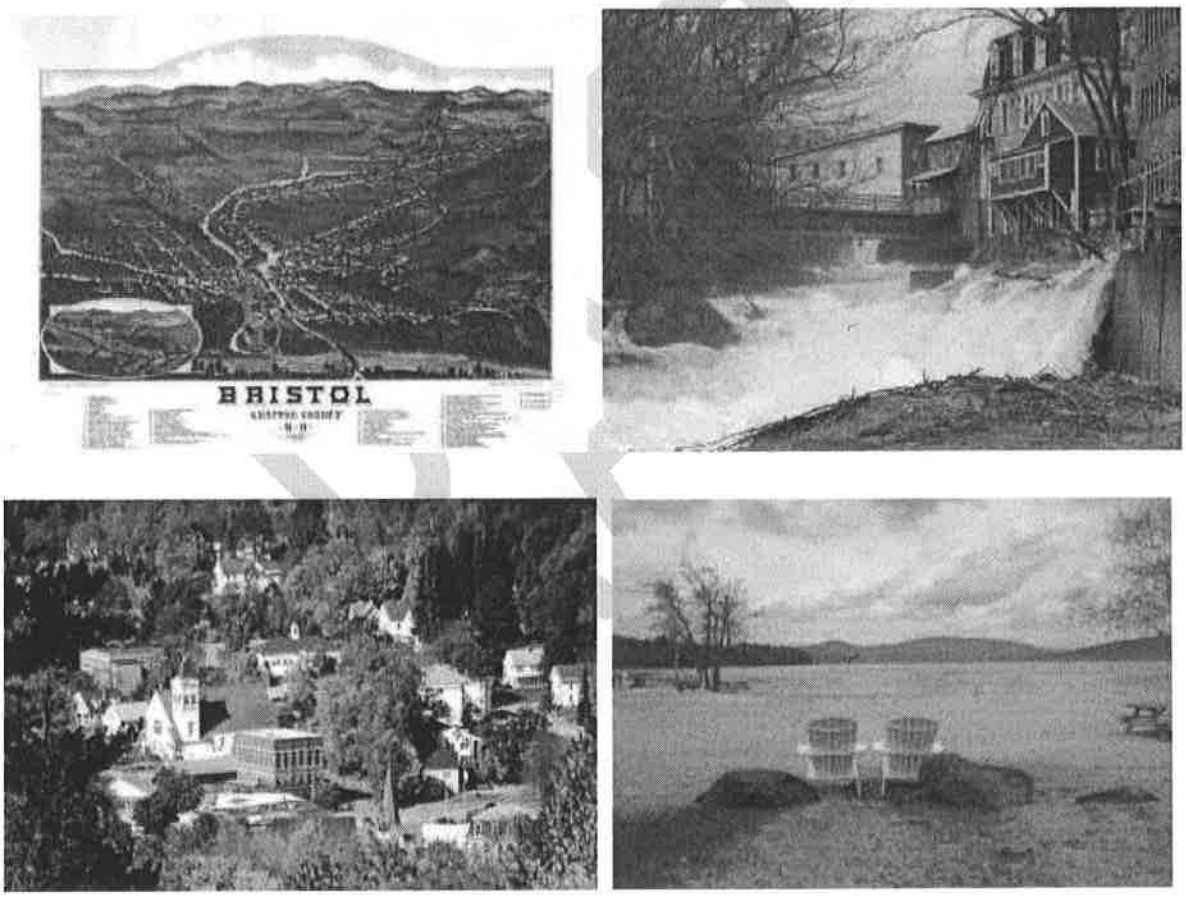
Town of Bristol, New Hampshire
Hazard Mitigation Plan Update, 2016

Prepared by the:

Bristol Hazard Mitigation Update Committee



(Month of FEMA Approval) 2016

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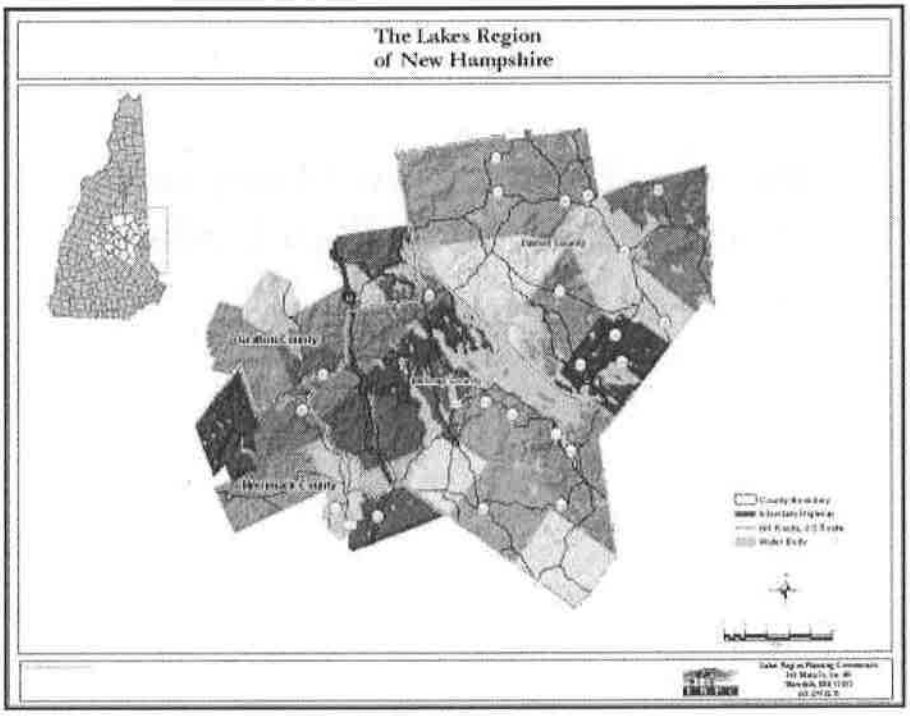
Town of Bristol, New Hampshire
Hazard Mitigation Plan Update

(Month of FEMA Approval), 2016

With Assistance from:
Lakes Region Planning Commission
103 Main Street, Suite #3
Meredith, NH 03253
Phone: (603) 279-8171
Fax: (603) 279-0200
www.lakesrpc.org

Funding for this plan was provided by the NH Department of Safety, Homeland Security and Emergency Management, and with matching funds provided by the Lakes Region Planning Commission.



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Acronyms and Abbreviations

CNHRPHN	Central NH Regional Public Health Network
CEO	Code Enforcement Officer
Cons. Com.	Conservation Commission
COPS	Community Oriented Policing Services
CRS	Community Rating System
DES	New Hampshire Department of Environmental Services
DOT	New Hampshire Department of Transportation
DPW	Department of Public Works
Dth	Death
ESF	Emergency Support Function
EMD	Emergency Management Director
EMPG	Emergency Mitigation Performance Grant
EOC	Emergency Operations Center
FD	Fire Department
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HazMat	Hazardous Materials
HD	Highway Department
HMGP	Hazard Mitigation Grant Program
HSEM	New Hampshire Homeland Security and Emergency Management
Inj	Injury
IBC	International Building Code
IPC	International Plumbing Code
ISO	Insurance Service Office - A fire protection rating scale
LEOP	Local Emergency Operations Plan
LRPC	Lakes Region Planning Commission
Mag	Magnitude
NIMS	National Incident Management System
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
PB	Planning Board
PD	Police Department
PHEPRP	Public Health Emergency Preparedness Response Plan
POD	Point of Distribution
PrD	Property Damages
PSU	Plymouth State University
RSA	Revised Statute Annotated (New Hampshire's state laws)
SADES	Statewide Asset Data Exchange System
T2	New Hampshire Technology Transfer Center
UNH	University of New Hampshire
USACE	United States Army Corps of Engineers

EXECUTIVE SUMMARY

The *Bristol Hazard Mitigation Plan Update* (the Plan) serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Bristol Hazard Mitigation Planning Update Committee (the Committee) with assistance from the Lakes Region Planning Commission, and contains statements of policy adopted by the Board of Selectmen in Chapter VI.

The Committee determined those natural and human-related hazards which pose at least a medium risk, based on a ranking system detailed in Chapter III, and shown below:

High Risk	Medium Risk
Hurricane	Flood
Severe Winter Weather (Blizzard/Snowstorm, Ice Storm, Nor'easter)	Extreme Temperatures
Earthquake	Epidemic
Severe Wind (Tornado/Downburst/Thunderstorm)	Conflagration/Urban Fire
Terrorism	Motor Vehicle Accident involving Hazardous Materials

There are no new critical facilities but the list has been streamlined. The Committee identified numerous existing programs related to hazard mitigation including the following:

Existing Plans, Regulations and Practices Supporting Hazard Mitigation	
Hazard Mitigation Plan 2010	Subdivision Regulations
Master Plan beginning an update	Site Plan Review Regulations
Zoning Ordinance	Capital Improvements Plan
Floodplain Ordinance and up-to-date FIRM maps	Water Resources Plan for Rural Fire Protection (2009)
Mutual Aid Agreements	Local Emergency Operations Plan (2010)
	Dam Emergency Operations Plans

Five of the eightteen Actions from the 2010 Plan have either been completed or are no longer pertinent. In its effort to further reduce the vulnerability of the town to future hazards, the committee developed a list of 17 general and hazard-specific mitigation actions, including the thirteen actions deferred from the previous plan. These actions were prioritized based on local criteria. Discussions were held regarding how implementation might occur over the next five years. The results of these discussions are summarized in Table 20: Implementation Schedule for Mitigation Actions.

CHAPTER I: PLANNING PROCESS

A. BACKGROUND

In order to be eligible to receive disaster related Federal Emergency Management Agency (FEMA) grant funding to be used for hazard mitigation projects and actions that will ultimately reduce and mitigate future losses from natural or human hazard events, FEMA has required that all communities within the state of New Hampshire establish local hazard mitigation plans. In response to this requirement, the NH Department of Safety's Division of Homeland Security and Emergency Management (HSEM) and the nine regional planning commissions in the state entered into agreements to aid communities with plan development and update. The plan development process generally followed the steps outlined in FEMA's *Local Mitigation Planning Handbook (2013)*

B. AUTHORITY

The Bristol, NH Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act and Section 104 of the Disaster Mitigation Act (DMA) of 2000. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts.

C. FUNDING SOURCE

The New Hampshire Department of Safety's Homeland Security and Emergency Management (NH HSEM) funded the Plan through a Pre-Disaster Mitigation Plan with matching funds from the Lakes Region Planning Commission.

D. PURPOSE

The Bristol Hazard Mitigation Plan is a planning tool to be used by the town of Bristol, as well as other local, state, and federal government entities, in their efforts to reduce the negative effects from natural and human-related hazards. The Plan contains statements of policy as outlined in the Implementation Schedule for Mitigation Actions and in Chapter VI: Plan Adoption and Monitoring. All other sections of this plan are support and documentation for informational purposes only and are not included as a statement of policy.

E. SCOPE OF PLAN

The scope of this Plan includes the identification of natural hazards affecting the town of Bristol, as identified by the Committee, their potential impacts on the community, along with identification and prioritization of mitigation strategies.

F. METHODOLOGY

The Lakes Region Planning Commission (LRPC) corresponded with the Bristol Emergency Management Director (EMD) in summer 2014 to initiate the hazard mitigation update process in the town of Bristol. The EMD established the Bristol Hazard Mitigation Planning Update Committee in November 2014 for the purpose of updating a long-range plan for hazard mitigation. The Committee

consisted of representatives from the departments of Police, Fire, Water and Sewer, and Public Works, the Planning Board, the Newfound Area Nursing Association, a local business owner, and the Town Administrator. All meetings were open to the public.

Using FEMA's *Local Mitigation Plan Review Guide (2011), Mitigation Planning Workshop (2012)* materials, and the *Local Mitigation Planning Handbook (2013)* as guidance, the Committee reviewed and updated various elements of the town's 2010 Hazard Mitigation Plan. The planner and the committee reviewed and referenced a variety of plans, studies, reports, and technical information during the development of this Plan Update; a list of these resources can be found in Appendix J. Data on property valuation was gathered through correspondence with the Town of Bristol's Assessing Department.

The Committee held meetings from November 2014 through April 2015 with a review of the draft plan by committee members in December 2015. The following timeline shows the dates and corresponding Committee actions. The committee reviewed each section of the plan and LRPC provided updated information on hazards in New Hampshire. Each section of the existing plan was revised and in some cases reformatted in order to develop a more comprehensive document. Meeting agendas were sent to a variety of stakeholders, including neighboring EMDs, posted in Town Hall and at the LRPC web page, and are included in Appendix C.

Committee Meetings

November 21, 2014: *Introductory Committee Meeting: Bristol Town Office Building*
Overview of update process and objectives
Discussion of Development Trends since 2010
Identify Hazard Events since 2010

December 8, 2014: *Committee Meeting: Bristol Fire Station*
Review of Critical Facilities and Capabilities
Probability of Hazard Occurrence
Asset Assessment

January 12, 2015: *Committee Meeting: Bristol Fire Station*
Risk Assessment
Review of Community Goals
Status of 2010 Mitigation Projects

February 23, 2015: *Committee Meeting: Bristol Fire Station*
Risk Assessment – Impacts
Gaps
Potential Mitigation Actions

March 16, 2015: *Committee Meeting: Bristol Fire Station*
Presentation on the status of Ayers Island Dam
Costs of Actions
Prioritization of Potential Mitigation Actions

April 20, 2015: *Committee Meeting: Bristol Fire Station*
Implementation of Mitigation Actions

December XX, 2015: *Committee Meeting: Bristol Fire Station*
Review of Draft Plan by Committee

Public Involvement
The Bristol EMD invited a variety of Hazard Mitigation Planning stakeholders to join the Hazard Mitigation Planning Committee. The Committee was well represented by municipal officials, including the town Administrator on behalf of the Board of Selectmen. Specific opportunities for public input occurred at each meeting. EMDs in neighboring communities were sent copies the meeting agendas and notes. Local businesses and members of the public were encouraged to attend all meetings through press releases and postings on the town and LRPC websites. Additionally, a survey seeking input regarding hazards, preferred types of mitigation actions, and potential actions was made available to the public at the Bristol Town Office and at the Fire Department's website and Facebook page for more than a month (Appendix D). Sixteen responses were received and the concerns and comments were reviewed and discussed at the March meeting and incorporated into the plan in Section IV.C. One resident and Chair of the Pemigewasset River Local Advisory Committee attended several of the meetings, initially focusing on the river and Ayers Island Dam but also engaging in discussion about other aspects of the plan.

The Committee held a public comment period in order to obtain additional feedback on the draft document. The Plan (including comment instructions) was available for public review at Town Hall, the town library, and at the town website from December XX –YY, 2015. The neighboring towns were also notified of all meetings and the review period. This provided an opportunity for local and regional businesses, organizations, agencies, educational and health institutions in Bristol and surrounding towns to review and comment on the plan update. ZZ comments were received from the public during this review period and incorporated into the plan.

G. ACKNOWLEDGMENTS

Special thanks to those that assisted in the development of this Plan:

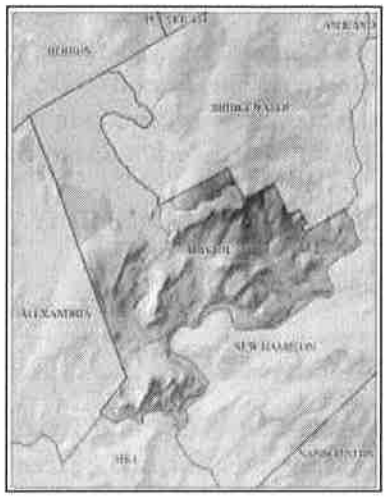
Steve Yannuzzi	Bristol Fire Chief/EMD
Amanda Drake, RN	Newfound Area Nursing Association
Denice DeStefano	Bristol Planning Board, Bristol Business Owner
Michael Lewis	Bristol Police Chief
Mark Bucklin	Bristol Highway Department, Superintendent
Michael Capone	Bristol Town Administrator
Jeff Chartier	Bristol Water & Sewer
Steven Favorite	Bristol LRPC Commissioner & Planning Board
Max Stamp	Bristol Citizen and Chair Pemigewasset River Local Advisory Committee
Paul Hatch	NHHSEM, Field Representative
David Jeffers	Lakes Region Planning Commission, Regional Planner

Additional information was provided by:

Christina Goodwin	Assessing Assistant, Town of Bristol
Ryan McGlone	Hydro Engineer, Eversource Energy
Donna Keeley	Community Relations Specialist, Eversource Energy
Jennifer Gilbert	Floodplain Management Coordinator, NH Office of Energy and Planning
Kelly Walsh	Assistant Planner, NH Office of Energy and Planning

CHAPTER II: COMMUNITY PROFILE

A. GEOGRAPHY



The town of Bristol is located in Central New Hampshire in southeastern Grafton County. Bristol is bordered to the north by Bridgewater and Hebron, to the east and south by New Hampton, to the west by Alexandria, and to the south by Hill. The town is comprised of approximately 17.1 square miles of land area (10,929 acres). The topography is generally hilly with areas of steep slopes found throughout the town. Approximately 13 percent of the land area in Bristol has some degree of development limitations based on steep slopes (25% slope or greater). The most prominent elevations are found on Roundtop Hill, Sugar Hill, Hemp Hill, and Bristol Peak. Newfound Lake is the largest body of water in town and this 4,106 acre lake is shared with Bridgewater, Hebron and Alexandria. Other surface waters in Bristol include Pemigewasset, Newfound, Fowler, and Smith Rivers.

Both the Pemigewasset and Newfound Rivers have been dammed in Bristol. The Ayers Island Dam on the Pemigewasset River impounds 500 acres of water. The impoundment serves as a water supply for Everource's electric power generation. The Newfound Lake Dam is located at the outlet of Newfound Lake. The dam is owned and operated by the New Hampshire Department of Environmental Services (NHDES). The dam controls 95 square miles, or nearly 95% of the Newfound River's watershed area.

B. WEATHER CONDITIONS

The average temperature for the area varies from 20 degrees Fahrenheit in January to 70 degrees Fahrenheit in July. Annual precipitation totals average between 42 and 48 inches, where the distribution is slightly lower in the winter months when compared to summer months. Bristol averages about 70 inches of snow per year.[1] Records indicate that this region has been experiencing more heavy precipitation events (>4" in 48 hours) over the past thirty years than prior to that.[2] New Hampshire is in a 160-mph wind zone; the majority of the southern half of the state (including all of Grafton County) is located in a hurricane-susceptible region.

C. PUBLIC SERVICES AND INFRASTRUCTURE

A five-member Board of Selectmen governs the town of Bristol, directing the work of the Town Administrator. The Fire Department has a staff of seven and 25 on-call firefighters. The Police Department consists of a Chief and twelve full-time officers. The Highway Department has a four full-time staff. The town has a Land Use Compliance Officer who is responsible for enforcement of the town's various zoning ordinances and other land use regulations.

[1] http://www.city-data.com/city/Bristol-New-Hampshire.html visited Sept. 6, 2014.
[2] http://www.unh.edu/news/releases/2014/04/ds04climate.cfm visited Sept. 6, 2014.

Bristol Water Works is the public water supplier, and approximately 35% of the community has access to public sewer. Both Eversource and the New Hampshire Electric Coop provide electric service to Bristol residents with Eversource providing service to more than 90% of the community. Bristol has schools for all levels of primary education: Bristol Elementary School (K-4), Newfound Memorial Middle School (5-8), and Newfound Regional High School (9-12). The middle school and regional high school serve other neighboring communities as well as the students in Bristol. There are two licensed childcare facilities in Bristol, with a total capacity of 84 children. The nearest college is Plymouth State University in Plymouth. The nearest hospital is Speare Memorial in Plymouth; other hospitals include Lakes Region General in Laconia, Concord, and Dartmouth-Hitchcock in Hanover.

NH Route 104 runs east-west through Bristol, intersecting NH Route 3A (north-south) in the downtown area.

D. LAND USE AND DEVELOPMENT TRENDS

Population, Housing Stock, and Growth Patterns

The leading employers in Bristol include Newfound Area Schools, Freudenberg-NOK, the Town of Bristol, Shop 'N Save, TD Banknorth, Homestead Restaurant, RP Williams and Sons, and Shackett's Grocery. In 2013 the largest major employment sectors were comprised of 45% services, 34% retail trade, and 21% government.

Like many Lakes Region communities, the population of Bristol grew rapidly between 1960 and 1980; the growth rate was high during the 1980s and 1990s, followed by very little growth during the 2000s (Table 1). This population growth actually is projected during this current decade, then rise very slowly during the following decades (Table 2). The median age of residents is 43.5 years, a couple of years above the county and state averages but a couple of years below the Lakes Region average.

Table 1: Bristol, NH Year-Round Population, 1980-2010

Year	1980	1990	2000	2010
Population	2,198	2,537	3,033	3,054
% Changed	---	15%	20%	1%

Table 2: Bristol, NH Projected Year-Round Population, 2020-2040[3]

Year	2010	2020	2030	2040
Population	3,054	2,880	2,966	2,995
% Change	---	-6%	3%	1%

The 2010 Census reported 2,488 housing units in Bristol, an increase of 415 units since the 2000 Census. Most of that growth occurred prior to recent economic downturn; between 2008 and 2013 just twenty-two residential permits were recorded in Bristol[4]. The seasonal character of the community is highlighted by the fact that 1,089 of the housing units were considered seasonal (44%), nearly twice the rate of Grafton County (24%). Because of this very seasonal nature of housing in Bristol, it is important to acknowledge that the actual number of people residing in town during the summer months might be twice that of the year-round population.

[3] New Hampshire Office of Energy and Planning, March 2013 http://www.nh.gov/oep/data-center/documents/2013-projections-municipalities.pdf.

[4] Development Activity in the Lakes Region, 2015 Annual Report, Lakes Region Planning Commission.

While there has been some variability in traffic over the years, the Traffic Volume Reports from the NH Department of Transportation indicate no dramatic changes in traffic volumes since 2008 along most of the roads in Bristol. Table 3 indicates the Average Annual Daily Traffic counts, measured in vehicles per day. As this is a projected average over the entire year, there are certainly many summer days when the volume of traffic on any one of these roads far exceeds these figures.

Table 3: Bristol Traffic Counts

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC

Bureau of Planning, Traffic Section, Traffic Reports *20-Feb-15*

STAT.	TYPE	LOCATION	FC	2007	2008	2009	2010	2011	2012	2013	2014
Town: BRISTOL											
059051	82	NH 104 (SUMMER ST) WEST OF RIVER RD	06	*	8200	*	*	8000	*	*	8500
059052	82	RIVER RD AT BRIDGEWATER TL	09	*	500	*	*	600	*	*	430
059053	82	NH 104 (PLEASANT ST) WEST OF NH 3A	06	*	6200	*	*	6400	*	*	6500
059054	82	NH 3A (LAKE ST) AT NEWFOUND RIVER BRIDGE NORTH OF CHANDLER ST	07	*	6700	*	*	6700	*	*	6500
059071	62	NH 3A OVER SMITH RIVER AT HILL TL	07	*	2000	*	*	2000	*	*	2000
059072	82	NH 104 (PLEASANT ST) AT ALEXANDRIA TL	06	*	4400	*	*	4400	*	*	4400
059074	82	NH 104 (SUMMER ST) AT DANFORTH BROOK (EB-WB) (81059086-81059087)	06	*	8900	*	*	7900	*	*	8300
059078	82	WEST SHORE RD AT FOWLER RIVER BRIDGE	08	*	1300	*	*	1700	*	*	1400
059080	82	NH 3A (LAKE ST) AT BRIDGEWATER TL	07	*	4100	*	*	4300	*	*	3700
059081	82	WEST SHORE RD OVER NEWFOUND RIVER	08	*	3200	*	*	3900	*	*	3300
059082	82	BRISTOL HILL RD OVER NEWFOUND RIVER	09	*	1400	*	*	1500	*	*	1500
059083	82	RIVERDALE RD OVER NEWFOUND RIVER	09	*	250	*	*	150	*	*	140
059084	82	DANFORTH BROOK RD OVER DANFORTH BROOK	09	*	140	*	*	120	*	*	120
059085	82	NH 3A (SOUTH MAIN ST) OVER NEWFOUND RIVER	07	*	3500	*	*	2600	*	*	2700

While population growth and development have been slow during the past few years, the committee noted that since the last HMP, there is now a new elderly home in town and a six-unit subdivision. Prior to granting a permit for development of a project near the Bridgewater town line, the applicant was required to install a retention pond to address erosion and runoff concerns. The committee commented that there is little room for further development along the Newfound River. The town expects most residential development in the next few years to occur in the downtown area and these applications will be required to have fire alarms. Overall, the recent development activity has made the town of Bristol safer.

CHAPTER III: RISK ASSESSMENT

A. IDENTIFYING HAZARDS

The town of Bristol is prone to a variety of natural and man-made hazards. The *2013 Multi-Hazard Mitigation Plan*, developed by the New Hampshire Department of Safety's Division of Homeland Security and Emergency Management identified the following hazards as those posing a risk to Grafton County communities.[5]

Table 4: Grafton County Hazards

Flooding	Epidemic	Earthquake	Severe Winter Weather
Wildfire	Dam Failure	Hurricane	Tornado/Downburst
Lightning	Drought	Snow Avalanche	Landslide
Terrorism	Radon	Radiological	Fire & Hazardous Materials

The Committee considered the various hazards identified in the 2010 Plan. This plan identified the following hazards events as the greatest threats to the town at that time.

Table 5: Hazards identified in the 2010 Bristol Hazard Mitigation Plan

Severe Risk	Moderate Risk
Conflagration	Flood
Thunderstorm/Lightning	Ice Jam
Blizzard/Snow Storm	Wildfire
Ice Storm	Landslide
Nor'easter	Tornado/Downburst
	Hail
	MV Accidents w/ Haz. Mat.
	Oil Spills
	Recreational Activities

The Committee also reviewed historical information from internet sources about past hazard events in and near Bristol since 2010. Through this review of state-wide hazards, past regional and local events, and with discussion, the committee identified the hazards listed in Table 6 as the most significant hazards to the town of Bristol.

Tornado, downburst, and thunderstorm were grouped as "High Wind Event" and similarly, blizzard, snowstorm, nor'easter and ice storm were grouped together. Oil spills were grouped in with MV Accidents w/ Hazardous Materials. For this update, lightning was treated as a hazard distinct from thunderstorm.

At the state level, radon is no longer considered a natural hazard to be included in future updates of the State HMP, the NH DES radon monitoring program was discontinued in 2012. The committee acknowledged that radon and other bedrock chemicals exist in New Hampshire but did not feel that the HMP was the best place to address them. Radiological contamination (most closely associated with

[5] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf, visited December 2013.

nuclear power plants and hospital labs) was not considered a threat to Bristol. Recreational Activities is not a natural hazard and the committee did not consider as hazard in itself.

Drought, hail, and landslide do occasionally occur but were found to be very low risk to the community and not addressed in the main text. Avalanche was likewise found to be a low risk hazard but there is some discussion regarding one section of West Shore Road. For these reasons the committee decided not to include these hazards in this plan. There is some description of these hazards in Appendix H.

Table 6: Significant Hazards: Bristol, NH

High Risk	Medium Risk
Hurricane	Flood
Severe Winter Weather (Blizzard/Snowstorm, Ice Storm, Nor'easter)	Extreme Temperature
Earthquake	MV Accident involving Hazardous Materials
Severe Wind (Tornado/Downburst)	
Terrorism	
Epidemic	
Conflagration	

B. PROFILING HAZARD EVENTS

The committee reviewed the various hazards that might occur in Bristol and assessed the probability of such an event occurring in Bristol. This process began by taking the risk rating matrix from the previous plan, reviewing the hazards, past occurrences, specific areas of concern, and revising the Probability of Occurrence (Table 7) rating using the following categories:

- Unlikely: Less than 1% probability of occurrence in the next year or a recurrence interval of more than every 100 years.
- Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

The resulting summary (Table 7) indicates that Winter Weather is considered a Highly Likely natural hazard occurrence while Lightning, Hurricane, and Ice Jam as Likely natural events and Epidemic and Terrorism as Likely Human-Caused hazards. Especially because of recent upgrades to Ayers Island Dam, dam failure was seem as unlikely.

Table 7: Probability of Occurrence

Highly Likely	Likely	Occasional	Unlikely
Winter Weather	Lightning	Earthquake	Dam Failure
	Hurricane	Flooding	
	Epidemic	MV Accident w/ HazMat	
	Ice Jam	Wildfire	
	Terrorism	Drought	
		Severe Wind	
		Landslide/Avalanche	
		Extreme Temperature	
		Conflagration	

Each of the hazards that the Committee identified as likely or highly likely to occur in Bristol is profiled below along with some hazards that occur less frequently but due to their potential impact, the committee felt warranted a full discussion in the body of this plan. It describes the likely location of each hazard, the extent of the hazard, and the probability of an occurrence in Bristol.

