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**Public Information Meeting (PIM) & Adoption
At Select Board 06-09-25**

**Town of
Bradford
New
Hampshire**

Hazard Mitigation Plan Update 2025

**PLAN ACTIVE TERM
THROUGH MON XX, 2030**

**Adopted by the
Bradford
Select Board
June 9, 2025**

**Approved by FEMA
Mon xx, 2025**



Plan active
to XX-XX-30

Town of Bradford, NH

Hazard Mitigation Plan Update 2025

Select Board Adopted June 9, 2025

FEMA Approved Month xx, 2025



Town of Bradford

75 West Main Street
Bradford, NH 03221
Phone: (603) 938-5900
www.bradfordnh.org

Central NH Regional Planning Commission (CNHRPC)

28 Commercial Street, Suite 3
Concord, NH 03301
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www.cnhrpc.org



NH Department of Safety (NHDOS)

NH Homeland Security and Emergency Management (NHHSEM)
33 Hazen Drive
Concord, NH 03305 (Mailing Address)

NH Homeland Security and Emergency Management (NHHSEM) Incident Planning and Operations Center (IPOC)

110 Smokey Bear Blvd
Concord, NH 03301 (Physical Address)
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US Department of Homeland Security

Federal Emergency Management Agency (FEMA), Region 1
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1 PLANNING PROCESS

The Town's Hazard Mitigation Committee reformed to update the Plan, incorporating the new [FEMA Local Mitigation Planning Policy Guide, effective April 11, 2025](#) requirements, revising outdated material with current information, and providing the latest **5**-year history of Bradford since the last Plan was approved in **December 2018**. A new online community survey was made available to the public for wider input, and the new plan development procedure was documented in the [Methodology](#) section.

Certificate of Adoption, 2025

Town of Bradford, NH
Select Board
Bradford Town Office
75 West Main Street
Bradford, NH 03221

A Resolution Adopting the Bradford Hazard Mitigation Plan Update 2025

WHEREAS, the Town of Bradford has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the **Hazard Mitigation Plan Update 2025** including but not limited to flooding, high wind events, severe winter weather, and fire, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Bradford has developed an updated **Plan** and received approval pending adoption (APA) from the Federal Emergency Management Agency (FEMA) for its **Hazard Mitigation Plan Update 2025** under the requirements of 44 CFR 201.6; and

WHEREAS, public and Committee meetings were held between **January 2024** through **May 2025** regarding the development and review of the **Hazard Mitigation Plan Update 2025**; and

WHEREAS, the **Plan** specifically addresses hazard mitigation strategies, and Plan maintenance procedures for the Town of Bradford; and

WHEREAS, the **Plan** recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Bradford 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 Bradford eligible for funding to alleviate the effects of future hazards; now therefore be it

RESOLVED by Town of Bradford Select Board:

The **Hazard Mitigation Plan Update 2025** is hereby adopted as an official plan of the Town of Bradford; The respective officials identified in the mitigation action plan of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

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; and

An annual report on the progress of the implementation elements of the Plan shall be presented to the Select Board by the Emergency Management Director or designee.

IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Bradford this 9th day of June 2025.

Select Board

Marlene Freyler, Chair date

Charles F. Meany III, Member date

Beth Downs, Member date

ATTEST

SEAL

Town Clerk

Erica Gross, Town Clerk date

Plan Process Acknowledgments

The Select Board-appointed Hazard Mitigation Committee was comprised of these individuals on behalf of their respective Departments, Boards or Committees who met between **January 2024** through **May 2025** to develop the **Bradford Hazard Mitigation Plan Update 2025**:

- **Maureen Brandon**, Bradford Town Finance Director
- **Sandra Bravo**, Bradford Energy Committee Member
- **Cheryl Frey**, Bradford Welfare Director
- **Marlene Freyler**, Bradford Select Board Chair
- **Stephen Hall**, Bradford Highway Department Road Agent
- **Karen Hambleton**, Bradford Town Administrator
- **Brooks McCandlish**, Bradford Conservation Commission Member, Fire Department Member
- **Bryan Nowell**, Bradford Emergency Management Director, Fire Department Chief
- **Devin Pendleton**, Bradford Parks and Recreation Director
- **Walter Royal**, Bradford Code Enforcement/ Building Inspector
- **Doug Southard**, Bradford Conservation Commission Member

The following Central NH Regional Planning Commission (CNHRPC) staff facilitated and prepared the Hazard Mitigation Plan Update:

- **Stephanie Alexander**, CNHRPC Senior Planner
- **Matthew Baronas**, CNHRPC Principal Planner (mapping)
- **Riley Stafford**, CNHRPC Office Coordinator (Plan assistance)

PARTICIPATION FROM NON-HAZARD MITIGATION COMMITTEE MEMBERS

Several other Town staff, non-Town-affiliated individuals or other agency representatives attended one or more Committee meetings and/or contributed information to the content of the Plan. Members of the public* participated as fully as appointed members in the Hazard Mitigation Committee meetings during the meetings they attended. Many titled participants are Bradford residents and are also considered members of the public.

- **Chris Frey**, Bradford Resident*
- **Lynne Doyle**, State Hazard Mitigation Planner, NH Department of Homeland Security and Emergency Management

- **Joseph Hoebeke**, Eversource Energy Community Relations & Economic Development Specialist*
- **Matthew Koehler**, Eversource Energy Community Relations & Economic Development Specialist (former)*
- **Wayne Whitford**, Newbury Emergency Management Director*

PARTICIPATION FROM SOCIALLY VULNERABLE AND UNDERREPRESENTED COMMUNITIES

All non-Committee members were invited to participate fully in the meeting discussions and activities. Aside from the general meeting postings and notifications on the Town website, the Bradford Hazard Mitigation and Severe Weather Survey, and other methods of promotion, the Bradford Hazard Mitigation Committee (HMC) reached out by personal contact and by email to multiple organizations that represent and support the general public, socially vulnerable people and traditionally underrepresented communities within the Town. These included social support organizations, Bradford Area Community Center, Bradford Elementary School, Brown Memorial Library, and area organizations representing vulnerable populations in Bradford, such as Capital Area Public Health Network.

These identified individuals and groups were placed onto the Committee's agenda and meeting notification distribution email lists for primary meetings. Several representatives did participate in many of the HMC meetings. When there was no response after more than one or two attempts at communication, email notifications ceased so unwanted "spamming" did not occur. Anyone attending the Hazard Mitigation Committee meetings had the opportunity to actively participate in discussions and decision making. See also **Table 1.2**.

Who is a Member of the Public?

For the purposes of this Plan, "**a member of the public**" or "**the public**" or "**public participant**" means:

Anyone who is not a Town of Bradford, School District, County, State, or federal government employee; anyone who is not paid for services by property tax dollars; anyone who is not a volunteer of the Town; and anyone who does not represent non-profit agencies and other Committees of which the Town is a member.

- **Damian Santana**, Capital Area Public Health Network CAPHN – Granite State United Way, Capital Area Public Health Emergency Preparedness Coordinator

Authority

In 2000, the President enacted the Disaster Mitigation Act 2000 (DMA) which requires states and municipalities to have local adopted and FEMA approved natural hazard mitigation plans in place to be eligible for disaster and mitigation funding programs such as the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) programs, including Hazard Mitigation Grant Program, and Flood Mitigation Assistance (FMA) Program. New Hampshire is awarded funds based upon the completeness of its State Plan and the number of local plans.

As a result of the DMA, funding was provided to state offices of emergency management, including the New Hampshire Homeland Security and Emergency Management, to produce local (municipal) hazard mitigation plans. To remain in compliance with the DMA, the Town of Bradford is required to submit for FEMA approval a revised **Hazard Mitigation Plan Update** every five years.

The newest version of New Hampshire Homeland Security and Emergency Management (NH HSEM)'s *State of New Hampshire Multi-Hazard Mitigation Plan 2023* was approved **October 6, 2023**, for the next five years. The State's Plan guides local hazard mitigation planning and allows for New Hampshire to receive federal Hazard Mitigation Assistance (HMA) funding programs to provide to local communities for mitigation, after disasters, and for emergency management assistance.

Prior versions of the Town's Hazard Mitigation Plan are noted in the **Final Plan Dates** section. A **2021** Building Resilient Infrastructure and Communities (BRIC) grant provided 75%/25% funding for the Town to update its prior Plan through the Central NH Regional Planning Commission. The 25% match required by the Town was provided by in-kind staff and volunteer time and labor.

This **Bradford Hazard Mitigation Plan Update 2025** has been developed in accordance with the Disaster Mitigation Act of **2000** and the *FEMA Local Mitigation Planning Policy Guide, effective April 11, 2025*. The most recent Plan development standards provided by FEMA Region I have also been incorporated. The hazard mitigation planning effort of the Town is a regular process, and this Plan is considered a "living document."

The new Bradford Hazard Mitigation Committee was established by the Select Board to begin meeting **January 2024** and guided the development of the Plan. The appointed Committee consisted of the Town's Fire and Emergency Management Departments, Highway Department, Select Board, Conservation Commission, and Administrative Staff. Department, Board, staff and volunteer representatives rounded out the meetings. The Town opted to hold remote meetings on Zoom Webinar hosted by CNHRPC and advertised by the Town, with in-person meetings at the Town Hall until the Public Information Meeting and Select Board adoption meeting.

The attendees of the meeting process are noted in the **Acknowledgements**. The Central NH Regional Planning Commission, of which Bradford is a member, contributed to the development of this Plan by

facilitating the meeting and technical processes, working with the Committee and its members to obtain information, preparing the document, and handling the submissions to NH HSEM and FEMA.

Methodology

The **Bradford Hazard Mitigation Plan Update 2025** was developed with a group of Town staff members and volunteers, open to public participants, and the CNHRPC comprising the Hazard Mitigation Committee. The **2024** methodology for Plan development is summarized in this section. The **Hazard Mitigation Plan** is designed differently from the **2018 Plan** with the intent to better conform to the current approvable Central NH Region format and incorporating the new **2023 State Multi-Hazard Mitigation Plan** items, with the purpose of easier updating and implementation while meeting FEMA’s requirements. The Plan roughly follows the **FEMA Local Mitigation Planning Handbook, 2023** by using its terminology and some of its tasks, ensuring **Bradford’s Plan Update 2025** begins to follow a standardized approach to Plan construction and content endorsed by FEMA. Many of the vital sections of the **2025 Plan Update** will be contained in **10 APPENDICES** for easier display, usage, sharing, and update.

MEETINGS AND DUTIES

The meetings and tasks of the Hazard Mitigation Committee were dictated by Agendas and how much the Committee was able to complete for each Agenda is displayed in **Table 1.1**. Work Sessions were designed to accomplish what could not be completed at meetings due to time constraints and additional information to process. The HMC opted to hold all of its meetings on Zoom only and all meetings were publicly accessible by Zoom through general Town publicity and direct email list invitations.

Table 1.1
Meeting Schedule and Agenda Activities

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public and Stakeholders
Meeting 1 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	01-29-24	Discuss Process and Schedule Tasks for HMP 2025 Update; Review Declared Disasters and Public Assistance, 1973-2023; Develop New Natural Hazard Identification and Risk Assessment (HIRA) Rating; Begin to Identify RECENT PAST Hazard Events, 2019-2025; Schedule Next Meetings	HMC, CNHRPC, Eversource, Newbury EMD, Resident CF
Work Session 1 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	02-12-24	Finish New Natural Hazard Identification and Risk Assessment (HIRA) Rating; Determine Change in Intensity for Each Natural Hazard Over Next 10 Years; Complete HIRA Magnitudes for Each Natural Hazard; Identify RECENT PAST Natural Hazard/Severe Weather Events, 2019-2025; Next Steps	HMC, CNHRPC, Eversource, Resident CF

Town of Bradford, NH Hazard Mitigation Plan Update 2025

1 PLANNING PROCESS

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public and Stakeholders
Work Session 1.2 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	02-26-24	Complete HIRA Magnitudes; Review/Edit and Finalize BRA HM/Severe Weather Survey DRAFT; Identify RECENT PAST Natural Hazard Events, 2019-2025; Update Critical & Community Facilities Assessment, Begin Problem Statements; Next Steps	HMC, CNHRPC, Eversource, Resident CF
Work Session 1.3 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	03-11-24	Complete HIRA Magnitudes; Review/Edit and Finalize BRA HM/Severe Weather Survey DRAFT; Identify RECENT PAST Natural Hazard Events, 2019-2025; Update Map 1 (potential Hazards), Map 2 (Past Hazards) Update Critical & Community Facilities Assessment, Begin Problem Statements; Next Steps	HMC, CNHRPC, Newbury EMD, Resident CF
Work Session 1.4 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	03-25-24	Identify RECENT PAST Natural Hazard Events, 2019-2025; Update Map 1 (potential Hazards), Map 2 (Past Hazards); Update Critical & Community Facilities Assessment, Begin Problem Statements; Schedule Meetings	HMC, CNHRPC, Resident CF
Work Session 1.5 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	04-29-24	Identify RECENT PAST Natural Hazard Events, 2019-2025; Update Map 1 (potential Hazards), Map 2 (Past Hazards) Update Critical & Community Facilities Assessment, Begin Problem Statements; Schedule Meetings	HMC, CNHRPC, Eversource
Work Session 1.6 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	05-13-24	Update Critical & Community Facilities Assessment, Begin Problem Statements; REPOST Hazard Mitigation and Severe Weather; Community Survey; Update Map 1 (potential Hazards), Map 2 (Past Hazards); Schedule Meetings	HMC, CNHRPC
Work Session 1.7 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	05-20-24	Update Critical & Community Facilities Vulnerability Assessment & Problem Statements; REPOST Hazard Mitigation and Severe Weather Community Survey; Update Hazard Maps 1 & 2; Next Steps	HMC, CNHRPC, Eversource
Meeting 2 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	06-03-24	Meeting 1 Series Updates; Review and Update Goals & Objectives; Finalize Problem Statements and Identify ones to Utilize; Next Steps	HMC, CNHRPC
Work Session 2 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	06-17-24	Meeting 1 Series Updates; Review and Update Goals & Objectives; Finalize Problem Statements and Identify ones to Utilize; Prepare for Capability Assessment Update; Next Steps	HMC, CNHRPC, NH HSEM
Work Session 2.2 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	07-01-24	Meeting 1 Series Updates; Review and Update Goals & Objectives; Finalize Problem Statements and Identify ones to Utilize; Begin Capability Assessment Update; Next Steps	HMC, CNHRPC
Work Session 2.3 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	07-15-24	Meeting 1 Series Updates; Begin Capability Assessment Update; Next Steps	HMC, CNHRPC, NH HSEM

Town of Bradford, NH Hazard Mitigation Plan Update 2025

1 PLANNING PROCESS

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public and Stakeholders
Work Session 2.4 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	08-05-24	Meeting 1 Series Updates; finish Capability Assessment Update; Next Steps	HMC, CNHRPC
Meeting 3 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	09-09-24	Meeting 1 Series Updates; finish Capability Assessment Update; Next Steps; Review Draft Hazard Mitigation and Severe Weather Survey Results; Determine Status of 2018 Mitigation Actions; Next Steps.	HMC, CNHRPC
Work Session 3 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	09-23-24	Determine Status of the 2018 Mitigation Actions; Provide Observations on 2018 Plan to Improve 2025 Plan Update; Begin Developing Mitigation Action Plan; Next Steps	HMC, CNHRPC
Work Session 3.2 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	10-07-24	Provide Observations on 2018 Plan to Improve 2025 Plan Update; Follow up with Prior Town Tasks for Completion; Begin Developing Mitigation Action Plan; Next Steps	HMC, CNHRPC
Work Session 3.3 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	10-21-24	Complete Observations on 2018 Plan to Improve 2025 Plan Update; Follow up with Prior Town Tasks for Completion; Develop Mitigation Action Plan; Next Steps	HMC, CNHRPC
Work Session 3.4 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	11-04-24	Follow up with Prior Town Tasks for Completion; Develop Mitigation Action Plan 2025; TBD- Prioritize Mitigation Actions with Enhanced STAPLEE after Actions are written; Next Steps	HMC, CNHRPC
Work Session 3.5 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	12-02-24	Report on Prior Town Tasks for Completion; Develop Mitigation Action Plan 2025; Prioritize Mitigation Actions with Enhanced STAPLEE; Next Step	HMC, CNHRPC
Work Session 3.6 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	12-16-24	Report on Prior Town Tasks for Completion; Develop Mitigation Action Plan 2025; Prioritize Mitigation Actions with Enhanced STAPLEE; Schedule Meetings	HMC, CNHRPC
Work Session 3.7 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	01-13-25	Report on Prior Town Tasks for Completion; Develop Mitigation Action Plan 2025; Prioritize Mitigation Actions with Enhanced STAPLEE; Next Steps	HMC, CNHRPC, Capital Area Public Health Network
Work Session 3.8 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	01-27-25	Report on Prior Town Tasks for Completion; Develop Mitigation Action Plan 2025; Prioritize Mitigation Actions with Enhanced STAPLEE; Next Steps; Schedule Meetings	HMC, CNHRPC
Meeting 4 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	05-19-25	Review Draft Hazard Mitigation Plan and determine missing components, Schedule Work Session 4 and Public Information Meeting	HMC, CNHRPC

1 PLANNING PROCESS

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public and Stakeholders
Work Session 4 <i>Remotely held via Zoom Webinar and hybrid at Town Hall</i>	06-02-25	Review Draft Hazard Mitigation Plan, Prepare for Public Information Meeting and Plan Adoption 06-09, Next Steps	HMC, CNHRPC
Public Information Meeting <i>In person at Town Hall</i>	06-09-25	TBD	

Source: Bradford Hazard Mitigation Committee Agendas, 2024-2025

For all meetings hosted remotely via Zoom, CNHRPC staff took a roll call during each meeting and completed a meeting match timesheet for participants documenting their time at the meetings. The Committee members worked to complete the Agendas, including developing the **Hazard Risk Assessment, Critical and Community Facilities Vulnerability Assessment, Capability Assessment**, and **Mitigation Action Plan**, completing the **Enhanced STAPLEE Action Prioritization**, etc. along with input from members of the public and guests. The Agendas are included in **APPENDIX C** of the Plan.

The specific meeting tasks are described in detail on the Agendas in **APPENDIX C** and in **Table 1.1**. CNHRPC staff facilitated the Committee Meetings and Work Sessions. Information required to complete the Agenda Tasks indicated above was collected by CNHRPC from any attendees present, including members of the public during discussions among attendees. The new and updated information was described in each Chapter under the **2025 Plan Update** section. Maps developed by CNHRPC using the ARCGIS platform were reviewed and updated by the Committee and guests.

In between meetings, Town staff and volunteers and CNHRPC staff researched and collected information for the Chapters. CNHRPC updated and rewrote Chapters, tables, and sections as appropriate. The Chapters were also updated by revising the document to the current FEMA standards and the **2023 State Multi-Hazard Mitigation Plan**.

OPPORTUNITY FOR PUBLIC PARTICIPATION

Several types of public participation were possible throughout the planning process. These ranged from in-person and online Hazard Mitigation Committee meetings, responding to the online survey, and attending the Public Information Meeting.

Public Invited to Attend Bradford's Hazard Mitigation Committee Meetings

Bradford went to lengths to have an inclusive hazard mitigation planning process. One successful avenue was the online Hazard Mitigation and Severe Weather Survey where **54** responses were provided. Information on how the public can attend Committee meetings was included on the survey. Active citizens were engaged for most of the HMC planning process. The Town's website, Town calendar, and social media pages initially promoted the meetings. The Committee meetings were held remotely using Zoom Webinar with an in-person hybrid meeting at the Town Hall.

Public Outreach Strategy

Many individuals were personally invited to attend and participate in the Bradford Hazard Mitigation Plan Committee meetings. They included surrounding community Emergency Management Directors, Town Boards and Committees and Town Departments. Other invitations to the public were provided at Select Board meetings. The NH Homeland Security and Emergency Management (NH HSEM) staff was also invited and attended some of the meetings.

The Hazard Mitigation Committee itself was comprised of most primary Town Departments and Committees, including Highway Department, Emergency Management, Fire Department, Conservation Commission, Select Board, and Welfare Department.

The public process for this Plan included posting the meeting information on the Town's online calendar and website at www.bradfordnh.org, occasional press releases to the Intertown Record (subscription regional newspaper serving **11** Kearsarge-region communities) and notices were physically posted at the Town Office and Bradford Area Community Center. Local interests had multiple opportunities to attend and participate in the meetings. Bradford had a proportionately large number of members of the public attend and participate in HMC meetings. Copies of publicity for the Plan are included in **APPENDIX C**.

The Central NH Regional Planning Commission, a quasi-governmental regional organization of which Bradford is a member, contributed to the development of this Plan by facilitating the meetings, guiding the planning process, and preparing the Plan documents, Appendices, and Maps.

As a final attempt to obtain additional public input, a specially noticed Public Information Meeting was held on [June 9, 2025](#) at a Select Board's meeting at which many members of the public participated. This meeting was publicly noticed at the Town Office, and online and all documents were available for review on the Town's website in advance of the meeting.

The attendees and publicity of the public planning process are noted in the **Acknowledgements**.

Table 1.2

Meeting Invitations and Participation

HMC Invitations and Participation		
MUNICIPAL INVITEES	How Invited	Participation (see Also Table 1.1)
General Public	Town website. Meetings Calendar http://www.bradfordnh.org/ Zoom Webinar Paper surveys left at the Bradford Area Community Center	Completed Online Surveys Attended some HMC Meetings. Paper Surveys completed.
Town Boards (volunteer) Planning Board Conservation Commission Select Board Energy Committee Parks and Recreation Comm	Appointed by Select Board. Received all HMC Meeting Emails	Hazard Mitigation Committee. Attended some HMC meetings (see Meeting Timesheets).
Town Departments & Staff Emergency Management Fire Department Town Administration Police Department Highway Department Planning Board Welfare Department	Appointed by Select Board. Received all HMC Meeting Emails	Hazard Mitigation Committee. Attended some HMC meetings (see Meeting Timesheets).
Non-Municipal Local Stakeholders	How Invited	Participation
Bradford Elementary School	Received all HMC Meeting Emails	Responded to HMC member inquiries for information, may have submitted surveys.
Library	Received all HMC Meeting Emails	Did not attend meetings, may have submitted surveys.
Bradford Area Community Center	Emailed Stakeholder invitation; Emailed some Agendas (did not spam), Emailed Survey information	Did not attend meetings, may have submitted surveys.
Concord to Lake Sunapee Rail Trail Group	Received all HMC Meeting Emails	Did not attend meetings, may have submitted surveys.
Selected interested residents	Received all HMC Meeting Emails	Participated in some HMC meetings, may have submitted surveys (see Meeting Timesheets).
Abutting Community EMDs	How Invited	Participation (No or type)
Newbury EMD Sutton EMD Warner EMD Henniker EMD Hillsborough EMD Washington EMD Goshen EMD	Emailed Stakeholder invitation; Emailed some Agendas (did not spam)	Newbury EMD attended some meetings
Intertown Record	Emailed Stakeholder invitation; Emailed some Agendas (did not spam)	Did not attend meetings
Regional & State Stakeholders	How Invited	Participation (No or type)

HMC Invitations and Participation		
Central NH Regional Planning Commission	Contracted by Select Board	Facilitated Plan update on behalf of community, participated in all HMC meetings.
Capital Area Public Health Network	Received all HMC Meeting emails	Participated in some HMC meetings (see Meeting Timesheets).
NH Homeland Security and Emergency Management	Received all HMC Meeting emails	Attended some HMC meetings (see Meeting Timesheets).
Eversource	Received all HMC Meeting emails	Attended some HMC meetings (see Meeting Timesheets).

Public Input from the Hazard Mitigation Committee Meetings

The public notification is described in the Public Outreach Strategy sidebar. Members of the public who attended the HMC meetings are indicated in the **Acknowledgements** and by the Meeting Timesheets in **APPENDIX C Meeting Information**, in addition to Public Information Meeting attendees. Members of the public would have assisted with completing the Agendas, including developing the **Hazard Identification Risk Assessment, Critical and Community Facilities Vulnerability Assessment, Capability Assessment, and Mitigation Action Plan**, completing the **Enhanced STAPLEE Action Prioritization**, etc. along with the Committee members. The general public had the opportunity to attend and participate in the **24** posted meetings or to contact Town Administration/Emergency Management Director for more information prior to the Select Board adoption of the Plan.

Public Input from the Public Information Meeting

Bradford Community Survey for Hazard Mitigation and Severe Weather Events

To obtain broad public input on hazard mitigation and severe weather events, an online community survey posted on Survey Monkey was developed in June 2024 and remained open through the Public Information meeting held **June 9, 2025**. Every person on the Town's public email distribution list received notification of the survey, the Town website prominently published its link, as did Department social media. A total of **54** responses were received from the community at large. Following the HIRA hazard list, the survey asked respondents seven questions:

➤➤ **Q1** Please indicate the description that best fits your relationship to Bradford.

41 of the 54 respondents indicated they are residents of Bradford. Of the 13 other respondents, 5 indicated they are seasonal or part-time residents of the town, 5 are employees of the Town, the School, or a business in town, 2 are visitors of Bradford, and lastly one respondent is a commuter.

- **Q2** Which roads, areas, or water bodies are you most concerned about in Bradford when storms or severe weather or other hazard events occur? Check all that apply.

The most respondents were concerned about the Lake Massasecum Area (41%), followed by Fairgrounds Road (32%), NH 114 (28%), and the Warner River (26%). Additionally, NH 103 East, West Main Street, and Center Road, were all noted by 12 respondents (22%). Additionally, locations with at least 10% of respondents designating concern were the West Branch of the Warner River, the Lake Todd Area, NH 103 West, East Main Street, as well as generally damage to local maintained trails, recreation fields, parks, and Town Forests. The remaining responses were selected by less than 10% of respondents and a write-in category which garnered 20% response.

- **Q3** How concerned are you about the following natural hazards, storms/severe weather events, or human/technological hazards impacting Bradford within the next 5 years? (On an Extremely Concerned-Very Concerned-Moderately Concerned-Slightly Concerned-Not Concerned 1-5 scale)

Aggregated responses of Extremely Concerned + Very Concerned hazards indicated respondents were most concerned about Aging Infrastructure (57%), Ice Storms (52%), and Winter Storms (52%). Additionally, Inland Flooding (39%), Long Term Utility Outages (39%), High Wind (37%), Public Health (32%), Wildfires (35%), Cyber Attacks (32%), River Hazards (30%), and Excessive Cold (30%), all received at least 30% response when aggregating the two most concerned categories. Conflagration (9%), Earthquake (4%), and Landslide (2%) were the least concerning to respondents, all garnering less than 10% in Extreme and Very Concerned responses.

- **Q4** Natural hazards or severe weather can have a significant impact on a community, but planning for or mitigating these events can help lessen the impacts. Planning projects may require Town funds as well as federal funds in addition to Town staff support and volunteer support. Please indicate how important you believe these local mitigation planning priorities are for Bradford over the next 5 years: (On an Extremely Important-Very Important-Moderately Important-Slightly Important-Not Important 1-5 scale).

The aggregated Extremely + Very Important top three mitigation planning priorities were to limit Stormwater Runoff by Managing Natural Features (80%), Protect and Reduce Damage to Utilities (67%), and Limit Development in Hazard Areas (66%). Two other priorities, Protect Town Facilities and Operations (63%) and Improve the Transportation Network (61%) also scored highly. Only one selection was lower than 50%, Protecting Historical and Cultural Landmarks (40%).

- **Q5 & Q7** Can you describe any notable severe weather event/storm, disaster or other hazard incident you experienced in Bradford within the last 5 Years (since 2019)? If yes, please provide brief comments on up to two events by describing what happened, how you were impacted, where in Bradford, and the approximate month and year of the occurrence.

Twenty-six (26) respondents identified at least one event, and 12 respondents identified two. The most frequently recalled events related to flooding (14 recollections). More specifically, many recalled the Lake Massasecum flooding in the summer of 2023. Others recalled flood events washing out roads or impacting homes and buildings. Other respondents focused on heavy rain which also could lead to flooding. Snow and ice storms were other hazards recalled by multiple residents. Beyond flooding at Lake Massasecum, there were no identifiable concentrations of locations in Town impacted by hazards. In fact, many respondents indicated that their recalled hazard impacted “everywhere” or “all over town”.

- **Q6 & Q8** How severe would you rate Event 1 & 2? (On an adjustable scale bar between 0-100, with 0-Not Too Bad/ 50-Bad/ 100-Worst in Memory).

Respondents provided a wide range of ratings for the events they recounted, averaging 70% for the first event and 71% for the second.

- **Q9** To protect your home and family from severe weather and natural disasters, has anyone in your household completed any of the following preparedness or mitigation activities over the last 5 years? Check all that apply.

Regarding mitigation and preparedness, over half of respondents cited they changed batteries in smoke or carbon monoxide detectors (69%), talked about what to do with members of their household in case of a severe weather emergency or natural disaster (65%), installed a generator (or use a portable generator or battery) and maintained the generator annually (57%), removed hazardous trees at their home (52%), and installed a secondary heating source (wood stove, propane, etc.) in case of utility outages (52%).

The next most common strategies respondents selected were maintaining their driveway culvert annually (42%) and updated, installed, or enhanced their cellular communications (cell phone booster, WiFi, network extender etc.) (39%). The least frequently selected strategies included: attended disaster training or workshops (17%), floodproofed their home’s exterior (17%), and installed a solar array (15%). Only 1 respondent cited they had not completed any of the listed preparedness or mitigation activities.

➤➤ **Q10** What are the best ways for you to receive **immediate**, essential information about storms, disasters and severe weather events in Bradford? Please check your top 5:
Respondents preferred to receive immediate information about storms, disasters and severe weather events via the National Weather Service (51%), Local Television (WMUR 9) (47%), by Emergency Alert System or Reverse 911 (43%), or from internet news media (42%). No respondents reported receiving information from posted notices or visits to the Town Office.

➤➤ **Q11** Please feel free to provide any other concerns or information related to severe weather, disasters, and hazard mitigation in Bradford in the space below.
Only four of the 54 respondents added write-in comments with additional concerns or information. One comment requested the Town consider an emergency shelter for residents in the event of a long-term power outage or other hazardous event. Another respondent suggested more information about the Town's current mitigation efforts and plans be made available. Three of the comments mentioned the importance of preparedness for Town Staff, especially the highway department, so that local infrastructure including roads can be made safer during storms. These comments included suggestions such as training regarding preventative road grading, ditching, and culvert work as well as having a greater number of staff to help with storm response. Additionally, each question of the survey offered additional room for write-in choices or comments. The summary of survey responses including all write-in comments are provided in **APPENDIX F COMMUNITY SURVEY**.

Public input from the **54** survey responses was used to confirm Town Department and operations priorities and specifically informed the Town on how the public wishes to be notified during a disaster event. The natural hazards of greatest concern to the public, **High Winds, Winter, Ice Storms** and **Inland Floods**, are being addressed in **8 MITIGATION ACTION PLAN**.

How Public and Community Input Was Incorporated into the Plan

Aside from the Community Survey responses, and the Stakeholders attending the Hazard Mitigation Committee meetings, the general public has not shown much interest in updating the **Bradford Hazard Mitigation Plan** yet the level of interest is higher than previous **Plan** update cycles. During periods of relatively few major weather events, emergency declarations, or disaster declarations, the public tends to not participate until they experience a significant event and want to affect change. It is difficult for New Hampshire communities including Bradford to retain volunteers for their regular municipal committees. Volunteers are often available during the evening after their jobs have ended while

Department staff, who hold the bulk of the update information needed for the **Plan**, are available during the daytime because their jobs require other nighttime meetings or calls. Town Department staff and others participating in the Plan update process are often Bradford residents, and the participating Boards and Committee members are required to be Bradford residents.

Survey responses were not directly incorporated into the Plan, but the results ran in tandem with activities underway. Although the broad prioritization of hazards from the public were slightly different than the detailed HIRA ratings in **CHAPTER 4** completed by the Committee, the Town of Bradford works to combat the effects of seasonal climate variation (wind, rain, storms, ice, flood, drought, winter and resultant electricity losses) through staff Department and volunteer Committee work. The Survey results were used to bolster Department priorities but did not directly change the Plan's content. For instance, the Highway Department upgrades culverts and rehabilitates roads washed out by flooded areas. Unifil Electric and Eversource Electric maintain trees along the utility rights of way to reduce the risk of tree debris during winter, ice or wind events. The Survey helped both understand the public's perspective, solidifying the work in progress. From the Emergency Management perspective, some public education and outreach Actions were developed based on their Survey responses.

Anyone who participated in developing the **Hazard Mitigation Plan 2025**, including the members of the general public, Hazard Mitigation Committee, Town staff, Town volunteers, Stakeholders, and guests, attended meetings and worked on the following group tasks as noted in the Agendas **Table 1.1**, including: **Goals and Objectives (CHAPTER 3)**, **Hazard Identification Risk Assessment** and identification of new hazard events since the last Plan (**CHAPTER 4**), **Critical and Community Facilities Vulnerability Assessment (CHAPTER 5)**, **Capability Assessment (CHAPTER 6)**, identifying the **Status of Prior Actions (CHAPTER 7)**, developing **Mitigation Action Plan** from problem statements, new ideas, and deferred Actions, and completing the **Enhanced STAPLEE Action Prioritization (CHAPTER 8)**. These primary tasks are the basis upon which the **Hazard Mitigation Plan** is founded, about **75%** of the document. These sections are found in the **TABLE OF CONTENTS**.

COMPLETION OF THE PLAN STEPS AND DATES

On **June 9, 2025**, the Committee held a **Public Information Meeting**. The same extensive public notification described in the Public Outreach Strategy sidebar occurred to obtain review and comment from the public for the Plan. On **June 13, 2025**, this Plan, Appendices and Maps were submitted to the NH Homeland Security and Emergency Management (NHHSEM) for compliance review and revision to apply for Approved Pending Adoption (APA) status from FEMA, also known as conditional approval.

On **June 9, 2025**, the Select Board **adopted the Hazard Mitigation Plan Update** for the Town at a duly noticed public meeting. Copies were made available at the Town Office and on the Town website for public review. The draft minutes are included in **APPENDIX C**. The signed Certificate of Adoption was sent to NHHSEM/FEMA.

On **Month xx, 2025**, Bradford received a **Notification of Formal Approval** from NHHSEM, with the Plan approval granted effective that day. A **Letter of Formal Approval** from FEMA confirming the notification will be forthcoming. The next Hazard Mitigation Plan update is due five (5) years from this date of approval, on **Month xx, 2030**.

Final Plan Dates

The following is a summary of the required dates which guide the adoption and update of the **Bradford Hazard Mitigation Plan**. Included is the history of the Plan approvals and lapsing dates as shown in **Table 1.3**.

Table 1.3
Bradford's Hazard Mitigation Plan Adoption History

Year of FEMA-Approved Hazard Mitigation Plan	Adoption by Bradford Select Board	NHHSEM/ FEMA's Formal Approval	Plan Lapse
Original 2007	05/15/07	08/13/07	08/13/12
Update 2012	11/07/12	12/03/12	12/03/17
Update 2018	11/19/18	12/10/18	12/10/23
Update 2025	06/09/25	xx/xx/25	xx/xx/30

Source: Plan Adoption History

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2 COMMUNITY PROFILE

It has been over seven years since the last Plan was written, with some basic information available from the newest **2020** decennial US Census beginning in mid-2021. The best available new data has been used in this Chapter to portray the population, housing, and overall demographic picture of present-day Bradford. The tables clearly identify the facilities in Town and which natural, human, and technological hazard events could most likely occur in those areas, as described in **5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION**. New sections have been added on Social Vulnerability, Climate Resilience, Climate Change, and the Hazard Vulnerability section from **4 HAZARD RISK ASSESSMENT** has been moved to this chapter.

A simplified description of how the Town's population and housing have grown within the last four decades follows. Relationships of the locations of people and buildings to natural hazard events are generally explored. Examination of this information will allow the Town to better understand the land use and demographic trends within its borders and how emergency and preventative services can best serve the growing and changing population and landscape.

Geographic Context

The Town of Bradford is located in Central New Hampshire within Merrimack County on the edge of Sullivan County. The Town is bordered by the Towns of Newbury and Sutton to the north, the Town of Warner to the east, the Towns of Henniker and Hillsborough to the south, and the Towns of Washington and Goshen west. The State's capital of Concord is about **30** miles from the Bradford in a straight line, or a bit further along Interstate 89. State highways NH 114 and 103 traverse the eastern corner of Bradford. The Town is accessed by I-89 Exit 9 in Warner, then NH 103 from the west; or to the south, NH 114 connects in Henniker to US 4/202 which is the main east-west corridor in the region. Portions of an old railroad corridor are found along NH 103, and the community has recently rehabilitated and enlarged its Tilly Wheeler Rail Trail with a bicycle and pedestrian bridge over the side of Lake Todd shared with Newbury. Lake Massasecum, a three-season residential community, is fully contained within the community. Bradford's relative inaccessibility, and its rural character with farms, forests and the lakes and rivers, ensure the Town is a haven for residents. Few retail or service businesses are located here in this quiet community of **>1,700** people.

The West Branch Warner River flows through Bradford along the entire northern top of the community and follows along NH 103 east into Warner where it joins with the Warner River. The Warner River then continues south to bisect the Town of Warner in a diagonal direction. The Warner River flows into Hopkinton where it joins with the Contoocook River. The newest addition to the NH Rivers Management and Protection Program, Warner River is one of the Central NH Region's main rivers.

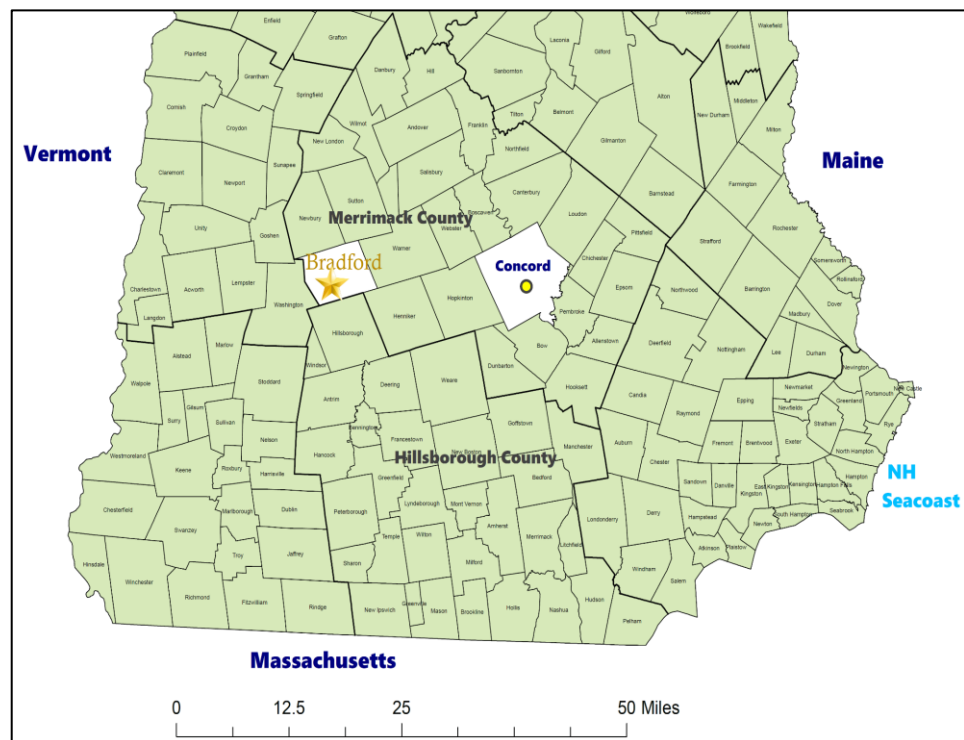
BRADFORD'S LOCATION IN NH

Merrimack County in which Bradford resides is often referred to as a valley as its borders are higher in elevation than its middle communities. Concord is the only City in the County. Merrimack County is surrounded on all sides by other NH Counties, including Hillsborough, Sullivan, Belknap, Rockingham, Strafford, and Grafton. Most, but not all, communities in Merrimack County comprise the majority of the Central NH Planning Region joined by two communities from Hillsborough County. Hillsborough County borders Massachusetts and includes the cities of Manchester and Nashua. Bradford often better relates to Sullivan County and the Upper Valley due to geography.

Concord is about **50** miles from the Massachusetts state border, the Vermont state border, the Maine state border, and the seacoast traveling along New Hampshire's Interstates, US Routes, NH Routes, and local roadways. Bradford is located geographically more toward NH's seacoast and Maine. Bradford's context within Merrimack County and the State of New Hampshire are shown in **Figure 2.A**.

The Town is a voluntary member of the Central New Hampshire Regional Planning Commission. The **19** Towns and **1** City comprising the Central NH Region contain several major rivers and New Hampshire and Interstate highways. Bradford's historically rural identity, commuting accessibility, limited available services, business and transportation, and river access could ensure regular future development within this community.

Figure 2.A
Bradford in the State



Source: Central NH Regional Planning Commission

Bradford is growing as a bedroom community to Lebanon and Concord with traffic concerns and new housing developments. With easy access to I-89, Bradford may continue to experience substantial growth until rising development pressures require zoning changes or non-maintained road upgrades.

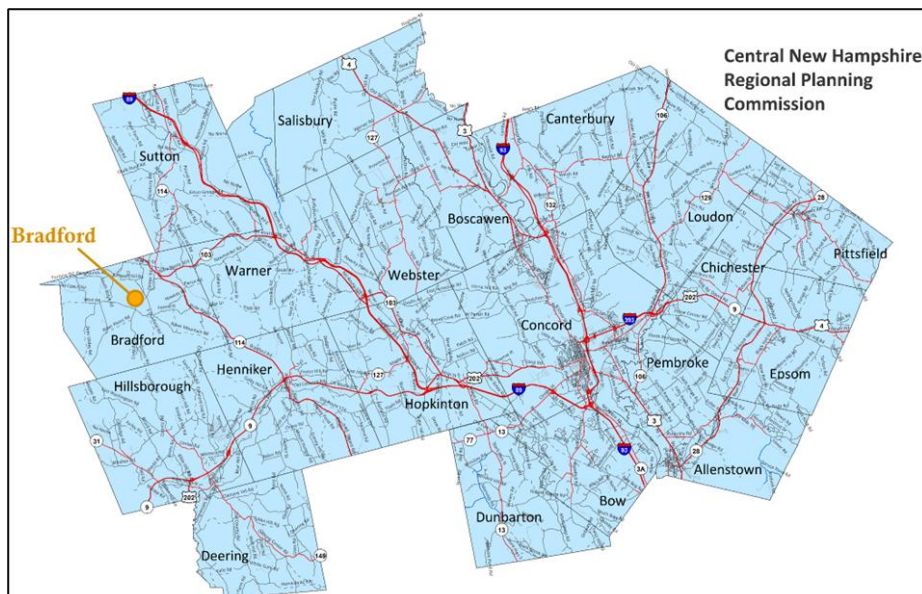
BRADFORD'S LOCATION IN CENTRAL NH

As a rural community on the edge of distinctive New Hampshire characteristics, Bradford is associated not only with the Central NH planning region, one of the nine legislatively bound planning regions in the State, but also relates to the local School District area of the Mount Kearsarge Region, the tourism-based Lake Sunapee Region, and the agricultural region of Sullivan County. The Town is a voluntary member of the Central New Hampshire Regional Planning Commission. The **19** Towns and **1** City comprising the Central NH Region contain several major rivers and important highways. The varied identity of Bradford ensures its adaptability as growth occurs around the community but not within.

The **Blackwater River** (Salisbury, Webster, Warner) and the **Warner River** (Bradford, Sutton, Warner, Hopkinton) flow south into the **Contoocook River**. The **Contoocook River** flows in a north-easterly direction through Hillsborough, Henniker, Hopkinton, Concord, and Webster until its confluence with the **Merrimack River** in Boscawen/Penacook (Concord). The **Contoocook** and the **Merrimack Rivers** effectively bisect the region into three sections. The **Soucook River** flows south through Loudon along the Concord/Pembroke border and enters the **Merrimack River**. The **Suncook River** originates in Belknap County, flowing south through Pittsfield, Chichester, Epsom, Pembroke, and Allenstown until it also converges into the **Merrimack River** in Bow/Hooksett.

In the Central NH Region, Interstates 89, 93 and 393 stretch north, northwest, east, and south directions, meeting in Concord and Bow. Major traffic routes of US Route 3 travel north-south and US Routes 4/202 traverses in an east-west direction. Bradford hosts segments of NH 114 (north-south) and NH 103 (east). Dozens of NH state highways cross the entire region. A map of the Central NH Region and its major routes is displayed in **Figure 2.B**.

Figure 2.B
Bradford in the Central NH Region



Population and Housing Growth

The latest *Bradford Master Plan 2020* was adopted in **April 2020**, developed by the Planning Board with assistance from the CNHRPC. The Planning Board has the goal of rotating Chapter review and revision annually. Chapters updated include Vision, “Today” Housing and Demographics, History & Culture, Community Facilities, Natural Resources, Existing and Future Land Use, Housing, Transportation, and Implementation. The Master Plan influences the Zoning Ordinance and the Subdivision and Site Plan Review Regulations along with the Capital Improvements Program. These documents are used by local land use boards and staff to guide growth and development of Bradford. The **Hazard Mitigation Plan 2025** could eventually be adopted as an Appendix or a Chapter to the *Master Plan* by the vote of the Planning Board.

POPULATION AND HOUSING TRENDS

The following tables contain the newest consistent data on housing and population growth which depict development trends over time. Shown in **Table 2.1**, Bradford’s population and housing boomed during the **1970-1980** decade (**+664** people, **+88%** homes) and following into the **1980-1990** decade (**+26%** people, **+47%** homes). Beginning with the **1990-2000** decade (**+4%** people and **<+1%** homes), population and housing trends slowed. The **2000-2010** decade which included a series of significant natural disasters and an economic recession shows Bradford experienced some growth (**+14%** people and **+20%** homes), after which population **2010-2020** declined to the lowest rates over the **50-year** span. **Table 2.1** displays the population and housing growth comparisons.

Table 2.1
Overall Population and Housing Growth Trends in Bradford, 1970-2022

Growth	Population	Net Change		Housing Units	Net Change	
		#	%		#	%
1970 Census	679	N/A	0	277	N/A	0
1980 Census	1,115	436	64.2%	520	243	87.7%
1990 Census	1,405	290	26.0%	757	237	45.6%
2000 Census	1,454	49	3.5%	762	5	0.7%
2010 Census	1,650	196	13.5%	917	155	20.3%
2020 Census	1,662	12	0.7%	906	-11	-1.2%
Total Change from 1970 – 2020 Census	---	983	144.8%	---	629	277.1%
2022 ACS	1,706	+44	2.6%	928	+22	2.4%

Sources: 1970-1990 US Census CPH-2-31 Table 9 Population and Housing Unit Counts;

US Census 2000 & 2010 Data *includes all housing units, including vacant and seasonal and Group Quarters. US Census 2020 Population, American Community Survey (ACS) 2022; NH BEA 2022 Current Estimates, 2023

CHANGES IN POPULATION AND HOUSING TRENDS SINCE THE LAST PLAN (2018)

Since the **2018 Plan**, the new **2020** Census population housing unit figures calculated growth of **<+1%** people and **>-1%** housing units between **2010-2020**, the slowest housing growth period in **50** year, although population experienced a bit more growth. Sometimes, similar percentage trends are found throughout the Central NH region during this period.

Population and Housing Evaluation

Using the available Census data, the Town grew by **+983** people (by **145%**) and **+629** housing units (by **277%**) using confirmed Census counts from **1970-2020**. In **Table 2.1**, Bradford's confirmed **2020** Census population of **1,662** shows an overall increase from **679** people in **1970**. Bradford experienced a larger proportionate increase of housing units between **1970-2020**, with a **+277 (629 units)** increase since **1970** to total **9069** units by **2020**. Between **2010-2020**, the Town's population increased by **+12** people while during the same time housing units decreased by **-11** units.

Overall, population growth trends are declining from the **2010-2020** decade, while the number of new housing units are declining at an even slower rate. The overall dual population and housing growth rates by percentage in Bradford since **1970** are smaller than other than the similar geographically small-sized population communities in the Central NH region.

