

LOCAL HAZARD MITIGATION PLAN



TOWN OF BRISTOL, VERMONT

2024

FEMA Approval Pending Adoption Date

Municipal Adoption Date:

FEMA Formal Approval Date:

Prepared by the Bristol Local Hazard Mitigation Planning Committee

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Key Partners	
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VT Department of Health	Addison County Regional Planning Commission
Green Mountain Power	Agency of Natural Resources – Department of Environmental Conservation National Flood Insurance
Otter Creek Clean Water Service Provider	

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	With the almost annual occurrence of a significant snow or ice storm, the town feels an impact most on the infrastructure of the community. The town is able to keep the roads open and treated for most storms and any loss of power is usually limited to hours, however, the intersection of Burpee Road and Monkton Road is subject to frequent drifting of snow (Tab c). This area has the potential to be a high accident area.	16
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1 INTRODUCTION

Mitigation planning provides an opportunity for local government to lessen the impact of the next natural disaster. The impact of probable, but unpredictable natural events can be reduced through community planning and action. The goal of this Plan is to advance and prioritize mitigation investments to reduce risks posed by natural hazards and to increase the Town of Bristol resilience to damages from natural hazard impacts.

Hazard Mitigation is any sustained policy or action that reduces or eliminates long-term risk to people and property from the effects of natural hazards. FEMA and state agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that opportunities exist for communities to identify mitigation strategies and measures during all the other phases of Emergency Management: Preparedness, Response and Recovery. While the hazards can never be completely eliminated, it is possible to identify what the hazards are, where their impacts are most severe, and identify local actions and policies that can be implemented to reduce or eliminate the severity of the impacts.

2 PURPOSE

The purpose of this Plan is to assist the Town in identifying all natural hazards facing the community, ranking them according to local vulnerabilities, and developing strategies to reduce risks from those hazards. Once adopted, this Plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property. The intent is to create a both short term 5- year pathway of actions while thinking more long term resilience to mitigating hazards within the community. The benefits of mitigation planning include:

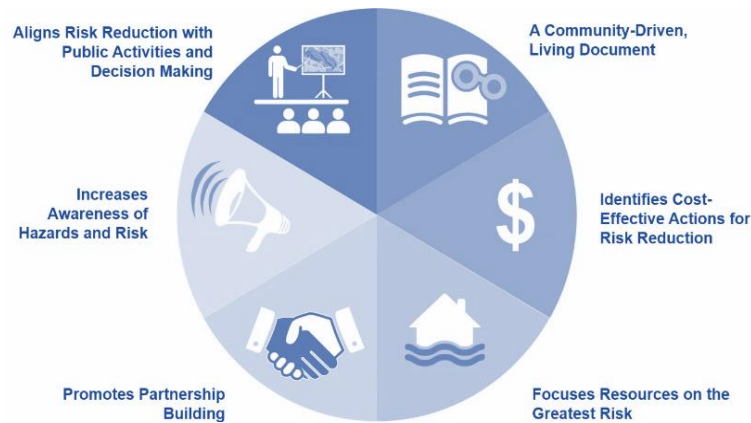


Figure 1 Source: FEMA LHMP Skill Share Workshop 2021

Land Use – Development Patterns

Bristol from its inception has enjoyed a full range of uses of its land: agricultural, residential, commercial (retail and office), manufacturing, timber harvesting and the extraction of sand, soil, gravel and rock. The concentration of commercial facilities and manufacturing has traditionally been in and around the Village. This is also where the largest concentration of residential development has occurred. The surrounding area outside of the Village area has been designated as a rural planning area and conservation planning area. Bristol is the third largest center of employment in Addison County after Middlebury and Vergennes. Between 2010 and 2017, Bristol’s local economy added 30 business establishments (21%) and the number of people working in town increased by 97

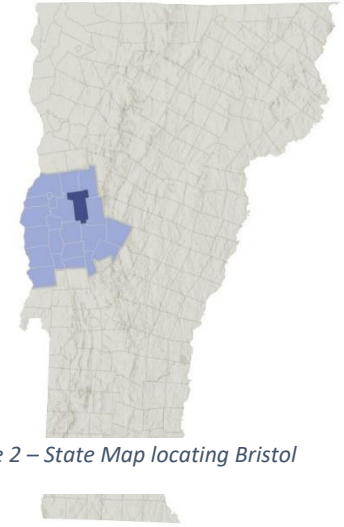


Figure 2 – State Map locating Bristol

some

(7.6%)

Land Features

The Town of Bristol is located at the foot of the Green Mountains and as such has a topography that ranges from steep to relatively flat as the town extends out onto the bed of the Champlain Valley. The town covers approximately 26,860 acres of which or 20% is owned by the Green Mountain National Forest.

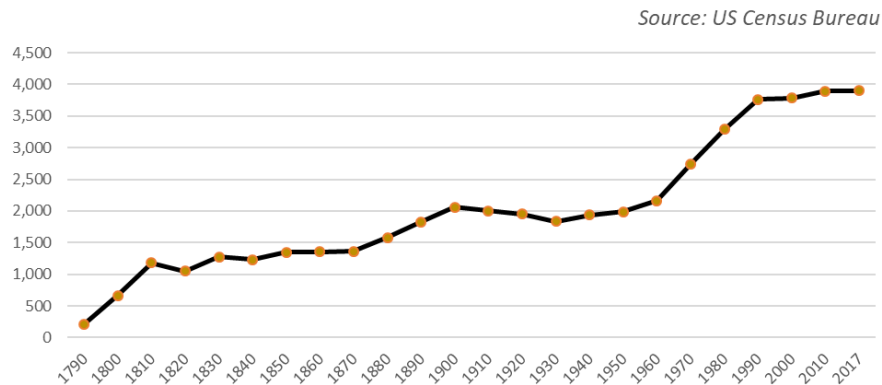
5,338

Demographics and Growth Potential

Bristol experienced dramatic growth from 1960 to 1990, but the rate of growth essentially plateaued from 1990 to 2010 and recently decreased 2.9% from 3,907 to 3,782. The overall population is also aging rapidly with significant drops being felt in the 18-34 age group. The rapid population growth experienced from 1970-1990 coupled with an overall reduction in family size was also reflected in an 80% increase in housing during that period.

Even though the household number has dropped to 1,638 the housing has increased from 1,600 units in 2016 to 1,762, as of the 2020 Census. A little more than two-thirds (69%) of the housing units in Bristol are single-family, approximately 22% are multi-family units and 9% are mobile homes. Nearly all new residential construction has occurred in the downtown area since 2000. More than 30% of housing units were built before 1939. Bristol has seen an increase in the desire for the aging population to move into the village resulting in more renovation activity than new construction.

Table 1 – Census History



Source: US Census Bureau

Precipitation and Water Features

Based on National Weather Service’s precipitation records for nearby Burlington, VT, the summer months of June July and August receive the greatest amount of rain. The Bristol Flood Map indicates where flooding risk is highest. Generally, any rain events in excess of 2.5” in a 24-hour period are likely to result in some flash flooding.

Bristol has numerous scenic water features including the New Haven River which meanders through the center of the town and its many tributaries. Winona Lake to the north along with Norton Brook and other numerous streams.

Bristol has several significant Class II wetlands that includes marshes surrounding Bristol Pond aka Lake Winona, North Gilmore Ponds, east and southeast of Bristol cliffs. The watershed center where the Norton Brook flows into the Little Otter Creek and the area around Sycamore Park.

Water and Wastewater

The village has a water distribution system that is spring fed and includes a covered storage reservoir located above town off Mountain Street. This water system serves 646 connections and provides exceptional water pressure and volume, invaluable for fire suppression. Most Bristol residents outside of the Village area have private wells and springs that serve individual houses. There is a small Town-operated septic system that supports a portion of the commercial blocks downtown. Bristol’s remaining residents are served by individual on-site septic systems. Storm water is an ongoing concern for many residents due to a limited village storm water system capacity and an outflow that directly discharges onto the banks of the New Haven River.

Transportation

Bristol is 42.2 square miles in size with primary access via VT Route 17 bisecting the Town and Village east/west or VT Route 116 running generally north/south. Bristol has 13.336 miles of State highway running through the town that the Vermont Agency of Transportation (VTrans) maintains. The 2022 VTrans Town Highway Data indicates Bristol owns and maintains 36.595 miles of roads: 1.225 of Class 1; 11.090 of Class 2; 24.28 of Class 3 excluding Class 4 roads.

Electric Utility Distribution

In Bristol, power is provided by Green Mountain Power through a 12.5KW line that is slated to be upgraded to 34.5KW within the next 20 years.

There are three commercial solar fields owned by Acorn Energy that are subscriber systems which could be impacted by various hazards high wind/ hail event.

Table 2: Green Mountain Power Average Annual Outage Data for Bristol

Average Annual Outage Data(2019-2023)	
Average number of outages per customer per year	1.27 times per year
Total outage duration per customer	2.84 hours per year
Average length of each outage	3.62 hours per year

Public Safety

The Bristol Fire Department is staffed by 32 firefighters that fill various functions within the Department to include but not limited to: Firefighter, Exterior Firefighter, Pumping Apparatus Driver/Operator, and Fire Officer. The Fire Department currently has three pumper trucks, rescue truck and tanker trucker. The officers and firefighters of the Bristol Fire Department operate under the direction of the Fire Chief who reports to the Selectboard through the Town Administrator. The Fire Chief always has control of the fire department for day-to-day operations and when it is called to service. The fire department responds to on average 130 calls a year for motor vehicle crashes, smoke/CO alarm, fire, hazardous condition, service calls and medical assists.

Law Enforcement by the Bristol Police Department is in a designated Police District and is provided by 4 full time and 3 part time officers. The district is limited to an area of approximately 1 square mile around the central business district. Vermont State Police is the primary agency and the Addison County Sheriff’s Department support the remainder of the Town of Bristol.