The extent is a description of "how bad the hazard could get", taking into account three factors – magnitude, onset, and duration. Magnitude is size of the hazard, such as depth of floodwaters or wind speed. Onset is how quickly the hazard approaches. Depending on geography as well as the nature of the rainstorm, floodwaters might rise over a period of days, or it might take just a few hours to build up a concentrated flow. Duration is a matter of how long is the hazard present. A downburst or tornado exists for minutes or hours, while a hurricane or tropical depression is usually around for days. The four terms used to rate the extent of a hazard are as follows:

- **Weak:** limited magnitude, slow onset, short duration
- **Moderate:** moderate magnitude, moderate onset speed, moderate duration
- **Severe:** Severe magnitude, fast speed of onset, long duration
- **Extreme:** Extreme magnitude, immediate onset, extended duration

SEVERE WINTER WEATHER (SNOW STORMS, NOR'EASTERS, ICE STORMS)

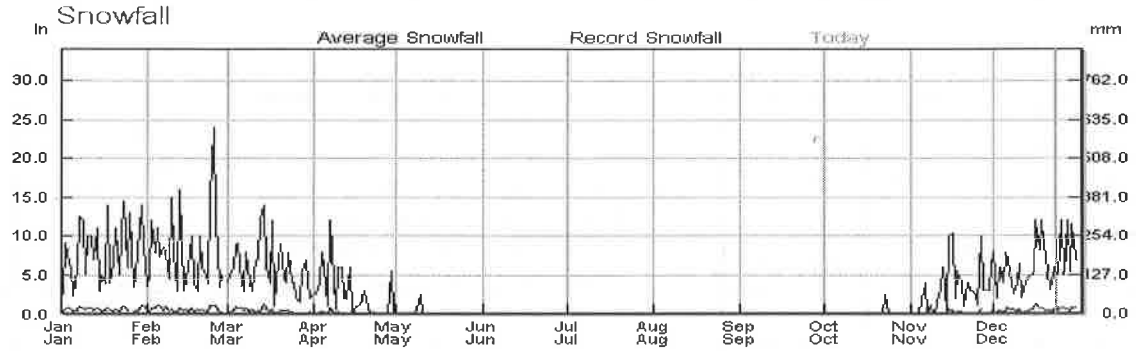
Location: Snow and Ice Storms can affect the entire town. Severe winter weather occurs frequently in the northeast and the possibility exists for residents to have to withstand several days without power. No one area of the town and region is at greater risk than another, but there are segments of the population that are more at risk. These include the elderly, people that are in need of regular medical care, and young children. These weather events can vary greatly based on slight differences in temperature, humidity, and elevation. Some events will produce a combination of winter weather types. This year EverSource split the electrical loop in town, making the town less vulnerable to wide-spread outages due to a downed wire, building greater resilience. During heavy snowfall events, staff at the schools now regularly monitor the snow loads on the roofs of buildings to prevent dangerous accumulations.

Extent:

A heavy snowstorm can be defined as one which deposits four or more inches of snow in a twelve hour period. Bristol receives an average of 79" of snow annually, with a record single day snowfall of

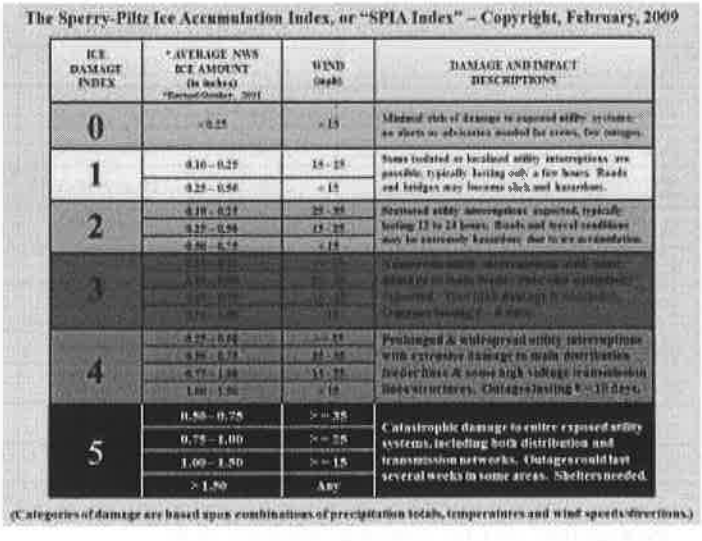
24" in February 1958.[6] Records indicate that eight or more inches have fallen in a single day on most dates from late November through mid-March but the region's average snowfall on any day from November through April is less than an inch. The record also shows that deposits of more than ten inches have happened in each of these months and on several days in February the town has seen more than fifteen and even twenty inches of snow in one day.

Average and Record Snowfalls for the Laconia, NH Airport[7]



In the winter months, the region may experience blizzard conditions. A blizzard is characterized by sustained winds or frequent gusts to 35 miles per hour or greater and considerable amounts of falling or blowing snow that last for a duration of three hours or longer. The combination of winds and snow reduce visibility to less than a quarter mile.[8]

New Hampshire generally experiences at least one or two nor'easters each year with varying degrees of severity. A nor'easter is defined as a large anticyclone weather system that resides near the New England region. These storms have the potential to inflict more damage than many hurricanes because high winds can last from twelve hours to three days, while the duration of hurricanes ranges from six to twelve hours. A nor'easter also has the potential to sustain hurricane force winds, produce torrential rain, and create blizzard conditions in winter months.


The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	*AVERAGE NWS ICE AMOUNT (in inches) *Period of October - 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, tree outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	< 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.25 – 0.50	25 - 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Outages lasting 1 - 5 days.
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission line structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

An ice storm coats trees, power lines, streets, vehicles, and roofs with a very slick and heavy coating of ice. In the winter of 1998, a major ice storm crippled much of New Hampshire, coating everything with as much as three inches of ice. The U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory estimates a 40 – 90 year return period for an event with a

[6] http://average-snowfall.findthebest.com/l/11455/Bristol-New-Hampshire, visited January 25, 2015.
[7] Laconia is the nearest official station with historical records. Weather Underground, Season Weather Averages http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KLCI&SafeCityName=Bristol&StateCode=NH&Units=none&IATA=LCI.
[8] "Winter storm terms," http://www.fema.gov/hazard/winter/wi_terms.shtm, visited February 8, 2011.

uniform ice thickness of between 0.75 and 1.25 inches. Ten years later (2008), however, New Hampshire was struck again by another severe ice storm.

The Sperry-Piltz Ice Accumulation (SPIA) Index is being used to forecast and classify ice storms based on a combination of the average thickness of ice coating (referencing expected temperature and precipitation levels) and wind speed; ratings range from 0 to 5.[9] The SPIA Index was first used in the United States in 2009 and is now beginning to be utilized by the National Weather Service.

History:

Hazard	Date	Location	Remarks/Description	Source
Ice Storm	12/11/2008	Statewide	Emergency declaration after major power & transportation disruption. $15 million in damages. Over 400,000 without power, 2 fatalities due to carbon monoxide poisoning. Disaster Declaration DR-1812. In So. Grafton County, damages were $225K.	NH HSEM NOAA
Nor'easters	Feb. 23 – March 3, 2010	Statewide	330,000 without power and $2 million in damages. Heavy snow, winds over 40 mph. Disaster Declaration DR-1892	FEMA
Ice Storm	3/6/2011	Statewide	$700,000 plus numerous power outages. Ice jams along the Pemigewasset River in Plymouth. In Southern Grafton County, damages were $159,000.	NOAA
Heavy Snow	10/29-10/30/2011	Statewide	Heavy, wet snow (16-20") brought down limbs and wires. Statewide 315,000 without power. EM-3344	NOAA, HSEM

Additionally, NOAA reported fifteen heavy snow and winter storm events impacting southern Grafton County between 2009 and 2014, with no significant winter storms in 2012.

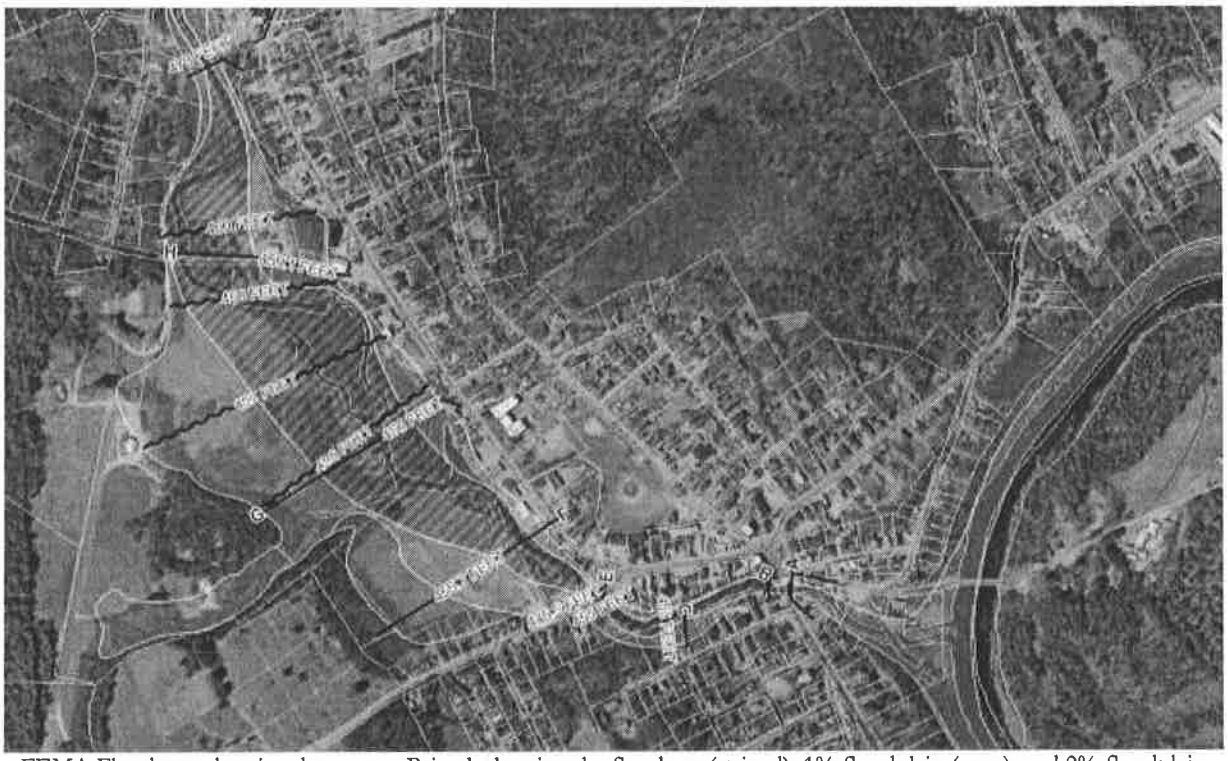
Location	Date	Type	Mag	Dth	Inj	PrD	Notes
SOUTHERN GRAFTON (ZONE)	12/26/2010	Heavy Snow	18.5"	0	0	0.00K	In Alexandria
SOUTHERN GRAFTON (ZONE)	1/12/2011	Heavy Snow	10"-18"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	1/18/2011	Heavy Snow	6"	0	0	0.00K	Mixed precipitation
SOUTHERN GRAFTON (ZONE)	2/2/2011	Heavy Snow	8"-12"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	2/5/2011	Heavy Snow	6"-12"	0	0	0.00K	Back-to-back storms
SOUTHERN GRAFTON (ZONE)	2/25/2011	Heavy Snow	8"-12"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	11/22/2011	Heavy Snow	6"-12"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	2/8/2013	Heavy Snow	6"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	3/19/2013	Heavy Snow	6"-10"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	12/14/2013	Heavy Snow	8"-14"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	12/29/2013	Heavy Snow	5"-10"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	1/2/2014	Heavy Snow	6"-14"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	2/5/2014	Heavy Snow	6"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	3/12/2014	Heavy Snow	6"-10"	0	0	0.00K	
SOUTHERN GRAFTON (ZONE)	3/19/2014	Heavy Snow	6"-12"	0	0	0.00K	

Probability of Occurrence: Highly Likely

[9] SPIA Northeast webpage, http://www.spia-index.com/neIce.php, June 3, 2014.

FLOODING (INCLUDING DAM FAILURE AND ICE JAMS)

Location: The Grafton County Digital Flood Insurance Rate Map (DFIRM, 2008[10]) shows the flood boundaries in the event of a 100-year flood, defined as a having a one percent chance of flooding each year. This identifies areas along the Newfound and Pemigewasset Rivers impacting properties along US Route 3, into downtown, and along River Road.



FEMA Floodmap showing downtown Bristol, showing the floodway (striped), 1% floodplain (aqua), and 2% floodplain (orange), along with lines of elevation http://msc.fema.gov/portal/search?AddressQuery=Bristol%2C%20nh..

As noted elsewhere in this plan, Ayers Island Dam controls flow along the Pemigewasset as it approaches the center of Bristol and the Newfound River has a couple of dams, two additional dams along the Newfound were removed over the last couple of years. The Smith River forms Bristol's southern border with the town of Hill.

On occasion minor ice jams do form in the Newfound and Pemigewasset Rivers. Davidson's Campground has had some minor damage, no deaths or injuries.

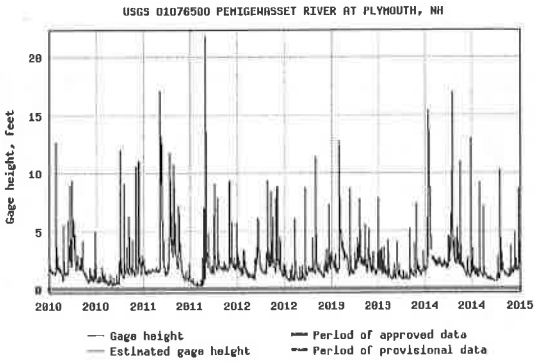
Two upgrades to drainage were noted by the Committee, a culvert upgrade on Hemlock Brook Road and several upgrades along Danforth Brook.

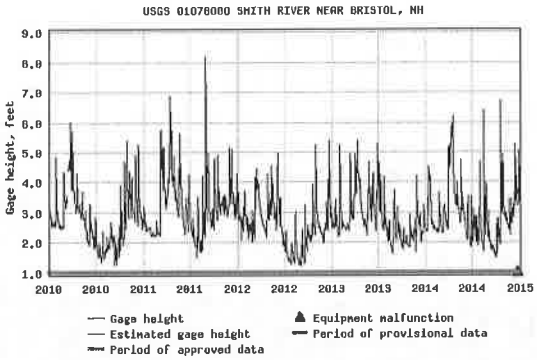
Extent: Flooding is defined as a temporary overflow of water onto lands that are not normally covered by water. It results from the overflow of rivers and tributaries or inadequate drainage. Flooding is most commonly associated with structures and properties located within the 1% annual

[10] Screenshot of downtown Bristol from FEMA's National Flood Hazard Layer (Official) with local parcels. http://fema.maps.arcgis.com/home/item.html?id=cbe088e7c8704464aa0fc34eb99e7f30. The map shows the floodplain in blue-green and brown and the floodway in striped pattern. See Appendix G for more maps.

(or 100-year) floodplain. Areas in this floodplain have been identified as having a one percent chance of flooding any given year.

The US Geological Survey (USGS) stream gauges along the Pemigewasset River in Plymouth (upstream of Bristol) and along the much smaller Smith River give an indication of when flooding has occurred and the number of feet above flood stage at which each river can run[11]. This graph indicates that the height of the Pemigewasset varies throughout the year from two feet to nearly ten feet. In a few instances since 2010 the river has gone over fifteen feet. The Smith River typically fluctuates between two and seven feet at the gauge. Flooding from Tropical Storm Irene (2011) caused the both rivers to reach their highest levels over the five-year time period.





Dams in New Hampshire are classified by the New Hampshire Department of Environmental Services Dams Bureau. The four dam hazard classifications (High, Significant, Low, and Non-Menace) are based on the potential losses associated with a dam failure (see Appendix H for a detailed description). High (H) and Significant (S) Hazard dams have the highest potential for damage; this could include damage to state or municipal roadways as well as structures. There are five active dams in Bristol (Table 8), two High Hazard Class, one Significant Hazard Class, and two Non-Menace dams. Since the last HMP Update, the Upper and Lower IPC dams (both Significant Hazard Class) along the Newfound River and owned by the Freudenberg Company have been removed.

Table 8: Dams in Bristol

Hazard Class	Name	River	Impound (Acre-ft)	Height (Feet)	Drainage Area (Acres)	Owner
H	NEWFOUND LAKE DAM	NEWFOUND RIVER	4100	12	95	NH WATER RESOURCES COUNCIL
H	AYERS ISLAND DAM	PEMIGEWASSET RIVER	500	90	746	PSNH
S	NEWFOUND RIVER DAM	NEWFOUND RIVER	0.2	7	98	NEWFOUND HYDRO
NM	FARM POND DAM	NATURAL SWALE	0.3	9	0	OAKCREST ASSOCIATION
NM	POITRAS POND DAM	NATURAL SWALE	1.5	10	0	OAKCREEK ASSOCIATION

[11] Daily Streamflow for New Hampshire's Rivers http://waterdata.usgs.gov/nh/nwis/rt.

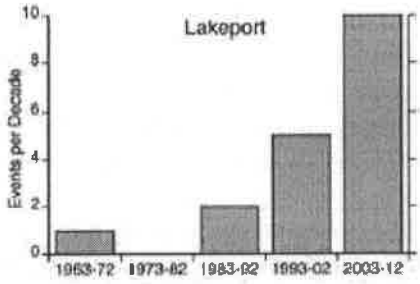
History:

Hazard	Date	Location	Remarks/Description	Source
Flood	7/24/2008-8/14/2008	Grafton Co.	Damages of over $3 million Declared Disaster DR-1787	NOAA
Flood	4/26-30/2011	Grafton Co.	Damages of $1.8 million Declared Disaster DR-4006	NOAA
Flood	8/28/2011	Grafton Co., Holderness, Plymouth	Tropical Storm Irene caused the Pemigewasset River to crest at 21.7 feet in Plymouth, 8.7 feet above flood stage. Some flooding in Bristol was associated with this event. Declared Disaster DR-2046	NOAA
Flood	10/26 – 11/6/2012	Grafton County	Declared Disaster DR-4095 Remnants of Hurricane Sandy	NOAA
Flood	6/26 – 7/3/2013	Grafton Co.	Declared Disaster, DR-4139	NOAA

In May 2008 flooding occurred at the Fire Station, which was serving as the town's Emergency Operations Center (EOC). Maintaining operations there required the assistance from the state National Guard. On August 4, 2008 rain events caused substantial flash flooding and washouts in Ashland, New Hampton, Center Harbor, and Meredith. In addition to property damages, one girl died in Ashland as a result of this storm[12]. The NOAA database reports a total of 27 flooding events in Grafton County since 2009.

Recent studies of weather records show that the number of heavy precipitation events (> 4" in 48 hours) in New Hampshire has been increasing over the past several decades and models indicate that this will continue into the future[13].

The extent for flooding and dam failure were seen as moderate and ice jams as weak.



Heavy precipitation events (>4" in 48 hours) by decade in Laconia, NH.

Probability of Occurrence: Flood – Occasional Dam Failure – Unlikely, Ice Jam – Likely

SEVERE WINDS (THUNDERSTORM/TORNADO/DOWNBURST)

Location: On average, six tornadoes touch down somewhere in New England each year. There is no way of knowing where or when the next damaging tornado will strike as they are among the most unpredictable weather phenomena. Downbursts are 10 times more likely to occur than tornadoes. All areas of town are susceptible to damage from high winds, with the area around Newfound Lake having a slightly higher chance of a severe wind. Committee members did note that the hills and mountains to the northwest of town do tend to divert and disrupt the region's prevailing northwest winds.

[12] USAToday http://usatoday30.usatoday.com/news/nation/2008-08-08-596728286_x.htm.
[13] *Climate Change in Southern New Hampshire: Past, Present, and Future* (Wake, et.al.), 2014. http://www.climatesolutionsne.org/sites/climatesolutionsne.org/files/unhsi-csne-southernnh_climateassessment_june_4_2014.pdf

Extent: Tornadoes are violent rotating storms that extend to the ground with winds that can reach 300 miles per hour. They are produced from thunderstorms and can uproot trees and buildings. Tornados are classified using the Enhanced Fujita (EF) Scale, based on wind estimates based on damage (Table 9)[14,15].

Table 9: Enhanced Fujita Scale

Operational EF Scale						
EF Number	**0**	**1**	**2**	**3**	**4**	**5**
3-Second Gust (mph)	**65-85**	**86-110**	**111-135**	**136-165**	**166-200**	**Over 200**

According to the National Oceanic and Atmospheric Administration (NOAA) a downburst is a strong downdraft, rotational in nature, which causes damaging winds on or near the ground. Winds can exceed 130 mph.[16] Downbursts fall into two categories based on their size:

- microbursts, which cover an area less than 2.5 miles in diameter, and
- macrobursts, which cover an area at least 2.5 miles in diameter.

Although tornadoes are locally produced, damage paths can be in excess of one mile wide and 50 miles long.[17] An F2 tornado ripped through a 50-mile section of central NH in July of 2008 from Epsom to Ossipee leading to requests for federal disaster declarations in several counties.[18]

The major damage from downbursts come from falling trees, which may take down power lines, block roads, or damage structures and vehicles. New Hampshire experienced three such events in the 1990s. One event occurred in Moultonborough on July 26, 1994 and was classified as a macroburst. It affected an area one-half mile wide by 4-6 miles in length.

The tornado/downburst risk for an individual community in New Hampshire is relatively low compared to many other parts of the country.

History:

Hazard	Date	Location	Remarks/Description	Source
Tornado	7/24/2008	Southern Lakes Region	F2 Tornado 50-mile path Uprooted and snapped trees, damaged structures. Declared disaster DR-1782	NOAA
Tornado	8/21/2011	Grafton, Orange	F1 Tornado - 2.7 miles long, 350 yds wide Damaged hundreds of trees and several buildings	NOAA
Tornado	7/17/2012	Bridgewater	F0 Waterspout on Newfound Lake No damages	NOAA
Microburst	10/31/2012	Franklin	Winds > 50 knots Downed numerous trees, destroying one house and damaging several others	NH Union Leader[19]

[14] For more details go to the NOAA FAQ sheet http://www.spc.noaa.gov/faq/tornado/ef-scale.html.
[15] Prior to 2007 the Fujita Scale was used for tornado classification. This scale is described in Appendix H.
[16] *Weather Glossary.* National Oceanic and Atmospheric Administration, http://www.weather.gov/glossary/index.php?letter=d, visited March 8, 2011.
[17] FEMA Hazards: Tornadoes http://www.fema.gov/business/guide/section3c.shtm, visited February 8, 2011.
[18] http://www.fema.gov/news/newsrelease.fema?id=45525 visited March 8, 2011.
[19] http://www.unionleader.com/article/20121031/NEWS11/121039788

NOAA reported twenty-seven thunderstorm/high wind events impacting southern Grafton County between 2009 and 2014; one injury was reported but no substantial damages.

Probability of Occurrence: Occasional

LIGHTNING

Location: Lightning can strike anywhere in town.

Extent: Lightning is a giant spark of electricity that occurs within the atmosphere, or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the Sun. During a lightning discharge, the sudden heating of the air causes it to expand rapidly, resulting in thunder.[20] Thunderstorms occur mainly in the summertime; some can be anticipated and detected well in advance while others are "pop-up" storms that are limited in size and duration. Exactly where and when lightning will strike is unknown. Most thunderstorms do not last long in any one location but move through fairly quickly. These giant sparks of electricity can result in fire or electrical damage to property or electrocution of people.

The National Weather Service does utilize a six-point scale for characterizing lightning activity called the Lightning Activity Level (LAL) based on frequency of ground strikes along with rainfall and ground conditions.[21]

Table 10: Lightning Activity Level Scale

LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

History: Committee members indicated that there have been structures been hit by lightning over the last ten years, causing damage to electrical systems and structure fires; no dates were available at the time of this report. The potential for damage or injury exist within any of the many thunderstorms that pass overhead each year, especially in the summertime.

Probability of Occurrence: Likely.

WILDFIRE

Location: Portions of Bristol are heavily wooded, especially near the Bridgewater, Alexandria and Hill town lines.

[20] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-3.pdf accessed September 16, 2013.

[21] NWS Definitions webpage, http://graphical.weather.gov/definitions/defineLAL.html. Accessed June 3, 2014.

Extent: A wildfire is defined as a fire in wooded, potentially remote areas that may endanger lives. New Hampshire has about 500 wild land fires each year; most of these burn less than half an acre. Much of the Lakes Region is forested and susceptible to fire.

The National Wildfire Coordinating Group (NWCG) has defined seven classes of wildfire based on size:

- Class A - one-fourth acre or less;
- Class B - more than one-fourth acre, but less than 10 acres;
- Class C - 10 acres or more, but less than 100 acres;
- Class D - 100 acres or more, but less than 300 acres;
- Class E - 300 acres or more, but less than 1,000 acres;
- Class F - 1,000 acres or more, but less than 5,000 acres;
- Class G - 5,000 acres or more.

History: No local occurrences have been reported since 2008. In 2013 Grafton County wildland fires burned 22.3 acres. In 2014 there were 112 wildland fires through the state, burning 72 acres, injuring two, and damaging ten structures. The largest fire was 24 acres.[22]

Probability of Occurrence: Occasional

EARTHQUAKE

Location: An earthquake could affect all areas of Bristol but especially the downtown area with its multi-story buildings.

Extent: An earthquake is a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating. Earthquakes are commonly measured using *magnitude*, or the amount of seismic energy released at the epicenter of the earthquake. The Richter magnitude scale is a mathematical device used to compare the size of earthquakes, shown in Table 11.[23]

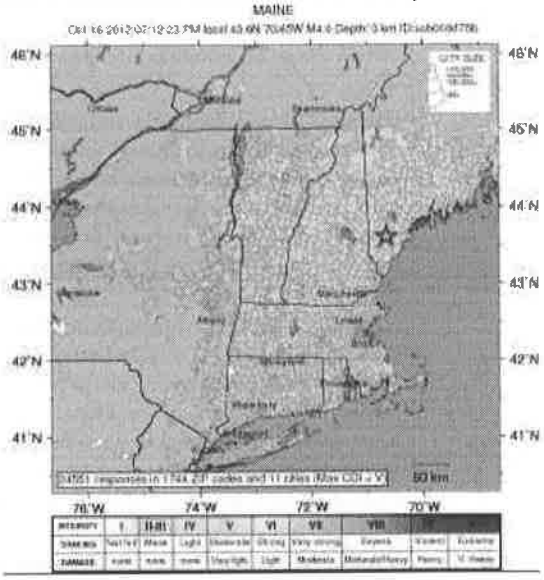
Table 11: Richter Magnitude Scale

Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.
6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

[22] NH Division of Forests and Lands http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx.
[23] US Geological Survey on-line publication, *The Severity of an Earthquake (2000)* http://pubs.usgs.gov/gip/earthq4/severitygip.html.

New Hampshire is considered to be in an area of moderate seismic activity with respect to other regions of the country. This means the state could experience large (6.5-7.0 magnitude) earthquakes, but they are not likely to occur as frequently as in a high hazard area like the Pacific coast. There is the potential for nearby earthquakes to register 5.5 on the Richter scale, causing slight damage to buildings and structures. Due to the unique geology of New Hampshire, earthquake propagation waves travel up to 40 times further than they do in the western United States, possibly enlarging the area of damage.[24] The strongest earthquakes to strike New Hampshire occurred December 20 and 24, 1940 in the town of Ossipee. Both earthquakes had a magnitude of 5.5 and were felt over an area of 400,000 square miles.

History: On average, every other year the Lakes Region experiences an earthquake, though these earthquakes are mild and go mostly undetected by people. Sanbornton (Gaza) and Tamworth are identified as a major epicenters in the region.[25] A search of the USGS National Earthquake Information Center database shows that since 1995 there have been 17 earthquakes with a magnitude of at least 3.0 within a 100 miles of Bristol; the largest was magnitude 5.2 in central New York (2002), a 4.0 quake in southern Maine (2012), and a 3.4 event centered in Penacook, NH (2010)[26]. The image at right indicates the communities where people reported feeling the Maine event.[27]



Areas where the October 16, 2012 earthquake was felt

Probability of Occurrence: Occasional

HURRICANE

Location: A hurricane could affect all areas of Bristol. Stream crossings, floodplains, and steep slopes are most likely to be impacted.

Extent: Hurricanes are severe tropical storms that have winds at least 74 miles per hour. In the Lakes Region they could produce heavy rain and strong winds that could cause flooding or damage buildings, trees, power lines, and cars.[28] Hurricanes are measured by the Saffir-Simpson Hurricane Scale: a 1-5 rating based on a hurricane's intensity using wind speed as the determining factor (Table 12). The scale is used to give an estimate of the potential property damage and flooding expected from a hurricane landfall.

[24] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html visited February 8, 2011.
[25] http://des.nh.gov/organization/commissioner/pip/factsheets/geo/documents/geo-3.pdf , pg. 3, visited January 25, 2011.
[26] USGS, Earthquake Hazards Program. http://earthquake.usgs.gov/earthquakes/search/. Accessed Jan. 10, 2015.
[27] USGS, Earthquake Archive Search. http://earthquake.usgs.gov/earthquakes/search/ accessed August 8, 2013
[28] http://www.fema.gov/hazard/hurricane/hu_about.shtm, visited January 25, 2011.

Table 12: Saffir-Simpson Hurricane Scale

Category	Characteristics
1	Winds 74-95 mph (64-82 kts or 119-153 km/hr). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.
2	Winds 96-110 mph (83-95 kts or 154-177 km/hr). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.
3	Winds 111-129 mph (96-113 kts or 178-209 km/hr). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.
4	Winds 130-156 mph (114-135 kts or 210-249 km/hr). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).
5	Winds greater than 156 mph (135 kts or 249 km/hr). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Source: http://www.nhc.noaa.gov/aboutsshs.shtml

According to NOAA, while 2010 was one of the busiest hurricane seasons on record, 2013 was one of the least active hurricane seasons.[29] New Hampshire has not experienced a severe hurricane directly since 1938. On September 21, 1938, a Category 3 hurricane claimed 13 lives in New Hampshire and many more throughout New England. Official records at the Weather Bureau in Concord show sustained winds of 56 miles per hour, but around the state, gusts around 100 miles per hour were reported, mostly due to topographical acceleration. The Merrimack River rose nearly 11 feet above its flood stage, *The Hanover Gazette* reported that in New Hampshire, 60,000 people were homeless and many areas were without power. Damages were estimated at $22 million.[30] Hurricane Bob, a category 2 storm, in 1991, was declared a major federal disaster in New Hampshire and is recorded as a severe storm in the state's history.[31]

Rainfall resulting from Hurricane Irene, 3"-5" in New Hampshire.
https://en.wikipedia.org/wiki/Hurricane_Irene

[29] http://www.noaanews.noaa.gov/stories2010/20101129_hurricaneseason.html visited January 25, 2011 and http://www.noaanews.noaa.gov/stories2013/20131125_endofhurricaneseason.html,.