Over the **1970-2020** period, the number of people living in each housing unit has declined steadily from its high of **2.5** people per housing unit in **1970** to its low of **1.8** people per housing unit in **2020**. Overall, these numbers are lower in comparison to other small-sized population Central NH Region towns and likely indicate an aging population living singly and fewer new families living in town.

Population Density

Another good measurement of community population and housing change is population density, or how many people live in a square mile of land area. Although Bradford encompasses a total land area of **35.2** square miles (**22,549** acres), an additional **0.69** square miles (**445** acres) is water area (**22,994** total acres, or **35.9** total square miles). Over the **50**-year period between **1970-2020**, the data for population density in Bradford is displayed in **Table 2.2**.

Table 2.2

Population Density in Bradford, 1970-2020

Municipality Size		Persons per Square Mile					
Land Acreage	Land Area in Square Miles	1970	1980	1990	2000	2010	2020
22,549	35.2	19	32	40	41	47	47

Sources: **Table 2.1**, NH Office of Planning and Development GIS acreage calculations, 2013

From **Table 2.2**, the overall population density between **1970** and **2020** increased from **19** people per square mile in **1970** to an estimated high of **47** people per square mile in **2020**. Bradford is a geographically small-sized community in the Central NH Region at **35.9** total square miles including water acreage. Bradford has a comparatively low number of people per square mile as compared to other geographically small Central NH Region communities and communities statewide.

Precise changes since the last **2018 Plan** cannot be measured with the new 2020 Census figures, although as noted, comparisons between the decades can be made.

CHANGES IN DEVELOPMENT SINCE THE LAST PLAN (2018)

Development and redevelopment of lands and buildings continue across Bradford. Since **2018**, the Town has seen an increase in the number of attached accessory dwelling units (ADUs) and has fielded more inquiries about detached ADUs. No new commercial/industrial subdivisions occurred, but conversions of larger, old homes have taken place. Residential land uses are scattered throughout the community along major routes and in the more rural areas. Technological hazards like **transportation accidents** or natural hazards like **winter storms, freezing rain, snowmelt and flash floods** may be the greatest threats to the population living along major transportation routes or backwoods Class V and VI roads or along the **West Branch of the Warner River** and the **Warner River**.

New Construction

Table 2.3 displays Bradford's estimated new home and new building construction permits issued by the Building Inspector between **2019-2024**. During this **6-year** period, a total of **51** new construction permits for homes and housing units have been issued, but not necessarily built. For counts of newly developed units, data on the number of certificates of occupancy issued would be helpful for future **Plans** to understand what was actually constructed.

Table 2.3

New Construction Permits Issued by Building Type, 2019-2024

Building Type	2019	2020	2021	2022	2023	2024	2019-2024 Totals	2013-2018 Totals (Last Plan)
Single Family Homes	7	11	6	8	2	6	40	21
Multi-family Homes	0	0	0	0	0	0	0	0
Manufactured Homes	0	1	1	1	1	2	6	3
Non-Residential Buildings	0		1		1	2	4	21
Accessory Dwelling Units	1	0	0	0	0	0	1	--
Totals	8	12	8	9	4	10	51	45

Source: Bradford Building Permit Reports

From **Table 2.3**, **40** permits were issued for new single family homes, with **1** permits for new accessory dwelling units, over the last **6** years. Six (**6**) new construction permits for manufactured homes and **0** multi-family homes were issued during the period. Four (**4**) new commercial/ industrial/ exempt non-residential permits were issued. The most active years were **2020** and **2024** to date respectively, when a total of **12** and **10** new permits were issued.

It is important to note that the number of permits *issued* does not necessarily equate to buildings *constructed*. When using these figures, compared to most similar-sized Central NH region communities, Bradford issued a similar number of new construction permits between **2019-2024**.

Comparing the data to the last **2018 Plan**, Bradford issued more building permits between **2019-2024** than between **2013-2018** when **45** total permits were issued. There was an emphasis on single family permits (**21**) and non-residential permits (**21**) during this previous Plan period.

Land Use and Zoning

According to NH Office of Planning and Development's geographic information system (GIS) calculations, Bradford has a total land area of **22,549** acres, or **35.2** square land miles. An additional **35.9** acres (about **0.37** square miles) is water area, to total **22,994** Town acreage within Bradford's political boundaries. The GIS land acreage figure is much larger than the most recent **MS-1 2024** assessing reporting calculation of **22,203** total land and water acres for the Town. Certain acreages are often posted in more than one land use category for taxation purposes, and certain other land acreage is not displayed on MS-1 reports to the NH Department of Revenue Administration. Reviewing the assessing information closely should clarify the answer as to why this discrepancy exists. Small differences between the actual taxable land calculations from the assessing records and the acreage from the basic GIS calculations are often found and are not unusual.

For New Hampshire and specifically the Central NH Region, Bradford is considered a geographically small-sized community in terms of land area and contains low population and housing figures. Bradford's proportion of residential land is less than most towns in the Central NH Region.

CHANGES IN LAND USE SINCE THE LAST PLAN (2018)

The total number of Bradford parcels is **1,447** in **2025**. The number of parcels in **2018**, **975**, was believed to be inaccurate and too low.

Land Use Types and Acreage

Table 2.4 provides a snapshot of the Town's **2024** land use acreage from the Town's assessing database. Land use categories were combined for ease of summary. Because the Total Acres used when calculating land use are far higher than the actual Town acres – since often land is classified as more than one type- the most accurate measurement would be to compare the percentage of **Land Use Categories** in Bradford.

From **Table 2.4**, Forest Land is the most extensive land use type, comprising **67%** of the Town's land area. Residential accounts for over **16%** of the land area. Exempt land use is almost **9%**. Smaller land uses in Bradford are Farm Land (**<3%**), Wet (**<3%**), Unproductive (**2%**), Commercial Improved (**1%**), Discretionary Easement acres (**<1%**).

Table 2.4
Land Use Acreage, 2024

Land Use Category 2025	Acres	% of Town 2024	% of Town 2018
Residential	3,631	16.4%	19.4%
Commercial Improved	202	0.9%	1%
Utilities	---	---	0%
Exempt	1,888	8.5%	---
Farm Land	612	2.8%	3.1%
Forest Land	11,523	51.9%	55.4%
Forest Land with Stewardship	3,122	14.1%	15.7%
Discretionary Easement	92	0.4%	---
Unproductive	524	2.4%	2.4%
Wet	609	2.7%	3.0%
Totals	22,203	100.0%	100.0%

Source: MS-1 Assessing Database, Nov 2024

The land use changes represented in **Table 2.4** between **2018** and **2024** display how land is now classified by landowners and assessing agencies. Compared with the **2018** Land Use percentages, the largest differences are an increase of Industrial (**+3%**), and a decrease of Residential (**-2%**). Many differences are accounted for by the more accurate assessing system.

CHANGES IN ZONING SINCE THE LAST PLAN (2018)

The Zoning Ordinance has sections amended every year at the annual March Town Meeting and is used and applied by the Building Inspector and Planning Board.

Bradford Zoning

The perspective of the Town's Zoning Districts offers another way to view how the land is utilized within Bradford in **Table 2.5**. The Zoning Ordinance includes a Table of Uses, indicating what types of facilities are permitted in which District and descriptions of Dimensional Regulations indicating lot sizing requirements. A Schedule of Amendments tracks the annual revisions to the Zoning Ordinance. Several commercial, business and residential districts fall within Bradford, over which floodplain and wetlands protection overlay districts apply further regulation.

Table 2.5
Bradford Zoning Districts, 2025

Zoning District	Abbreviation	Acreage
Residential Business District	RES/BUSI	740
Conservation District	CONV	5,950
Residential Rural District	RURAL RES	16,775
	Total	23,465
Zoning Overlay District	Abbreviation	
Historic District Overlay District		
Floodplain Development Ordinance		
Surface Water District Overlay	SWOD	
Other Zoning Ordinances pertaining to use of land		
Cluster Residential District		
Shoreland Protection Act		
Manufactured Housing Regulations		
Workforce Housing Ordinance		
Wetlands Ordinance		
Sign Regulation		
Wireless Telecommunications Facilities		

Source: Town of Bradford Zoning Ordinance, March 2025

The content of the Bradford Zoning Ordinance undertakes multiple small changes annually to revise, add new, tighten and recodify zoning regulations. Changes since **2018** include: Accessory Dwelling Unit regulation, and a new Table of Uses.

The Town website at www.bradfordnh.gov displays the ordinances, regulations, fees, and proposed zoning amendments governing the use of land.

Town Building Codes and Regulatory Protections

More than zoning helps to keep the Town resilient to new building and (re)development. The Town has a planning and land office with contracted staff (CNHRPC) people assigned to the role of planning director. There is also Building Inspector and Code Enforcement Officer on staff. Short and long-range planning documents provide guidance and activities are regulated under Building Codes and Subdivision and Site Plan Regulations. These codes and regulations mean Bradford businesses, residents and visitors are safer from the dangers of severe weather and natural disasters, including flooding, high wind, and earthquake events.

Table 2.6

Bradford Building Codes and Regulatory Protections, 2025

Regulation	Date	Who Oversees
Master Plan (last adopted 2020)	April 2020	Planning Board
Subdivision Regulations	2015	Planning Board
Site Plan Review Regulations	2015	Planning Board
Zoning Ordinance	March 2025	Planning Board
Capital Improvements Program (CIP)	2025-2034	Select Board
State Building Code- International Building Code (IBC) 2018. Includes	State adopted in 2022, so did Bradford	Building Inspector
NFPA 1 Fire Inspection Code 2018	State adopted in 2022, so did Bradford	Fire Department
NFPA 101 Life Safety Codes Occupancy Inspections	State adopted in 2022, so did Bradford	Fire Department

Source: Capability Assessment, Chapter 6

Bradford has many Town Ordinances (or Policies) that are not land-use based. The entire Code of the Town of Bradford can be accessed here at www.bradfordnh.org. They are the guiding regulations and ordinances of the community as overseen by different Boards, Committees, and Departments. **6 CAPABILITY ASSESSMENT** contains the full list of plans, codes, policies, SOPs, etc.

FUTURE DEVELOPMENT IN BRADFORD 2025-2030

Very few known future residential developments were brought before the Planning Board for review and approval between **2018-2025**. The number of home businesses have likely increased. Valley Bus was destroyed by fire and is in a new building, sprinklered, steel, state of the art, alarmed. Ayer & Goss expanded their depot to propane tanks. Residential conversion of old homes into apartments are being sold for about **\$250,000** per unit, with rent at **\$1,600** per month. This is not a buyer's market right now,

it's seller's market. Homes are very expensive in Mt. Kearsarge Area and availability of homes is very low. There is too much competition for average incomes to purchase.

Most of the Town's existing roads and homes are located in remote locations, but some are located along or accessible to NH 103 and NH 114. Bradford is accessible to I-89 interchanges leading to Concord, Manchester, Boston, Lebanon, Vermont and the Seacoast. There is much residential land available in Bradford. A solid tax base is much desired by the Town.

Existing residents are aging but have few housing options. Only higher income people can afford to move and purchase a home in Bradford, and some of these people work from home. This again raises the need for more and better quality internet, cellular, and VOIP services. Technological infrastructure stress requires upgrade to meet demand.

Future subdivisions are anticipated along existing Class V roads and large lots. Since the easily developable land in Town has already been built or subdivided, future developments may occur near **wetlands** or **steep slopes**, or in-fill development in the Main Street areas. **Floods, landslides, erosion,** and **fires** could occur in these potential residential areas. **Severe winter weather, storms** and **wind events** on these hilly locations will bring trees down on roadways, interrupt **power and communication** services and will **flood** ditches and **wash out** roads.

Many remaining parcels keep the potential for subdivisions in the future when the lots change hands to younger generations ("legacy parcels") if the largest parcels are not placed under conservation. Conservation land for land trust management is preferable by the Town especially along the **Warner River** and existing conservation lands.

When developments come before the Planning Board, potential hazards including **flooding, fire, traffic accidents,** and **evacuation** are regularly considered. A Technical Review Committee and the developers should try to solve the problems before a project is brought to the Planning Board to be approved. The existing roads and bridges experiencing **erosion** and **flooding** will need to be upgraded for additional usage. The Town will continue to grow and change, and attention should be focused on the hazards any new development could face during the consideration process. Techniques to mitigate identified hazards could be undertaken before the facilities are sited and constructed.

The main natural hazards for this community remain **wildfire, flood, wind events, winter events, debris impacted infrastructure** (trees down on powerlines and trees/powerlines down on roads), **aging infrastructure** and **utility failures** and the potential for **dam breach**. The Town will need to ensure Town services are not eclipsed by the needs of new development. Any future development in Town could be vulnerable to the various natural hazards identified previously. A few agricultural operations are present. New (or replacement) buildings and infrastructure and potential future development appear in **APPENDIX A Critical and Community Facility Vulnerability Assessment**.


Flooding Vulnerability in Town


Flooding can be a more easily locatable hazard since waterbodies and roadways can be used to approximate the range of future potential flooding areas. Bradford has many areas particularly susceptible to flooding. Rapid pack snow melt affecting roadways and drainage, old waterline infrastructure breaking and washing out roads, culvert and bridge constriction, beaver dams, **West Branch Warner River** flooding and inundation of local roads, NH 103, NH 114 and hilly roadside drainage systems are just a few of the most likely locations to be damaged by flood events. There are many highly sloped roads in Town that could wash out during flash flooding and heavy rain events.

WATERBODIES

Bradford has many areas particularly susceptible to flooding. Some key culverts need to be up-sized to address the increased water load and these are listed as Actions in **8 MITIGATION ACTION PLAN**. The Town has been communicating with the State to upgrade some of their culverts and bridges, such as Main Street.

These large watercourses and numerous individual brooks and ponds in Bradford contribute to flooding these and other areas in Town:

 **Watercourses:** Third Order streams Hoyt Brook and West Branch Warner River (also commonly referred to as West Branch Warner River) combine to create the Fourth Order Warner River; also, Bog Brook, Beard's Brook, Ring Brook, Warren Brook; intermittent streams, and several unnamed brooks.

 **Waterbodies:** Ayer's Pond, Lake Todd and Lake Massasecum; smaller waterbodies Brown's Marsh, Day Pond, Cressy Pond, Kiskanari Pond, Lovewell Lake, Mud Pond, Bradford Bog, Bradford Springs, West Meadow; several Recreation & Farm Ponds and Fire Ponds; and several unnamed ponds and wetlands. Twenty-two (**22**) major wetlands were identified by the Conservation Commission in the Wetlands Inventory.

ROAD WASHOUTS AND EROSION

Roads in Bradford are vulnerable to washouts and floods and may washout during flash flooding and heavy rain events. Some of the local Town Class V maintained roads in Bradford are constructed using ditching; storm drains are found along the densely developed paved roads. About **46** miles of the Town maintained (Class V) roads are located throughout Bradford. Many of the above culvert upgrades have been developed into Actions, with many culvert and drainage projects undertaken annually.

These roads are either most common, regular locations of **road washouts** or water flooding over the roadways, are locations which could be washed out during a flood event, or have been flooded and repaired:

Regular or Seasonal Susceptibility to Flooding, Washout, Overtop

- Breezy Hill Road Bridge
- Blaisdell Lake Road
- Center Road
- Center Road covered bridge (footings subject to erosion)
- Davis Road
- Deer Valley Road
- East Washington Road
- Fairgrounds Road (Dodge Corner area)
- Jewett Road
- NH 114 (at Ayer & Goss)
- NH 114 intersection with NH 103 (meadow)
- Rowe Mountain Road
- Water Street (by the bridge)
- West Main Street Bridge erosion (sinkhole)
- West Meadow Road
- West Road

Potential Flooding and Washouts

- Lake Todd dam failure would impact homes on Main Street, plus Water Street, Center Road and likely would enter West Branch Warner River, which would then enter Warner River.
- Lake Massasecum's homes and cottages, including a seasonal campground, are vulnerable to flooding. There could be potential rescue issues on Davis Road, East Shore Road, and Latvia Lane.
- If NH 114 were flooded by Lake Massasecum, Bradford emergency responders would be unable to approach south end of Town.
- If Locke Linden Dam in Sutton were breached it would impact Gillingham Road in Bradford.

Warner River flooding events endanger the bridges in Town, including the West Main Street Bridge, two bridges on Breezy Hill Road (one is already closed), and the Center Road covered bridge (the embankment at the covered bridge has already washed away once).

DAM BREACH SUSCEPTIBILITY

There are only a few dams in Bradford with the potential for immense flooding damage *if* breached. One **(1) Significant Hazard (H)** dam, the Lake Todd Dam at **Ring Book**, could have severe consequences on the Main Street area if a failure occurs.

One **(1) Low Hazard (L)** dams are situated in Bradford, the West Branch Dam at a **West Branch River tributary**. Seven **(7) Non-Menace** dams are located throughout the community. Except for the Bradford Recreation Pond Dam (Town), these dams are privately owned and maintained following the NH Department of Environmental Services' (NHDES) regulations for Dam Emergency Action Plans (DEAPs).

The following areas have been classified by the NH Department of Environmental Services as being hazardous if **dam breach flooding** were to occur, including two dams outside the Town of Bradford according to the Hazard Mitigation Committee:

- ➔ **028.001 Lake Todd Dam (Ring Brook), Significant Hazard (S)** - 221 feet long, 16.5 feet high, 336 acres water
- ➔ **028.012 West Branch Dam (West Branch Warner River), Low Hazard (L)** - 500 feet long, 7 feet high, 0.7 acres water.
- ➔ **168.001 Loch Lyndon (Loch Lyndon Development) Reservoir Dam in Newbury, Low Hazard (L)** - 180 feet long, 12 feet high, 360 acres water.
- ➔ **023.011 Blaisdell Lake Dam (Blaisdell Lake Protective Association) in Sutton, Low Hazard (L)** - 150 feet long, 9 feet high, 425 acres water.

Flooding Resource Links:

- ☐ FEMA Map Center
<https://msc.fema.gov/portal/home>
- ☐ NH Department of Environmental Services Dam Safety, Maintenance and Management
<https://www.des.nh.gov/water/dam-maintenance-and-management>
- ☐ NH Department of Environmental Services Dam Pool elevations
<https://nhdes.rtiamanzi.org/stations>
- ☐ NH State Emergency Operations Center WebEOC
<https://nheoc.nh.gov/eoc9/default.aspx>

Bradford's Hazard Vulnerability Changes Since the 2018 Plan

The following statements are the Hazard Mitigation Committee's overall assessment of the Town's change in vulnerability to disasters since the **2018 Plan**. Natural disasters are the focus of discussion in the **Bradford Hazard Mitigation Plan Update 2025**, but acknowledgements of the potential for human and technological disasters to occur in Bradford are provided.

Natural Disasters Vulnerability The Town's overall vulnerability to natural disasters **is believed to have STAYED THE SAME over the last 5 years**.

2025

Factors considered include the Town's aging population, the costly climate and severe weather impacts, continual trees falling on major roads, local and one egress roads during wind or winter events, warming winters, frequency continuing disasters and hazard events has increased, more resilience and better resources, more biological disasters. More regular and severe storms have been experienced, resulting in higher costs, more damages from road flooding, more debris and slower damage repairs, yet better response to events. Regular infrastructure improvements and bridge and culvert upgrades have occurred, better traffic flow, more attention is paid to energy efficiency and community, consistent staff and volunteer training and drills, and good preparation and mitigation to date help to offset greater damages.

Human and Technological Disasters Vulnerability The Town's overall vulnerability to human and technological incidents **is believed to have INCREASED over the last 5 years** with the potential for great technological escalation in the future.

2025

Factors include an aging population, rise in financial scams, increase in vehicle crashes after COVID. Weekend tourism has increased on the Lakes and at the nearby mountains, resulting in crashes, distracted driving, bicycles). Potential impairment to electric grid (including long-term cyberattack risk) exists, and the Town's dependency has increased. Permits for auxiliary power. Medical calls increased 29% in the last year. Internet availability will continue to be a premium service while cellular coverage is not available consistently over the entire Town. The Town must stay in a mainly reactive position due to costs and staffing, although training and response to human and technological incidents improved. With necessary but costly infrastructure to upkeep, it will remain difficult to stay ahead of technological disasters.

3 GOALS AND OBJECTIVES

The overall purpose of this Plan is to reduce future losses to life and property from potential hazard events by identifying appropriate **Actions** to implement during the five-year span of this Plan.

Inspired by early *State of New Hampshire Hazard Mitigation Plans*, the Bradford's **Goals** were initially developed in the previous **Bradford Hazard Mitigation Plans**. To conform with the latest state and federal guidance while attending to the Town's needs, the **Goals** and **Objectives** were reviewed and updated as applicable by the Hazard Mitigation Committee during a public meeting for the **2025 Plan**. Lastly, with the most recent change in hazard types utilized in the *State of New Hampshire Multi-Hazard Mitigation Plan 2023*, it was necessary to revise some of the main hazard groups for the **General Hazard Mitigation Objectives** identification.

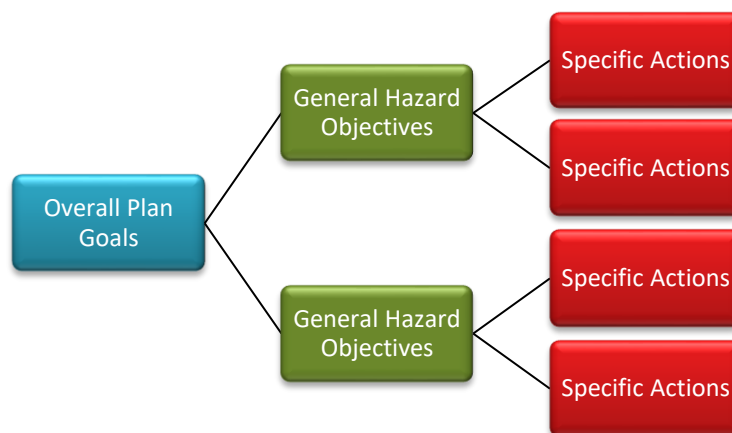
What Are Goals, Objectives and Actions

Goals, Objectives and **Actions** are used in the Hazard Mitigation Plan to define different levels of meaning. Their relationship is displayed in **Figure 3.A**.

The overall **Goals** provide a macro-level view of what emergency managers want to accomplish to keep the Town's life, property and infrastructure safer from natural disasters. Statements of overall **Goals**, beginning with "To", describe the desired vision of mitigation and safety for the community. **Goals** enable the development of thoughtful hazard **Objectives** designed to generally fulfill those **Goals**.

Figure 3.A

Relationship of Goals, Objectives and Actions



HAZARD CATEGORIES

From the **Hazard Identification and Risk Assessment**, the individual natural hazards under consideration have been grouped into similar event types for simplification of determining Objectives. These *Main Hazard Categories* in **Table 3.1. Objectives** begin to narrow down the focus of the overall **Goals** into hazard minimization statements and will use these categories.

Finally, **Actions** are the specific activities or projects which can be undertaken to accomplish an **Objective**. The **Action** is the target to reach to help mitigate hazards in the community. The completed **Action** fulfills the associated **Objectives**. Actions will be listed and reviewed later in **8 MITIGATION ACTION PLAN**.

Table 3.1

Updated Hazards for Objectives 2025

Main Hazard Category	Specific Hazards Included	Hazard Type
Drought	Drought	Hydrologic
High Wind/ Tropical/ Storms	Thunderstorms, Downbursts, High Winds, Tornadoes, Tropical and Post-Tropical Cyclones, Hail	Atmospheric
Wildfire /Fire/ Lightning	Wildfire, Lightning, Fire	Hydrologic/Atmospheric
Flood/ River	Dam Failure, Inland Flooding, River Hazards	Hydrologic
Winter	Winter Storms, Blizzard, Ice Storm	Atmospheric
Extreme Temperatures	Cold Wave, Heat Wave	Atmospheric
Earthquake/ Landslide	Earthquake, Landslide	Geologic
Public Health/ Biological	Swimming Water Quality, Air Quality, Drinking & Surface Water Quality, Infectious Diseases, Arboviral Diseases, Tickborne Diseases	Biologic
Solar	Geomagnetic Storms, Solar Radiation, Radio Blackout	Space Weather
Hazardous Materials/	Hazardous Materials, Radiological	Haz Mat
Human Hazard	Crash, Mass Casualty Incident, Cyber Event, Terrorism/ Violence	Human
Technological	Aging Infrastructure, Conflagration (Fire), Long Term Utility, Outage	Technological

The Bradford Hazard Mitigation Committee aimed to develop at least one Plan **Objective** for each of the *Main Hazard Categories* noted.

Overall Hazard Mitigation Plan Goals

Natural hazards are the focus of this **Hazard Mitigation Plan 2025**. Because Human and Technological hazards are also a concern for emergency responders, they have appeared in prior Plan versions and are demoted in importance, but are still considered, in each section of this **2025 Plan**. The following **Goals** for the **Hazard Mitigation Plan 2025** were developed by the Hazard Mitigation Committee as the vision for the community with respect to the declared disaster declarations, general hazard events, seasonal weather events and changing climate patterns resulting in unexpected events. Collectively, the **Goals** guided the formulation of **Objectives** for each of the main hazard categories. These **Goals** were slightly revised from the **2018 Plan** to accommodate consistent grammar and to reflect updated hazards. The **Hazard Mitigation Goals** are displayed in **Figure 3.B**.

Figure 3.B

Hazard Mitigation GOALS

1

To reduce the risk of injury in the Town from the impacts of natural hazards, severe weather, disasters, and human and technological hazards

2

To reduce the risk of potential damage in Town to public and private property, infrastructure, critical facilities, historic resources and the natural environment from the impacts of natural hazards, severe weather, disasters, and human and technological hazards..

3

To enhance communication and public outreach, educational programs and enforcement activities to help protect the community from the impacts of natural hazards, severe weather, disasters, and human and technological hazards.

Source: Bradford Hazard Mitigation Committee

General Hazard Mitigation Objectives

Main natural hazard event categories of **Drought, High Wind/Tropical, Wildfire/Fire/Lightning, Flood/River, Winter, Extreme Temperatures, Earthquake/Landslide, Public Health/Biological, Solar** are intended to encompass their respective full sub-hazards range described in this Plan. The non-natural hazard categories of **Hazardous Materials/Radiological, Human, and Technological** are secondary to the natural hazards but also receive **Objectives**. Many of the hazards included in the **2018 Plan** did not have an Objective, which is now rectified in the **2025 Plan**. The **General Objectives** are developed by addressing the primary hazard events that could impact Bradford. They focus on minimizing or mitigating the hazard events to support the overall **Goals** while driving the direction of **Action** development later in the Plan.

Although human and technological hazards are not natural disasters, many technological hazards are secondary to (are caused by) the natural and weather hazards. **General Hazard Mitigation Objectives** were crafted for the **Bradford Hazard Mitigation Plan 2025** as displayed in **Figure 3.C**.

Figure 3.C

Hazard Mitigation OBJECTIVES

1	Drought	Minimize the impact of drought events to agricultural areas, private and municipal wells, and other locations.
2	High Wind/ Tropical	Minimize the damage to life, property, and infrastructure from severe wind events, including thunderstorms, hail, downbursts, tornadoes, hurricanes and tropical storms, including damage resulting from tree debris.
3	Wildfire/ Fire/ Lightning	Minimize the damage to life, property, and infrastructure, including the Town Forests, forested easements, Town-owned property, State forests and parkland, trails, and the telecommunications towers, from wildfires and lightning.
4	Flood/ River	Minimize the damage to life, property, and infrastructure from floodwaters or erosion from the Warner River, West Branch of the Warner River, brooks and other floodplains; from Lake Todd and Lake Massasecum, other ponds, wetlands, and marshes; and from dams in Town and upstream.

5	Flood/ River	Minimize the damage to life, property and infrastructure caused by snowmelt and precipitation resulting in erosion and flooded roads; culvert washouts, small dam failures, debris impaction, or beaver dam breakage; or scouring and erosion damage of bridges.
6	Winter	Minimize the damage to life, property and infrastructure from winter weather events, including storms, snow, ice and minimize damage from utility failure, tree fall, blocked transportation routes, and roof collapses.
7	Extreme Temperatures	Minimize the damage to life, property and infrastructure due to temperature fluctuation resulting from climate change, including excessive heat events, energy consumption, heat waves, extreme cold events, and wind chill.
8	Earthquake/ Landslide	Minimize the threat of potential landslide or rockslide areas along local roads and excavation areas.
9	Earthquake/ Landslide	Engage in public awareness of local earthquake activity and safety precautions.
10	Public Health/ Biological	Minimize the threat or impact of public health events to the public, including close-quarter communicable diseases (coronavirus, influenza, hepatitis, meningitis), air and water quality decline, biological infestations (milfoil, emerald ash borer, mold), arboviral (mosquito) and tick-borne diseases, and substance misuse, etc.
11	Solar	Minimize the impact to life, property and infrastructure from solar storms and space weather, including solar winds, geomagnetic storms, solar radiation, and radio blackout.

12	Hazardous Materials/ Radiological	Minimize the damage to life, property, and infrastructure from hazardous materials exposure, chemical spills, trucking accidents, and radiological materials incidents, including impacts and exposures caused by brownfields sites, leaking underground storage tanks, aboveground storage tanks, and occupational sites.
13	Human	Minimize the damage to life, property and infrastructure from human threats such as transportation crashes, sabotage/vandalism, terrorism, hostage situations, active threat, arson, mass casualty, civil disturbance, and cyber events.
14	Technological	Minimize the damage from multiple hazards to the aging infrastructure of the community, including bridges, culverts, dams, local Town maintained roads, State roads (NH 103, NH 114), NHDES listed public water supplies, and seek to maintain operational efficiency.
15	Technological	Minimize the impact to life, property and infrastructure from the risks of various utility outages, such as live wire dangers, long-term outages, and high tension power lines, in electrical power, internet and telecommunications services;

Source: Bradford Hazard Mitigation Committee

4 HAZARD RISK ASSESSMENT

Natural disasters, severe weather events and technological, and human hazards that *previously* occurred in Bradford or have the *potential* to occur in the Town were assessed in a **Hazard Identification Risk Assessment (HIRA)** to determine their **Overall Risk** to the community. Included in this assessment are a **Change in Intensity** and **Highest Magnitude** of each natural hazard. The major disasters declarations covering the Central NH Region (Hillsborough County and Merrimack County) were inventoried and additional hazard events occurring in Bradford and the surrounding area have been described. FEMA Public Assistance funding to the Town is detailed for each disaster declaration. A review of climate variations is described for the region to provide perspective on how the weather may change over time. All information was updated for the **2025 Plan**.

As noted in **3 GOALS AND OBJECTIVES**, the natural hazards and Natural Hazard Categories themselves have slightly altered to better fit with the *State of New Hampshire Multi-Hazard Mitigation Plan 2025* and federal guidelines. No hazards were removed. Natural hazards such as **Avalanche, Tsunami, Volcanic Activity**, and **Coastal Flooding** were not discussed in Bradford's **2025 Plan** because they have no ascertained relevance to the Town. While there is a distinct emphasis on natural hazards, **Hazardous Materials/ Radiological, Human, and Technological** hazard events are described if a notable impact was found on the Town.

Main Hazard Category	Specific Hazards Included
Drought	Drought
High Wind/Tropical/Storms	Thunderstorms, Downbursts, High Winds, Tornadoes, Tropical and Post-Tropical Cyclones, Hail
Wildfire/Fire/Lightning	Wildfire, Lightning, Fire
Flood/River/Dam	Dam Failure, Inland Flooding, River Hazards
Winter/Ice	Winter Storms, Blizzard, Ice Storm
Extreme Temperatures	Cold Wave, Heat Wave
Earthquake/Landslide	Earthquake, Landslide
Public Health/Biological	Swimming Water Quality, Air Quality, Drinking & Surface Water Quality, Infectious Diseases, Arboviral Diseases, Tickborne Diseases
Solar	Geomagnetic Storms, Solar Radiation, Radio Blackout
Hazardous Materials/Radiological	Hazardous Materials, Radiological
Human Hazard	Crash, Mass Casualty Incident, Cyber Event, Terrorism/ Violence
Technological	Aging Infrastructure, Conflagration (Fire), Long Term Utility, Outage

Within these *Main Hazard Categories* are numerous related *Specific Hazards*, most of which are detailed in the **Hazard Identification and Risk Assessment (HIRA)**. This Assessment provides a measure of **Frequency (Probability of Occurrence)**, **Location Area**, **Severity of Impact to the Town**, and **Overall Risk**, **Change in Intensity**, and **Highest Hazard Magnitude**, for each hazard in a numerical format as determined by the Hazard Mitigation Committee. Scale definitions and the process to define hazards are discussed.

Many of these examined natural hazards may pose little threat to the Town. The Hazard Mitigation Committee wanted to acknowledge their possibility as opposed to simply focusing on a handful of top hazards which will certainly occur in the community.

Using this broad vision allows Bradford to contemplate the impact of a variety of hazards and to develop mitigation actions and design emergency planning programs as appropriate. Only the most predominant hazards, or even multiple hazards, will have mitigation actions developed to try to reduce the hazards' impact. These are later discussed in **Potential Mitigation Actions** and prioritized in the **Mitigation Action Plan**.

Hazard Identification and Risk Assessment (HIRA) Ratings

Twenty-two (22) natural, technological, and human hazards are evaluated within this Plan. The 14 natural hazards are ranked within the **Hazard Identification Risk Assessment**. Some hazards may be more likely to occur in the community than others based on past events and current conditions, and some hazards may have a greater impact than other hazards. How vulnerable Bradford could be to natural hazards can be measured in terms of **Overall Risk**.

The location of where each hazard has occurred either in the past or may be prone to future hazard occurrences is noted in the **Hazard Locations in Town** column.

Knowing where events may be likely to occur, the 2024 Hazard Mitigation Committee examined each potential hazard for its **Probability of Occurrence in 10 Years** and its potential **Severity of Impact to the Town** affecting people, services/infrastructure and property based on past personal recollections and community hazard trends to determine the **Overall Risk** to the community.

HIRA RATINGS EXPLANATION

The Committee identified each hazard's **Probability of Occurrence in 10 Years** score on a 1-2-3-4 scale from **Unlikely/1** (0-25% chance of occurring in 10 years, which is two **Hazard Mitigation Plan** cycles) to **Highly Likely/4** (76-100% chance in 10 years) as shown below.

Probability of Occurrence in 10 Years

1	Unlikely	0 - 25% chance
2	Possible	25 - 50% chance
3	Likely	51 - 75% chance
4	Highly Likely	76 - 100% chance

The Committee determined the likely **Severity of Impact to the Town** of an event based on a **1-2-3-4** scale for **3 Impact** characteristics – Human Injuries, the length of time Essential Services/Infrastructure are shut down and resulting Property Damage or Economic Impact. Not all of these characteristics must be expected because each hazard differs. The scale runs from **Limited/1** to **Catastrophic/4** and the more specific definitions are described below.

The **Probability of Occurrence in 10 Years** score was multiplied by the average of each **Severity of Impact to the Town** (Human Injury, Essential Services or Infrastructure and Property Damage or Economic Impact) score to obtain the **Overall Risk** score.

The technological and human hazards were not scored to ensure the natural hazards retained the focus of the **Hazard Mitigation Plan Update 2025**. However, **Dam Failure** was promoted to a natural hazard and was rated because of its close correlation to **Flooding**.

Severity of Impact to the Town

1	Limited	Human: Injuries treatable with first aid. Essential Services/Infrastructure: Minor “quality of life disturbance; Shutdown for 3 days or less. Property Damage or Economic Impact: Less than 10%.
2	Significant	Human: Significant injuries or illnesses result in no permanent disability. Essential Services/Infrastructure: Shutdown for up to 2 weeks. Property Damage or Economic Impact: 10% to 25%.
3	Critical	Human: Significant injuries or illnesses result in permanent disability. Essential Services/Infrastructure: Complete shutdown for at least 2 weeks. Property Damage or Economic Impact: 25% to 50%.
4	Catastrophic	Human: Death or multiple deaths. Essential Services/Infrastructure: Complete shutdown for 30 days or more. Property Damage or Economic Impact: Greater than 50%.

Concern Summary of HIRA Scores

A summarization of the scores is provided to ascertain at a glance the **Probability of Occurrence**, **Severity of Impact**, and **Overall Risk** using an **EXTREME**, **HIGH**, **MEDIUM** or **LOW Concern** designation for the numeric results. This summarization is also utilized in the following the **Description and Magnitude of Hazard Events** section.

Numeric Probability and Severity	NATURAL HAZARD CONCERN SUMMARY	Numeric Overall Risk Score
1	LOW	1.0 – 4.9
2	MEDIUM	5.0 – 7.9
3	HIGH	8.0 – 11.9
4	EXTREME	12.0 – 16.0

HAZARD IDENTIFICATION AND RISK ASSESSMENT SCORES

The highest possible **Overall Risk** score a natural hazard could be ranked using this **Hazard Identification Risk Assessment (HIRA)** system is **16.0** while the lowest score a hazard could be ranked is **1.0**. The **Overall Risk** numeric score is one which can help the community weigh the hazards against one another to determine which hazards are most detrimental to the community and which hazards should have the most Actions developed to try to mitigate those hazards. The **Overall Risk** is calculated simply by adding the two scores of the **Probability of Occurrence in 10 Years** and the average of the three **Severity of Impact to the Town** figures.

Out of the ranked natural hazards, Bradford's **Overall Risk** scored between **1.0 – 16.0** out of a possible Risk score of **16**, as displayed with calculated decimals in **Table 4.1**. Several hazards were ranked **EXTREME**. Few were ranked **LOW**. Comparing the natural hazards broadly since **2018**, significant increases in **Overall Risks** were seen in **Public Health** (now **13.3**, not previously rated) and in most hazard ratings. Rating **Public Health, Cold Wave**, and **Solar Storms** was new in **2025**.

Table 4.1

Highest Overall Risk Hazards and Hazard Events Since the Last Plan

Natural Hazard Event	HIRA Overall Risk 1-16	NATURAL HAZARD CONCERN SUMMARY	Notable Hazard Events Within the Last 5 Years? (See Table 4.5)	Mitigation Actions Developed (see Ch 8)	Comparison to 2018 HIRA Overall Risk 1-16*
Drought	4.0	LOW	Yes	Yes	5.3
Wildfire	5.0	MED	Yes	Yes	8.0
Winter Storms	8.0	HIGH	Yes	Yes	9.3
Ice Storm	6.0	MED	Yes	Yes	9.3
Cold Wave	5.3	MED	Yes	Yes	n/a
Heat Wave	4.0	LOW	Yes	Yes	6.7
Dam Failure	3.7	LOW	No	Yes	6.0
Inland Flooding	6.7	MED	Yes	Yes	4.0
River Hazards	6.7	MED	Yes	Yes	2.7
Earthquake	4.0	LOW	Yes	Yes	4.0

Natural Hazard Event	HIRA Overall Risk 1-16	NATURAL HAZARD CONCERN SUMMARY	Notable Hazard Events Within the Last 5 Years? (See Table 4.5)	Mitigation Actions Developed (see Ch 8)	Comparison to 2018 HIRA Overall Risk 1-16*
Landslide	5.3	MED	No	Yes	2.0
Public Health/Biologic	9.3	HIGH	Yes	Yes	n/a
Solar Storm	4.0	LOW	Yes	Yes	n/a
High Wind	4.0	LOW	Yes	Yes	16.0
Thunderstorm	4.0	LOW	Yes	Yes	16.0
Downburst	3.0	LOW	No	Included	16.0
Lightning	4.0	LOW	Yes	Yes	11.0
Tornado	2.0	LOW	No	Included	4.0
Hail	4.0	LOW	Yes	Included	16.0
Tropical and Post Tropical Cyclone	3.0	LOW	Yes	Yes	16.0
No = No notable impacts since the last Plan. Yes = Notable impact events added to Table 4.5. Annual = Annual occurrence with variable impacts; any notable impacts added to Table 4.5.					*Or equivalent hazard to 2025 Plan

Source: Compilation of Bradford HMC Data

INTENSITY CHANGE AND HIGHEST MAGNITUDE SCORES

In the **HIRA**, a **Change in Intensity** of each rated natural hazard over the next **10** Years was expressed by the Committee on a **25%** scale, with **0%** No Change in **10** Years, **-100%** Extreme Decrease, and **+100%** Extreme Increase in **10** Years. Each natural hazard's **Intensity Change** was based on the evaluation of past and current weather changes and an overall feel for how the climate could change in Bradford over the next **10** years.

Natural Hazard Intensity Change in Next 10 Years								
-100%	-75%	-50%	-25%	0%	25%	50%	75%	100%
Extreme Decrease	High Decrease	Moderate Decrease	Slight Decrease	No Change	Slight Increase	Moderate Increase	High Increase	Extreme Increase

Identification of the **Highest Magnitude** or Extent of each natural hazard in the **HIRA** could reach in **10** Years was determined by using the most common scientific scales. Extent is defined by a geographic area or dimension while magnitude is defined by the representative strength of an event. Sometimes, a natural hazards' **Highest Magnitude** or Extent was rated by more than one scale.

Table 4.2

Predictions for Future Natural Hazard Events Over Next 10 Years

Natural Hazard Event	Intensity Change %	Highest Magnitude of Hazard	Scale Range	Scientific Scales Used
Drought	+25%	D3 Extreme Drought (Red)	D0 Abnormally Dry to D4 Exceptional Drought	US Drought (D-scale) Monitor Intensity Scale
Wildfire	+25%	Extreme (Red), spring-fall	Low (Green) to Extreme (Red) Fire Danger	National Fire Danger Rating System
Winter Storms	-25%	4 Crippling	1 Notable to 5 Extreme Snowfall	Northeast Snowfall Impact Scale (NESIS)
		Major Impacts (Red)	No Impacts to Extreme Winter Impacts	NWS Winter Storm Severity Index (WSSI)
Ice Storm	0%	3 Excessive (Red)	0 Damage to 5 Ice Damage	Sperry-Piltz Ice Accumulation Index
Cold Wave	0%	<=30 minutes (blue)	<5 minutes to > 2 hours for Frostbite Times	NOAA Wind Chill Temperature Index
Heat Wave	+25%	Danger (Orange)	Likelihood of Heat Disorders, Caution (Yellow) - Extreme Danger (Red)	NOAA Heat Index
Dam Failure	0%	Low Hazard Class (Blaisdell, Newbury Reservoir)	Non-Menace to High Hazard Dam Class	NHDES Dam Hazard Classifications
Inland Flooding	+25%	100 Year Flood	100 Year to 500 Year Flooding	Special Flood Hazard Areas (SFHAs) on 2010 & Preliminary Digital 2023 Flood Rate Insurance Maps (for Zones A, AE, X)
		Moderate >40% (Red)	>5% Marginal to >70% High Rainfall Risk	NOAA Excessive Rainfall Risk Categories
River Hazards	+25%	Much Above Normal Stream Flow (Dark Blue)	Much Below Normal Flow (Red) to Much Above Normal Stream Flow (Blue)	National Water Dashboard (USGS Stream Gages, Groundwater Monitors)
Earthquake	0%	III Weak (Blue)	I Not Felt to X Extreme Shaking Intensity	USGS Modified Mercalli Intensity Scale
		2.5 MM	<1.5 Magnitude to 8> Magnitude	KGS Earthquake Moment Magnitude (Size) Scale, formerly Richter Magnitude
Landslide	+25%	Relatively Low Risk (Light Blue)	Very Low Risk (Blue) to Very High Risk (Red)	<i>No widely-used scale;</i> FEMA National Risk Index Map
Public Health/Biologic	+25%			
Swimming Water Quality		Cyanobacteria & e. Coli (Lakes Massasecum & Todd)	Bacteria Advisory to Bacteria Warning	NHDES Cyanobacteria/Public Beach Bacterial Warning Levels
Air Quality		Unhealthy (Orange)	Good (Green) to Hazardous (Maroon) Air Quality	NHDES Air Quality Index

Natural Hazard Event	Intensity Change %	Highest Magnitude of Hazard	Scale Range	Scientific Scales Used
Drinking & Surface Water Quality		Poor (Orange)	Good Water Quality (Green) to Severe Water Quality (Red)	NHDES Watershed 305(b) Assessment Summary Reports by Watershed 2020-2022
Infectious Diseases		Elevated (Orange)	Minimal (White) to Very High (Red)	NHDHHS Acute Respiratory Activity by County (weekly map)
Arboviral Diseases		Low (Yellow)	No Risk (Yellow) to Very High Risk (Red)	NHDHHS Arboviral Risk Map by Town (annual)
Tickborne Diseases		300 cases/year (Merr Cty)	Rate Per 100,000 persons - Latest 2017-2021 (4 years) = 131 (Merr Cty), 101 (Hills Cty)	NH DHHS Reported Cases of Lyme Disease by County 2017-2021
Substance Misuse		1-5 EMS Drug Overdose/Abuse Incidents/ year (Blue)	NH DHHS Drug Monitoring Initiative (Map) Monthly and YTD	NH DHHS Drug Monitoring Initiative
Solar Storms/ Space Weather	+25%			
Geomagnetic Storms		G3 Strong (Orange)	G1 Minor to G5 Extreme Geomagnetic Storm	NOAA Geomagnetic Storms Scale
Solar Ration		S3 Strong (Orange)	S1 Minor to S5 Extreme Solar Radiation	NOAA Solar Radiation Storms Scale
Radio Blackout		R3 Strong (Orange)	R1 Minor to R5 Extreme Radio Blackouts	NOAA Radio Blackouts Scale
High Winds	+25%	10 Whole Gale 55 to 63 mph	0 Calm to 12 Hurricane Force Wind	Beaufort Wind Scale (Land)
Thunderstorms	+25%	3 Enhanced Risk (Orange)	1 Marginal (Lt Green) to 5 High Thunderstorm Risk (Pink)	NOAA Severe Thunderstorm Risk Categories
Downbursts	0%	Microburst <2.5 miles	<2.5 miles wide Microburst to >2.5 miles wide Macroburst	NOAA Downbursts
Lightning	0%	LAL 2 Infrequent T-storms	LAL 1 No Thunderstorms to LAL 6 Dry Lightning Activity	NWS Lightning Activity Level (LAL)
Tornados	0%	EF1 86-110 mph	EF0 65-85 mph to EF5 >200 mph	NOAA Enhanced Fujita Scale
Hail	0%	0.75" (Penny)	1/4" Pea Size to 4.5" Grapefruit Size Hail Stones	NOAA Hail Size
	0%	H2 Significant 10-20 mm	H0 5mm Hard Hailstorm to H10 >100mm Super Hailstorm	TORRO Hailstorm Intensity Scale Adapted
Tropical and Post Tropical Cyclones	0%	Category 1 74-95 mph Devastating	Category 1 74-95 mph Minimal to Category 5 >157 mph Catastrophic Winds	NOAA Saffir-Simpson Hurricane Wind Scale

Source: Bradford Hazard Mitigation Committee 2024

HAZARD IDENTIFICATION AND RISK ASSESSMENT RATINGS AND POTENTIAL HAZARD EXTENT

Included with the **Table 4.3 Hazard Identification Risk Assessment (HIRA)** are the final figures and a description of the potential locations or extent such a hazard might impact Bradford. Dates and descriptions of the new hazard impacts within the last 5 years are provided in a later table, **Table 4.5 Local and Area Hazard Event and Disaster History (Sequential)**.