The Bristol Rescue Squad Inc. is a private non-profit EMS agency providing primary 24/7 9-1-1 EMS response to the entirety of the towns of Bristol and Lincoln, along with portions of Monkton, New Haven and Starksboro. Bristol Rescue Squad is a

combination paid/volunteer agency who responded to 1,034 calls in 2023, 936 in 2022, 770, in 2021 and 777 in 2020. Bristol Rescue currently operates two Type 1 Ambulances and one Type 2 ambulance at the Advanced EMT (AEMT) level. In addition to 9-1-1 response and transports services, the Bristol Rescue Squad provides Interfacility transportation between healthcare facilities and from healthcare facilities to a patient’s residence.

The nearest hospital services are provided by Porter Medical Center, a satellite of the UVM Health Network, which is a 45-bed community hospital located 10 miles away in Middlebury. The nearest Level I Trauma center is located 25 miles north in Burlington, VT.

Emergency Management

The Town uses a Local Emergency Management Plan (LEMP) to guide its response to larger incidents. The LEMP identifies the Emergency Management Director (EMD) as the Town Administrator along with a volunteer as Deputy EMD, who are also the Emergency Management Planners. Additionally, the LEMP designates Holley Hall the Bristol Police Department and the Rescue Garage as potential emergency operations centers. Mount Abraham Union High School (MAUHS) is designated as the primary shelter while Bristol Elementary School is the alternate shelter. MAUHS Parking lot has been identified as a potential **Community Point of Distribution (C-POD) in the event Federal supplies need to be distributed in the area.**

4 PLANNING PROCESS

Plan Developers

The Town Administrator assembled a Hazard Mitigation Planning Committee to participate in updating the Plan. Team members included the: Town Administrator, Road Foreman, members of the Selectboard, Fire Chief, Planning Commission, Conservation Commission, Rescue Squad, Citizen Liaison, Water Operations and Addison County Regional Planning Commission.

SEAM Solutions assisted the Town with this Plan update. FEMA Building Resilient Infrastructure and Communities (BRIC) funds supported this process.

Plan Development Process

The 2024 Local Hazard Plan is an update to the 2018 single jurisdiction mitigation plan. A summary of the process taken to develop the 2023 update is provided in **Table 3**.

Table 3 – Plan Development Timeline and Process

March 20, 2024 – Kick off meeting. Discussed current plan status; planning process; update to plan sections; outreach strategy. Committee meetings were held online but not made available to the public
April 11, 2024 – Plan update announcement was posted on the Town’s website , physically posted at the Town Office along with the Town’s social media pages.
April 17, 2024 – Planning Committee working meeting - Discussed public outreach strategy, identify community stakeholders, reviewed and made updates to the Introduction, Purpose and Community Profile, compiled information to identify critical facilities.
June 19, 2024 – Planning Committee working meeting – reviewed dam information, reviewed critical facilities list identified by the Town and map that identifies the critical facilities, river corridor and FEMA flood hazard area.
July 17, 2024 – Planning Committee working meeting – Discussed the impact of the remnants of Beryl on the community and identified the need to submit a draft. Started to identify and rank hazards and their risk to the Town.
July 22, 2024 – Planning Committee working meeting - Finished ranking hazards, reviewed mitigation goals, strategies and actions from the 2018 plan for completeness, identified prior actions that should be included in the 2024 plan.

July 29, 2024 – Planning Committee working meeting - Discussed community capabilities and areas for improvement for administrative and technical, planning and regulatory, outreach and education. Identified mitigation action opportunities.
August 21, 2024 – Prioritize mitigation actions and add any if there are gaps
Present at Selectboard meeting or public meeting?
Present draft to Whole Community stakeholders

In addition to the local knowledge of the Planning Committee members and relevant stakeholders, many existing local, regional and state plans, bylaws, studies, reports, and technical information were reviewed and utilized in the update of this plan.

Table 4 – Existing Plans, Studies Reports and Technical Information

<u>2020 Town Plan</u> Referenced to develop the Community Profile, Capabilities, Integrating into Existing Plans and Procedures, Mitigation Strategy Updates – Changes Since 2018 Plan in Section 6.
<u>2024 Local Emergency Management Plan</u> Primarily used to identify local organizations that support vulnerable populations to ensure these organizations are invited to participate in the plan update along with updating the Section 3.
<u>2019-2023 Green Mountain Power Outage Data</u> Used to develop Table 2 in the Community Profile Section and identify potential vulnerabilities.
<u>2020 US Census Data</u> Used to develop the Demographics and Growth Potential information in Section 3.
<u>2020 Unified Development Regulations</u> Referenced to develop Community Capabilities, Integrating into Existing Plans and Procedures, Mitigation Strategy Updates in Section 6 and Changes Since 2018 Plan in Section 4.
<u>2021 American Community Survey Five-Year Estimate</u> Used to develop the Demographics and Growth Potential information in Section 3.
<u>2023 State of Vermont Hazard Mitigation Plan</u> Primarily referenced to develop the risk assessment and profiles in Section 5.
<u>2023 FEMA Local Mitigation Planning Handbook</u> Used to ensure plan meets the Federal mitigation planning requirements, including those for addressing climate change.
<u>2023 FEMA Hazard Mitigation Assistance Program Policy Guide</u> Used to ensure plan meets the Federal mitigation planning requirements, including those for addressing climate change.
<u>2021 Vermont Climate Assessment</u> Referenced to develop the flood risk profile in Section 5.
<u>FEMA NFIP Insurance Reports</u> Used to determine how many structures are insured and describe NFIP compliance in Section 6. NOTE: Due to FEMA Region I concerns related to personally identifiable information (PII), NFIP repetitive loss and severe repetitive loss information is unavailable for this plan update.
<u>2017 FEMA Region I Mitigation Ideas for Natural Hazards</u> Used to develop mitigation actions to address impacts from severe winter storms, high winds and floods.
<u>2019 Road Erosion Inventory</u> Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.
<u>VTrans Transportation Resilience Planning Tool</u> Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.
<u>Vermont Dam Inventory (VDI)</u> Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.
<u>National Oceanic and Atmospheric (NOAA) National Climatic Data Center’s Storm Events Database</u> Referenced to develop the risk profile and hazard history in Section 5.
<u>FEMA Disaster Declarations for Vermont</u> Referenced to develop the risk profile and hazard history in Section 5.
<u>OpenFEMA Dataset: Public Assistance Funded Project Summaries for Vermont</u> Referenced to develop the risk profile and hazard history in Section 5.
<u>Vermont Department of Health</u> Referenced to develop the risk profile in Section 5.

Vermont Agency of Natural of Resources Referenced to develop the risk profile in Section 5.

Vermont Agency of Natural of Resources Watershed Projects Referenced to identifying completed and develop mitigation actions to address floods in Section 6

Changes since the 2018 Plan

The 2018 local hazard mitigation planning effort analyzed both natural and man-made hazards based on frequency, warning time, geographic impact, property damage and committee concern to derive at an overall vulnerability score. The committee identified the hazards as either high or low risk. Flash flood; landslide/rockslide; earthquake; wildfire; invasive species; hazmat spill/ or structure fire were prioritized as a high risk/vulnerability to the community. Actions proposed in 2018 focused on mitigating risks from flooding and flash flooding, while identifying actions for the remaining hazards except for earthquakes. While this hazard ranked high the Town did not believe that the risk was large enough to require town building retrofits as that time.

While the Town pursued the implementation of the mitigation strategies identified in the 2018 Plan, they also looked for opportunities to incorporate recommendations and information from the 2018 Plan into other plans, programs, and procedures. The Town successfully incorporated elements of the Plan in the updates to the Town Plan and Unified Development Regulations.

The Bristol Town Plan, updated in 2020, provides the vision for how Bristol should grow and develop. All Regulations governing land use in the Town of Bristol stem from the Bristol Town Plan and should serve to implement the visions contained in it. The Regulations should work in concert to provide a clear, fair and efficient administrative process to guide and control development.

The new Plan contains a Flood resilience Plan that identifies Flood Hazard and Fluvial (River) Erosion Hazard areas along with land use policies and policies that support the goal of mitigation risks to public safety, critical infrastructure, historic structures and municipal investments posed by flooding and fluvial erosion.

The Unified Regulations (these “Regulations”), also updated in 2020, constitute the primary regulatory tool by which the Town of Bristol implements the vision in its Town Plan. They include Bristol’s Zoning Regulations, Subdivision Regulations, the Flood Hazard Area Regulations and the Downtown Design Review criteria for the area encompassing Bristol’s Downtown Designation. For any given application, only a portion of these Regulations will apply. These Regulations are intended to be comprehensive and are organized to clarify the review process before the Zoning Administrator, Development Review Board or Downtown Design Review Committee.

In addition, Bristol made significant progress in completing other mitigation actions identified in the 2018 Plan – see **Appendix XXX**.

Include

- Under Flood section: Town has also conserved riverside lands (e.g., Saunders River Access/ Paul Fuller river easement) to prevent development in the floodplain.

Future action : Fluvial erosion hazard area

Eagle park gets repetitive inundation flooding – 2011 2019 remove railings tends to have debris hang ups – platform and railings be removeable

Any additional guidelines DEC? – information outreach initiatives for water conservation measures -using social media

Town utilizes VTAlert – voluntarily sign up – use for water district

Outreach potential

In the midst of replacing all the 1905 water lines – public health and impactful when water lines break – emergency repairs are costly

Updating the water ordinance for line extension beyond ROW to ensure integrity

Water commission are getting increasing water line extension requests

Bristol is on a major gravel bed that causes water line leaks

Inspections are conducted at least every other year to identify waterline leaks

Valerie may have a blurb to add

As described in the Community Profile above, Bristol's population has started to decline after peaking in 1990 and plateauing for the 20 years, however the town plan would like to seek expansion of housing options including affordable housing but would need partnerships to build out public water and sewer utilities.

As the Unified Development Regulations have evolved changes in population and development since 2018 have not made Bristol more vulnerable to natural hazards and therefore are not the primary drivers for a shift in the Town's mitigation priorities in 2024. However, changing weather conditions most influenced the Town's current mitigation strategy.