[30] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html, visited January 25, 2011.

History: In the past five years no hurricanes have hit the region. By the time that a hurricane reaches central New Hampshire, it is rare that it is retains the characteristics of a hurricane. Wind speeds usually dissipate but they can still bring a great deal of rainfall to the region. That was the case with the remnants of Hurricane Irene, which hit the area in 2011 as a tropical depression (see Flooding).

Probability of Occurrence: Likely

EXTREME TEMPERATURES

Location: The entire town could be impacted by extreme temperatures, areas in valleys, on hilltops, and away from water are most likely to experience temperature extremes. The greatest impacts are likely to be felt by those most vulnerable to loss of power or exposed to the elements for long periods.

Extent: Bristol's location in central New Hampshire places it in a temperate climate zone. The water in the town's lakes, ponds, and rivers further moderates temperatures. During the winter Bristol does see a number of days well below 0°F, which can last for a week at a time. If combined with a loss of power (see Severe Winter Weather) and limited backup power, this can lead to death.

Bristol is a summertime destination for many wishing to escape the heat and congestion of cities. The region is known for warm and mild summer days. The region does; however, experience heat waves of three or more days above 90°F or extreme heat waves (above 95°F) from time to time. Those without air conditioning or some other method of cooling down are most at risk of heat stress.

History: Records for Bristol were not available for this report. Records for nearby Franklin Falls indicate that between 1980 and 2009 there were an average of eight days per year over 90°F and one day per year over 95°F. Models indicate that those numbers will rise in the coming years[32].

Probability of Occurrence: Occasional.

MOTOR VEHICLE INCIDENTS INVOLVING HAZARDOUS MATERIALS

Location: Major roadways, especially in populated areas or near water bodies are areas of concern. The committee noted NH Routes 3A and 104 run through the downtown area and in several locations pass near or over water bodies, including Newfound Lake and the Newfound and Pemigewasset Rivers. These are the major evacuation routes through town and NH 104 is the primary access route to the regional high school.

Extent: Oil spills along the roads noted above could result in the contamination of wells or waterbodies in the watershed. In addition to distributing fuel to central locations in the region, tankers travel throughout the area daily to deliver home heating fuel. Many oil tankers have the capacity to carry 10,000 gallons of home heating oil. The committee noted the fact that the Freudenberg plant is switching over to propane (30,000 gallon tanks) which will mean more propane trucks travelling through town.

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[31] http://www.fema.gov/news/event.fema?id=2118 visited January 25, 2011

[32] *Climate Change in Southern New Hampshire: Past, Present, and Future* (Wake, et.al.), 2014, p. 59. http://www.climatesolutionsne.org/sites/climatesolutionsne.org/files/unhsi-csne-southernnh_climateassessment_june_4_2014.pdf

History: Recent incidents include a 275 gallon oil spill at West Shore Marine and an oil spill on Fourth Street.

Probability of Occurrence: Occasional

EPIDEMIC

Location: An epidemic is an outbreak of a disease, generally isolated to one area. A pandemic is a widespread disease outbreak. The disease spreads easily person-to-person, can cause serious illness, and can sweep across the country and around the world in very short time.[33] An outbreak could impact anyone in town. Newfound Regional High School serves as a regional POD in the event of an outbreak. Transmission of germs and diseases between people is accelerated in a close living and socializing environment. Schools and areas where the elderly gather are good places for transmission to occur.

Extent: The New Hampshire Health and Human Services developed an epidemic and pandemic response plan in February 2007, so that communities can be prepared and respond to outbreaks.[34]

Over the past ten years, two strains of influenza viruses have become concerns across the country. The Lakes Region of New Hampshire has a large influx of seasonal visitors, which could make viral containment very difficult. Between 2005 and 2006, the Avian Influenza H5N1 virus infected 81 people and killed 52 in 10 countries in Asia and Africa. Most of the H5N1 cases were a result of human contact with infected poultry and the spread of the virus has not continued beyond that person. Although no human-to-human cases have been reported, viruses have the ability to mutate. The significance of the H5N1 pandemic is that it brought local, state, and federal attention to the need for pandemic emergency preparedness plans.

H7N9 is the most recent version of influenza; the NH DHHS website reported that this virus has not been detected in birds or people in the United States.

History: While there certainly have been minor outbreaks of flu in town, no major outbreaks of this or any other infectious disease was identified during this process. The 2012-13 flu season was much more severe in New Hampshire than any of the previous decade; 35 deaths occurred statewide, the most since 1997.[35]

Probability of Occurrence: Occasional.

CONFLAGRATION

Location: The closely-built buildings in downtown Bristol are the most susceptible to conflagration. Additionally the cottages at the base of Newfound Lake are at some risk.

Alton Bay Christian Conference Center, 2009

[33] http://www.pandemicflu.gov/, visited February 8, 2011.

[34] http://www.dhhs.nh.gov/dphs/cdcs/avian/documents/pandemic-plan.pdf, visited February 8, 2011.

[35] NH Department of Health and Human Services http://www.dhhs.nh.gov/media/pr/2013/01-jan/01112013flu.htm, visited January 17, 2013.

Extent:
Conflagration is an extensive, destructive fire in a populated area that endangers lives and affects multiple buildings. Hillsides provide a natural updraft that makes fire-fighting more difficult. In particular, structural fires spread more readily in hillside developments because burning buildings pre-heat the structures that are situated above them.

Downtown Bristol has dozens of buildings in close proximity to one another. This includes mixed used development and several apartment buildings. Sprinklers in new development downtown have reduced the likelihood of a fire spreading. The northern section of town at the base of Newfound Lake has dozens of cottages, many closely-built.

History: On April 12, 2009 the Alton Bay Christian Conference Center complex caught fire, resulting in an 11-alarm fire and destroying more than 40 structures. There is no recent history of conflagration in Bristol.

Probability of Occurrence: Occasional.

TERRORISM
Location: The areas most vulnerable to an act of terrorism are the schools and water supplies.

Extent: There are multiple forms of terrorism; at its core, it is, "the use or threat of use of force or violence against persons or property to intimidate"[36]. While the Lakes Region is known as a vacation destination and Bristol as a small, quiet, lakeside community, it does nevertheless have the potential to be the site of some incidents of terrorism. A determined individual intent on inflicting harm or terror might gain access to a number of sites where they could do harm to individuals or groups of people. Potential target sites include the schools where several hundred children learn and play and the water systems that serve the downtown and many residences.

History: No acts of terrorist violence have been carried out in Bristol in recent memory. Bomb threats have on occasion been called in to the schools in Bristol, including one in spring 2015. Some minor vandalism was reported on the monitoring system for the town's water system.

Probability of Occurrence: Unlikely.

Summary
Slightly different scales were used in this this update and the earlier version of the plan regarding probability of occurrence, leading to minor differences. Based on the recent history of hazard events, there were a few areas where substantive changes in the committee's ratings of the probability of occurrence of hazards should be noted. In the 2010 plan hurricane and epidemic were rated low, now they are considered likely. Conflagration had been rated high, it is now rated as occasional, in part due to preventive actions implemented.

It is cost prohibitive to make the built environment resistant to the most devastating natural hazards that could occur, though reasonable measures can be taken to minimize loss of life and property damage. Bristol may be affected by an unavoidable extraordinary circumstance such as a violent

[36] State of New Hampshire Hazard Mitigation Plan, p. 87
http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf.

earthquake, but historically, events of this magnitude have been infrequent. Those natural events that are common to the northeast also have common elements of concern for public safety. These include the potential for long-term power outages, the potential need for short-term sheltering facilities, and the availability of equipment and trained personnel. Key to loss prevention in these relatively common event scenarios is pre-event planning that critically assesses communications within the community, mutual aid resources regionally, public awareness and education, and emergency response training.

A list of events prior to 2010 is included in Appendix F. For more information on these and other hazards, please see Appendix H.

CHAPTER IV: VULNERABILITY ASSESSMENT

A. INVENTORY ASSETS

The list of critical infrastructure for the town of Bristol (Table 13) was updated by the Committee and the values updated at the Town Offices (2014). The critical infrastructure list has five facility classifications, 1) Essential Services; 2) Emergency Shelters; 3) Populations to Protect; 4) Structures and Services; 5) Evacuation Routes. The first category contains facilities essential in a hazard event, including the Emergency Operation Center. The second contains the emergency shelters. The third category contains special populations that may require additional attention in the event of a disaster. The fourth category is a list of facilities that have been identified by the Committee as facilities to protect in order to minimize additional risk to hazards. The fifth include the major routes in and out of town.

The primary change to the list is the removal of ten sites listed as emergency shelters but did not have appropriate facilities (mainly churches and social halls).

Table 13: Critical Facilities

NAME	ADDRESS	CLASSIFICATION	VALUE
Town Offices	230 Lake Street	Essential Services	$640,860
Newfound Regional High School	150 Newfound Rd	Emergency Shelter	$10,145,170
Newfound Memorial Middle School	155 North Main St	Emergency Shelter	$3,499,470
Bristol Elementary School	55 School St	Emergency Shelter	$1,835,100
Elderly Housing	throughout town	Population to Protect	n/a
Multifamily Housing	throughout town	Population to Protect	n/a
Downtown		Population to Protect	n/a
Bristol Nursery School		Population to Protect	n/a
Freudenberg NOK		Population to Protect	n/a
State Highway Dept. Patrol Facility	84 Ayers Island Rd	Structures & Services	$288,400
Fire Station, EOC	85 Lake St	Structures & Services	$429,010
High Street Fire Station	15 High St	Structures & Services	$134,770
Wastewater Treatment Plant Bristol Water and Sewer (Old & New bldg)	180 Ayers Island Rd	Structures & Services	$1,264,570
Highway Department	100 Ayers Island Rd	Structures & Services	$110,990
Ayers Island Dam workshop	59 Ayers Island Rd	Structures & Services	$5,300,000
Ayers Island Hydro-Electric Plant	61 Ayers Island Rd	Structures & Services	
Newfound Hydro Dam workshop	Central Street	Structures & Services	$2,961,300
Newfound Hydro-Electric Plant	Central Street	Structures & Services	
Danforth Brook Well	70 Hall Road	Structures & Services	$17,380
Fowler Well	500 West Shore Road	Structures & Services	$39,400
Pleasant Street pump station	Pleasant Street	Structures & Services	$48,000
Central Street pump Station	56 Central Street	Structures & Services	$3,150

NAME	ADDRESS	CLASSIFICATION	VALUE
Bristol Hill Road pump Station	22 Bristol Hill Road	Structures & Services	$48,120
NH Route 3A- North and South		Evacuation Route	n/a
NH Route 104- East and West		Evacuation Route	n/a
River Road- East		Evacuation Route	n/a

B. IMPACT OF HAZARDS

The committee reviewed the vulnerability of the various critical facilities in Bristol, taking into consideration the exposure to hazard, the value of the facility and contents to the town, and the likelihood of damage to the structure and compromised services to the town in a hazard event (Table 14).

Table 14: Vulnerability of Critical Facilities

High = 3, Moderate = 2, Low = 1 **Natural Hazards in Bold font,** Man-made hazards in plain font

BRISTOL Facility/Infrastructure	**Blizzard/ Snowstorm**	**Ice Storm**	**Nor'easter**	**Flood**	**Lightning**	MV Accident-Haz. Mat.	Epidemic	Conflagration/ Urban Fire	**Wildfire**	**Ice Jam**	**Landslide**	**Tornado/ Downburst**	**Hail**	Dam Failure	**Radon**	**Hurricane**	**Avalanche**	**Earthquake**	**Drought**	**Extreme Heat**	Terrorism	**Total**
Town Offices	1	2	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Newfound Regional High School	2	2	1	1	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
Newfound Memorial Middle School	2	2	1	2	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
Bristol Elementary School	2	2	1	1	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
Elderly Housing (Fox Run, Beech St. Lake St.)	2	2	2	1	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
Newfound Meadows, Multifamily Housing	2	2	2	1	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
Downtown	2	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29
Bristol Nursery School	2	2	2	1	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
Freudenberg NOK	2	2	2	1	2	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29
State Highway Dept. Patrol Facility	3	3	3	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30
Fire Station	2	2	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29
High Street Fire Station	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23
Wastewater Treatment Plant	2	2	2	3	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	29
Highway Department	3	3	3	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30
Ayers Island Dam workshop	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24
Ayers Island Hydro-Electric Plant	2	2	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	26
Newfound Hydro Dam workshop	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21

BRISTOL Facility/Infrastructure	Blizzard/ Snowstorm	Ice Storm	Nor'easter	Flood	Lightning	MV Accident-Haz. Mat.	Epidemic	Conflagration/ Urban Fire	Wildfire	Ice Jam	Landslide	Tornado/ Downburst	Hail	Dam Failure	Radon	Hurricane	Avalanche	Earthquake	Drought	Extreme Heat	Terrorism	Total
Newfound Hydro-Electric Plant	2	3	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	28
Danforth Brook Well	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Fowler Well	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Pleasant Street pump station	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Central Street pump Station	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Bristol Hill Road pump Station	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
NH Route 3A- North and South	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33
NH Route 104- East and West	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33
River Road- East	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33
Lake St./Pleasant St. bridge	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	27
All other bridges	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	33
Airport	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Bristol Hill Communications Tower	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Bert Williams booster station (N. Main st.)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Water Storage Tank, N. Main St.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	21
Total	**56**	**58**	**53**	**48**	**56**	**51**	**49**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	**30**	

The 2014 assessed structural value of the critical facilities are listed in Table 13, totaling $26,765,690. This does not; however, include the contents of the buildings and does not necessarily reflect the cost of full replacement. Also not reflected in this assessment is the value of built infrastructure such as streets, bridges, drainage, and utility transmission lines.

The 2014 assessed value of all of the structures in Bristol is $359,063,800. The value of the residential structures in town totals $282,649,000 or 79%. The value of the commercial/industrial structures in Bristol is $32,012,000 and the value of the tax-exempt structures is $25,837,500. An additional $18,565,300 of structural value is classified as public utilities. The figures used are from the town's 2014 MS-1 report to the NH Department of Revenue. Table 15 illustrates the potential loss if a hazard event impacted even a small percentage of the structures in Bristol.

Table 15: Bristol Structural Assessment (2014) and Selected Percentages

Bristol 2014 Assessment - Structures Only	Residential*	Manufactured Housing	All Housing	Comm/Indust	Exempt	Utilities	Total
Value - structures	$269,524,100	$13,124,900	$282,649,000	$32,012,000	$25,837,500	$18,565,300	$359,063,800
Number of parcels with structure	1,805	373	2,178	123	103	10	2,414
Average structural value	$149,321	$35,187	$129,775	$260,260	$250,850	$1,856,530	$148,742
1%	$2,695,241	$131,249	$2,826,490	$320,120	$258,375	$185,653	$3,590,638
2%	$5,390,482	$262,498	$5,652,980	$640,240	$516,750	$371,306	$7,181,276
5%	$13,476,205	$656,245	$14,132,450	$1,600,600	$1,291,875	$928,265	$17,953,190

*Residential includes Duplex, Multi-Family, and Condominium

The impact of a hazard is the potential degree of damage that could occur in Bristol. To rate the impact of a hazard, committee members considered the damages and consequences that might result from an event, in three separate impact areas Human, Property, and Businesses & Services. This incorporates the likelihood of injury or death, the assessed value of each critical facility and the vulnerability of these facilities. It also takes into account the anticipated disruption of services to residents and visitors. Four levels of impact were used, as defined below:

- **Low:** There is little likelihood that injury or death will result from this hazard. The damage to land and property will likely be limited. Essential services and other services that residents and visitors depend upon will not be interrupted.
- **Moderate:** There is some likelihood that injury or death will result from this hazard. There will likely be some damage to land and property. There will likely be some interruption of essential services and other services that residents and visitors depend upon for hours of days.
- **High:** It is quite likely that injury or death will result from this hazard. There will be damage to multiple properties. Essential services and other services that residents and visitors depend upon be likely be interrupted for days.
- **Catastrophic:** Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interrupted for days or weeks.

Most hazards were seen as having a low to moderate impact on Bristol. A couple of hazards were rated as potentially having a high impact in a single category and none reached the level of catastrophic.

In Chapter II Community Profile it was pointed out that while the year-round population of Bristol is about 3,000 residents, the true number of people in the town in the summertime could be more than four times that figure due to seasonal visitors.

Winter Weather (Snow storm, Blizzard, Nor'easter, Ice Storm)

Infrastructure, especially the major evacuation routes were the critical facilities/infrastructure identified by the committee as being particularly vulnerable to a winter weather event. The state and municipal highway facilities were identified as vulnerable due to the critical nature of the services that their staff provide along with major roadways and bridges. Flat-roofed buildings are all susceptible to damage from snow and ice loads. It was noted that during winter storms, the town has a policy of checking the school roofs to avoid excessive snow loads.

Downed limbs and wires and unplowed or untreated roads can severely limit emergency access to many residences. The potential for very cold temperatures and loss of power can quickly compound the issue. A severe ice storm struck central and southern New Hampshire and New England on December 11, 2008. Over 400,000 people statewide were without power, some for over two weeks, and overall damages exceeded $15 million.

All structures in Bristol are susceptible to damage by winter weather events, whether through ice storms, blizzards, or the heavy, wet snow often associated with a nor'easter. Assuming 1% to 5% town-wide damage to buildings, winter weather could result in $3,590,638 to $17,953,190 in damages annually.

The potential for impact to the town is seen as moderate.

Severe Winds (Thunderstorm, Tornado, Downburst)
Tornados and downbursts could strike anywhere in town with little, if any warning. While individual events may be small and rare, their impacts could be devastating. All structures, especially older ones, which are not necessarily built to the current building code standards, could be at risk. No critical facilities were considered particularly vulnerable to severe winds.

Damage can occur to most structures in town as a result of downed trees in any high wind event, including the commonly occurring thunderstorms. These winds can bring down limbs and trees, causing damage to structures as well as pulling down power and telephone lines and blocking roads. This is particularly the case along private roadways that may only get limited cutback of vegetation. No critical facilities or infrastructure were identified as particularly vulnerable.

All structures in Bristol are susceptible to damage by high wind events, whether through thunderstorms, downburst, or tornado. Assuming 1% to 5% town-wide damage to buildings any given year, high winds could result in $3,590,638 to $17,953,190 in damages annually.

The potential impact to the town due to high winds is considered moderate.

Flooding (including dam failure and ice dam)
Bristol began participation in the National Flood Insurance Program (NFIP) on March 15, 1980 (Emergency Entry May 5, 1976). The town is an active participant in the program through the administration of its floodplain ordinance. This includes correspondence with the NH Floodplain Manager regarding specific issues and periodically updating the town's floodplain ordinance. By actively participating in the NFIP property owners are able to purchase flood insurance through this FEMA program.

The Digital Flood Insurance Rate Maps (DFIRM) for Grafton County were reviewed and released on February 20, 2008. The town's Level D Floodplain Ordinance was revised at that time in coordination with New Hampshire Office of Energy and Planning and adopted at March Town Meetings in 2007 and 2008. The Grafton County Flood Insurance Study (FIS) was also published on February 20, 2008. The Bristol Board of Selectmen are responsible for maintaining floodproofing and elevation certificates and do so through the town's Land Use Officer. In Bristol floodplains exist along the Newfound and Pemigewasset Rivers. There is minimal development along the Pemi River in Bristol. Over the years there has been development along NH Route 3A as it runs between downtown and Newfound Lake, alongside the Newfound River.

There are currently 44 structures with flood insurance policies in force through the NFIP (insurance value $6,004,500 - average insured value of $136,466). All but one of these are residential structures; forty-one of these are single family homes and eight are considered condos. There is one non-residential structure with an NFIP policy. Twenty-nine of the insured properties are in the A-Zone (1% chance of an annual flood), the other fifteen properties are in the B, C, and X Zones (less than 1% chance of an annual flood - Moderate to Low Risk Areas), one in the Standard and fourteen in the Preferred areas[37]. The town was contacted by the NH Office of Energy and Planning on June 15, 2010 for a Community Action Call, no follow up was required. The town sought General Technical Assistance in September 2010, no comments were noted.

[37] FEMA definitions, https://msc.fema.gov/portal.

Since 1976 there have been eight losses paid out for a total of $72,890, five of the losses paid were on structures in the Preferred B, C, & X-Zones. There have been no repetitive losses in Bristol.

Town assessing records indicate that there are 125 lots that have structures on them that are in the floodplain with a combined value of $19.2 million (average $153,750). Many of these structures are boat slips. While the majority of these structures are not insured through the NFIP, some may have another form of flood insurance. Critical facilities considered particularly vulnerable to flooding include the wastewater treatment plant, the dams, and most major roadways and bridges.

With a minimum of 29 residential structures in the floodplain and an average of 2.4 people per household, the town could expect that there may be 70 people in the floodplain and thus could be at risk due to flooding. If there is a 1% chance of each of these properties flooding each year, then there is the potential that flooding could result in $39,575 in damages and put one person at risk each year.

Potential impact to the town due to flooding is considered moderate.

Lightning

Although the numbers have trended downward in recent decades, during the last half of the twentieth century more people were killed in the United States each year by lightning than by any other weather event. It can also wreak havoc with electrical and communications systems.

Power outages, whether associated with natural or man-made hazards have the potential to cause great disruption to residents and the functioning of the town. There is reliable back-up power for the Fire Station, Department of Public Works, and Newfound Regional High School (shelter). The Town Hall/Police Station/EOC does not have reliable back-up power.[38]

All structures in Bristol are susceptible to damage by lightning and resulting fires. The town's computer and communication systems could also be impacted by lightning. Most critical facilities were rated moderately vulnerable to lightning, none were viewed as highly vulnerable. Assuming 1% town-wide damage to buildings annually, then each year lightning could result in $3,590,638 in damages.

The potential impact to the town due to lightning is considered low.

Hurricane

All structures in Bristol are susceptible to damage by hurricanes, which can bring high winds, heavy rains, and flooding in certain areas, especially along the Newfound River floodplain. Infrastructure such as roads, bridges, dams, and to a lesser degree the water treatment plant, water & sewer facility, and the fire station are vulnerable. Emergency services might be compromised due to heavy rain, downed trees, or erosive damage to roads.

Assuming 1% to 5% town-wide damage to buildings, a hurricane event might result in $3,590,638 to $17,953,190 in damages.

The potential impact to Bristol due to the flooding and wind damage associated with a hurricane is considered moderate.

[38] Note that a grant application has been submitted to FEMA to purchase and install a generator at Town Hall.

Earthquake
According to the US Geologic Survey, the overall earthquake risk to the state is high due to the built environment; which means that many structures in the state are old or not built to withstand an earthquake. The 1940 earthquakes in Ossipee are the largest in recent history and included some damage to most of the chimneys in the epicenter region, ranging from cosmetic cracks to total collapse. Sections of several foundations collapsed and at least one house rotated on its foundation. Splits found in the rafters and trusses temporarily closed Ossipee High School. No damages were associated with the October 2012 earthquake in Maine but the potential does exist for some damages to occur.[39]

A relatively large earthquake in all likelihood would impact buildings, especially multi-story brick structures. Roads including the bridges would be impacted, limiting the ability of emergency services to be rendered, although in most cases there are alternate options, requiring redeployment or mutual aid assistance. Ayers Island dam was recently upgraded substantially to protect against seismic activity[40]. Assuming 1% town-wide damage to buildings, an earthquake could result in $3,590,638 in damages any given year.

The likely impact of an earthquake on the town was considered to be moderate.

Wildfire
In Bristol a wildfire could have the greatest impact on individual homes or seasonal camps. Critical facilities were not viewed as being particularly vulnerable, as they are located along the town's major roadways.

Bristol is moderately wooded, the properties with the greatest potential to be impacted by a wildland fire are in the more remote and steeper areas of town, such as Bristol Hill. The areas most susceptible tend to be rather remote and relatively few structures would be impacted. Assuming 1% town-wide damage to buildings, each year wildfire could result in $3,590,638 in damages.

The impact on the town by a wildfire event would be low.

Motor Vehicle Incident involving Hazardous Materials
The release of hazardous materials along one of the roadways in Bristol has the potential to cause damage in the town; there are many variables that could affect the degree of impact. Variables include the nature of the material, the location of the accident and its proximity to surface and groundwater, as well as structures.

A hazardous materials accident would not likely impact structures; rather the impact would be environmental. The Bristol water & sewer and wastewater treatment facilities, roads and bridges, and the Freudenberg facility were noted as vulnerable. A spill along NH Route 3A near Newfound Lake, in downtown, or along NH Route 104 near the Pemigewasset River could significantly impair water quality for the region, leading to a downturn in tourism. A 2007 report from NH Department of

[39] USGS http://earthquake.usgs.gov/earthquakes/eventpage/usb000d75b#pager, accessed October 17, 2012.
[40] Press release from Public Service of NH http://psnhnews.com/press-releases/construction-ayers-island-hydro-begins-may-23, (2011)

Environmental Services found that a reduction in water quality could lead to $25 million of lost income to the Lakes Region (30 communities).[41]

Impact to the town from a motor vehicle incident with hazardous materials is considered moderate.

Epidemic
The concerns associated with an epidemic include local capacity to respond to not only the residents of Bristol but also visitors and serving as a regional shelter and POD. The community does partner with Public Health Network of Central New Hampshire (http://www.nhphn.org/) for resources and training. The facilities that would most likely be impacted are the schools, elderly housing, and the town's largest employer, Freudenberg. In fact, most of the impact would be on staff and services, not the structures themselves.

The impact of an epidemic on the town would be moderate.

Conflagration
If a conflagration did break out, it would likely impact a number of the buildings in and around the downtown. While a number of steps have been and are being taken to limit such an event, such as requiring sprinklers in commercial construction downtown and revitalization of the town's Gamewell alarm system (see Existing Protections and Policies), this is seen as the hazard posing the greatest threat to structures in town. The town's ISO rating is 5/9, reflecting the insurance industry's assessment of town's available firefighting infrastructure and assets. Assuming 1% to 5% town-wide damage to buildings, each year conflagration could result in $3,590,638 to $17,953,190 in damages.

The overall impact from conflagration is considered moderate to high.

Terrorism
Actions taken to harm or terrorize individuals or segments of the population may injure, scar, or result in fatalities. Structural impacts would likely be minimal. The facilities considered most vulnerable are the schools and water & sewer facilities. No monetary calculation was made at this time.

The overall impact from terrorism is considered moderate.

[41] http://des.nh.gov/organization///commissioner/pip/publications/wd/documents/whats_our_water_worth.pdf.

C. SUMMARY OF RISK

Taking into account how widespread a hazard event could be, the potential extent of the hazard, the likelihood of occurrence of an event, and the potential impact of a particular hazard event, the significance of the various hazards that might occur in Bristol was determined (Table 16). Level of Overall Risk was determined using the definitions that follow below the matrix.

Table 16: Risk and Hazard Significance

Bristol Hazards	Probability	Extent	Human Impact	Property Impact	Business Impact	Average Impact	Risk
Definition	Likelihood this will occur w/in 100 yrs	(Magnitude/ Strength)	Probability of Death or Injury	Physical Loss or damage	Interruption of Service	Average of Human, Property, Business	Probability x Extent x Avg. Impact
Scale	0: Improbable 1: Unlikely 2: Occasional 3: Likely 4: Highly Likely	1: Weak, 2: Moderate, 3: Severe, 4: Extreme	0: n/a 1: Low 2: Moderate 3: High 4: Catastrophic	0: n/a 1: Low 2: Moderate 3: High 4: Catastrophic	0: n/a 1: Low 2: Moderate 3: High 4: Catastrophic	0: n/a 1: Low 2: Moderate 3: High 4:Catastrophic	**Low Medium High**
Hurricane	3	3	1	2	2	1.67	**15.00**
Blizzard/Snow Storm/Nor'easter	4	2	1	2	2	1.67	**13.33**
Ice Storm	4	2	1	2	2	1.67	**13.33**
Earthquake	2	3	1	2	3	2.00	**12.00**
Tornado/Downburst	2	3	2	2	2	2.00	**12.00**
Flood	2	2	1	2	2	1.67	**6.67**
Extreme Temperature	2	2	2	2	1	1.67	**6.67**
Wildfire	2	2	1	1	1	1.00	**4.00**
Ice Jam	3	1	1	2	1	1.33	**4.00**
Avalanche (West Shore Rd.)	2	2	1	1	1	1.00	**4.00**
Lightning	3	1	1	1	1	1.00	**3.00**
Landslide	1	2	1	1	1	1.00	**2.00**
Drought	2	1	1	1	1	1.00	**2.00**
Hail	2	1	1	1	1	1.00	**2.00**
Other Events							
Terrorism	3	2	2	2	2	2.00	**12.00**
Epidemic	3	2	2	1	2	1.67	**10.00**
Conflagration/ Urban Fire	2	2	2	3	2	2.33	**9.33**
MV Accident involving Hazardous Materials, Oil	2	2	2	2	2	2.00	**8.00**
Dam Failure	1	2	1	2	3	2.00	**4.00**

Probability of Future Events

- **Unlikely:** <1% probability of occurrence in the next year or a recurrence interval of more than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- **Highly Likely:** 90 to 100% probability of occurrence in the next year or a recurrence interval of less than 1 year.

Extent

- **Weak:** limited magnitude, slow onset, short duration, little damage.
- **Moderate:** moderate magnitude, moderate onset speed, moderate duration, some damage/loss of service for days.
- **Severe:** Severe magnitude, fast speed of onset, long duration, devastating damage and loss of service for weeks
- **Extreme:** Extreme magnitude, immediate onset, extended duration, catastrophic damage, uninhabitable conditions.

