "Indian Streets" section along Narragansett Avenue Town unsuccessfully sought funds at Annual Town Meeting 2015 to begin this work; some work conducted using Chapter 90 funds Hold a workshop for residents within the floodplain area and public officials to update them on the NFIP program and possible flood mitigation techniques Notify all floodplain property owners about NFIP program and floodproofing options Request verification and updating of FIRM maps for the Pontoosuc Lake area Continue to support the building inspector and the Conservation Commission in their protection of floodplain and wetlands resource Ongoing; Commission members attend ongoing training sessions areas

OBJECTIVE #2: Secure public drinking water supplies.

Actions	Actions Taken since Plan adoption 2009
Continue to strictly enforce the Water Supply Protection District bylaw	Ongoing
Pursue additional drinking water source and construction of a new water storage tank	Installed new 750,000 tank in 2011 with USDA grant and long term loan; additional well site identified
	but funding not found
Develop a response and spill control plan for the Rt 7 corridor and follow this up by conducting training exercises	
Consider enacting a Water Supply Protection District for the Berkshire Village Cooperative aquifer	
Develop wellhead protection plans, including stormwater management and hazardous spill containment, within Zone II areas of	
public drinking water wells	

OBJECTIVE #3: Increase emergency preparedness

Actions	Actions Taken since Plan adoption 2009
Provide workshops to help local businesses to develop disaster mitigation plans for their facilities	
Secure adequate sheltering	· Shelter plans w/ Pittsfield secured
Consider retrofitting the elementary school with showers	Police station wired and generator ready
Wire the police station to more readily allow portable generator hookup	· Land purchased for Senior Center
Secure a formal agreement with Berkshire Mall for its use as a mass care shelter	Central region shelter equip. purchased and stored
• Consider designing the new Community/Senior Center so that it can serve as a shelter, e.g. with power backup and showers	
Locate and store shelter equipment, such as cots and blankets	
Educate residents about disaster response	MEMA video on homeowner preparedness shown periodically on public access TV; focuses on shelter-in-
Conduct local disaster response drills at the school and feature them in local news	place
Provide evacuation and sheltering information to residents in the floodplain	
Provide residents outside the hazard areas with information on how to equip their homes for "on-site" sheltering	
Encourage owners and managers of special needs facilities to share information about their clients and their facilities to local first	Improved; Communications between town first responders and special needs group housing agency
responders	improved; plans for all new housing now shared w/ town first responders
Pursue funding for the hiring of a full-time EMT / Firefighter position	Funding pursued but not successful
Work with the CBREPC and other emergency organizations to increase the opportunities for local volunteers to attend NIMS and other	Ongoing; town first responders receive NIMS and other trainings
trainings	
Sign the Berkshire Mutual Aid Addendum	Completed
	Retrofitted vehicle to serve as mobile emergency command center