Climate Change

The 2023 Vermont State Hazard Mitigation Plan states; Warming temperatures, shrinking winters and increasing incidence of intense storm events are beginning to have a significant impact on Vermont's economy, people and environment and require immediate attention across all planning efforts. Accordingly, and as a guiding principle of this Plan, we have aimed to recognize and include the impacts of climate change throughout Plan development, most notably reflected in the hazard profiles and mitigation actions. Both direct and indirect impacts of climate change are addressed within pertinent hazard profiles, as well as the potential for compounding impacts.

Bristol's Town Plan recognizes with climate change models predicting increased precipitation and stronger storms, many communities now find themselves and their infrastructure increasingly vulnerable to natural disasters like flooding. The Town of Bristol has already been proactive in protecting its community with flood hazard area regulations for future development and substantial improvements. The Town considered the effects of future conditions, like climate change, on the type, location, and range of intensities of identified hazards when they conducted the risk assessment in 2024.

The primary mitigation goal in the 2023 Plan is to increase the Town's resilience to natural hazards by advancing mitigation investment to reduce or avoid long-term risk to people, homes, neighborhoods, the local economy, cultural and historic resources, ecosystems, and Community Lifelines.

5 HAZARD IDENTIFICATION AND RISK ASSESSMENT

Local Vulnerabilities and Risk Assessment

To be consistent with the approach to hazard assessment in the 2023 State Hazard Mitigation Plan, the Hazard Mitigation Planning Committee conducted an initial analysis of known natural hazard events to determine their probability of occurring in the future and their potential impacts on the people, infrastructure, the environment, and local economy.

This assessment considered the effects of future conditions, like climate change, on the type, location, and range of intensities of identified hazards.

The ranking results are presented (in bold and darker blue in **Table 5**) and reflect the following **highest risk hazard impacts** that the Town believes they are most vulnerable to:

	<i>Invasive Species such as Japanese Knotweed, Poison Parsnip and Emerald Ash Borer</i>		<i>Strong wind associated with thunder and/or winter storms.</i>
	<i>Extreme cold and snow associated with severe winter storms.</i>		<i>Floods associated with thunder and/or winter storms and ice jams.</i>

Each of the **highest risk hazard impacts** are profiled in this section. Lower risk hazard impacts do not justify mitigation due to a low probability of occurrence and/or low impact and are not profiled in this Plan. See the State Hazard Mitigation Plan for information on the lower risk hazards.

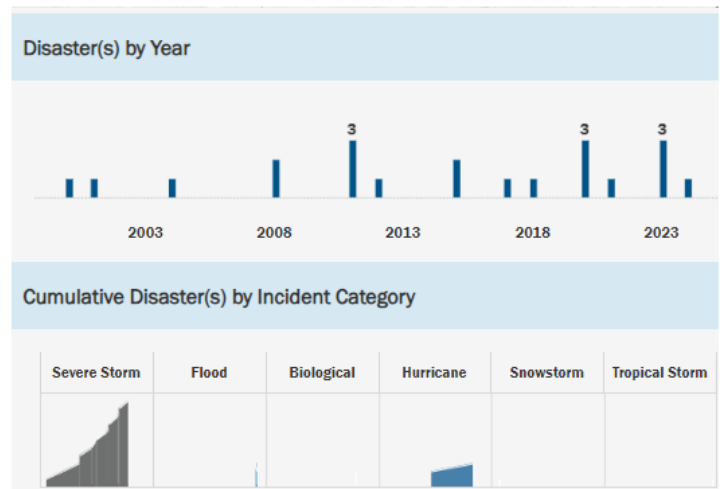
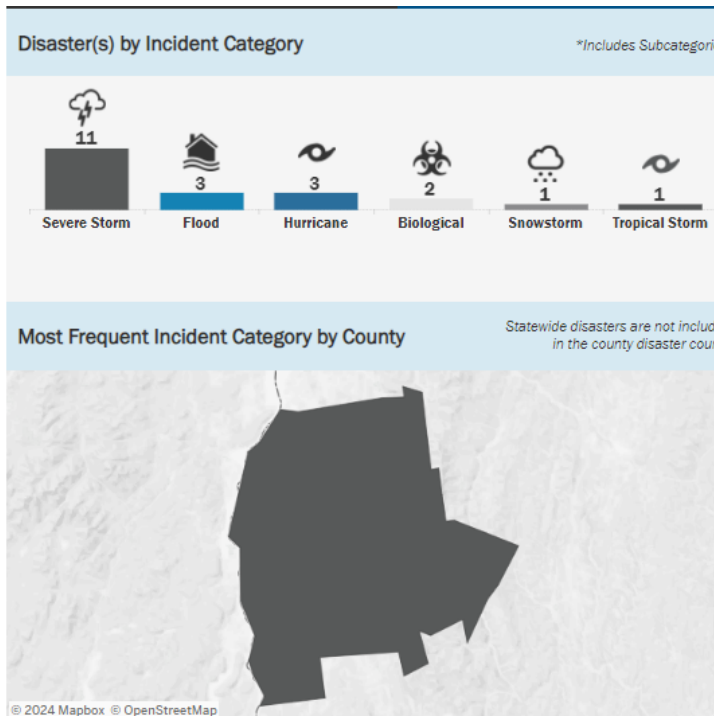


Figure 3 - FEMA Declarations

Table 5 - Community Hazard Risk Assessment

Hazard Events	Hazard Impact	Probability	Potential Impact					Score	Rank
			Infrastructure	Life	Economy	Environment	Average		
Thunderstorm	Fluvial Erosion	3	2	1	2	3.5	2.875	8.625	6
	Flash Flooding - Road Erosion	3	3	1	2.5	3.5	3.25	9.75	4
Ice Jam	Inundation Flooding	3	2	1	2.5	2	2.625	7.875	8
Tropical Storm/Hurricane	Strong Wind	3.5	3	2	2.5	3	3.5	12.25	2
Tornado	Hail	1	1	1	1	1	1.25	1.25	15
Landslide	Landslide /Slope failure	2	2.5	1	2	2	2.375	4.75	11
Winter Storm	Ice	1.5	3	1.5	2.5	2	2.625	3.938	13
	Snow	3.5	3	1	2.5	1.5	2.875	10.06	3
	Cold	3	3	2	2.5	1	2.875	8.625	5
Drought	Heat	3	2.5	2.5	1	2	2.75	8.25	7
	Drought	2	1.5	1	2	2	2.125	4.25	12
Wildfire	Wildfire	2	3	3	3	3	3.5	7	9
Earthquake	Earthquake	1	2	2	2	2	2.25	2.25	14
Invasive Species	Invasive Species	4	2	1	2.5	3.5	3.25	13	1
Infectious Disease	Infectious Disease	2	1	4	3	2	3	6	10

*Score = Probability x Average Potential Impact

	Frequency of Occurrence: Probability of plausibly significant event	Potential Impact: Severity and extent of damage and disruption to population, property, environment, and the economy
1	Unlikely: < 1% probability of occurrence per year	Negligible: Isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
2	Occasionally: 1% to 10% probability of occurrence per year, or at least one chance in the next 100 years	Minor: Isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
3	Likely: >10% but <75% probability per year, at least one chance in the next 10 years	Moderate: Severe property and environmental damage on a community scale, injuries or fatalities, short-term impact
4	Highly Likely: > 75% probability in a year	Major: Severe property and environmental damage on a community or regional scale, multiple injuries or fatalities, significant economic impact

Highest Risk Hazard Profiles



Invasive Species are becoming a widespread problem throughout Bristol and the rest of Vermont. Damages range from skin blistering and scarring in the case of poison parsnip, to the devastating effect the Asian Longhorn Beetle (ALB) or Emerald Ash Borer (EAB) could have on Bristol's forest products industry.

The Bristol hazard mitigation committee pointed out that much of the spread of unwanted invasive plants is along roadsides and has entered the town via state highways. Flying insect invasives will be far more widespread due to the mobility of these pests and could strike anywhere in the community where their hosts live (Ash for Emerald Ash Borer and Maple for Asian Longhorned Beetle). From small woodlots to large-tract forests, all treed land is susceptible.

Widespread establishment of Wild or Poison Parsnip (*Pastinaca sativa*) along roadsides and/or open fields can effectively remove those areas for recreational purposes through much of the summer months. Once contracted, many are quite hesitant to venture far from cleared paths and given the non-developed nature of much of Vermont's attraction for tourists, could heavily impact future visits.

Ash trees are the source for hardwood that can bend and withstand considerable stress. Historically, ash has been the source for axe handles, hockey sticks and baseball bats. It is a component of timber harvesting in Vermont and provides that industry with a moneymaking product. Spread of the Emerald Ash Borer (*Agrilus planipennis*) (EAB) into Vermont's forests would have a significant impact on timber values. The Emerald Ash Borer Strategic Plan Committee was established in 2020 by the Selectboard with the mission to update and broaden the 2014 street tree inventory to identify the location and condition of all ash trees on public properties, including along neighborhood streets, within public parks, and along roadways. This committee also identified locations, established priorities and timelines for removal of ash trees

A third invasive of immediate concern to Vermont is the Asian Longhorned Beetle (*Anoplophora glabripennis*) (ALB) which attacks and kills maple trees. Vermont is famous for its maple syrup and is the largest producer of maple products in the United States. Widespread loss of maple trees could result in the collapse of this iconic industry and a severe impact to the state's economy.

Other invasives include Purple Loosestrife, Japanese Knotweed, Rock Snot and many others which all have a detrimental impact on the state's native populations and the state's ecological balance.

The most noticeable impact of invasives in Vermont began when a load of elm lumber was imported into this country from Europe in the early 1900s. Embedded in this load were spores of what we now call Dutch elm disease. At the time, elm was the most popular street tree in the US due to its hardiness in many types of conditions. The loss of these trees which were liberally planted as shade trees in many village greens and along roadsides had an extreme impact both aesthetically and due to the loss of shade, in the overall use of electricity in summer months. Now, elm is uncommon in most of the northeast and the disease continues to spread westward.

Other examples include the importation of gypsy moth in an attempt to create locally grown silk, the spread of zebra mussels which threaten water intakes on infested water bodies and the unintentional importation of the Norway Rat in ships holds with early colonists. Each of these has had its own impacts on the economy and ecological stability of the US and Vermont.