Table 4.3

Natural Hazard Identification and Risk Assessment (HIRA) and Potential Extent (Present and Future)

Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
HYDROLOGIC Hazards						
DROUGHT	4	1	1	1	4.0	Entire Town / Region. Areas susceptible include: <ul style="list-style-type: none"> • <u>Water Supplies:</u> residences with private wells and water supplies. A large aquifer runs beneath Bradford but is not refilled during drought conditions, a particularly concerning issue. Higher elevations and ledgy locations tend to run dry first. • <u>Fire:</u> Drought brings increased risk of brush fire with dry vegetation (see Wildfire for areas). Fire ponds will be low or dry during drought conditions. • <u>Roads:</u> Gravel roads are affected because they cannot be graded when water is low. Yet when rains occur, these gravel roads and ditches will erode. • <u>Agriculture:</u> Nurseries, orchards, tree farms may produce less food.
WILDFIRE Brushfire, Outdoor Fires, Accidental, etc	3	2	1	2	5.0	Entire Town. Areas most susceptible include: <ul style="list-style-type: none"> • <u>Wooded areas:</u> Town and State forests, recreation areas, conservation areas, open recreation fields, locations difficult to access by vehicles. • <u>Populated areas:</u> Residential backyards, Single family homes in Bradford are situated in the woods. Dozens of cul-de-sacs are identified as one-way access and surrounded by woods; these

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
						forested, dead-end residential neighborhoods would be difficult to evacuate. Entire southern half of the Town, many Class VI roads because of the railroad, Ayers Pond Area inaccessible by vehicle unless accessed by Washington, Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill. • <u>Susceptible structures</u> : aboveground utilities, transformers, telecommunications towers, radio antennas.
Cold Weather Storms (ATMOSPHERIC Hazards)						
WINTER STORMS, BLIZZARD (winds >35 mph, visibility <0.25 mile, >3 hours), NOR'EASTER (tropical pattern, low pressure, follows East Coast)	4	2	2	2	8.0	Entire Town. Areas of particular concern: • <u>Critical facilities</u> : Town and School buildings, roof collapse anywhere, dams, bridges, utilities, vulnerable populations, Schools, over age 55+ communities. Remote areas in the Town may be more difficult to access and/or without power or heat. • <u>Transportation</u> : Roadways (fallen trees) on one-egress roads, electrical power utilities. Roads or areas of high elevation: Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill. Wooded and forested sections of Town are vulnerable to trees or debris impacted infrastructure: entire southern half of the Town, many Class VI roads because of the railroad, Ayers Pond Area inaccessible by vehicle unless accessed by Washington.
ICE STORM	3	2	2	2	6.0	Entire Town. See also Winter Storms. Areas of concern: • <u>Most remote roads/ areas of Town</u> : Roads or areas of high elevation: Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill. <u>Crash</u> : The entire road network is susceptible to winter conditions, including the state and interstate roads (NH 114, NH 103). might have the greatest opportunity for vehicle crash. <u>Electric and Utility lines</u> : On Town roads, the ice can weigh down trees and branches, causing breakage and downed power lines. Ice storms historically create more damage than snowstorms. (Eversource is Bradford's electricity provider). The Highway Department keeps up with the snowfall, but ice storms require

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
						more time and resources to keep the roads safe. The Town Shelters can be opened.
Extreme Temperatures (ATMOSPHERIC Hazards)						
COLD WAVE Wind Chill, Freezing	4	2	1	1	5.3	Entire Town. The socially vulnerable populations of Bradford will be more vulnerable to cold waves and power outages. Age restricted communities and younger children. See also Winter Storms and Ice Storms .
HEAT WAVE Excessive Heat	4	1	1	1	4.0	Entire Town. Groups most susceptible to excessive heat include: Elementary School, and Bradford Area Community Center. The facilities should have access to either air conditioning or cooling facilities. Older, individual homes may lack air conditioning. Excessive heat can cause dehydration, heat exhaustion and more serious illnesses. Shelters may need to be opened as cooling centers during extended heat conditions.
Flooding (HYDROLOGIC Hazards)						
DAM FAILURE Water Overtop, Breach, Beaver, etc.	1	4	4	3	3.7	Areas downstream and inundation from Significant Hazard (S) Lake Todd, and Low Hazard (L) West Branch dams. Areas downstream (and inundation) from Non-Menace (NM) hazard classifications and beaver dams. These dams, if failed, could present a severe problem to those downstream or directly nearby. Lake Todd dam failure would impact approximately three homes on Main Street, also impacting Water Street and Center Road, and then likely entering Lake Massasecum. Lake Massasecum's homes and cottages are vulnerable, also including a seasonal campground.
INLAND FLOODING Rain, Snow Melt, Flash Floods- Cause Ditch Erosion, Washouts, Pond Overtop, etc	4	1	2	2	6.7	Entire Town. Runoff from impervious surfaces and roadways or from tree cover and fields can cause floods over the Entire Town. Susceptible areas include: • Roads: All of the roads in Bradford are constructed using ditching instead of storm drains. Regular road washouts include: • Breezy Hill Road Bridge • Blaisdell Lake Road • Center Road • Center Road covered bridge (footings subject to erosion) • Davis Road • Deer Valley Road • East Washington Road • Fairgrounds

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
						<p>Road (Dodge Corner area) • Jewett Road • Route 114 (at Ayer & Goss) • Route 114 intersection with Route 103 (meadow) • Water Street (by the bridge) • West Main Street Bridge erosion (sinkhole) • West Meadow Road • West Road.</p> <p>• <u>Waterways</u>: Floodplains of Warner River result in expanded flooding, West Branch Brook, Hoyt Brook, Ring Brook, Ayers Pond, Day Pond, Cressy Pond, Lake Todd and Lake Massasecum are the largest waterbodies and watercourses. Runoff from roadways or heavy rain can cause floods over the Entire Town. Fast moving brooks near roads like West Branch Brook on Fairgrounds Road and Hoyt Brook cause flooding. Heavy rain, fast now. Placing in 15-18" culverts. Next erosion will occur at the bridge, S-turn end of Jones Road on the meadow side of Route 114, in the floodplain.</p> <p>• <u>High Density Housing</u>: Lake Massasecum's homes and cottages are vulnerable, also including a seasonal campground. There would be potential rescue issues on Davis Road, East Shore Road, and Latvia Lane. The Fire Department would be cut off from that end of Town if Route 114 were flooded. If Locke Linden Dam in Sutton were breached it would impact Gillingham Road in Bradford. Flooding events endanger the bridges in Town, including the West Main Street Bridge, two bridges on Breezy Hill Road (one is already closed), and the Center Road covered bridge (the embankment at the covered bridge has already washed away once).</p> <p>• <u>Public facilities</u>: Bridges, roads, infrastructure.</p>
RIVER HAZARDS Flood, Ice Jams, Scouring, Erosion, Channel Movement, Debris, etc	4	1	2	2	6.7	<p>Floodplains of West Branch Warner River, Warner River, and other large brooks.</p> <p>Particularly vulnerable roads to stream bank erosion and scouring include Jewett Road, Breezy Hill Road, West Road, and the surrounding area of Dodge Corner. Jewett Road is impacted by East Branch River about 40' every time it rains. Breezy Hill Road is scoured by Warner River. East Shore Drive's small unnamed brook scours. West Road's shoulders by Dodge Corner is scoured by West Branch. Other roads in Bradford that have been affected in the past</p>

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
						and are still vulnerable to damage are Fairgrounds Road, Center Road, Blaisdell Road, and West Meadow Road. • <u>Runoff</u> from roadways or heavy rain can cause floods over the Entire Town. • Roads, bridges, drainage systems and areas of past, repaired, or existing potential for road washout. • Minor ice jams have occurred in the past under Bement Covered Bridge (West Branch Brook), it is likely they will occur again. Future consideration should be given to the West Branch Bridge. With that bridge gone, there would be no access to three homes on the dead end Fairgrounds Road.
GEOLOGIC Hazards						
EARTHQUAKE >4.0MM	4	1	1	1	4.0	Entire Town. The Central NH Region is seismically active and earthquakes are regularly felt from area epicenters. Damage to utility poles and wires, roadways and infrastructure (water and wastewater treatment facilities, bridges, dams) can be significant. Areas with underground utilities, community water systems, cisterns, old buildings, and tall, old wooden buildings are particularly susceptible.
LANDSLIDE Soil, Rockslide, Excavation Areas, etc	4	1	2	1	5.3	Slopes greater than 15% (many locations in Town noted). Bradford has extreme topography and most local roads have steep slopes. Roads with steep ditching or embankments are most vulnerable to landslides. River and brook banks can also slide, usually known as erosion (West Branch Warner River).
Public Health (BIOLOGIC) Hazards	4	3	2	2	9.3	
Swimming Water Quality						Lake Massasecum and Lake Todd in Bradford are the most likely locations to be influenced by swimming water quality. Cyanobacteria and e. coli are frequent occurrences.
Air Quality						Entire Town. Air quality is generally good but can be influenced from wildfires in Canada and in the Midwest. Vulnerable populations include the youngest and elderly.

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
Drinking & Surface Water Quality	--	--	--	--		Aquifers and surface water. No municipal water in Bradford, but larger establishments / high density areas may be on community wells. Residents have private drilled or dug wells.
Infectious Diseases	--	--	--	--		Most susceptible transfer sites: Schools/daycares, health clinics, eating establishments, populated areas, large employers, senior apartments, stores and public assembly venues (see Appendix A).
Arboviral Diseases	--	--	--	--		Entire Town. The Town is completely forested except for the developed areas, including Main Street/Downtown and NH 114, NH 103. There are many watercourses and waterbodies including the West Branch Warner River, Warner River, Hoyt Brook, Ring Brook, Ayers Pond, Day Pond, Cressy Pond, Lake Todd and Lake Massasecum several recreation/farm ponds and unofficial Fire Ponds; and several drainage ponds, unnamed ponds and wetlands. Mosquitos have countless locations to breed.
Tickborne Diseases	--	--	--	--		Entire Town. With much of the Town forested, including public land with wildlife corridors and trails, there is ample opportunity for ticks to thrive. Animals including herds of deer are found throughout Bradford.
Substance Misuse	--	--	--	--		Entire Town. All populations are vulnerable to the misuse of substances, illegal drugs, prescription drugs, OTC drugs, alcohol, and other substances.
SOLAR STORMS AND SPACE WEATHER Hazards	4	1	1	1	4.0	
GEOMAGNETIC STORMS Aurora Borealis	--	--	--	--		Entire Town. Emergency dispatch would be greatly impacted by any solar storm events. Communications failure would be worse with antenna disruption at the Fire and Police Depts, Highway Department communications equipment. Power failure (Eversource) would further complicate emergency dispatch and EOC operations. If high tension transmission lines were disrupted regionally, the community could lack electricity until the grid is restored.
SOLAR RADIATION	--	--	--	--		
RADIO BLACKOUT	--	--	--	--		

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
Warm Weather Storms (ATMOSPHERIC Hazards)						
HIGH WINDS	4	1	1	1	4.0	Entire Town. Most areas vulnerable to downbursts include populated buildings and high-density locations: Eversource powerlines, communications equipment; high density or vulnerable populations such Local government operations are susceptible to damage by debris impacted infrastructure. Most housing is situated on large lots on Class V or Class VI roads which could be difficult to access with treefall and downed power lines. Most vulnerable areas include populated buildings and high-density locations: Elementary School, Lake Massasecum & Lake Todd cottages, Main Street. Wooded and forested sections of Town are vulnerable to wind (trees, debris impacted infrastructure): entire southern half of the Town, many Class VI roads because of the railroad, Ayers Pond Area inaccessible by vehicle unless accessed by Washington, Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill.
THUNDERSTORMS	4	1	1	1	4.0	Entire Town. Areas of particular concern include dams, bridges, vulnerable populations, Schools, assisted living or age 55+ communities. Roadways (fallen trees), electrical power utilities, communications network, local government operations are susceptible to damage to debris impacted infrastructure.
DOWNBURSTS	3	1	1	1	3.0	Entire Town. Most areas vulnerable to downbursts include populated buildings and high-density locations: Eversource powerlines, communications equipment; high density or vulnerable populations; telecomm towers. Local government operations are susceptible to damage by debris impacted infrastructure. Much of the Town is wooded and forested and sections would be difficult to access with trees and power lines down on the residential roads; most housing developments are situated on cul-de-sacs. Most remote roads/areas of Town could be difficult to access with treefall and downed power lines (see High Winds)

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
LIGHTNING	4	1	1	1	4.0	Entire Town. Areas most susceptible include points of higher elevation than surrounding area: Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill. Old, historic wooden buildings: Town Hall, Bement Covered Bridge. Remote, forested areas, parks, conservation areas can be dangerous to people and property: entire southern half of the Town, many Class VI roads because of the railroad, Ayers Pond Area inaccessible by vehicle unless accessed by Washington. Aboveground utilities: Eversource power lines, transformers, telecommunications towers, and power lines. Those buildings without lightning rods would be more susceptible to damage from a strike than those buildings with the rods.
TORNADOES	2	1	1	1	2.0	Entire Town. See High Wind and Thunderstorms. The Downtown/Main Street area, Lake Todd, and Lake Massasecum homes and cottages would be the most vulnerable during tornadoes.
HAIL	4	1	1	1	4.0	Entire Town. See High Wind, Lightning and Thunderstorms. Hail can be detrimental to power lines, windows, infrastructure, and can bring down tree limbs.
TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms, Tree Debris	3	1	1	1	3.0	Entire Town. See High Wind, Thunderstorms, and Tornadoes for vulnerable locations.
NOT APPLICABLE TO TOWN & REGION						
COASTAL FLOODING (Hydrologic Hazard)	n/a	n/a	n/a	n/a	n/a	
AVALANCHE (Geologic Hazard)	n/a	n/a	n/a	n/a	n/a	

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
TSUNAMI (Geologic Hazard)	n/a	n/a	n/a	n/a	n/a	
VOLCANIC ACTIVITY (Geologic Hazard)	n/a	n/a	n/a	n/a	n/a	
Technological and Human Hazards						
AGING INFRASTRUCTURE Bridges, Roads, Stormwater, Water Treatment, Wastewater	not scored	not scored	not scored	not scored	N/A	Dams, bridges, culverts, roadways. Most prominent dams and bridges that could experience debris impacted infrastructure included in Appendix A or are included as Mitigation Actions.
CONFLAGRATION (FIRE)	not scored	not scored	not scored	not scored	N/A	Entire Town. Areas most susceptible include: other populated areas. Vacant foreclosure homes or seasonal buildings in the Town and buildings in densely populated areas or residential manufactured home communities. Vehicle fires could occur anywhere, parking lots, driveways, roadways. The Main Street/Downtown area, Lake Massasecum, Lake Todd area would be greatly impacted by conflagration.
HAZARDOUS MATERIALS Haz Mat Spills, Brownfields, Trucking, etc	not scored	not scored	not scored	not scored	N/A	Most significant routes where vehicular traffic transports hazardous waste include: <ul style="list-style-type: none"> • Vehicular traffic around the Homes, businesses, vulnerable populations along the transportation routes could be vulnerable. • <u>Largest or most dangerous stationary sites</u> that store and/or handle haz mat on site include those in Appendix A. Sites those that store fertilizer, pesticides, fuel, etc. Occupational haz mat sites where spills could occur include: medical facilities, Schools, manufacturing sites, etc. Same for radiological waste. • <u>NH 114, NH 103</u>, and some local roads are the most realistic routes taken where vehicular and railcar traffic transport hazardous waste. Serious transportation accidents involving hazardous materials have the greatest possibility here.
RADIOLOGICAL Trucking, Stationary Sites, etc (Not within a 10-mile Emergency Planning Zone (EPZ))	not scored	not scored	not scored	not scored	N/A	

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
						<ul style="list-style-type: none"> • <u>Vulnerable areas</u> for targeted evacuation include the Schools and Bradford Area Community Center, Lake Massasecum.
LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications, Live Wire Danger, etc	not scored	not scored	not scored	not scored	N/A	Entire Town. Vulnerable Populations (see APPENDIX A) and critical facilities such as the Eversource powerlines, communications equipment; Elementary School, elderly housing, manufactured housing parks. Wooded, forested and remote areas can experience tree fall and become isolated, inaccessible by vehicle: entire southern half of the Town, many Class VI roads because of the railroad, Ayers Pond Area inaccessible by vehicle unless accessed by Washington, Cochran Hill, Marshall Hill, Hog Hill, Center Road, Rowe Mountain, and Ring Hill. Aboveground utilities: transformers, telecommunications towers, and power lines. Power outages may last for several days before service is restored in a large event. Bradford residents are customers of Eversource electricity. Much of the Town is wooded and forested and sections would be difficult to access with excessive tree fall or power lines down. Most remote roads/ areas of Town. Power outages may last for several days before service is restored from a large event.
TRANSPORTATION CRASH Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian, Bicycle,	not scored	not scored	not scored	not scored	N/A	Roadways. NH 114, NH 103, local Class V roads. See Map 4 for certain intersections, curves, straightaways, hills. Pedestrian and bicycle crashes should also be considered. Air traffic routes may fly over the Bradford area.
MASS CASUALTY INCIDENT As a result of any hazard event	not scored	not scored	not scored	not scored	N/A	Entire Town. Large events could cause mass casualty incidents (Downtown area, parades, community events). The closest hospital is Concord Hospital.
TERRORISM/ VIOLENCE Active Shooter, Hostage, Public Harm, Civil	not scored	not scored	not scored	not scored	N/A	None anticipated. Most susceptible sites could include Town Hall, Bradford Schools, Post Office, Bradford Area Community Center, Library. Also communication towers, major employers (especially those with large quantities of haz materials), health clinics, grocery or convenience stores, restaurants, high volume roadways, water

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Natural Hazard Categories with Technological, Human Hazard Categories	Probability of Occurrence in 10 Years 1 Unlikely 2 Possible 3 Likely 4 Highly Likely	Severity of Impact to			OVERALL RISK 1.0 -16.0	Potential Locations /Extent in Town (Present and Future)
		Human Injury 1 Limited 2 Significant 3 Critical 4 Catastrophic	Essential Services or Infrastructure 1 Limited 2 Significant 3 Critical 4 Catastrophic	Property Damage or Economic 1 Limited 2 Significant 3 Critical 4 Catastrophic		
Disturbance/ Unrest, Politically Motivated Attacks, Incendiary Devices, Sabotage, Vandalism, etc						supply infrastructure or dams, Post Office, all governmental facilities, state facilities, political offices or rallies, churches, etc.). Town systems or facilities. Sabotage would be most likely to occur Town computer systems & website, Town buildings, utilities, dams, water supplies, water and wastewater treatment facilities, cemeteries, vacant buildings, under bridges. Entire Town, but isolated incident. Hostage situations are isolated events. Locations where hostages could be taken include: Town Hall and other public buildings, Schools, banks, Post Office, workplaces, grocery and convenience stores, restaurants, high density population areas, domestic home situations. None, locations where civil disturbance could occur should be limited. Occasions include Town Meetings, voting day, during visits from political candidates, sporting events, large events such as Old Home Day or veteran's parades, school graduation. Locations include Schools, recreational fields, Town Hall, stores, restaurants, establishments serving alcohol, high density population areas (Downtown), one egress neighborhoods, Police and Fire Stations.
CYBER EVENT Computer Systems Attack, Website Overtake, Cloud Data Breach, Telephone Rerouting, Identity Theft, Phishing, Ransomware, Virus, Phone Scams, etc	not scored	not scored	not scored	not scored	N/A	Town files server or cloud, School District files server or cloud. A cyber event could occur in any digital location with no warning.

Source: Bradford Hazard Mitigation Committee

Central NH Region Major Disaster Declarations, 1973-2025

The Central NH region, which encompasses parts of Merrimack County (**18** communities) and Hillsborough County (**2** communities), has been damaged by **31** presidentially-declared major disasters [DR-] and presidentially-declared emergencies [EM-] in the last **50** years between **1973-2025**. Some of these are double-counted by being designated both EM- and DR- in the same county. Yet storms that qualify as a disaster in one community, like Bradford, may not yield the same damages in surrounding towns. When the Pre-Damage Assessment (PDA) figures are provided to FEMA after a storm, sometimes they are not high enough on a County basis to be declared a disaster.

Although a natural disaster typically befalls multiple counties in New Hampshire, only those major disaster (DR-) or emergency declarations (EM-) within either Hillsborough County or Merrimack County were identified in this Plan.

Disaster declarations [DR-] within a county enable the ability to receive Public Assistance (PA) funding and Individual Assistance (IA) funding, Hazard Mitigation Grant Program (HMGP) *plan* funding is typically made available to all communities statewide, and for those towns with an active, approved Hazard Mitigation Plan, HMGP *project* funding becomes available. *Emergency declarations* [EM-] are often proclaimed for counties in New Hampshire to help communities receive funding for less serious hazard events that may have caused more damage in nearby declared declaration [DR-] counties or states. EM- declarations typically open Hazard Mitigation Grant Program (HMGP) plan and project funding for communities with an active hazard mitigation plan.

Over the last **20** years (**2005-2025**), the Central NH region containing communities within Merrimack and Hillsborough Counties experienced **18** presidentially- declared natural major disasters [DR-] or presidentially- declared emergency declarations [EM-] which differ between DR- or EM- depending on which county was declared. The earliest Central NH region declarations spanned **1973** to **2004** (**32** years) and yielded total **13** disasters of both [DR-] and [EM-].

PUBLIC ASSISTANCE GRANT FUNDING

The last weather disaster declared in Merrimack County in which Bradford is located was the **October 2017** Wind and Rainstorm (Tropical Storm Phillippe); the last weather event for which Bradford applied for and received federal Public Assistance funding (**\$102,504**) was Tropical Storm Irene in **2011**. Details of Central NH region declared disasters and emergency declarations since **1973** and the related federal funding provided to the Town of Bradford are displayed in **Table 4.4**. Most of these disasters will be described within the following **Past Disasters and Severe Weather Events** section.

Table 4.4

Central NH Region (Merrimack & Hillsborough Cty) Major Disaster Declarations, 1973 to 2025

FEMA DR- or EM-	Year	Local Disaster Name	Incident Period	DR- MER	DR- HIL	DR- Other Cty	\$ FEMA Public Assistance (PA) Funding to TOWN
Next DR							
4516 EM-3445	2020	(COVID-19 Pandemic) Novel Coronavirus Public Health Pandemic	Jan 20, 2020- April 2022	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
4355	2017	Severe Rain and Wind Storm from Tropical Storm Phillippe	Oct 28-30	MER	---	BEL-CAR-COO-GRA- SUL	\$0
4209	2015	Severe Winter Storm and Snowstorm	Jan 26-28	---	HIL	ROC-STR	\$0
4105	2013	Severe Winter Storm and Snowstorm	Feb 8-10	MER	HIL	BEL-CAR-CHE-STR- SUL-ROC	\$8,897
4095 EM-3360	2012	Hurricane Sandy	Oct 26-Nov 8	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
4049	2011	(Halloween) Severe Storm and Snowstorm	Oct 29-30	---	HIL	ROC	\$0
EM-3344	2011	(Halloween) Severe Storm and Snowstorm	Oct 29-30	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
4026	2011	Tropical Storm Irene	Aug 26-Sep 6	MER	---	BEL-COO-CAR-GRA- STR-AUL	\$102,504
EM-3333	2011	Tropical Storm Irene	Aug 26-Sep 6	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
1913	2010	Severe Storms and Flooding	Mar 14-31	---	HIL	ROC	\$0
1892	2010	High Winds, Rain, Snow	Feb 23-Mar 3	MER	HIL	GRA-ROC-SUL-STR	\$28,927
1812	2008	(Ice Storm) Severe Winter Storm	Dec 11-23	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$19,524
EM-3297	2008	(Ice Storm) Severe Winter Storm	Dec 11-23	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
1799	2008	Severe Storms and Flooding	Sep 6-7	MER	HIL	---	\$0
1782	2008	Tornado, Severe Winds, Heavy Rains	24-Jul	MER	---	BEL-CAR-ROC-STR	\$0
1695	2007	Severe Storms and Flooding	Apr 15-23	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$95,809
1643	2006	(Mother's Day) Severe Storms and Flooding	May 12-23	MER	HIL	BEL-CAR-GRA-ROC- STR	\$10,916
1610	2005	(Columbus Day) Severe Storms and Flooding	Oct 7-18	MER	HIL	BEL-CHE-SUL	\$364,832
EM-3258	2005	Hurricane Katrina Evacuation	Aug 29-Oct 1	MER	HIL	BEL-CAR-CHE-COO- GRA-ROC-STR-SUL	\$0
EM-3211	2005	Snowstorm	March 11-12	---	HIL	CAR-CHE-ROC-SUL	\$0

FEMA DR- or EM-	Year	Local Disaster Name	Incident Period	DR-MER	DR-HIL	DR- Other Cty	\$ FEMA Public Assistance (PA) Funding to TOWN
EM-3207	2005	Snowstorm	Jan 22-23	MER	HIL	BEL-CAR-CHE-GRA-ROC-STR-SUL	\$7,155
EM-3193	2003	Snowstorm	Dec 6-7	MER	HIL	BEL-CAR-CHE-COO-GRA-SUL	\$7,175
EM-3177	2003	Snowstorm	Feb 17-18	MER	HIL	CHE-ROC-STR	\$5,006
EM-3166	2001	Snowstorm	Mar 5-7	MER	HIL	CHE-COO-GRA-ROC-STR	\$7,122
1231	1998	Severe Storms and Flooding	Jun 12-Jul 2	MER	HIL	BEL-CAR-GRA-ROC-SUL	\$0
1199	1998	Ice Storms	Jan 7-25	MER	HIL	BEL-CAR-CHE-COO-GRA-STR-SUL	\$0
1144	1996	Severe Storms and Flooding	Oct 20-23	MER	HIL	GRA-ROC-STR-SUL	\$0
1077	1995	Storms and Floods	Oct 20-Nov 15	MER	---	CAR-CHE-COO-GRA-SUL	\$0
EM-3101	1993	Blizzards, High Winds and Record Snowfall	Mar 13-17	MER	HIL	BEL-CAR-CHE-COO-GRA-ROC-STR-SUL	\$0
917	1991	Hurricane Bob, Severe Storm	Aug 18-20	---	HIL	CAR-ROC-STR	no data
876	1990	Flooding and Severe Storm	Aug 7-11	MER	HIL	BEL-CAR-CHE-COO-GRA-SUL	no data
789	1987	Severe Storms, Flooding	Mar 30-Apr 11	MER	HIL	CAR-CHE-GRA-ROC-SUL	no data
771	1986	Severe Storms, Flooding	Jul 29-Aug 10	---	HIL	CHE-SUL	no data
399	1973	Severe Storms, Flooding	Jul 11	MER	HIL	BEL-CAR-CHE-COO-GRA-STR-SUL	no data
Weather Disasters DR- & EM-Pandemic Funds DR-4516*			Total Public Assistance to TOWN 1993-2025**				\$667,867
			Total GOFERR Assistance to TOWN 2020-2022**				\$0
* CARES Act/NH Governor's Office for Emergency Relief and Recovery (GOFERR) 2020-2022 https://www.goferr.nh.gov/welcome			Total Federal Disaster Funding to TOWN 1993-2025**				\$667,867

Source: http://www.fema.gov/disasters/grid/state/33?field_disaster_type_term_tid_1=All

*M = Merrimack County (18 towns in CNH region) H = Hillsborough County (2 towns in CNH region)

** Dollar figures are rounded to the nearest \$100 and include only PA and HMGP. PA dataset available at <https://www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1> July 2023

To help reclaim some of the costs these disasters wrought on town property and infrastructure and for additional staff time, Bradford applied for and received FEMA Public Assistance (PA) funds, Categories A-G, a 75% grant and 25% match program for several declared Merrimack County disasters. These PA funds have been used for overtime wages for Town employees, equipment rentals, snow removal, washout repair, road reconstruction, bridge repair, debris removal, and more.

The database where the Public Assistance funding information resides is available from **1993** to present (**2025**); over time, the reported FEMA dollars differ between **Hazard Mitigation Plans** for unknown reasons, so the latest reported figures appear in this **2025 Plan**. Bradford in Merrimack County was eligible for reimbursement for up to a total of **28** disasters and emergency declarations. This detail is displayed previously in **Table 4.4** and is summarized to rounded in the forthcoming **Table 4.5** for each disaster.

2020 GOVERNOR’S OFFICE FOR EMERGENCY RELIEF AND RECOVERY (GOFERR)

The NH Governor’s Office for Emergency Relief and Recovery (GOFERR) at <https://www.goferr.nh.gov/> provides transparent review and access to the state’s CARES Act - Coronavirus Relief Fund allocations for the DR-4516 COVID-19 Pandemic. The US HR 748 Coronavirus Aid, Recovery, and Economic Security (CARES) Act enacted 3/27/20 provided **\$1.25b** to the state and was one of several relief bills and funding sources for the COVID-19 disaster. The GOFERR is making these funds available through various programs. Municipalities, businesses, and individuals were to apply to several funding programs through GOFERR.

Bradford's Past Disasters and Severe Weather Events

The Town of Bradford has been affected by several significant natural disasters within the last decade and applied for and received Public Assistance (PA) funding for many of these events. Severe natural hazard events have been occurring more frequently in Merrimack County than in the past. While these events on occasion disrupted the flow of the community and isolated residents for days, the disaster impacts were relatively mild as few injuries were reported. FEMA provided Public Assistance funding to the Town for tasks such as cleanup, road repairs, tree and brush cutting, and culvert replacement.

The Hazard Mitigation Committee helped provide anecdotal descriptions of how the recently declared natural disasters or emergency declarations for the Central NH Region affected Bradford and its residents. Public Assistance disaster funding opportunities open to communities when a disaster is declared within a county. The Town of Bradford applied for and received this funding for several recently declared disasters.

Although New Hampshire experienced more disasters than those shown in **Table 4.5**, typically only those which occurred as declared disasters [DR-] or emergency declarations [EM-] in the Central NH region (Merrimack and Hillsborough Counties) were described. Sometimes a disaster occurring in a nearby county, such as Rockingham County in proximity to Bradford, will be included. Refer to the [State of New Hampshire Multi-Hazard Mitigation Plan 2023](#) for a complete list of disasters which impacted the rest of New Hampshire.

Also identified were numerous past hazard events or severe weather events that occurred locally in the community and within the area that were impactful enough to note in **Table 4.5 Local and Area Hazard Event and Disaster History (Sequential)**. These past hazard events are listed consecutively with the newest events at the top of the table. If a specific category of event was not recorded in Bradford in the last **5** years, this means the Hazard Mitigation Committee did not recall an event of significance since the **2018 Plan**.

COLOR KEY for **Table 4.5**:

Not a Declared Disaster (DR-) or Emergency Declaration (EM-) in Merrimack County or Hillsborough County in Central NH Region. Town of Bradford ----- NOT ELIGIBLE FOR PA Funding or FUNDING NOT RECEIVED by Bradford	DR- or EM- in Merrimack or Hillsborough County ----- ELIGIBLE FOR PA FUNDING and PA \$ Received by Bradford	Other Bradford Local Hazard or Severe Weather Event	Regional Hazard Event with Bradford Impacts
--	---	---	---

This breakdown of hazards is identical to the list of natural disaster categorizations found also in **3 GOALS AND OBJECTIVES**.

Table 4.5

Local and Area Hazard Event and Disaster History (Sequential- Lastest to Earliest)

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/Tropical/Downburst	Wildfire/ Fire/Lightning	Inland Flood/River/ Dam	Winter/ Snow/Ice	Extreme Heat/Cold	Earthquake/Landslide	Public Health/Biological	Solar	Haz Mat/Radiological	Human	Technological
TOWN TO ADD NEW EVENT ROWS HERE																			
TOWN TO ADD NEW EVENT ROWS HERE								+	+	+	+	+	+	+	+	+	+	+	+
Hazard Events 2018-2025 (Since Last Plan)																			
Earthquake Jan 2025	No	2025	Jan 27	N/A	M 3.8; 9 km SE of York Harbor, Maine: *2025-01-27 15:22:56 (UTC) *43.066°N 70.571°W *0.6 km depth The Earthquake was felt quite distinctly in the Central NH Region.	Bradford experienced the rumbling of the Earthquake on par with the Central New Hampshire Region. Residents described their desks as shaking, rumbling, and the feeling of something like a shockwave. The sound was reminiscent of a large truck in idle.	Bradford Hazard Mitigation; WMUR; USGS							+					
Bradford Conflagration; Fatal Human Hazard Event Dec 2024	No	2024	Dec 26	N/A	N/A	An armed standoff occurred between a male subject and Bradford police; ultimately ending in the death of the subject after he set fire to the residence within which he had barricaded himself. The subject was the sole individual involved in the incident, aside from responding to emergency	Bradford Hazard Mitigation; WMUR			+								+	

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						personnel. No other individuals were harmed.													
Winter Storm, Snow Accumulation Nov-Dec 2024	No	2024	Nov-Dec	N/A	The Central New Hampshire Region experienced a winter storm over the Thanksgiving holiday, and again around the Christmas holiday, 2024.	Bradford experienced winter storm conditions comparable to the Central New Hampshire Region. Power outages were observed in the area of the NH 114/NH 103 corridor, W Main Street/Town Hall (alarms activated). 6-7" total accumulation of wet snow in some areas. DPW crew worked over holiday into Fri.	Bradford HMC, CNHRPC					+	+						+
Extreme Heat Event; Drought Jul-Oct 2024	No	2024	Jul-Oct	N/A	The area experienced extremely hot, dry conditions throughout the latter part of July. The drought conditions persisted into the fall season.	Bradford experienced heat and drought conditions comparable to the Central New Hampshire Region. Open burning/burn ban was issued in October due to persistent high fire risk from lack of precipitation.	Bradford HMC, CNHRPC	+		+			+		+				
Heavy Rains; Windstorm Event July 2024	No	2024	Jul	N/A	The region experienced Heavy summer rains and wind.	Bradford experienced storm and wind conditions comparable to the Central New Hampshire Region, as well as some fallen trees.	Bradford HMC, CNHRPC		+										+
Extreme Heat Event Jun 2024	No	2024	Jun 18-19	N/A	Central New Hampshire Region experienced extremely hot temperatures on June 18-19.	Bradford experienced temperatures between 90-100° Fahrenheit.	Bradford HMC, CNHRPC						+		+				
Total Solar Eclipse Event Apr 2024	No	2024	Apr 8	\$0	A solar eclipse occurred on Apr 8, 2024, with parts of New Hampshire in the path of totality, and	Bradford experienced the dynamic solar eclipse event in line with the rest of the Central New Hampshire	Bradford HMC, CNHRPC									+			

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					others with about a 75-95% solar obstruction (eclipse).	Region. The town prepared for the temporary large draw to the electrical infrastructure at the unusual time of day.													
Sever Winter Storms and Flooding Apr 2024	4799	2024	Apr 3-5	\$0	An exceptionally volatile series of winter storms struck the entirety of New Hampshire in the beginning of April 2024. Thousands of residents across the state were without power; some for well over week. The outages were partly due to snow laden trees falling onto powerlines, and partly due to extreme wind gusts. . Massive amounts of snow accumulation - over 12" in most affected areas and nearing almost 2 ft of snowfall in some of those. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford experienced severe winter storm conditions comparable to the Central New Hampshire Region. Bradford did not apply for or receive federal funds.	FEMA, CNHRPC		+		+	+	+						+
Severe Winter Storms with Ice/Mixed Precipitation Mar 2024	No	2024	Mar 23	N/A	The Central New Hampshire Region Experienced Severe winter storms, featuring a mixture of snow, sleet, and rain in March of 2024.	Bradford experienced the following impacts: Mar 23 – 22-24" snow, rain, snow. Mixed precipitation. Came in two different storm batches Several days without power in some areas.– 36 hours later, ice vs. snow. Some roads closed due to powerlines													

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						down, trees wrapping – East Washington, Breezy Hill, major thoroughfare. Old Sutton Road blocked on NH 114 side. Marshal Hill/Hogg Hill, barricades low hanging wires. East Shore (Massasecum outage.) Scattered outages, pine trees loaded down with ice.													
Winter Storms and Flooding Jan 2024	4771	2024	Jan 9, 14	\$0	Severe storms and flooding was experienced by several areas in New Hampshire. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford experienced severe storm and flooding conditions comparable with the Central New Hampshire Region. Bradford did not apply for or receive federal funds.	FEMA				+	+							+
Severe Storms and Flooding Dec 2023	4761	2023	Dec	\$0	Several areas in New Hampshire experienced Severe rainstorms, wind, and flooding, resulting in extensive damage and disruptions to power. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford experienced extensive power outages due to downed trees on powerlines. This resulted in multiple temporary school and business closures. Bradford did not apply for or receive federal funds.	FEMA		+		+	+							+
Bradford Cyanobacteria Bloom + Pathogen Contamination Jul 2023	No	2023	Jul	N/A	N/A	Bradford: Cyanobacteria at Lake, e. coli identified at the Lake - had to close park (septic systems overtopped from the Jul 2023 storm). DES tests on a regular basis at beaches, Town Hall, School. Does DES test East Main Street apt building	Bradford Hazard Mitigation								+		+		

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Severe Storms and Flooding Jul 2023	4740	2023	Jul 9-17	\$0	The region experienced severe storms and subsequent flooding / erosion, and exceptionally high-water levels in mid-July. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford Experienced severe storms; flooding/erosion comparable to the Central New Hampshire Region. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC		+		+								
Extreme Heat Event Jun 2023	No	2023	Jun	N/A	The Central New Hampshire area experienced a heat wave in June of 2023.	Bradford experienced extreme high temperature conditions comparable to the Central New Hampshire Region. High electric demands posed the threat of a brownout.	Bradford HMC, CNHRPC						+						
Hailstorm Jun 2023	No	2023	Jun	N/A	The Central New Hampshire area experienced an uncharacteristic hailstorm featuring quarter-sized hail, in June 2023.	Bradford experienced hailstorm conditions comparable to the Central New Hampshire Region.	Bradford HMC, CNHRPC					+							
Deep Freeze; Frost May 2023	No	2023	May 16	N/A	The Central NH region experienced an out-of-season deep freeze on May 16.	Bradford experienced a deep frost resulting in economic loss. deep frost. Lots of crops were damaged with freeze. Apples, cherries, pears, peaches, oak trees, strawberries, blueberries. Food crops were devastated locally, impacts economics. Gould Hill Frost impacted badly (apple orchards)	Bradford HMC, CNHRPC					+							

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Severe Winter Storms Mar 2023	No	2023	Mar 6, 14, 24	N/A	The state of New Hampshire experienced a plethora of late winter/early spring storms throughout the month of March. The storms brought in swaths of wet, heavy snow.	Bradford experienced intense snowfall on several days throughout the month of March, to include a 24-hr. accumulation of 28" on March 14. Trees blown down across roads. Heavy, Wet snow. Little recovery in between storms. Frost melt created tons of mud and an excess need for plowing. Roads were carving into ditches; roadsides eroded; roads went down from 2 lanes to 1 lane.	Bradford HMC, CNHRPC					+	+						+
Extreme Cold Event Feb 2023	No	2023			Most communities in Central NH experienced negative temperatures of between -10° to -19° Fahrenheit. Windchills as low as -45° Fahrenheit were seen for a 36-hour period.	Bradford experienced extreme cold temperatures comparable to the Central New Hampshire Region.	Bradford HMC, CNHRPC						+		+				
Heavy Rainstorm, Wind, Flooding Dec 2022	4693	2022	Dec 22-25	\$0	The region experienced very heavy rainfall and some moderate flooding on Dec 22. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford received a total of 4 inches of rain, ultimately causing some flooding in the area of Lake Massasecum. Pembroke Plausawa tower was also blown down. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC		+		+								
Heavy Wind Event; Tree Damage Nov 2022	No	2022	Nov 29	N/A	The region experienced heavy winds on Nov 29, bringing down some trees and powerlines.	Bradford experienced heavy winds and subsequent damage	Bradford HMC, CNHRPC		+										+

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						comparable to the Central New Hampshire Region.													
Minor Flooding Oct 2022	No	2022	Oct 23	N/A	The region experienced minor flooding from late summer-fall precipitation.	Bradford experienced minor flooding conditions comparable to the central New Hampshire Region.	Bradford HMC, CNHRPC				+								
Thunderstorm, Windstorm Jul 2022	No	2022	Jul	N/A	The region experienced a moderate thunder and windstorm.	Bradford experienced storm conditions comparable to the central New Hampshire Region.	Bradford HMC, CNHRPC		+	+									
Lightning and Electrical Storm May 2022	No	2022	May	N/A	The region experienced a moderate lightning storm, in conjunction with rainfall.	Bradford experienced lightning strikes comparable to the central New Hampshire Region.	Bradford HMC, CNHRPC			+									
Bradford Brush Fire May 2022	No	2022	May	N/A	Mutual aid likely responded to this local wildfire hazard which included the town of Warner.	Brushfire - notable Bradford/Warner at Day Pond, Day Pond Road off NH 114. Rapid spread, potential for structure damage 6-7 acres.	Bradford HMC, CNHRPC			+								+	
Severe Rainstorm, Windstorm April 2022	No	2022	Apr 18-19	N/A	The region experienced heavy rainfall and significant wind gusts on April 18 and 19.	Bradford experienced wind and rainstorm conditions comparable to the central New Hampshire Region. Rain and wind caused some felled trees.	Bradford HMC, CNHRPC		+										+
Solar Storm Event, Tech Disruption Apr 2022	No	2022	Apr 4	N/A	Increased solar activity due to magnetic storms was observed on April 4. The solar radiation produced by events like these can cause disturbances/interference/disruption/dysfunction to many facets of day-to-day activities, such as communications (radio	Bradford residents experienced some technological disruption due to the solar storm event. Capital Area Fire & EMS Simulcast dispatch. microwave system dropped connection from solar storms. Several towns were offline until the Lakes Region backup engaged.	Bradford HMC, CNHRPC									+			+

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					blackouts), satellite services, and network connectivity.	Multiple antennas were replaced.													
Winter Storm Feb 2022	No	2022	Feb 16	N/A	The region experienced a winter storm with moderate snowfall.	Bradford experienced winter storm conditions comparable to the central New Hampshire Region.	Bradford HMC, CNHRPC					+	+						
Hurricane Henri Aug 2021	No	2021	Aug 19-27	N/A	Hurricane Henri made landfall on New England's southern coastline and caused significant weather events in the immediate area. New Hampshire was not impacted by Hurricane Henry in a catastrophic capacity, but heavy rainfall was observed in portions of the state. Not a declared disaster in the state of New Hampshire	Bradford experienced mild-moderate weather comparable to the central New Hampshire Region. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC		+										
Severe Storms and Flooding Jul-Aug 2021	4624	2021	Jul 29-Aug 2	\$0	Many parts of New Hampshire experienced severe summer storm fronts and subsequent flooding. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford experienced severe storms and flooding comparable to the central New Hampshire Region. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC		+		+								
Severe Storms and Flooding Jul 2021	4622	2021	Jul 17-19	\$0	Many parts of New Hampshire experienced severe summer storm fronts and subsequent flooding. Not a declared disaster in Merrimack or Hillsborough Counties.	Bradford experienced severe storms comparable to that of the Central New Hampshire Region. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC		+		+								

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Extreme Heat Event Jun 2021	No	2021	Jun 29	N/A	A heatwave fell upon much of the state in late June 2021, with excessively high temperatures and humidity around June 29 th .	Bradford experienced temperatures between 90-100° Fahrenheit.	Bradford HMC, CNHRPC						+		+				
Multiple Windstorm Events March 2021	No	2021	March 2, 29	N/A	Multiple windstorm events occurred in the Central NH region during the month of March, resulting in some power outages.	Bradford experienced windstorm conditions comparable to that of the central New Hampshire region.	Bradford HMC, CNHRPC		+										
Severe Winter Storm, Snowstorm Feb 2021	No	2021	Feb 1-2	N/A	Significant winter storm conditions were experienced throughout the state. Snow accumulations from 3-16" occurred.	Bradford experienced winter storm conditions comparable to that of the central New Hampshire region.	Bradford HMC, CNHRPC					+	+						+
Windstorm, Heavy Rain Dec 2020	No	2020	Dec 25	N/A	The region experienced a sudden shift from winter conditions to heavy rain and extremely strong wind gusts, on Christmas Day.	Bradford experienced rain accumulations of 1.5-2.5" and Strong winds of 45-55 mph (extreme).	Bradford HMC, CNHRPC		+										+
Snowstorm, significant accumulation Dec 2020	No	2020	Dec 17	N/A	On December 17, the state of New Hampshire was hit with a winter storm, culminating in a large volume of snowfall and subsequent accumulation of between 5-25".	Bradford experienced winter storm conditions comparable to that of the central New Hampshire region.	Bradford HMC, CNHRPC					+	+						+
Moderate – severe Drought Conditions Dec 2020	No	2020	Dec 1	N/A	The region experienced moderate to severe drought conditions at the beginning of December.	Bradford experienced drought conditions comparable to that of the	Bradford HMC, CNHRPC	+							+				

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						central New Hampshire region.													
Tropical Storm Isaias Aug 2020	No	2020	Aug 3-6	N/A	While Tropical Storm Isaias hit the state of Connecticut particularly hard, the more northerly New England States were not impacted in a devastating way. No disaster declarations were issued within the state of New Hampshire , which only experienced moderate-heavy rainfall during this time.	Bradford experienced rainfall comparable to that of the central New Hampshire region.	Bradford HMC, CNHRPC		+		+								+
Moderate-Severe Drought Conditions Jul-Oct 2020	No	2020	Jul 10; Sep 1; Oct 27	N/A	The central New Hampshire region experienced moderate to severe drought conditions on several days across a multi-month period between July and October,	Bradford experienced the following drought conditions in the summer-fall of 2020: 10 Jul - Moderate drought conditions 1 Sep - severe drought conditions 27 Oct - Severe to extreme drought conditions 1 Dec - Moderate to severe drought conditions.	Bradford HMC, CNHRPC	+							+				
Extreme Cold Event Feb 2020	No	2020	Feb 13	N/A	The central New Hampshire region experienced extremely cold temperatures on February 13 th .	Bradford experienced freezing temperatures, plummeting to between minus (-) 15° and minus (-) 25° Fahrenheit.	Bradford HMC, CNHRPC						+		+				
Winter Storms, Heavy snowfall Feb 2020	No	2020	Feb 7-8	N/A	The central New Hampshire region experienced heavy winter storm conditions.	Bradford experienced heavy snow, freezing rain, and sleet, ultimately leading to many power outages.	Bradford HMC, CNHRPC					+	+						+

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COVID-19 Global Pandemic Event Jan-May 2020-2023	4516	2020-2023	Jan-May	\$0	January 2020 - May 2023 global Coronavirus (COVID-19) pandemic. Virtually all facets of daily life in the state of New Hampshire were impacted by this global event, as were in many other places around the world. Mass business closures, curfews, stay-at-home protocols, and social distancing practices were observed. The state of New Hampshire	Bradford experienced the impacts of the COVID-19 pandemic comparable to the Central NH region and the state as a whole.	Bradford HMC, CNHRPC								+			+	
Winter Storms Dec 2019	No	2019	Dec 2, 29	N/A	New Hampshire experienced widespread winter storm conditions across the state in the month of December. Notable snowfall occurred on December 2 and December 29.	Bradford experienced winter storm conditions comparable to much of the Central NH region.	Bradford HMC, CNHRPC					+	+						+
Severe Windstorm, Rain Oct 2019	No	2019	Oct 17	N/A	Heavy rain and wind impacted the region. Some trees were brought down.	Bradford experienced wind and storm conditions comparable to much of the Central NH region.	Bradford HMC, CNHRPC		+										
Extreme Heat Event Jul 2019	No	2019	Jul 19	N/A	A heatwave fell upon much of the state in mid July 2019, with excessively high temperatures and humidity around July 19 th .	Bradford experienced temperatures between 90-100° Fahrenheit.	Bradford HMC, CNHRPC						+		+				
Regional Thunderstorms, Heavy Rains, Wind, Flooding	4457	2019	Jul	\$0	Repeated thunderstorms brought winds and heavy rain to the region on July 11 and 12, 2019. Not a	Bradford experienced flash flooding due to the severity and consistency of the summer storms in July.	Bradford HMC, CNHRPC		+		+								