Impact - Human, Property, Business

Low: There is little likelihood that injury or death will result from this hazard. The damage to land and property will likely be limited. Essential services and other services that residents and visitors depend upon will not be interrupted.

Moderate: There is some likelihood that injury or death will result from this hazard. There will likely be some damage to land and property. There will likely be some interuption of essential services and other services that residents and visitors depend upon for hours of days.

High: It is quite likely that injury or death will result from this hazard. There will be damage to multiple properties. Essential services and other services that residents and visitors depend upon be likely be interupted for days.

Catastrophic: Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interupted for days or weeks.

Overall Risk

Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.

Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.

High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

Input from the public survey (Appendix D) showed that severe winter weather was the greatest concern. Protecting critical facilities and utilities were the steps most important to those completing the survey.

It should be noted that the ranking of individual hazards for the purposes of planning discussion should not in any way diminish the potential severity of the impacts of a given hazard event. Further, hazards ranked as low risk may have the impact of increasing the risk of other hazards when they occur. For example, in the event of a drought, the risk of wildfire may be greater. In combination, hazard events may have the impact of overwhelming existing emergency response systems.

CHAPTER V: MITIGATION STRATEGIES

A. CURRENT PLANS, POLICIES, AND REGULATIONS

The planning decisions that affect community growth patterns have evolved over the years as Bristol has developed. Some local programs have the effect of mitigating disasters; and while some of these have been in effect for years, others were implemented since the development of the 2010 Hazard Mitigation Plan. A review of existing mitigation strategies was conducted, including a review of pertinent documents such as the zoning ordinance, subdivision regulations, site plan regulations, and discussion with Committee members. The following strategies detail existing plans, regulations, and policies related to hazard mitigation. The review of existing capabilities and effectiveness utilized these categorizations:

Excellent *.....The policy, plan or mutual aid system* ***works very well*** *and* ***often exceeds its goals.***
Good *.....The policy, plan or mutual aid system* ***works well*** *and* ***is achieving its goals.***
Fair *.....The policy, plan or mutual aid system does* ***not work as well as it should*** *and* ***sometimes*** *falls short of meeting its goals.*
Poor *.....The policy, plan or mutual aid system does* ***not work as well as it should*** *and* ***often*** *falls short of meeting its goals.*
Untested *.....The policy, plan or mutual aid system* ***has not yet been tried or put to the test.***

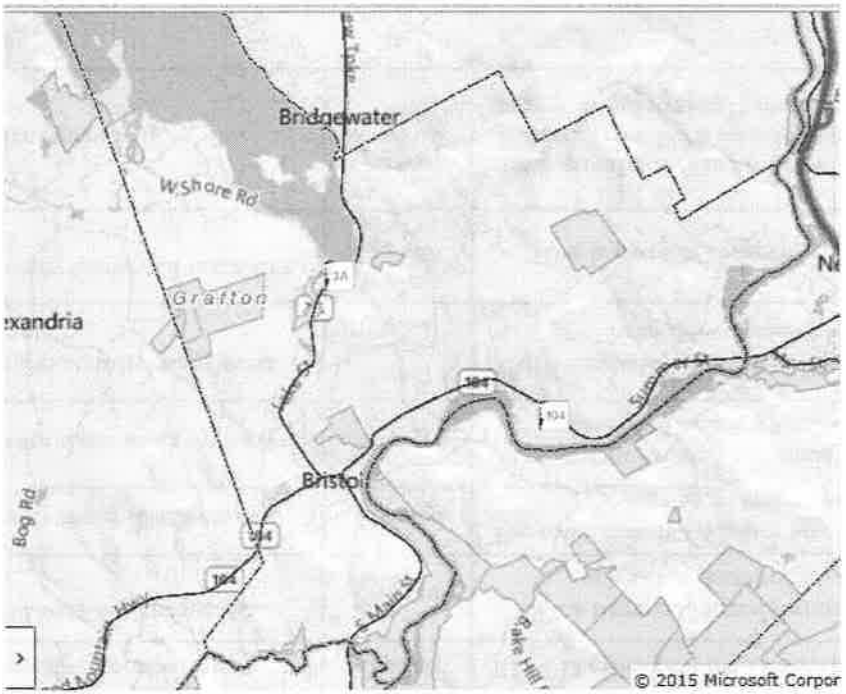
Table 17: Existing Protections and Policies

Protection	Description	Year	Comments	Effectiveness
Master Plan	Guiding document for land use planning. It serves to guide the overall character, physical form, growth, and development of a community. RSA 674:2		Has been updated periodically. Beginning a multi-year update process.	Fair
Capital Improvement Plan	A CIP is an outline of anticipated expenditures for capital projects over at least six years. It links local infrastructure investments with master plan goals, land use ordinances, and economic development. RSA 674:5	2011-2020	Threshold: $10,000 & 3 yr lifespan. Includes generators for FD and Town Offices (and PD) - 2010 HMP recommendations, but no others included. Concern - Although recommendations may be made, CIP is not well funded.	Fair
Emergency Operations Plan	Guides response to an emergency	2013	HMP is an Appendix to this Plan. Did Tabletop Exercise - as a result now have a guidelines for setting up the EOC (Fire Station)	Excellent
EOC	Emergency Operations Center (Fire Station)		Would like to use Town Hall as back-up EOC; however, there is no back-up power.	Excellent/ Fair

Protection	Description	Year	Comments	Effectiveness
Water Resources Plan for Rural Fire Protection	Inventories, assesses, and maps local water resources for fire protection (fire ponds, cistern, and dry hydrants) and recommends any additional actions to enhance fire protection.	2009	Prepared by North Country RC&D Rural Fire Protection Program. Local funds for new hydrants are limited.	Fair
Building Codes and Inspector	NH Building Code and Life Safety Code	2009	Rely on State Building Code. No Code Inspector, do have a Land Use Officer - Fire Chief can enforce the code after the fact. There is coordination between the Fire Chief and PB.	Fair/ Good
Fire Dept. ISO rating	Insurance rating system. It is based on a number of factors including firefighting resources, staffing, and response time. Impacts insurance rates for home and business owners.	2000	5/9 Due for a new rating review. Now have sprinkler systems in many buildings downtown and fire alarms are required. Improved documentation may result in a better rating but it is not expected to lead to substantial reduction in insurance rates.	Good
Zoning Ordinance	Zoning involves regulating the size, location, and use of structures for the purpose of promoting the health, safety, and general welfare of the community. RSA 674:16	2014	No changes that significantly impact hazard mitigation.	Good
Floodplain Ordinance	Limits development in flood-prone areas and requires floodproofing actions on any permitted development. National Flood Insurance Program (NFIP) requirements have been adopted in the town's zoning ordinance.	2008	Requirement for participation in the National Flood Insurance Program (NFIP).	Good
Flood Insurance Rate Maps (FIRM)	Maps developed by FEMA delineating boundaries of various flood-prone areas, including the 1% Annual (100-year) Floodplain. The current Federal Emergency Management Agency (FEMA) Digital Flood Insurance Rate Maps (DFIRM) for Grafton Co. were revised February 20, 2008.	2008	Available in Land Use Office.	Good

Protection	Description	Year	Comments	Effectiveness
Subdivision Regulations	Regulation of subdivision guides municipal development, protecting residents from poorly designed areas. New development must mesh efficiently with the municipal pattern of infrastructure, essential services, and vehicular access. RSA 674:35	2008	None	Good
Site Plan Regulations	Site Plan Review by the Planning Board is required of all non-residential and multi-family (two or more units) housing development. RSA 674:43	2013	None	Good
Other Natural Hazard-specific Ordinances	Steep Slopes (no development on slopes > 25%, limits on development on slopes > 15%), Erosion & Sediment Control	2012	None	Good
Regional Planning	In New Hampshire communities may be members of region planning commissions and receive assistance with land use planning.		Long-time member of LRPC. Get assistance with land use, transportation, and environmental planning. Master Plan and GIS mapping assistance.	Good
Mutual Aid Agreements	Agreements with nearby communities to receive or provide assistance in emergency/call situations. Usually written agreements updated on a regular basis.		Fire: LR Mutual Aid (32 Others) PD: Dispatched by Franklin DPW - Yes (T2)	Good
Emergency Management Director	Responsible for coordinating Emergency Services and Planning		Fire Chief: FT. Police Chief is Assistant EMD	Good
Fire Department	Staff: 7 FT, 25 on-call		A little understaffed on FT, esp. in the day	Good/ Fair
Fire Department	Training Programs		NIMS compliant - Moving more into leadership	Good
Highway Department	Staff: 4 FT		T2, Chainsaw training	Good

Protection	Description	Year	Comments	Effectiveness
Maintenance programs to reduce risk	Tree trimming: Utilities, town		PSNH (EverSource) covers most of town. Town trimming occurs on an as needed basis - limited funds	Good/Fair
Maintenance programs to reduce risk	Clearing drainage systems - occurs in the fall		Flooding has not been a problem. Culvert upgrade on Hemlock Brook Rd.	Good
Shelters	Newfound Regional HS		Only has partial power. Was open for TS Irene. Although there are many other "shelters" listed in 2010 HMP, none have appropriate facilities, back-up power, and accessibility.	Good
Shelters	Staffing		In an emergency the town would struggle to implement staffing of the shelter including accommodating special needs, and pets. Would rely on the Mid-State Regional Health Network for medical support (new facility).	Fair
	Health distribution site.		Central NH Regional Health Network runs school vaccination clinics and Newfound Regional High School is a regional POD (Point of Distribution) and hosted drill. It has the capacity to attending to 3,000 people over a three-day period.	Good
Town Administration	Selectmen and Town Administrator		Could use more NIMS/ICS training for elected officials	Good
Dams	Inspection by NH DES.		Five active dams in Bristol - two are High Hazard, one is a Significant Hazard. The two IPC dams (Signif. Hazard) have been removed. Ayers Island dam recently had a substantial upgrade, especially regarding seismic resilience.	Excellent
Bridges	One State, One Municipal Red-listed bridge		Danforth Brook Rd. bridge is large culvert - no plans to address it at this time.	Good



Conservation Lands (green) in Bristol and adjacent communities. Source: NH GRANIT

B. STATUS OF 2010 ACTIONS

The 2010 HMP contained eighteen recommendations. A review of the status of these actions reveals that a five of these have either been completed or are no lingered considered pertinent. The status of the mitigation actions recommended in the 2010 plan is indicated in Table 18 as either, Deleted, Completed, or Deferred, and in a few cases portions of the work have been completed and the remainder has been deferred. Effectiveness was rated using the same terms and definitions as were used in Table 17. Some of the deleted Actions are now listed above as "Current Plans, Policies, and Regulations". Deferred Actions (or deferred portions of Actions) were carried forward to be considered as new Mitigation Actions (Table 19).

Table 18: Status of Mitigation Actions from the 2010 Hazard Mitigation Plan

Description	Completed, Deleted, Deferred	Comments	Effectiveness
Assess, map, and clear access routes in areas at risk of wildfire	Deleted	Very low risk of wildfire does not justify the effort.	
Establish a local hazardous materials response team	Deleted	The FD calls upon the Central NH Haz Mat Team.	Good
Coordinate with the American Red Cross to improve local shelters	Deleted	This is being addressed through other programs such as the partnership with LRPPH.	Good
Purchase a water hose for emergency water distribution	Deleted	The town now has a better way of distributing water in an emergency.	n/a
Develop a vulnerability assessment for town water systems	Completed	Assessment exists; it was updated in 2014. Should have a more complete list of contacts.	Good
Improve drinking water protection and security using water protection grant	Partially completed, deferred	ARRA funded alarms, gates. The Fowler site has not been done (funding is needed)	Excellent
Improve and expand existing community Gamewell fire alarm system	Partially completed, deferred	Work is partially complete (funding is needed).	Fair
Purchased confined space equipment	Partially completed, deferred	Have materials at Water & Sewer, including an updated gas detector. FD is coordinating with Freudenberg (biggest user of service) to obtain equipment and training.	Good

Description	Completed, Delete, Defer	Comments	Effectiveness
Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	Partially completed, deferred	It is incorporated in the LEOP as an appendix and some actions are in the CIP. The Master Plan is undergoing an update and might incorporate the HMP by reference RSA 674:2.III(e).	Good
Continue Hazard Mitigation Planning Committee	Partially completed, deferred	Need to establish a regular meeting schedule.	Fair
Assess municipal radio communications site on Bristol Hill	Deferred	Important location (funding is an issue)	Good
Evaluate road drainage on Timber Lane, Fourth Street, and High Street	Deferred	High Street is slated for upgrades in Summer 2015.	Fair
Further evaluate and map hazardous materials storage sites in town	Deferred	Funding and time are issues.	Untested
Integrate town water system emergency plan with Bristol Emergency Management Plan	Deferred	These are and should remain two separate plans but they certainly can and should explicitly reference each other.	Fair
Provide emergency power generation for essential services	Deferred	Water Department has a generator but the Town Hall and Police Station do not. Grant funding for generators exists and the CIP does recommend raising matching funds for this. The funds have not yet been approved by voters.	Fair
Further evaluate the properties that could be impacted in the event of a dam failure	Deferred	Funding is an issue.	Untested
Distribute Bristol HMP to abutting communities	Deferred	Funding/Time	Untested
Evaluate and improve radio communications for all essential services	Deferred	Funding	Good

C. MITIGATION GOALS AND TYPES OF ACTIONS

In the 2010 Hazard Mitigation Plan the committee affirmed its support for the goals stated in the State HMP at the time. While the overall goals of the town of Bristol have not changed substantially since then, the form in which they are stated has. The general goals below are similar to the goals in the earlier plan while the hazard-specific goals address specific local concerns. Note that the flooding and severe wind goals are both applicable to hurricanes.

General Goals:

Prevention

1. Reduce the potential impact of natural and man-made disasters on public and private property in Bristol.

Protection

2. Improve the level of protection of the health, safety, and well-being of all Bristol community members.
3. Maintain and improve the existing emergency response system.

Coordination

4. Work in cooperation with the State of New Hampshire's Hazard Mitigation goals[42].
5. Maintain compatibility with the goals of the Bristol Master Plan.

Education

6. Educate the public regarding how to protect and maintain their property in a manner that will mitigate the impacts of hazards.

Hazard Specific

Flooding

7. Minimize the impact that a flood would have on life, property, and infrastructure along the Newfound and Pemigewasset Rivers and their floodplain along with various streams of the town of Bristol.

Fire

8. Reduce the risk of loss of life, and damage to property and infrastructure due to structural or wildfires.
9. Minimize the impact to life, property, and the environment during a hazardous materials spill.

Winter Weather

10. Minimize the impact of severe winter weather on people living in or visiting Bristol along with structures and infrastructure.

Severe Wind

11. Reduce the likelihood of damage or loss of life due to high wind events.

Earthquake

12. Reduce the risk of loss of life, and damage to property and infrastructure due to seismic activity.

Terrorism

13. Reduce the risk of loss of life, and damage to infrastructure due to terrorism.

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[42] State of New Hampshire Hazard Mitigation Plan (2013) http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hazard-mitigation-plan.pdf, p. 192.

There are a number of types of actions that communities may take to reduce the likelihood that a hazard might impact the community. These include:

A. Actions that will keep things from getting worse - Prevention

a. Zoning – floodplain and steep slope overlays
b. Open space preservation
c. Subdivision and Site Plan Review
    i. Impervious surface limits
    ii. Stormwater management
d. Capital Improvements Plan – limiting the extension of public infrastructure into hazard areas
e. Building and Fire codes

B. Actions that address individual buildings - Property Protection

a. Flood-proofing existing buildings
b. Retrofitting existing buildings to reduce damage
c. Relocating structures from hazard-prone areas
d. Public procurement and management of land vulnerable to hazard damage

C. Actions that will inform the public - Public education and awareness

a. Make hazard information and maps available to residents and visitors.
    i. Paper or electronic
    ii. Targeted at residents and businesses in hazard-prone areas
    iii. Set up displays in public areas, or homeowners associations.
    iv. Give educational programs in schools.
    v. Make information available through newspapers, radio, TV.
b. Ask businesses to provide hazard information to employees.
c. Adopt a real estate disclosure requirement so that potential owners are informed of risks prior to purchase.

D. Actions that will protect natural resources

a. Erosion and sediment control programs
b. Wetlands protection programs
c. Expand public open space
d. Environmental restoration programs

E. Actions that will protect emergency services before, during, and immediately after an event (long-term continuity)

a. Protect warning system capability
b. Protection or hardening of critical facilities such as fire stations or hospitals
c. Protection of infrastructure, such as roads that are needed in emergency response

F. Actions that will control the hazard – Structural projects

a. Diversion of stormwater away from developed areas
b. Reservoirs to store drinking water

D. POTENTIAL ACTIONS

Through a review of the risk assessment and local vulnerabilities, a number of Gaps were identified and refined by the Committee. As noted earlier, actions or portions of actions which were deferred from the previous plan were brought forward in this table and considered along with new ideas. Multiple brainstorming sessions yielded an updated list of potential actions to address these current problems. Table 19:

- lists the gaps and potential actions along with the hazard(s) that they address, in many cases multiple hazards are addressed.
- Shading of the stated action indicates that the potential action is likely to mitigate the gap/problem as opposed to a preparedness/response action,
- whether the action addresses existing structures/infrastructure or future (new) structures/infrastructure
- which goal(s) they address and the type of mitigation action each represents. Note: The goals and their numbers are listed on the preceding pages.
- The Committee identified the various costs and benefits associated with each action. The estimated cost represents what the town estimates it will cost in terms of dollars or staff hours to implement each action.
- The final column lists some potential funding sources.

Table 19: Potential Actions

Problem	Hazard	Actions	New or Existing Structure	Goal	Type	Anticipated Cost	Potential Funding
Safe drinking water is important to all in town. The downtown area relies on the municipal system, which is well protected from contamination & vandalism except for the Fowler site.	Terrorism	Improve drinking water protection and security at the Fowler site, including fencing.	Existing	1.2.3.4.5.13	Property Protection	$40,000 ($15,000 in engineering)	NH DES water protection grant
Comprehensive fire alarm systems can reduce response time, reducing injuries, loss of life and property.	Fire	Improve and expand existing community Gamewell fire alarm system, including public outreach.	Existing	1.2.3.4.5.6.8.9	Property Protection & Public Education/ Awareness	$4,000/year	Fire Dept. budget

Problem	Hazard	Actions	New or Existing Structure	Goal	Type	Anticipated Cost	Potential Funding
Accidents and fires can occur in confined spaces; responding to emergencies in a confined space requires specialized training and equipment.	Fire	Purchase confined space equipment and ensure that staff has training.	Existing	1.2.4.5.9	Property Protection	$10,000	Private funds
If the HMP is not referenced in the Master Plan or the HMP recommendations which meet CIP thresholds are not incorporated into the CIP, then it is less likely that the town will be able to implement these recommendations.	All	Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	New	1.2.3.4	Prevention	Staff Time 20 hrs.	Operating Budget
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on High Street.	Existing	1.2.4.5.7.10	Long-term Continuity	$5,000	Warrant Article, Operating Budget, HMGP
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on Fourth Street.	Existing	1.2.4.5.7.10	Long-term Continuity	$5,000	Warrant Article, Operating Budget, HMGP
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on Timber Lane.	Existing	1.2.4.5.7.10	Long-term Continuity	$5,000	Warrant Article, Operating Budget, HMGP

Problem	Hazard	Actions	New or Existing Structure	Goal	Type	Anticipated Cost	Potential Funding
There is incomplete communication regarding the location and type of hazardous materials in town, limiting efforts to mitigate accidents and response.	Haz. Materials	Evaluate and map hazardous materials storage sites in town.	Existing	1.2.4.5.10	Prevention	Staff Time 40 hrs./year	Operating Budget
The town water system supports the downtown area, including several of the critical facilities. Failure of this system could limit emergency response and sheltering efforts.	All	Cross-reference the Bristol Water System Emergency Plan and the Bristol Emergency Management Plan.	Existing	1.2.3.4.5	Prevention	Staff Time 10 hrs.	Operating Budget
Several of the Critical Facilities in town do not have emergency power, potentially limiting their effectiveness during an emergency.	All	Provide emergency power generation for critical facilities (Town Hall, Police Station).	Existing	2.3.4.5	Long-term Continuity	$26,000	HSEM grants for 50%
Without regular review of mitigation activities, some actions might not be implemented in a timely fashion.	All	Use the Hazard Mitigation Planning Committee to review the HMP annually.	n/a	1.2.3.4.5	Prevention	Staff Time 20 hrs/yr.	Operating Budget
There are some gaps in regional understanding and partnerships.	All	Distribute Bristol HMP to abutting communities.	n/a	1.2.3.4.5.7	Prevention	<$500	Operating Budget
In the past there have been some 'dead spots' in town.	All	Evaluate and upgrade radio communications for all essential services	Existing	2.3..4.5	Long-term Continuity	$12,660 approved	Town Warrant, Possible Grant Funding

Problem	Hazard	Actions	New or Existing Structure	Goal	Type	Anticipated Cost	Potential Funding
Due to the incomplete list of contacts, it would be difficult to contact all property owners in an emergency.	All	Conduct outreach and education for all types of emergencies, including the importance of providing up-to-date emergency contact information.	Existing	1.2.3.4.5.7	Public Education & Outreach	$5,000 - $10,000	Operating Budget or possible Town Warrant
There are a number of steps that the owners of homes and businesses in Bristol can do to help make their properties more resilient to a variety of hazards such as snow loads, earthquakes, lightning, high winds, flooding, and extreme temperatures.	All	Conduct outreach and education for all types of emergencies and make informational resources more widely available.	Existing	1.2.3.4.5.7	Public Education & Outreach	$5,000 - $10,000	Operating Budget or possible Town Warrant
Power lines tend to come down in severe winter weather (ice, wet snow, high winds), leaving many residents without power.	Winter Storms	Develop and fund a tree maintenance program.	Existing	1.2.4.5.11.12	Prevention	$5,000/year	Operating Budget
Power lines tend to come down in severe winter weather (ice, wet snow, high winds), leaving many **at-risk residents** without power.	Winter Storms	**A.** Identify populations that would be at-risk in a power outage. **B.** Conduct outreach to at-risk populations including education regarding appropriate shelters and resources.	n/a	2.3.4.5.7	Public Education & Outreach	$5,000 - $10,000	Operating Budget or possible Town Warrant

E. PRIORITIZATION OF ACTIONS

After considering the pros and cons of each proposed action, the Committee began to prioritize the various projects which had been identified. All suggested actions, whether deferred or new were treated as potential actions and prioritized in a similar manner. Committee members agreed to adapt the standard prioritization tool to better reflect the concerns of the community. The tool that came out of this process asks the committee to consider eleven separate aspects for each proposed action including the Costs (See Appendix I for full details). Table 20 shows the Actions ordered by their overall score; those with similar scores are then ordered by their Cost score and then Life Safety and Property Protection score. Total scores range from a high of 9 to a low of 2.

Table 20: Proposed Actions in Ranked Order

Hazard	Bristol Proposed Actions	Total
Fire	Improve and expand existing community Gamewell fire alarm system, including public outreach.	9
All	Provide emergency power generation for critical facilities (Town Hall, Police Station).	9
All	Conduct outreach and education for all types of emergencies, including the importance of providing up to date emergency contact information.	9
Terrorism	Improve drinking water protection and security at the Fowler site, including fencing.	8
Fire	Purchase confined space equipment and ensure that staff has training.	8
Haz. Materials	Evaluate and map hazardous materials storage sites in town.	8
All	Evaluate and upgrade radio communications for all essential services.	8
Flood/ Erosion	Upgrade road drainage on High Street.	7
Flood/ Erosion	Upgrade road drainage on Fourth Street.	7
Flood/ Erosion	Upgrade road drainage on Timber Lane.	7
All	Cross-reference the Bristol Water System Emergency Plan and the Bristol Emergency Operations Plan.	7
All	Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	6
All	Use the Hazard Mitigation Planning Committee to review the HMP annually.	5
All	Distribute Bristol HMP to abutting communities.	4
Winter Storms	**A.** Identify populations that would be at-risk in a power outage. **B.** Conduct outreach to at-risk populations including education regarding appropriate shelters and resources.	2

F. IMPLEMENTATION OF MITIGATION ACTIONS

There are many factors that influence how a town chooses to spend its energy and resources in implementing recommended actions. Factors include:

- Urgency
- How quickly an action could be implemented
- Likelihood that the action will reduce future emergencies
- Regulations required to implement the action
- Administrative burdens
- Time (both paid and volunteer)
- Funding availability
- Political acceptability of the action.

In the context of these factors, the Committee discussed the mitigation actions and relative level of priority, recognizing that some actions are of greater priority to different town departments. This implementation schedule (Table 20) indicates the estimated cost of implementation, potential funding sources, parties responsible for bringing about these actions, comments, and implementation time frame. Though some of the proposed actions received a high scores in the previous section, the time frame for which the actions are executed depend upon staff time and budgetary limitations. Note: A couple of actions were added after the prioritization process had occurred and identified with an asterisk (*).

Timeframe	Description
Short Term	1 year or less, or ongoing*
Medium Term	2 -3 years
Long Term	4-5 years

*Ongoing - This action will be completed on an ongoing basis throughout the life of the plan.

Actions are listed in order of Time Frame, then by whether it is a mitigation action or not, and then by anticipated cost. To keep the plan current, the implementation schedule should be updated and re-evaluated on a regular basis as outlined in the monitoring section of this plan (Section VI.B).

Table 20: Implementation Schedule for Mitigation Actions by Time Frame

Problem	Hazard	Actions	Anticipated Cost	Potential Funding	Comments	Responsible Party	Time Frame
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on High Street.	$5,000	Warrant Article, Operating Budget, HMGP	Highest priority road drainage for Highway Department. Work scheduled for within the year.	DPW	Short

Problem	Hazard	Actions	Anticipated Cost	Potential Funding	Comments	Responsible Party	Time Frame
Several of the Critical Facilities in town do not have emergency power, potentially limiting their effectiveness during an emergency.	All	Provide emergency power generation for critical facilities (Town Hall, Police Station).	$26,000	HSEM grants for 50%	The CIP does recommend raising matching funds for this. The funds were just approved by voters at the March Town Meeting.	Town Admin., EMD	Short
In the past there have been some 'dead spots' in town.	All	Evaluate and upgrade radio communications for all essential services	$12,660 approved	Town Warrant, Possible Grant Funding	The 2015 warrant article was just approved by voters to upgrade communications at Bristol Hill to fill in the dead spots around town.	Town Admin., EMD	Short
There are some gaps in regional understanding and partnerships.	All	Distribute Bristol HMP to abutting communities.	<$500	Operating Budget	Sharing the HMP with adjacent communities can help foster regional understanding and partnerships.	Town Admin., EMD	Short
The town water system supports the downtown area, including several of the critical facilities. Failure of this system could limit emergency response and sheltering efforts.	All	Cross-reference the Bristol Water System Emergency Plan and the Bristol Emergency Management Plan.	Staff Time 10 hrs.	Operating Budget	These are and should remain two separate plans but they certainly can and should explicitly reference each other.	W & S, EMD	Short
Due to the incomplete list of contacts, it would be difficult to contact all property owners in an emergency.	All	Conduct outreach and education for all types of emergencies, including the importance of providing up-to-date emergency contact information.	$5,000 - $10,000	Operating Budget or possible Town Warrant	Recommendation of Town Water Vulnerability Assessment. Can make better use of NH Alerts, ReadyHN, CodeRED, and PSAs on TV, radio, newsletter, website, and Facebook. Work with EverSource.	EMD, Town Admin.	Ongoing

Problem	Hazard	Actions	Anticipated Cost	Potential Funding	Comments	Responsible Party	Time Frame
There are a number of steps that the owners of homes and businesses in Bristol can do to help make their properties more resilient to a variety of hazards such as snow loads, earthquakes, lightning, high winds, flooding, and extreme temperatures.	All	Conduct outreach and education for all types of emergencies and make informational resources more widely available.*	$5,000 - $10,000	Operating Budget or possible Town Warrant	Discussed in conjunction with communication action above. *Broken out as a separate action after the committee prioritization.	EMD, Town Admin.	Ongoing
Without regular review of mitigation activities, some actions might not be implemented in a timely fashion.	All	Use the Hazard Mitigation Planning Committee to review the HMP annually.	Staff Time 20 hrs/yr.	Operating Budget	Regular review (and record-keeping) can help keep project implementation on track, identify new needs, and facilitate future updates.	EMD	Ongoing (Annual)
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on Fourth Street.	$5,000	Warrant Article, Operating Budget, HMGP	Moderate priority road drainage for Highway Department.	DPW	Medium
Safe drinking water is important to all in town. The downtown area relies on the municipal system, which is well protected from contamination & vandalism except for the Fowler site.	Terrorism	Improve drinking water protection and security at the Fowler site, including fencing.	$40,000 ($15,000 in engineering)	NH DES water protection grant	ARRA funded alarms, gates. The Fowler site has not been done.	W & S	Medium
Power lines tend to come down in severe winter weather (ice, wet snow, high winds), leaving many **at-risk residents** without power.	Winter Storms	**A.** Identify populations that would be at-risk in a power outage. **B.** Conduct outreach to at-risk populations including education regarding appropriate shelters and resources.	$5,000 - $10,000	Operating Budget or possible Town Warrant	Can make better use of NH Alerts, ReadyHN, CodeRED, and PSAs on TV, radio, newsletter, website, and Facebook. Work with EverSource.	EMD, Town Admin.	Medium
Power lines tend to come down in severe winter weather (ice, wet snow, high winds), leaving many residents without power.	Winter Storms	Develop and fund a tree maintenance program.*	$5,000/year	Operating Budget	Some work is done by utility companies, and some tree work is done by DPW on as needed basis. *Action added after committee prioritization.	DPW	Medium

Problem	Hazard	Actions	Anticipated Cost	Potential Funding	Comments	Responsible Party	Time Frame
If the HMP is not referenced in the Master Plan or the HMP recommendations which meet CIP thresholds are not incorporated into the CIP, then it is less likely that the town will be able to implement these recommendations.	All	Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	Staff Time 20 hrs.	Operating Budget	It is incorporated in the LEOP as an appendix and some actions are in the CIP. The Master Plan is undergoing an update and might incorporate the HMP by reference RSA 674:2.III(e).	Town Admin., PB, EMD	Medium
Accidents and fires can occur in confined spaces; responding to emergencies in a confined space requires specialized training and equipment.	Fire	Purchase confined space equipment and ensure that staff has training.	$10,000	Private funds	Have materials at Water & Sewer, including an updated gas detector. FD is coordinating with Freudenberg (biggest user of service) to obtain equipment and training.	Fire Chief	Medium
Comprehensive fire alarm systems can reduce response time, reducing injuries, loss of life and property.	Fire	Improve and expand existing community Gamewell fire alarm system, including public outreach.	$4,000/year	Fire Dept. budget	Work is partially complete. Do need more public outreach.	Fire Chief	Medium
Poor drainage leads to flooding and washouts, which occur regularly at three locations in town.	Flood/ Erosion	Upgrade road drainage on Timber Lane.	$5,000	Warrant Article, Operating Budget, HMGP	Lower priority road drainage for Highway Department.	DPW	Long
There is incomplete communication regarding the location and type of hazardous materials in town, limiting efforts to mitigate accidents and response.	Haz. Materials	Evaluate and map hazardous materials storage sites in town.	Staff Time 40 hrs./year	Operating Budget	Knowing the locations and types of hazardous materials in town can improve prevention of incidents through communication. Work with CNH Haz Mat Team and link with 911 mapping.	Fire Chief	Long

CHAPTER VI: PLAN ADOPTION AND MONITORING

A. IMPLEMENTATION

The Bristol Hazard Mitigation Plan Update Committee, established by the EMD and Board of Selectmen, will meet annually to review the Plan and provide a mechanism for ensuring that an attempt is made to incorporate the actions identified in the plan into ongoing town planning activities. Essential elements of implementation require that all responsible parties for the various recommendations understand what is expected of them, and that they are willing to fulfill their role in implementation. It is therefore important to have the responsible parties clearly identified when the town adopts the final plan. Where appropriate it would be helpful to have any hazard mitigation activities identified in job descriptions.