With an increasing global economy, new and unknown invasives are sure to be imported from other countries in the future. In recognition of the inevitable spread of EAB and ALB into Vermont, trapping is being conducted by foresters and biologists along the border areas of Vermont. ALB is expected in Vermont within the next few years and damage caused by their spread is already anticipated by the Vermont Agency of Natural Resources. EAB was reported in the State of Vermont for the first time in early 2018 and State plans have been put into action.

Bristol is extremely vulnerable to the economic impacts of invasives and is limited in its ability to combat their spread. The community does what it can but is highly dependent on State and Federal agencies to slow down the spread of invasives. With a local economy highly focused on the forests and forest products, the community is highly at risk. The hazard mitigation committee scored Invasives at the highest risk rating with a score of 13, this reflects the HIGH PRIORITY that should be given to these hazards to the community.



Strong Wind can occur on its own as a single event or it can be associated with other natural hazards, including thunderstorms or winter events. Wind in Vermont typically flows from west to east and is most significant on mountain peaks. While Bristol has managed to avoid many of the larger events, localized strong winds have resulted in occasional loss of roofs on lesser maintained structures but is susceptible to high directional winds town wide. With its location at the intersection of the Champlain Valley and the Green Mountains winds from the SSW tend to be compressed against the mountains causing locally higher winds than are experienced in other areas of the region. Fortunately for Bristol, these same geographic conditions tend to break up potential tornadic wind patterns.

FEMA's National Risk Index defines Strong Wind as damaging winds that exceed 58 mph. Strong Wind poses a threat to lives, property, and vital utilities primarily because of flying debris or downed trees and power lines. Addison County has seen winds as high as 86 mph however on average the winds events range on the low end of what FEMA considers strong winds. From 1997 to 2022 wind events has caused more than \$345,000

Downed trees within the road right-of-way are the root cause of many power outages. Roads that pass through dense wooded areas are prone to downed trees, which can lead to fallen power lines. Strong wind events with associated power outages can have a short-term impact on the local economy due to business closures. Environmental impacts such as the Emerald Ash can have an impact on the health of trees that can become vulnerable to strong winds. A committee and plan, cited in the invasive species section was established, for the removal of vulnerable trees. The potential risk to public and private woodlots and impacts on the local economy have not been quantified.

Power outages are the main reason for disrupting communications, which are crucial in times of crisis. Telecommunications are also needed for warning systems before a disaster, as well as for response during and recovery after. During a disaster, municipal response is managed by the local Emergency Operations Center (EOC), this would include all communications – from phone calls to internet browsing and 2-way radio. The Fire Department's repeater also goes down when there is a loss of power hindering communications if there are responding to an event.

Public buildings lacking power backup? Repeater does not have generator?

Town is considering changing zoning to allow tower on fire department building , would save a lot of money not paying for the service

In addition to power outages, downed trees during strong wind (and heavy snow/ice) events can damage buildings and other property.

Strong Wind Hazard History

These are the most up to date significant events impacting Bristol. Federal Declarations are depicted in bold. Damages are to Addison County

3/28/2000	68 mph	\$75,000
9/19/2003	52 mph	\$10,000
11/13/2003	35 mph	\$ 5,000
12/11/2003	46 mph	\$ -
11/28/2004	50 mph	\$5,000
9/29/2005	35 mph	\$50,000
1/18/2006	55 mph	\$30,000
2/17/2006	37 mph	\$50,000
10/28/2006	60 mph	\$20,000
12/16/2007	50 mph	\$10,000
12/9/2009	74 mph	\$100,000
1/25/2010	50 mph	\$10,000
2/26/2010	50 mph	\$25,000
12/1/2010	61 mph	\$250,000
12/12/2010	50 mph	\$10,000
4/16/2011	50 mph	\$20,000
10/29/2012	50 mph	\$10,000
12/21/2012	53 mph	\$50,000
4/1/2018	56 mph	\$150,000
12/23/2022	52 mph	\$100,000



Extreme Cold and Snow

With the almost annual occurrence of a significant snow or ice storm, the town feels an impact most on the infrastructure of the community. The town is able to keep the roads open and treated for most storms and any loss of power is usually limited to hours, however, the intersection of Burpee Road and Monkton Road is subject to frequent drifting of snow (Tab c). This area has the potential to be a high accident area.

As population growth and housing expands into the more rural areas of town, increasing dependency on local roads by the new homeowners requires changes in winter maintenance. The town has, thus far, been able to keep up with those increased demands on its services.

Extreme Cold temperatures are part of Vermont's climate tendency to stray above or below expected temperature values. What constitutes 'extreme cold' can vary and is based on what a population is accustomed to in their respective climates. This hazard can have a significant effect on human health and on commercial/agricultural businesses, and primary and secondary effects on infrastructure including burst water pipes and power failure. Colder than normal temperatures during the grow season can devastate crops and plants.

Extreme Cold and Snow

These are the most up to date significant events impacting Bristol. Federal Declarations are depicted in bold. Damages are to Addison County

1/4/2001	DR3167	\$5,411
2/3/2015	DR4207	\$ 32,450
11/13/2003	35 mph	\$ 5,000
12/11/2003	46 mph	\$ -
11/28/2004	50 mph	\$5,000
9/29/2005	35 mph	\$50,000
1/18/2006	55 mph	\$30,000
2/17/2006	37 mph	\$50,000
10/28/2006	60 mph	\$20,000
12/16/2007	50 mph	\$10,000
12/9/2009	74 mph	\$100,000
1/25/2010	50 mph	\$10,000
2/26/2010	50 mph	\$25,000
1/25/2007	-11° F	-25° to -40° windchill
3/6/2007	-8° F	-20° to -40° windchill
3/9/2007	-18° F	
1/14/2009	-20° F	
1/7/2015	?	-25° to -40° windchill
1/11/2022	-?° F	-25° to -35° windchill
1/14/2022	-10° F	-25° to -40° windchill
2/3/2023	-11° F	-25° to -40° windchill



Floods

Bristol's moderate to steep terrain, when combined with heavy rainfall are conditions conducive to flash flooding throughout town. The New Haven River transitions from a steep fast flowing stream north and east of town to a much lesser gradient just south of the village. It is prone to flash flooding all along this route depending on the amount of rainfall, upstream in Lincoln. The only area of town where inundation flooding may be more common than flash flooding is along the north-south valley of the New Haven River on the flats south of town along Rte. 116. Based on the results of overlaying the FIRM flood maps with the location of the E911 points, thirty-four 911 locations in the town are vulnerable to potential flooding. These locations include 27 single family homes, 3 mobile homes, 2 camps, 1 commercial establishment and 1 utility substation located on Hewett Road. The estimated loss for damage to these properties ranges between \$5-7 million.

Flash flood and related erosive failure risks are associated almost entirely with the instability of the New Haven River along its entire route through town. Flash floods identified as a primary risk in Bristol generally also produce major erosion events as river banks and road bases along the river are destabilized. Infrastructure at risk to erosive damage is generally located along the river between the Lincoln Town line and the A Johnson lumber mill located south of the village area. This stretch of river includes portions of River Road and VT Route 116 east of town, both of which have experienced major damages over the past 20 years.

Geomorphic assessments conducted since the 1998 flood of record have identified multiple locations where infrastructure and private homes are at risk due to channel migration and flooding as shown in the following table:

Table 6 – Locations at risk due to channel migration

Reach	Town	Structure	Description/Identified Vulnerability
M10	Bristol	Residence, Left Bank	One residence at 390 Cove Rd is positioned mid-way along the reach at the southern boundary of the historic channel migration zone and could be subject to future erosion hazards if the channel migrates to the south. (avg. house value \$200,000)
M11	Bristol	Route 116	A series of 90-degree meander bends in the reach has resulted in low-to-moderate flows directed nearly perpendicular to Route 116 armoring along right bank at the upstream extent and mid-reach. (Continued expansion of meanders could adversely affect State Rte. #116 in this area)
M11	Bristol	residence, RB	A residence at 2016 S 116 Rd. along right bank has experienced erosion and inundation hazards in past floods, including the 1998 and 2004 flood and impacts to outbuildings in 2011 and 2019 (avg. House value \$200,000)
M12, M13	Bristol	Lumber Mill, RB	This mill located at 995 S 116 Rd was constructed on the historic floodplain decades ago and is susceptible to erosion and inundation hazards during flood events and impacts also occurred in 1938, 1970, 1998, 2011 and 2019 (Total Mill value \$1,758,900) possible new mitigation strategies with change in business ownership
M13	Bristol	residence	Residential properties along RB: 50 to 521 Hewitt Lane and 3 Cold Spring Road, and power substation, 575 Hewitt Lane
M14	Bristol	Residence	Residential properties along LB: 111 and 114 Lower Notch Rd and 1513 and 1859 Carlstrom Rd
M14	Bristol	Town Septic System, RB	Erosive action could put the town septic system at risk during high volume flooding events. (replacement cost: \$1,500,000)
M14	Bristol	Residences, Commercial properties along High RB	These structures are potentially susceptible to both mass failure of the West Street bank above (Top-Down) in 2004 or from erosion of the toe of the slope below. Bottom up mass failures after 1938 flood. (Total values; \$1,434,000) Still vulnerable with recent stabilization?
M14	Bristol	Mill, LB	44 South St potentially susceptible to mass failure from RB failure of West Street above and from erosion of LB during flood event. (Total Mill value \$695,000)
M14	Bristol	South Street, Notch Road LB	Erosive action could put these town roads at risk during high volume flooding events. (Repair Costs \$350,000)
M15	Bristol	residences, RB	The newly-constructed home and Blaises Trailer Park homes along right bank are at imminent risk from streambank erosion and failures in this actively adjusting reach. Other homes and businesses in the Rockydale development are also at risk. (Total at risk property values \$308,000)
M15	Bristol	Route 17 / 116	Route 17 / 116 is highly susceptible to failures from streambank erosion particularly mid-way along the reach. (State owned highway failed in this area during the 1998 flood event)
M15	Bristol	residence	Residential properties along RB: 15, 87, 95, 125 Basin Street; 7, 79, 81, 83 Drake Smith Rd; 91 East St

M16	Bristol	Lincoln Rd	Lincoln Road has seen repetitive damages in historic (1927, 1938, 1970s, 1998) and more recent floods (2019, 2023, 2024) including bottom up failures (from river erosion) and top-down failures (from stormwater-related landslides) (e.g., Briggs Hill Road failures)
M16	Bristol	potential infrastructure	The downstream 750 feet of reach M16 near the confluence with Baldwin Brook is a highly adjusting subreach of river channel subject to braiding flows and lateral channel migration. Future development and placement of infrastructure in this area should be minimized. (Currently largely undeveloped)
M17	Bristol	Eagle Park	Town-owned Eagle Park has seen repetitive damages to Universal Fishing Platform from inundation and erosion (e.g., 2011, 2019)

Based on National Weather Service’s precipitation records for nearby Burlington, VT, the summer months of June July and August receive the greatest amount of rain. The Bristol Flood Map indicates where flooding risk is highest. Generally, any rains in excess of 2.5” in a 24-hour period are likely to result in some flash flooding. Rains in excess of 3-4” can cause floods in multiple locations with considerable damage to town roads. Single 24-hour storm totals exceeded 6” in both 1927 and 2011, the two “watershed” events which resulted in statewide devastation. Due to its siting near the river, there is also a possibility of contamination to the spring that supports the water distribution system in the village.