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Jul 2019					declared disaster in Merrimack or Hillsborough counties.	Bradford did not apply for or receive federal funds.													
Moderate Drought Conditions, Seasonal May 2019-2021	No	2019-2021	May	N/A	The area experiences seasonal exposure to moderate drought conditions around the month of May.	Bradford experienced drought conditions comparable to much of the Central NH region.	Bradford HMC, CNHRPC	+							+				
Regional Heavy Rain, Snowmelt, Inland Flooding Apr 2019	No	2019	Apr 19-22	N/A	Heavy rain, warmer weather, and snowmelt caused spring flooding	Bradford experienced heavy rain and spring melt flooding was comparable to much of the Central NH region.	Bradford HMC, CNHRPC				+	+							
Severe Winds/ Windstorm Feb 2019	No	2019	Feb 25	N/A	Strong wind gusts observed throughout the region	Some trees were felled by the wind in Bradford. Gusts of wind were comparable to much of the Central NH region.	Bradford HMC, CNHRPC		+										
Widespread Winter storm; Moderate Snow Accumulation Jan-Feb 2019	No	2019	Jan-Feb	N/A	January 20: snowstorm 4-12" throughout the state. February 12, 13: - Snow and wintry mix storm 6-12.	Bradford experienced moderate snowfall, comparable to much of the Central NH region.	Bradford HMC, CNHRPC					+	+						+
Regional Thunderstorm, Severe Winds, Tornado and Debris May 2018	No	2018	May 3-5	N/A	All across the northern Central NH region, the evening of May 4 experienced heavy downpours along with strong wind gusts, straight line winds (microbursts) and possible tornadic activity. Many communities suffered significant tree and structure damage. The National Weather	In Bradford, an EF-1 tornado with winds 80-100 mph traveled through the Town and knocked down trees and over a dozen power line poles, blocked roads, and caused short-term power outages. Isolation on Blaisdell Hill Road (vulnerable home), Center Road, West Road loop, East Washington Road. NH 103 to Warner is	Bradford Hazard Mitigation Committee, CNHRPC, wmur.com, Concord Monitor		+										+

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					Service determined an EF-1 tornado blew 36 miles, about 300 yards across, through Warner, Bradford and Webster in the CNHRPC Region after originating in Charlestown (Sullivan County). About 41,000 customers lost power as a result of the storm.	impassable. Breezy Hill has trees and wires down, as does West Meadow, Fairgrounds, Pleasant View, and Old Warner Road. Cell service limited or unavailable in most places. Behind bus depot on NH 114, the tower is operational, with FD, PD and County having emergency services, improved communication dramatically but no cell service. Elementary School cannot use 2-way radios, have to go on top of the hill. Bradford is mountainous and most areas are shaded from service. Infrastructure improvements are necessary for communication.													
Severe Winter Storm, Snowstorm Mar 2018	4371	2019	Mar 13-14	\$0	A Severe Winter storm occurred across much of the state of New Hampshire between March 13 and March 14. Not a declared disaster in Merrimack or Hillsborough counties.	Bradford experienced moderate snowfall, comparable to much of the Central NH region. Bradford did not apply for or receive federal funds.	Bradford HMC, CNHRPC					+	+						+
Severe Storms and Flooding Mar 2018	4370	2019	Mar 2-8	\$0	Severe storms and flooding occurred across much of New Hampshire between March 2 and March 8.	Bradford experienced moderate rainfall and flooding comparable to much of the Central NH region.	Bradford HMC, CNHRPC		+		+								

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					Not a declared disaster in Merrimack or Hillsborough counties.	Bradford did not apply for or receive federal funds.													
Contoocook Earthquake 2.4M Mar 2018	No	2018	Mar 7	N/A	A significant 2.4M earthquake was recorded by the USGS in March 2018. Its epicenter was around the Blackwater River in Hopkinton at a depth of 3.4km. Weak to light shaking was reported by a great number of people in Henniker, Hopkinton, Webster, Salisbury (felt the greatest intensity), Bradford and Concord. The Concord area has experienced 9 earthquakes in the past 365 days.	Reports may have been made to the Bradford Fire and Police Departments. Contoocook is only 15 miles to the southeast of Bradford.	Bradford Hazard Mitigation Committee, Earthquake track.com, Earthquake.usgs.gov, CNHRPC							+					
Regional Flooding, Ice Storms, Snow Melts and Ice Jams Jan 2018	No	2018	Jan 13-23	N/A	During the month of January 2018 with several snowfall and melt periods, the region experienced high snow totals, flooding, and temperature fluctuations.	Multiple storms in a row brought cold and warm weather to Bradford. The West Branch River flooded homes on Fairgrounds Road. Water flooded over the road at Dodges Corner causing a washout. Bog Brook flooded East Washington Road. An ice jam occurred in West Branch River at Dodge Corner. Two inches of rain and trees and roads were iced over. There were power outages and	Bradford Hazard Mitigation Committee, CNHRPC				+	+	+						

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						accidents. Many birch and smaller trees were so burdened with ice that most people had to get out of their cars to remove the trees to get by.													
Bradford Hazardous Materials Spill, Transportation Accident Jan 2018	No	2017	Jun	N/A	N/A, although it is possible other communities and/or the State police assisted through mutual aid	During a month of snow, ice, flooding, and storms, there were icy conditions, and an oil truck tipped over on the Oakdale Road / NH 103 section spilling more than 25 gallons of fuel and the DES had to clean it up.	Bradford Hazard Mitigation Committee , CNHRPC								+		+		
Hazard Events 2017-2005																			
Bradford/ Sutton Shooting Nov 2017	No	2017	Nov 19	N/A	N/A, although State Police and mutual aid called in. Occurred in nearby Sutton	Suspect shot a moving vehicle off I-89 Exit 10 then took shelter near the Sutton Elementary School, which closed all district schools as the search commenced. All units were called in including Bradford Police Dept, State Police, K-9, etc and the suspect was apprehended the next day.	Bradford Hazard Mitigation Committee , CNHRPC, Boston cbslocal											+	
Severe Wind Storm and Flood Oct 2017	4355	2017	Oct 28-30	\$0	Merrimack and Hillsborough Counties experienced downed trees on powerlines, debris to clean up, and some flooding of drainage catch basins and culverts. The storm impacted northern NH, with 6 counties declared	Bradford did not apply for or receive federal funds. Not much flooding damage was sustained. During severe windstorm, only about 50 customers lost power, some out of power for 4-5 days. Town had to bring portable generators to homes of people	Bradford Hazard Mitigation Committee , Newbury and New London Emergency Management		+		+								+

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					disasters. Power was out for an estimated 270,000 customers. Nearby Newbury lost power for 4-5 days and New London is considered remote and does not have power restored quickly.	requiring oxygen. Eversource provided power right away to priority vulnerable homes but waited to call for outside help until too late, disorganized. No PA claim was needed.													
Bradford Public Health Emergency Oct 2017	No	2017	Oct	N/A	N/A, although this local restaurant was a favorite breakfast location, in an old red caboose, across the region.	The famous Bradford Junction Restaurant on NH 114 had a food poisoning incident whereby a patient was transported to the hospital. The NH Dept of Health and Human Services reports multiple food safety violations in Sept 2017, just prior to the incident. Inspections between 2016-2017 indicate numerous food safety and sewage disposal violations. The restaurant closed before Jan 2018.	Bradford Hazard Mitigation Committee, FEMA CNHRPC, WMUR, NOAA								+			+	
Bradford Wildfire Aug 2017	No	2017	Aug	N/A	N/A, although it is likely area communities were more susceptible to wildfire because of drought conditions	A Cressey Road bonfire caused a 10-acre brush fire during very dry conditions.	Bradford Hazard Mitigation Committee	+		+									
Severe Storms and Flooding Jul 2017	4329	2017	Jul 1-2	N/A for Bradford	The entire State, North Country and Central NH region experienced severe storms with rain, wind, lightning, thunder and flooding. Not a declared disaster in	Bradford did not apply for or receive federal funds. Bradford conducted debris clean up along roads but noted the storm was not out of the ordinary in Town.	Bradford Hazard Mitigation Committee, FEMA CNHRPC, WMUR, NOAA		+	+	+								+

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					Merrimack or Hillsborough counties.														
Bradford Transportation Accident Jun 2017	No	2017	Jun	N/A	N/A, although it is possible other communities or the State police assisted through mutual aid	Gentleman leaving the light on NH 103 heading west toward Newbury fell asleep at the wheel and hit another car head-on at the intersection causing major damage to the road and both vehicles were totaled. Both occupants were transported.	Bradford Hazard Mitigation Committee , CNHRPC											+	
Bradford Excessive Heat Day May 2017	No	2017	May	N/A	N/A, although it is likely other NH and Central NH communities were affected	Hottest day of the year was in May. PD calls the seniors and schools for welfare checks to ensure ok, only 2 calls this year. Heat waves are considered rare. No specific events identified. Cooling center in BACC.	Bradford Hazard Mitigation Committee , CNHRPC						+						
April Fool's Snowstorm Apr 2017	No	2017	Apr 1	N/A	A spring snowstorm impacted New England, with 50,000 without power in NH alone and 180,000 in the NE. Massachusetts was buried in nearly 2 feet of snow. The Central NH Region experienced more snowfall than the rest of the state, with Henniker at 15", Deering and Concord at 13", and Pembroke at 12".	Bradford was reported to have had 18" of new snow in the community as a result of this storm. This was the highest snowfall of the region. The Town likely had power failures because of snow and trees down on roadways.	wmur.com , CNHRPC, USA Today					+	+						+

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Severe Snowstorm-Town Meeting Blizzard Mar 2017	4316	2017	Mar 14-15	N/A for Bradford	Many other NH towns had to choose whether to close or not to accommodate the blizzard, which became a legal issue to sort out. Not a declared disaster in Merrimack or Hillsborough counties.	Bradford did not apply for or receive federal funds. A state-wide blizzard occurred during Town Meeting, (Election Day Storm). Bradford did not delay their Town Meeting.	Bradford Hazard Mitigation Committee, CNHRPC					+	+						+
Webster Pillsbury Lake Earthquake 1.9M Feb 2017	No	2017	Feb 27	N/A	Residents of Contoocook, Webster and Warner in Central NH communities also felt this earthquake. Since it occurred overnight, there were fewer reports. Its epicenter was at Pillsbury Lake.	It is likely Bradford residents felt this earthquake and made local calls to the Fire and Police Departments. Webster is about 15 miles to the east of Bradford, only 2 towns away.	Bradford Hazard Mitigation Committee, Earthquake track.com, Earthquake.usgs.gov							+					
Central NH Region and Bradford Excessive Heat 2016-2017	No	2016	-2017	N/A	NH and the Central NH region experienced high heat records throughout 2016 and 2017.	Many people don't have AC, lots of 90 degree days, humid. Lots of elderly people in live in private homes in Bradford that require welfare checks, and many attend the Bradford Area Community Center for social activities and A/C.	Bradford Hazard Mitigation Committee, CNHRPC						+						
Bradford/Merrimack County Drought Severe Emergency 2015-2017	No	2015	-2017	N/A	Severe Drought (D2), Moderate Drought (D1) and Abnormally Dry (D0) intensities were found in communities of Merrimack County and Hillsborough in 2016. The State's counties had been	The Severe Drought (D2) conditions as of 09/17 caused some problems in Bradford. Dry hydrants were low- West Branch (West Meadow Road), Fairgrounds was dry, Four Corners (County, West,	Bradford Hazard Mitigation Committee, US Drought Monitor	+					+		+				

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					experiencing levels of drought for over a year. The NH DES issued a series of statements and tips for homeowner water conservation. Residents and municipalities had been requested to voluntarily conserve water. Some communities or water precincts enacted water restrictions or bans for certain water usage.	Center Roads), Box Corner. Ordway Farm (animals) Warner Road was out of water for 10 days. Wheeler Farm (Center Road), dug well went dry, had to run hose from house to water the animals. In Summer 2017 (every year lately) House on NH 114 lost water, FD made non-potable water available. NH 114, Warner Road, Center Road, went dry, some dug artesian wells.	NH, NH DES, CNHRPC												
Bradford Lightning Strikes 2017-2018+	No	2017	2018+	N/A	N/A, although lightning strikes tend to strike an area including other Central NH region towns	All over Town, public and private alarm systems go off during lightning strikes. Fire Department must investigate each one.	Bradford Hazard Mitigation Committee		+	+									+
Earthquake 1.8M Andover Epicenter Oct 2016	No	2016	Oct 31	N/A	Epicenter in Andover/ Salisbury 1.8M with a depth of 6.1 km. Two other earthquakes occurred within 10 minutes on this day in the same area.	Although no known reports were made to USGS from Bradford, local calls may have been made to the Fire and Police Departments. Andover is about 25 miles to the northeast of Bradford, still in Merrimack County.	Bradford Hazard Mitigation Committee, Earthquake track.com, Earthquake.usgs.gov, CNHRPC							+					
NH Severe Wind Rain & Thunder Storm Jul 2016	No	2016	Jul 23	N/A	The entire region and the State experienced a severe storms with rain, wind, lightning and thunder. A possible microburst was reported.	The entire Deer Valley Road washed out and Johnson Hill Road experienced a partial washout. Other roads were washed out as well. About	Bradford Hazard Mitigation Committee Concord Patch,		+	+									+

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					As many as 72,000 customers lost electricity. A similar storm earlier in the week brought several confirmed microbursts and also downed trees.	\$27,000 in emergency funding raised to repair all. Isolation on Blaisdell Hill Road (vulnerable home), Center Road, West Road loop, East Washington Road.	CNHRPC, WMUR, NOAA												
Bradford/ Newbury Wildfire Jul 2016	No	2016	Jul	N/A	Fire in Newbury. It is likely area communities were more susceptible to wildfire because of drought conditions	Old Sutton Road (Newbury) wildfire, less than 1 acre.	Bradford Hazard Mitigation Committee	+		+									
Earthquake 2.8M Warner Epicenter Mar 2016	No	2017	21-Mar	N/A	Epicenter in Warner/ Hopkinton area, 2.8 magnitude. Felt in the Central NH Region/most of Merrimack County, light in Hillsborough County. Felt most strongly in Hopkinton, Henniker, Warner, Webster, Salisbury, Franklin, Webster, Concord, and Hillsborough	Warner abuts Bradford. Residents reported a bump was felt, but did not hear anything.	Bradford Hazard Mitigation Committee, Earthquake track.com, Earthquake.usgs.gov, CNHRPC							+					
Earthquake 2.3M Boscawen Epicenter May 2015	No	2015	May 24	N/A	Epicenter in lower Boscawen around Queen Street with 2.3M at a depth of 5km. A lot of reports were made at the USGS.	Although no known reports were made to USGS from Bradford, local calls may have been made to the Fire and Police Departments. Boscawen is about 25 miles to the east of Bradford.	Bradford Hazard Mitigation Committee, Earthquake track.com, Earthquake.usgs.gov, CNHRPC							+					

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Tornado, Severe Thunderstorms Jul 2015	No	2015	31-Jul	N/A	In Warner, NWS confirmed an EF-0 tornado touched down in the evening. It had a maximum wind speed of 75 mph and was 100 yards wide. Town officials said the tornado ripped the roof off a barn, but there were no injuries reported.	Bradford had high winds and some limbs down but no major damage. Warner is located in the Central NH Region, abutting Bradford to the east.	Bradford Hazard Mitigation Committee, WMUR, CNHRPC		+	+									
Severe Winter Storm and Snowstorm - January Blizzard 2015	4209	2015	Jan 26-28	N/A for Bradford	Predicted at near blizzard conditions, the end of January, 2015 snowstorm's major declaration ended up having a Hillsborough County wide per capita impact of \$3.88, making the storm a fairly expensive one at \$3.3 million dollars in Public Assistance over three southern NH counties. Snow approached 30" in some areas with heavy snow and 50 mph whiteout wind conditions. The closest reporting weather station, Concord Airport (CON), had accumulated 29" of heavy snow, 50 mph whiteout wind conditions in the region. <u>Not declared in Merrimack County.</u>	Bradford could not apply for/receive funding. The storm was not particularly notable by the Town. No recollections of anything other than a typical winter storm.	Bradford Hazard Mitigation Committee, fema.gov, Boston Globe						+	+					+

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Thanksgiving Day Snowstorm Nov 2014	No	2014	27-Nov	N/A	Large amount of snowfall fell in a very short period of time ahead of typical seasonal expectations. Power outages were prolific, with a peak of about 200,000 outages, from the Public Service of New Hampshire, Unitil (Concord area), and NH Electric Co-op. Nearby Concord and the towns on the eastern side of the Central NH region accumulated only 6-12" of snow according to PSNH, far less snow than southern and western NH. This was not a presidentially declared disaster in NH.	Bradford was not as badly affected as other Towns, had low numbers of power outages. In Concord, a regional shelter opened.	Bradford Hazard Mitigation Committee, Concord Monitor, CNHRPC						+	+					+
Bradford Severe Rain Storm Jul 2014	No	2014	Jul	N/A	N/A, although it is likely other area communities experienced storm and rain conditions	Severe storm caused road washouts on Deer Valley Road (whole road) and could not exit Johnson Hill Road (partial).	Bradford Hazard Mitigation Committee, CNHRPC		+		+								
Regional Communications Failure by Lightning 2014	No	2014	Summer	N/A	Regional event- Plausawa Hill (Pembroke) Lightning Strike - affected Capital Area Fire Compact Dispatch. Fairpoint went down due to equipment failure so Merrimack County dispatch went down.	Bradford, as part of the Central NH Dispatch, likely experienced both the lightning effects in Town and the emergency response problems with the main tower down.	Bradford Hazard Mitigation Committee, CNHRPC			+									+

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Bradford Wildfire 2014	No	2014	---	N/A	N/A, although mutual aid from surrounding communities likely responded	A bonfire made by a minor on Wadley's burned about 1/8 acre.	Bradford Hazard Mitigation Committee	+		+									
Bradford Structure Fire 2014	No	2014	---	N/A	N/A, although mutual aid from surrounding communities likely responded	Structure fire on West Meadow Road. The house was lost but the barn was saved. The fire caused a two and a half month business interruption as the Bowie family relocated their market to the town of Andover.	Bradford Hazard Mitigation Committee, CNHRPC, Concord Monitor			+									
Bradford Hostage Situation 2014	No	2014	---	N/A	N/A, although the Central NH Special Operations Unit responded	Breezy Hill Road, called in CNH SOU for domestic disturbance.	Bradford Hazard Mitigation Committee, CNHRPC											+	
Earthquake 2.6M Warner Epicenter Oct 2013	No	2013	11-Oct	N/A	Epicenter in Warner, 2.6 magnitude. Felt in the Central NH Region/ northern Merrimack County, most strongly in Hopkinton, Henniker, Warner, Bradford, Concord, Salisbury, Franklin.	Reports were likely made to the USGS from Bradford residents feeling the earthquake as a rumble or loud noise. Warner is abuts Bradford to the east.	USGS, CNHRPC							+					
Bradford Vandalism/ Sabotage Sum 2013	No	2013	Summer	N/A	N/A	The Town's Tillie Wheeler Trail's fitness structures were knocked over and broken.	Bradford Hazard Mitigation Committee, CNHRPC											+	
NH Severe Storms, Flooding and Landslide Jun-Jul 2013	4139	2013	Jun 26 – Jul 3	N/A	This declared disaster for Grafton, Sullivan and Cheshire Counties included landslides from the heavy rain. Public	Bradford was not within the declared disaster area and did not apply for HMA funding. There were no specific issues in Town	FEMA, CNHRPC		+		+			+					+

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					Assistance (PA) was available for these 3 Counties and Hazard Mitigation Assistance (HMA) became available statewide. Damage per capita was high – Grafton (\$39.58), Sullivan (\$24.48), and Cheshire (\$21.46). <u>Not declared in Merrimack or Hillsborough Counties.</u>	noted. Any flooding or other problems were handled as normal business.													
Severe Winter Storm and Snowstorm - Winter Storm NEMO 2013	4105	2013	Feb 8-10	\$8,897	Winter Storm "Nemo". FEMA-3360-DR. Blizzard conditions with winds gust of 50-60 MPH and over 20 inches snow hit New Hampshire and the New England area. Disaster declaration received for emergency protective measures in eight counties of the State.	Bradford received \$8,897 in FEMA Public Assistance funding for protective measures. This was considered a bad, long-lasting snowstorm. Salt was in short supply and high demand so the Town had to import. Snowbanks very high. Isolation on Blaisdell Hill Road (vulnerable home), Center Road, West Road loop, East Washington Road.	FEMA, Bradford Hazard Mitigation Committee, CNHRPC					+	+						+
Bradford Landslides 2012-2017	No	2012-2017	---	N/A	N/A	Regular occurrence to see rocks on the road. Newbury experiences more regular rockfalls on NH 103 and need jersey barriers to line the road, protecting the road. Annually NH 114 ice build-up on the ledges, in danger of falling.	Bradford Hazard Mitigation Committee							+					

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Hurricane Sandy Oct 2012	4095 EM-3360	2012	Oct 26-Nov 8	\$0	Merrimack County and Hillsborough County received a disaster declaration for Emergency Protective Measures. Five counties experienced severe damage from heavy winds and moderate flooding, 218,000 customers without power. Fallen trees and debris closed roads, building and vehicle damage.	Bradford did not apply for or receive federal funds. This storm was reportedly very mild in Bradford. Trees were likely down on power lines and on roads. Debris clean up and restoring electricity were the main outcomes of the storm. The footprint of the Bement Covered Bridge over the Warner River was scoured and opened up too far. Repairs for reinforcement of footing occurred through a grant.	Bradford Hazard Mitigation Committee, FEMA, Nashua Telegraph, CNHRPC		+		+								+
Earthquake 4.0M Hollis ME Epicenter Oct 2012	No	2012	16-Oct	N/A	With the epicenter near Hollis Center, Maine, a 4.0 earthquake was measured and felt not only in Central NH, but throughout New England. Reportedly sounding like a jumbo jet and lasting for 10 seconds, calls came in to local Fire Departments inquiring about the event. By two hours later, no calls reporting damages or injuries had been received.	Reports may have been made to the USGS from Bradford with an earthquake of this magnitude as it was felt around the Central NH Region. Hollis is about 40 miles to the southwest of Bradford	Concord Monitor, Earthquake--track.com, CNHRPC							+					
NH Severe Storm and Flooding May 2012	4065	2012	May 29-31	N/A	This declared disaster for Cheshire County. Public Assistance (PA) was available and Hazard Mitigation Assistance	Bradford was not within the declared disaster area and did not apply for HMA funding. There were no specific issues in Town	FEMA, CNHRPC		+		+								

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					(HMA) became available statewide. Damage per capita was high – Cheshire (\$26.04). <u>Not declared in Merrimack or Hillsborough Counties.</u>	noted. Any flooding, tree fall or other problems were handled as normal business.													
Bradford Potential for Public Unrest 2011-Present	No	2012-	2018+	N/A	N/A	Built in the 1860s, the Town Hall been closed since 2011 and has been in need of renovation. Although the yearly vote counts were very close, March Town Meeting votes in the first 5 years could not reach the necessary 2/3 majority needed to approve funding to rehabilitate and modernize the Town Hall, during which time significant donations were collected. In March 2017, voters approved a \$675k bond; however after work began, it was determined that more funding was necessary to complete the project, so work stalled. New architects were hired. In March 2018, voters denied a \$1.3m bond to complete the work. The situation involving the future of the Town Hall has been contentious with voters and taxpayers since 2011, after Town offices	Bradford Hazard Mitigation Committee, CNHRPC, Concord Monitor, Town of Bradford www.bradfordnh.org											+	

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						were moved to the Community Center and the Police Department was relocated to the strip mall. The Town Hall Restoration Committee was formed in 2011 to guide and oversee the project.													
Halloween Snow Storm Oct 2011	4049	2011	Oct 29-30	N/A for Bradford	FEMA-4049-DR. Towns in Central NH were impacted by this shocking, early severe snowstorm, although a major disaster declaration was <u>not</u> declared in Merrimack County. Halloween festivities were cancelled in most communities, to the heartbreak of young children. In Hillsborough County, damages were at the equivalent of \$5.11 per capita (400,721 people in 2010). The storm was also declared in Rockingham County.	Bradford could not apply for/receive funding. Large snowstorm, the only one occurring during winter 2011-2012 year, never snowed again. Some power losses, nothing extensive. School was out for about 3 days. Warmer winter was experienced.	FEMA, Bradford Hazard Mitigation Committee, CNHRPC					+	+						+
Tropical Storm-Irene Aug-Sep 2011	4026	2011	Aug 26-Sep 6	\$102,504	Carroll, Coos, Grafton, and Merrimack Counties suffered severe impacts to roads and bridges as a result of flooding from Tropical Storm Irene, which also caused power outages. Merrimack County reimbursement to towns was \$4.29 per	Bradford received \$102,504 in FEMA Public Assistance funding for protective measures, debris removal and roads and bridges. Nearly 5" of rain fell on Bradford during this period. Power loss was experienced for only six to eight hours. Tree	FEMA, Bradford Hazard Mitigation Committee, CNHRPC, NH State Climate Office 8/11 Summary		+		+								+

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					capita (146,455 people in 2010), a total of \$11m was allocated. Disaster was not declared for Hillsborough County.	blowdowns and limbs falling were the primary problem. West Branch Road and Fairgrounds Road were flooded by the West Branch of the Warner River. The regular flooding occurred at the NH 114 corner. The West Branch was flowing over the West Main Street bridge. Breezy Hill Road had several trees waiting to be falling over in the wind, but none did. Isolation on Blaisdell Hill Road (vulnerable home), Center Road, West Road loop, East Washington Road.													
Bradford Public Health Concern Sum 2011	No	2011	Summ-Fall	N/A	N/A	The Town Hall was found to be harboring moderate amounts of mold. The walls had been plastered, and behind was found to be moldy conditions during testing. Water was running down the inside walls in the building, caused by the improper drains of four roofs. Water leaked into the Police Department, and employees began complaining about respiratory distress and allergic reactions. Blood tests of antibodies had shown to beyond normal	Bradford Hazard Mitigation Committee, CNHRPC								+				

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						limits, indicating mold exposure. The Town Hall's operations and employees, including the Police Department, moved to the Community Center while the problem is being addressed. As of Summer 2018, the Town Hall has not yet been renovated and the Town office services remain at the Community Center													
Bradford Landslide 2011	No	2011	---	N/A	N/A	Falling rocks have been reported along a cut on NH 103 between Gillingham and Main Streets	Bradford Hazard Mitigation Committee, wmur.com, CNHRPC, cbsnews							+					
April Fool's Snowstorm Apr 2011	No	2011	Apr 1	N/A	A Nor'easter snowstorm impacted the State, causing over 30,000 power outages, most by PSNH. Snow fell in depths of up to 8", but stopped by noon. Although dozens of accidents were reported, no serious injuries were reported.	The first April Fool's (2011) snowstorm with heavy, wet snow brought down trees and powerlines. Power outages ensued	Bradford Hazard Mitigation Committee, Union Leader, USGS, CNHRPC					+	+						+
Earthquake 3.4M Webster/ Boscawen Epicenter Sep 2010	No	2010	Sep 26	N/A	"A magnitude 3.4 earthquake rattled buildings and nerves across much of New Hampshire Saturday night. The quake occurred	Boscawen is about 20 miles to the east of Bradford. Although the quake was felt all across central-south New Hampshire, Bradford residents did not report	Bradford Hazard Mitigation Committee, CNHRPC							+					

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					at 11:28 p.m. and was centered about 10 miles north of Concord, according to the U.S. Geological Survey. State police said they received reports from residents across the state who reported what they thought was an explosion. The quake was felt in places like Fremont, Derry, Durham, Henniker, Penacook and Raymond. There were no reports of damage.” The quake was in fact felt all over the state, Southern ME and MA, but most reports were received from the Central NH region.	experiencing the earthquake.													
Quebec-Ottawa Earthquake 5.0M Jun 2010	No	2010	Jun 23	N/A	Earthquake lasted about 30 seconds, epicenter near Buckingham, Quebec 35 north of Ottawa. Ottawa declared this earthquake the most powerful in 65 years. Tremors felt in Central NH.	No known impacts to Bradford specifically, but this large quake was felt regionwide.	Bradford Hazard Mitigation Committee , CNHRPC							+					
Bradford Hazardous Materials Contamination / Public Health Jun 2010	No	2010	Jun	N/A	N/A, although nearby communities, State Police, and/or Central NH Hazardous Materials Team likely responded via mutual aid	During East Main Street road repairs, storm drains were being repaired when employees complained about odor and became ill immediately. Fumes were	Bradford Hazard Mitigation Committee , FEMA								+		+		

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						overpowering, later identified as being from gasoline compounds from leaking fuel tanks.													
Severe Storms and Flooding Mar 2010	1913	2010	Mar 14-31	\$0	Severe storms and flooding occurred over two weeks and damaged roads and bridges. Merrimack County reimbursement to towns for repair was \$0.28 per capita (146,455 people in 2010), and in Hillsborough County reimbursements were \$1.80 per capita (400,721 people in 2010)	Bradford did not apply for/ receive funding. Much of the damage from the previous storm was still being cleaned up and repaired. The Town did not experience much additional flooding and high winds during this event.	Bradford Hazard Mitigation Committee , FEMA		+		+								+
Severe Winter Storm Feb-March Storm and Flooding 2010	1892	2010	Feb 23-Mar 3	\$28,927	This severe weather event included high winds, rain, and snow over a week-long period. The primary impact was debris removal and repair reimbursement for fallen trees and powerlines. In Merrimack County, the reimbursement to communities was the equivalent of \$10.39 per capita (146,455 people in 2010), with Hillsborough County at \$3.68 per capita (400,721 people in 2010). In the Concord area, 21,000 Unital customers were out of	Bradford received \$28,927 in FEMA Public Assistance funding for roads & bridges, debris removal, protective measures. This was a multi-hazard storm which included a snowstorm and high wind event in February and subsequent flooding in March. The emergency management fear was that the snow had weighed down the trees so much, that with the high winds, the trees could have fallen. However, little power loss was experienced. The whole NH 103 and 114 corridor was pruned by	Bradford Hazard Mitigation Committee , FEMA, Unital				+	+	+						

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/Tropical/Downburst	Wildfire/Fire/Lightning	Inland Flood/River/Dam	Winter/Snow/Ice	Extreme Heat/Cold	Earthquake/Landslide	Public Health/Biological	Solar	Haz Mat/Radiological	Human	Technological
					power at the peak outage period.	PSNH. Crews have been out on the back roads too pruning regularly since the 2008 ice storm. Rapid snow melt was reported from lots of snow that year.													
Severe Winter Storm - Dec 2008 Ice Storm	1812	2008	Dec 11-23	\$19,524	Accumulating ice, snow, rain, and strong winds caused downed trees and power lines, with power outages and traffic accidents resulting. In Merrimack County, debris removal and repair cost reimbursement FEMA the equivalent of \$10.07 per capita (146,455 people in 2010). In Hillsborough County, debris removal costs were \$6.35 per capita (400,721 people in 2010). The major disaster was declared in all 10 counties. New England was blanketed with ice and snow during the winter storm. Weight of ice caused branches to snap, and trees to either snap or uproot, bringing down power lines and poles across the region. About 400,000 utility customers lost power during the event, with some customers without power for two weeks.	Bradford received \$19,524 in FEMA Public Assistance funding for debris removal and protective measures. The Ice Storm of 2008 caused severe electrical outages: Unitil had 96,000, PSNH 32,000, and NH Electric Co-op 4,700. Caused between 1 to 15 days loss of power for most utility customers in Town. The ice storm event affected telephone service throughout Town. Trees were down everywhere, although the 1998 was ice storm was noted to be worse. More ice fell in Newbury. Lake Massasecum residents lost power for seven days, but the downtown area and homes and businesses along NH 103 and 114 lost power for less than two days. The Town was isolated, with both NH 103 and 114 covered with downed trees. The National Guard came to	Bradford Hazard Mitigation Committee, FEMA, CNHRPC												

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					Property damage across northern, central and southeastern NH was estimated at over \$5 million. Event was the largest power outage in NH history.	Town and brought cots for the emergency shelter at the Bradford Area Community Center, which was open for 14 days. People were coming to the shelter from neighboring towns as trees were cleared from NH 103 and 114. School was out of session for three days. Mutual Aid with New London, was only available place with showers. Isolation on Blaisdell Hill Road (vulnerable home), Center Road, West Road loop, East Washington Road.													
Severe Storms and Flooding (Hurricane Hannah) - Sep Flood 2008	1799	2008	Sep 6-7	\$0	Heavy rain from the remnants of tropical storm Hanna resulted in flooding on small rivers and streams in the Central NH area. The remains of tropical storm Hanna moved through eastern New England dumping 3 to 6 inches of rain in New Hampshire in about 8 hours causing rapid rises on area streams. In Merrimack County, damage to road systems totaled the equivalent of \$1.48 per capita (146,455 people in	Bradford did not apply for or receive FEMA Public Assistance funding. The washouts and trees down from the storm were repaired and/or removed in a business as usual fashion. No specific recollections of this event were available.	FEMA, Bradford Hazard Mitigation Committee, CNHRPC		+		+								

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					2010) for town reimbursement. Hillsborough County's damage was much higher at \$6.90 per capita (400,721 people in 2010)														
Severe Winds, Heavy Rains July Tornado 2008	1782	2008	Jul 24	\$0	An EF3 tornado touched down in Rockingham County then proceeded into another county. Then in Merrimack County, the tornado was rated up to an F-3 and killed a woman in Deerfield trapped in a collapsed house. In the county, there was substantial damage totaled the equivalent of \$1.12 per capita (146,455 people in 2010) for the towns' debris removal reimbursement costs. A total of 123 residences statewide were affected, with 17 destroyed and another 37 suffering major damage. Damage was estimated to exceed \$10 million. Hillsborough County	Bradford did not apply for or receive FEMA Public Assistance funding. . The trees down and power outages from the storm were removed and/or repaired in a business as usual fashion. No specific recollections of this event were available.	FEMA, Bradford Hazard Mitigation Committee, CNHRPC		+										+
Severe Storms and Flooding - April Spring Flood 2007	1695	2007	Apr 15-23	\$95,809	Extensive flooding caused by severe storms impacted seven counties. Indirect peak discharge measurements on stream gages on the Suncook	Bradford received \$95,809 in FEMA Public Assistance funding for roads & bridges, protective measures and recreational/other. Fields	FEMA, USGS Flood of 2007, Bradford Hazard		+		+								+

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					River at Short Falls Road in Epsom were 14,100 ft3, which was determined to be greater than 100-year flood discharge levels. The heavy rain combined with snow melt to cause small rivers and streams in much of New Hampshire to flood. Over land, the strong winds downed numerous trees. The downed trees caused widespread power outages, especially near the coast, and numerous road closures. The storm also brought heavy rain to the region which, when combined with snow melt, produced widespread flooding across much of the region.	along NH 103 and NH 114 flood on a regular basis and are impacted by branches, trees, leaves	Mitigation Committee, CNHRPC												
Severe Storms and Flooding – Mother's Day Flood 2006	1643	2006	May 12-23	\$10,916	Extensive flooding caused by severe storms impacted seven counties including Merrimack and Hillsborough Counties. The USGS recorded the highest flows on record for several rivers including the Contoocook River in Davisville village, Soucook in Concord, and Piscataquog in Goffstown.	Bradford received \$10,916 in FEMA Public Assistance funding for roads and bridges, debris removal, protective measures, and recreational/other. Heavy rains caused several days of widespread flooding. Temporarily-closed roads in Bradford include sections of NH NH 114. School was also cancelled temporarily. This flooding	Bradford Hazard Mitigation Committee, FEMA, USGS, CNHRPC		+		+			+					

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						event had problems similar to the 2005 flood. Many residents of Bradford were isolated because roads and main routes were flooded, and residents could not evacuate the Lake Massasecum area because roads were blocked. Several homes and cottages on Massasecum were flooded. NH 114 flooded out again, although not as bad as 2005. Water was higher on Lake Todd, but the water did not surge. The Blaisdell Lake Road was washed out. Water Street Dam was damaged during the Mother's Day floods. Residents could not get out of their driveways. Repairs were completed a few days later by the private owner after the water level had dropped. Forest Street 2x3" stone culvert filled with debris, backed up the stream, and impacted the road. Main Street's culvert debris made a pond on the opposite side of the road, and water then tunneled under the pavement, which collapsed.													

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Bradford Bank Erosion and Scouring 2006-unknown	No	2006-	2009	No	N/A, although bank scouring and erosion often have downstream impacts	Jewett Road impacted by Hoyt Brook about 40' every time it rains. Breezy Hill Road is scoured by Warner River. East Shore Drive's small unnamed brook scours. West Road by Dodge Corner scoured by West Branch River, scours the shoulders. Was noted to be an ongoing problem.	Bradford Hazard Mitigation Committee, CNHRPC				+								
Bradford West Branch River Ice Jam 2006	No	2006	-	N/A	N/A	The private West Branch Bridge experienced ice jam damage.	Bradford Hazard Mitigation Committee, CNHRPC					+	+						
Severe Storms and Flooding - Columbus Day Flood 2005	1610	2005	Oct 7-18	\$364,832	Extensive flooding caused by severe storms impacted five counties, including Merrimack and Hillsborough. Alstead experienced several fatalities as the result of dam failure.	Bradford received \$364,832 in FEMA Public Assistance funding for roads & bridges. At least a foot and a half of water pooled NH 114 near Ayer and Goss, and a rescue of a woman was necessary. Deer Valley Road washed out. Lake Massasecum Dam breached and needed to be sandbagged. East Washington road was flooded. A notice to evacuate was issued. Locke Linden (Sutton) was threatened by floodwaters but did not breach. Five residents at the dam of	Bradford Hazard Mitigation Committee, FEMA		+		+								

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						Lake Todd could have been in danger. Water surged under the West Main Street stone arch bridge, which developed a hole. The West Branch (of the Warner River) took out the stonewall abutment along the edge of Fairgrounds Road on Dodge Corner, and the wall had to be rebuilt. Center Road West Branch Warner River took out about 40' of shoreline and caused the road to be undermined. West Meadow Road had scouring from Hoyt Brook. The Lower Bridge on West Meadow Road was undermined and collapsed, and has not yet been fixed.													
Regional Thunderstorms and Lightning Jun 2005	No	2005	12-Jun	N/A	During a thunderstorm, lightning struck and severely damaged the historic Loudon Town Hall on Clough Hill Road. Winds from severe thunderstorm knocked down trees and power lines down in the towns of Warner, Hopkinton, Concord, Bow, Loudon, and Webster in Merrimack County.	Lightning strikes Town Hall computer system.	Bradford Hazard Mitigation Committee, CNHRPC, Area Hazard Mitigation Committees		+	+									+

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Bradford 2 Structure Fires May 2005	No	2005	May 10 & 28	N/A	N/A, although mutual aid from surrounding communities likely responded	On May 28, A family of four escaped harm from a fire in their home on Rowe Mountain Road but 2 dogs and a cat did not survive. The home suffered extensive smoke, fire and water damage. At the time of the report, the exact cause of the fire was unknown. On May 10, A fire at Bowie's Market on East Main Street completely destroyed Bruce Bowie's business. The building's roof collapsed. Sixty firefighters responded to and extinguished the 3 alarm blaze.	Bradford Hazard Mitigation Committee, CNHRPC, Concord Monitor			+								+	
Bradford Structure Fire Mar 2005	No	2005	Mar 4	N/A	N/A, although mutual aid from surrounding communities likely responded	A garage and automotive repair shop on Massasecum Ave. were destroyed in a 3 alarm fire. The cause of the fire was believed to have been a welding machine. The fire spread to a tractor and other vehicles that were located near the detached garage.	Bradford Hazard Mitigation Committee, CNHRPC, Concord Monitor			+								+	
Bradford Lightning Strike 2005	No	2005	---	N/A	N/A, lightning strikes likely occurred within other communities in the area	Lightning struck the Town Hall's computer system and ruined the computers.	Bradford Hazard Mitigation Committee, CNHRPC			+									+

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Snow Emergency Jan 2005	EM-3207	2005	Jan 22-23	\$7,155	Record and near record snowstorm for 8 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	Bradford received \$7,155 in FEMA Public Assistance funding for protective measures, including snow removal and debris clean up.	Bradford Hazard Mitigation Committee, CNHRPC, FEMA					+	+						
HAZARD Events 2004-1973																			
Bradford Structure Fire Mar 2004	No	2004	Mar 23	N/A	N/A, although mutual aid from surrounding communities likely responded	A fire in an apartment building on High Street burned through a stairwell and roof of the wood-framed structure and an adjoining home. No injuries were reported, but there was property damage of \$20,000.	Bradford Hazard Mitigation Committee, CNHRPC, Concord Monitor			+								+	
Earthquake 2.2M Henniker-Hopkinton Epicenter Jan 2004	No	2004	20-Jan	N/A	An earthquake measuring 2.2 on the Richter Scale was centered in the Henniker- Hopkinton area. Shaking and noise were reported, but no damage occurred.	Reports were likely made to the USGS by Bradford residents feeling the earthquake as a rumble or loud noise. The epicenter was within 5 miles of Bradford, the next town to the east.	Concord Monitor, January 2004, USGS, Earthquake Monitor, CNHRPC							+					
Snow Emergency Dec 2003	EM-3193	2003	Dec 6-7	\$7,175	Record snow fall event impacting much of New England. In NH, 8 counties received emergency protective measures, including Merrimack and Hillsborough.	Bradford received \$7,175 in FEMA Public Assistance funding for protective measures including snow removal and debris clean up.	Bradford Hazard Mitigation Committee, CNHRPC, FEMA					+	+						

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Snow Emergency Feb 2003	EM-3177	2003	Feb 17-18	\$5,006	Record and near record snowstorm for 5 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	Bradford received \$5,006 in FEMA Public Assistance funding for protective measures including snow removal and debris clean up.	Bradford Hazard Mitigation Committee, CNHRPC, FEMA					+	+						
NH Drought Emergency 2002	No	2002	Aug	N/A	All counties in the State of NH except Coos County. One of the hottest Augusts on record in Concord along with drought conditions since March made for a high fire danger in New Hampshire. Numerous forest fires were reported, including a 30-acre blaze in New Durham.	Canary Farm on West Road ran out of water for animals Silver Hill Farm brought water over.	Bradford Hazard Mitigation Committee, CNHRPC Concord Monitor 8/20/02, NHDES	+					+						
Bradford Lightning Strike Fire 2002	No	2002	---	N/A	N/A, although mutual aid from surrounding communities likely responded	House fire on Dunfield Road, caused by lightning striking the gas power source in the well and burned the house.	Bradford Hazard Mitigation Committee			+									
Bradford Severe Thunderstorms May 2002	No	2002	May	N/A	N/A, although it is likely Merrimack County communities experienced similar storm conditions	High winds resulting from severe thunderstorms caused widespread power outages.	Bradford Hazard Mitigation Committee, CNHRPC, National Climactic data Center		+	+									+

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Snow Emergency Mar 2001	EM-3166	2001	Mar 5-7	\$7,122	Record and near-record snowfall from late winter storm, emergency declaration was issued for protective measures. Merrimack, Hillsborough and 5 other counties declared eligible.	Bradford received \$7,122 in FEMA Public Assistance funding for protective measures, including snow removal and debris clean up.	Bradford Hazard Mitigation Committee, CNHRPC, FEMA					+	+						
Bradford Hazardous/ Radioactive Materials Accident Circa 2000	No	2000	Circa	N/A	N/A	On NH 103 near Breezy Hill Road, a private hauler went off the road. It had contained a small amount of radioactive material. No damage to materials was sustained.	Bradford Hazard Mitigation Committee, CNHRPC								+		+	+	
Bradford Wildfires 1999	No	1999	---	N/A	N/A, although it is likely area communities were more susceptible to wildfire because of drought conditions	Six brush fires as a result of the drought.	Bradford Hazard Mitigation Committee	+		+									
Regional Downbursts and Severe Winds Jul 1999	No	1999	6-Jul	N/A	Severe storms in July 1999 bring strong damaging winds and 3 downbursts. Two deaths occurred. The roof of the Ralph Pill building in Concord is blown off during a storm. The downburst was designated a macroburst (at least 2.5 miles in diameter). Other communities in the Central NH Region experienced damages	Bradford likely experienced some heavy winds, tree fall, and power lines down as it is located in the region.	Concord Monitor, NH HSEM, CNHRPC,		+										+

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/Fire/ Lightning	Inland Flood/ River/Dam	Winter/Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Bradford Downburst and Severe Winds Dec 1998	No	1998	Dec	N/A	Occurred at Newbury town line. It is likely Merrimack County communities experienced similar wind conditions	Trees were snapped in an area about 100 yards wide and about a mile long at Bradford/ Newbury Town line off NH 103/Lake Todd area.	Bradford Hazard Mitigation Committee, CNHRPC		+										
Severe Storms and Flooding Summer 1998	1231	1998	Jun 12-Jul 2	No	Heavy flooding in six counties, including Merrimack and Hillsborough Counties. Damages of \$3.4m for all counties.	Bradford did not apply for/receive funding. As Bradford is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	FEMA, CNHRPC		+		+								
Ice Storm of Jan 1998	1199	1998	Jan 7-25	\$0	This ice storm was the first to test our statewide and local emergency management systems and utility providers. Tree and infrastructure damage was extensive and power failures lasted up to two weeks in some parts of the state. In The Central NH Region, many lost power for over a week. This ice storm had severe impacts throughout most of the State, with 52 communities impacted. FEMA Disaster Declaration #1199, Six injuries and one death resulted. Damage totaled \$12,446,202. In addition, there were 20 major road closures, 67,586 people	Bradford did not apply for/receive funding. Severe ice storm that affected most of the state caused power outages, downed trees, and affected some roofs in Town.	FEMA, US Army Corps of Engineers NH Storms database, Bradford Hazard Mitigation Committee, CNHRPC						+	+					+

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					left without electricity, and 2,310 people without phone service.														
Bradford Lightning Strike and 21-Alarm Fire 1997	No	1997	Jul	N/A	N/A, although it is likely other Merrimack County communities experienced lightning strikes during this time	Jul 1997- Lightning ignited a massive 21 alarm fire in Bradford. More than 200 firefighters and 50 trucks battled the blaze that eventually gutted a lumber yard. Lightning destroyed the Town Hall computers which needed to be replaced	Bradford Hazard Mitigation Committee, CNHRPC			+									
Bradford Wildfire 1997	No	1997	---	N/A	N/A	Kearsarge Reel, Page's house on NH 103, High Street caught fire during a wildfire.	Bradford Hazard Mitigation Committee			+									
Bradford Lightning Strike 1997	No	1997	---	N/A	N/A, lightning strikes likely occurred within other communities in the area	Lightning struck the Town Hall's computer system and destroyed the computer which needed to be replaced.	Bradford Hazard Mitigation Committee, CNHRPC			+									+
Severe Storms and Flooding Oct 1996	1144	1996	Oct 20-23	\$0	Heavy rains caused flooding in six counties, including Merrimack and Hillsborough Counties. Damage totaled \$2.3m for all counties.	Bradford did not apply for/receive funding. As Bradford is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	FEMA, NH HSEM, CNHRPC		+		+								
Bradford Milfoil Infestation Sum 1996	No	1996	Summer	N/A	N/A, although milfoil travels easily to new waters and easily establishes new colonies	Milfoil was discovered on the north end of Lake Massasecum in Bradford. A 10 to 11 acre portion of the lake was closed. Several chemical treatments were tried but failed to eradicate the	Bradford Hazard Mitigation Committee, CNHRPC, Blaisdell Lake Property								+				

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						milfoil. Eventually, the weed was harvested.	Owners Assn												
Storms and Floods Oct-Nov 1995	1077	1995	Oct 20-Nov 15	\$0	Four NH counties were damaged by excessive rain, high winds and flooding, including Merrimack (not Hillsborough).	Bradford did not apply for/receive funding. As Bradford is within Merrimack County, it is likely experienced heavy rains, trees down and power outages.	FEMA, Federal Register, CNHRPC		+		+								+
Bradford Lightning Strike and Barn Fire 1995	No	1995	Jul	N/A	N/A, although it is likely other Merrimack County communities experienced lightning strikes during this time when drought was prevalent in the area	Lightning and resulting fire destroyed a 200 year-old farmhouse causing \$200,000 damage.	Bradford Hazard Mitigation Committee, CNHRPC	+		+									
Bradford Hazardous Materials Contamination 1994	No	1994	---	N/A	N/A	Along East Main Street, the road and storm drains were being repaired and employees complained about odor. The old underground gasoline tanks at the former Bowie's Market were replaced because of fumes. The Lake Sunapee Savings Bank was closed because the fumes were emanating into the building.	Bradford Hazard Mitigation Committee, CNHRPC								+		+		
Bradford Terrorism Target Nov 1993	No	1993	Nov 1	N/A	Two workers in the Newbury Town Hall lost their lives as a result of one man's rage over taxation, and another woman was in critical condition and later recovered. The man shot	Bradford was extremely fortunate to have had a near-miss from a disgruntled taxpayer. The Bradford Town Hall was next on the list to be visited after the Newbury shooting.	Bradford Hazard Mitigation Committee, CNHRPC											+	