Many of the actions in this plan rely on the town's operating budget along with grant funds available through FEMA and other sources such as those listed in Appendix B. The Emergency Management Director will coordinate with the department heads, Budget Committee, and Selectmen to ensure that funds and staff time for these projects are available. The EMD and Hazard Mitigation Committee will work with the Selectmen and Capital Improvements Plan (CIP) Committee to incorporate the various projects into subsequent budgets. The EMD will also coordinate with the NH HSEM Field Representative to ensure that the town applies for appropriate grant funds.

For those mitigation actions which involve either revisions to the Subdivision Regulations or development of regulations or standards, members of the Hazard Mitigation Committee will work with the Planning Board to develop appropriate language.

When appropriate, an effort will be made to incorporate this plan into the Emergency Operations Plan. Within a year after the town officially adopts the 2016 update to the Hazard Mitigation Plan, an attempt will be made to have hazard mitigation strategies integrated into these existing mechanisms and into all other ongoing town planning activities.

B. PLAN MAINTENANCE & PUBLIC INVOLVEMENT

The Bristol Hazard Mitigation Planning Committee and the Selectboard, in order to track progress and update the mitigation strategies identified in Chapter V - D & E, will review the Bristol Hazard Mitigation Plan every year or after a hazard event. The town of Bristol Emergency Management Director is responsible for initiating this review and needs to consult with members of the Bristol Committee identified in this Plan. Changes will be made to the Plan to accommodate projects that have failed, are no longer consistent with the timeframe identified, are no longer consistent with the community's priorities, or lack funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, will be reviewed during the monitoring and update of this Plan to determine feasibility of future implementation. In keeping with the process of adopting the Plan, a public hearing will be held to receive public comment on the Plan.

Maintenance and updating will be held during the annual review period and the final product adopted by the Selectboard. The Committee will meet annually as part of this plan maintenance. The Emergency Management Director is also responsible for updating and resubmitting the plan to

FEMA to be re-approved every five years. The EMD will convene a plan update committee in mid-2020 to begin updating this plan before it expires.

On behalf of the Hazard Mitigation Committee, the Emergency Management Director, under direction of the Selectboard, will be responsible for ensuring that town's departments and the public have adequate opportunity to participate in the planning process during the Plan's annual review and during any Hazard Mitigation Committee meetings. Administrative staff may be utilized to assist with the public involvement process.

For each committee meeting, and the annual update process, techniques that will be utilized for public involvement include:

- Provide invitations to Budget Committee members;
- Provide invitations to municipal department heads;
- Post notices of meetings at the Town Hall, Fire Station, and on the town website;
- Submit press releases for publication in the *Newfound Laker, Plymouth Record Enterprise*, *Laconia Daily Sun*, and other appropriate newspapers or media outlets.

Entities to invite to future Hazard Mitigation plan updates include the Emergency Management Directors of the neighboring communities of Alexandria, Bridgewater, Hebron, Hill and New Hampton.

C. SIGNED CERTIFICATE OF ADOPTION

Town of Bristol, NH
Board of Selectmen

A RESOLUTION ADOPTING THE BRISTOL, NH HAZARD MITIGATION PLAN UPDATE 2016

WHEREAS, the town of Bristol has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of flooding, high winds, snow and ice storms, earthquake, and fire resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the town of Bristol has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2016 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between November 2014 and April 2015 regarding the development and review of the Hazard Mitigation Plan Update **2016**; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for the town of Bristol; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the town of Bristol, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the town of Bristol eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the town of Bristol;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by the Emergency Management Director

IN WITNESS WHEREOF, **the undersigned has affixed his/her signature and the corporate seal of the Town Seal or Notary** _____ **this** _____ **day of** _____, ***2016.***

Janet Cote, Selectman _____ Elizabeth Schneider, Selectman _____

Shaun Lagueux, Selectman _____ Paul Mananiello, Selectman _____

Rick Alpers, Selectman _____

APPENDIX A: TECHNICAL RESOURCES

NH Homeland Security and Emergency Management 271-2231
http://www.nh.gov/safety/divisions/HSEM/
Hazard Mitigation Section 271-2231
http://www.nh.gov/safety/divisions/hsem/HazardMitigation/index.html

Federal Emergency Management Agency ..... (617) 223-4175
http://www.fema.gov/
FEMA, National Flood Insurance Program, Community Status Book
http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book

NH Regional Planning Commissions:
Central NH Regional Planning Commission 796-2129
http://www.cnhrpc.org/
Lakes Region Regional Planning Commission 279-8171
http://www.lakesrpc.org/
Nashua Regional Planning Commission 883-0366
http://www.nashuarpc.org/
North Country Council 444-6303
http://www.nccouncil.org/
Rockingham Regional Planning Commission 778-0885
http://www.rpc-nh.org/
Southern New Hampshire Regional Planning Commission 669-4664
http://www.snhpc.org/
Southwest Regional Planning Commission 357-0557
http://www.swrpc.org/
Strafford Regional Planning Commission 742-2523
http://www.strafford.org/
Upper Valley Lake Sunapee Regional Planning Commission 448-1680
http://www.uvlsrpc.org/

NH Governor's Office of Energy and Planning 271-2155
http://www.nh.gov/oep/index.htm
New Hampshire Floodplain Management Program
http://www.nh.gov/oep/programs/floodplainmanagement/index.htm

NH Department of Transportation 271-3734
http://www.nh.gov/dot/index.htm

NH Department of Cultural Affairs 271-2540
http://www.nh.gov/nhculture/
Division of Historical Resources 271-3483
http://www.nh.gov/nhdhr/

NH Department of Environmental Services 271-3503
http://www.des.state.nh.us/
Dam Bureau 271-63406
http://www.des.state.nh.us/organization/divisions/water/dam/index.htm

NH Municipal Association 224-7447
https://nhmunicipal.org/

NH Fish and Game Department 271-3421
http://www.wildlife.state.nh.us/

NH Department of Resources and Economic Development 271-2411
http://www.dred.state.nh.us/
Division of Forests and Lands 271-2214
http://www.nhdfl.org/
Natural Heritage Inventory 271-2215
http://www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
Division of Parks and Recreation 271-3255
http://www.nhstateparks.org/

NH Department of Health and Human Services 271-9389
http://www.dhhs.state.nh.us/

Northeast States Emergency Consortium, Inc. (NESEC) ..... (781) 224-9876
http://www.nesec.org/

US Department of Commerce ..... (202) 482-2000
http://www.commerce.gov/
National Oceanic and Atmospheric Administration ..... (202) 482-6090
http://www.noaa.gov/
National Weather Service, Eastern Region Headquarters
http://www.erh.noaa.gov/
National Weather Service, Tauton, Massachusetts ..... (508) 824-5116
http://www.erh.noaa.gov/er/box/
National Weather Service, Gray, Maine ..... (207) 688-3216
http://www.erh.noaa.gov/er/gyx/

US Department of the Interior
http://www.doi.gov/
US Fish and Wildlife Service 225-1411
http://www.fws.gov/
US Geological Survey 225-4681
http://www.usgs.gov/
US Geological Survey Real Time Hydrologic Data
http://waterdata.usgs.gov/nwis/rt
US Army Corps of Engineers ..... (978) 318-8087
http://www.usace.army.mil/

US Department of Agriculture
http://www.usda.gov/wps/portal/usdahome
US Forest Service ..... (202) 205-8333
http://www.fs.fed.us/

EverSource (Electric Power) ..... (800) 662-7764
https://www.eversource.com/content/
New Hampshire Electrical Cooperative ..... (800) 698-2007
http://www.nhec.com/

Cold Region Research Laboratory 646-4187
http://www.crrel.usace.army.mil/

National Emergency Management Association ..... (859) 244-8000
http://nemaweb.org

National Aeronautics and Space Administration
http://www.nasa.gov/
NASA Optical Transient Detector – Lightning and Atmospheric Research
http://thunder.msfc.nasa.gov/

National Lightning Safety Institute
http://lightningsafety.com/

The Tornado Project Online
http://www.tornadoproject.com/

National Severe Storms Laboratory
http://www.nssl.noaa.gov/

Plymouth State University Weather Center
http://vortex.plymouth.edu/

APPENDIX B: MITIGATION FUNDING RESOURCES

There are numerous potential sources of funding to assist with the implementation of mitigation efforts. Two lists of state and federal resources are provided below. Some of these may not apply or be appropriate for Bristol. The NH Homeland Security and Emergency Management Field Representative for Grafton County can provide some assistance.

404 Hazard Mitigation Grant Program (HMGP) ..... NH Homeland Security and Emergency Management

406 Public Assistance and Hazard Mitigation ..... NH Homeland Security and Emergency Management

Community Development Block Grant (CDBG) ..... NH HSEM, NH OEP, also refer to RPC

Dam Safety Program ..... NH Department of Environmental Services

Emergency Watershed Protection (EWP) Program ..... USDA, Natural Resources Conservation Service

Flood Mitigation Assistance Program (FMAP) ..... NH Homeland Security and Emergency Management

Highway Safety Improvement Program ..... NH Department of Transportation

Mitigation Assistance Planning (MAP) ..... NH Homeland Security and Emergency Management

Mutual Aid for Public Works ..... NH Municipal Association

National Flood Insurance Program (NFIP) ..... NH Office of Energy & Planning

Project Impact ..... NH Homeland Security and Emergency Management

Roadway Repair & Maintenance Program(s) ..... NH Department of Transportation

Shoreline Protection Program ..... NH Department of Environmental Services

Various Forest and Lands Program(s) ..... NH Department of Resources & Economic Development

Wetlands Programs ..... NH Department of Environmental Services

State Aid Bridge Program for Communities ..... NH Department of Transportation

Contribution to Damage Losses (RSA 235:34) ..... NH Department of Transportation

Federal Emergency Management Agency (FEMA)

FEMA makes funds available for mitigation efforts to reduce future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Flood Mitigation Assistance Program (FMA)	Provides funding to implement measures to reduce or eliminate the long-term risk of flood damage http://www.fema.gov/government/grant/fma/index.shtm	States and localities
Hazard Mitigation Planning Grant (HMPG)	Provides grants to implement long-term hazard mitigation measures after a major disaster declaration http://www.fema.gov/government/grant/hmpg/index.shtm	Open
National Flood Insurance Program (NFIP)	Enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages http://www.fema.gov/business/nfip/	States, localities, and individuals
Pre-Disaster Mitigation Program (PDM)	Provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event http://www.fema.gov/government/grant/pdm/index.shtm	States, localities, and tribal governments

Environmental Protection Agency (EPA)

The EPA makes funds available for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulation. http://www.epa.gov/OWOW/NPS/cwact.html	Funds are provided only to designated state and tribal agencies
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals, and others for high-priority water-quality activities. http://www.epa.gov/owow/wetlands/initiative/srf.html	States and Puerto Rico
Wetland Program Development Grants	Funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. http://www.epa.gov/owow/wetlands/initiative/#financial	See website

Floodplain, Wetland and Watershed Protection Programs

US Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service offer funding and technical support for programs designed to protect floodplains, wetlands, and watersheds.

Mitigation Funding Sources Program	Details	Notes
USACE Planning Assistance to States (PAS)	Fund plans for the development and conservation of water resources, dam safety, flood damage reduction and floodplain management. http://www.lre.usace.army.mil/planning/assist.html	50 percent non-federal match

USACE Flood Plain Management Services (FPMS)	Technical support for effective floodplain management. http://www.lrl.usace.army.mil/p3md-o/article.asp?id=9&MyCategory=126	See website
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse of dredged materials. http://el.erdc.usace.army.mil/index.cfm	See website
U.S. Fish & Wildlife Service Coastal Wetlands Conservation Grant Program	Matching grants to states for acquisition, restoration, management or enhancement of coastal wetlands. http://ecos.fws.gov/coastal_grants/viewContent.do?viewPage=home	States only. 50 percent federal share
U.S. Fish & Wildlife Service Partners for Fish and Wildlife Program	Program that provides financial and technical assistance to private landowners interested in restoring degraded wildlife habitat. http://ecos.fws.gov/partners/viewContent.do?viewPage=home	Funding for volunteer-based programs

Bureau of Land Management

The Bureau of Land Management (BLM) has two technical assistance programs focused on fire mitigation strategies at the community level.

Mitigation Funding Sources Program	Details	Notes
Community Assistance and Protection Program	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas across the country at-risk for wildland fire to work with local residents. http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html	See website
Firewise Communities Program	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts. http://www.firewise.org/	See website

Housing and Urban Development

The Community Development Block Grants (CDBG) administered by HUD can be used to fund hazard mitigation projects.

Mitigation Funding Sources Program	Details	Notes
Community Development Block Grants (CDBG)	Grants to develop viable communities, principally for low and moderate income persons. CDBG funds available through Disaster Recovery Initiative. http://www.hud.gov/offices/cpd/communitydevelopment/programs/	Disaster funds contingent upon Presidential disaster declaration
Disaster Recovery Assistance	Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes. http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm	Individuals

Neighborhood Stabilization Program	Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis. http://www.hud.gov/offices/cpd/communitydevelopment/programs/neighborhoodspg/	State and local governments and non-profits

U.S. Department of Agriculture

There are multiple mitigation funding and technical assistance opportunities available from the USDA and its various sub-agencies: the Farm Service Agency, Forest Service, and Natural Resources Conservation Service.

Mitigation Funding Sources Agency Program	Details	Notes
USDA Smith-Lever Special Needs Funding	Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html	Population under 20,000
USDA Community Facilities Guaranteed Loan Program	This program provides an incentive for commercial lending that will develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population under 20,000
USDA Community Facilities Direct Loans	Loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Community Facilities Direct Grants	Grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Farm Service Agency Disaster Assistance Programs	Emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/	Farmers and ranchers
USDA Forest Service National Fire Plan	Funding for organizing, training, and equipping fire districts through Volunteer, State and Rural Fire Assistance programs. Technical assistance for fire related mitigation. http://www.forestsandrangelands.gov/	See website
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. http://www.fs.fed.us/spf/coop/programs/eap/	80% of total cost of project may be covered
USDA Natural Resources Conservation Service Emergency Watershed Protection Support Services	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. http://www.nrcs.usda.gov/programs/ewp/	See website
USDA Natural Resources Conservation	Funds for soil conservation; flood prevention; conservation, development, utilization and disposal of	See website

Service Watershed Protection and Flood Prevention	water; and conservation and proper utilization of land. http://www.nrcs.usda.gov/programs/watershed/index.html	

Health and Economic Agencies

Alternative mitigation programs can be found through health and economic agencies that provide loans and grants aimed primarily at disaster relief.

Federal Loans and Grants for Disaster Relief Agency Program	**Details**	**Notes**
Department of Health & Human Services Disaster Assistance for State Units on Aging (SUAs)	Provide disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. http://www.aoa.gov/doingbus/fundopp/fundopp.asp	Areas designated in a Disaster Declaration issued by the President
Economic Development Administration (EDA) Economic Development Administration Investment Programs	Grants that support public works, economic adjustment assistance, and planning. Certain funds allocated for locations recently hit by major disasters. http://www.eda.gov/AboutEDA/Programs.xml	The maximum investment rate shall not exceed 50 percent of the project cost
U.S. Small Business Administration Small Business Administration Loan Program	Low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster damaged property. http://www.sba.gov/services/financialassistance/index.html	Must meet SBA approved credit rating

APPENDIX C: PUBLICITY AND INFORMATION

The Bristol EMD invited key personnel to be on the Hazard Mitigation Plan Update Committee. An invitation to members of the public was also posted on the town website. Committee meetings were posted at the Bristol Town Offices. They were also posted on the LRPC web calendar and through regional e-blasts, reaching approximately 900 individuals and groups around the region. Press releases were sent to the weekly *Plymouth Record Enterprise* and the local daily papers *Laconia Citizen* and *Laconia Daily Sun* prior to the Committee meetings. Several informational handouts and the 2010 Hazard Mitigation Plan were distributed to the committee and available at all meetings. The survey was made available at the town office, the public safety building, the town website, and on the Bristol Fire Department's Facebook page.

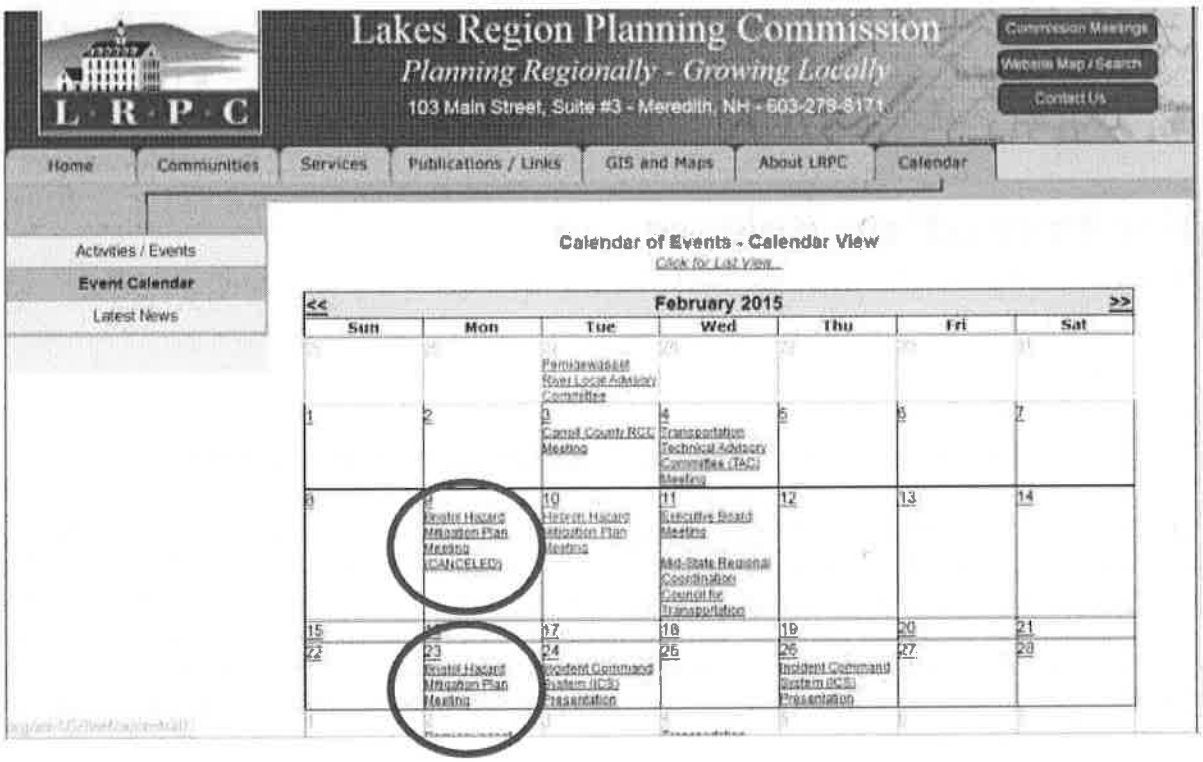
Hazard Mitigation Plan

The State of New Hampshire Department of Homeland Security has received a grant to assist towns with updating their Hazardous Mitigation Plans.

The Town of Bristol's Hazardous Mitigation Plan is due to be updated in 2015. However the process will start in September 2014.

The Town is seeking members of the community to serve as committee members to assist with the development of this plan.

If you are interested on serving on this committee or have any questions **contact Fire Chief Steve Yannuzzi at 744-2632 or syannuzzi@townofbrsitolnh.org**


Lakes Region Planning Commission
Planning Regionally - Growing Locally
103 Main Street, Suite #3 - Meredith, NH - 603-279-8171
Commission Meetings
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Calendar
Activities / Events
Event Calendar
Latest News
Calendar of Events - Calendar View
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<<
February 2015
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Sun
Mon
Tue
Wed
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Fri
Sat
Pemigewasset River Local Advisory Committee
Carroll County RCC Meeting
Transportation Technical Advisory Committee (TAC) Meeting
Executive Board Meeting
Mid-State Regional Coordination Council for Transportation
Hazard Mitigation Plan Meeting (CANCELED)
Hazard Mitigation Plan Meeting
Incident Command System (ICS) Presentation
Hazard Mitigation Plan Meeting
Incident Command System (ICS) Presentation

LAKES REGION PLANNING COMMISSION

103 Main Street, Suite #3
Meredith, NH 03253
tel (603) 279-8171
fax (603) 279-0200
www.lakesrpc.org

October 30, 2014

For Immediate Release

Contact: David Jeffers, 279-8171, djeffers@lakesrpc.org

Town of Bristol Hazard Mitigation Plan Meeting

The Bristol Hazard Mitigation Plan Committee will begin the process of updating its 2010 Hazard Mitigation Plan. The committee, which is represented by a variety of local interests, will focus on the natural and manmade hazards that put Bristol at risk as well as the development of recommendations to protect the safety and well being of town residents. The committee will have its first meeting on November 21, 2014 at the Bristol Town Office building (230 Lake Street) starting at 1:30 PM. Residents of Bristol and representatives from neighboring communities are encouraged to attend and provide input.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Bristol will be determined as a result of this process. With the update to the Hazard Mitigation Plan, community leaders will be able to prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Bristol one step closer to that goal.

For more information please call Chief Steve Yannuzzi, Bristol Fire Chief and Emergency Management Director at 744-2632 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-5341.

Bristol Hazard Mitigation Plan Committee meets Jan. 12

BRISTOL — The Bristol Hazard Mitigation Plan Committee has begun the process of updating its 2010 Hazard Mitigation Plan.

The committee is represented by a variety of local interests including the Fire, Police, and Public Works Departments, the Planning Board, the Town Administrator, the Newfound Area Nursing Association, and a local business owner. The group is focusing on the natural and manmade hazards that put Bristol at risk as well as the development of recommendations to protect the safety and well being of town residents.

The committee will have its next meeting on Jan. 12 at the Bristol Fire Department (85 Lake St.) starting at 5 p.m. Residents of Bristol and representatives from neighboring communities are encouraged to attend and provide input.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Bristol will be determined as a result of this process; in the 2010 Plan, these included urban fire, lightning, and winter hazards. With the update to the Hazard Mitigation Plan, community leaders will be able to evaluate the status of current plans, policies, and actions then develop and prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Bristol one step closer to that goal.

For more information, please call Chief Steve Yannuzzi, Bristol Fire Chief and Emergency Management Director at 744-2632 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-5341.

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Department Deputy
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Kiwnanis Club raffling 55-inch TV just in time for March Madness

LACONIA — The Kiwanis Club of Laconia is conducting a March Madness 55-inch LG SMART TV Raffle as it puts on a full-court press for fundraising. Tickets are $10 and the winner's name will be drawn on March 16 at City Hall by Mayor Ed Engler, just in time for the start of the NCAA Division 1 Basketball Tournament — March Madness.

"Picture yourself watching your favorite college team driving in for the winning hoop in the Final Four on a state-of-the-art television," said Kiwanis President John Walker. "Not a basketball fan? No problem. This television can dial up anything you want — it's that SMART."

"This must-have TV is now on display at [illegible] on Main Street in Laconia," continued Walker, "where you can buy as many $10 raffle tickets as you need to put the remote in your hand. Walk in and check it out. You will be happy you took a chance."

Raffle tickets are also available at the Belknap Mill and from any Kiwanis Club member.

The club meets on the second and fourth Monday evenings of every month for a light dinner and informative program. More information is available online at www.laconiakiwanis.com.

The Kiwanis Club motto is, "Improving our communities, one child at a time." All proceeds from the TV raffle — as is true of the proceeds from all Kiwanis fund-raising activity — go back into the community for the benefit of children.

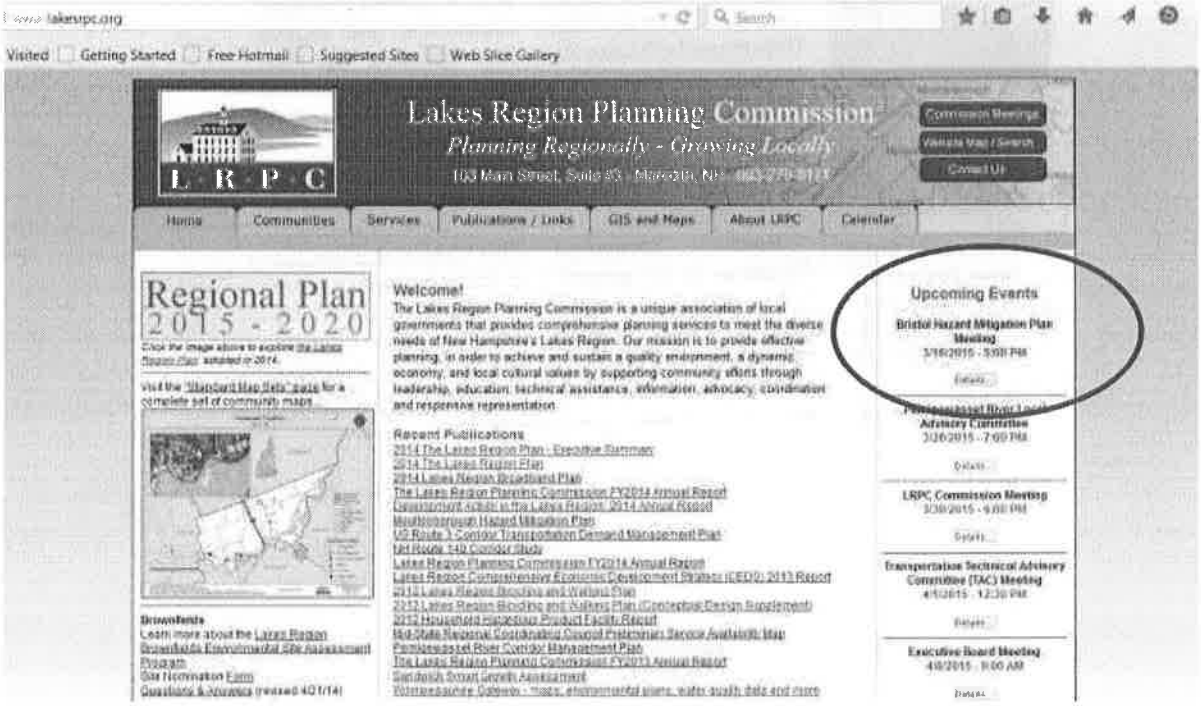
Bristol Hazard Mitigation meeting Mon.

BRISTOL — The Bristol Hazard Mitigation Steering Committee is in the process of updating its 2010 Hazard Mitigation Plan. A meeting will be held on Monday, February 9 at the Bristol Fire Department starting at 5 p.m.

The committee is represented by a variety of local interests including the Fire, Police, and Public Works Departments, the Planning Board, the Town Administrator, the Newfound Area Nursing Association, and a local business owner. The group is focusing on the natural and man made hazards that put Bristol at risk as well as the development of recommendations to protect the safety and well being of town residents.

Hazard Mitigation Planning is an important to reducing disaster losses as are appropriate zoning and land use ordinances. The most significant areas of concern for Bristol are being determined through this process; in the 2010 Plan these included urban fire, lightning, and winter hazards. With the update to the Hazard Mitigation Plan, community leaders will be able to evaluate the status of current plans, policies, and actions then develop and prioritize actions to reduce the impacts of these and other hazards.

For more information please call Chief Steve Yannazzi, Bristol Fire Chief and Emergency Management Director at 744-2632 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-5341.