The committee identified several storms in Bristol where damage was great enough to warrant federal assistance. In late June of 1998, Bristol was the recipient of a chain of successive rainstorms. Once the ground was saturated, the remainder flowed into streams in torrents. The nearby Town of Lincoln was entirely cut off from the rest of the state and Bristol also had major damages. The damage resulted in disaster declaration DR1228 which caused over \$2 million in damages in Addison County alone. This same storm flooded several mobile homes that had slowly crept into a floodplain and resulted in one of the first major mitigation buyouts in the state.

In 2004, a stalled summer storm dropped large amounts of rain onto South Mountain and Deer Leap causing flooding to residences and businesses in the downtown area as well as inflicting damage to town and state highways. The 2004 storm caused over \$70,000 in damage to the Town of Bristol, much of which was reimbursed through State and Federal sources.

In 2008 a single storm concentrated its rain on the towns of Bristol and Nearby New Haven, causing localized flash flooding resulting in DR1790. 2011 saw another banner year for flooding/flash flooding in Bristol. Tropical Storm Irene DR-4022 alone contributed to damages of over \$44,000 in town. There have been no flash flooding events large enough to warrant federal assistance in Bristol since 2011.

Whether the current climate change trend is the direct result of human activity or due to other circumstances, it is impossible to not see it happening. While FEMA has only existed for the past half century, the increase in disaster declarations in Vermont has been noticeable. As one committee member identified, we had five, 700yr storms in a 10yr period. Observing and predicting a rising trend in larger and more severe storms is not a stretch. Following an extended period of calmer/drier weather from the 1950s through the 1980s, this current trend is even more obvious and it is likely to continue on into the future.

The Town of Bristol’s topography and location along the western slopes of the Green Mountains practically guarantees the likelihood of flash flooding events. The most damages to date have occurred to the town highway infrastructure in the form of washouts and culvert failures. Fortunately, a progressive road crew monitors trends and proactively installs culverts and repairs ditching in anticipation of ever worsening rainfall/flooding events. The Bristol hazard mitigation committee rightly identified flash flooding as the highest vulnerability to the community. Scoring a risk rating of 14, the vulnerability to flash flooding would be considered of regional concern which shows as a similar vulnerability in much of the rest of Vermont. Fortunately, the community understands this vulnerability and supports the road crew’s efforts to prepare against future risk.

Flood Hazard History
 These are the most up to date significant events impacting Bristol. Federal Declarations are

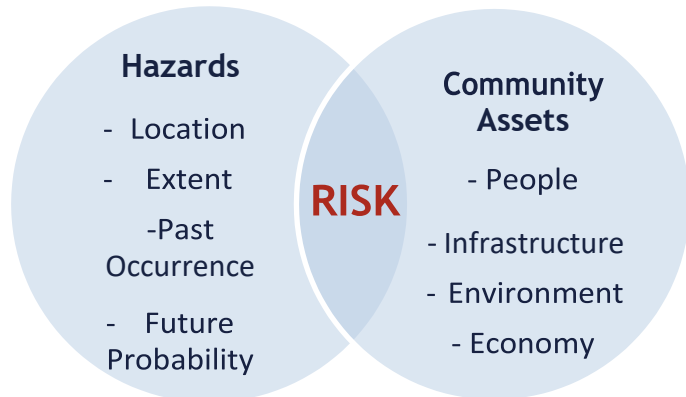
depicted in bold. Damages are to Addison County

Bristol damages

4/23/2004	DR1559	\$ 73,684
9/12/2008	DR1790	\$ 23,655
9/1/2011	DR4022	\$ 39,908
1/2/2018	DR4356	\$ 9,381
9/29/2005	DR4474	\$252,898
7/14/2023	DR4720	\$ 19,210
7/10/2024	EM3609	\$TBD

Recorded County Wide Damages

4/1/1998	\$10,000
4/23/2001	\$5,000
5/1/2001	\$1,000
4/13/2002	\$20,000
5/19/2006	\$25,000
6/26/2006	\$15,000
6/15/2009	\$25,000
10/1/2010	\$50,000
4/26/2011	\$250,000
1/11/2014	\$2,000
6/9/2015	\$250,000
7/19/2015	\$2,500
2/25/2016	\$1,000
2/25/2017	\$30,000



-NOAA 2022 Vermont Climate summary

The Hazard Identification and Risk Assessment is the foundation for the Mitigation Strategy to reduce future risk.

<u>Vulnerability Summary</u>	
Invasive Species Vulnerable Assets: Location Extent Past Occurrence Future Probability	Wind Vulnerable Assets: Location Extent Past Occurrence Future Probability
Extreme Cold and Snow	Floods

Vulnerable Assets:	Vulnerable Assets:
Location	Location
Extent	Extent
Past Occurrence	Past Occurrence
Future Probability	Future Probability

6 HAZARD MITIGATION STRATEGY

The highest risk natural hazards and vulnerabilities identified in the previous section of this Plan directly inform the hazard mitigation strategy outlined below, which the community will strive to accomplish over the coming years. The mitigation strategy chosen by the Town includes the most appropriate activities to reduce future risk from potential hazards.

Mitigation Goals and Objectives

The Hazard Mitigation Planning Team identified the following as the community’s primary mitigation goal:

Current goals

The Town of Bristol has identified that its goals for hazard mitigation are to reduce and/or avoid all long and short-term vulnerabilities to the hazards identified in section 1.3

Identified Hazard	Primary Mitigation Goal
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Flash Flood	Protect the health and safety of the public
Landslide/Rockslide	Ensure that highway improvements result in safer conditions
Earthquake	Protect existing and new properties and structures
Wildfire	Protect the health and safety of the public
Invasive Species	Reduce impacts to residents and local industry and provide for the outdoor recreational safety of the public
HazMat Spill	Protect the health and safety of the public
Structure Fire	Protect the health and safety of the public

Increase the Town of Bristol’s resilience to natural hazards by advancing mitigation investment to reduce or avoid long-term risk to people, homes, neighborhoods, the local economy, cultural and historic resources, ecosystems, and Community Lifelines such as transportation, water, sewer, energy, and communications.

Community Capabilities

Administrative and Technical

This capability refers to the Town’s staff and their skills and tools that can be used for mitigation planning and to implement actions. In addition to the Emergency Management staff described in Section 3, municipal staff that can be used for mitigation

planning and to implement specific mitigation actions include: **Town Administrator, Town Treasurer, Town Clerk, Assistant Town Clerk, and Planning and Zoning Administrator.**

In addition to paid staff, there is a 5-member Selectboard, 7-member Planning Commission, Fire Warden, Town Health Officer, Conservation Commission, and Constable. Look at annual report and website

To augment local resources, the Town has formal mutual aid agreements for emergency response – fire and public works. Technical support is available through the ACRPC in the areas of land use planning, emergency management, transportation, GIS mapping, and grant writing. Technical support is also available through the State ANR for floodplain bylaw administration and VTrans Districts for hydraulic analyses.

Strengths community with a family atmosphere committed small core of volunteers involved in several committees and groups strong interdepartmental communication and cooperation

Areas for Improvement potential candidates for volunteering is limited small pool of volunteers creates burn out and limited time commitments. Separating EMD and town administrators roles.

Fill emergency management coordinator position

Planning and Regulatory

These capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Examples of planning capabilities that can either enable or inhibit mitigation include: land use plans, capital improvement programs, transportation plans, stormwater management plans, disaster recovery and reconstruction plans, and emergency preparedness and response plans. Examples of regulatory capabilities include the enforcement of zoning ordinances, subdivision regulations, and building codes that regulate how and where land is developed, and structures are built.

Bristol does not have any local building codes. Vermont has adopted statewide codes for commercial building fire safety and energy standards. The energy code also applies to residential buildings. Codes enforced by Vermont’s Division of Fire Safety are the 2015 National Fire Protection Association (NFPA) 1 Fire Code; 2015 NFPA 101 Life Safety

Town Plan

Zoning

LEMP

Roads and Bridge Standard

Fire Department ISO Rating improved a few years ago – strength

Fire District Plans? Or other plans? Look on website EMAB plan

Strengths plans and regulations in place are being executed keep plans and regulations up to date strong local partners in implementing plans

Draft CIP does integrate other plans

Areas for Improvement

Review plans and identify areas for integration

Planning commission considering fluvial erosion hazard areas

Financial

These capabilities are the resources that a community has access to or is eligible to use to fund mitigation actions.

Bristol’s 2024-2025 town budget is \$xxxx, with \$xxx to fund the Highway Department and several other capital improvement funds. In addition to property tax revenues, the Town collects separate fees for x services. Application fees for services, local option tax may be introduced for community development. – ACTION

Any other fee collections?