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					himself in the head later died of his wounds.														
Severe Storm-Hurricane Bob Aug 1991	917	1991	Aug 18-20	N/A for Bradford	Public assistance was available for Hillsborough County and 2 other counties (not declared in Merrimack County) as a result of damages caused by Hurricane Bob. The 2 seacoast counties fared the worst.	As Bradford is within Merrimack County, it likely experienced heavy rains, wind gusts, tree debris, power outages and possibly some flooding.	FEMA, CNHRPC		+		+								+
Flooding and Severe Storm Aug 1990	876	1990	Aug 7-11	No data available	Moderate to heavy rains caused flooding in eight counties, including Merrimack and Hillsborough Counties. Damage totaled \$2.3m for all counties	As Bradford is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	FEMA, NH HSEM, CNHRPC		+		+								+
Bradford Rapid Pack Snow Melt Flood Mar 1990	No	1990	Mar 29 & 30	N/A	N/A, although it is likely other Central NH region towns experiences similar snow melt	Two dates where temperatures were in the 90s, causing the Lake Massasecum water level to rise and cause minor flooding of roads, yards and cabins	Bradford Hazard Mitigation Committee, CNHRPC				+		+						
Bradford Plane Crash 1988	No	1980-	1982	No	N/A, although it is likely other communities and/or the State assisted with response	An Enstrom F28 helicopter, piloted by a student pilot, made a takeoff from the pilot's property and crashed into nearby trees. The pilot reported a loss of control and strong winds. The extent of the pilot's injuries was unknown.	Bradford Hazard Mitigation Committee, CNHRPC											+	

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/Fire/ Lightning	Inland Flood/ River/Dam	Winter/Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Severe Storms and Flooding Mar-Apr 1987	789	1987	Mar 30-Apr 11	No data available	Flooding caused by snowmelt and intense rain was felt in seven counties, including Merrimack and Hillsborough Counties. Nearly \$5m in damages.	Heavy snow pack melted quickly and Lake Massasecum flooded, with both bridges which were the sole access in and out of the homes also flooded. Residents could not get out their houses, but some were reported to have canoed out.	Bradford Hazard Mitigation Committee, CNHRPC, FEMA, NH HSEM, US Army Corps of Engineers				+								
Severe Storms and Flooding Jul-Aug 1986	771	1986	Jul 29-Aug 10	N/A for Bradford	Severe summer storms with heavy rains, tornadoes, flash floods, and severe winds, damaged the road network statewide. Disaster declared in Cheshire, Sullivan and Hillsborough Counties (not declared in Merrimack County).	Bradford likely experienced heavy rains and possibly some flooding as it is on the line with Sullivan County	FEMA, NH HSEM, CNHRPC		+		+								
Bradford Rapid Pack Snow Melt Flood Apr-May 1984	No	1984	Apr-May	N/A	N/A, although it is likely other Central NH region towns experiences similar snow melt	Week long flood occurred in Bradford due to rapid snow pack melt.	Bradford Hazard Mitigation Committee, CNHRPC, Town Report				+	+							
Bradford Hazardous Materials Contamination 1985 & 2006	No	1985 & 2006	---	N/A	N/A	1985-Soil contamination at Naughton area affecting storage and test wells, resulting in an ongoing inspection. The town purchased the property on East Main Street which was previously a junkyard.	Bradford Hazard Mitigation Committee, CNHRPC								+		+		

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						2006- Soil was hauled from a Naughton garage site.													
Bradford Wildfire 1982	No	1980	---	N/A	N/A	The Marshall/Naughton Fire occurred on Main Street.	Bradford Hazard Mitigation Committee			+									
Bradford Transportation Accident 1982	No	1982	---	N/A	N/A	A farm tractor was overturned, resulting in a fatality.	Bradford Hazard Mitigation Committee											+	
Earthquake 4.5M Sanbornton Jan 1982	No	1982	Dec	N/A	An earthquake originating near in Sanbornton in Belknap County measured 4.5M and was felt in various locations throughout the State. The area it was felt includes all of northern Merrimack County including the Concord area communities in Central NH.	A Sanbornton-centered earthquake caused little physical damage in Merrimack County. Sanbornton is about 40 miles to the northeast of Bradford.	CNHRPC, Earthquake-track.com							+					
Bradford Wildfire 1980	No	1980	---	N/A	N/A	The Moore House located on Sunset Hill caught fire during a wildfire	Bradford Hazard Mitigation Committee, CNHRPC			+									
Bradford Traffic Accidents 1980-1982	No	1980-	1982	No	N/A, although it is likely other communities and/or the State assisted with response	Circa 1980- A fatality occurred at the intersection of Main Street and Rt. 103. Circa 1981- Two people were killed due to icy road conditions on Rt. 114. Circa 1982- A farm tractor was overturned resulting in a fatality.	Bradford Hazard Mitigation Committee, CNHRPC												

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
NH Blizzard of Feb 1978	No	1978	Feb 5-7	N/A	RSI Index of Category 5 (Extreme). This snowstorm is described as “a natural disaster of major proportions” and stunned all of New England. The storm was caused by an intense coastal Nor’easter that produced winds in excess of hurricane force and very high snow totals. Most of southern New England received more than three feet of snow, 25-33” in NH and higher throughout New England. Abandoned cars along roadways immobilized infrastructure and blocked major interstates. For over a week, New England remained paralyzed by the storm. All of New Hampshire was impacted. Governor Meldrim Thomson Jr. declared a state of emergency.	Ice jams on the West Branch River (of the Warner River) off of Fairgrounds Road took out the abutments of the West Branch Bridge. It is likely many of the same snow depths and effects occurred across the Town as occurred in Merrimack County and New England	Bradford Hazard Mitigation Committee ; American Meteorological Society, Northeast States Emergency Consortium, CNHRPC						+						+
Bradford Erosion and Scouring 1978	No	1978	-	N/A	N/A, although bank scouring and erosion and debris impacted infrastructure often have downstream impacts	The private West Branch Bridge was flooded and scoured and took out its abutments	Bradford Hazard Mitigation Committee , CNHRPC, Concord Monitor				+								

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
Quebec Earthquake 4.8M Jun 1973	No	1973	15-Jun	N/A	An earthquake originating near the Quebec border at a scale of 4.8 was felt in various locations throughout NH.	N/A, although some Bradford residents may have felt the effects.	Northeast States Emergency Consortium, CNHRPC							+					
Severe Storms and Flooding Jul 1973	399	1973	Jul 11	No data available	All counties in the State of NH experienced storm damage and were declared disaster areas, including Merrimack and Hillsborough Counties.	No information available for Bradford.	FEMA, CNHRPC		+		+								
Hazard Events Before 1973																			
Bradford Fire (Explosion) 1968	No	1968	---	N/A	N/A, although mutual aid from surrounding communities likely responded	An occupant of the Bibbo farmhouse on Deer Valley Road accidentally ignited a leaking propane tank. People were severely injured and the home was destroyed.	Bradford Hazard Mitigation Committee, CNHRPC			+							+	+	
Bradford Earthquake 1964	No	1964	Jun	No	N/A, although the earthquake was felt between Bradford and Springfield VT and must have been regional in nature	An earthquake reached intensity VI at Meriden (fallen plaster) and caused slight damage at Bradford, NH and Springfield, VT.	Bradford Hazard Mitigation Committee, CNHRPC							+					
Older Hurricanes 1954-1991	No	1954 to 1991		N/A	Many older hurricanes have impacted New Hampshire including the 1954 – 1991 Hurricanes: Carol on August 31, 1954 (tree and crop damage), Edna on September 11,	Downed trees, wind damage, and flooding were likely experienced in Bradford during many of these hurricanes.	NH Homeland Security and Emergency Managem		+										

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					1954, Donna on April 12, 1960 (heavy flooding), Dora on August 28, 1971, Bell on August 10, 1976, Gloria on September 27, 1985, and Bob in 1991.		ent, CNHRPC												
10 Severe Snowstorms 1940-1978	No	1940	to 1978	N/A	Ten severe snowstorms are documented in south-central NH during this time span, Feb 14-15, 1940 (depths over 30" and high winds), Feb 14-17, 1958 (20-33"), Mar 18-21, 1958 (22-24"), Mar 2-5, 1960 (up to 25"), Jan 18-20, 1961 (up to 25", blizzard conditions), Jan 11-14, 1964 (up to 12"), Jan 29-31, 1966 (up to 10"), Feb 22-28, 1969 (24-98", slow-moving storm), Dec 25-28, 1969 (12-18"), Jan 19-21, 1978 (up to 16").	Although it is unknown what Bradford experienced, it is likely many of the same snow depths occurred.	American Meteorological Society, CNHRPC					+	+						+
Regional Snow Storm and Rapid Snow Pack Melt Mar 1953	No	1953	Mar	N/A	N/A, although similar rain or snow storms and rapid snow pack melt likely impacted the region. The highest level of water in the Blackwater Dam was measured, with the capacity at 93%. No flooding was reported. Uncertain as to exactly what type of storm caused this effect. A total of nearly 8" of	The storm was not particularly notable by the Town, although the rapid snow pack melt probably caused flooding effects in Bradford along the roads, Warner River, West Branch River, and main brooks.	FEMA, NH HSEM, US Army Corps of Engineers, CNHRPC				+	+							

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River / Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					precipitation in March 1953.														
Bradford Wildfire 1947	No	1947	---	N/A	Mount Sunapee Fire	A forest fire on Mt. Sunapee that lasted for several days, although confined to the town of Newbury, involved many men from Bradford.	Bradford Hazard Mitigation Committee , CNHRPC			+									
Regional & Bradford Hurricane of Sep 1938	No	1938	Sep 21	N/A	Hurricane made landfall as a 3 on the Saffir-Simpson Scale, killed about 682 people and damaged or destroyed over 57,000 homes. Most deadly New England hurricane. Central New Hampshire was inundated with water. Downed trees caused extensive damage to homes, businesses and community infrastructure. President Roosevelt ordered emergency aid be sent to NH, including Merrimack County.	Nearly 10” of rain fell in Bradford from Sep 12 to 22, 1938. The Warner River dam in Bradford discharged at “1,730 second-feet per square mile.” It is likely that trees were uprooted and homes were damaged. The Warner River may have flooded. No information was available from the community about this disaster.	CNHRPC, USGS 1938 report		+		+								
Regional & Bradford Flood of Mar 1936	No	1936	Mar 11-21	N/A	Simultaneous high snowfall totals, heavy rains, and warm weather combined to hit all of New England. Floods killed 24 people, caused \$133,000,000 in damage, and made 77,000 people homeless in New England. The great	The Warner River dam in Bradford discharged at “2,370 second-feet per square mile.” It is likely the Warner River and West Branch River flooded the Town. No information was available from the community about this disaster.	Concord Monitor, Union Leader, Army Corps of Engineers Ice Jam Database, CNHRPC,				+	+							

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
					flooding of 1936 resulted from heavy rains and rapid snow pack melt. Snow north of Concord contributed to the higher waters in Lake Winnepesaukee and Contoocook and Pemigewasset Rivers that were largely responsible for the destruction in Concord and the surrounding area. NH issued boil water warnings to everyone.		USGS 1938 report												
Bradford Wildfire Sep 1829	No	1829	Sep	N/A	Fire occurred in both Henniker and Bradford, beginning in Henniker and lasting for weeks.	The History of Henniker reports a brush fire in the south east part of Town, on the farm of Moses Colby, west of Day Pond. A road from Henniker to Bradford was destroyed as logs that covered low sections of the road caught fire. The fire lasted for weeks before it was extinguished. One house and a sawmill were consumed by the flames.	Cogswell's Henniker History, Bradford Hazard Mitigation Committee, CNHRPC			+									
Bradford Cold Year 1816	No	1816	'---	No	N/A, although NH communities likely experienced similar problems	Frosts occurred every month of the year and little produce could be raised as a result. Many citizens of Bradford dubbed 1816 the "Poverty Year" and "Eighteen hundred and froze to death". Some people talked of "dark	Bradford Hazard Mitigation Committee, Bradford Town Historian, CNHRPC					+	+						

DRAFT

4 HAZARD RISK ASSESSMENT

Event	DR-EM-	Year	Date	FEMA PA Funding \$	Area Impact Description	Local Impact Description	Source	Drought	High Wind/ Tropical/ Downburst	Wildfire/ Fire/ Lightning	Inland Flood/ River/ Dam	Winter/ Snow/ Ice	Extreme Heat/ Cold	Earthquake/ Landslide	Public Health/ Biological	Solar	Haz Mat/ Radiological	Human	Technological
						days” and a “yellow day”, when some thought the world was coming to an end.													

Source: Bradford Hazard Mitigation Committee and CNHRPC

Description and Magnitude of Hazards

A compilation of past hazards that have occurred in Bradford and the Central NH Region area is provided in the prior Table of **Local and Area Hazard Events**. **Existing and Susceptible Hazard Locations in Town** are areas to watch, areas of particular susceptibility and may be vulnerable to future events. **Potential Future Hazards** are determined based on the past hazard events, possibilities, and existing issues in Town to provide focus to future potential problem areas and to help with mitigation action development and are provided in the **Potential Future Hazards** section.

The **2025** natural hazard categorization identified previously which separates the primary natural hazards into groupings is also used as a framework to describe and evaluate each of the hazards. The human and natural hazards included in previous Plans are also considered here since they do have impacts on Bradford.

Each hazard is generally described and then is noted how and where it could occur in Bradford. Details related to the scientifically measured magnitude scales are provided.

Committee member experiences, knowledge, and recollections generally comprise the **Local and Area Hazard Events** and **Hazard Locations in Town**. While additional hazards might have occurred in Town, those events in the Plan are what the Committee chose to list, or were familiar with to list, to comprise the hazard events within the in Tables. The same is true for the **Potential Future Hazards** section.

Hazard Type	Main Hazard Category	Specific Hazards Included
Hydrologic	Drought	Drought
	Wildfire	Wildfire, Fire
	Flood/River	Dam Failure, Inland Flooding, River Hazards
Atmospheric	High Wind/Tropical/Storm	Thunderstorm, Downburst, High Wind, Tornado, Tropical and Post-Tropical Cyclone, Hail
	Lightning	Lightning
	Winter	Winter Storm, Blizzard, Ice Storm
	Extreme Temperature	Cold Wave, Heat Wave
Geologic	Earthquake/Landslide	Earthquake, Landslide
Biologic	Public Health/Biological	Swimming Water Quality, Air Quality, Drinking & Surface Water Quality, Infectious Diseases, Arboviral Diseases, Tickborne Diseases, Substance Misuse
Heliospheric	Solar	Geomagnetic Storm, Solar Radiation, Radio Blackout
Haz Mat	Hazardous Materials/Radiological	Hazardous Materials, Radiological
Human	Human Hazard	Crash, Mass Casualty Incident, Cyber Event, Terrorism/Violence
Technological	Technological	Aging Infrastructure, Conflagration (Fire), Long Term Utility, Outage

Several natural hazards in the [State of New Hampshire Hazard Mitigation Plan 2023](#) are not pertinent in Bradford. These hazards are **Coastal Flooding**, **Avalanche**, **Tsunami**, and **Volcanic Activity**. These are not discussed in Bradford's Plan.

HYDROLOGIC HAZARDS

The hydrologic hazards evaluated in the **Hazard Mitigation Plan** are:

Hazard Type	Main Hazard Category	Specific Hazards Included
Hydrologic	Drought	Drought
	Wildfire	Wildfire, Fire
	Flood/River	Dam Failure, Inland Flooding, River Hazards

Drought

The overall ratings of **Drought** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Drought	4.0	LOW	+25%	D3 Extreme Drought (Red)	D0 Abnormally Dry to D4 Exceptional Drought	US Drought (D-scale) Monitor Intensity Scale

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are becoming more common in New Hampshire, often coupled with regular, severe, heavy rainstorms. Rain is unable to percolate into the soil, running off into ditches, overflowing wetlands and culverts, eroding roadways. The effect of droughts is indicated through measurements of soil moisture, groundwater levels, and streamflow. However, not all indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground-water levels or increasing streamflow. Low streamflow also correlates with low ground-water levels and commonly cause diminished water supply because ground water discharge to streams and rivers maintains streamflow during extended dry periods.

In the case of drought, residential (dug wells especially) supplies would be threatened. Residences, non-residential buildings and Town facilities rely either on community water systems pumped from bedrock or on individual well water systems which are not easily replenished during periods of drought. During the **2015-2022** drought periods, many residences notified the Town of their dug wells going dry. The residents either made private arrangements for potable water or they dug new bedrock wells. All orchards, tree farms, and conservation areas in Town would be affected by drought. Additionally, wildfires have the potential of being more severe and commonplace during periods of drought, more difficult to contain. The

Fire Department uses stationary water sources for pumping into tankers, from over two dozen fire ponds located around the Town.

Table 4.6 displays overall drought magnitude as measured by the US Drought Monitor (USDM) and Palmer Hydrological Drought Index (PHDI), the extent of hydrological drought in the form of long-term, cumulative monthly moisture conditions. The weekly US Drought Monitor for NH can be accessed online. The Palmer indices are developed by algorithms taking into consideration precipitation, temperature data, and the local Available Water Content (AWC) of the soil.

Table 4.6
US Drought Monitor Intensity Scale

Category	Description	Description of Possible Impacts	Palmer Drought Severity Index (PDSI)
None	Normal or wet conditions	Normal or near normal conditions.	-1.9 to +1.9
D0	Abnormally Dry	Going into drought: - Short-term dryness, slow planting, growth of crops or pastures Coming out of drought: - Some lingering water deficits - Pastures or crops not fully recovered	-1.0 to -1.9
D1	Moderate Drought	- Some damage to crops, pastures - Streams, reservoirs or wells low, some water shortages developing or imminent - Voluntary water use restrictions requested	-2.0 to -2.9
D2	Severe Drought	- Crop or pasture losses likely - Water shortages common - Water restrictions imposed	-3.0 to -3.9
D3	Extreme Drought	- Major crop/pasture losses - Widespread water shortages or restrictions	-4.0 to -4.9
D4	Exceptional Drought	- Exceptional and widespread crop/pasture losses - Shortages of water in reservoirs, streams and wells creating water emergencies	-5.0 - higher

Drought Resource Links:

- ☐ US Drought (D-scale) Monitor Intensity Scale
<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?NH>
- ☐ National Integrated Drought Information System (New Hampshire)
<https://www.drought.gov/drought/states/new-hampshire>

Wildfire

The overall ratings of **Wildfire** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Wildfire	5.0	MEDIUM	+25%	Extreme (Red), spring-fall	Low (Green) to Extreme (Red) Fire Danger	National Fire Danger Rating System

Fire can be caused by several agents and can spread rapidly to consume property and endanger lives. This **2025 Plan** examines **lightning**, and **wildfire** (natural) fire sources and places other **fires (vehicles, structure, arson, explosions)** with **Technological Hazards**.

Wildfire is a significant concern and can quickly get out of control without good infrastructure, easily accessible forested backlots and practiced procedures. Lightning or human folly can cause wildfire. Locations of older narrow graveled roads, densely packed residential areas, cul-de-sacs, and roads or areas of Town with only **1** access/egress are among the most vulnerable locations for fire and wildfire hazards. Rural, forested areas of the community or recreation and conservation areas are often the most vulnerable to both **wildfire** and **lightning**.

Wildfire is defined as any unwanted and unplanned fire burning in forest, shrub or grass. Wildfires are frequently referred to as forest fires, brush fires, shrub fires or grass fires, depending on their location and size. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. The threat of wildfires is greatest where vegetation patterns have been altered by past land-use practices, fire suppression and fire exclusion. Because fire is a natural process, fire suppression can lead to more severe wildfires due to vegetation buildup. With the Town's conservation lands, **wildfire** seems particularly relevant. The burning of brush, permitted or not, can become an uncontrollable brushfire in dry or unsuitable conditions.

Increased severity over recent years in California, Quebec and Nova Scotia has decreased capability to extinguish wildfires because of the personnel drawn from other parts of the country, including New Hampshire. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure and cultural and economic resources. Recent air quality impacts have been experienced by New Hampshire residents as a result of 2022-2023 Canadian and Nova Scotian wildfire smoke.






When wildfire occurs locally, there are several potential indices to gauge its extent and severity. The current standard of measuring wildfire magnitude is utilizing the National Wildfire Coordinating Group (NWCG)'s wildfire classification scale. **Table 4.7** displays the wildfire classification size per the number of acres burned.

Table 4.7
National Wildfire Coordinating Group Wildfire Classification Scale

Fire Class	Sizes in Acres
Class A	1/4 acre or less
Class B	> 1/4 acre to < 10 acres
Class C	10 acres to < 100 acres
Class D	100 acres to < 300 acres
Class E	300 acres to < 1,000 acres
Class F	1,000 acres to < 5,000 acres
Class G	5,000 acres or more

Source: National Wildfire Coordinating Group

The New Hampshire Department of Natural and Cultural Resources Division (NHDNCR) of Forest and Lands (DFL) helps to promote daily fire danger ratings which community members can readily understand. The Fire Department posts the National Fire Danger Rating System (NFDRS) information in a prominent location, at the Fire Station.

National Fire Damager Rating System Categories	
 Low GREEN	Fire starts are unlikely. Weather and fuel conditions will lead to slow fire spread, low intensity and relatively easy control with light mop-up. Controlled burns can usually be executed with reasonable safety.
 Moderate BLUE	Some wildfires may be expected. Expect moderate flame length and rate of spread. Control is usually not difficult and light to moderate mop-up can be expected. Although controlled burning can be done without creating a hazard, routine caution should be taken.
 High YELLOW	Wildfires are likely. Fires in heavy, continuous fuel such as mature grassland, weed fields and forest litter, will be difficult to control under windy conditions. Control through direct attack may be difficult but possible and mop-up will be required. Outdoor burning should be restricted to early morning and late evening hours.
 Very High ORANGE	Fires start easily from all causes and may spread faster than suppression resources can travel. Flame lengths will be long with high intensity, making control very difficult. Both suppression and mop-up will require an extended and very thorough effort. Outdoor burning is not recommended.
 Extreme RED	Fires will start and spread rapidly. Every fire start has the potential to become large. Expect extreme, erratic fire behavior. NO OUTDOOR BURNING SHOULD TAKE PLACE IN AREAS WITH EXTREME FIRE DANGER.

Wildfire Hazards Resource Links:

- ☐ New Hampshire Department of Natural and Cultural Resources Division (NHDNCR) of Forest and Lands (DFL)
<https://www.nh.gov/nhdf/community/daily-fire-danger.htm>
- ☐ National Wildfire Coordinating Group (NWCG) Incident Response Pocket Guide 2022
<https://www.nwcg.gov/publications/461>

Inland Flooding

The overall ratings of **Inland Flooding** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Inland Flooding	6.7	MEDIUM	+25%	100 Year Flood	100 Year to 500 Year Flooding	Special Flood Hazard Areas (SFHAs) on 2010 & Preliminary Digital Flood Rate Insurance Maps 2023 (Zones A, AE, X)
				Moderate >40% (Red)	>5% Marginal to >70% High Rainfall Risk	NOAA Excessive Rainfall Risk Categories

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. However, floods can be beneficial to the low lying agricultural areas which are used for active farming and enriches the soil.

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term **100-year flood** does not mean that a flood will occur once every **100** years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase **1% annual chance flood**. This phrase means that there is a **1%** chance of a flood of that size happening in any single year. The **500-year** floods are phrased as **0.2%** annual chance of flood.

Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of year. A sudden thaw during the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to drain. Flooding is the most common natural disaster to affect New Hampshire, a common and costly hazard.

Dam Breach, Release or Failure has a close relationship with **Flood Hazards**, uses the NH DES Dam Hazard Classification categories, and has therefore been rated along with the natural hazards. **Inland flooding** hazards from storms, spring temperatures, rains and more can be measured by Special Hazard Flood Areas (SFHAs) and river gage flood stage heights.

Special Flood Hazard Areas (SFHAs)

Base Flood Elevations (BFEs) are abundant within Central NH along the **Merrimack River**, **Contoocook River**, **Blackwater River**, **Warner River**, **Soucook River**, and **Suncook River** on the official FEMA Digital Firm Insurance Rate Maps (DFIRMs) DFIRMs of **2009** (Hillsborough County) and **2010** (Merrimack County). In Bradford (**#330106**) New Hampshire (**33011C**), there are several DFIRMs identifying floodplains. DFIRM panels are not printed when floodplains are not present in an area.

DFIRMs illustrate the location of floodplains as a significant upgrade from the previous series of outdated paper maps, known as FIRMs. These new **2010** maps for Bradford are now set on an aerial photography background that displays roads, buildings, forested areas, waterbodies and watercourses. Bradford's Zoning Ordinance references the **2010** maps appropriately as the official DFIRMS. The general Flood Zone types appear in **Table 4.8**.

Table 4.8
Special Flood Hazard Area (SFHA) Zones on 2010 DFIRMS

Special Flood Hazard Areas on Bradford DFIRMs	
Zone A	1% annual chance of flooding <ul style="list-style-type: none"> • 100-year floodplains <i>without</i> Base Flood Elevations (BFE)
Zone AE (with or without floodways)	1% annual chance of flooding <ul style="list-style-type: none"> • 100-year floodplains <i>with</i> Base Flood Elevations (BFE) • some identified as floodways with stream channel and/or adjacent floodplain areas • areas must be kept free of encroachment so 1% annual chance of flood will not substantially increase flood height
Zone X	0.2% annual chance of flooding <ul style="list-style-type: none"> • 500-year floodplain <i>without</i> Base Flood Elevations (BFE) • sheet flow flooding less than 1-foot deep • stream flooding where the contributing drainage area is less than 1 square mile • areas protected from 100-year floodplains by levees • OR areas determined to be outside the 0.2% annual chance of flood (see DFIRMs)


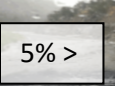



Sources: FEMA and NH Geographically Referenced Analysis and Transfer System (NH GRANIT) websites

Bradford DFIRMs can be viewed online at and downloaded from the FEMA Map Center website. Alternatively, the DFIRMs' respective paper FEMA **2010** Floodplain Maps in the Town Office could be consulted; the Zoning Ordinance Maps display the location of floodplains. Should the **Zone A** or **Zone X** or **Zone AE** flood to either the **100-year** or **500-year** level, the DFIRM areas will help **measure the location of the floodplain and potential magnitude of the flood**.

New **Preliminary May 2023 DFIRMs** were produced for the western **Merrimack River Watershed** which includes the **Contoocook River** area and **Warner River** area and remain in this draft format subject to revision until they become the new official maps. Although the DFIRMs are available at the FEMA Map Center, the digital floodplain layer is not yet posted online. This site should be regularly reviewed to download the data once available to the public.

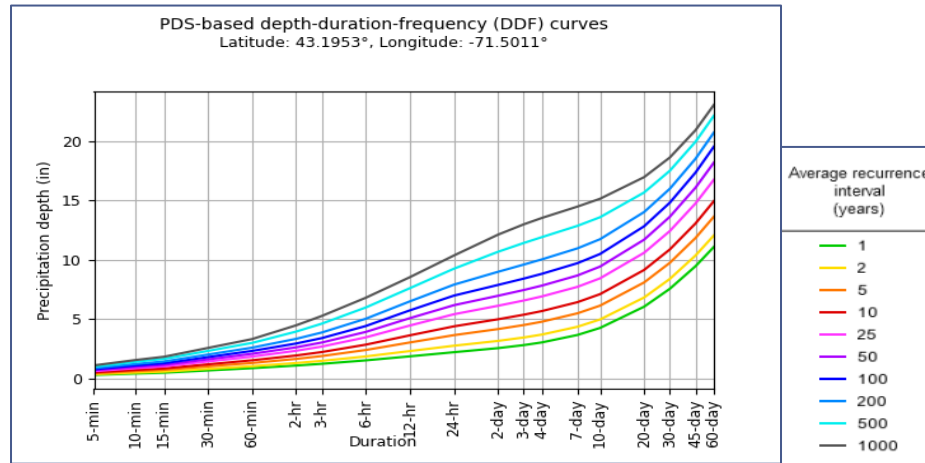
Excessive Rainfall

Inland flooding can come from many sources, including rainfall, snowmelt, and inundation. NOAA tracks storm systems that include excessive rainfall categories exceeding flash flood guidance within 25 miles of a point. These range from Marginal Risk (Green), isolated flash floods to High Risk (Pink), widespread flash floods. As more summer storms impact the Central NH region and the Northeast, excessive rainfall is likely to continue to occur due to climate change. Excessive rainfall can occur throughout Bradford and can impact roadways and waterbodies.

Understanding WPC Excessive Rainfall Risk Categories				
No Area/Label	MARGINAL (MRGL)	SLIGHT (SLGT)	MODERATE (MDT)	HIGH (HIGH)
Flash floods are generally not expected.	Isolated flash floods possible	Scattered flash floods possible	Numerous flash floods likely	Widespread flash floods expected
Localized and primarily affecting places that can experience rapid runoff with heavy rainfall.	Mainly localized. Most vulnerable are urban areas, roads, small streams and washes. Isolated significant flash floods possible.	Numerous flash flooding events with significant events possible. Many streams may flood, potentially affecting larger rivers.	Severe, widespread flash flooding. Areas that don't normally experience flash flooding, could. Lives and property in greater danger.	
www.wpc.ncep.noaa.gov @NWSWPC				
Flash flooding near me?	Flash Flooding	Flash Flooding	Flash Flooding	Flash Flooding
NO Flash Flooding				
				
WEATHER PREDICTION CENTER	5% >	15% >	40% >	70% >

The NWS developed a precipitation model that shows how much rain can fall during a period (duration) and charts the curve of the rainfall depth across the average yearly recurrence interval. At the Central NH Region weather data collection at Concord Municipal Airport which collects weather and precipitation data, in **12** hours if **2"** of rain falls, this is considered an annual occurrence. Yet, if in **12** hours **5"** of rain falls, this is considered a **50**-year occurrence at this location as shown in **Figure 4.A**. This model will vary depending on the location. Based on forecasting for each storm, the probability of flooding can be explained to the public using the Excessive Rainfall Risk image above.

Figure 4.A
NWS Precipitation Frequency Depth Recurrence at Concord Municipal Airport



Inland Flooding Resource Links:

- ☐ FEMA Flood Map Service Center
<https://msc.fema.gov/portal/home>
- ☐ NH OPD Current NH Floodplain Mapping Activities
<https://www.nheconomy.com/office-of-planning-and-development/what-we-do/floodplain-management-program/floodplain-maps>
- ☐ FEMA Flood Zone Designation Descriptions (2010)
https://efotg.sc.egov.usda.gov/references/public/NM/FEMA_FLD_HAZ_guide.pdf
- ☐ NOAA Excessive Rainfall Outlook
https://www.wpc.ncep.noaa.gov/qpf/excessive_rainfall_outlook_ero.php
- ☐ NOAA Atlas 14 Point Precipitation Frequency Estimates NH
https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=nh

River Hazards

The overall ratings of **River Hazards** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
River Hazards	6.7	MEDIUM	+25%	Much Above Normal Stream Flow (Dark Blue)	Much Below Normal Flow (Red) to Much Above Normal Stream Flow (Blue)	National Water Dashboard (USGS Stream Gages, Groundwater Monitors)

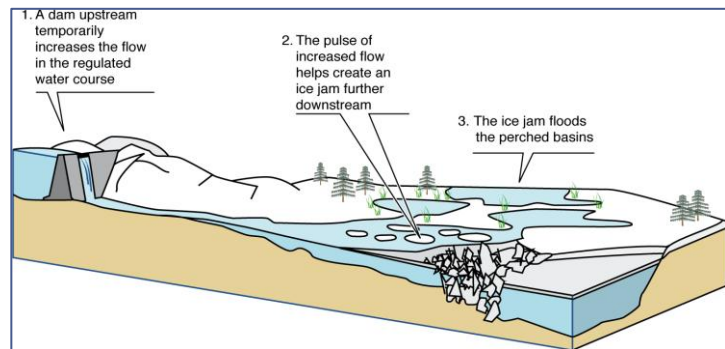
There are several types of **River** hazards examined in the **Hazard Identification and Risk Assessment**. River hazards are considered different from flooding in this **Hazard Mitigation Plan**. They include ice jams, scouring of banks and infrastructure, erosion of banks and shoreline, channel movement, and woody material debris. These types of incidents could occur on large brooks or other watercourses as well as rivers.

River Ice Jams

Rising waters in early spring often break ice into chunks, which float downstream, pile up and cause flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice in riverbeds and against structures presents significant flooding threats to bridges, roads, and the surrounding lands. The **Warner River** has experienced minor **ice jams** in the far past. Roads in general are always susceptible to the effects of winter ice conditions, and this could include the **West Branch Warner River** that runs along local roads.

Typical Ice Jam Commencement

There is no standardized magnitude scale of ice jams. The US Army Corps of Engineers (ACOE) maintains the Ice Jam Database, Bulletins & Surveys website which locates where known ice jams are presently occurring and where they have occurred in the past. Reports can be generated in various formats so emergency responders can identify the locations of prior ice jams and begin to mitigate the effects of future events.

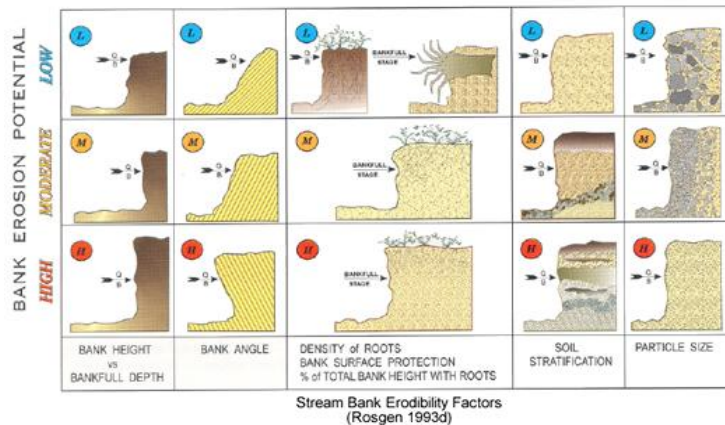
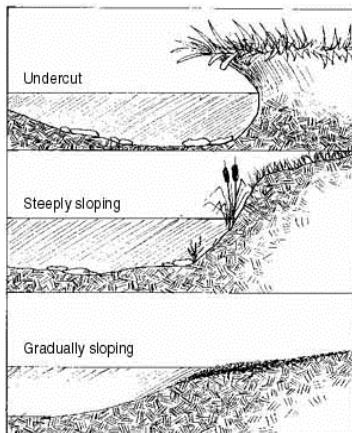


Fluvial Erosion, Bed Scouring and Channel Movement

Fluvial erosion is the wearing away of the river/stream bank and floodway. Bed scouring is the wearing away of the bed of the river or stream, typically shown as a pool type formation at downstream culvert outflows. Watercourses with high elevation change (stream gradient) are particularly prone to flash-flooding conditions and most vulnerable to erosion and scouring. During flooding or even high flow events, rivers can erode their banks and migrate into their floodplains. A migrating river, when channel movement is occurring, has the potential to impact nearby structures (berms, dams, buildings, etc.) or infrastructure such as river or stream crossings (culverts and bridges) or transportation features (roads, drainage structures, rail, etc.) in its migration path.

Fluvial geomorphology is the study of how processes of flowing water in rivers work to shape river channels and the land around them. Fluvial assessments are a collection of field data undertaken within designated river reaches. A **river reach** is a length of stream that has characteristics similar enough that condition data collected within that length is representative of the entire reach. Visual bank erosion characteristics give cues as to how a bank can react to further water interference. In Bradford, fluvial geomorphology is most pertinent to the **West Branch Warner River** and the **Warner River** in Bradford. There is no standardized magnitude scale of fluvial or bank erosion.

Bank Erosion Characteristics



Particularly vulnerable roads to stream bank erosion and scouring include Jewett Road, Breezy Hill Road, West Road, and the surrounding area of Dodge Corner. Jewett Road is impacted by Hoyt Brook about 40' every time it rains. Breezy Hill Road is scoured by the **Warner River**. East Shore Drive's small unnamed brook scours. West Road's shoulders by Dodge Corner is scoured by the **West Branch**. Other roads in Bradford that have been affected in the past and are still vulnerable to damage are Fairgrounds Road, Center Road, Blaisdell Road, and West Meadow Road.

River Height and Flow Volume by Stream Gages

Stream gages are dynamic measurement tools that enable immediate warning of river volume. The National Water Dashboard includes an inventory of the USGS Stream Gages and Groundwater Monitors, enabling flow levels between Much Below Normal Flow <10% (Red) to Much Above Normal Flow >90% (Blue). The USGS National Water Dashboard is an interactive map which monitors Stream Gages and other water mapping layers to predict how much below normal to how much above normal flow conditions are for that particular day of the year. At least 10 years (10 data points) of data are needed for this evaluation.

USGS Streamflow Status Levels

USGS Streamflow Status Levels	Flow %
All Time High for this Day	100%
Much Above Normal	>90%
Above Normal	76%- 90%
Normal	25%- 75%
Below Normal	10%- 24%
Much Below Normal	<10%
All Time Low for this Day	0%

There are no local river gages in Bradford which could give warning of flood conditions on the West Branch Warner River or the Warner River. The closest is located downstream in Warner, the USGS **#01086000** Warner River Davisville Gage provides flood stage warning at the NH 127 bridge. The **Warner River** gage flood stage information is shown in **Table 4.9**.

Table 4.9

Downstream Warner River Gage Flood Stage Categories

Flood Stage Category	USGS Warner River at Davisville Flood Stage (River Gage #01086000 NOAA #DAVN3)	What Flood Stage Category Means
Major Flood Stage	12 Feet	Flooding has increased in spatial extent. Road closures more widespread, and feet of water may enter structures.
Moderate Flood Stage	10 Feet	Road closures more numerous. Water starts to enter homes and businesses.
Flood Stage	8 Feet	Flooding expands in spatial extent resulting in greater inundation of farmland and recreational areas. Few road closures possible.
Action Stage	6 Feet	Streams and river are out of their banks. Flooding confined to greenways, farmland, and isolated secondary roads.
Below Flood Stage	< 6 Feet	Normal stream and river levels up to bank full.

Gages that measure the height and volume of water along rivers are very helpful tools in understanding what level of flooding will become a concern. Flood stage measurements differ per river and these indicators help the community prepare for flood conditions.

River Hazards Resource Links:

- ☐ US Army Corps of Engineers (ACOE)
<https://icejam.sec.usace.army.mil/ords/f?p=1001:7>
- ☐ National Water Dashboard (USGS Stream Gages, Groundwater Monitors)
<https://dashboard.waterdata.usgs.gov/app/nwd/en/?aoi=default>
- ☐ USGS Warner River at Davisville Hydrograph (River Gage #01086000, NOAA #DAVN3)
<https://water.noaa.gov/gauges/davn3>
<https://waterdata.usgs.gov/monitoring-location/01086000>
- ☐ USGS Fluvial Erosion Hazards (FEH) Primer
<https://geonarrative.usgs.gov/fehprimer>
- ☐ US Army Corps of Engineers (ACOE) New England Regulated River Basins
https://reservoircontrol.usace.army.mil/nae_ords/cwmsweb/cwms_web.cwmsweb.cwmsindex
- ☐ National Weather Service Gray Maine Northeast River Forecast Center
<https://www.weather.gov/nerfc/>

Dam Failure

The overall ratings of **Dam Failure** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Dam Failure	3.7	LOW	+0%	Low Hazard Class	Non-Menace to High Hazard Dam Class	NHDES Dam Hazard Classifications

Dam breach and the resulting failure cause rapid loss of water that is normally impounded by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property as they are quick, unexpected, and if they occur during a flooding event, dam failures can overload an already burdened water channel.

Bradford has **1** Significant Hazard dam at the **Lake Todd** and **1** Low Hazard dam at **West Branch Warner River Dam**.

Although dam failure could be considered a **Technological Hazard**, failure is often a secondary hazard caused by flooding conditions and has been rated along with the natural hazards. Classifications of dams and their magnitude of failure can be measured by the NH DES Dam Hazard Classifications.

NH Dam Hazard Classification		
NON-MENACE Structure		Inspection
NM	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: *if certain criteria are met	Every 6 years *
	<ul style="list-style-type: none"> ○ Less than 6 feet in height if it has a storage capacity greater than 50 acre-feet; ○ Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet. 	
LOW Hazard Structure		Inspection
L	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:	Every 6 years
	<ul style="list-style-type: none"> ○ No possible loss of life. ○ Low economic loss to structures or property. ○ Structural damage to a town/city road or private road accessing property other than the dam owner's that could render the road impassable or interrupt public safety services. ○ The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than 2 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 Structure		Inspection
S	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:	Every 4 years
	<ul style="list-style-type: none"> ○ No probable loss of lives. ○ Major economic loss to structures or property. 	

NH Dam Hazard Classification		
	<ul style="list-style-type: none"> ○ 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: <ul style="list-style-type: none"> ◆ 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 Structure		Inspection
H	<p>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 from:</p> <ul style="list-style-type: none"> ○ Water levels and velocities causing structural failure of a foundation of a habitable residential, commercial, or industrial structure, which is occupied under normal conditions. ○ Water levels rising above the first floor elevation of a habitable residential, 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. 	Every 2 years

Dam Failure Hazards Resource Links:

- ☐ NH Department of Environmental Services (NHDES) DB-15: Classification of Dams in New Hampshire Fact Sheet 2020
<https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/db-15.pdf>
- ☐ NHDES Dams Safety, Maintenance and Management
<https://www.des.nh.gov/water/dam-maintenance-and-management>

ATMOSPHERIC HAZARDS

The atmospheric hazards evaluated in the **Hazard Mitigation Plan** are:

Hazard Type	Main Hazard Category	Specific Hazards Included
Atmospheric	High Wind/Tropical/Storm	Thunderstorm, Downburst, High Wind, Tornado, Tropical and Post-Tropical Cyclone, Hail
	Lightning	Lightning
	Winter	Winter Storm, Blizzard, Ice Storm
	Extreme Temperature	Cold Wave, Heat Wave

High Wind

The overall ratings of **High Wind Events** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
High Winds	4.0	LOW	+25%	10 Whole Gale 55 to 63 mph	0 Calm to 12 Hurricane Force Wind	Beaufort Wind Scale (Land)

High wind events can take the form of severe winds, rainstorms, thunderstorms, tornadoes, and downbursts.

Severe wind is likely to occur throughout all seasons. Significantly high winds occur especially during hurricanes, tornadoes, downbursts, winter storms, and thunderstorms any time of the year. Falling objects like trees and downed power lines are dangerous risks associated with high winds. Property damage and downed trees are common during high wind occurrences. All utilities, including power lines, are at risk and their damage or destruction would create a hazard to the Town. A communications interruption or failure resulting from damage to telecommunications towers could affect the capabilities of emergency personnel to respond to the hazard event. Often with wind events, precipitation accompanies, increasing the danger of the hazard.

The Beaufort Wind Scale (Land) in **Table 4.10** as a form of wind magnitude measures the wind speed, description, and allocates a magnitude scale of 0 (Calm) -to 12 (Hurricane Force).

Table 4.10

Beaufort Wind Scale (Land Effects)

Beaufort Number	Description	Speed in mph	Visual Clues and Damage Effects
0	Calm	Calm	Calm wind. Smoke rises vertically with little if any drift.
1	Light Air	1 to 3	Direction of wind shown by smoke drift, not by wind vanes. Little if any movement with flags. Wind barely moves tree leaves.
2	Light Breeze	4 to 7	Wind felt on face. Leaves rustle and small twigs move. Ordinary wind vanes move.
3	Gentle Breeze	8 to 12	Leaves and small twigs in constant motion. Wind blows up dry leaves from the ground. Flags are extended out.
4	Moderate Breeze	13 to 18	Wind moves small branches. Wind raises dust and loose paper from the ground and drives them along.
5	Fresh Breeze	19 to 24	Large branches and small trees in leaf begin to sway. Crested wavelets form on inland lakes and large rivers.
6	Strong Breeze	25 to 31	Large branches in continuous motion. Whistling sounds heard in overhead or nearby power and telephone lines. Umbrellas used with difficulty.
7	Near Gale	32 to 38	Whole trees in motion. Inconvenience felt when walking against the wind.
8	Gale	39 to 46	Wind breaks twigs and small branches. Wind generally impedes walking.
9	Strong Gale	47 to 54	Structural damage occurs, such as chimney covers, roofing tiles blown off, and television antennas damaged. Ground is littered with many small twigs and broken branches.
10	Whole Gale	55 to 63	Considerable structural damage occurs, especially on roofs. Small trees may be blown over and uprooted.
11	Storm Force	64 to 75	Widespread damage occurs. Larger trees blown over and uprooted.
12	Hurricane Force	over 75	Severe and extensive damage. Roofs can be peeled off. Windows broken. Trees uprooted. RVs and small mobile homes overturned. Moving automobiles can be pushed off the roadways.

High Wind Hazards Resource Links:

- ☐ National Weather Service Beaufort Wind Scale (on Land)
<https://www.weather.gov/pqr/wind>

Thunderstorm

The overall ratings of **Thunderstorm** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Thunderstorm	4.0	MEDIUM	+25%	3 Enhanced Risk (Orange)	1 Marginal (Lt Green) to 5 High Thunderstorm Risk (Pink)	NOAA Severe Thunderstorm Risk Categories

More commonly experienced are **severe windstorms**, **rainstorms** and **thunderstorms**. The most severe windstorms occur during all months of the year while thunderstorms tend to erupt during periods of humidity. On occasion, precipitation in the form of rain or hail is experienced during these storms. Rainstorms bring can flooding and high winds. **Thunderstorms** can also bring lightning and hail hazards, making these storms among the most dangerous, widespread, and numerous in New Hampshire. Tree limbs and utility lines can fall onto roadways, causing crash hazards and power and internet outages.







There are several types of thunderstorms:

- ➔ **Single-cell** – Ordinary, short, brief, weak storms that grow and die within an hour or so. They are typically driven by heat on a summer afternoon. Single-cell “popcorn” convection storms may produce brief heavy rain and lightning.
- ➔ **Multi-cell cluster** – Common, garden-variety thunderstorm in which new updrafts form along the leading edge of rain-cooled air (the gust front). Individual cells usually last 30 to 60 minutes, while the system as a whole may last for many hours. Multicell storms may produce hail, strong winds, brief tornadoes, and/or flooding.
- ➔ **Multi-cell line (squall line)** – Group of thunderstorms arranged in a line, often accompanied by squalls of high wind and heavy rain. Squall lines tend to pass quickly and are less prone to produce tornadoes than are supercells. They can extend laterally for hundreds of miles but are typically only 10 or 20 miles wide.
- ➔ **Supercell- single cell** - Thunderstorm lasting for hours, characterized by updrafts over 100 mph with giant hail and tornados, high precipitation and flash flooding.
- ➔ **Derecho (squall line)**- Long-lived, straight-line winds associated with a thunderstorms which blow out in front of the squall line, appearing from large, shelf-like cloud formation. Derechos can be as large as **200** miles wide in extent with gusts of at least **58** mph. They can last up to **12** hours or more and are associated with very strong straight-line winds. Derechos can knock over trees and power lines and cause rain and lightning to come from all directions.

Although a thunderstorm may comprise many variables, generally, a severe thunderstorm (Marginal 1-Slight 2 categories) produces winds of at least 58 mph, could produce hail at up 1" in diameter, and could produce localized tornadoes. These storms can be expected to occur several times per year in New

Hampshire. Structural damage to trees, roofing, and vehicles implies the occurrence of a significantly severe thunderstorm, with an annual to lifetime chance (Enhanced 3- High 5 categories).