Lakes Region Planning Commission <admin@lakesrpc.org>

April 2015 News from the Lakes Region Planning Commission

to

LRPC Executive Board Meeting

LRPC Annual Meeting

About LRPC

The Lakes Region Planning Commission is established according to state law (NH RSA 36:45) to provide area communities with the opportunity to prepare a coordinated plan of development for the region.

With a varied area [illegible] over 1,200 square miles in Belknap, Carroll, Grafton, and Merrimack Counties, the LRPC also provides a wide range of planning services to member municipalities.

We address regional issues that are beyond the capability of individual towns or cities, yet affect us

Contact: Michael Ward - (603) 279-5337

Mid-State Regional Coordination Council for Transportation

Date: Tuesday, April 14, 2015
Time: 1:00 PM
Location:

The Good Life Center
254 North State Street
Concord, NH

Contact: David Jeffers - 279-5341

http://[illegible]

Bristol Hazard Mitigation Plan Meeting

Date: Monday, April 20, 2015
Time: 6:00 PM
Location:

Bristol Fire Station
65 Lake Street
Bristol, NH

For more information contact Chief Steve Yannuzzi, Bristol Fire Chief and Emergency Management Director at 744-2032 or David Jeffers, Regional Planner at Lakes Region Planning Commission at 279-5341

State and Local Mitigation Planning

Building stronger and safer

Hazard mitigation planning is the process state, local and tribal governments use to identify risks and vulnerabilities associated with natural disasters and to develop long-term strategies for protecting people and property in future hazard events. The process results in a mitigation plan that offers a strategy for breaking the cycle of disaster damage, reconstruction and repeated damage and a framework for developing feasible and cost-effective mitigation projects. Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and Tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

Reducing risks through mitigation planning

A hazard mitigation plan is a long-term strategy for reducing disaster losses. The planning process promoted by the Disaster Mitigation Act of 2000 is as important as the resulting plan because it encourages jurisdictions to integrate mitigation with day-to-day decision-making regarding land-use planning, floodplain management, site design and other functions.

Mitigation planning elements

- Public involvement – In addition to government agencies involved in incident management, floodplain management and economic development, the planning process usually involves a range of stakeholders, including representatives of neighborhood groups, civic organizations, academia, environmental groups, the business community and individual citizens. Involving stakeholders is essential to determining the most vulnerable populations and facilities in the community and to assuring community wide support for the plan.
- Risk assessment – A risk assessment is the process of identifying natural hazards and risks associated with them, including threats to public health and safety, property damage and economic loss. The assessment answers the fundamental question, "What would happen if a natural disaster occurred?" and provides a factual basis for the mitigation activities proposed in the strategy. The assessment includes a description of the type, location and extent of natural hazards; the jurisdiction's vulnerability to the hazards; and the type and numbers of buildings, infrastructure and critical facilities located in identified hazard areas.
- Mitigation strategy – Based on the risk assessment, State, local and Tribal governments develop mitigation goals and objectives and a strategy for mitigating disaster losses. The strategy sets forth an approach for implementing activities that are cost-effective, technically feasible and environmentally sound.

Hazard mitigation plan required to receive HMGP Project Grants

Local jurisdictions are required by federal law to have a FEMA-approved hazard mitigation plan in order to receive Pre-Disaster Mitigation (PDM) or Hazard Mitigation Grant Program (HMGP) project grant funding. However, in extraordinary circumstances, HMGP funds can be awarded to communities that agree to develop a hazard mitigation plan within 12 months of receiving the project grant. Every State has a FEMA-approved hazard mitigation plan, though many local jurisdictions still do not.

Fact Sheet

State and Local Mitigation Planning

FEMA

Mitigation Examples

History shows that the physical, financial and emotional losses caused by disasters can be reduced significantly through mitigation planning. Mitigation focuses attention and resources on solving a particular problem (such as reducing repetitive flood losses) and thereby produces successive benefits over time. Through implementation of local floodplain ordinances, for example, it is estimated that $1.1 billion in flood damages are prevented annually.

Mitigation includes a broad range of activities designed to protect homes, schools, public buildings and critical facilities. Examples include the following types of projects:

- Adopting and enforcing more stringent building codes, flood-proofing requirements, seismic design standards, or wind-bracing requirements for new construction or the retrofit of existing buildings.
- Exceeding the National Flood Insurance Program (NFIP) floodplain management regulations by elevating structures above the base flood elevation (BFE) in high-risk areas.
- Adopting stricter development regulations and zoning ordinances that steer development away from areas subject to flooding, storm surge, or coastal erosion.
- Retrofitting public buildings, schools and critical facilities, such as police and fire stations, to withstand hurricane-strength winds or ground shaking from earthquakes.
- Using public funds to acquire damaged homes or businesses in flood-prone areas, demolish or relocate the structures and use the property for open space, wetlands, or recreational uses.
- Building community shelters and "safe rooms" to help protect people in public buildings and schools in hurricane- and tornado-prone areas.

Planning tool available for government agencies

FEMA has developed a number of planning tools to help government agencies develop mitigation plans. These include how-to guides, CD ROMs and online information about organizing a planning team, involving stakeholders, conducting risk assessments, evaluating potential mitigation measures, conducting benefit-cost analyses and other planning issues.

For more information

Please visit: http://www.fema.gov/plan/mitplanning/index.

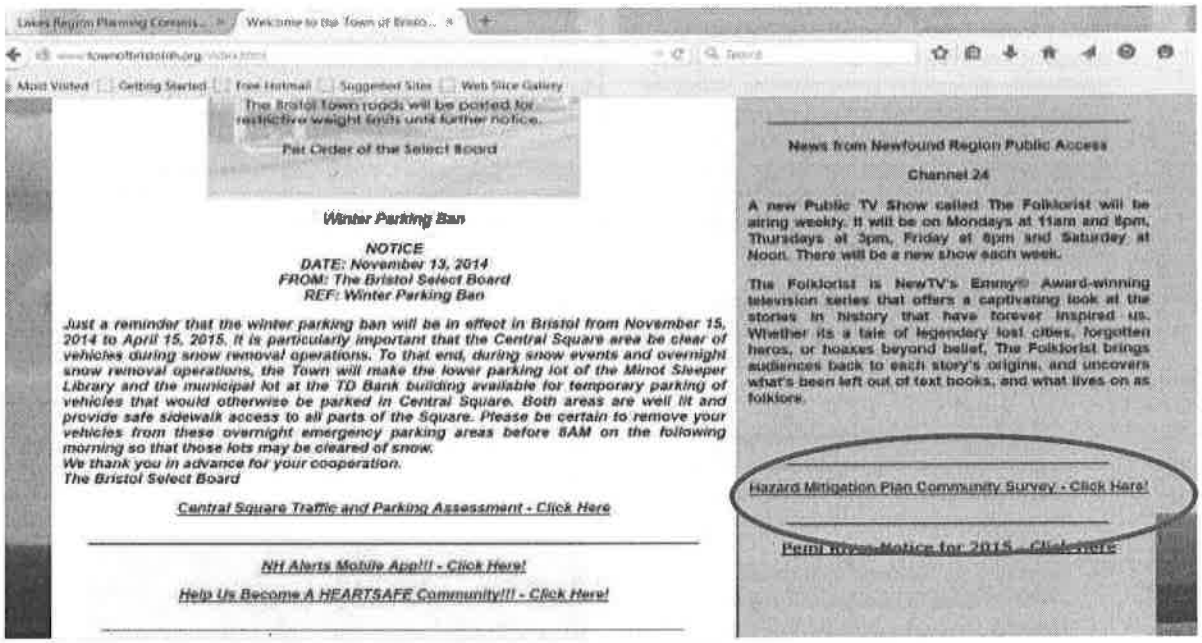
For state name disaster recovery, visit www.fema.gov or your state Web-site.

FEMA

"FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

APPENDIX D: HAZARD MITIGATION SURVEY

As short survey of concerns and input from the public was made available in both paper and electronic format for a bit more than a month, including a one week extension of the original deadline. Sixteen responses were received. The input from this survey was discussed at committee meetings.



The Bristol Town roads will be posted for restrictive weight limits until further notice.

Per Order of the Select Board

Winter Parking Ban

NOTICE
DATE: November 13, 2014
FROM: The Bristol Select Board
REF: Winter Parking Ban

Just a reminder that the winter parking ban will be in effect in Bristol from November 15, 2014 to April 15, 2015. It is particularly important that the Central Square area be clear of vehicles during snow removal operations. To that end, during snow events and overnight snow removal operations, the Town will make the lower parking lot of the Minot Sleeper Library and the municipal lot at the TD Bank building available for temporary parking of vehicles that would otherwise be parked in Central Square. Both areas are well lit and provide safe sidewalk access to all parts of the Square. Please be certain to remove your vehicles from these overnight emergency parking areas before 8AM on the following morning so that those lots may be cleared of snow.
We thank you in advance for your cooperation.
The Bristol Select Board

Central Square Traffic and Parking Assessment - Click Here

NH Alerts Mobile App!!! - Click Here!

Help Us Become A HEARTSAFE Community!!! - Click Here!

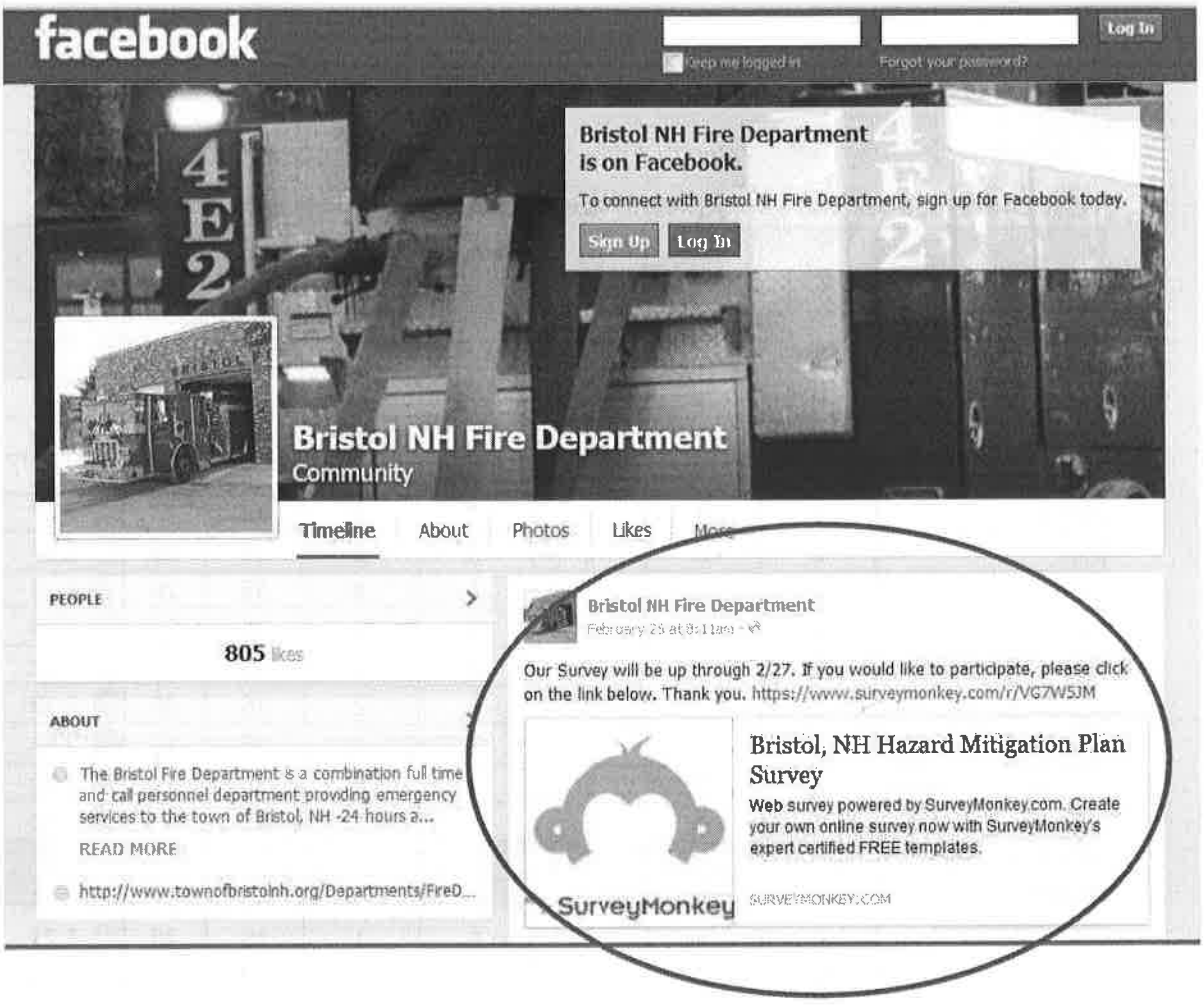
News from Newfound Region Public Access

Channel 24

A new Public TV Show called The Folklorist will be airing weekly. It will be on Mondays at 11am and 8pm, Thursdays at 3pm, Friday at 6pm and Saturday at Noon. There will be a new show each week.

The Folklorist is NewTV's Emmy® Award-winning television series that offers a captivating look at the stories in history that have forever inspired us. Whether its a tale of legendary lost cities, forgotten heros, or hoaxes beyond belief, The Folklorist brings audiences back to each story's origins, and uncovers what's been left out of text books, and what lives on as folklore.

Hazard Mitigation Plan Community Survey - Click Here!



Bristol, NH Hazard Mitigation Plan Update
Public Survey

Background: The Bristol Hazard Mitigation Plan Committee has begun the process of updating its 2010 Hazard Mitigation Plan. The committee is represented by a variety of local interests and is focusing on the natural and human-related hazards that put Bristol at risk as well as the development and prioritization of recommendations to protect the safety and well-being of town residents. The committee is seeking your input; please take a few moments to complete this the five questions in this survey regarding hazard mitigation in Bristol.

1. **How concerned are you about the following disasters affecting Bristol?**

Natural Hazards	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned	Number of responses	Total	Average
Value	4	3	2	1	0			
Drought	0	2	5	7	1	15	23	1.53
Earthquake	0	2	3	6	4	15	18	1.20
Extreme Heat	0	3	4	7	1	15	24	1.60
Flood	1	7	3	3	1	15	34	2.27
Hail	0	6	2	6	1	15	28	1.87
Hurricane	0	4	5	4	2	15	26	1.73
Ice Jam	0	6	5	3	1	15	31	2.07
Landslide	1	1	5	5	3	15	22	1.47
Lightning	1	7	4	2	2	16	35	2.19
Severe Winter Storm	3	7	4	1	1	16	42	2.63
Tornado/Downburst	0	3	5	5	3	16	24	1.50
Wildfire	1	4	5	4	1	15	30	2.00
Human-Related Events								
Conflagration - Urban Fire	0	4	4	6	1	15	26	1.73
Dam Failure	0	3	4	5	3	15	22	1.47
Epidemic	0	7	2	5	1	15	30	2.00
MV Accident involving Hazardous Materials	1	5	2	6	1	15	29	1.93
Terrorism	1	3	5	5	2	16	28	1.75

2. **What is the most effective way for you to receive information about how to make members of your household and your home safer from disasters? (Please check up to three.)**

Newspaper	9		Other	n/a
Radio	7		schools	4
Television	14		mailings	8
Internet	1		fire department	8
town website	9		public workshops	4
electronic newsletter	1		town hall/building permit	4
social media	8		other	3

3. **Natural hazards can have a significant impact on a community but planning for these events can help lessen the impacts. The following statements will help determine citizen priorities regarding planning for natural hazards in Bristol.**

Statements	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Number of responses	Total	Average
	4	3	2	1	0			
Protecting private property	5	8	1	0	0	14	46	3.29
Protecting critical facilities (such as transportation networks, fire stations, medical facilities)	15	0	0	0	0	15	60	4.00
Preventing development in hazard areas	6	6	2	0	0	14	46	3.29
Enhancing the functions of natural features (such as streams and wetlands)	3	7	3	2	0	15	41	2.73
Protecting historical and cultural landmarks	3	6	2	2	2	15	36	2.40
Protecting and reducing damage to utilities	9	4	0	1	0	14	49	3.50
Strengthening emergency services (police, fire, ambulance)	8	4	4	0	0	16	52	3.25
Disclosing natural hazards during real estate transactions	6	7	0	1	0	14	46	3.29
Promoting cooperation among public agencies, citizens, non-profit organizations,	8	6	1	1	0	16	53	3.31

4. **We would appreciate any information that you are willing to share regarding you and your household. (Check all that apply.)**
   - o Resident of Bristol **[5]**
   - o Resident of a nearby community
   - o Visitor
   - o Work in Bristol **[1]**
   - o Business owner
   - o Homeowner **[4]**
   - o Renter

5. **Please feel free to provide any other information related to hazard mitigation in Bristol in the space below.**

   No additional information was provided.

After completing the survey, please put it in the collection box or return it to the Bristol Fire Station 85 Lake Street Bristol, NH 03222 **by February 19, 2015** (extended to Feb. 27).
For more information please contact Chief Steve Yannuzzi, Bristol Fire Chief and Emergency Management Director at 744-2632 or syannuzzi@townofbristolnh.org.

APPENDIX E: MEETING AGENDAS AND NOTES

This section contains copies of the Committee meeting agendas, notes, and a summary of participation. The first Committee meeting was held in the Bristol Town Office, the remaining meetings were held at the Bristol Fire Station. Agendas were developed by the LRPC planner, and meetings were chaired by the Emergency Management Director; copies were posted and sent to neighboring EMDs. At each meeting there was opportunity for public input.

Bristol Hazard Mitigation Plan Update Committee

November 21, 2014 – 1:30 PM
Bristol Town Office building
230 Lake Street Bristol, NH

AGENDA

1. Introductions

2. What is Hazard Mitigation Planning?
   a. Mitigation planning vs. emergency response planning

3. Purpose of Committee and Community Outreach

4. Review Community Capabilities
   a. Planning & Regulatory
   b. Administrative and Technical
   c. Financial
   d. Education & Outreach
   e. National Flood Insurance Program (NFIP)

5. Discussion of Development Trends

6. Identify Critical Facilities on base map

7. Identify all hazards (past – especially since 2010 & potential) in the Bristol area and mark on map

8. Set schedule for future meetings

9. Public Input

Goals for next meeting:

   a. Risk Assessment, including data collection
   b. Town Goals

FEMA

(Back of agenda)

The focus of this process is **mitigation**, which is action taken to reduce or eliminate long-term risk to hazards.
Mitigation is different from preparedness, which is action taken to improve emergency response or operational preparedness.

Definitions for evaluation of Capabilities

Poor (P)..... *The policy, plan, mutual aid system or action does* ***not work as well as it should*** *and* ***often*** *falls short of meeting its goals.*

Fair (F)..... *The policy, plan, mutual aid system or action does* ***not work as well as it should*** *and* ***sometimes*** *falls short of meeting its goals.*

Good (G)..... *The policy, plan, mutual aid system or action* ***works well*** *and* ***is achieving its goals.***

Excellent (E)..... *The policy, plan, mutual aid system or action* ***works very well*** *and* ***often exceeds its goals.***

Untested (U)..... *The policy, plan, mutual aid system or action* ***has not yet been developed, tested, or built*** *and* ***cannot yet be evaluated.***

Bristol Hazard Mitigation Plan (HMP) Update Committee Meeting
November 21, 2014
Bristol Town Offices
NOTES

In Attendance:

Steve Yannuzzi	Bristol Fire Department, Chief Emergency Management Director (EMD)
Michael Lewis	Bristol Police Department, Chief
Mark Bucklin	Bristol Highway Department, Superintendent
Denice DeStefano	Bristol Planning Board Chair Bristol Business Owner
Amanda Drake, RN	Newfound Area Nursing Association
Paul Hatch	NH Homeland Security and Emergency Management, Field Rep
David Jeffers	Lakes Region Planning Commission (LRPC), Regional Planner

After Introductions, the distinctions between Mitigation and Response planning were discussed, and reviewed the plan development process.

- Chief Yannuzzi noted that Michael Capone, Bristol Town Administrator is a Committee member and will keep the Selectmen abreast of the update process, he was unable to attend this meeting. Several business owners and members of the public were invited to participate but declined. There was discussion about additional methods of outreach and ways to provide opportunity for public feedback.
- D. Jeffers explained that hazard mitigation is sustained action to reduce or eliminate long-term risk to people and property from hazards, NOT preparing for an impending event, immediate response, or short-term recovery; for example installing a larger culvert in advance as opposed to fixing a blown out culvert. (Several FEMA handouts were provided to all.)
- An adopted HMP is a requirement for receiving FEMA funding for mitigation projects.
- The LRPC has been contracted by NH HSEM (Homeland Security and Emergency Management) to assist communities in updating their HMP, which require updating every five years. The funding for this program comes from FEMA (Federal Emergency Management Agency).
- The focus will be on any local changes that may have occurred in terms of hazards, facilities, and priorities since 2010.
- Since 2010 there have also been some changes to the interpretation of the elements that are required by FEMA with greater requirements for quantifying the potential impacts of hazards, evaluation of plans, policies, and actions, more specifics about mitigation actions, and more documentation of opportunities for public involvement.
- LRPC will research and map information, facilitate meetings, and write drafts of the plan.
- The committee is responsible for providing local information, brainstorming mitigation actions, and prioritizing those actions.
- The draft plan will be reviewed by the committee and the public, sent to NH HSEM and FEMA for review and conditional approval, and ultimately needs to be adopted by the Selectmen.

Review of Community Capabilities

- The committee reviewed a matrix of more than two dozen different plans, policies, and protections. These included the Bristol Master Plan, Zoning Ordinances and Regulations, staffing levels and maintenance policies, and public outreach programs.
- Restricted funding was noted as a factor limiting the implementation of several recommended policies and projects.
- There have not been major changes since 2010. It was noted that some culvert enlargement has occurred (Hemlock Brook Rd.) and a couple of dams have been removed during the last five years.
- Flooding has not been much of a problem; geography tends to divert storms away from the town.
- The committee discussed sheltering facilities and resources.
- There was discussion about the need for greater NIMS/ICS training in town.

Development Trends since 2010 were discussed.

- There is a new elderly housing facility in town along with a six-unit subdivision along the lakeshore.
- There has been some development along near the Bridgewater town line; runoff and erosion from this was a concern. The Planning Board and Fire Department required a retention pond.

For the next meeting

- Committee members were asked to review the listed hazards hazard events from the past to rate the probability of occurrence using the defined rating scale.
- Members were also asked to review the status of the 18 Actions identified in the 2010 Plan and rate their effectiveness.

Next meeting: 12/8/14 at 5:00 PM in the Bristol Fire Station

Future meetings: **1/12/15 at 5:00 Location TBD**
2/2/15 at 5:00 Location TBD
2/23/15 at 5:00 Location TBD
3/16/15 at 5:00 Location TBD

Bristol Hazard Mitigation Plan Update Committee

December 8, 2014 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions

2. Review of Capabilities

3. Risk Assessment
    a. Hazards
        i. location
        ii. extent
        iii. frequency
    b. Assets
        i. people
        ii. economy
        iii. built environment
            1. existing structures
            2. infrastructure
            3. critical facilities
            4. cultural resources
            5. future development
    c. Impacts

4. Status of 2010 Mitigation Projects

5. Schedule next meeting

6. Public Input

Goals for next meeting:

a. Goals
b. Gaps
c. Mitigation Actions

FEMA

(This reference was on the back of this and all subsequent agendas through March 23.)

The focus of this process is mitigation, which is action taken to reduce or eliminate long-term risk to hazards.

Mitigation is different from preparedness, which is action taken to improve emergency response or operational preparedness.

Definitions for evaluation of Capabilities

Poor (P)..... *The policy, plan, mutual aid system or action does* ***not work as well as it should*** *and* ***often*** *falls short of meeting its goals.*

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Good (G)..... *The policy, plan, mutual aid system or action* ***works well*** *and* ***is achieving its goals.***

Excellent (E)..... *The policy, plan, mutual aid system or action* ***works very well*** *and* ***often exceeds its goals.***

Untested (U)..... *The policy, plan, mutual aid system or action* ***has not yet been developed, tested, or built*** *and* ***cannot yet be evaluated.***

Location

- **Negligible:** <10 percent of planning area or isolated single-point occurrences.
- **Limited** 10 to 25 percent of the planning area or limited single-point occurrences.
- **Significant** 25 - 75 percent of the planning area or frequent single-point occurrences.
- **Extensive** 75 - 100 percent of the planning area or consistent single-point occurrences.

Extent

- **Weak:** limited magnitude, slow onset, short duration, little damage.
- **Moderate:** moderate magnitude, moderate onset speed, moderate duration, some damage/loss of service for days.
- **Severe:** Severe magnitude, fast speed of onset, long duration, devastating damage and loss of service for weeks
- **Extreme:** Extreme magnitude, immediate onset, extended duration, catastrophic damage, uninhabitable conditions.

Probability of Future Events

- **Unlikely:** <1% probability of occurrence in the next year or a recurrence interval of more than every 100 years.
- **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- **Highly Likely:** 90 to 100% probability of occurrence in the next year or a recurrence interval of less than 1 year.

Bristol Hazard Mitigation Plan (HMP) Update Committee Meeting
December 8, 2014
Bristol Fire Department
NOTES

In Attendance:

Michael Capone	Bristol Town Administrator
Jeff Chartier	Bristol Water & Sewer
Steven Favorite	Bristol Planning Board & LRPC Commissioner
David Jeffers	Lakes Region Planning Commission (LRPC), Regional Planner

Note: Just prior to the meeting calls came in of fires in the area requiring the Fire Department and emergency services to respond.

As none of the three members present had been able to attend the November meeting, D. Jeffers reviewed some of the HMP Update process, including the purpose of the plan, distinctions between Mitigation and Response planning, and changes in plan requirements over the past five years.

- ☐ The group reviewed and commented on the status of several of the Actions identified in the 2010 HMP.
- ☐ Additional activities that were discussed included:
  - In conjunction with state roadwork downtown upgrades to the Water & Sewer (W&S) systems were made in the area.
  - Now have the capacity to sprinkle buildings in downtown, if needed. This could impact the town's ISO rating.
  - W&S conducts inspections at river crossings.
  - Ayers Island dam has had some recent upgrades.
  - There have been some upgrades to the control gates at the Newfound Lake dam.
  - The Smith River Road hazard mitigation project (bank stabilization) was cited as a good project.
  - Upgraded drainage at Danforth Brook
- ☐ A survey for members of the public was well received and options for distribution were discussed.

For the next meeting

- ☐ Committee members were asked to review the listed hazards hazard events from the past to rate the probability of occurrence using the defined rating scale.

Next meeting: 1/12/14 at 5:00 PM in the Bristol Fire Station

Future meetings: **2/2/15 at 5:00 Location TBD**
2/23/15 at 5:00 Location TBD
3/16/15 at 5:00 Location TBD

Bristol Hazard Mitigation Plan Update Committee

January 12, 2015 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions

2. Review of Capabilities

3. Presentation on Ayers Island dam – R. McGlone, PSNH

4. Risk Assessment
    a. Hazards
        i. location
        ii. extent
        iii. frequency
    b. Assets
        i. people
        ii. economy
        iii. built environment
            1. existing structures
            2. infrastructure
            3. critical facilities
            4. cultural resources
            5. future development
    c. Impacts

5. Status of 2010 Mitigation Projects

6. Schedule next meeting

7. Public Input

Goals for next meeting:

a. Goals
b. Gaps
c. Mitigation Actions

FEMA

Bristol Hazard Mitigation Plan (HMP) Update Committee Meeting
January 12, 2015
Bristol Fire Department
NOTES

In Attendance:

Steve Yannuzzi	Bristol Fire Chief & EMD
Jeff Chartier	Bristol Water & Sewer
Mark Bucklin	Bristol Highway Department, Superintendent
Steven Favorite	Bristol Planning Board & LRPC Commissioner
Max Stamp	Bristol Citizen & Representative to PRLAC (Pemigewasset River Local Advisory Committee)
Paul Hatch	NH Homeland Security and Emergency Management, Field Representative
David Jeffers	Lakes Region Planning Commission (LRPC), Regional Planner

Introductions:
All present introduced themselves. D. Jeffers explained that R. McGlone from PSNH would be unable to attend this meeting but would like to speak to the group at a future meeting regarding hazard mitigation efforts at Ayers Island dam. The group looks forward to hearing about the dam.

A copy of the Public Survey was reviewed.

Risk Assessment:
The group reviewed the matrix of Existing Protections.

- The Post Office is in the Floodplain.
- Most dams have been removed.
- Ice dams do occur; Davidson's Campground has been impacted.
- There is no room for new development along the Newfound River.
- There was flooding associated with Hurricane Irene in 2011.
- The Fowler River can flood.
- The Water & Sewer pumps were elevated in both 1979 and 1998 to reduce the likelihood of flooding.
- The ISO fire rating is being updated.
- The PSNH power station is in the floodplain. The electrical loop is being split to improve service.
- There is a lack of emergency back-up power generation. The Town Hall and DPW do not have it. The EMD is working with NH HSEM on a 50-50 grant to address this. Raising local match is a challenge.
- There was discussion about shelter capacity (Newfouund Regional H.S.) and the need to be able to provide warming and cooling services.
- Challenges still exist in the notification system.
- An electrical study and assessment has been conducted.