Strengths well-funded budgets

Town just developed its first CIP – statutory adoption

Downtown designation requires a CIP

Areas for Improvement staffing increases in Highway Department some aging fleet vehicles capital reserves for equipment need to be increased

Education and Outreach

Identify outreach and education opportunities

Conservation Commission evasive hazards

Invasive species

Residents to adopt mitigation actions to protect personal property

- activities intended to inform and remind people about hazardous areas and the measures to avoid potential damage and injury. Examples are: Outreach projects, Real estate disclosure, Technical assistance, Community education programs.
- Annual report for fire department outreach
 - Smoke detector installations
 - Drives for volunteers to join
 - Website and social media for burn permits and fire prevention
- FD does an annual community day
- Town office also uses social media for public outreach

Strengths multiple programs/organizations are already in place in the community particularly strong online and social media presence

Areas for Improvement better coordination needed to help implement future mitigation activities leverage communication tools

National Flood Insurance Program

The Town joined the National Flood Insurance Program (NFIP) in 1986. The effective date of the current Flood Insurance Rate Map (FIRM) is August 28, 2008.

The Town of Bristol is a member in good standing of the National Flood Insurance Program. There are 8 structures in town that have policies under the NFIP. These structures represent \$1,447,900 in total coverage in the community. A total of \$26,096.36 has been paid out to NFIP policy owners since 1978. There are currently no structures in the Town of Bristol which are considered to be Repetitive Loss Structures under the National Flood Insurance Program.

The Town of Bristol has an adopted and approved set of floodplain regulations which are administered by the Town Administrator in his role as Zoning Administrator. All town zoning applications are reviewed against a map that has the FIRM superimposed over the zoning districts. Required reports are submitted to FEMA on an annual basis indicating compliance with the NFIP.

The Town of Bristol has been active in mitigating some of its hazards by utilizing available FEMA mitigation funds to complete buyouts of at-risk residences. Following the 1998 flooding, multiple homes were purchased in the “Tin City” area, removed and the space converted into “Sycamore Park” which serves as an education and recreation area for the town.

The Town of Bristol has also adopted road and bridge standards as recommended by VT AOT. These documents address road and bridge construction standards designed to mitigate local traffic issues and are particularly designed to mitigate potential damages due to flooding and flash flooding. The standards address culvert sizing, ditch treatments and driveway access to reduce flood caused erosion.

The Town supports continued compliance with the NFIP and would support Community Rating System (CRS) improvements where the benefits to the town's residents would outweigh the costs of additional administration and compliance. The town also supports buyouts where this solution is economically feasible and supported by the landowners.

Any discussion to continue and expand NFIP compliance?

State Incentives for Flood Mitigation

Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match FEMA Public Assistance after federally declared disasters. Eligible public costs are generally reimbursed by FEMA at 75% with a 7.5% State match. The State will increase its match to 12.5% or 17.5% if communities take steps to reduce flood risk as described below.

12.5% funding for communities that have adopted four (4) mitigation measures:

- 1) NFIP participation;
- 2) Town Road and Bridge Standards;
- 3) Local Emergency Plan; and
- 4) Local Hazard Mitigation Plan.

17.5% funding for communities that also participate in FEMA's Community Rating System OR adopt Fluvial Erosion Hazard or other river corridor protection bylaw that meets or exceeds the Vermont ANR model regulations.

Hazard Mitigation Action Identification

The Hazard Mitigation Planning Team discussed the mitigation strategy, reviewed projects from the 2018 Plan, and identified possible new actions from the following categories for each of the highest risk natural hazards identified in Section 5.

Act 121 requires ANR to update river corridor maps and requires towns with existing flood hazard bylaws to update them to the new standards that will be released by the state by 1 January 2028. (page 25)

Invasive species/wind/extreme cold/floods

- 1) assigned a responsible party to lead the completion of each action;
- 2) identified potential grant funding;
- 3) defined a timeframe for implementation; and ranked each action's priority (high, medium, low).

Local Plans and Regulations

- Adopt river corridors?
- General tree plans in addition to emerald ash borer
- Conservation commission identified in town plan to address invasive species (p 131 of town plan)

Structure Infrastructure

- MRGP – improving ditching and culverts
- Drainage projects – the village Pine st not connected to stormwater system
 - Infiltration school st – look at last meeting notes
- Harvey rd class 4 bridge
- 4.7acre purchase for new public works ** possible addition -current site is on a landfill
- Trimming and removing trees potential impact of public properties, row and parks
- Town office roof is slate and on the national registry – implement better maintenance practices – snow/wind/ice

Natural Systems Protection

- Grant from RPC 1 mile new haven river downstream of hewitt - natural systems projects improve water quality and flood resiliency – lead to specific strategies – bug Andrew- SLR was awarded project
- Locations would be prime areas for buyout
 - Near river and vt 116 near sycamore pare
 - At the bottom Basin st abandoned home (98 and TS 11) state buyout eligible
 - Kristen may provide more
 - Rockydale area including - the

Outreach and Education Programs

- Consider implementing town invasive species practices for private homeowners
- Snow removal plan outreach
- VTAlert – notification of residents – landlines included

Mitigation Action Evaluation

For each mitigation action identified, the Planning Team evaluated its potential benefits and/or likelihood of successful implementation. Actions were evaluated against a range of criteria, including a planning level assessment of whether the costs are reasonable compared to the probable benefits. Results of this evaluation are presented in **Table 5**.

Mitigation Action Evaluation and Prioritization

After careful evaluation, the Planning Team agreed on a list of actions that support the Mitigation Goals of this Plan and are acceptable and practical for the community to implement.

For the selected actions, the Planning Team then 1) assigned a responsible party to lead the completion of each action; 2) identified potential grant funding; 3) defined a timeframe for implementation; and ranked each action's priority (high, medium, low).

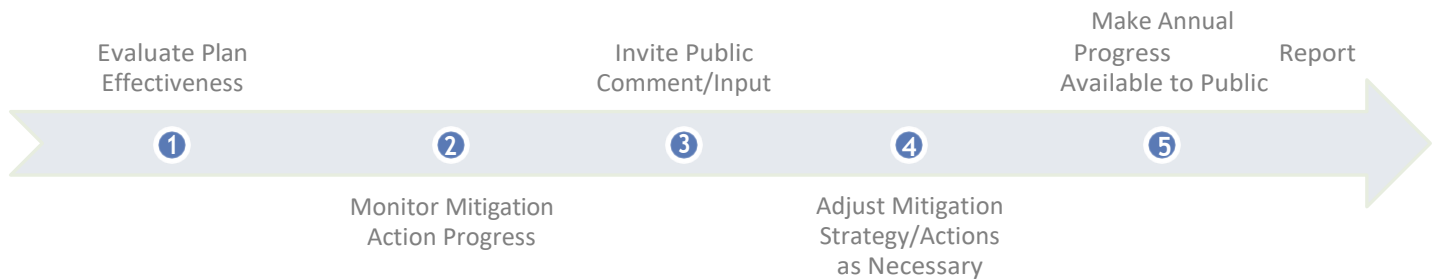
Natural hazards pose a unique threat to the Town's vulnerable populations. Data has shown that underserved and marginalized populations tend to live in at-risk hazard-prone areas or in homes with substandard construction. The data also suggests that this segment of the community is less likely to fully recover after a disaster.⁴ When ranking an action's priority, those that directly benefit a vulnerable population were ranked high.

7 PLAN MAINTENANCE

This Plan is dynamic. To ensure it remains current and relevant, it should be annually evaluated and monitored and updated every five years, in accordance with FEMA guidelines in effect at the time.

Annual Evaluation and Monitoring

Within 12 months of FEMA Final Approval, the Plan will be annually evaluated and monitored as follows:



- 1 The Selectboard will assemble a Review/Update Committee to evaluate the effectiveness of the Plan in meeting the stated goals. Things to consider during this evaluation:
 - What disasters has the town (or region) experienced?
 - Should the list of highest risk natural hazard impacts be modified?
 - Are new data sources, maps, plans, or reports available? If so, what have they revealed, and should the information be incorporated into this plan?
 - Has development in the region occurred and could it create or reduce risk?
 - Has the town adopted new policies or regulations that could be incorporated into this plan?
 - Have elements of this plan been incorporated into new plans, reports, policies, or regulations?
 - Are there different or additional community capabilities available for mitigation implementation?
- 2 Next, the Review/Update Committee will monitor mitigation action progress. Things to consider:
 - Is the mitigation strategy being implemented as anticipated?
 - Were the cost and timeline estimates accurate?
 - Should new mitigation actions be added?
 - Should proposed actions be revised or removed?
 - Are there new funding sources to consider?

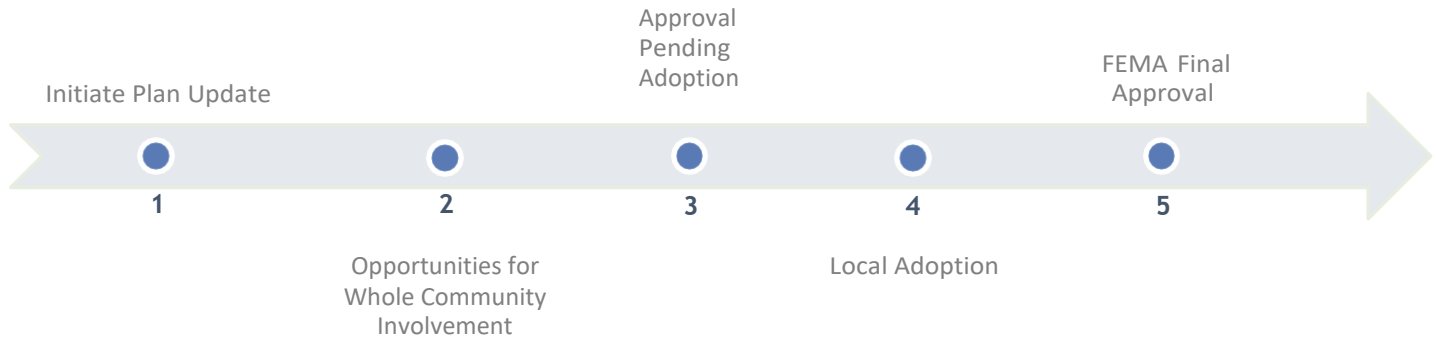
The status (e.g., in progress, complete) of each action should be recorded in **Table 7**. If the status is “in progress” note whether the action is on schedule. If not, describe any problems, delays, or adverse conditions that will impair the ability to complete the action.
- 3 The Selectboard will seek public comment from the Whole Community on plan implementation. Things to consider:
 - Are there any new stakeholders to include?
 - What public outreach activities have occurred?
 - How can public involvement be improved?
- 4 Based on input received, the mitigation strategy and/or actions will be modified, if needed.
- 5 A report (or record in the form of meeting minutes) of the annual evaluation and monitoring will be made available to the public.