Severe Thundstorm Outlook Categories

Understanding Severe Thunderstorm Outlook Categories						
LEVEL	CATEGORY	DETAILS	SUMMARY	How many severe storms are possible?	How bad could the worst storms be?	DEFINITIONS
	General Thunderstorm	Although severe weather is not expected, <i>all</i> thunderstorms can produce deadly lightning, gusty winds, and small hail.	No severe thunderstorms expected		Similar to storms your area experiences many times per year	Severe Storm Any storm that contains at least one of the following:
1	Marginal (MRGL)	Some storms could be capable of damaging winds and severe hail. Localized tornado threat could develop.	Isolated severe storms possible		Similar to storms your area may experience several times per year	Wind gusts of at least 58 mph Hail at least one inch in diameter Tornado
2	Slight (SLGT)	Increased confidence that some storms will contain damaging winds, severe hail, and/or tornado potential. <i>A few severe storms could be significant</i>	Isolated to scattered severe storms expected		Similar to storms your area may experience a few times per year	
3	Enhanced (ENH)	High confidence that several storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms could be significant</i>	Scattered to numerous severe storms expected		Similar to intense storms your area may only experience once or twice per year	Significant Severe Any of the following hazards:
4	Moderate (MDT)	High confidence that many storms will contain damaging winds, severe hail, and/or tornadoes. <i>Several severe storms likely to be significant</i>	Scattered to numerous severe storms expected		Similar to intense storms your area may only experience once per year or less	Wind gusts of at least 75 mph Hail at least two inches in diameter Tornado of at least EF-2 rating
5	High (HIGH)	High confidence that an outbreak of storms will contain tornadoes, damaging winds, and/or severe hail. <i>Tornado outbreak and/or widespread damaging winds</i>	Numerous severe storms expected		Very intense storms your area may only experience once or twice in a lifetime	
spc.noaa.gov weather.gov						

Thunderstorm Hazards Resource Links:

- ☐ National Weather Service Thunderstorm Outlook Severity
https://www.spc.noaa.gov/new/images/SPC_outlook_final_updated.png
- ☐ NWS Storm Prediction Center
<https://www.spc.noaa.gov/classic.html>
- ☐ NOAA Jetstream Online Education Tool
<https://www.noaa.gov/jetstream>
- ☐ NOAA Types of Thunderstorms
<https://www.noaa.gov/jetstream/tstrmtypes>
- ☐ NOAA Derechos
<https://www.noaa.gov/jetstream/derechos>

Hail

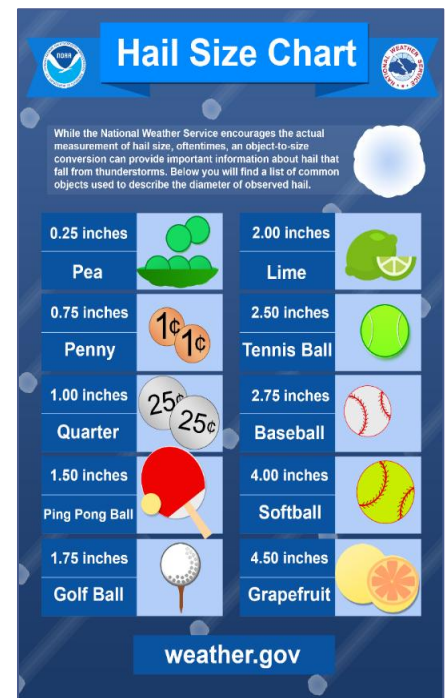
The overall ratings of **Hail** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Hail	4.0	LOW	+0%	0.75" Ping Pong Ball	1/4" Pea Size to 4.5" Grapefruit Size Hail Stones	NOAA Hail Size
				H2 Significant 10-20 mm	H0 5mm Hard Hail Storm to H10 >100mm Super Hail Storm	TORRO Hailstorm Intensity Scale Adapted

Thunderstorms include hail, hard balls of frozen water ranging from under pea-sized to softball-sized which rain down onto trees, roof, vehicles and roads. Often hail is damaging to vehicles and landscaping.

According to NOAA, hailstones are formed when raindrops are carried upward by thunderstorm updrafts into extremely cold areas of the atmosphere and freeze. Hailstones then grow by colliding with liquid water drops that freeze onto the hailstone's surface. The hail falls when the thunderstorm's updraft can no longer support the weight of the hailstone. Smaller hailstones can be blown away from the updraft by horizontal winds, so larger hail typically falls closer to the updraft than smaller hail. If the winds near the surface are strong enough, hail can fall at an angle or even nearly sideways. Wind-driven hail can tear up siding on houses, break windows and blow into houses, break windows on and dent the roofs of cars, and cause severe injury and/or death to people and animals.

The NOAA Hail Size chart describes the size of hail. In the Central NH region, hail has been reported recently as larger than a quarter dollar (>1"). In Maine and New Hampshire, hail is fairly common during well-developed thunderstorms. Although most hail that reaches the ground in northern New England is an inch or less in diameter, occasionally hailstones over 2" in diameter will fall. Large hailstones can fall at speeds faster than **100 mph** and can do considerable damage to cars, homes, and buildings, and can be a significant threat to people, as well.



The intensity of hail, or how large and damaging hail can become, can be depicted by the Tornado and Storm Research Organization's (TORRO) Hailstorm Intensity Scale, developed by researchers in the United Kingdom. The TORRO ranges from the smallest value of **H0** (<5 mm and causing no damage) to the largest value of **H10** (>100 mm and causing extensive structure damage and potential fatalities). The TORRO scale is displayed in **Table 4.11**.

Table 4.11

TORRO Hail Intensity Scale

Scale	Intensity Category	Typical hail Diameter (mm)	Size Object Comparison	Typical Damage Impacts
H0	Hard Hail	5	Pea	No damage
H1	Potentially Damaging	5-15	Mothball	Slight general damage to plants, crops
H2	Significant	10-20	Marble, grape	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	Ping pong ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75	Tennis ball	Severe roof damage, risk of serious injuries
H8	Destructive	60-90	Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	Softball	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Hail Hazards Resource Links:

- ☐ NOAA Thunderstorm Infographics with Hail Size Chart
https://www.weather.gov/vef/Thunderstorm_Infographics
- ☐ National Weather Service Estimating Hail Size
<https://www.weather.gov/boi/hailsize>
- ☐ TORRO Hailstorm Intensity Scale
<https://www.torro.org.uk/research/hail/hscale>
- ☐ NOAA Severe Weather 101 Hail Basics
<https://www.nssl.noaa.gov/education/svrwx101/hail/>

Tornado

The overall ratings of **Tornado** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Tornado	2.0	LOW	+0%	EF1 60-110 mph	EF0 65-85 mph to EF5 >200 mph	NOAA Enhanced Fujita Scale

Significantly high winds occur especially during hurricanes, winter storms, and thunderstorms, but can also exist independent of other storms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during high wind occurrences.

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down, they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of **200** mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can extend in excess of one-mile wide and **50** miles long. Violent winds and debris slamming into buildings cause the most structural damage.

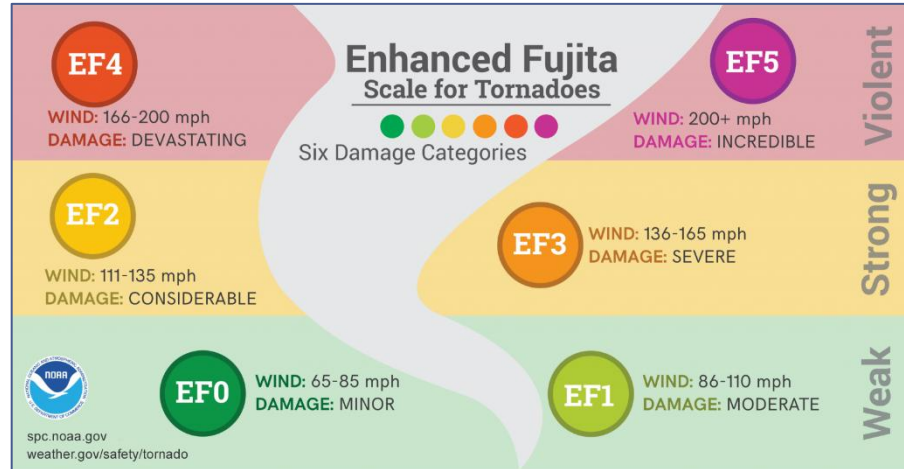
A tornado occurring in Bradford would cause considerable damage. Roofs could be torn off frame houses; dams could be damaged; large trees snapped or uprooted; and light object missiles would be generated by an **EF-2** Tornado (**111-135** mph). Tornado magnitude is measured by the Enhanced Fujita (EF) Scale and is displayed in **Table 4.12**.

Table 4.12

Enhanced Fujita (EF) Scale

EF Rating	3-Second Gust mph
EF0	65-85 mph
EF1	86-110 mph
EF2	111-135 mph
EF3	136-165 mph
EF4	166-200 mph
EF5	over 200 mph

Aside from the NH 114 and NH 103 corridors, most sections of the Bradford are forested and its Class V and Class VI gravel roads run the risk of isolation through **debris impacted infrastructure** (trees down on roads and powerlines) after a **tornado**, resulting in **power failure** and the potential for delayed emergency access until the way is cleared. Wooded and forested sections of Town are vulnerable to tree fall. One-egress roads and remote neighborhoods are especially at risk from the impacts of high wind events, including tornadoes.



Tornado Hazards Resource Links:

- ☐ National Weather Service Enhanced Fujita (EF) Scale
<https://www.weather.gov/oun/efscale>
- ☐ National Weather Service Tornado Infographics
https://www.weather.gov/wrn/tornado_infographics

Downburst

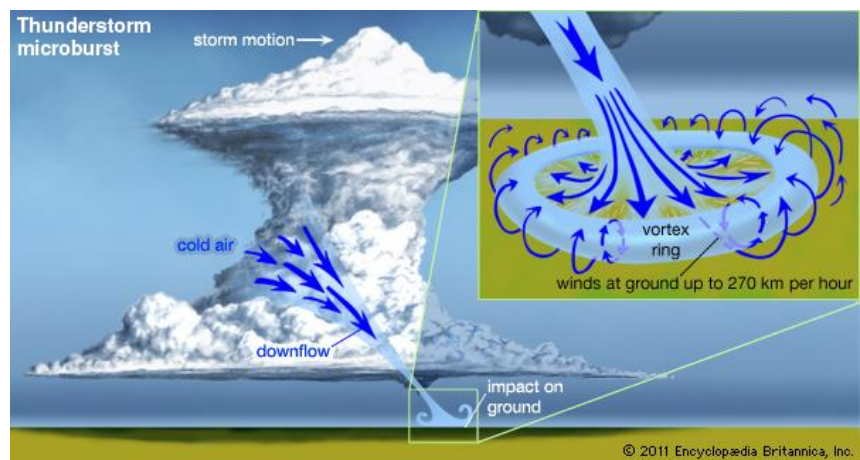
The overall ratings of **Downbursts** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Downburst	3.0	LOW	+0%	Microburst <2.5 miles	<2.5 miles wide Microburst to >2.5 miles wide Macroburst	NOAA Downbursts

Originating from a strong thunderstorm, an intense downburst called a microburst is a severe localized downdraft blowing over a horizontal area. When these downdrafts reach the ground, they spread out very quickly causing strong and often damaging winds at the ground. Downburst damage is often referred to as straight-line wind damage since fallen trees generally line up in the same direction. In Maine and New Hampshire, most thunderstorm wind damage is caused by downbursts. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts can produce winds of up to **168** mph and are life threatening. Downbursts are quite common during Central NH's hot weather months. The "dry" microbursts or macrobursts are strong downdrafts known to occur in Central New Hampshire almost annually, but the "wet" microbursts accompanied by rain are uncommon in the Northeast.

Downbursts can produce strong wind shear, large changes in wind speed and direction over a short distance. Trees are regularly snapped off in a singular direction by a macroburst or microburst. Downbursts typically originate from thunderstorm clouds, with air moving in a downward motion until it hits the ground level and then spreads outward in all directions. In fact, the wind pattern of a downburst is the opposite of a tornado's wind pattern.

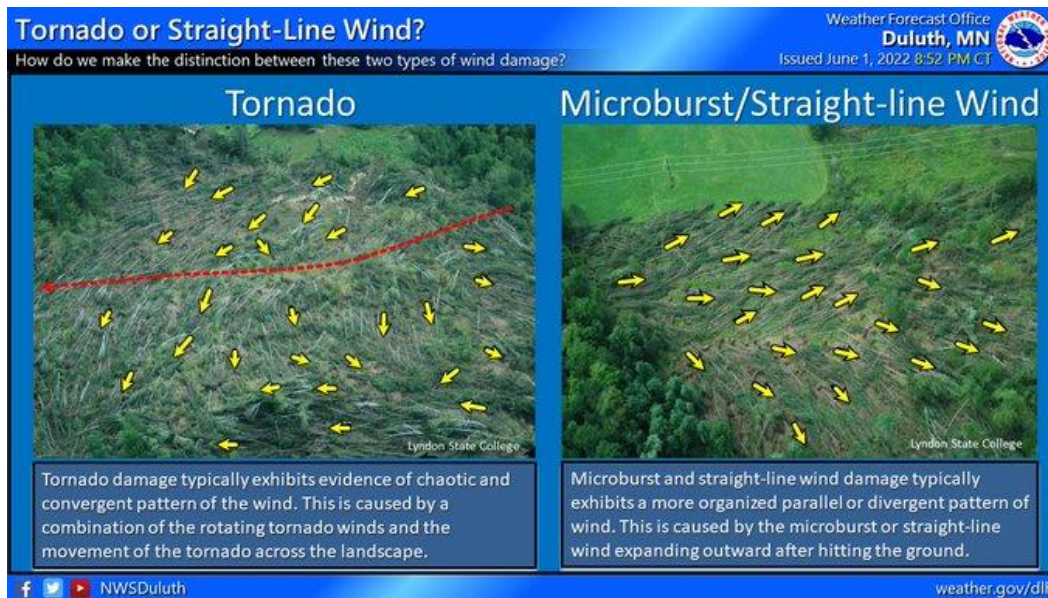
Microburst Forming from Thunderstorm Cloud



Two sizes of downbursts occur in New Hampshire and their magnitudes are categorized by extent as well as on the Enhanced Fujita Scale.

- A **microburst** is a small downburst with an outflow, defined as cooled air quickly moving outward from the storm, less than **2.5 miles (<4 km)** in horizontal diameter and lasting **2-5 minutes**. Despite their small size, microbursts can produce destructive winds up to **168 mph**, producing tornado-like damage up to an **EF-4** scale event. Microbursts get their name because they generally affect a much smaller geographical area, but the winds in a microburst can be very intense. Like the general downburst, most of the damage with microbursts lines up in one direction, although, there may be a tendency for the damage to radiate outward. Microbursts are usually accompanied by heavy rain and/or hail and can have winds as strong as those in a small tornado.
- A **macroburst** is larger than a microburst, with a horizontal extent greater than **2.5 miles (>4 km)** in diameter. A macroburst is not quite as strong as a microburst but can still produce winds as high as **130 mph**. Damaging winds generally last longer, from **5 to 20 minutes**, and produce tornado-like damage up to an **EF-3** scale event.

NWS Tornado Damage vs. Microburst Tree Damage Comparison



Downburst Hazards Resource Links:

- ☐ NOAA Thunderstorm Hazards – Macrobursts and Microbursts
https://www.noaa.gov/jetstream/wind_damage
- ☐ NWS Straight-Line Winds vs. Tornado Differences
https://www.weather.gov/iwx/2013_straight-line_winds_vs_tornado
- ☐ NOAA National Severe Storms Laboratory Damaging Winds
<https://www.nssl.noaa.gov/research/wind/>

Tropical and Post-Tropical Cyclone

The overall ratings of **Tropical and Post Tropical Cyclone** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Tropical and Post Tropical Cyclone	3.0	LOW	+0%	Category 1 74-95 mph Devastating	Category 1 74-95 mph Minimal to Category 5 >157 mph Catastrophic Winds	NOAA Saffir-Simpson Hurricane Wind Scale

Hurricane season officially begins on June 1 and continues through the end of November. August and September are the most active hurricane months. It is not uncommon for New England to be impacted by a hurricane more than once in a season. River and flooding due to heavy rains is a risk to Bradford during hurricanes. Numerous hurricane events in recent history have occurred in the State, region, and the local area surrounding Bradford that may have also had an impact on the Town.

A **hurricane** is a tropical cyclone in which winds reach speeds of **74** miles per hour or more and blow in a large spiral around a relatively calm center. Flooding is often caused from the coastal storm surge of the ocean and torrential rains, both of which accompany the storm. The floods and high winds can result in loss of life and property. Hurricanes, high wind and rain events, and thunderstorms can damage Bradford just like any other community in Central New Hampshire. Forested lands and trees along the transportation infrastructure can be blown down across roads; the above-ground powerlines along the sides of the road can be snapped either by trees or high winds and fall onto the roads or nearby objects; and runoff flooding and stream/brook and river flooding can occur because of hurricanes and severe storms.

Table 4.13

Saffir-Simpson Hurricane Wind Scale

Category	Sustained Wind Speed mph	Types of Damage Due to Hurricane Winds
--	< 38 mph	Tropical Depression
--	39-73 mph	Tropical Storm
1	74-95 mph	MINIMAL. Very dangerous winds will produce minimal damage. Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph	MODERATE. Extremely dangerous winds will cause moderate damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.

Category	Sustained Wind Speed mph	Types of Damage Due to Hurricane Winds
3	111-129 mph	EXTENSIVE. Extensive damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156 mph	EXTREME. Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	CATASTROPHIC. Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.








The Saffir-Simpson Hurricane Wind Scale **measures the magnitude of wind event** on a **1** through **5** rating basis. The definitions of Category **1** through **5**'s sustained wind miles per hour and their respective threats to people, different types of homes, shopping centers, trees, power lines, water, and more are displayed in **Table 4.13**.

Tropical Depression

An organized group of thunderstorms that persists for **24** hours is called a tropical disturbance. When winds exceed **30** mph, it becomes a tropical depression. The Earth's rotation (coriolis effect) drives wind around the warm core of the storm. For the storm to continue to strengthen, it must remain over warm water and encounter minimal wind shear. This is when vertical winds slant the storm, dispersing the heat over a larger area, degrading the storm. Without wind shear, the cyclone remains upright and continues to develop.

Tropical Storm

When winds reach **39** mph, the cyclone becomes a tropical storm and meteorologists give the storm system a name, alphabetically chosen from a pre-selected annual list for the Atlantic Ocean tropical storms. These lists are recycled every six years, but the names of deadly or costly storms are changed in future rotations. For instance, the **2023** Atlantic hurricane season, a strong El Nino year with record warm Atlantic

Saffir-Simpson Hurricane Wind Scale				
	Category	Wind Speed	Storm Surge	Damage
	Tropical Depression	0 - 38 mph	0 feet	
	Tropical Storm	39 - 73 mph	0 - 3 feet	
	Category 1 Hurricane	74 - 95 mph	4 - 5 feet	Minimal
	Category 2 Hurricane	96 - 110 mph	6 - 8 feet	Moderate
	Category 3 Hurricane	111 - 129 mph	9 - 12 feet	Extensive
	Category 4 Hurricane	130 - 156 mph	13 - 18 feet	Extreme
	Category 5 Hurricane	157 mph or higher	18 feet or higher	Catastrophic

sea surface temperatures, ranks **4th** for the most-named storms in a year: **20** named storms, which included seven hurricanes and three major hurricanes.

Tropical Storm or Post Tropical Storm Hazards Resource Links:

- ☐ NWS Saffir-Simpson Hurricane Winds Scale
<https://www.nssl.noaa.gov/research/wind>
- ☐ NOAA National Hurricane Center Tropical Storm Names
<https://www.nhc.noaa.gov/aboutnames.shtml>
- ☐ NWS Climate Prediction Center
<https://www.cpc.ncep.noaa.gov/>
- ☐ National Weather Service Storm Surge Threat
<https://www.weather.gov/mhx/HTIStormSurge>
- ☐ NWS National Hurricane Center Hurricanes.gov
<https://www.nhc.noaa.gov/>

Lightning

The overall ratings of **Lightning** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Lightning	4.0	LOW	0%	LAL 2 Infrequent	LAL 1 No Thunderstorms to LAL 6 Dry Lightning Activity	NWS Lightning Activity Level (LAL)

The NOAA National Severe Storms Laboratory defines lightning as a giant spark of electricity in the atmosphere between the clouds, the air, or the ground. In the early stages of development, air acts as an insulator between the positive and negative charges in the cloud and between the cloud and the ground. When the opposite charges build up enough, this insulating capacity of the air diminishes, forming a rapid discharge of electricity (lightning). The flash of lightning temporarily equalizes the charged regions in the atmosphere until the opposite charges build up again.

All thunderstorms contain lightning, but not all lightning is caused by thunderstorms. Lightning can also be seen during volcanic eruptions, surface nuclear detonations, and heavy snowstorms. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, a shock wave that can damage building walls and break glass. Lightning strikes can cause death, injury, and property damage. Lightning is often referred to as the “underrated killer.” Lightning can strike where it is not raining, or even before rain reaches the ground.

There are four main types of lightning:

- ➔ **Cloud-to-ground (CG)** strike is the most common type of lightning, reaching toward the surface.
- ➔ **Cloud flashes like intra-cloud (IC) or sheet lightning** occur either in the same cloud or from cloud-to-air (CA) and do not reach the ground.
- ➔ **Cloud-to-cloud (CC)** or spider lightning travel among and illuminate multiple clouds.
- ➔ **Transient luminous events (TLE)** are rarely observed from the ground and occur in the high atmosphere above the storms.

Where the CG lightning will strike downward, a channel current of **1-2** inches develops toward the earth’s surface. As lightning nears the ground, objects like trees, telephone poles, and buildings start sending up static electricity sparks to meet this channel. Taller objects such as trees and historic buildings with cupolas, or hills are more likely than the surrounding ground to produce one of the connecting sparks and so are more likely to be struck by lightning. Yet lightning can strike the ground in an open field even if the tree line is nearby. The National Weather Service provides information about lightning safety.

The magnitude of lightning can be measured to determine how likely it may be for starting fires. Using a Level system of **1** to **6** corresponding with storm development and the number of lightning strikes, the NWS Lightning Activity Level (LAL) measures the magnitude of lightning strikes as displayed in **Table 4.14**.

Table 4.14
Lightning Activity Level (LAL)

Level 1-6	LAL Cloud and Storm Development	Cloud to Ground Strikes per 5 Minutes	Cloud to Ground Strikes per 15 Minutes
LAL 1	No thunderstorms.	n/a	n/a
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a 5- minute period.	1 to 5	1 to 8
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.	6 to 10	9 to 15
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a 5-minute period.	11 to 15	16 to 25
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.	> 15	> 25
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.	6 to 10	9 to 15

Lightning Hazards Resource Links:

- ☐ National Weather Service Lightning Activity Level
<https://graphical.weather.gov/definitions/defineLAL.html>
- ☐ National Weather Service Lightning Safety Tips and Resources
<https://www.weather.gov/safety/lightning>
- ☐ National Oceanic & Atmospheric Administration (NOAA) Severe Storms Laboratory Lightning Basics Education
<https://www.nssl.noaa.gov/education/svrwx101/lightning>

Winter Storms

The overall ratings of **Severe Winter Weather** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Winter Storms	8.0	HIGH	-25%	4 Crippling	1 Notable to 5 Extreme Snowfall	Northeast Snowfall Impact Scale (NESIS)
				Major Impacts (Red)	No Impacts to Extreme Winter Impacts	NWS Winter Storm Severity Index (WSSI)

A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding, wind-driven snow over **35** mph that lasts several days. A severe winter storm deposits four or more inches of snow during a **12**-hour period or six inches of snow during a **24**-hour period.

An ice storm involves rain, which freezes upon impact. Ice coating at least **¼"** in thickness is heavy enough to damage trees, overhead wires, and similar objects. Ice storms also often produce widespread power outages.

A Nor'easter is a large weather system traveling from South to North, passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a Northeasterly direction. In the winter months, blizzard conditions often accompany these events. The added impact of the masses of snow and/or ice upon infrastructure often affects transportation and the delivery of goods and services for extended periods.

Ice and snow events typically occur during the winter months and can cause loss of life, property damage, and tree damage. Severe winter storms, including Nor'easters, typically occur during January and February. However, winter storms can occur from late September through late May. Numerous severe winter events in recent history have occurred in the State, region, and the local area surrounding Bradford that may have also had an impact on the Town. Unlike the relatively infrequent hurricane, New Hampshire generally experiences at least several Nor'easters each year with varying degrees of severity. They form along the East coast as warm air from the Atlantic Ocean collides with cold arctic winds to the north and west. A hurricane, the nor'easter's warm-weather counterpart, differs in that it has a narrow range of strong winds around a warm, low-pressure core—nor'easter winds are more dispersed around a cold, low-pressure center.

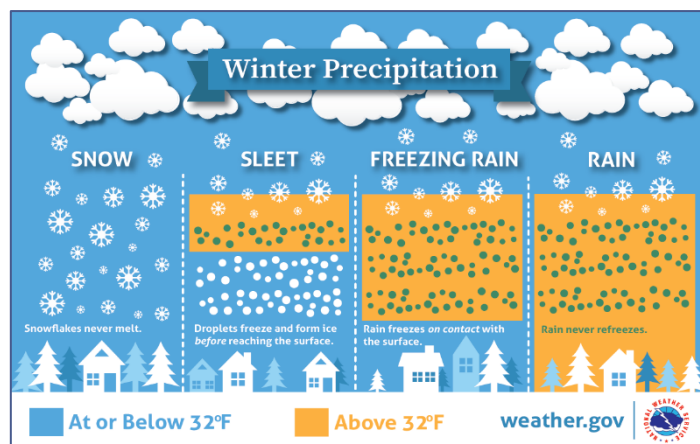
Extreme cold temperatures are associated with continental Arctic air masses. The actual temperatures reached depend specifically on the nature of the cold air mass and where it originated. In general, those from the Arctic regions are the coldest. Though cold temperatures are dangerous, they become more so in conjunction with strong winds. The combination produces a wind-chill factor – heat loss measured in

Watts per meter squared (Wm^{-2}). A wind-chill factor of **1400** Wm^{-2} is equivalent to a temperature of **-40** degrees F. At **2700** Wm^{-2} , exposed flesh freezes within a half-minute.

Heavy snow can immobilize a region, strand commuters, stop the flow of supplies, and disrupt emergency responders. Accumulations of snow can knock down trees and power lines and cause some roofs to collapse. Homes and farms may be isolated for days and unprotected livestock may be lost while businesses either close or are open with reduced hours. The cost of snow removal, repairing damages, and the loss of business can have severe economic impacts on New Hampshire communities.

Winter precipitation includes the following types of weather described and is summarized below:

- ➔ **Blizzard:** Winds of 35 mph or more with snow and blowing snow reducing visibility to less than $\frac{1}{4}$ mile for 3 hours or more.
- ➔ **Blowing Snow:** Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- ➔ **Snow Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- ➔ **Snow Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- ➔ **Snow Flurries:** Light snow falling for short durations with little or no accumulation.
- ➔ **Freezing Rain:** Occurs when the layer of freezing air is so thin, raindrops do not have enough time to freeze before reaching the ground.
- ➔ **Sleet:** Frozen raindrops occurs when the layer of cold, freezing air along the surface is thicker than the warmer air above. This causes the raindrops to freeze before reaching the ground.
- ➔ **Ice Storm:** Results in the accumulation of at least 0.25" of ice on exposed surfaces. Creates hazardous driving and walking conditions, and tree branches and powerlines can easily snap under the weight of the ice.
- ➔ **Lake Effect Storm:** Cold, dry air mass moves over the Great Lakes regions, picking up moisture from the Great Lakes. This air, now full of water, dumps the water as snow in areas to the south and east of the Lakes.



All winter storms make walking and driving extremely dangerous. The elderly and very young are at high risk during winter storms and may be affected by hypothermia and isolation. During winter storms, there is an increased risk of **fire** because people experience **power failure** and use candles, portable gas stoves, generators, and flammable sources of heat and light.

Winter Storm Severity Index (WSSI)

Potential Winter Storm Impacts	
0	No Impacts Impacts not expected.
1	Limited Impacts Rarely a direct threat to life and property. Typically results in little inconveniences.
2	Minor Impacts Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.
3	Moderate Impacts Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.
4	Major Impacts Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.
5	Extreme Impacts Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.

Severe winter weather magnitude can be measured using several different scales and indices including the Winter Storm Severity Index (WSSI), the NCDC Regional Snowfall Index (RSI) for the Northeast and forecasted weather advisories.

The NOAA Weather Prediction Center uses a Winter Storm Severity Index (WSSI), a 1-5 color-coded indices from 0- No Impacts to 5- Extreme Impacts which is used on the winter maps to predict storms **1-3** days out. The WSSI does not depict official warnings of an event.

The Northeast Snowfall Impact Scale (NESIS), upon which was built the national Regional Snowfall Index (RSI) is used to categorize significant snowstorms for the eastern seaboard. The NESIS/RSI ranks snowstorm effects on a scale from **1** to **5**, similar to the Enhanced Fujita Scale for tornadoes or the Saffir-Simpson Hurricane Wind Scale for hurricanes after the fact. The NESIS differs from these other indices because it includes population, a social component.

The NESIS is based on the spatial extent of the storm, the amount of snowfall, and the juxtaposition of these elements with population. The indices in **Table 4.15** measure the magnitude of a snowstorm in the Northeast, which includes New Hampshire.

Table 4.15
Regional Snowfall Index (RSI) for the Northeast (NESIS)

Storm Category	RSI Value	Snow Description
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

Several types of public alert warnings are issued for people to have a chance to prepare and respond accordingly to the winter weather threat. Winter warnings are the most serious alert and represent different types of storms forecasted as displayed in **Table 4.16**.

Winter Alerts	
✳ Winter Watch BE PREPARED	Issued in the 24 to 72 hour forecast timeframe when the risk of a hazardous winter weather event has increased (50 to 80% certainty). It is intended to provide enough lead time so people can prepare.
✳ Winter Advisory BE AWARE	Advisories are issued when a hazardous winter weather event is occurring, is imminent, or has a very high probability of occurrence (generally greater than 80%). An advisory is for less serious conditions that cause significant inconvenience and, if caution is not exercised, could lead to situations that may threaten life and/or property.
✳ Winter Warning TAKE ACTION	Warnings are issued when a hazardous winter weather event is occurring, is imminent, or has a very high probability of occurrence (generally greater than 80%). A warning is used for conditions posing a threat to life or property within the next 12-36 hours.

Table 4.16

Winter Weather Warning Events

Warning Type	Criteria	Description for Next 12-36 Hours
Blizzard Warning	Gusts \geq 35 mph, visibility $< 1/4$ mile	Blizzard event is imminent or expected in the next 12 to 36 hours. Sustained wind or frequent gusts greater than or equal to 35 mph will accompany falling and/or blowing snow to frequently reduce visibility to less than 1/4 mile for three or more hours.
Ice Storm Warning	$\frac{1}{2}$ " ice over 50% of area	An ice storm event is expected to meet or exceed local ice storm warning criteria in the next 12 to 36 hours. Criteria for ice is 1/2 inch or more over at least 50 percent of the zone or encompassing most of the population.
Winter Storm Warning	7" snow in 12 hrs, or 9+ snow in 24 hrs over 50% of area	A winter storm event (heavy sleet, heavy snow, ice storm, heavy snow and blowing snow or a combination of events) is expected to meet or exceed local winter storm warning criteria in the next 12 to 36 hours. Criteria for snow is 7 inches or more in 12 hours or less; or 9 inches or more in 24 hours covering at least 50 percent of the zone or encompassing most of the population. Use "mid-point" of snowfall range to trigger warning (i.e 5 to 8 inches of snow = warning). Criteria for ice is identical to Ice Storm Warning.
Lake Effect Snow Warning	7" snow in 12 hours, limited area	A lake effect snow event is expected to meet or exceed local lake effect snow warning criteria in the next 12 to 36 hours. Widespread or localized lake induced snow squalls or heavy snow showers which produce snowfall accumulation to 7 or more inches in 12 hours or less. Lake effect snow usually develops in narrow bands and impacts a limited area within a county or forecast zone. Use "mid-point" of snowfall range to trigger warning (i.e 5 to 8 inches of snow = warning).
Wind Chill Warning	Low temps to -25°F	Wind chill temperatures are expected to meet or exceed local wind chill warning criteria in the next 12 to 36 hours. Wind chill temperatures may reach or exceed -25°F .

Source: [Weather.gov](https://www.weather.gov), compiled by CNHRPC 2021

Recent Severe Winter Weather in New Hampshire

The winter season is shifting to January – April, instead of the traditional November to February. The most recent winter seasons have resulted in a recurring snow-and-melt cycle. Winter snowstorms will drop **6"** or more of snow, then will melt within a week or two, or winters will result in little snowfall. These patterns have been more consistently occurring since **2018** in Central New Hampshire. Warmer weather winter storms have the potential to inflict more damage than many hurricanes because the high storm surge and high winds can last from **12 - 72** hours, while the duration of hurricanes ranges from **6 - 12** hours.

Winter Storms Hazards Resource Links:

- ☐ NWS Winter Storm Severity Index (WSSI)
<https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php?id=HGX>
- ☐ NOAA Northeast Snowfall Impact Scale (NESIS)
<https://www.ncei.noaa.gov/access/monitoring/rsi/nesis>
- ☐ NOAA Regional Snowfall Index for US
<https://www.ncdc.noaa.gov/snow-and-ice/rsi>
- ☐ NWS Winter Weather Preparedness Week
https://www.weather.gov/bou/winter_wx_preparedness_week

Ice Storms

The overall ratings of **Ice Storms** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Ice Storm	6.0	MEDIUM	0%	3 Excessive (Red)	0 Damage to 5 Ice Damage	Sperry-Piltz Ice Accumulation Index

Sleet occurs when snowflakes only partially melt when they fall through a shallow layer of warm air. These slushy drops refreeze as they next fall through a deep layer of freezing air above the surface, and eventually reach the ground as frozen rain drops that bounce on impact.

Freezing rain occurs when snowflakes descend into a warmer layer of air and melt completely. When these liquid water drops fall through another thin layer of freezing air just above the surface, they don't have enough time to refreeze before reaching the ground. Because they are "supercooled," they instantly refreeze upon contact with anything that is at or below 0 degrees C, creating a glaze of ice on the ground, trees, power lines, or other objects. A significant accumulation of freezing rain lasting several hours or more is called an ice storm.

Accumulation of ice on roads, trees, and utility lines are dangerous for travelers until the roads are cleared and the utility lines are repaired. Ice storms occur in New Hampshire, especially when warmer winter temperatures mix with precipitation. **Table 4.17** displays the ice damage index.

Table 4.17
Sperry-Piltz Ice Accumulation Index (SPIA)

Ice Damage Index	Average NWS Ice Amount in Inches	Wind Speed mph	Ice Damage and Impact Descriptions
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems. No alerts or advisories needed for crews, few outages.
1	0.10 to 0.25	15 to 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges might become slick and hazardous.
	0.25 to 0.50	> 15	
2	0.10 to 0.25	25-35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions might be extremely hazardous due to ice accumulation.
	0.25 to 0.50	15-25	
	0.50 to 0.75	< 15	
3	0.10 to 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days. Warming sites needed.
	0.25 to 0.50	25 - 35	
	0.50 to 0.75	15 - 25	
	0.75 to 1.00	< 15	

Ice Damage Index	Average NWS Ice Amount in Inches	Wind Speed mph	Ice Damage and Impact Descriptions
4	0.25 to 0.50	> = 35	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days. Shelters or warming sites needed.
	0.50 to 0.75	25 - 35	
	0.75 to 1.00	15 - 25	
	1.00 to 1.50	< 15	
5	0.50 to 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 to 1.00	> = 25	
	1.00 to 1.50	> = 15	
	> 1.50	Any	

Source: www.spia-index.com copyright 2009 (adapted by CNHRPC)

Ice Storm Hazards Resource Links:

- ☐ NWS Ice Storms
<https://www.weather.gov/safety/winter-ice-frost>
- ☐ NOAA National Severe Storms Laboratory – Severe Winter Weather 101
<https://www.nssl.noaa.gov/education/svrwx101/winter/types>
- ☐ Sperry-Piltz Ice Accumulation Index
<https://www.spia-index.com/index.php>

Extreme Heat (Heat Wave)

The overall ratings of **Extreme Heat or Heat Wave** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Heat Wave	4.0	LOW	+25%	Danger (Orange)	Likelihood of Heat Disorders, Caution (Yellow) - Extreme Danger (Red)	NOAA Heat Index

A heat wave is a period of abnormally and uncomfortably hot and unusually humid weather that typically lasts two or more days. The National Weather Services' Heat Index is used to measure humidity against temperature to develop a "real feel" temperature. Heat disorders on the body are quick and can be deadly. These now normal hot temperatures in the summer are commonly known as **excessive heat**.

The National Weather Service categorizes a **Hot Day** when temperatures reach **90°** or warmer. An official **Heat Wave** is defined as three or more consecutive days with the temperature reaching or exceeding **90°**.

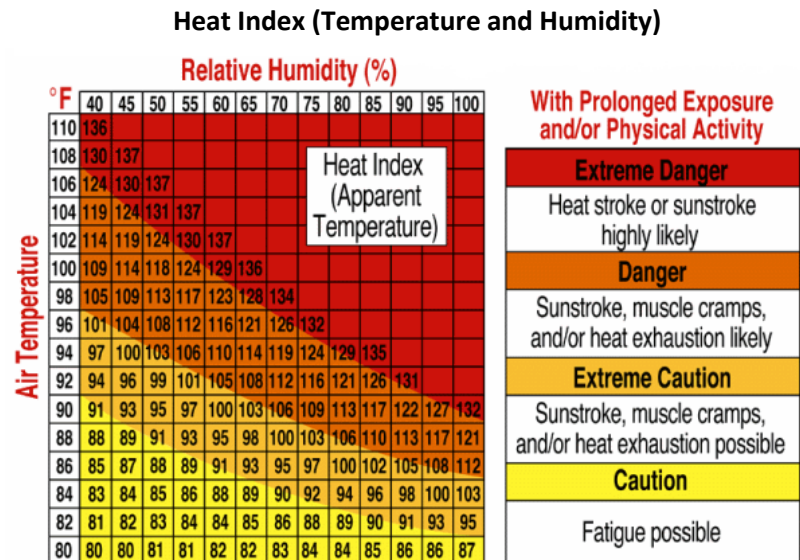
Extreme heat weather is forecasted with the following levels of high temperatures. **Excessive Heat Outlooks** are issued when the potential exists for an excessive heat event in the next **3-7** days. An outlook provides information to those who need considerable lead-time to prepare for the event.

Excessive Heat Alerts	
Excessive Heat Outlook BE AWARE	The Excessive Heat Outlooks are issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.
Excessive Heat Watch BE PREPARED	A Heat Watch is issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
Excessive Heat Warning TAKE ACTION	An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Warning is when the maximum heat index temperature is expected to be 105°F or higher for at least 2 days and nighttime air temperatures will not drop below 75°F ; however, these criteria vary across the country, especially for areas not used to extreme heat conditions. If you don't take precautions immediately when conditions are extreme, you may become seriously ill or even die.
Heat Advisory TAKE ACTION	A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions. The general rule of thumb for this Advisory is when the maximum heat index temperature is expected to be 100°F or higher for at least 2 days, and nighttime air temperatures will not drop below 75°F ; however, these criteria vary across the country, especially for areas that are not used to dangerous heat conditions. Take precautions to avoid heat illness. If you don't take precautions, you may become seriously ill or even die.

Excessive heat is measured by the NOAA's Heat Index and Excessive Heat Warning Classifications. As both the air temperature and the humidity rise, so will the danger level to people. Heat disorders will become more likely with prolonged exposure or strenuous activity as shown in the Heat Index.

The **Caution** stage describes how fatigue is possible, while **Extreme Caution** temperatures can result in sunstroke, muscle cramps, or heat exhaustion. The **Danger** temperatures could cause sunstroke, while at the **Extreme Danger** temperatures, heatstroke or

sunstroke is likely according to the humidity and temperature Heat Index. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to **15°F**. Strong winds, particularly with very hot, dry air, can be extremely hazardous due to dehydrating effects.



Extreme Heat Hazards Resource Links:

- ☐ National Integrated Heat Health Information System (Data & Mapper)
<https://www.heat.gov>
- ☐ US EPA Climate Change Indicators: Heat Waves
<https://www.epa.gov/climate-indicators/climate-change-indicators-heat-waves>
- ☐ NOAA Jet Stream-Heat Index
<https://www.noaa.gov/jetstream/synoptic/heat-index>
- ☐ NWS Heat Watches and Warnings
<https://www.weather.gov/safety/heat-ww>

Extreme Cold (Cold Wave)

The overall ratings of **Extreme Cold or Cold Wave** in Bradford from the **HIRA** are:

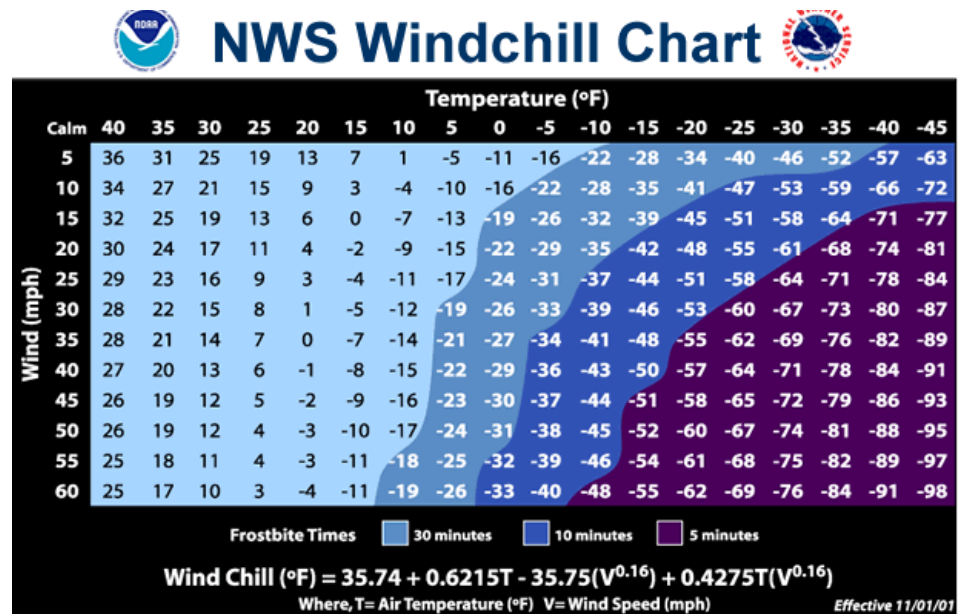
Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Cold Wave	5.3	MEDIUM	0%	<=30 minutes (blue)	<5 minutes to > 2 hours for Frostbite Times	NOAA Wind Chill Temperature Index

A **cold wave** is a rapid fall in temperature within 24 hours and extreme low temperatures for an extended period. The temperatures classified as a cold wave are dependent on the location and defined by the local National Weather Service (NWS) weather forecast office.

Extreme cold temperatures are associated with continental Arctic air masses. The actual temperatures reached depend specifically on the nature of the cold air mass and where it originated. In general, those from the Arctic regions are the coldest. Though cold temperatures are dangerous, they become more so in conjunction with strong winds. The combination produces a wind-chill factor, which is heat loss measured in Watts per meter squared (Wm^{-2}). A wind-chill factor of **1400** Wm^{-2} is equivalent to a temperature of **-40° F**. At **2700** Wm^{-2} , exposed flesh freezes within a half-minute.

Extreme cold magnitude can be measured for **windchill** using the **NWS Windchill Temperature (WCT) Index**, measuring the wind and temperature leading to how quickly frostbite can occur. The **extreme cold weather** warning stages describe the potential impacts of the weather.

Windchill Temperature & Wind Index



To determine the wind chill temperature, find the value closest to outside air temperature and the value that most closely represents present wind speed. Wind chill temperature is the value where lines drawn from the air temperature and wind cross. The colder and windier, the faster frostbite and hypothermia will occur.

Cold weather warnings incrementally warn people of the dangers of **extreme cold**. The local National Weather Service provides watches, advisories, and warnings of wind chill.

Wind Chill Alerts	
⇒ Wind Chill Advisory BE AWARE	NWS issues a wind chill advisory when seasonably cold wind chill values, but not extremely cold values, are expected or are occurring. Be sure you and your loved ones dress appropriately and cover exposed skin when venturing outdoors. A Wind Chill Advisory is issued for New Hampshire when wind chill values are expected to be -20°F to -29°F and winds are greater than 5 mph .
⇒ Wind Chill Watch BE PREPARED	NWS issues a wind chill watch when dangerously cold wind chill values are possible. As with a warning, adjust your plans to avoid being outside during the coldest parts of the day. Make sure your car has at least a half tank of gas and update your winter survival kit.
⇒ Wind Chill Warning TAKE ACTION	NWS issues a wind chill warning when dangerously cold wind chill values are expected or are occurring. A Wind Chill Warning is issued for New Hampshire when wind chill values are expected to be -30°F and winds are greater than 5 mph .

In addition to cold winds, the National Weather Service provides **extreme cold** guidance for several stages of weather alerts that are usually directed towards vegetation and crops. However, these freezing stages can also apply to watercourses, to animals kept outdoors or in barns, and to infrastructure such as bridges, dams, and roads (“black ice”).

Frost to Freeze Alerts	
✱ Frost Advisory BE AWARE	A Frost Advisory is issued when areas of frost are expected or occurring, posing a threat to sensitive vegetation. Frost develops on clear, calm nights and can occur when the air temperature is in the mid-30°Fs. Each plant species has a different tolerance to cold temperatures.
✱ Freeze Watch BE PREPARED	NWS issues a Freeze Watch when there is a potential for significant, widespread freezing temperatures (below 32°F) within the next 24-36 hours. A freeze watch is issued in the autumn until the end of the growing season and in the spring at the start of the growing season.
✱ Freeze Warning TAKE ACTION	When temperatures are forecasted to go below 32°F for a long period of time, NWS issues a Freeze Warning . This temperature threshold kills some types of commercial crops and residential plants.
✱ Hard Freeze Warning TAKE ACTION	NWS issues a Hard Freeze Warning when temperatures are expected to drop below 28°F for an extended period of time, killing most types of commercial crops and residential plants.

The **extreme cold** is difficult to define because what constitutes **extreme cold** varies in different parts of the country. Generally, in New Hampshire **extreme cold hazards** can arise through a combination of wind chill, below freezing cold temperatures, and winter storm events. In the Northeast, **extreme cold** means temperatures below zero (**-0°F**). Extended **extreme cold** durations are often referred to as cold snaps.

Although New Hampshire residents are used to frosts, freezes and vegetation protection, **extreme cold** may cause water pipes to freeze and burst in homes that are poorly insulated or without enough heat. The demand for additional heating fuel is necessary during **extreme cold** events, and often electricity failure is experienced during winter storms with **extreme cold**. Exposure to cold conditions can cause frostbite or hypothermia and become life-threatening. Infants, children, and elderly people are most susceptible. Most New Hampshire households are become used to winter storm events and use woodstoves, or propane or electric generators to keep homes warm during extreme cold when power failure occurs. Recommendations are to maintain at least **72** hours' worth of fuel, food, water, medical supplies, medications, and warm clothing in a storm emergency kit as well as to keep vehicles fueled.

Frostbite is damage to body tissue caused by **extreme cold**. A wind chill of **-20°F** will cause frostbite in just **30** minutes. Frostbite causes a loss of feeling and a white or pale appearance in extremities, such as fingers, toes, ear lobes or the tip of the nose. Additional exposure can turn the appendage purple, a dangerous condition. If symptoms are detected, get medical help immediately. If help must wait, slowly re-warm affected areas. However, if the person is also showing signs of hypothermia, warm the body core before the extremities.

Hypothermia is a potentially deadly condition when the body temperature drops to less than **95°F** through exposure to **extreme cold** or extended cold or water submersion. For those who survive, there are likely to be lasting kidney, liver and pancreas problems. Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and apparent exhaustion. Take the person's temperature and if below **95°F**, seek medical care immediately. If help must wait, place the person into a lukewarm bath to warm the core gradually.