The group then reviewed the definition associated with Hazard Location, Extent, and Probability of Occurrence and updated the matrix. This led to further discussions about:

- Ice in the rivers
- Occasional avalanche occurrences along West Shore Rd.
- Hazardous materials - The fact that Freudenberg is switching over to propane (30,000 gallon tanks) will mean more propane trucks on the road through town. The fact that trucks supplying materials to Maxxum travel through town raised some concern. There have been a couple of incidents with hazardous materials in the past year (275 g. oil spill at West Shore Marine and oil spill on Fourth St.). The FD does have initial containment capacity and maintains good communication with CNHRHMTeam.
- On the topic of Epidemics and Health Emergencies, it was noted that the town has a good working partnership with the Central NH Regional Health Netork (CNHRHN). They run prevention programs including school vaccination clinics. Newfound Reg. HS is a POD for the region and has hosted drills and should have a capacity of 3,000 people over a 3-day period.
- Conflagration - Many parts of downtown Bristol are one-dimensional, as buildings back up to the river, limiting accessibility for fire-fighting. There are now sprinklers in some of the structures downtown and fire alarms are required. The cottages at the base of Newfound Lake are vulnerable to fire.
- Terrorism can take a number of different forms. The middle school recently had a bomb threat. There has been some vandalism to the town's water tank system.

The Critical Facilities Vulnerability Matrix was refined.

Status of 2010 Mitigation Projects:

- Additional information was provided to the matrix assessing the status and effectiveness of Actions identified in the 2010 HMP.

Future meetings:

Next meeting: Due to a conflict that has arisen D. Jeffers asked that the meeting scheduled for 2/2/15 be rescheduled; those present agreed upon 2/9/15 at 5:00 PM for the new meeting date and time.

2/9/15 at 5:00 Bristol Fire Station
2/23/15 at 5:00 Location TBD
3/16/15 at 5:00 Location TBD

Bristol Hazard Mitigation Plan Update Committee

February 23, 2015 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions

2. Hazard Risk Assessment
   a. Extent
   b. Impacts

3. Gaps/Problems

4. Mitigation Actions

5. Schedule next meeting

6. Public Input

Goals for next meeting:

   a. Mitigation Actions and Prioritization

Bristol Hazard Mitigation Plan (HMP) Update Committee Meeting
February 23, 2015
Bristol Fire Department
NOTES

In Attendance:

Steve Yannuzzi	Bristol Fire Chief & EMD
Jeff Chartier	Bristol Water & Sewer
Steven Favorite	Bristol Planning Board & LRPC Commissioner
Michael Capone	Bristol Town Administrator
Denice DeStefano	Bristol Planning Board Chair and Bristol Business Owner
Paul Hatch	NH Homeland Security and Emergency Management, Field Representative
David Jeffers	Lakes Region Planning Commission (LRPC), Regional Planner

Introductions:
All present introduced themselves.

Chief Yannuzzi noted that a dozen people have responded to the public survey and that it will be available for a few more days both on-line and at Town Hall. Topics mentioned included CodeRed, lack of cell phone coverage in some areas of town, communication using TV, and transportation of hazardous materials (Maxxum trucks).

Risk Assessment (Extent & Impacts):
The group reviewed the matrix of Risk.

- There was agreement to remove radon from the list of hazards addressed in this plan and to use the term "Extreme Temperature".
- All agreed with the stated level of Probability for each hazard.
- Extent was discussed and the level for Lightning was changed from Moderate to Weak and Extreme Temperature changed from Weak to Moderate. Avalanche was kept at Moderate but noted that this was limited to the Ledges area along West Side Road.
- Three types of Impact were discussed and rated (Human, Property, and Business). These will be averaged.
- Each rating term has an associated point value (0-4).
- Risk will be determined by multiplying Probability x Extent x Average Impact.
- Flooding - May 2008, National Guard assistance, evacuated the EOC (Fire Station). Also mentioned dam removal.
- Snow - Actions being taken - School staff are measuring depth of snow on roofs daily
- Ice - Anchor ice in the Fowler and Smith Rivers. Ice can have impacts on bridges - Central St. and Water St.
- Extreme Temps - Discussed Reverse Notifcation. Have list of At-Risk individuals but it is from two different hospitals (Speare and LRGH).
- Dam Failure - Inundation Pathway
- Haz Mat - Freudenberg will be having propane deliveries 2-3 days a week
- Conflagration - The downtown is expected to have more residential development. There are more sprinkler systems in downtown.

Gaps/Problems/Mitigation Actions:

The group reviewed a matrix with Gaps in Protection and Potential Actions. More details were filled in on several of the items and a few additional gaps were discussed. Many actions revolved around education and outreach. More brainstorming and then prioritization of Actions are the next steps in the process.

Future meetings:
Next meeting: **3/16/15 at 5:00 Bristol Fire Station**

Bristol Hazard Mitigation Plan Update Committee

March 16, 2015 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions
2. Presentation on Ayers Island dam – R. McGlone, PSNH
3. Review – Survey Results, Risk Matrix, Floodplain properties
4. Mitigation Actions and Prioritization
5. Schedule next meeting
6. Public Input

Goals for next meeting:

a. Implementation and draft plan

Bristol Hazard Mitigation Plan (HMP) Update Committee Meeting
March 16, 2015
Bristol Fire Department
NOTES

In Attendance:

Steve Yannuzzi	Bristol Fire Chief & EMD
Jeff Chartier	Bristol Water & Sewer
Steven Favorite	Bristol Planning Board & LRPC Commissioner
Michael Capone	Bristol Town Administrator
Ryan McGlone	EverSource Energy
Donna Keeley	EverSource Energy
Paul Hatch	NH Homeland Security and Emergency Management, Field Representative
David Jeffers	Lakes Region Planning Commission (LRPC), Regional Planner

Introductions:
All present introduced themselves.

Presentation on Ayers Island dam:
Ryan McGlone, Hydro Engineer for EverSource Energy gave a presentation to the group on the Ayers Island Dam including its construction and recent upgrades, especially those aimed at reducing the dam's vulnerability to earthquakes. He also addressed mapping, analyses, monitoring, action plans, and emergency exercises. He addressed a number of questions from the group.

Review - Survey Results, Risk Matrix, Floodplain Properties:
Survey Results - D. Jeffers distributed a summary of the feedback from the HMP Survey which had been available at the Town Hall, on the Bristol Town website, and on the Bristol FD Facebook page for the past five weeks. Sixteen responses were received.

Risk Matrix - The group asked for input from R. McGlone on the Dam Failure rating. They felt comfortable with the revised Risk Ratings.

Floodplain Properties - The group also reviewed the updated list of structural values within the floodplain. D. Jeffers pointed out that the new FIRM maps for Grafton County were published just as the last HMP was being finalized. Thirty-two structures listed in the 2010 were removed from the list and seventy new structures were added. There was discussion about ensuring that Site Plan and Subdivision applications require identification of where the structure is within the 1% floodplain.

Mitigation Actions:
The group reviewed and discussed a matrix listing gaps (problems) and potential mitigation actions. Also addressed were anticipated project costs, potential funding sources, and who might be responsible for implementation.

Future meetings:
Next meeting: **4/20/15 at 5:00 Bristol Fire Station**

Bristol Hazard Mitigation Plan Update Committee

April 20, 2015 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions
2. Review – Mitigation Actions and Costs
3. Mitigation Action Prioritization
4. Next Steps
5. Public Input

The focus of this process is **mitigation**, which is action taken to reduce or eliminate long-term risk to hazards.
Mitigation is different from preparedness, which is action taken to improve emergency response or operational preparedness.

FEMA

L · R · P · C

Name	Position	6/28/14	11/21/14	12/8/2014	1/12/2015	2/23/2015	3/16/2015	4/20/2015
Steve Yannuzzi	Bristol Fire Chief/EMD	X	X		X	X	X	X
Mark Bucklin	Bristol Highway Dept.		X		X			
Michael Lewis	Bristol Police Chief		X					
Michael Capone	Bristol Town Administrator			X		X	X	X
Denice DeStefano	Bristol PB & Business Owner		X			X		
Jeff Charter	Bristol Water & Sewer Dept.			X	X	X	X	X
Steven Favorite	Bristol Citizen & LRPC Commiss.			X	X	X	X	X
Amanda Drake, RN	Newfound Area Nursing Assoc.		X					
Max Stamp	Bristol Resident, PRLAC representative				X		X	
Ryan McGlone	EverSource						X	
Donna Keeley	EverSource						X	
Paul Hatch	NH HSEM Field Rep				X	X	X	X
David Jeffers	LRPC Planner	X	X	X	X	X	X	X

Note: Additional time was contributed by staff at the Bristol Town Offices gather assessing information and posting announcements and the survey.

APPENDIX F: HAZARD EVENTS PRIOR TO 2010

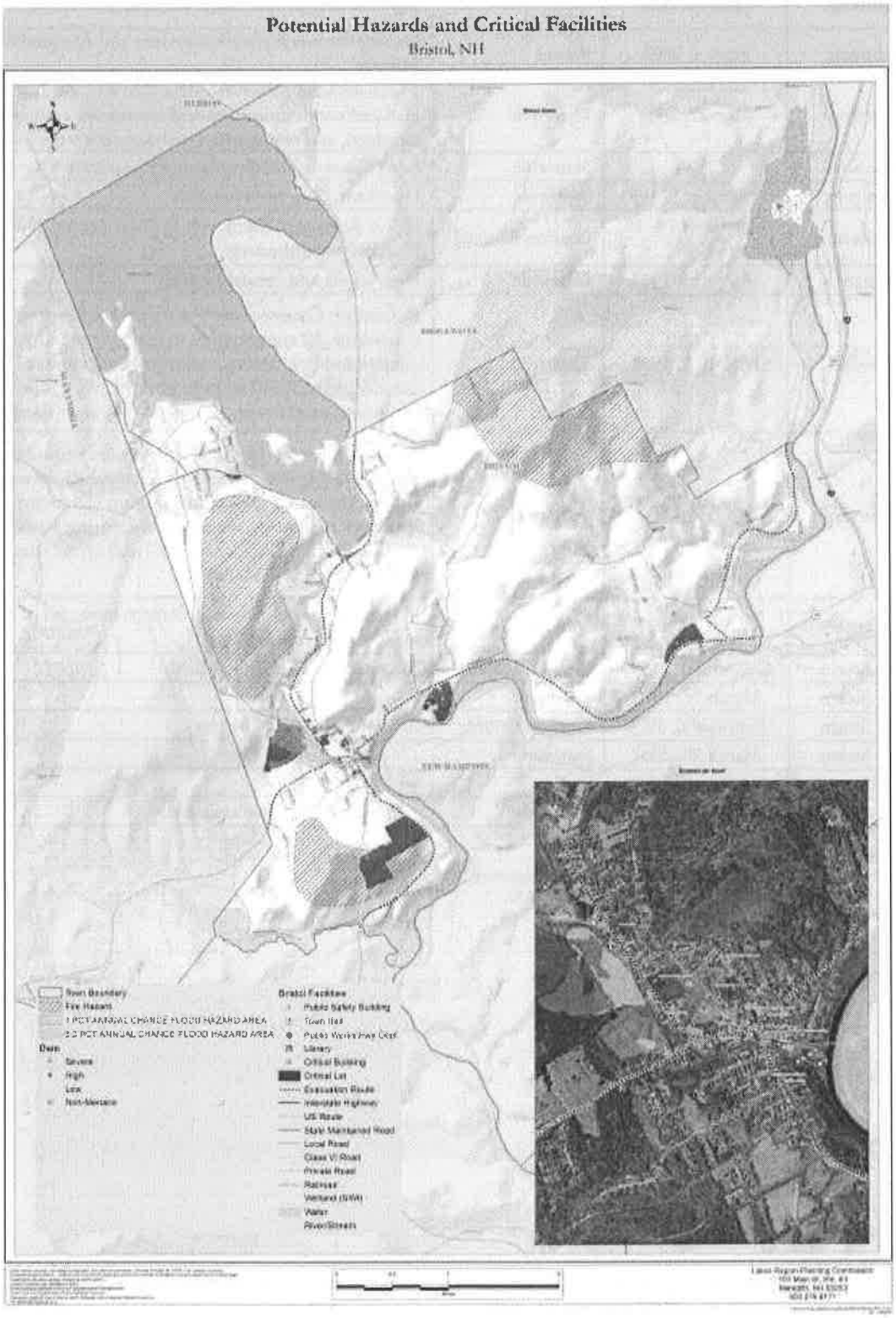
Hazard	Date	Location	Impacts/Assessment
Tornado	July 14, 1963	Grafton County	F1, $3,000 in damages
Tornado	June 27, 1964	Grafton County	F0, $25,000 in damages
Tornado	August 11, 1966	Grafton County	F2, $250,000 in damages
Tornado	August 25, 1969	Grafton County	F1, $25,000 in damages
Tornado	July 21, 1972	Grafton County	F1, $25,000 in damages
Tornado	July 21, 1972	Grafton County	F1, $25,000 in damages
Tornado	May 11, 1973	Grafton County	F2
Tornado	June 11, 1973	Grafton County	F0
Downburst	July 6, 1999	Grafton, Merrimack, and Hillsborough Counties	
Drought	1929-1936	Statewide	Regional
Drought	1939-1944	Statewide	Severe in Southeast
Drought	1947-1950	Statewide	Moderate
Drought	1960-1969	Statewide	Longest record continuous period of below normal precipitation.
Drought	June 1, 1999	Statewide	Governor's Office declaration moderate drought for most of the state.
Drought	Aug. – Dec. 2001	Statewide	Governor's Office declaration moderate drought for most of the state. Palmer Drought Severity Index was Moderate.
Earthquake	December 24, 1940	Carroll County	5.5 - felt over 400,000 square miles. Severe damage.
Flood	July 4, 1973	Grafton County	Fourteen bridges and many roadways were damaged totaling $171,000.
Flood	July 1, 1986 - August 10, 1986	Statewide	Severe summer storms with heavy rains, flash flooding and severe high winds
Flood	August 7-11, 1990	Statewide	Wide spread flooding, a series of storm events with moderate to heavy rains
Flood	October - November 1995	Grafton County	Heavy Rains
Flood	October 1, 1996	Grafton County	Heavy Rains
Flood	June 1998	Bridgewater	Numerous road and culvert washouts. This led to the release of FEMA funding over the next two years. One death.
Flood	Sept. 16-18, 1999	Grafton County	Remnants of Hurricane Floyd resulted in $570,500 of property damage. Power out to 10,000 customers.
Flood	September 12, 2003	Statewide	Severe storms and flooding
Flood	June 9, 2005	Southern Grafton County	Flash flooding resulted in $1.0 M in property damages.
Flood	October 26, 2005	Statewide	Severe storms and flooding
Flood	May 14-16, 2006	Grafton County	Up to 12 inches of rain in three days.
Flood	May, 12 - June 30, 2006	Statewide	Severe storms and flooding
Forest Fire	August 9, 2001	Holderness	Livermore - Fire caused by lightning burned 0.75 acres.

Hazard	Date	Location	Impacts/Assessment
Forest Fire	Summer 2006	Bristol	Adjacent town – Bristol Peak had seven acre forest fire.
Lightning	April 12, 2001	Plymouth, Ashland	Separate fires in apartment building and house.
Lightning	Sept. 4, 2003	Bristol	Damage to home electrical system and equipment totaled $10,000.
Lightning	June 27, 2005	Plymouth	Three separate strikes caused a barn fire, damage to Town Hall and communications and electronics equipment were damaged, and one injury. Total damages were $110,000.
Hurricane	1938	Statewide	Severe storms, flooding along Pemigewasset River
Hurricane	September 9, 1991	Statewide	Hurricane Bob, severe storms
Hurricane	September 18- 19, 1999	Grafton County	Heavy Rains associated with tropical storms, Hurricane Floyd affected the area.
Blizzard	March 16, 1993	Statewide	High winds and record snowfall
Ice Storm	January 7, 1998	Statewide	In Grafton County there was moderate to severe conditions. 52 communities in county were impacted, six injuries and one fatality, major roads closures, 67,586 with our electricity, 2,310 without phone service, one communication tower, 17 million dollars of damages.
Ice Storm	December 11-12, 2008	Statewide	On December 11-12, 2008, a severe ice storm befell the region, leaving 400,000 in New Hampshire, or roughly 30% of the state's population without electricity for up to two weeks following the storm. Restoring power cost an estimated $75 million, and took 1,205 crews from as far as the Midwest and Canada[43]
Nor'easter	April 27, 2007	Statewide	Nor'easter caused flooding, damage in excess of $25 million as of August, 2007.
Snow Storm	December 1, 1973	Grafton County	Two back-to-back snow storms
Snow Storm	March 16, 1993	Statewide	
Snow Storm	February 6, 2001	Grafton County	Accumulation of 34 inches
Snow Storm	March 28, 2001	Statewide	
Snow Storm	January 15, 2004	Statewide	
Snow Storm	March 30, 2005	Statewide	$6.5 million in public assistance

Table Sources:
1 = http://www.tornadoproject.com
2 = New Hampshire Homeland Security and Emergency Management (NHHSEM)
3 = National Oceanic and Atmospheric Administration (NOAA)
4 = National transportation Safety Board (NTSB)
5 = Federal Emergency Management Agency (FEMA)
6 = Northeast States Emergency Consortium (NESEC)
7 = National Interagency Fire Center (NIFC)

[43] *The Union Leader, http://www.unionleader.com/article.aspx?headline=PSNH%27s+estimated+ice+storm+bill%3a+%2475+million&articleId=014030af-0548-4211-92fa-ef55dfa98ed9,* visited February 27, 2009.

APPENDIX G: MAPS AND FLOODPLAIN DATA



Structures in the floodplain – Bristol, NH

Map/Lot #	Property Location	Building Value (2014)
102-001-174	81 Wulamat Rd Lot 174 (174 Moorings Ln)	$40,900
102-001-176	81 Wulamat Rd Lot 174 (176 Moorings Ln)	$40,000
102-001-177	81 Wulamat Rd Lot 174 (177 Moorings Ln)	$40,000
102-001-178	81 Wulamat Rd Lot 174 (178 Moorings Ln)	$44,600
102-001-179	81 Wulamat Rd Lot 174 (179 Moorings Ln)	$46,300
102-001-180	81 Wulamat Rd Lot 174 (180 Moorings Ln)	$44,700
102-001-181	81 Wulamat Rd Lot 174 (181 Moorings Ln)	$39,500
102-001-182	81 Wulamat Rd Lot 174 (182 Moorings Ln)	$47,000
102-001-192	81 Wulamat Rd Lot 174 (192 TBD)	$45,300
102-001-193	81 Wulamat Rd Lot 174 (193 TBD)	$45,800
102-001-194	81 Wulamat Rd Lot 174 (194 TBD)	$45,800
102-001-195	81 Wulamat Rd Lot 174 (195 TBD)	$46,000
102-001-196	81 Wulamat Rd Lot 174 (196 TBD)	$45,000
102-002	115 Greenwood Path	$45,500
102-004	111 Greenwood Path U01	$39,900
102-005	111 Greenwood Path U02	$34,800
102-006	111 Greenwood Path U3	$48,300
102-007	111 Greenwood Path U4	$40,100
102-008	111 Greenwood Path U5	$36,500
102-009	111 Greenwood Path U6	$37,500
102-010	111 Greenwood Path U07	$36,600
102-011	111 Greenwood Path U08	$37,300
102-018	50 Greenwood Path - Camp Wulamat	$728,899
102-019	52 Greenwood Path	$100,000
102-021	303 Wulamat Road	$62,700
102-025	311 Wulamat Road	$75,400
102-027	19 Arrowhead Point Road	$54,500
102-028	25 Arrowhead Point Road	$92,400
102-029	33 Arrowhead Point Road	$226,100
102-030	39 Arrowhead Point Road	$298,900
102-031	47 Arrowhead Point Road	$101,588
103-005	55 Arrowhead Point Road	$199,800
103-006	63 Arrowhead Point Road	$126,406
103-007	71 Arrowhead Point Road	$107,400
103-011	381 Wulamat Road	$85,700
103-012	383 Wulamat Road	$110,279
103-013	391 Wulamat Road	$65,000
103-021	455 Wulamat Road	$96,814
103-022	465 Wulamat Road	$105,945
103-023	471 Wulamat Road	$59,200

104-122	110 Browns Beach Road	$112,700
104-134	6 Olde Lane Road	$96,400
104-160	16 Woodland Road	$57,700
104-165	7 Belmore Court Drive	$37,800
104-166	9 Belmore Court Drive	$41,300
104-167	260 W Shore Road	$66,200
104-173	40 Belmore Court Drive	$101,800
104-174	54 Belmore Court Drive	$135,500
104-175	51 Belmore Court Drive	$60,200
104-176	15 Belmore Court Dr	$48,800
104-180	31 Shacketts Road	$33,700
104-181	41 Shacketts Road	$38,000
104-182	45 Shacketts Road	$39,000
104-183	46 Shacketts Road	$35,900
104-184	40 Shacketts Road	$38,900
104-185	30 Shacketts Road	$68,800
105-004	56 North Pikes Point Rd	$72,500
105-009	287 Pikes Point Rd	$101,400
105-027	189 Pikes Point Rd	$85,400
105-028	187 Pikes Point Rd	$17,200
106-002	Lake St -- Dock/Shed	$3,200
106-009	105 Pikes Point Rd	$264,200
106-010	145 Pikes Point Rd	$224,400
107-116	55 Lakeside Rd	$48,000
107-117	63 Lakeside Rd	$36,600
107-118	65 Lakeside Rd	$35,700
107-119	67 Lakeside Rd	$45,200
107-120	69 Lakeside Rd U5	$33,800
107-121	75 Lakeside Rd	$35,700
107-126	57 Lakeside Road	$101,200
107-127	Clarks Cabins 77/79/81/89/95/99	$403,900
107-130	117 Lakeside Rd	$35,400
107-131	119 Lakeside Rd	$45,100
107-132	121 Lakeside Rd	$47,800
107-133	123 Lakeside Rd	$74,700
107-134	133 Lakeside Rd	$76,300
107-135	135 Lakeside Rd	$42,100
107-139	185 Lakeside Rd	$4,500
107-140	191 Lakeside Rd	$6,000
107-141	197 Lakeside Rd	$47,700
108-051-001	210 West Shore Road Unit 1	$87,400
108-051-002	210 West Shore Road Unit 2	$75,300
108-114 through 119	West Shore Marine - Boat Slips	$1,227,400

109-063	24-40 Waring Road	$156,900
109-080	45 Manor Estates Drive Unit 16	$138,400
109-081	45 Manor Estates Drive Unit 17	$142,900
109-082	45 Manor Estates Drive Unit 18	$142,900
109-083	45 Manor Estates Drive Unit 19	$138,400
109-084	45 Manor Estates Drive Unit 20	$138,400
110-077	78 West Shore Rd	$67,600
111-058	15 Lakeside Rd	$39,400
111-059	19 Lakeside Rd	$39,900
111-060	23 Lakeside Rd	$35,800
111-061	27 Lakeside Rd U2	$29,300
111-062	31 Lakeside Rd	$42,800
111-063	35 Lakeside Rd	$77,500
112-006	31 Bristol Hill Rd	$85,100
112-007	33 Bristol Hill Rd	$20,800
112-008	37 Bristol Hill Rd	$78,400
112-009	43 Bristol Hill Rd	$65,900
112-017	44 Bristol Hill Rd	$96,100
112-018	30 Bristol Hill Rd	$62,000
112-037	409 Lake Street	$53,900
113-020	45 Lake St	$80,100
113-021	55 Lake St	$92,400
113-025	85 Lake St - Bristol Fire Department	$490,400
113-028	123 & 125 & 127 Lake St	$189,900
114-113	76 Central Street	$138,000
114-119	Water Street - Hydro	$2,051,200
203-152 through 239	Newfound Boat Club - Boat Slips on Fowler River	$4,032,300
204-001	1 Mayhew Island - Exempt property	$666,600
209-047	3795 River Rd (also in Current Use)	$98,800
209-049	105 Barron Rd	$93,400
209-050	164 Barron Road	$33,600
209-051	150 Barron Rd	$114,300
209-054	4035 River Road	$51,000
209-055	4071 River Road	$79,500
209-056	4185 River Road	$87,800
220-013	4252 River Road	$321,500
221-030	44 Towne Rd	$163,400
222-037	255 Pemigewasset Shores	$299,800
224-002	435 Lake St	$196,500
224-003	437 Lake St	$229,600
224-052	Lake St - Bike Path Bridge	$10,000
229-003	2471 Smith River Rd	$131,000
TOTAL		**$19,218,731**

APPENDIX H: HAZARDS – SUPPLEMENTARY HAZARD INFORMATION

This section provides statewide or regional information regarding hazards. Some information is about hazards mentioned in the NH Hazard Mitigation Plan. Other information either provides context or extra detail which supplements the locally important information addressed in Chapter III.

I. FLOOD, WILDFIRE, DROUGHT

Flooding

Historically, the state's two largest floods occurred in 1936 and 1938. The 1936 flood was associated with snow melt and heavy precipitation. The 1938 flooding was caused by the Great New England Hurricane of 1938. Those floods prompted the construction of a series of flood control dams throughout New England, built in the 1950s and '60s. They continue to be operated by the US Army Corps of Engineers.[44]

A series of floods in New Hampshire began in October 2005 with a flood that primarily affected the southwest corner of the state and devastated the town of Alstead. The flood killed seven people. It was followed by floods in May 2006 and April 2007 and a series of floods during the late summer and early fall of 2008. The most recent flooding in the region was associated with Tropical Storm Irene in September 2011.

Flooding in the Lakes Region is most commonly associated with structures and properties located within a floodplain. There are numerous rivers and streams within the region and significant changes in elevation, leading to some fast-moving water. The region also has a great deal of shoreline, making it exposed to rising water levels as well. Although historically, there have not been many instances of shoreline flooding, the potential always exists for a major flood event to occur.

Recent rain events have proven this is becoming an increasing concern as additional development is contributing to flood hazards. As areas are covered with impervious surfaces, less water is allowed to infiltrate, evaporate, or be transpired by vegetative growth and more of it runs off directly into surface drainages and water bodies. This increases the likelihood of flash floods and substantial overland flow. Of greatest concern are the waterfront properties on the rivers, lakes, ponds, and associated tributaries.

Culvert improvements and roadwork have been conducted throughout the region as a result of localized flooding events. Of particular concern in the region are areas of steep slopes and soils with limited capacity to accept rapid volumes of rainwater. Roads and culverts in close proximity to these conditions are most at risk of localized flooding.

Flooding due to Dam Failure

Dam failure results in rapid loss of water that is normally held back by a dam. These types of floods can be extremely dangerous and pose a threat to both life and property. Dam classifications in New Hampshire are based on the degree of potential damages that a failure or disoperation of the dam is

[44] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html date visited: January 18, 2011

expected to cause. The classifications are designated as non-menace, low hazard, significant hazard, and high hazard and are summarized in greater detail in Table H-1.

The designations for these dams relate to damage that would occur if a dam were to break, not the structural integrity of the dam itself. In the Lakes Region, the Town of Alton was impacted by an earthen dam failure on March 12, 1996. Although listed in the NH Hazard Mitigation Plan as a significant hazard, it did result in the loss of one life.

Table H-1: New Hampshire Dam Classifications[45]

Classification	Description
Non-Menace	A dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is: • Less than six feet in height if it has a storage capacity greater than 50 acre-feet; or • Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.
Low Hazard	A dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: • No possible loss of life. • Low economic loss to structures or property. • Structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupt public safety services. • The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course. • Reversible environmental losses to environmentally-sensitive sites.
Significant Hazard	A dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: • No probable loss of lives. • Major economic loss to structures or property. • Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services. • Major environmental or public health losses, including one or more of the following: • Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair. • The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more. • Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.
High Hazard	A dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of: • Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions. • Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot. • Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services. • The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII. • Any other circumstance that would more likely than not cause one or more deaths.

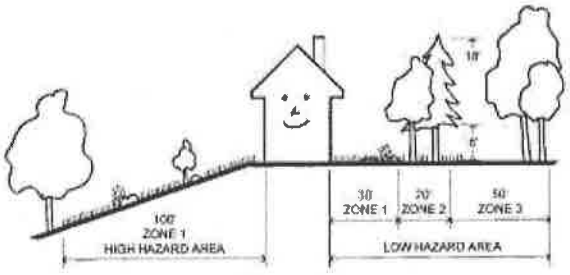
[45] NH DES Fact Sheet WD-DB-15 "Classification of Dams in New Hampshire", http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf. Accessed October 1, 2012.

Wildfire

Several areas in the region are relatively remote in terms of access and fire-fighting abilities. Of greatest concern are those areas characterized by steep slopes and vast woodlands, with limited vehicular access.

As these once remote areas begin to see more development (the urban wildfire interface), care should be taken to ensure that adequate fire protection and buffers are established. Techniques include increased buffers between wooded areas and residential buildings, requirements for cisterns or fire ponds, a restriction on the types of allowable building materials such as shake roofs, and special considerations for landscaping. While historically massive wildfires have been western phenomena, each year hundreds of woodland acres burn in New Hampshire. The greatest risk exists in the spring when the snow has melted and before the tree canopy has developed, and in the late summer – early fall. Appropriate planning can significantly reduce a community's vulnerability for woodland fires. There are four-zone suggestions from the Firewise community program that could be potentially helpful homeowners in Bristol.[46]

ZONE 4 is a natural zone of native or naturalized vegetation. In this area, use selective thinning to reduce the volume of fuel. Removing highly flammable plant species offers further protection while maintaining a natural appearance.



FIREZONES

ZONE 3 is a low fuel volume zone. Here selected plantings of mostly low-growing and fire-resistant plants provide a decreased fuel volume area. A few well-spaced, fire resistant trees in this zone can further retard a fire's progress.

ZONE 2 establishes a vegetation area consisting of plants that are fire resistant and low growing. An irrigation system will help keep this protection zone green and healthy.

ZONE 1 is the protection area immediately surrounding the house. Here vegetation should be especially fire resistant, well irrigated and carefully spaced to minimize the threat from intense flames and sparks.

Drought

Drought occurs when less than the normal amount of water is available for extended periods of time. Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced rain/snowfall, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

Since 1990 New Hampshire has had a state Drought Emergency Plan, which identifies four levels of action indicating the severity of the drought: Alert, Warning, Severe, and Emergency. There have been five extended droughts in New Hampshire in the past century: 1929 – 1936, 1939 – 1944, 1947

[46] http://www.firewise.org accessed September 22, 2014.