Table X: Mitigation Action Status

Mitigation Action	2024	2025	2026	2027	2028
Local Plans & Regulations					
Structure & Infrastructure Projects					
Natural Systems Protection					
Outreach & Education Programs					

5-Year Updates

This Plan will be updated at a minimum every five (5) years as follows:



- 1 Currently, funding to assist municipalities in paying for planning services to update the Local Hazard Mitigation Plan is available through FEMA's Building Resilient Infrastructure and Communities (BRIC) grant program. If using this grant, TOWN XXX should contact Vermont Emergency Management (VEM) to apply for funding in 2027 – approximately 2 years before the Plan expires.

Once funding is secured and the grant agreement between the Town and State is in place, the Town Manager can issue a request for proposals (RFP) to procure planning services in accordance with the grant agreement. The RFP should be issued approximately 14 months before the Plan expires.

Once a consultant is procured, the Plan update can begin with a kick-off meeting including the consultant and local hazard mitigation planning team. The kick-off meeting should be scheduled approximately 12 months before the Plan expires. The Town should allot approximately 8 months for the Plan update process.

- 2 Opportunities for Whole Community involvement throughout the Plan update process need to be factored into the schedule. These opportunities may include a community survey, planning workshop, and public meetings at critical milestones agreed to at the project kick-off meeting.
- 3 Once the local hazard mitigation planning team has prepared a final draft, they can seek authorization from the Selectboard to submit the Plan for VEM/FEMA approval. Plan approval is accomplished in two steps – the first is Approval Pending Adoption. The Town should submit for Approval Pending Adoption approximately 4 months before the Plan expires to allow for time to respond to any review comments received from VEM/FEMA.
- 4 Once the Town receives Approval Pending Adoption, the Selectboard should adopt the Plan as soon as their next regular meeting.
- 5 Once adopted, the Town can submit the Plan for VEM/FEMA Final Approval. The Town should submit for Final Approval approximately 1 month before the Plan expires to ensure there is no gap in coverage between updates. The plan will expire 5 years from the FEMA Final Approval.

DRAFT

APPENDIX B – Past Mitigation Actions Updates

Flood/Flash Flood

The Town supports continued enrollment in the NFIP to allow residents the option of purchasing flood insurance on their properties. As a part of continued compliance, the Town supports participation in NFIP training for the Zoning Administrator when offered by the State or NFIP.

Estimated cost: \$200-\$300

Source of Funds: Town General Fund Planning and Zoning budget

Responsibility: Town Zoning Administrator

Timeframe: 2018 to 2025 and ongoing

Current Project Status as of January 2018: Ongoing, ZA has attended quarterly ZA roundtables which include all aspects of zoning administration including NFIP

2024 Update - Ongoing

The following specific projects have been identified which will serve to mitigate the effects of flooding and/or flash flooding in the Town of Bristol:

- Protect the village spring from contamination due to flooding. A feasibility study and/or engineering will be needed prior to implementation.

Estimated cost: \$5,000- \$10,000

Source of Funds: Village water budget

Responsibility: Town Administrator and water dept

Timeframe: Q3 2021-Q3 2022

Current Project Status as of January 2018: No action since 2012. Funds have not been available

2024 - Ongoing need but lacks funding Town Plan identified a need for a feasibility study for protecting the spring in the next 3 years

The following stormwater projects are planned concurrently with a West St/Main St. paving project scheduled for 2020.

- Improve storm water capacity on Mountain Terrace and East Street to limit basement flooding

Estimated cost: \$208,000

Source of Funds: HMGP, PDM-C

Responsibility: Town Administrator, highway dept and selectboard

Timeframe: Q3 2020 (tentative based on funding)

Current Project Status as of January 2018: (See general stormwater progress following)

2024 Update - COMPLETED

- Expand storm water capacity in the Mountain Street/ Crescent Street area to meet a minimum 10-year flooding event.

Estimated cost: \$364,000

Source of Funds: HMGP, PDM-C

Responsibility: Town Administrator, highway dept and selectboard

Timeframe: Q3 2020 (tentative based on funding)

Current Project Status as of January 2018: (see general stormwater progress following)

2024 Update - Continue into next plan

- Replace and upgrade storm water system along Spring Street and North Street to prevent flooding damage to the elementary school during heavy rain events.

Estimated cost: \$1,330,000

Source of Funds: HMGP, PDM-C

Responsibility: Town Administrator, highway dept and selectboard

Timeframe: Q3 2020 (tentative based on funding)

Current Project Status as of January 2018:

Portions of the previous three projects have been completed as well as a 2017 rebuild of stormwater infrastructure on West St.

A stormwater infrastructure mapping project was conducted in 2015 which identified multiple areas of concern in Bristol's village center. The Town has applied for funding to create a stormwater master plan which will identify priority areas and provide 30% design for 5-10 of those locations. Utilizing "Green Infrastructure" techniques, projects will be designed to reduce direct flow into surface waters. Projects will reduce stormwater surges and nutrients flowing into the New Haven River.

2024 Update – In Progress

VEM grant to conduct a study – grant deadline 12/2026

2019: Bristol completed a Stormwater Master Plan:
https://anrweb.vt.gov/PUBDOCS/DEC/STORMWATER/Town%20Reports%20and%20Maps/Bristol/Bristol%20SWMP_2019.pdf

ERP program 60% infiltration chambers (green infrastructure?) – elementary school and off of school st near the green stormwater and sediment control

Identified in stormwater master plan

Stormwater grant – to implement improvements on Basin street with possible green infrastructure

Replace South St. Bridge with more flood resistant span when needed

Estimated cost: \$1,200,000

Source of Funds: State bridge/culvert grant program

Responsibility: Town Administrator, highway dept and selectboard

Timeframe: 2019-2030, as funding allows

Current Project Status as of January 2018: Bridge was replaced with a more flood resistant structure in 2016

2024 Update - Completed – was not removed in 2018 update

Landslide/Erosion Hazard

The Town supports adoption of a Fluvial Erosion Hazard Overlay district in its zoning bylaw rewrite.

Estimated cost: \$2,000 as part of an overall rewrite

Source of funds: Municipal planning grants.

Responsibility: Joint Selectboard and Planning Commission

Timeframe: 2020-2023, once studies are finalized

Current Project Status as of 2018: The recently adopted town plan (March 2017) reaffirms the town's support for this project and the town has requested State ANR support in determining the potential boundaries of the river's corridor in advance of any ordinance adoption. Final determination of language and locations to be determined

2024 Update - Add to new plan

Note: State of Vermont guidance has been adjusted since major flooding statewide in 2011. Fluvial Erosion Hazard Zones have been replaced by River Corridors sized and located so as to protect the area needed for future meandering.

The Town also supports the following specific projects which are intended to limit erosion hazards in known locations:

- Stabilize the intersection of Basin Street where it meets East St./Rte. 17
Estimated cost: \$5,000- \$10,000
Source of Funds: Village water budget
Responsibility: Town Administrator and water dept
Timeframe: Q2 2020 or as repaving occurs
Current Project Status as of 2018: No action taken

2024 Update - Over \$1M estimated now see notes above – stabilization issues have grown

Stormwater and relocation – VTrans and downtown funds and stormwater grant

2024 pre-app potential \$90M app potential

- Explore options for river bank stabilization along West Street behind existing structures especially behind the Merchants Bank.
Estimated cost: \$15,000
Source of Funds: State ERG grants, town highway funds, cooperative private funding
Responsibility: Town Administrator and water dept
Timeframe: 2020-2023
Current Project Status as of 2018: Ongoing, A stormwater infrastructure mapping project was conducted in 2015 which identified multiple areas of concern in Bristol's village center. The Town is currently applying for funding to create a stormwater master plan which will identify priority areas and provide 30% design for 5-10 of those locations. Utilizing "Green Infrastructure" techniques, projects will be designed to reduce direct flow into surface waters. Projects will reduce stormwater surges and nutrients flowing into the New Haven River.

2024 Update – In Progress

Some has been done, slope failure from a culvert- slope was armored

Slope failure behind west st properties – Halloween 2019 – finished 2020-21

NRCS watershed program fund – armored at the toe

- Support a study of options for additional bank stabilization West of Mount Abraham Union High School.
Estimated cost: \$5,000- \$10,000
Source of Funds: UHSD budget
Responsibility: UHS School Board and Superintendent
Timeframe: Q2 2018 or following passage of bond.
Current Project Status as of 2018: No Action Taken. Proposed as part of a High School bond as of March 2018.

2024 Update - Ask school?- the town's gravel pit is adjacent and having a decommission plan – stabilization Bristol trail network

- Explore options for bank/ditch stabilization along Upper Notch Road.
Estimated cost: \$70,000
Source of Funds: BBR, Town Highway funds, stormwater pollution grants
Responsibility: Town Administrator and highway dept
Timeframe: 2019-2023 as funding allows
Current Project Status as of 2018: Stabilization completed Fall 2017

2024 Update - Ongoing

initiative along with lower notch road – MRGP sections

Earthquake

While recognizing the potential for severe damage in the region, the Town does not believe the risks associated with earthquake are large enough to require any town building retrofits at this time.

No local action necessary-cost \$0
Current Project Status as of 2018: No Change

2024 Update -No action will be identified

The Town believes it is the responsibility of private homeowners to be ready for earthquakes. The town generally believes that building construction standards are the responsibility of each private homeowner.