Extreme Cold Hazards Resource Links:

- ☐ NWS Windchill Chart
<https://www.weather.gov/bou/windchill>
- ☐ NWS Wind Chill Warning vs. Watch
<https://www.weather.gov/safety/cold-wind-chill-warning>
- ☐ FEMA Cold Wave Risk Index
<https://hazards.fema.gov/nri/cold-wave>

GEOLOGIC HAZARDS

Hazard Type	Main Hazard Category	Specific Hazards Included
Geologic	Earthquake/Landslide	Earthquake, Landslide

Earthquake

The overall ratings of **Earthquake** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Earthquake	4.0	LOW	0%	III Weak (Blue)	I Not Felt to X Extreme Shaking Intensity	USGS Modified Mercalli Intensity Scale
				2.5 MM	<1.5 Magnitude to 8> Magnitude	KGS Earthquake Moment Magnitude (Size) Scale, formerly Richter Magnitude

An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. **Earthquakes** can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause **landslides, flash floods, fires**, and possibly snow avalanches, which are not considered relevant to Bradford's geography. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by scales such as the Richter scale and Mercalli scale. Geologic events are often associated with California, but New England is considered a moderate risk earthquake zone. New Hampshire experiences regular, minor earthquakes with its bedrock geology.

Because the first-used Richter scale method could not account for large magnitude (size) earthquakes, a new logarithmic (base 10) Moment Magnitude (MM) Scale was developed to better measure earthquake magnitude. For each number going up on the scale, the ground motion recorded by a seismograph is increased by tenfold (10 times). The Moment Magnitude records the *energy* of an earthquake.

An earthquake's *intensity* can be measured by the Modified Mercalli Instrumental Intensity (MMI) scale. The two scales do not correlate consistently among sources but utilizing a combination of scales and descriptions on USGS and NOAA sites, **Table 4.18** approximates the Richter to Mercalli comparison. For practical purposes, descriptions of potential impacts to people, furnishings, the built environment and the natural environment are provided to better place earthquake magnitude in perspective.

Table 4.18

Modified Mercalli Intensity (MMI) and Earthquake Moment Magnitude (MM) Scales

Approx. Moment Magnitude (MM)	Modified Mercalli Intensity (MMI)	Damage Category	Perceived Shaking	Potential Impacts			
				People's Reaction	Furnishings	Built Environment	Natural Environment
< 3	I	Instrumental	Not felt	Not felt.	N/A	Passing truck vibrations and noises	Changes in level and clarity of well water are occasionally associated with earthquakes not felt by people
3 – 3.4	II	Just Perceptible	Weak	Felt by a few.	Delicately suspended objects may swing.	N/A	Trees and bodies of water sway.
3.5 - 4	III	Slight	Weak	Felt by several. Vibrations like a truck passing.	Hanging objects may swing appreciably. Vehicles rocked slightly.	N/A	N/A
4.1 – 4.4	IV	Moderate	Light	Felt by many. Sensation like heavy truck striking building.	Dishes rattle. Vehicles rocked noticeably.	Walls creak, windows rattle.	N/A
4.5 – 4.8	V	Rather Strong	Moderate	Felt by nearly all. Frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows in the community.	Trees and bushes shaken noticeably.
4.9 – 5.4	VI	Strong	Strong	Frightens many. People move unsteadily	Many objects fall from shelves. Damage is slight.	A few instances of fallen plaster, broken windows and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
5.5 - 6	VII	Very Strong	Very strong	Frightens most. Some lose balance.	Heavy furniture overturned	Damage negligible in buildings of good design and construction but considerable in some historic, poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread with increasing intensity. Water is stirred and muddy.

Approx. Moment Magnitude (MM)	Modified Mercalli Intensity (MMI)	Damage Category	Perceived Shaking	Potential Impacts			
				People's Reaction	Furnishings	Built Environment	Natural Environment
6.1 – 6.5	VIII	Destructive	Severe	Many find it difficult to stand	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant but severe in historic or some poorly built structures. Widespread fall of chimneys, walls and monuments. Powerlines fallen.	N/A
6.6 - 7	IX	Ruinous	Violent	Some forcibly thrown to the ground	N/A	Damage considerable in some buildings designed to be earthquake resistant; buildings shift off foundations if not bolted.	N/A
7.1 – 7.3	X	Disastrous	Extreme	N/A	N/A	Some well-built wooden structures destroyed. Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant. Dams destroyed.	N/A
7.4 – 8.1	XI	Very Disastrous	N/A	N/A	N/A	Few if any masonry structures remain standing. Bridges destroyed. Rails bent greatly. Wide cracks in ground. Pipelines break	Waves seen on the ground
> 8.1	XII	Catastrophic	N/A	N/A	N/A	Total damage. Lines of sight and level are distorted. Objects thrown into air.	Waves seen on the ground

Source: compiled by CNHRPC, updated June 2023

Most earthquakes in the Central NH region are kilometers deep in bedrock and are of a <3 Magnitude. Little impact is observed or felt during these quakes.

Earthquake Hazards Resource Links:

- ☐ US Geological Survey Modified Mercalli Intensity Scale
<https://www.usgs.gov/media/images/modified-mercalli-intensity-scale>
- ☐ US Geological Survey Earthquake Magnitude, Energy Release, Shaking Intensity
<https://www.usgs.gov/programs/earthquake-hazards/earthquake-magnitude-energy-release-and-shaking-intensity>
- ☐ USGS ShakeMap Earthquake Instrumental Intensity
<https://earthquake.usgs.gov/data/shakemap>
- ☐ Moment Magnitude
<https://geokansas.ku.edu/measuring-earthquake-magnitude-and-intensity>

Landslide

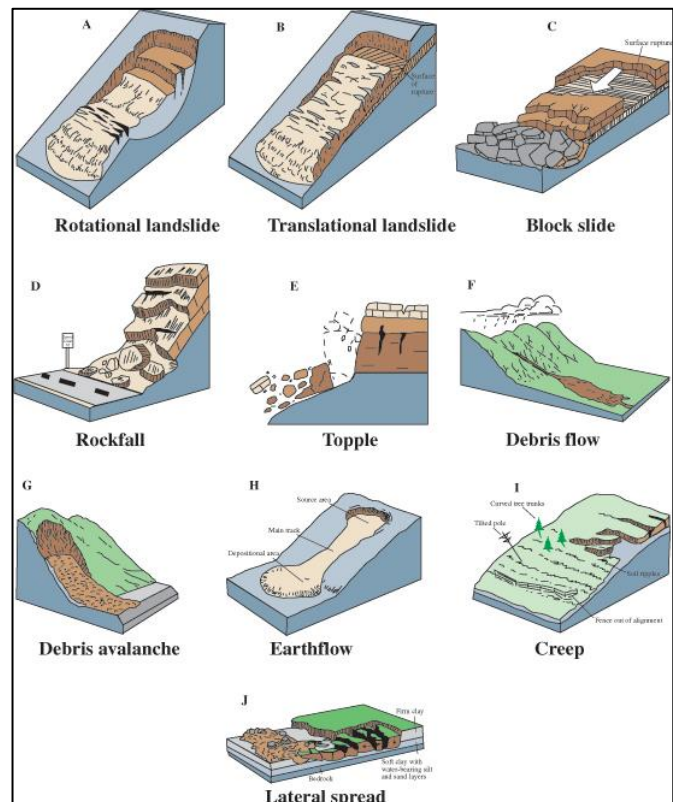
The overall ratings of **Landslide** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Landslide	5.3	MEDIUM	+25%	Low (Blue)	Very Low Risk (Blue) to Very High Risk (Red)	No widely-used scale; FEMA National Risk Index Map

A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity, including: mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides, and earth flows. Erosion of soil may also contribute to landslides. **Landslides** could damage or destroy State roads or local Class V roads, electrical and telephone lines, buildings, sewers, bridges, dams, forests, parks, and farms and landslides are dangerous to people. Different types of landslides could occur depending on geography and conditions.

There is no known standardized measurement of landslide magnitude available. However, FEMA's National Risk Index Map of natural hazards includes landslides, so the Hazard Mitigation Committee chose to use their rating (Relatively Moderate Risk) for Merrimack County.

USGS Basic Types of Landslides



Landslide Hazards Resource Links:

- ☐ FEMA National Risk index Map (Landslides) <https://hazards.fema.gov/nri/map>
- ☐ USGS Landslide Hazards Program <https://www.usgs.gov/programs/landslide-hazards>
- ☐ USGS The Landslide Handbook—A Guide to Understanding Landslides <https://pubs.usgs.gov/circ/1325>

BIOLOGIC HAZARDS

Hazard Type	Main Hazard Category	Specific Hazards Included
Biologic	Public Health/Biological	Swimming Water Quality, Air Quality, Drinking & Surface Water Quality, Infectious Diseases, Arboviral Diseases, Tickborne Diseases, Substance Misuse

The overall ratings of **Public Health** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Public Health/Biologic	9.3	HIGH	+25%			
Swimming Water Quality				Cyanobacteria & E. coli	Bacteria Advisory to Bacteria Warning	NHDES Cyanobacteria/Public Beach Bacterial Warning Levels
Air Quality				Unhealthy (Orange)	Good (Green) to Hazardous (Maroon) Air Quality	NHDES Air Quality Index
Drinking & Surface Water Quality				Poor (Orange)	Good Water Quality (Green) to Severe Water Quality (Red)	NHDES Watershed 305(b)Assessment Summary Reports by Watershed 2020-2022
Infectious Diseases				Elevated (Orange)	Minimal (White - Very High (Red)	NHDHHS Acute Respiratory Activity by County (weekly map)
Arboviral Diseases				Low (Yellow)	No Risk (Yellow) to Very High Risk (Red)	NHDHHS Arboviral Risk Map by Town (annual)
Tickborne Diseases				300 cases/year (Merr Cty)	Rate Per 100,000 persons - Latest 2017-2021 (4 years) = 131 (Merr Cty), 101 (Hills Cty)	NH DHHS Reported Cases of Lyme Disease by County 2017-2021
Substance Misuse				1-5 EMS Drug Overdose/Abuse Incidents/ year	NH DHHS Drug Monitoring Initiative (Map) Monthly and YTD	NH DHHS Drug Monitoring Initiative

Public health issues can be measured in many ways. Students and the elderly are vulnerable to seasonal health outbreaks as they tend to congregate in large numbers and in shared environments where physical contact is common. Large groups can make bioterrorism more effective.

It is difficult to predict where an epidemic would occur due to human, mosquito and wildlife mobility. Commonly occurring epidemics following extreme heat or cold can include **influenza**, norovirus, rhinovirus (viruses), Lyme disease, Anaplasmosis and Babesiosis, Borrelia miyamotoi or Powassan (tickborne diseases), Eastern Equine Encephalitis (EEE), West Nile, Jamestown Canyon Virus or Zika (arboviral, mosquito-borne diseases) and any others could occur in Bradford. The Town has swampy areas around its

rivers, wetlands and brooks which are prime breeding ground for **mosquitoes**. Large deer herds that roam can carry **black-legged ticks** in the Town's heavily forested sections and into State Forests. The **coronavirus** global pandemic is contagious between humans in aerosol /droplet form and is much more contagious and deadly than influenza.

Other wide-spread public health hazards include **water quality degradation** (failing septic systems, flooding, pipes breaking, runoff, haz mat spills) that could sicken residents using the public water supplies (those serving over **25** people), dug wells or bedrock wells, or could cause aquatic and wildlife deaths. Epidemics could result from water quality issues.

Air quality could decline from ground-level ozone or fine particulates and is monitored by the [NH Department of Environmental Services](#). Air Quality Action Days are announced when monitoring sites report poor breathing air.

Food-borne illnesses could result from improperly handled or cooked food, either at home or at restaurants, cafeterias, or from markets or farms.

The NH DHHS maintains [NH Health WISDOM](#), a database portal of public health data for air quality, childhood lead, cancer, asthma, tickborne disease, radon, and more. Many public health threats in New Hampshire have indices, monitoring, and data recording. The NH Department of Health and Human Services (NH DHHS) <https://www.dhhs.nh.gov/> is a good resource to determine what diseases are most prominent in the state at any given time.

Most of these diseases can cause epidemics transmitted through food, water, environment, or personal contact. An epidemic could also result from bioterrorism, whereby an infectious agent is released into a susceptible population. Drug addiction is reportedly high in New Hampshire and is considered a public health hazard. There are many facets public health hazards could take in Bradford. The Town of Bradford is an active member of the [Capital Area Public Health Network](#) and has a designated Point of Dispensing (POD) location at the Bradford Middle School in Bradford.

Biological Infestation

Depending on the type of biological invasive species, a different State department monitors and reports their appearance within New Hampshire.

Invasive Insect Pests

The [NH Department of Agriculture, Markets and Foods Division of Plant Industry's](#) mission is to promote and protect plant health by curtailing the spread of dangerous insects, diseases and weeds moved in commerce. A biological pest, the [Emerald Ash Borer](#), has consumed most of the Central NH Region's ash trees. Only a minority have not been infected. Active logging operations are asked to identify them. The [Hemlock Woolly Adelgid](#) and [Elongate Hemlock Scale](#) are infesting hemlock trees, and the [Red Pine Scale](#)

are infesting our local pine trees (hyperlinks lead to recent NH maps of known infestations). These forest problems have been increasing over the years in Merrimack County and surrounding areas.

Invasive Land Plants

Invasive plants like need to be managed or removed. The [NH Department of Agriculture, Markets and Foods Division of Plant Industry](#) (NHDAMF) also regulates invasive upland plants: It is illegal in New Hampshire to collect, transport, sell, distribute, propagate or transplant any living or viable portion of any listed prohibited invasive plant species including all of their cultivars, varieties, and specified hybrids.

Invasive Aquatic Plants and Insects

The NHDES hosts an [invasive aquatic species program](#) and maintains a [statewide map of the invasive aquatic plant infestations](#) along with an accompanying [list of infested waterbodies](#). and invertebrate pest species and [NH Fish and Game](#) regulating invasive aquatic invertebrates. For public waters throughout the region, the NHDES Volunteer Rivers Assessment Program and NH Lakes Association can check help monitor [invasive water species](#).

Public Beach Monitoring

The NH Department of Environmental Services [Public Beach Inspection Program](#) regularly tests public beaches, both freshwater and saltwater, for the presence of bacteria, like cyanobacteria and e. coli, and dangerous species like jellyfish. Cyanobacteria advisories are issued when there are blooming conditions and cyanobacteria cell concentrations exceed **70,000** cells/ml in recreational waters. Freshwater beach standards for e. coli is 1 sample **> 158** counts/**100** ml.

Milfoil infestation can occur on public ponds of 10 acres or greater. Rivers can carry invasive species like **zebra mussels**. Wetlands, ponds, and meadows are subject to such biological hazards, including in Bradford. The [NHDES OneStop](#) data resource center can be accessed to provide reports on potential water hazards.

Cyanobacteria

Blooms are dynamic. Cyanobacteria are natural components of water bodies worldwide, though blooms and surface scums may form when excess nutrients are available to the water. Some cyanobacteria produce toxins that are stored in the cells and released into the water when the cells die. Toxins can cause both acute and chronic health effects that vary in severity. Acute health effects include irritation of the skin and mucous membranes, tingling, numbness, nausea, vomiting, seizures, and diarrhea.

Chronic effects may include liver and central nervous system damage. Be cautious of lake water that has a



Cyanobacteria Bloom in Loudon, 2022

surface scum, changes colors, or appears to have green streaks or blue-green flecks aggregating along the shore.

If a person or animal is sick from a potential cyanobacteria exposure, please seek medical attention. Inform your physician or veterinarian that you or your pet may have been exposed to toxic cyanobacteria via recreation. Bradford does not likely have locations where cyanobacteria are present.

The NHDES Public Beach Monitoring system tests for cyanobacterial conditions at certain known, specific swimming areas. The mapping system includes Warnings, Advisories, and Alerts for fecal bacteria and cyanobacteria at <https://www.arcgis.com/apps/dashboards/8d84a6b03acb4efaab571b222c78447b>. No river, lake or pond locations are monitored by this program in Bradford.

Public Beach Safety	
WARNING	CLOSED- Bacteria levels exceed recreational health threshold of 70,000 cells/ml (cyanobacteria)
ADVISORY	CLOSED – Continued weekly sampling and likely bacteria/toxin exposure
ALERT	POSSIBLE Bacterial Alert – stay wary
OK	NO Advisory or Advisory Removed

Swimming Warning (Advisory)

Advisories are lake-wide warnings issued when cyanobacteria cell counts exceed the recreational health threshold of 70,000 cells/mL. Surface blooms can rapidly change and accumulate in various locations around a waterbody. Please continue to monitor shorelines for changing conditions. NHDES advises lake users to avoid contact with the water in areas experiencing blooms. Pets and livestock should also be kept out of the water. There are no official public swimming beaches in Bradford, although water recreation is found at Turee Pond.

When an advisory is issued, resampling is performed weekly until the bloom subsides. Advisories are issued from May 15 through October 15. Advisories are not based on toxin evaluation but occur at cyanobacteria cell count densities when toxin production may be likely and are intended as a precautionary measure for short term exposure to cyanotoxins.

Swimming Alert

Alerts are issued 1) based on a photo before NHDES can analyze a sample; 2) when the cyanobacteria density is approaching the recreational health threshold but does not yet exceed it; or 3) if a bloom was reported but may have passed by the time a sample was reviewed but could reoccur. Alerts are intended to serve as statements to be on the watch for a potential cyanobacteria bloom. Waterbody users should avoid contact with bloom material and keep pets and livestock out of the water. Sometimes alerts become advisories, and sometimes they pass. Alerts remain active for a week. Resampling only occurs if further bloom reports are submitted. Alerts are issued year-round as needed.

Air and Water Quality

The [NH DES Drinking Water and Groundwater Bureau](#) administers the federal Safe Drinking Water Act and NH statutes to protect public water systems, drinking water sources and groundwater supplies to help maintain safe **water quality** for drinking. NHDES calculates Total Maximum Daily Load (TMDL) reports of pollutants for the state's water every two years.

Surface Water Quality


Water quality hazards such as radon, arsenic, uranium Per- and polyfluoroalkyl substances (PFAS) industrial chemicals, cyanobacteria, coliform bacteria, lead and copper in public water systems, are constantly being tested for and when found, monitored. Once these enter the groundwater (aquifers) system, they are extremely difficult to mitigate. Damage to infrastructure from natural hazards such as **Inland Flooding** and spring **snow melt** runoff can occur. Various publications describe the NHDES programs to create more resilient water systems.

Although there is no recognized, universal water quality index, state and federal testing is completed to ensure the quality of New Hampshire's **surface waters**. NHDES completed recent Water Quality Assessments (Section 305(b) of the Clean Water Act) of the state's rivers and brooks, covering all of Bradford's waters with a comprehensive report within each watershed. An assessment summary is provided for aquatic life, fish consumption, swimming, and boating.

Watershed 305(b) Water Quality Assessment Index	
Good (2-Good)	Meets water quality standards/thresholds by a relatively large margin.
Marginal (2-Marginal, 2-OBS)	Meets water quality standards/thresholds, but only marginally.
Likely Good (3-PAS)	Limited data available. However, the data available suggests the parameter is Potentially Attaining Standards (PAS).
No Current Data (3-ND)	Insufficient information to make an assessment decision.
Likely Bad (3-PNS)	Limited data available. However, the data available suggests the parameter is Potentially Not Supporting (PNS) water quality standards.
Poor (4A, 4B, 4C)	Not meeting water quality standards/thresholds. The impairment is marginal.
Severe (5-Poor)	Not meeting water quality standards/thresholds. The impairment is more severe and causes poor water quality.

Like most Central NH region towns, fish consumption from local waters in Bradford is unadvisable. **Figure 4.B** displays an excerpt of the latest surface water assessment.

Figure 4.B
Bradford Water Quality Assessment Excerpt 2020/2022



Assessment Unit ID	Map Label	Assessment Unit Name	Aquatic Life	Fish Consump.	Swimming	Boating
NHIMP700030302-02	I*02	West Branch Warner River		4A-M	3-ND	3-ND
NHIMP700030302-03	I*03	West Branch Warner River - West Branch	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-04	I*04	Warner River - Warner River Hydro	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-05	I*05	Warner River - Swain Lovell Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-06	I*06	Unnamed Brook - Fire Pond Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-07	I*07	Unnamed Brook - Recreation Pond	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-08	I*08	Unnamed Brook - Webbs Dugout Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-09	I*09	Unnamed Brook - Tr Hoyt Brook Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-10	I*10	Unnamed Brook - Bibbo Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-11	I*11	Unnamed Brook - Private Pond Dam	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-12	I*12	Unnamed Brook	3-ND	4A-M	3-ND	3-ND
NHIMP700030302-13	I*13	Unnamed Brook	3-ND	4A-M	3-ND	3-ND

Drinking Water Quality

Drinking water quality is a separate issue from surface water and is testing handled differently. According to the NHDES Drinking Water and Groundwater Bureau, naturally occurring contaminants are common in groundwater in New Hampshire. About half of the state's bedrock wells have radon at levels of concern and an estimated 30% have arsenic at levels that exceed the 5 ppb limit that is enforceable in public water systems. Iron and manganese are also quite common at levels that taste bad or cause staining of laundry or fixtures. Manganese may also occur at potentially unsafe levels. Fluoride, beryllium, and radionuclides other than radon are less common but do occur naturally at levels of concern for human consumption throughout the state. Dug wells are less likely to have problems with minerals (arsenic, radon, etc.) but are more likely to have issues with bacteria low pH, road salt and nitrate. New, rising contaminants like Per- and Polyfluorinated Substances (PFAS) are being discovered in water supplies.

Most Bradford residents use private drilled wells for their water consumption. Any testing is completed, or mitigation installed, at the desire and expense of the property owner.

Those who obtain drinking water from public water systems have a regular testing schedule for contaminants, with an annual report available to customers. NHDES may require a water system to implement a drinking water advisory to protect public health. Such advisories may be



issued after detection of E. coli bacteria, a nitrate or nitrite exceedance, a lapse in system integrity, failure of a treatment process, or suspicion of other water-borne pathogens. Drinking water advisories are posted on the NH DES website and customers are notified locally.

Bradford has no municipal water system.

Air Quality

Air quality is a particular danger to the young, elderly people, and those with Chronic Obstructive Pulmonary Diseases (COPD), asthma and other breathing diseases. Ground level ozone and particle pollution are monitored, reported and forecasted for New Hampshire counties. The [Map of Current Air Quality](#) changes daily and is coded to [US EPA's Air Quality Index](#). Air Quality Action Days are announced when the air quality becomes Moderate, Unhealthy or Hazardous. Transportation corridors such as I-89 and I-93, large local industries such as Merrimack Station and Wheelabrator contribute to Central NH Region air pollution, but New Hampshire's air is also impacted by industries and wildfires across the United States and Canada. Greenhouse gases from industrial pollution and manufacturing contributes to poor **air quality**.

The US EPA places these categories into an Ozone and Particulate Pollution table that provides a particulate value of indices to use for magnitude:

Table 4.19

EPA Air Quality Index (AQI) Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Relative AQI Pollutant Levels Comparison



Infectious Diseases

The *2023 State Multi-Hazard Mitigation Plan* includes **Infectious Diseases** as a natural hazard. From this resource, the definition and extent of the potential magnitude of public health threats are identified as follows. These disease levels are described at the US Center for Disease Control (CDC) and included measures New Hampshire has been practicing for COVID-19, including masking, social distancing, staying at home, and quarantine. However, the levels have been archived by the CDC and are no longer actively published.

The magnitude and severity of infectious and/or respiratory diseases are described by speed of onset (how quickly people become sick or cases are reported) and how widespread the infection is. Some infectious diseases are inherently more dangerous and deadly than others, but the best way to describe the extent of diseases relates to the disease occurrence:

Infectious Disease Spread	
§ Sporadic	Disease that occurs infrequently and irregularly.
§ Endemic	(Baseline) Constant presence and/or usual prevalence of a disease or infection agent in a population within a geographic area.
§ Hyperendemic	The persistent, high levels of disease occurrence in the area.
§ Cluster	The aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known.
§ Epidemic	An increase, usually sudden, in the number of cases of a disease above what is normally expected in the population of the area.
§ Outbreak	The same as epidemic, but over a much smaller geographical area.
§ Pandemic	An epidemic that has spread over several countries or continents, usually affecting many people.

The NH Department of Health and Human Services Infectious Disease Control provides information about all types of illnesses spread by community transmission. These illnesses include, but are not limited to flu, sexually transmitted infections, illnesses someone has gotten while in a hospital or other healthcare setting, hepatitis, tuberculosis, Legionnaires disease or HIV, rabies, and Lyme disease.

Coronavirus (Respiratory Infectious)

Coronaviruses are a large family of viruses, but only several types are known to commonly cause infections in people, with these common human coronaviruses usually causing mild to moderate respiratory illness (like the common cold). Newer human coronaviruses, like Severe Acute Respiratory Syndrome (SARS), Middle Eastern Respiratory Syndrome (MERS), and the COVID-19 can cause more severe

symptoms. The COVID-19 disease is originally thought to have spread from animals to humans, but now person-to-person spread is occurring. The virus is spread through the air by coughing and sneezing; by close personal contact, such as touching or shaking hands; and by touching an object or surface with the virus on it, then touching mouth, nose, or eyes before washing hands.

During **March 2020-May 2023** when COVID-19 was extremely active and contagious, the NH Department of Health and Human Services maintained a [COVID-19 dashboard website](#) with current information, statistics, legislation, and testing locations, and resources. Community practices such as social distancing (staying at least **6** feet away from people outside of one's household), wearing cloth or medical facial masks, sanitizing hands, monitoring for symptoms, working from home, remote schooling, and staying at home when possible are the ways to fight the COVID-19. Vaccinations and boosters were necessary and are now an annual (endemic) necessity. Even four years after the pandemic, people throughout the New Hampshire and United States recall feeling stifled and restricted and despite the new variants and the endemic nature of COVID-19, often disregard the community protection practices. With home testing and self-isolation, it is not possible to track new cases unless hospitalization occurs.

Johns Hopkins Coronavirus Resource Center reports in New Hampshire a total of **378,428** confirmed cases and **3,003** deaths from COVID-19, with nearly **73%** of the state's population fully vaccinated. Johns Hopkins stopped collecting data as of **March 10, 2023**, resulting in three years of global data. These figures correlate with data formerly posted by the NH DHHS.

Through March 10, 2023, Johns Hopkins reports nearly **104 million** positive cases in our country and over **1.1 million** people have died in the United States alone from COVID-19 complications. Globally, nearly **677 million** people tested positive and nearly **6.9 million people** died during this time.

Since **March 2, 2020**, a total of **430** cases had officially tested positive in Bradford through **May 2023**. But with time and home testing, the actual figure will be much higher: the number of cases are sure to be under-reported and under-counted, especially as new variants arise and extend the endemic stage of the coronavirus.

Influenza (Respiratory Infectious)

Each week during the flu season, the NH DHHS undertakes Acute Respiratory Illness (ARI) Surveillance by county and produces a state-wide map indicating the levels of likely infection. Its color-codes indices are Minimal (white), Low (light green), Moderate (green), Elevated (orange), High (dark orange), and Very High (red).

The COVID-19 pandemic made plans like the [State of New Hampshire Influenza Pandemic Public Health Preparedness and Response Plan 2007](#) obsolete and no longer available to the public. Few new public health plans have been developed and published for public access, although practices and procedures have arisen to meet the newest public health challenges after consulting with the Centers for Disease

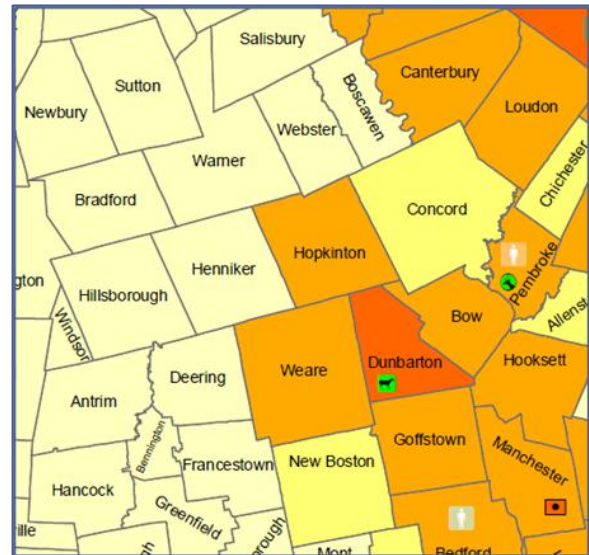
Control and Prevention (CDC). As a growing high-density community, Bradford may be particularly vulnerable to influenza-like respiratory illnesses.

Arboviral Transmission Diseases

Annually, the [NH DHHS publishes the State of New Hampshire Arboviral Illness Surveillance, Prevention, and Response Plan](#) and its associated [Arboviral Risk Map 2024](#). There are 44 species of mosquitos in New Hampshire, but only some species carry Eastern Equine Encephalitis Virus (EEEV), an alphavirus maintained in wild birds; West Nile Virus (WNV), a flavivirus also maintained in wild birds; or Jamestown Canyon Virus (JCV), a bunyavirus maintained in deer. The mosquitos can then infect people, horses, and other animals. Human cases of arboviral transmitted diseases are uncommon but can be severe, resulting in neurologic conditions ranging to death.

New mosquito-borne illnesses are being identified in New Hampshire over time, with WNV in 2000, EEEV in 2004, and JCV in 2013. Testing and surveillance are also conducted for St. Louis Encephalitis (SLE) and Powassan Virus (POWV). Risk levels are Baseline (white), Low (yellow), Moderate (orange), High (dark orange), and Very High (red).

Arboviral Risk Map Excerpt 2024



Tickborne Transmission Diseases

With the transition to warmer weather, tickborne diseases are increasing in New Hampshire. These five are Lyme Disease, Anaplasmosis, Babesiosis, Powassan Virus, and Borrelia miyamotoi. In New Hampshire, these diseases are all transmitted by the bite of the black legged tick, formerly known as the deer tick. Other tickborne diseases such as ehrlichiosis, tularemia and Rocky Mountain Spotted Fever can be caught when traveling to other parts of the country, including other New England states.

The State posts factsheets and other resources such as the [State of NH Tickborne Disease Prevention Plan 2015](#) to raise awareness and educate people how to avoid tick bites and when to seek medical attention. [Tick Free NH](#) is another popular educational resource site.

In **2019**, the NH DHHS ceased tracking Lyme disease and other tickborne diseases for the public by Town (County data is available to 2021). In **2022**, Merrimack County in which Bradford is situated had a reported Lyme disease case number of **107** infected people that year, per the CDC. Since that time, no specific increase in Lyme Disease or tickborne diseases in Bradford residents has been officially or anecdotally noted with no publicly available data to support conclusions.

Substance Misuse

New Hampshire has seen a rise in the number of heroin and opioid deaths over the last few years. Even Bradford has been subject to additional calls for service for overdose. Along with the use of these substances is a commensurate amount of buying and/or making of illegal drugs. The State has made national headlines since **2014** for its problems with overdoses and its public recognition of the problem, and the lack of State medical examiner staff overall to determine the cause of death of suspected overdose decedents.

By **2023**, overdose from opioids (up **6%**), meth (up **54%**), and cocaine (up **56%**) had increased in the state in comparison with previous years. Fentanyl was present in **324** of the **381** confirmed overdose deaths in **2023**. The New Hampshire Drug Monitoring Initiative (DMI) contains an online map and data viewer portraying the state's and counties' statistics for EMS suspected drug overdose or abuse incidents, EMS Narcan administration, opioid-related emergency department visits, drug overdose deaths, and other metrics by month and year. The data available to the public is aggregated by county, but health care personnel and emergency responders may have more specific figures available for communities. Hillsborough County had the highest number of overdose deaths at **3.4** deaths per **10,000** population; Merrimack County in which Bradford is located had **2.02** overdose deaths per **10,000** people. In Bradford in **2023**, between **1-5** people died from overdose, as confirmed by the State Medical Examiner's Office. For Merrimack County, the age group of **30-39** years old has the greatest number of drug overdose/abuse logs. Prescription drug take back boxes at local Police Departments and events that advertise their ability encourage the responsible disposal of drugs and medications.

The NH DHHS and the Capital Area Public Health Network should be notified of all public health infectious emergence threats.

Public Health Hazards Resource Links:

- ☐ NH Department of Environmental Services (NHDES) Healthy Swimming Mapper
<https://www.arcgis.com/apps/dashboards/8d84a6b03acb4efaab571b222c78447b>
- ☐ NHDES Health Advisories: Beach, Air Quality Action, Drinking Water (Data & Mapper)
<https://www.des.nh.gov/advisories>
- ☐ NHDES Water Quality Assessment Total Maximum Daily Load (TMDL)
<https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment>
- ☐ NHDES Water Quality Assessment Mapper and Report
<https://www.arcgis.com/apps/webappviewer/index.html?id=d1ba9c5ec85646538e032580e23174f7>
- ☐ NHDES Drinking Water Advisories
https://www4.des.state.nh.us/Advisories/Drinking_Water
- ☐ NHDES Drinking Water and Groundwater Bureau
<https://www.des.nh.gov/water/drinking-water>
- ☐ NH Department of Health and Human Services (NH DHHS) COVID-19 Dashboard

- ☐ <https://www.nh.gov/covid19/index.htm>
- ☐ NH DHHS Mosquito-Born Illnesses Tracking and Information
<https://www.dhhs.nh.gov/programs-services/disease-prevention/infectious-disease-control/mosquito-borne-illnesses>
- ☐ NH DHHS Infectious Disease Control
<https://www.dhhs.nh.gov/programs-services/disease-prevention/infectious-disease-control>
- ☐ NH DHHS Drug Monitoring Initiative (DMI) Data Reports
<https://www.dhhs.nh.gov/programs-services/health-care/substance-misuse-data-page>
- ☐ NH DHHS WISDOM
<https://wisdom.dhhs.nh.gov/wisdom/#main>
- ☐ NH DHHS Tick-Born Illnesses Tracking and Information
<https://www.dhhs.nh.gov/programs-services/disease-prevention/infectious-disease-control/tickborne-diseases>
- ☐ Capital Area Public Health Network
<http://www.capitalareaphn.org>
- ☐ Centers for Disease Control (CDC) Travel Alert Levels for Outbreak and Disease
<https://wwwnc.cdc.gov/travel/notices>
- ☐ CDC Lyme Disease Reported Case Map by County
<https://www.cdc.gov/lyme/data-research/facts-stats/lyme-disease-case-map.html>
- ☐ US Environmental Protection Agency (US EPA) Air Quality Index
<https://www.airnow.gov/aqi/aqi-basics>
- ☐ Johns Hopkins Coronavirus Resource Center
<https://coronavirus.jhu.edu/region/us/new-hampshire>
- ☐ Center for Disease Control (CDC) Radiation Hazard Scale
<https://www.cdc.gov/radiation-emergencies/php/toolkit/hazard-scale.html>

HELIOSPHERIC HAZARDS

Hazard Type	Main Hazard Category	Specific Hazards Included
Heliospheric	Solar	Geomagnetic Storms, Solar Radiation, Radio Blackout

Solar storms and space weather can refer to solar flares, coronal mass ejections, high-speed solar wind, or geomagnetic storms. Solar activity can occur for as short a duration as a few minutes to several hours and create resulting effects on the Earth for weeks. When a geomagnetic storm occurs, high speed solar winds penetrate the Earth's magnetosphere and can decrease the Earth's magnetic field for several hours.

A significant danger from solar storms is the potential communications and electronics disruption. Satellites, vehicles, radios, airplanes, cell phones, computers, power lines and the internet have the capability for temporary cessation because of solar winds. Solar radiation can become a personal radiation hazard the closer one is to the stratosphere, especially on planes. Satellites, navigation, and electricity are sensitive to geomagnetic storms, which can cause electrical current surges in power lines, interference in the broadcast of radio, television, and telephone signals, and problems with defense communications.

Solar Storms

The overall ratings of **Solar Storms** in Bradford from the **HIRA** are:

Natural Hazard Event	HIRA Overall Risk 1-16	HAZARD CONCERN SUMMARY	Intensity Change % Next 10 Yrs	Highest Magnitude Next 10 Yrs	Scale Range	Scientific Scales Used
Solar Storms	4.0	LOW	+25%			
Geomagnetic Storms				G3 Strong	G1 Minor to G5 Extreme Geomagnetic Storm	NOAA Geomagnetic Storms Scale
Solar Ration				S3 Strong	S1 Minor to S5 Extreme Solar Radiation	NOAA Solar Radiation Storms Scale
Radio Blackout				R3 Strong	R1 Minor to R5 Extreme Radio Blackouts	NOAA Radio Blackouts Scale

The Sun's activity cycle, called the "solar cycle," takes approximately **11** years during which the Sun's magnetic field flips and the Sun's north and south poles switch places. Then it takes about another **11** years for the Sun's north and south poles to flip back again. The Sun is now in Solar Cycle 25 according to NASA, which began in **December 2019** at the minimum end of Solar Cycle 24, which was considered a weak cycle.

For Solar Cycle 25, solar activity has been increasing fast, with more solar flares and sunspots than in Solar Cycle 24, beating initial expectations. The predicted solar maximum may occur earlier than the predicted July 2025. Yet, the cycle remains weaker than Solar Cycle 23. The solar cycle affects activity on the surface of the Sun, such as sunspots which are caused by the Sun's magnetic fields. As the magnetic fields change, so does the amount of activity on the Sun's

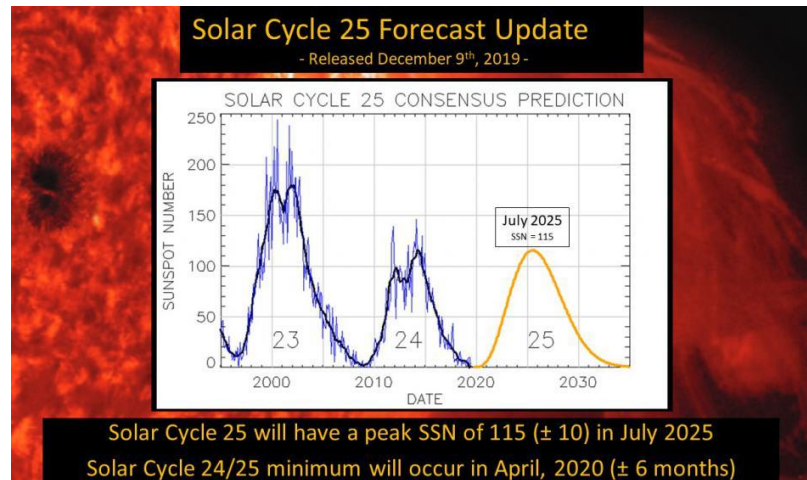
surface. Giant eruptions on the sun, such as solar flares and coronal mass ejections, increase during the solar cycle. These eruptions send powerful bursts of energy and material into space. When the sun's magnetic poles flip, the effects ripple through the solar system since the heliosphere — the region of space influenced by the solar wind — extends billions of miles beyond Pluto.

Magnitude scales for solar storm impacts, **Geomagnetic Storms (G)**, **Solar Radiation Storms (S)**, and **Radio Blackout (R)** are provided in the following respective **Tables**. The Kp is the planetary disturbance index, with 9 the highest.

Table 4.20

Solar Storms: Geomagnetic Storm (G) Magnitude Scale

Magnitude Scale	Description	Effect of Geomagnetic (G) Storm	Frequency Per Solar Cycle
GEOMAGNETIC STORM (G)			
G1 Geomagnetic	Minor Kp=5	<ul style="list-style-type: none"> ✦ Power systems: Weak power grid fluctuations can occur. ✦ Spacecraft operations: Minor impact on satellite operations possible. ✦ Other systems: Migratory animals are affected at this and higher levels; aurora is commonly visible at high latitudes (northern Michigan and Maine). 	1,700 per cycle (900 days per cycle)
G2 Geomagnetic	Moderate Kp=6	<ul style="list-style-type: none"> ✦ Power systems: High-latitude power systems may experience voltage alarms, long-duration storms may cause transformer damage. ✦ Spacecraft operations: Corrective actions to orientation may be required by ground control; possible changes in drag affect orbit predictions. ✦ Other systems: HF radio propagation can fade at higher latitudes, and aurora has been seen as low as New York and Idaho (typically 55° geomagnetic lat.). 	600 per cycle (360 days per cycle)
G3 Geomagnetic	Strong Kp=7	<ul style="list-style-type: none"> ✦ Power systems: Voltage corrections may be required, false alarms triggered on some protection devices. ✦ Spacecraft operations: Surface charging may occur on satellite components, drag may increase on low-Earth-orbit satellites, and corrections may be needed for orientation problems. ✦ Other systems: Intermittent satellite navigation and low-frequency radio navigation problems may occur, HF radio may be intermittent, and aurora has been seen as low as Illinois and Oregon (typically 50° geomagnetic lat.). 	200 per cycle (130 days per cycle)



Magnitude Scale	Description	Effect of Geomagnetic (G) Storm	Frequency Per Solar Cycle
G4 Geomagnetic	Severe Kp=8	<ul style="list-style-type: none"> ✦ Power systems: Possible widespread voltage control problems and some protective systems will mistakenly trip out key assets from the grid. ✦ Spacecraft operations: May experience surface charging and tracking problems, corrections may be needed for orientation problems. ✦ Other systems: Induced pipeline currents affect preventive measures, HF radio propagation sporadic, satellite navigation degraded for hours, low-frequency radio navigation disrupted, and aurora has been seen as low as Alabama and northern California (typically 45° geomagnetic lat.). 	100 per cycle (60 days per cycle)
G5 Geomagnetic	Extreme Kp=9	<ul style="list-style-type: none"> ✦ Power systems: Widespread voltage control problems and protective system problems can occur, some grid systems may experience complete collapse or blackouts. Transformers may experience damage. ✦ Spacecraft operations: May experience extensive surface charging, problems with orientation, uplink/downlink and tracking satellites. ✦ Other systems: Pipeline currents can reach hundreds of amps, HF (high frequency) radio propagation may be impossible in many areas for one to two days, satellite navigation may be degraded for days, low-frequency radio navigation can be out for hours, and aurora has been seen as low as Florida and southern Texas (typically 40° geomagnetic lat.). 	4 per cycle (4 days per cycle)

Table 4.21

Solar Storms: Solar Radiation (S) Magnitude Scale

Magnitude Scale	Description	Effect of Solar Radiation (S) Storm	Frequency Per Solar Cycle
SOLAR RADIATION (S)			
S1 Solar Radiation	Minor	<ul style="list-style-type: none"> ✦ Biological: None. ✦ Satellite operations: None. ✦ Other systems: Minor impacts on HF radio in the polar regions. 	50 per cycle
S2 Solar Radiation	Moderate	<ul style="list-style-type: none"> ✦ Biological: Passengers and crew in high-flying aircraft at high latitudes may be exposed to elevated radiation risk. ✦ Satellite operations: Infrequent single-event upsets possible. ✦ Other systems: Small effects on HF propagation through the polar regions and navigation at polar cap locations possibly affected. 	25 per cycle
S3 Solar Radiation	Strong	<ul style="list-style-type: none"> ✦ Biological: Radiation hazard avoidance recommended for astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. ✦ Satellite operations: Single-event upsets, noise in imaging systems, and slight reduction of efficiency in solar panel are likely. ✦ Other systems: Degraded HF radio propagation through the polar regions and navigation position errors likely. 	10 per cycle
S4 Solar Radiation	Severe	<ul style="list-style-type: none"> ✦ Biological: Unavoidable radiation hazard to astronauts on EVA; passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. ✦ Satellite operations: May experience memory device problems and noise on imaging systems; star-tracker problems may cause orientation problems, and solar panel efficiency can be degraded. ✦ Other systems: Blackout of HF radio communications through the polar regions and increased navigation errors over several days are likely. 	3 per cycle
S5 Solar Radiation	Extreme	<ul style="list-style-type: none"> ✦ Biological: Unavoidable high radiation hazard to astronauts on EVA (extra-vehicular activity); passengers and crew in high-flying aircraft at high latitudes may be exposed to radiation risk. ✦ Satellite operations: Satellites may be rendered useless, memory impacts can cause loss of control, may cause serious noise in image data, star-trackers may be unable to locate sources; permanent damage to solar panels possible. 	Fewer than 1 per cycle

Magnitude Scale	Description	Effect of Solar Radiation (S) Storm	Frequency Per Solar Cycle
		✦ Other systems: Complete blackout of HF (high frequency) communications possible through the polar regions, and position errors make navigation operations extremely difficult.	

Table 4.22

Solar Storms: Radio Blackout (R) Magnitude Scale

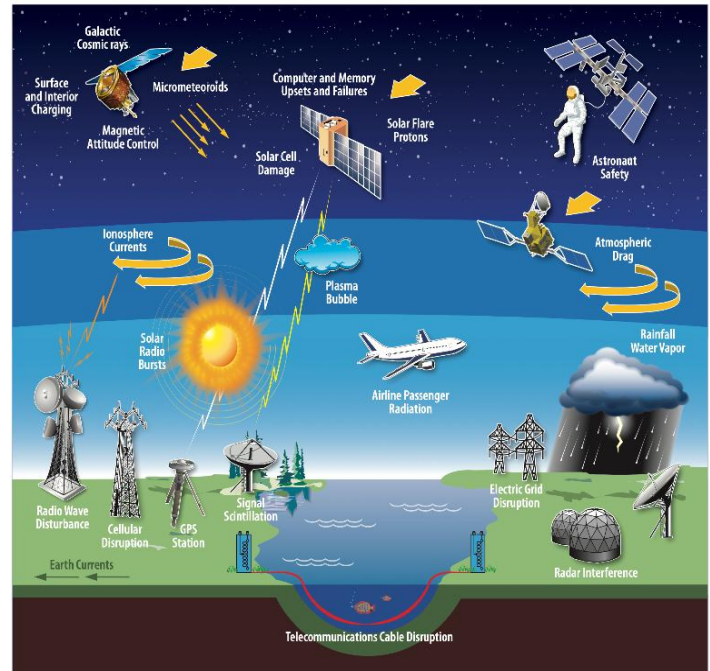
Magnitude Scale	Description	Effect of Radio Blackout (R)	Frequency Per Solar Cycle
RADIO BLACKOUT (R)			
R1 Radio Blackouts	Minor	✦ HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. ✦ Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	2,000 per cycle (950 days per cycle)
R2 Radio Blackouts	Moderate	✦ HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. ✦ Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	350 per cycle (300 days per cycle)
R3 Radio Blackouts	Strong	✦ HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. ✦ Navigation: Low-frequency navigation signals degraded for about an hour.	175 per cycle (140 days per cycle)
R4 Radio Blackouts	Severe	✦ HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. ✦ Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	8 per cycle (8 days per cycle)
R5 Radio Blackouts	Extreme	✦ HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. ✦ Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	Less than 1 per cycle

The average elevation in Bradford is above **800** feet in elevation, such as Pickett Hill, Rowe Mountain (Hill), Durrell Hill, Silver Hill, Ring Hill, Hogg Hill, Goodwin Hill, Guild Hill, Cedar Hill, Haystack Hill, Jericho Hill, Avery's Ledge, and Knights Hill, some of which are inaccessible by road and are particularly vulnerable to the effects of severe winter weather. Many residents in the Central NH region enjoy the aurora borealis viewed from highest elevations, such as nearby Mount Kearsarge. The Capital Area Fire Mutual Aid Fire Compact has emergency communications antennas throughout the region on these highest hilltops. On Mount Kearsarge in Warner, to Bradford's northeast, geomagnetic storms reaching New Hampshire can be readily observed. Emergency response personnel could monitor these storms from the Mount Kearsarge Fire Tower in Warner or from Pat's Peak in Henniker, or possibly the Oak Hill Fire Tower in Loudon. From an individual or municipal standpoint, little can mitigate the impacts of space weather.