– 1950, 1960 – 1969, and 2001 – 2002.[47] While much of the country experienced drought conditions in 2012, New Hampshire received adequate precipitation.[48] The US Drought Monitor provides weekly updates of drought status for each states and regions. May of 2015 was quite dry, resulting in moderate drought conditions for the Bristol area, but this was only for a short time period.

U.S. Drought Monitor

New Hampshire

May 26, 2015

(Released Thursday May 28, 2015)

Valid 8 a.m. EDT

Statistics type: Traditional (D0-D4, D1-D4, etc.) Categorical (D0, D1, etc.)

Drought Condition (Percent Area)

Week	Date	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	2015-05-26	0.00	100.00	68.30	0.00	0.00	0.00
Last Week	2015-05-19	0.00	100.00	68.30	0.00	0.00	0.00
3 Months Ago	2015-02-24	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year	2014-12-30	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year	2014-09-30	63.78	36.22	0.00	0.00	0.00	0.00
One Year Ago	2014-05-27	100.00	0.00	0.00	0.00	0.00	0.00

Population Affected by Drought: 1,227,817 View More Statistics

Intensity:

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

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

Author(s):

Brad Rippey, U.S. Department of Agriculture

Drought Severity Classification

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

[47] http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf visited February 8, 2011.

[48] US Drought Monitor http://droughtmonitor.unl.edu/. Accessed May 29, 2015

II. Geological Hazards

Earthquake

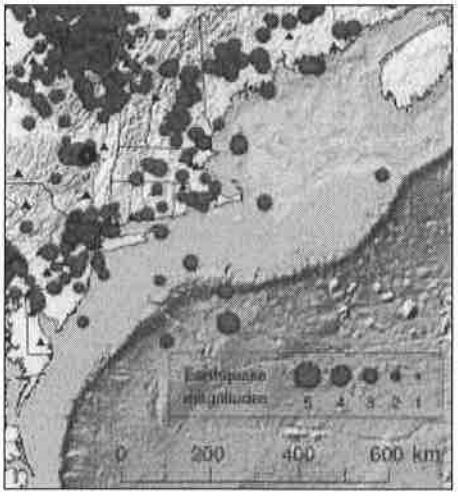
Notable New Hampshire earthquakes are listed in Table H-2 with the extent of the hazard expressed in the Modified Mercalli Intensity scale and the Richter Magnitude.[49]

Table H-2: NH Earthquakes of magnitude or intensity 4 or greater (1638-2007).

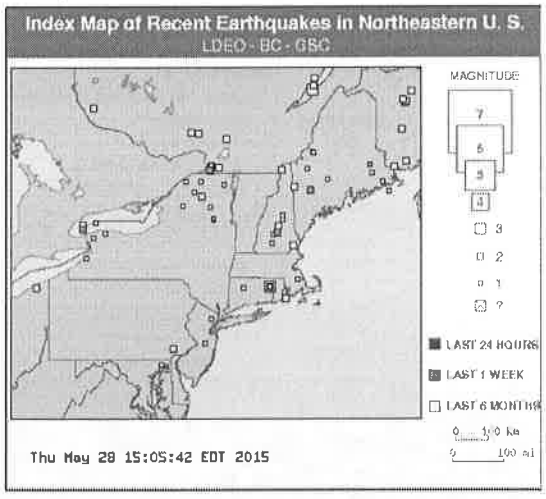
Location	Date	MMIntensity	Magnitude
Ossipee	December 24, 1940	7	5.5
Ossipee	December 20, 1940	7	5.5
Ossipee	October 9, 1925	6	4
Laconia	November 10, 1936	5	-
New Ipswich	March 18, 1926	5	-
Lebanon	March 5, 1905	5	-
Rockingham County	August 30, 1905	5	-
Concord	December 19, 1882	5	-
Exeter	November 28, 1852	5	-
Portsmouth	November 10, 1810	5	4
Off Hampton	July 23, 1823	4	4.1
15km SE of Berlin	April 6, 1989	-	4.1
5km NE of Berlin	October 20, 1988	-	4
W. of Laconia	January 19, 1982	-	4.7
Central NH	June 11, 1638	-	6.5

Earthquakes in the Northeast[50]

1990 – 2010



During the last six months



Damage from an earthquake generally falls into two types; Structural and Nonstructural.

[49] http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, visited June 8, 2012.
[50] Lamont-Doherty Cooperative Seismic Network http://www.ldeo.columbia.edu/LCSN/index.php.

- **Structural Damage** is considered any damage to the load bearing components of a building or other structure.
- **Nonstructural Damage** is considered any portion not connected to the superstructure. This includes anything added after the frame is complete.

According to the NH Division of Homeland Security and Emergency Management, some of the issues likely to be encountered after a damaging earthquake could be:

- Total or partial collapse of buildings, especially un-reinforced masonry structures and those not built to seismic codes.
- Damage to roads and bridges from ground settlement and structural damage.
- Mass Causalities.
- Loss of electric power.
- Loss of telecommunication systems.
- Fires from gas line ruptures and chimney failures.
- Total or partial loss of potable and fire-fighting water systems from pipe ruptures.
- Hazardous Material incidences.
- Loss of critical capabilities from structural and nonstructural damages.
- Lack of mutual aid support.

The NH HSEM also notes that a "cascade of disasters" typically occurs after a damaging earthquake. For example:

- Damage to gas lines and chimneys result in fires that are difficult to extinguish due to damage to the road, water systems, fire and police stations.
- Structural and Nonstructural damage cause many injuries, but because of damage to health care facilities and emergency response facilities, there is a slow or nonexistent response.
- Responders are slowed in their response because of Hazardous Material incidents.
- Flooding due to dam failures.

Landslide

A landslide is the downward or outward movement of slope-forming materials reacting to the force of gravity, including mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Seismic activity may play a role in the mass movement of landforms also. Although New Hampshire is mountainous, it consists largely of relatively old geologic formations that have been worn by the forces of nature for eons. Consequently, much of the landscape is relatively stable and the exposure to this hazard type is generally limited to areas in the north and north central portion of the state. Formations of sedimentary deposits and along the Connecticut and Merrimack Rivers also create potential landslide conditions.

Although the overall vulnerability for landslides in the state is low, there is considerable terrain susceptible to landslide action. This was exemplified in May of 2003 when the Old Man of the Mountain collapsed. The continuous action of freezing and thawing of moisture in rock fissures causes it to split and separate. This action occurs frequently on the steeply sloped areas of the state, increasing the risk of landslides.

West Side Road runs between Bristol and Hebron. The road straddles Newfound Lake and "The Ledges" as it passes through a small portion of Alexandria. While the road has certainly been upgraded since the old postcard shown here was produced[51], the topography and geometry are much the same. The committee did indicate that there has been at least one instance in recent time when snow and ice have fallen on the roadway, damaging a vehicle; there were no injuries and there are no structures to be damaged. The roadway was blocked and West Shore Road is the primary evacuation route on that side of the lake.

III. Other

Hail

High winds can bring down limbs and trees, knocking out electricity and blocking roads. Hail can cause damage to crops and structural damage to vehicles. Hail is measured by the TORRO intensity scale, shown in Table H-3. Although hailstorms are not particularly common in the Lakes Region, which averages fewer than two hailstorms per year, several have occurred in New Hampshire in the last decade. In 2007 and 2008 nearby Laconia experienced hail storms with no resulting damage, though reported hail sizes were as large as 1.25 inches (H4).

Table H-3: TORRO Hailstorm Intensity Scale

Code	Diameter	Description	Typical Damage
H0	5-9 mm*	Pea	No damage
H1	10-15 mm	Mothball	Slight damage to plants, crops
H2	16-20 mm	Marble, grape	Significant damage to fruit, crops, vegetation
H3	21-30 mm	Walnut	Severe damage to fruit/crops, damage to glass/plastic structures, paint & wood scored
H4	31-40 mm	Pigeon's egg	Widespread glass damage, vehicle bodywork damage
H5	41-50 mm	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	51-60 mm	Hen's egg	Aircraft bodywork dented, brick walls pitted
H7	61-75 mm	Tennis ball	Severe roof damage, risk of serious injuries
H8	76-90 mm	Large orange	Severe damage to aircraft bodywork
H9	91-100 mm	Grapefruit	Extensive structural damage. Risk of severe or fatal injuries to exposed persons
H10	>100 mm	Melon	Extensive structural damage. Risk of severe or fatal injuries to exposed persons

*mm = millimeters (Approximate range since other factors (e.g. number, density of hailstones, hail fall speed, surface wind speed) affect severity
Source: http://www.torro.org.uk/torro/severeweather/hailscale.php

[51] https://c1.staticflickr.com/3/2088/2382055944_812aa4aa19_z.jpg?zz=1.

APPENDIX I: PRIORITIZATION DETAILS

As the Committee began the process of prioritizing these actions, the group was introduced to an expanded version of the standard STAPLEE Prioritization Tool. They agreed to utilize this expanded version to capture local priorities. In addition to the standard STAPLEE categories (Social, Technical, Administrative, Political, Economic, and Environmental), the committee considered whether a particular action impacted Life Safety and Protected Property within Bristol, as well as whether there was a Local Champion for the project and whether the action augmented other Local Objectives, such as the master plan. The STAPLEE term "Economic" was changed to "Cost". The committee decided to discuss proposed actions as a group and agreed on a single score for each category as opposed to scoring separately and averaging the scores. They felt that this would lead to a greater group understanding and less misinterpretation.

This section contains a summary of rankings for each of the proposed Mitigation Actions by the Bristol Hazard Mitigation Committee. For each action, the benefits and costs of implementing the action (under each of the eleven categories) was considered and scored -1, 0, 1 with a 'minus one' indicating that the costs outweighed the benefits in a particular category, a 'one' meant that the benefits were greater that the costs, and a 'zero' meant that the while there are costs associated with the project, they are balanced out by the benefits. The eleven category scores were summed for an overall project total. A maximum total score is 11, the minimum is -11. Actual results ranged from 2 to 9. Highlighted ID numbers indicate that the Actions address are geared more towards mitigating a problem as opposed to preparing or responding to a hazard event. These ratings were arrived at through committee discussion and group consensus. During the review and prioritization process several actions were eliminated, either because the work is already being done or because the committee deemed it an impracticable action.

Scoring: 1 = Highly effective of feasible, 0 = Neutral, -1 = Ineffective or not feasible			Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Objectives	Cost	Total
ID*	**Hazard**	**Bristol Proposed Actions**												
1	Terrorism	Improve drinking water protection and security at the Fowler site, including fencing.	1	1	1	1	1	0	0	0	1	1	1	**8**
2	Fire	Improve and expand existing community Gamewell fire alarm system, including public outreach.	1	1	1	1	1	0	0	1	1	1	1	**9**
3	Fire	Purchase confined space equipment and ensure that staff has training.	1	1	1	1	1	0	0	0	1	1	1	**8**
4	All	Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	0	0	1	1	1	0	0	0	1	1	1	**6**

ID*	Hazard	Bristol Proposed Actions	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Objectives	Cost	Total
6A	Flood/ Erosion	Upgrade road drainage on High Street.	0	1	1	1	1	0	0	0	1	1	1	**7**
6B	Flood/ Erosion	Upgrade road drainage on Fourth Street.	0	1	1	1	1	0	0	0	1	1	1	**7**
6C	Flood/ Erosion	Upgrade road drainage on Timber Lane.	0	1	1	1	1	0	0	0	1	1	1	**7**
7	Haz. Materials	Evaluate and map hazardous materials storage sites in town.	1	1	1	0	1	0	0	1	1	1	1	**8**
8	All	Cross-reference the Bristol Water System Emergency Plan and the Bristol Emergency Operations Plan.	0	0	1	1	1	0	0	1	1	1	1	**7**
9	All	Provide emergency power generation for critical facilities (Town Hall, Police Station).	1	1	1	1	1	0	0	1	1	1	1	**9**
11	All	Use the Hazard Mitigation Planning Committee to review the HMP annually.	0	0	1	0	1	0	0	1	1	1	0	**5**
12	All	Distribute Bristol HMP to abutting communities.	0	0	1	0	1	0	0	1	1	0	0	**4**
13	All	Evaluate and upgrade radio communications for all essential services.	1	1	1	1	1	0	-1	1	1	1	1	**8**
15	All	Conduct outreach and education for all types of emergencies, including the importance of providing up to date emergency contact information.	1	1	1	1	1	0	1	1	1	1	0	**9**
18	Winter Storms	**A.** Identify populations that would be at-risk in a power outage. **B.** Conduct outreach to at-risk populations including education regarding appropriate shelters and resources.	1	0	1	1	-1	0	0	-1	1	0	0	**2**

APPENDIX J: EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

Bristol Hazard Mitigation Plan
Bristol Zoning Ordinance
Bristol Subdivision and Site Plan Regulations
"Development Activity in the Lakes Region, 2014 Annual Report", Lakes Region Planning Commission.
FEMA Community Information System
Bristol Assessor Database, 2014
State of New Hampshire Multi-Hazard Mitigation Plan, Update 2013
National Oceanic and Atmospheric Administration website, http://www.ncdc.noaa.gov/
NH Division of Forests and Lands http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx
NH Department of Transportation Traffic Volume Reports, http://www.nh.gov/dot/org/operations/traffic/tvr/locations/index.htm

APPENDIX K: MONITOR, EVALUATE, & UPDATE

Table A: Periodic Hazard Mitigation Plan Review Record

Meeting Schedule (dates)	Tasks Accomplished	How well (or not-so-well) is implementation progressing?	Lead Parties	Public Involvement (citizens, neighboring communities)

Table B: Project Implementation Checklist

Hazard	Actions	Responsible Party	Time Frame	Status 2017	Status 2018	Status 2019	Status 2020
Flood/ Erosion	Upgrade road drainage on High Street.	DPW	Short				
All	Provide emergency power generation for critical facilities (Town Hall, Police Station).	Town Admin., EMD	Short				
All	Evaluate and upgrade radio communications for all essential services	Town Admin., EMD	Short				
All	Distribute Bristol HMP to abutting communities.	Town Admin., EMD	Short				
All	Cross-reference the Bristol Water System Emergency Plan and the Bristol Emergency Management Plan.	W & S, EMD	Short				
All	Conduct outreach and education for all types of emergencies, including the importance of providing up-to-date emergency contact information.	EMD, Town Admin.	Ongoing				
All	Conduct outreach and education for all types of emergencies and make informational resources more widely available.	EMD, Town Admin.	Ongoing				
All	Use the Hazard Mitigation Planning Committee to review the HMP annually.	EMD	Ongoing (Annual)				

Hazard	Actions	Responsible Party	Time Frame	Status 2017	Status 2018	Status 2019	Status 2020
Flood/ Erosion	Upgrade road drainage on Fourth Street.	DPW	Medium				
Terrorism	Improve drinking water protection and security at the Fowler site, including fencing.	W & S	Medium				
Winter Storms	**A.** Identify populations that would be at-risk in a power outage. **B.** Conduct outreach to at-risk populations including education regarding appropriate shelters and resources.	EMD, Town Admin.	Medium				
Winter Storms	Develop and fund a tree maintenance program.	DPW	Medium				
All	Incorporate HMP into other town planning documents (CIP, Master Plan, etc.)	Town Admin., PB, EMD	Medium				
Fire	Purchase confined space equipment and ensure that staff has training.	Fire Chief	Medium				

Hazard	Actions	Responsible Party	Time Frame	Status 2017	Status 2018	Status 2019	Status 2020
Fire	Improve and expand existing community Gamewell fire alarm system, including public outreach.	Fire Chief	Medium				
Flood/ Erosion	Upgrade road drainage on Timber Lane.	DPW	Long				
Haz. Materials	Evaluate and map hazardous materials storage sites in town.	Fire Chief	Long				

Timeframe	Description
Short Term	1 year or less, or ongoing*
Medium Term	2 -3 years
Long Term	4-5 years

*Ongoing - This action will be completed on an ongoing basis throughout the life of the plan.

APPENDIX L: FEMA WEBLIOGRAPHY

DISASTERS AND NATURAL HAZARDS INFORMATION

FEMA-How to deal with specific hazards	http://www.ready.gov/natural-disasters
Natural Hazards Center at the University of Colorado	http://www.colorado.edu/hazards
National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather.	http://www.websites.noaa.gov
National Climatic Data Center active archive of weather data.	http://lwf.ncdc.noaa.gov/oa/ncdc.html
Northeast Snowfall Impact Scale	http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm
Weekend Snowstorm Strikes The Northeast Corridor Classified As A Category 3"Major"Storm	http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html

FLOOD RELATED HAZARDS

FEMA Coastal Flood Hazard Analysis & Mapping	http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1
Floodsmart	http://www.floodsmart.gov/floodsmart/
National Flood Insurance Program (NFIP)	http://www.fema.gov/nfip
Digital quality Level 3 Flood Maps	http://msc.fema.gov/MSC/statemap.htm
Flood Map Modernization	http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization
Reducing Damage from Localized Flooding: A Guide for Communities, 2005 FEMA 511	http://www.fema.gov/library/viewRecord.do?id=1448

FIRE RELATED HAZARDS

Firewise	http://www.firewise.org
NOAA Fire Event Satellite Photos	http://www.osei.noaa.gov/Events/Fires
U.S. Forest Service, USDA	http://www.fs.fed.us/land/wfas/welcome.htm
Wildfire Hazards - A National Threat	http://pubs.usgs.gov/fs/2006/3015/2006-3015.pdf

GEOLOGIC RELATED HAZARDS

USGS Topographic Maps	http://topomaps.usgs.gov/
Building Seismic Safety Council	http://www.nibs.org/?page=bssc
Earthquake hazard history by state	http://earthquake.usgs.gov/earthquakes/states/
USGS data on earthquakes	http://earthquake.usgs.gov/monitoring/deformation/data/download/
USGS Earthquake homepage	http://quake.wr.usgs.gov
National Cooperative Geologic Mapping Program (NCGMP)	http://ncgmp.usgs.gov/
Landslide Overview Map of the Conterminous United States	http://landslides.usgs.gov/learning/nationalmap/
Kafka, Alan L. 2008. Why Does the Earth Quake in New England? Boston College, Weston Observatory, Department of Geology and Geophysics	http://www2.bc.edu/~kafka/Why_Quakes/why_quakes.html
Map and Geographic Information Center, 2010, "Connecticut GIS Data", University of Connecticut	http://magic.lib.uconn.edu/connecticut_data.html

2012 Maine earthquake	http://www.huffingtonpost.com/2012/10/17/maine-earthquake-2012-new-england_n_1972555.html

WIND-RELATED HAZARDS

ATC Wind Speed Web Site	http://www.atcouncil.org/windspeed/index.php
U.S. Wind Zone Maps	http://www.fema.gov/safe-rooms/wind-zones-united-states
Tornado Project Online	http://www.tornadoproject.com/
National Hurricane Center	http://www.nhc.noaa.gov
Community Hurricane Preparedness Tutorial	http://meted.ucar.edu/hurrican/chp/hp.htm
National Severe Storms Laboratory, 2009, "Tornado Basics",	http://www.nssl.noaa.gov/primer/tornado/tor_basics.html

GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MAPPING

The National Spatial Data Infrastructure & Clearinghouse (NSDI) and Federal Geographic Data Committee (FGDC) Source for information on producing and sharing geographic data	http://www.fgdc.gov
The OpenGIS Consortium Industry source for developing standards and specifications for GIS data	http://www.opengis.org
Northeast States Emergency Consortium (NESEC): Provides information on various hazards, funding resources, and other information	http://www.nesec.org
US Dept of the Interior Geospatial Emergency Management System (IGEMS) provides the public with both an overview and more specific information on current natural hazard events. It is supported by the Department of the Interior Office of Emergency Management.	http://igems.doi.gov/
FEMA GeoPlatform: Geospatial data and analytics in support of emergency management	http://fema.maps.arcgis.com/home/index.html

DETERMINING RISK AND VULNERABILITY

HAZUS	http://www.hazus.org
FEMA Hazus Average Annualized Loss Viewer	http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cb8228309e9d405ca6b4db6027df36d9&extent=-139.0898,7.6266,-48.2109,62.6754
Vulnerability Assessment Tutorial: On-line tutorial for local risk and vulnerability assessment	http://www.csc.noaa.gov/products/nchaz/htm/mitigate.htm
Case Study: an example of a completed risk and vulnerability assessment	http://www.csc.noaa.gov/products/nchaz/htm/case.htm

DATA GATHERING

National Information Sharing Consortium (NISC): brings together data owners, custodians, and users in the fields of homeland security, public safety, and emergency management and response. Members leverage efforts related to the governance, development, and sharing of situational awareness and incident management resources, tools, and best practices	http://nisconsortium.org/

The Hydrologic Engineering Center (HEC), an organization within the Institute for Water Resources, is the designated Center of Expertise for the US Army Corps of Engineers	http://www.hec.usace.army.mil/
National Water & Climate Center	http://www.wcc.nrcs.usda.gov/
WinTR-55 Watershed Hydrology	http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1042901
USACE Hydrologic Engineering Center (HEC)	http://www.hec.usace.army.mil/software/
Stormwater Manager's Resource Center SMRC	http://www.stormwatercenter.net
USGS Current Water Data for the Nation	http://waterdata.usgs.gov/nwis/rt
USGS Water Data for the Nation	http://waterdata.usgs.gov/nwis /
Topography Maps and Aerial photos	http://www.terraserver.com/view.asp?tid=142
National Register of Historic Places	http://www.nps.gov/nr/about.htm
National Wetlands Inventory	http://www.fws.gov/wetlands/
ICLUS Data for Northeast Region	http://www.epa.gov/ncea/global/iclus/inclus_nca_northeast.htm

SUSTAINABILTY/ADAPTATION/CLIMATE CHANGE

Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability	http://www.fema.gov/media-library-data/20130726-1454-20490-3505/fema364.pdf
Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards	http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf
NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments)	http://ccrun.org/home
Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use	http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf
U.S. EPA	http://www.epa.gov/climatechange/
NOAA National Ocean Service (NOS)	http://oceanservice.noaa.gov/
The Northeast Climate Research Center (NRCC) folks were heavily involved in climate data in the NCA, below. They have a wealth of historic climate data and weather information, trends, etc.	http://www.nrcc.cornell.edu/
Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management	http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf
National Fish, Wildlife and Plants Climate Adaptation Strategy	www.wildlifeadaptationstrategy.gov
ICLEI Local Governments for Sustainability	http://www.icleiusa.org/
Kresge Foundation Survey	http://www.kresge.org/news/survey-finds-communities-northeast-are-trying-plan-for-changes-climate-need-help-0
New England's Sustainable Knowledge Corridor	http://www.sustainableknowledgecorridor.org/site/
The Strategic Foresight Initiative (SFI)	http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf
Northeast Climate Choices	http://www.climatechoices.org/ne/resources_ne/nereport.html
Northeast Climate Impacts Assessment	http://www.northeastclimateimpacts.org/

Draft National Climate Assessment Northeast Chapter released early 2013	http://ncadac.globalchange.gov/
Northeast Chapter of the National Climate Assessment of 2009:	http://www.globalchange.gov/images/cir/pdf/northeast.pdf
NEclimateUS.org	http://www.neclimateus.org
ClimateNE	www.climatenortheast.com
Scenarios for Climate Assessment and Adaptation	http://scenarios.globalchange.gov/
Northeast Climate Science Center	http://necsc.umass.edu/
FEMA Climate Change Adaptation and Emergency Management	https://www.llis.dhs.gov/content/climate-change-adaptation-and-emergency-management-0
Climate Central	http://www.climatecentral.org
EPA State and Local Climate and Energy Program	http://www.epa.gov/statelocalclimate/index.html

PLANNING

American Planning Association	http://www.planning.org
PlannersWeb - Provides city and regional planning resources	http://www.plannersweb.com

OTHER FEDERAL RESOURCES

U.S. Army Corps of Engineers: Provides funding for floodplain management planning and technical assistance and other water resources issues.	www.nae.usace.army.mil
Natural Resources Conservation Service: Technical assistance to individual land owners, groups of landowners, communities, and soil and water conservation districts.	www.nrcs.usda.gov
NOAA Coastal Services Center	http://www.csc.noaa.gov/
Rural Economic and Community Development: Technical assistance to rural areas and smaller communities in rural areas on financing public works projects.	www.rurdev.usda.gov
Farm Service Agency: Manages the Wetlands Reserve Program (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farmland set aside programs	www.fsa.usda.gov
National Weather Service: Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood-warning plans.	www.weather.gov
Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning	www.osec.doc.gov/eda/default.htm
National Park Service: Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment.	www.nps.gov
Fish and Wildlife Services: Can provide technical and financial assistance to restore wetlands and riparian habitats.	www.fws.gov
Department of Housing & Urban Development	www.hud.gov

Small Business Administration: SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements.	www.sba.gov/disaster
Environmental Protection Agency	www.epa.gov

OTHER RESOURCES

New England States Emergency Consortium (NESEC): NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Resources are available on earthquake preparedness, mitigation, and hurricane safety.	www.nesec.org
Association of State Floodplain Managers (ASFPM): ASFPM has developed a series of technical and topical research papers, and a series of Proceedings from their annual conferences.	www.floods.org
National Voluntary Organizations Active in Disaster (VOAD) is a non-profit, nonpartisan membership organization that serves as the forum where organizations share knowledge and resources throughout the disaster cycle—preparation, response, recovery and mitigation.	http://www.nvoad.org

FEMA RESOURCES

Federal Emergency Management Agency (FEMA)	www.fema.gov
National Mitigation Framework	http://www.fema.gov/national-mitigation-framework
Federal Insurance and Mitigation Administration (FIMA)	http://www.fema.gov/fima
Community Rating System (CRS)	http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system
FEMA Building Science	http://www.fema.gov/building-science
National Flood Insurance Program (NFIP)	http://www.fema.gov/national-flood-insurance-program
Floodplain Management & Community Assistance Program	http://www.fema.gov/floodplain-management
Increased Cost of Compliance (ICC): ICC coverage provides up to $30,000 for elevation and design requirements to repeatedly or substantially damaged property.	http://www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage
National Disaster Recovery Framework	http://www.fema.gov/national-disaster-recovery-framework
Computer Sciences Corporation: contracted by FIMA as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities	www.csc.com
Integrating the Local Natural Hazard Mitigation Plan	https://www.fema.gov/ar/media-

into a Community's Comprehensive Plan: A Guidebook for Local Governments	library/assets/documents/89725
Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning	http://www.fema.gov/media-library/assets/documents/4317

Mitigation Best Practices Portfolio http://www.fema.gov/mitigation-best-practices-portfolio

FEMA Multi-Hazard Mitigation Planning Website	http://www.fema.gov/multi-hazard-mitigation-planning
FEMA Resources Page	http://www.fema.gov/plan/mitplanning/resources.shtm
Local Mitigation Plan Review Guide	http://www.fema.gov/library/viewRecord.do?id=4859
Local Mitigation Planning Handbook complements and liberally references the Local Mitigation Plan Review Guide above	http://www.fema.gov/library/viewRecord.do?id=7209
HAZUS	http://www.fema.gov/protecting-our-communities/hazus
Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards	http://www.fema.gov/library/viewRecord.do?id=6938
Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials	http://www.fema.gov/library/viewRecord.do?id=7130
IS-318 Mitigation Planning for Local and Tribal Communities Independent Study Course	http://training.fema.gov/EMIWeb/IS/is318.asp

Bristol Hazard Mitigation Plan Update Committee

February 23, 2015 – 5:00 PM
Bristol Fire Department
85 Lake Street, Bristol, NH

AGENDA

1. Introductions

2. Hazard Risk Assessment
    a. Extent
    b. Impacts

3. Gaps/Problems

4. Mitigation Actions

5. Schedule next meeting

6. Public Input

Goals for next meeting:

a. Mitigation Actions and Prioritization

FEMA

The focus of this process is **mitigation**, which is action taken to reduce or eliminate long-term risk to hazards.
Mitigation is different from preparedness, which is action taken to improve emergency response or operational preparedness.

Definitions for evaluation of Capabilities

Poor (P)..... *The policy, plan, mutual aid system or action does* ***not work as well as it should*** *and* ***often*** *falls short of meeting its goals.*

Fair (F)..... *The policy, plan, mutual aid system or action does* ***not work as well as it should*** *and* ***sometimes*** *falls short of meeting its goals.*

Good (G)..... *The policy, plan, mutual aid system or action* ***works well*** *and* ***is achieving its goals.***

Excellent (E)..... *The policy, plan, mutual aid system or action* ***works very well*** *and* ***often exceeds its goals.***

Untested (U)**.....** *The policy, plan, mutual aid system or action* ***has not yet been developed, tested, or built*** *and* ***cannot yet be evaluated.***

Location
• **Negligible:** <10 percent of planning area or isolated single-point occurrences.
• **Limited** 10 to 25 percent of the planning area or limited single-point occurrences.
• **Significant** 25 - 75 percent of the planning area or frequent single-point occurrences.
• **Extensive** 75 - 100 percent of the planning area or consistent single-point occurrences.
Extent
• **Weak:** limited magnitude, slow onset, short duration, little damage.
• **Moderate:** moderate magnitude, moderate onset speed, moderate duration, some damage/loss of service for days.
• **Severe:** Severe magnitude, fast speed of onset, long duration, devastating damage and loss of service for weeks
• **Extreme:** Extreme magnitude, immediate onset, extended duration, catastrophic damage, uninhabitable conditions.
Probability of Future Events
• **Unlikely:** <1% probability of occurrence in the next year or a recurrence interval of more than every 100 years.
• **Occasional:** 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
• **Likely:** 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
• **Highly Likely:** 90 to 100% probability of occurrence in the next year or a recurrence interval of less than 1 year.