No local action necessary-cost \$0
Current Project Status as of 2018: No Change

2024 Update -No action will be identified

Wildfire

The Town supports the fire warden system requiring outdoor burn permits prior to any outdoor burning.

Estimated cost: None

Source of funds: Town General Fund
Responsibility: Joint Selectboard and Fire Warden
Timeframe: Annually
Current Project Status as of 2018: Ongoing

The Town believes it is the homeowner's responsibility to mitigate their susceptibility to wildfire through "firewise" practices.

No local action necessary-cost \$0
Current Project Status as of 2018: No change

2024 Update -No action will be identified

Invasive Species

The Town encourages residents to be observant of invasive species and eliminate them early in their cycle, if at all possible.

Estimated cost: None
Source of funds: Town General Fund
Responsibility: Bristol Conservation Commission (educational outreach)
Timeframe: Ongoing

2024 Update -No action will be identified

The Town instructs the Highway Dept. to follow best practices when conducting summer mowing in an effort to control spread of noxious weeds along roadsides.

Estimated cost: Additional time from road crew
Source of funds: Town General Fund
Responsibility: Joint Selectboard and highway dept.
Timeframe: Ongoing

2024 Update -No action will be identified

The Town encourages residents to take the "Forest Pest First Detector Program" when offered by VT ANR. Graduates will be prepared to recruit other volunteers to be "First Detectors as well.

Estimated cost: None
Source of funds: Town General Fund
Responsibility: Town Tree Warden.
Timeframe: Ongoing

2024 Update - Ongoing removal of ash trees with appropriate resistant species and locations and plan developed [Bristol Emerald Ash Management Plan](#)

forest and parks tree removal grants almost annually

Hazardous Materials and Highway Transport Accidents

The Town has identified the following high-risk locations on its highway system and supports mitigation of the hazard in any future construction/reconstruction activities:

- Implement Better Back Roads low cost safety improvements at intersection of Burpee Road and Monkton Road to reduce the likelihood and severity of motor vehicle accidents.
Estimated cost: \$5,000- \$10,000
Source of Funds: HMGP, BBR, Town Highway Funds
Responsibility: Town Administrator and highway dept
Timeframe: 2018-2020
Current Project Status as of 2018: Study was completed in 2015 and recommended actions including appropriate signage was installed.
2024 Update - Study completed
- Explore possible Plank Road/Burpee Road intersection improvements (signage, painting, 4-way stop?) to reduce numbers of accidents.
Estimated cost: \$2-3,000
Source of Funds: State/local highway funds
Responsibility: Town Administrator and highway dept
Timeframe: 2018-2020
Current Project Status as of 2018: No actions other than as recommended above have been undertaken.
Check with Brett? Valerie will check with Eric
- Work with State transportation personnel to realign the intersection of River Road with Rte. 116 as part of the bridge replacement on Rte. 116 in this area.
Estimated cost: \$10,000
Source of Funds: State Highway Funds
Responsibility: Town Administrator and highway dept
Timeframe: Dependent on state bridge replacement schedule
Current Project Status as of 2018: Route #116 bridge was replaced in 2015. Some improvements to the 116/River Rd. intersection were installed as part of the project.
2024 Update - Completed
- Support a feasibility/design study to address the intersection of Briggs Hill Rd, Lincoln Rd. and State Rte. 116 including possible abandonment of Lincoln Road in favor of Briggs Hill Road improvements
Estimated cost: \$15,000- \$20,000
Source of Funds: State Highway Funds

Responsibility: Town Administrator and highway dept

Timeframe: 1-5 years

Current Project Status as of 2018: No progress to date. – Low public support

2024 Update - [Study was completed](#)

- Support designs that would reduce accidents at the traffic light at Rte. 116/17 and North/South Streets.
Estimated cost: \$5,000- \$10,000
Source of Funds: State Highway Funds
Responsibility: Town Administrator and highway dept
Timeframe: 2019-2021
Current Project Status as of 2018: Bump outs, turning lanes, pedestrian crossings installed in 2016
2024 Update - Completed
- A study exploring a realignment of Plank Road at the Waterworks property should be conducted in conjunction with New Haven to review the feasibility of eliminating the two sharp curves.
Estimated cost: \$10,000,
Source of funds: Town highway budget or Regional Planning funds
Responsibility: Joint Town Highway Dep. and Selectboard
Timeframe: 0-3 years
Current Project Status as of 2018: No action to date. Concerns about wetlands permitting have reduced enthusiasm for this project.
2024 Update [Lost relevance - remove](#)

[Structure Fire – Send list to Brett for response](#)

The Town supports efforts by the fire department to install dry hydrants throughout town not served by the village water supply.

Estimated cost: None additional beyond annual FD support

Source of funds: Federal Rural fire protection grants and town FD funds

Responsibility: BFD

Timeframe: Annually dependent on grant awards

Current Project Status as of 2018: New Hydrant installed south on Rte. 116 at picnic pull-off, hydrant repaired in Upper Notch, 2 more installations scheduled for Q3 2018

The Town supports efforts by the fire department to improve its ISO rating through testing and training activities.

Estimated cost: None additional beyond annual FD support

Source of funds: Federal Rural fire protection grants and town FD funds

Responsibility: BFD

Timeframe: 1-3 years

Current Project Status as of 2018: Department supported reevaluation in 2013 resulted in 5X rating

The Town is exploring the feasibility and/or need for sprinkler system as part of a current Town buildings energy conservation project.

Estimated cost: \$10,000 as part of an overall project

Source of funds: Town Funds

Responsibility: Joint Selectboard and Energy Committee

Timeframe: 0-3 years

Current Project Status as of 2018: Renovation did not include sprinklers due to costs associated with historic preservation.

Additional Mitigation Projects from Bristol's 2012 hazard mitigation plan reflecting changes to community concerns

Drought

The Town supports recent changes to state rules which require a potable water supply and septic plans prior to development and supports groundwater protection efforts around both public and private water supplies.

No local action necessary-cost \$0

Current Project Status as of 2018: No action needed

2024 Update - Completed- ongoing as state rules change

Widespread Power Failure

Green Mountain Power (GMP) the utility servicing the Town of Bristol has ongoing programs of line clearing and relocation to ensure outages are kept to a minimum. The town balances its support for these efforts with residents' desires to keep the beauty of tree-lined streets and roads.

No local action necessary-cost \$0

Current Project Status as of 2018: Green Mountain Power (GMP) continues its efforts to mitigate future line damage.

2024 Update - Ongoing

High Winds

The town generally supports limiting damages due to high winds by removing dead and dying trees within the town right-of-way that could fall during a high wind event.

Estimated cost: \$5,000 annual cost

Source of funds: Town highway budget.

Responsibility: Joint Town Highway Dept and Selectboard

Timeframe: Annual maintenance task

Current Project Status as of 2018: Ongoing task

2024 Update - Ongoing

2023 wind storm had an impact on the town highway budget -estimated cost needs to be increased to \$10k

Lightning

The Town feels the risk to private residences of lightning strike should be borne by each resident on their own.

No local action necessary-cost \$0

Current Project Status as of 2018: No change

2024 Update - Not relevant to current hazard list

Winter Storm/Ice Storm

The Town supports the installation of snow fence when and where it can mitigate drifting on town highways.

Estimated cost: \$2,000 annually

Source of funds: Town Highway Funds

Responsibility: Town Highway Dept.

Timeframe: Annual treatments in fall

Current Project Status as of 2018: Town explored the feasibility of this action and has removed it from this project list.

2024 Update - REMOVE – not needed as current storms are not creating the same drifting effects as 5 years ago

The Town supports ongoing efforts by power companies to mitigate power outages due to ice storms by pruning and tree removal activities.

No local action necessary-cost \$0

Current Project Status as of 2018: Green Mountain Power continues its efforts to trim and remove trees which threaten power lines.

2024 Update - Ongoing

Dam Failure

The Town of Bristol does not generally address dam failure mitigation in its day-to-day activities, leaving the protection of the public up to State dam safety inspectors.

No local action necessary-cost \$0

Current Project Status as of 2018: No Change

2024 Update - Remove - Bristol's dams are not considered high hazard

The Town Planning Commission is considering writing of water impoundment construction standards into its zoning regulations. The intent of such standards would be to limit the volume of water which could be stored in a man-made impoundment and therefore limit risk.

Estimated cost: \$2,000 as part of an overall rewrite

Source of funds: Municipal planning grants.

Responsibility: Joint Selectboard and Planning Commission

Timeframe: 0-3 years

Current Project Status as of 2018: Rewrite is ongoing

2024 Update - zoning regulations point to Environmental Protection Rules, Chapter 22 governing Stormwater permitting effective March 15, 2019 as it may be amended. Applicants shall demonstrate compliance with all applicable State of Vermont Stormwater permitting requirements for both construction and development and Section 514 of these regulations.

DRAFT

DRAFT

APPENDIX D – Community Survey Questions

APPENDIX E – Certificate of Adoption

CERTIFICATE OF ADOPTION

Town of Bristol, Vermont Selectboard

A Resolution Adopting the Local Hazard Mitigation Plan – Town of Bristol, Vermont 2024

WHEREAS the Town of Bristol Selectboard recognizes the threat that natural hazards pose to people and property within the Town of Bristol; and

WHEREAS the Town of Bristol Selectboard has prepared a natural hazard mitigation plan, hereby known as the Local Hazard Mitigation Plan Town of Bristol, Vermont 2024 in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS the Local Hazard Mitigation Plan Town of Bristol, Vermont 2024 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Bristol from the impacts of future hazards and disasters; and

WHEREAS adoption by the Town of Bristol Selectboard demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Local Hazard Mitigation Plan Town of Bristol, Vermont 2024.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF BRISTOL, VERMONT, THAT:

Section 1. In accordance with 24 VSA §872, the Town of Bristol Selectboard adopts the Local Hazard Mitigation Plan Town of Bristol, Vermont 2024. While content related to the Town of Town of Bristol may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the Town of Bristol to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by a vote of _____ in favor and _____ against, and _____ abstaining, this _____ day of _____, 2024.

By: _____ (print name)
Selectboard Chair

ATTEST: By: _____ (print name)