Solar Weather Hazards Resource Links:

- ☐ NOAA Space Weather Prediction Center
Solar Cycle 25 Forecast Update
<https://www.swpc.noaa.gov/news/solar-cycle-25-forecast-update>
- ☐ NOAA Space Weather Scales
<https://www.swpc.noaa.gov/noaa-scales-explanation>
- ☐ NOAA's Space Weather Prediction Service
<https://www.swpc.noaa.gov>

NASA Potential Space Weather Impacts



NON-NATURAL HAZARDS

Hazard Type	Main Hazard Category	Specific Hazards Included
Haz Mat	Hazardous Materials/ Radiological	Hazardous Materials, Radiological
Human	Human Hazard	Crash, Mass Casualty Incident, Cyber Event, Terrorism/ Violence
Technological	Technological	Aging Infrastructure, Conflagration (Fire), Long Term Utility Outage

Because the **Hazard Mitigation Plan 2025** has a distinct focus on natural hazards, there will be little examination of human or technological hazards which can be described and acted upon in the local *Emergency Operations Plan*. While an effort will be made to concentrate discussions and evaluation on the natural hazards, there will be no magnitude, extent, or indices descriptions of non-natural hazards.

There is often some overlap between **Hazardous Materials** and **Technological Hazards** as secondary hazard effects of natural hazard events or disasters. A **flood** can cause an old bridge (**Aging Infrastructure**) to fail; **high winds** can cause electric lines to fall (**Utility Outage**). It is acknowledged that **Human**, **Technological**, and **Hazardous Materials** hazards could occur in Bradford, and that the existing preparedness, response, and recovery plans and teams across the region will participate to fix the issues. These non-natural hazards are often noted when discussing the impacts of natural hazards or mitigation because they are often the easiest to mitigate.

Hazardous Materials/Radiological

Hazardous materials and hazardous wastes contain properties that make them potentially dangerous or harmful to humans. They can be liquids, solids, contained gases or sludge. Hazardous wastes can be the by-product of manufacturing, as well as discarded commercial products. Most households contain cleaning agents that become hazardous waste when disposed of improperly. Chemicals have numerous benefits but can also cause hazards during their production, storage, transportation, use or disposal. Hazardous materials can have adverse health related effects and may even cause death in certain cases. In addition, hazardous materials may damage homes, businesses and other property, as well as natural ecosystems. Chemical accidents in plants or chemical spills during transportation may often release hazardous chemicals.

The risk from hazardous materials spills or releases into groundwater is present if consumers and homeowners make irresponsible decisions regarding the disposal of household chemicals. These household chemicals can contaminate drinking water in wells and cause damage to various ecosystems. Most people contaminate without being aware that they are doing so. Further education may be needed to reduce hazardous waste contamination. The necessity for continuing the program of holding biennial

municipal Household Hazard Waste (HHW) collection days is crucial to helping to maintain a healthy environment for Bradford's residents. There is no municipal landfill in Bradford, with contracted solid waste single stream curbside recycling services. Excess trash can be taken to the Concord Transfer Station. Private contracting solid waste services are located in Bradford.

Radiological hazards are unlikely to occur unless at occupational sites or along transportation routes during vehicle crashes. Bradford is outside of the **50**-mile Emergency Planning Zone (EPZ) for Seabrook Nuclear Power Plant. Nuclear power plants produce roughly **20%** of the nation's power and 3 million Americans live within **10** miles of a nuclear power plant, but most are being phased out. The greatest risk to life resulting from a nuclear power plant failure is radiation contamination resulting from radiation release into the environment. People in the immediate vicinity are at greatest risk of radiation contamination.

Transportation Crashes

Automobile crashes could occur on any roadway in the Central NH region. A major accident would have the greatest impact for travelers on Interstates 93, 393 or 89; on US Route 202, US Route 4/202 or US Route 3; on NH Route 3A, NH Route 9, NH Route 13, NH Route 28, NH Route 31 NH Route 49, NH Route 77, NH 103, NH Route 106, NH Route 107, NH 114, NH Route 127, NH Route 129 and NH Route 132 or on their bypasses, interchanges, Exits and on/off ramps. These are high speed corridors with high traffic volumes. Many local roads allow for residential and commuter vehicles at low speeds. A vehicle-pedestrian or vehicle-bicycle crash has a greater casualty rate on the local and state roads as different road users share the same limited space. Bradford's NH 114 and NH 103 corridors are prime locations for vehicle crashes.

Former railroad was converted into rail trail in Bradford. Actively, in the Central NH region, the railroad lines along the Merrimack River create the potential for a (railcar) transportation accident. Trains could potentially derail, causing injuries or fatalities and hazardous materials spills. In the Central NH Region, the Concord-Lincoln Line runs **73** miles between Concord and Lincoln. The New Hampshire Maine Line runs between Concord, Nashua and Lowell, MA. Several communities through which these lines travel have expressed the concern about hazardous material spills due to transportation crashes or sabotage. Concord Municipal Airport is a small airport in the Central NH region used by private small planes, but Manchester-Boston Regional Airport (MHT) can be accessed via I-293 in about 45 minutes. Air traffic can also be hazardous to the region's citizens. Small air traffic sites such as JBI Helicopter in Pembroke, local helipads in communities, and small private air strips increase the chances for a possible aviation crash, especially in the higher elevations around Mount Kearsarge and Pat's Peak. With the technological prominence of personal drones that can be flown within site of the user, possibilities for drone crashes with people, infrastructure or vehicles increase.

Mass Casualty Incident

Mass casualty is the situation for which local, regional, state and national personnel train for treating large numbers of people who are injured from any natural, human or technological disaster. The Central NH Region has many partners for mass casualty training and preparation. [Capital Area Public Health Network](#) (CAPHN) works to promote, protect, and improve the health and well-being of communities within the Capital Area of New Hampshire through the proactive, coordinated, and comprehensive delivery of essential public health services. These include substance misuse prevention, suicide prevention, public health emergency preparedness, vaccinations, and more. The staff works with area emergency management directors. Across New Hampshire, there are **13** regional public health networks.

Concord Hospital is a **295**-licensed beds (plus **238** staffed beds) facility and the only trauma center in the Central NH Region. New London Hospital (**25** critical access beds, **58** long term care beds) and Franklin Regional Hospital (**25** critical access beds) are smaller hospitals in Merrimack County. In Laconia, the Lakes Region General Hospital (**137** beds) has a trauma center. The Dartmouth-Hitchcock Medical Center (**396** beds) in Lebanon has a trauma center and is New Hampshire's only and teaching hospital. The closest hospital to Bradford is Concord Hospital only a **3-5** miles to the north. Mass casualty preparedness is a situation regularly trained for by hospital employees.

The [New Hampshire Hospital Association](#) provides leadership through advocacy, education and information in support of its member hospitals and health care delivery systems. The NHHA encourages its members to develop hospital emergency plans and staffs an Emergency Preparedness Coordinator position to plan for such events. **Mass casualties** of the magnitude that can be expected with a disaster related to terrorism or other incidents like public health events (like COVID) demand an expanded role for hospitals. They must be supported by their communities as they attempt to protect the facility, its patients and personnel while attending to the victims of a disaster. The NHHA has a mutual aid network designed to work together during times of crisis.

Terrorism/Violence

The use of force or violence against people to create fear, cause physical harm and/or intimidation or for reasons of ransom. Terrorists often make threats to create fear and change public opinion. Cyber terrorism consists of hackers who threaten the economy by attacking the intricate computer infrastructure, affecting business and communication. Biological and chemical terrorism refers to those infectious microbes or toxins used to produce illness or death in people or animals. Large groups or close quarters of people can make bioterrorism more effective. Terrorists may contaminate food or water, thus threatening an unprotected civilian population. Eco-terrorism refers to the destruction of property by persons who are generally opposed to the destruction of the environment or to make a visible argument against forms of technology that may be destructive to the environment.

Sabotage/Vandalism

Sabotage is a deliberate action aimed at someone or some institution to weaken that person's or institution's integrity and reputation through subversion, destruction, obstruction, or disruption. Sabotage may occur in war, a workplace, in the natural environment, as a crime, in politics or as a direct attack against an individual. Vandalism is the willful defacement or destruction of property.

Hostage Situation

A **hostage situation** is an incident where innocent civilian(s) are held by someone or some group of persons demanding something from third party not related to the individual(s) being held hostage to ensure the fulfillment of certain terms. Often, a hostage situation results from a domestic dispute.

Civil Disturbance/Public Unrest

This hazard refers to types of disturbances that are caused by a group of people, often in protest against major socio-political problems including sit-ins or protests against wars and any general and public expression of outrage against a political establishment or policy. Many instances of **civil disturbance** and public unrest are quelled by a use of force from police. Participants may be victims of personal injury in severe cases. The most probable locations of larger civil disturbance and/or protest in New Hampshire are at the State House in Concord and at the universities and colleges. They have also occurred at political locations, such as feminist health centers or political party headquarters.

Bioterrorism

Biological hazards can also be caused by bioterrorism, the deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plants. The [US Center for Disease Control \(US CDC\)](#) has categorized the bioterrorism agents into priority Categories **A**, **B** or **C**, indicating how easily they can be spread and the severity of illness or death they cause. The bioterrorism Categories measure the risk of transmission of infectious organisms, germs, or pathogens but does not include chemicals.

Cyber Event

While **cyber events** could be considered technological hazards, they are deliberately initiated by a person or group of people, thus falling into the human hazard category. Cyberattacks are malicious attempts to access or damage a computer system. These events are socially- or politically- motivated attacks carried out primarily through the Internet. Cyberattacks target the general public or national and corporate organizations and are carried out through the spread of malicious programs (viruses), unauthorized web access, fake websites, and other means of stealing personal or institutional information from targets of attacks, causing far-reaching damage. **Cyberattacks** are oriented toward organizations, services, and

individuals to obtain private, technical, and institutional information, and other intellectual assets for the purpose of vandalism or monetary gain.

As computer crimes, they can cause serious consequences to those against which this threat is used. The cyber events range from more harmless such as website hacking, to personally harmful such as identity theft to more dangerous, such as those that cripple critical infrastructure. Cyber events cause harm to people or property and can generate fear. Much of the infrastructure upon which the State of NH relies is automated and could be subject to cyberattacks. These could include the government, military, communications systems, utilities, fuel, electrical systems, nuclear power plants, transportation systems, financial systems, emergency medical services and more.

On a municipal level, computer systems data storage, transmission of emergency communications, daily operations and monitoring or financial information, could be disrupted or be redirected to the perpetrators. Information Technology (IT) **cybersecurity** is paramount, as is employee training, to reduce the incidence of malware, phishing, SQL injection, man-in-the-middle attack, zero-day exploit, and other techniques to gain access to systems. With our society's increasing reliance on electronic devices and computers, Bradford's local government and residents should be prepared to address **cyber events** in the various and growing forms they take.

Many technological hazards could be construed as secondary hazards, as they often occur as the result of a primary (natural) hazard. For example, **power failure** or **transportation accidents** (technological) can result from severe winter weather (natural). Scientific measures of magnitude are generally not available for individual technological hazards, but they are provided for **debris impacted infrastructure** and **dam failure** which are closely related to **flooding** and for **hazardous materials spills** and **radiological incident**.

Aging Infrastructure

Infrastructure of a community includes its roads, sidewalks, bridges, culverts, water lines, sewer lines. Those components such as electric lines, telecommunications towers and dams are not considered in this section because they are not usually municipal-owned. The State of New Hampshire maintains responsibility NH 114 and NH 103 in Bradford. The Town is responsible for nearly **46** miles of local Class V gravel and paved roadways, sidewalks, as well as the bridges and culverts. Communities in New Hampshire are faced with the dilemma of poor conditioned infrastructure with not enough funding to pay for rehabilitation, even with grants from the NH Department of Transportation (NHDOT) for roads and bridges and revolving loans from the NH Department of Environmental Services for water infrastructure.

Aging infrastructure creates hazards to people, through **transportation crashes**, **public health water quality crisis**, weakened bridges during **flooding** events, undersized culverts unable to accommodate storm water, and more.

Bridges, Culverts, Roads

Debris impacted infrastructure regularly occurs along the Central NH Region's rivers and streams and along roadways. Rivers or brooks flowing under bridges or through culverts could get clogged or damaged by woody material or leaves in the watercourse. Culvert maintenance is particularly important before and during heavy rainfall and floods. Tree limbs falling onto power lines and onto roadways, disrupting both electricity and the roadway, occur during wind or winter storms. Some of the gravel Town roads in Bradford are constructed using ditching instead of storm drains. The Town is not required to develop and maintain MS4 stormwater regulations. Some of the Town maintained roads are gravel, enabling easier maintenance and washout repair. Bridges and dams are described in the **APPENDIX A Critical and Community Vulnerability Assessment**. See the list of Stream Crossing Assessment culverts from the **Bradford Hazard Mitigation Plan 2019** to identify vulnerable locations to storm events.

Conflagration Fire

Fires which are not natural hazards are often associated with vehicles, structures or hazardous materials spills, or sometimes an explosion. A fire in a densely built or traveled area can become a large, deadly conflagration. These types of fires are considered **Technological Hazards**. Arson, the deliberate setting of a fire as an act of sabotage or mischief is a **Human Hazard** but is contained in this section for convenience. No magnitude scales were defined for these types of non-natural fires.

Long Term Utility Outage

Utilities systems exist everywhere and are subject to damage from construction work, accidents and extreme weather. Many utilities are protected by back-up generators to prevent failure, whatever the cause may be. Another common source of energy, coal, can be potentially hazardous because coal power plants emit chemicals such as mercury and sulfur dioxide.

Any service-providing businesses in Town (gas station, bank, fast food, convenience, etc.) would rely on electricity provided by powerlines, and in many cases, enterprise comes to a standstill during disaster events. Aging, vulnerable populations are at greatest risk in rural Bradford from the effects of **power/utility failure** and **communications failure**. A few individuals in Town require oxygen and power failure and the likely accompanying communications systems failure would comprise the most vulnerable populations. The Fire and Rescue Department and Police Department offer to conduct welfare checks for residents in need.

All residents should be able to shelter in place in their homes for up to **3** days or **72** hours, gathering needed supplies and water ahead of time. **Power failure** can cause inconvenience, loss of economy, extra Town expenditures and staffing, and could restrict emergency response because the typical power failure is a secondary hazard caused by natural weather event. This problem is applicable to the **High Wind**

Events and **Winter Weather** hazard events described earlier as well as **Debris Impacted Infrastructure** and **Transportation Crash** hazard events in the following sections.

Electricity

New Hampshire contains nuclear, coal and natural gas power plants. There is only one (1) coal power plant in New Hampshire, the Merrimack Station in Bradford, currently owned by Granite Shore Power, formerly owned by Eversource and Public Service of New Hampshire. As of 2018, the Merrimack Station is partially decommissioned, only operating when there is a need for additional kilowatt hours in the area. The Station requires 24 hours to become operational, then ceases firing when there is no additional electrical demand. Future plans for the station are to harness solar energy and phase out coal usage.

The US Energy Information Administration data from 2022 reports much of the State's electricity (58%) is provided by the Seabrook Nuclear Power reactor. The remaining 14% of electricity was generated from renewable sources, including solar, hydroelectric, wind, and biomass and Natural gas-fired (15%) and small amounts of coal-fired and petroleum-fired electricity.

In the harsh environment that New Hampshire residents are subjected to, power and utility failures on an isolated level are commonplace. During nearly every heavy snowstorm, ice storm, or other severe weather event, customers can easily lose power and/or other utilities. Bradford is served by Eversource.

Communications Systems Failure

Communications systems, like utilities, are found everywhere and are subject to damage by construction work, severe weather and traffic accidents. Because communications systems depend on electricity, any power outage may cause an interruption in a communications system. In addition, many communications systems have buried cables which are particularly vulnerable to being cut. Communications systems interruptions can negatively impact a region, town, neighborhood or household in the case of a natural disaster, catastrophe or other emergency. Power lines often share cables and poles with communications systems. When power fails, cable, telephone and radio services frequently fail as well.

Telecommunications towers often carry local, regional, county, state and sometimes federal antennas that relay emergency communications. In addition, personal cellular communications are often co-located at the same tower. When a major communications tower is out of service, its impacts are widespread. In some Central NH Regional municipalities, the existing towers do not provide coverage to the entire community and create dead zones. This is particularly dangerous to people without landlines or when emergency services are necessary.

Regional and state communications are often co-located on the tower upon which Town's emergency communications are based. The Town is a member of the Capital Area Mutual Aid Fire Compact which is a centralized communications hub for emergency fire and medical communications. The CAMAFC has redundancy sharing with the Lakes Region Fire Mutual Aid Compact. A series of towers throughout the region carry emergency communications.

5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

The Hazard Mitigation Committee developed and/or updated as needed each of the assets tables within this Chapter. Sites were added or removed, and contact information was revised. Modifications were made to the **Primary Hazard Vulnerability** column to reflect changes over the last five years. Revisions were made to the future development section, which now includes a clear table. The Plan's maps were also updated from the **Bradford Hazard Mitigation Plan 2018**.

The identification of Critical and Community Facilities within Bradford is integral to determining what facilities may be at risk from a natural disaster. Every Critical and Community Facility can be damaged by multiple hazards listed in **4 HAZARD RISK ASSESSMENT**. A tabular inventory of facilities in Bradford is provided in **APPENDIX A CRITICAL AND COMMUNITY FACILITIES VULNERABILITY ASSESSMENT**. The **911 Street Address** and **Phone** number of each facility is supplied, the assessed **Structure Replacement Value \$**, and the **Primary Hazard Vulnerabilities** to which the facility is most susceptible are listed. The hazards identified are primarily natural disasters but regularly include technological (and secondary disasters) such as power failure and communications systems failure as well as human hazards such as vandalism/ sabotage.

Most sites appear on **Map 3: Critical and Community Facilities** and **Map 4: Potential Hazards and Losses**.

Potential dollar losses for each of the facilities' **Structure Replacement Value \$** (not land) have been obtained through the 2024 assessing software and the Summary of Inventory Valuation to provide a starting point of the financial loss possible should these structures become damaged or require replacement. These community facility losses are estimated for the value of structure and does not include land (unless indicated), contents, or infrastructure.

Problem Statements were then generated for each type of facility when issues were identified by the Hazard Mitigation Committee during discussion of the facility characteristics and **Primary Hazard Vulnerabilities**. These **Problem Statements** are listed here.

Potential dollar losses to buildings in Bradford from flooding and other natural hazards are provided using the methods described in the chapter. The Town's participation in the National Flood Insurance Program (NFIP) offers a way for individuals to obtain insurance coverage for flooding. The Town's history with NFIP claims and repetitive losses are examined.

The Chapter provides an inventory of the **Community Facilities** and **Critical Facilities** and the most prevalent hazards to which they are vulnerable. Potential structure damage loss is also provided. The detailed information is available in **APPENDIX A Critical and Community Facilities Vulnerability Assessment**:

Facility Name	Street Address (911)	Phone	Structure Assessed Value* \$	Primary Hazard Vulnerabilities
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Critical Facilities

Critical Facilities are categorized as those Town or State buildings or services that are required to keep the community running during a disaster. The personnel in the Bradford Town Department facilities, the Town Hall, Fire and Rescue Department, Police Department, and Highway Department provide the services necessary for coordinating everyday activities and for emergency response. Other critical partners such as the School District and State of New Hampshire provide essential services. Many staffed and unstaffed support facilities are located in Bradford, such as the Library. Maintained roads, dams, and bridges are required for safe operation during both normal times and hazard events. Utilities or utility features such as cisterns, culverts, dry hydrants, telecommunications towers, phone and internet switching stations, gas lines, water & sewer lines, and electric transmission lines are included because of the essential communication and utility services provided, and their significant impact on Bradford residents when they fail. Other **Critical Facilities** would include educational facilities, medical facilities, and emergency shelters.

Many critical facilities are located in Bradford. The assessed structure/building only value is provided for each facility where available, otherwise estimates are provided to help ascertain the financial impact a disaster can have on the community. However, the assessed structure valuation does not reflect actual structure replacement (rebuilding) which would likely far exceed the valuations in many cases. To view the detailed **Critical Facilities** sites and tables, see **APPENDIX A**. Most of these facilities appear on [Map 3: Community and Critical Facilities](#).

Essential Facilities include: Fire Station, Police Department, Public Works Garage, Town Hall (historic), Bradford Area Community Center, Transfer Station.

Assessed structure (only) valuation for these essential facilities total \$3.3m.

Utilities include:

WATER AND WASTEWATER AND SOLID WASTE: Naughton & Son Recycling Waste and Construction Debris.

ELECTRIC, INTERNET, TELEPHONE: Eversource Main Office, TDS Substation, TDS Substation Box, TDS Substation, Eversource - Poles and Wires, TDS Fiber Optic - Poles and Wires.

TELECOMMUNICATIONS TOWERS: Telecomm Tower Sprint (covers downtown area).

FIRE SUPPRESSION: Breezy Hill Road DH (Lower OE Trucking), Breezy Hill Road DH (Upper), Chestnut Hollow Subdivision Cistern (at cul-de-sac), Davis Road DH, Deer Valley Road DH (Lower toward West Rd), Fairgrounds Road DH, Fairgrounds Road DH (Swamp Area), Fairgrounds Road DH (Upper by Bridge), High Street DH (by Dam), Jones Road & Center Road DH (Bridge), Old Warner Road DH (close to NH 114), Old Warner Road Cistern (Bradford Elementary School), Pleasant View Road DH (Rosewood Country Inn), Rowe Mountain DH (Upper), Rowe Mountain DH (Lower), NH 114 DH (Day Pond Corner), Solitude Ridge Development Cistern (Upper), Solitude Ridge Development Cistern (Lower), South Brook Circle DH, South Road DH (Newbury by Spec One), Sunset Hill Road DH (Lower), Water Street DH (Pond View Cottages),

West Main Street DH (Fire Station), West Meadow Road DH (Bridge), West Road DH (West & Center Rds), West Road DH (Torro's Pond), Private Cistern: Valley Fire Equipment (DBA) [Valley Transportation Inc], Cistern: Town Hall, Private Cistern: Pizza Chef.

Assessed structure (only) valuation for these utility structures total \$9.3m.

Dams include: **1 Significant Hazard (S) Dam** 028.001 Todd Lake Dam (Lake Todd Village District) on Ring Brook.

1 Low Hazard (L) Dam: 028.012 West Branch Dam (Poliquin) on a tributary of the West Branch River.

8 Non-Menace Dams: 028.006 West Branch Dam (West Branch Cottages), 028.009 Bradford Recreation Pond Dam (Town of Bradford), 028.013 Trib of West Branch Dam (Levin, Rowe Mountain Road), 028.016 Trib of Hoyt Brook Dam (Bibbo), 028.017 Reeves Farm Pond Dam (Reeves), 028.018 Klein Recreation Pond Dam (Klein), 028.19 Private Pond Dam (Cook), 028.20 Kincaid Dam (Kincaid).

Estimated structure (only) repair values for these dams total \$5.8m.

Bridges include:

16 TOWN BRIDGES 060/143 Newell Road over West Branch Brook, 063/141 Fairgrounds Road over West Branch Brook, 064/140 Fairgrounds Road over West Branch Brook, 091/102 East Washington Road over Hoyt Brook, 098/114 West Road over Hoyt Brook, 098/117 West Meadow Road over Hoyt Brook, 099/120 West Meadow Road over Hoyt Brook, 100/141 Fairgrounds Road over West Branch Brook, 126/150 Water Street over West Branch Brook, 128/114 Center Road over Hoyt Brook - decking & sides redone in 2023, 128/152 Main Street over Lake Todd Outlet, 135/114 Jewett Road over Hoyt Brook - single lane 10', low use, 140/144 Bradford Center Road over West Branch Brook (Bement Covered Bridge) - rehabilitated in 2018, 141/137 Jones Road over Hoyt Brook, 161/145 Breezy Hill Road over Warner River (Town rebuilt in 2017), 170/129 Breezy Hill Road over Pond Brook (Town rebuilt in 2017) - weight limits.

3 STATE BRIDGES: 127/158 NH 103 over Lake Todd Outlet, 180/105 NH 114 over Lake Massasecum Inlet, 146/140 NH 114 over Warner River, 180/105 NH 114 over Lake Massasecum Inlet.

3 RED LISTED BRIDGES: All of these are Town -owned bridges: 104/141 Johnson Hill Road over West Branch Brook, 168/162 Blaisdell Lake Road over Stream, 168/165 Blaisdell Lake Road over Stream.

Estimated structure (only) rehabilitation values for these bridges total \$57.0m.

Shelters, Schools, and Medical Facilities include:

SCHOOLS AND SHELTERS: Bradford Elementary School, Bradford Area Community Center (Town warming & cooling center, has automatic generator).

MEDICAL FACILITIES: Compassion Veterinary Hospital.

Assessed structure (only) valuation for these schools, medical facilities and shelters totals \$4.2m.

CRITICAL FACILITY PROBLEM STATEMENTS AND EVALUATION

During discussion of these **Critical Facilities**, the Hazard Mitigation Committee identified specific issues or problems that could be further evaluated. **Problem Statements** were developed after ascertaining the **Primary Hazard Vulnerabilities** to the sites and known existing issues. These potential hazards were typically those from the **Hazard Risk Assessment**. The Committee also evaluated these statements to determine whether mitigation actions could be developed. See **APPENDIX A CRITICAL AND COMMUNITY FACILITIES VULNERABLE ASSESSMENT** for the referenced Tables:

Essential Facilities Table

- ⊙ Ice builds up on Capital Area Fire Mutual Aid Compact, Merrimack County and Bradford municipal antennas. If the Bradford Fire Station's 40' antenna (affixed to the roof) is destroyed by a severe wind or winter event, the Town would lose emergency communication to Capital Area and most other locations. Repeaters are set on nearby towers - Craney Hill in Henniker, Wolf Hill in Deering or Mt Kearsarge. Ice buildup is huge on the mountaintop towers. Potential for colocation at the shared tower that contains the Police Dept antenna.
- ⊙ Limited cell service is available in Bradford. The Highway Dept is the first line of defense and radios are difficult to operate with topography.
- ⊙ The I-89 corridor is not built up to the AT&T FirstNet communications standard that I-93 is constructed to.
- ⊙ Consider signage for Fire Station - call 911 for emergencies. There may not be staffing at the Fire Station or Police Station even though there are vehicles in the lot. Personnel are in town vehicles. Refer to Town Website for hours, phone numbers and information. There is cell phone service there.
- ⊙ No radio interoperability in Bradford (HD radios are different).
- ⊙ INFO: Moved into newly renovated Town Hall in mid-May 2024. Will have 3 new meeting rooms. Police Dept does have a variable message board.

Utilities Table

- ⊙ Dry hydrants are vulnerable to many types of hazards. Drought dries up the water access to the hydrants, fed by the fire ponds, brooks and rivers, making wildfires more dangerous. Many fall out of service because of ice flow (like Jones Road at the bridge). Dry hydrants are now wrapped with Scotch-Lite to illuminate them better, on state 9-11 addressing. Fire Dept wants to work with E-911 to add the dry hydrants on the list accessible by mutual aid.

- ⊙ PVC pipe hydrants cracked over time, do not draft any longer because of the air flow. Very vulnerable to environment. Annual flushing and maintenance is performed.
- ⊙ In the winter, frozen fire ponds are not easily cut through to access water, so the fire tanker truck must make longer runs to an easier access. Some access to dry hydrants needs to be plowed (snow depth).
- ⊙ Coverage has improved since 2014, but there is still inadequate cell coverage in Bradford. Jones Road tower does not cover much except for NH 103 East and NH 114, boat launch area. Tower in South Sutton has no antennas yet. Henniker Liberty Hill "fake sequoia" tower may be running by June 2024, coverage slightly improved. I-89 AT&T First Net and US 202 not covered.
- ⊙ IamResponding application used by Fire Dept but if no cell service, phones are unable to provide or receive updates.
- ⊙ Cisterns are owned by private developments and they are supposed to maintain them. Fire Dept is following up on the maintenance for public safety.
- ⊙ There are many privately maintained roads constructed to Class V standards. Plowing access or emergency access might be unavailable.
- ⊙ Bradford has tourism to Lake Massasecum. Mt. Sunapee but does not have cell service and this is unexpected. Many homes do not have landlines. Airbnb renters do not realize there is no service. Economic impact, public safety impact without cellular and radio service. Highway Dept relies on towers and cell service but there is no service and tourists/residents are unable to call in if there is an issue, or worse are unable to call 911. Fire Dept uses Iamresponding app, limited availability for dispatching if there is no cell/data service, bars differ depending on location. Lots of dead spots. Winter 2024 FD submitted application for FEMA SAFER fire grants for booster repeaters in vehicles for better service.
- ⊙ NH Fire Marshal assistance did not have FirstNet coverage during June fire 2024. NH 114 south in Henniker helped by Liberty Hill Rd tower.
- ⊙ Bradford has lots of hills and high elevation areas in proximity to lowland. Cell companies might not be drawn here no matter the incentive. Very rural community.
- ⊙ INFO: NFPA requires subdivisions of 5+ homes needing fire protection.

Dams Table

- ⊙ If Loch Lyndon dam failed in Newbury, significant downstream water pressure on Lake Todd dam. Lake Todd dam- Water Street and houses along, Main Street, Fairgrounds Road access blocked. The Lake Todd Dam has breached in the 20 year+/- past on the High Street side and breaches may recur similarly in the future. Extensive roadwork

whenever a large dam breaches. Most fearful potential – a breach would magnify existing flooding conditions downstream, roadways, bridges, homes.

- ⊙ Beaver dams cause a lot of problems in Bradford. Many problem areas have been identified - West Road, Forest Street, Davis Road, NH 114 by Pleasant Valley, and Lake Todd high water under covered bridge to meadow. Flood annually. Working with Cons Comm, NH Fish & Game, and Trout Unlimited for fish friendly culverts. Highway will get designs to replace the culverts, plan, grant. Will try to live trap when possible, not always successful. Shooting is another option. Beaver raise the water level, higher than the road, culvert size doesn't matter. Next to the road is a bad location. Often building the dams in front of the culverts or across the culverts.
- ⊙ The area of West Road near Pleasant View Dodge's Corner floods occasionally at West Branch River, at Deer Valley culvert upgrade. East Washington Road (every 5 years). Beaver can make the problem worse.
- ⊙ Previous 100-year floods might be now undersized based on current storm conditions.
- ⊙ Blaisdell Lake dam failure in Sutton could impact NH 103 and Blaisdell Lake Road (2 red listed bridges).

Bridges Table

- ⊙ The Town should continue to monitor the red listed bridges to review and prioritize their rehabilitation. Deficient bridges can be dangerous to travelers in any weather and may not hold up well during significant flooding events.

Shelters, Schools and Medical Facilities Table

- ⊙ Bradford does not have a Town Shelter with showers when natural disasters or power outages occur. BACC serves as a warming/cooling shelter with kitchen & restrooms, areas for cots to be set up. People travel to New England College and Colby College if they are open, potential for school buses to be used for greater area communities. More residents have generators now, are self-sustaining.
- ⊙ INFO: Warner EOC could serve as Bradford's EOC during a disaster – all communications are present, generator, parking. Could consider Newbury remotely too.
- ⊙ INFO: Remote emergency response works as well as in person during an incident.
- ⊙ INFO: Local EMTs in Bradford, use Henniker ambulances first. Local Warner Concord Hospital branch and New London Hospital are not far (Sunapee ambulance available from New London). Henniker Rescue Squad is utilized for EMS, travels to New London under regional Compact, Newport. Mass casualty situations are met by mutual aid.

Concord Hospital is available for care. Concord Area Dispatch is used, mutual aid comes from different multiple areas, including Kearsarge Area Mutual Aid.

- ◉ **INFO:** Pay for contract with Henniker to provide ambulance service since 2014. Bradford disbanded ambulance service in 2014. 10/14 fire fighters are EMTs.

Many of these problem statements were developed into Actions discussed later in **7 PRIOR ACTION STATUS** and **8 MITIGATION ACTION PLAN**.

CULVERT UPGRADES

A table of culverts in need of upgrade could appear in multiple sections, such as the **Critical and Community Facility Vulnerability Assessment (APPENDIX A)** or with the **Aging Infrastructure** technological hazard. Instead, as critical facilities, they are included here once within this section and also appear within the **Mitigation Action Plan 2025**. Culverts (including box culverts, often considered “almost bridges”) are responsible for carrying large volumes of water safely under roadways, and with the prior severe flooding events it is necessary to keep Town infrastructure in good condition.

Like most communities, the Town of Bradford has hundreds of culverts under its responsibility. The Highway Department maintains multiple Town culverts daily (debris removal, clearing, repairs) and keeps pace with culvert upgrades as long as Town voters continue to annually fund the projects. The intent is to upgrade failing culverts with either open box culverts or to bridge standards, respectively. There are regular culvert upgrades completed each year, with these numerous smaller culvert upgrades essential.

Table 5.1 displays Bradford’s initial listing of culverts in need of most urgent upgrade and approximately when the upgrades should occur. The total estimated costs for these projects is to be determined, with the Town paying at least 20% for materials, permitting, study and design. Labor for the smaller projects is performed by Town staff and is usually considered an in-kind cost. For larger projects, contracted engineering, design and permitting may need to occur and would be included in the respective cost estimates. The optimal timeframe for these upgrades to protect the Town from **Inland Flooding, River Hazards** and **Aging Infrastructure** is between **2025-2030** which is within the span of this **2025 Plan**.

Table 5.1
Town-Owned Culverts in Need of Upgrade Through 2030

Action #	Location of Culvert(s) to Upgrade	# of Culverts	Intersecting Water	Issue(s) with the Culvert(s)	Upgrade Diameter Inches	Estimated Upgrade Year	Total Approx \$ Cost for All
#50-2012	West Main Street Stone Culverts and Sidewalk Rebuild	multiple	---	Bridge on both ends of the road, one is It is rusted and failing. This upgrade project would be preventative in nature to ensure road washouts during flooding	TBD	2029-2030	>\$100,000

5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

Action #	Location of Culvert(s) to Upgrade	# of Culverts	Intersecting Water	Issue(s) with the Culvert(s)	Upgrade Diameter Inches	Estimated Upgrade Year	Total Approx \$ Cost for All
				conditions do not occur as frequently. 15"			
#52-2012	West Main Street Bridge and High Street Culverts Drainage System	multiple	---	This culvert has flooded and eroded, and there was a hole in the road. Connects multiple streets, a 4-way intersection. Problems have included collapsing/ failing/ rusting older culverts blocking the water, water coming up through the road, roadway sinkholes	TBD	2027-2028	>\$100,000
#84-2025	Deer Valley Red Listed Culvert to a Box Culvert or Bridge	1	West Branch	Previous 100-year floods might be now undersized based on current storm conditions. Not beaver, floods occasionally. West Road near Pleasant View Dodge's Corner flood occasionally at West Branch River,	TBD	2025-2026	>\$100,000
#85-2025	Blaisdell Lake 2 Red Listed Bridges	2 bridges	---	Bridge has a metal deck plate to be replaced.	TBD	2027-2028	>\$100,000
#86-2025	Johnson Hill Road Red Listed Bridge	1 bridge	----	On Class V seasonal road. Good access off Sunset and Hogg Hill. Bridge has a metal deck plate to be replaced.	TBD	2029-2030	>\$100,000
Totals							\$TBD

Source: Bradford 2025 Mitigation Action Plan, Highway Department

This table can help the Town develop a formalized culvert upgrade and maintenance planning document. Mapped drainage facilities permit data to be collected and is easily revised and updated. Instant access to culvert and drainage information can be of valuable assistance during **flooding** events, such as **run-off**, **overtop flooding conditions** and **road washouts**. On an annual basis, a culvert maintenance plan can help guide the Town's decisions of priority replacement, maintenance, and monitoring of culverts and drainage facilities. Budgeting is clearer and may be more successful at Town Meeting with such a plan. Some of the culverts listed in **Table 5.1** have been developed into **Mitigation Action Plan** items in **8 MITIGATION ACTION PLAN**.

Like all communities, the Town owns and maintains hundreds of culverts. Most of the culverts are maintained (debris removal) on a regular basis and are upgraded when a specific need arises, such as a flood event which causes road erosion or washout. A comprehensive inventory of culverts and culvert conditions was conducted in Bradford to develop a Culvert Maintenance Program and policy followed by the Highway Department.

MOST VULNERABLE ROADS AND NEIGHBORHOODS

The Town of Bradford owns about **60** total miles of roadway including **46** miles of Town maintained Class V (both paved and unpaved roads) and over **13.5** miles unmaintained Class VI roads. Although not responsible for the maintenance of private roads (**9.6** miles) and State highways (**8.5** miles), these roads can also experience storms, natural hazard events, and other problems. Many of these roads are remote, have significant elevation changes, or are dead-end roads or cul-de-sacs with only one way in and one way out. Bradford residents reside in neighborhoods, subdivisions, along roadsides, and within cul-de-sacs. When trees and powerlines fall onto roads or floods or wildfire hazards are occurring, evacuation of most of these neighborhoods would be difficult. The Town's Road mileage, classification, and surface type are displayed in **Table 5.2**.

Table 5.2

Town Road Length and Classification

Bradford Roads Legislative Classification	Total Length in Miles	Percentage of Road Network
Class I (State Primary Highway)	7.4	9.5%
Class II (State Secondary Highway)	1.1	1.4%
Class III (State Recreational)	0	0
Class IV (Urban Maintained)	0	0
Class V (Town Maintained)	46.4	59.5%
Class VI (Town Unmaintained)	13.5	17.3%
Private	9.6	12.3%
Totals	78.0	100.0%

Source: NHDOT GIS Mileage by Town and Legislative Class, January 2025

The Town of Bradford is responsible for the maintenance of the **46** miles of Town owned roads (Class V), some of which are paved and some of which are unpaved. Compared to other small-sized Central NH region communities, the Town of Bradford hosts fewer than average roadway miles.

One-Egress Roads and Cul-de-Sacs

The Town of Bradford has over **60** miles of roadway covering over two dozen local roads, including Town maintained Class V, unmaintained Class VI and private roads, some of which are dead-end roads or cul-de-sacs with only one way in and one way out (**>29** miles). Most of these roads serve homes. Awareness of potential vulnerabilities may help with evacuation and other emergency planning as well as long term mitigation projects in these areas. Evacuation of many of these neighborhoods, most of which are forested, would be difficult. All identified one-egress roads are displayed in **Table 5.3**.

Table 5.3

Vulnerable, One-Egress Roads (Dead End) and Cul-de-Sacs

One-Egress (One Access/ Exit) Road Name	Road Class (Class V, Class VI or Private)	Specific Hazard Concerns	Paved or Unpaved	Approx. Length in Miles
Massasecum Islands (boat)	2 Islands, boat	Flood, Wind, Dam, Ice	---	---
Alder Plains Road	Class V, Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Paved	0.2 1.3
Bible Hill Road	----	Dam, Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	---
Blaisdell Farm Road	---	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	---
Blaisdell Lake Road	Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	1.0
County Road	Class V, Class VI	Wildfire, Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	2.6 0.5
Craig Road	Class VI	Wildfire, Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.3
Crittenden Road	Private	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	1.0
Davis Road	Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Paved	0.5
Day Pond Road	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	1.1
Deer Valley Road North	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Paved	1.7
Deer Valley Road South	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	1.4
East Dunfield Road	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	1.9
East Shore Drive Footpath (12 camps) (boat)	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.6
Forest Street	Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Paved Unpaved	1.0 1.1
Fortune Road	Class V, Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.7 0.6
Howlett Road	Private, Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.1 0.9
Jackson Road	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.3
Jewett Road	Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	0.9
Johnson Hill Road	Class V	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Unpaved	1.2
Massasecum Avenue	Class V, Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	Paved, Unpaved	0.8 0.7
Mountain Road	Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	1.2
Purrrington Road	Class VI	River, Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	0.4

One-Egress (One Access/ Exit) Road Name	Road Class (Class V, Class VI or Private)	Specific Hazard Concerns	Paved or Unpaved	Approx. Length in Miles
Ring Hill Road	Class V, Private	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion, Public Health	---	0.2
Rowe Mountain Road	Class V, Class VI	Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	2.4
West Dunfield Road	Class V	Wildfire, Flood, Lightning, Wind, Winter/Ice, Storms, Crash, Erosion	---	0.4
West Shore Drive	Class VI	Flood, River, Dam, Lightning	---	0.1
Total Miles:			More than 29 miles	

Source: Bradford Highway Department Road Agent,
NH DOT GIS Feb 2024;

Community Facilities

The **Community Facilities** inventoried in **APPENDIX A** are generally vulnerable to disasters and in need of careful consideration. Some facilities contain vulnerable populations, other community facilities are neighborhoods, roads with many homes or roads with only one access, places where people gather, the economic assets of the community, buildings or sites that contain the history of the town, or facilities which could release hazardous materials during hazard or disaster events. While **Critical Facilities** are strong with emergency preparedness and mitigation measures, **Community Facilities** are typically not as well attuned to these issues and would require more emergency services, and perhaps the first check, during a hazard event disaster.

Vulnerable Populations include:

GROUP QUARTERS: NFI North School (Institutional, ~12-15 beds).

SEASONAL HOUSING: Massasecum Campground and Casino, Beach (~25-30 sites, plus ~3-4 cabins), Miller Cabins (3 cabins @ SF), Wellness Retreat (~10-20 beds) TBD 2024.

CHILD CARE FACILITIES: Creative Learning (Day Care) (~12-24 children).

APARTMENTS/MULTI-FAMILY: Giroux Multi-Unit Apartment Building (~4+ units), Bradford Realty Trust Apartments (~16 units), Poliquin Multi-Unit Buildings (~4 units), Former Barn Apartments (~3-4 units), Vega Multi-Unit Home (~3 units).

Assessed structure (only) valuation for these vulnerable population facilities total \$3.2m.

Economic Assets include:

MAJOR BUSINESSES and services that employ a large number of people or contribute to the local economy: Appleseed Restaurant, Bar Harbor Bank and Trust, Lakeside Bookshop (formerly known as Books By The Lake), Bauer Construction, Bradford Corners (includes Post Office, Laundrymat, and Barbershop), Bradford Village Inn, Bradford Marketplace, Bruce's Auto, Dunkin' Donuts, Hugo Electric Services, Wolfpack Investments, LLC (Formerly Merrimack County Customs, LLC), Miller Amusements (traveling fair/carnival), Karl's Nest Egg Trust aka Rosewood Country Inn, Pickman & Sons Plumbing & Heating, Pizza Chef, Post Office, Rockborn Electric, Breezy Hill Storage, LLC, Sweet Beet Farmer's Market, Café, Community Kitchen (historic), Wicked Sweet Cakes and Treats.

AGRICULTURAL: Battles Farm Service, Bible Hill (chicken, duck eggs, veg) Farm [Dunne], Bradford Bear Hard Cider, Orchard (Bradford Bear, LLC), Cedar Brook Tree Farm (928 acres), Harris Farm Border Collies (also cattle, horse, poultry, veg, fruit, more), Country Design Group Landscape Architecture [Hasey], Davison's PYO Raspberries Farm [Davison], Deer Valley (honey, veg, horses) Farm [Bibbo], Dow Farm (Trees), Elior Acres (Chickens, Turkeys, Goats) Farm [Renk], Foxfield Farm, LLC, Granite Rose Morgans Horse Farm [Hayes], Harris Farm Border Collies (also cattle, horse, poultry, veg, fruit, more) [Sunny], Lumber Barn Building Supplies (Previously Hull Log Yard), Kearsarge Food Hub / Sweet Beet Market, Kiskanari (sheep, eggs, lamb) Farm [McCandlish], Marson (greenhouse, poultry) Farm, Mock Farm 1, Mock Farm 2 (land only), Nowell Hay Fields (land only), Silver Bear Tree Service, Silver Hill Farm [Bruss],

Stoneridge Farm [Troy], Twigs Firewood (land only), Up On The (cattle) Farm [McDonald], Webb/Gentile Hay Fields, West Meadow Stables, Wheeler Farm (oxen).

See also **Hazardous Materials** facilities. **Assessed structure (only) valuation for these economic asset facilities total \$16.6m.**

Hazardous Materials Facilities include:

INDUSTRY, LIKELY TIER 2 (REPORTABLE) FACILITIES - GAS STATIONS, PROPANE, OIL, MANUFACTURING:

Ayer & Goss Fuel Depot, 2345 Route 114 LLC (Formerly Valley Transportation).

OTHER FACILITIES - VEHICLE SALES, LANDSCAPING & EXCAVATION, LIGHT MANUFACTURE, POSSIBLE CHEMICAL USAGE: 5 Acres Garden Center & Pet Supply, Bradford Laundromat, Bradford Machine, A Cut Above Tree Service [Henderson], Gravel Pit (land only), Lumber Barn Inc, Messer Construction (not sure about this business), Messer Richard H Excavation (RHM Construction Inc) , O & E Trucking (not sure about this business), Valley Excavating, FVB Landscaping.

AUTO REPAIR SHOPS, SALVAGE YARDS, BROWNFIELDS: Bruce's Auto Repair, Inc., Breezy Hill Realty formerly Max Enterprises Garage [Chivers], Hill's Auto, Truck, & Marine, Former Naughton Site (brownfield) [Town], Larry's Salvage, Heselton Lumber Yard/Excavation, Cazz's Place (formerly Caswell Auto).

See also **Economic Asset** facilities. **Assessed structure (only) valuation for these hazardous material facilities total \$4.6m.**

Cemeteries and Churches include:

CHURCHES: First Baptist Church, First Baptist Church Rectory.

CEMETERIES: Ames Family Cemetery, Bagley/Hadley Cemetery, Baptist Church Cemetery, Bradford Center Cemetery (Old Burial Yard), Burial Hill Cemetery, Cheney Cemetery, Colby Cemetery, Cummings/Pierce Cemetery, Durrell Family Cemetery, Eaton Cemetery, French Cemetery, Howlett Cemetery, Marshall/Collins Family Cemetery, New Pond Cemetery* Active, Old Pond Cemetery, Pleasant Hill Cemetery, Presbury Cemetery, Sunny Plains Cemetery* Active Town Active, Union Cemetery.

Assessed structure (only) valuation for church facilities and headstone replacement estimates for cemeteries total \$1.6m.

Historic Sites and Buildings include:

Bradford Center Meetinghouse (Town), Brick Mill at Dam (private), Freight Train Station (former; private), Halsted House (private), Historical Society, Old Schoolhouse.

See also **Recreational and Gathering Sites**. **Assessed structure (only) valuation for these historic facilities total \$2.2m.**

Recreational and Gathering Sites of PUBLIC land and buildings include:

PRIVATE RECREATION: TRAILS, EASEMENTS AND CONSERVATION: Aiken Pasture Town Forest| 136 acres (11/99 public land access type: U), Battles Farm Easement|150 acres (10/11 public land access type: L),

Blitzer Easement (Moss)| 41.37 acres (12/14 public land access type: L), Blitzer Easement| 136 acres (12/99 public land access type: L), Box Corner Lots, Bradford Bog| 177.80 acres (12/08 public land access type: U), Bradford Bog Headwaters| Part of Bradford Bog, Bradford Springs| Part of Bradford Bog, George Clark Woods Easement| 63 acres (11/17 public land access type: L), Dodge Lots (Town)| 15.5 acres (listed as landlocked and largely wet/inaccessible by BCC), Fearnly Easement | 158 acres (3/11 public land access type: L), Governor's Grant Easement| 170 acres (30 in Bradford), McCandlish and Sillars (Kisakanari Easement)| 318 acres (3/11 public land access type: L), Knights Hill Trail| 2.5 miles; Connects to Blitzer Easement; Passes through Low State Forest , Langley Conservation Land (Langley & Kennard Forest) (Town), Low State Forest, Nelson Farm Easement| 88 acres (10/05 public land access type: N), NH Primary Snowmobile Trails 380 + 390, Pearl Town Forest/Park, Pillsbury-Sunapee Highlands Easement| several thousand acres, 451 in Bradford, West Meadow Wetlands (Town).

Some of these sites can be **Economic Assets** to the Town even if the land is untaxable. Only some structure valuations were available.

Assessed valuations for the recreational facilities for land and/or structures total \$2.6m.

Future Development includes both residential and commercial development potential in Bradford.

FUTURE DEVELOPMENTS: As of **11-24** there are several APPROVED/UNBUILT developments or potential developments according to the Planning Board: North Ridge Road Lots.

LEGACY PARCELS: Deer Valley Farm Lots [Bibbo's], Payne Lot, Blank Woodlot, Gagnon Family Lot , MGK Trust Home & Lots [Kincaid], multiple parcels, Rogus Home & Lot, Taylor Home & Lot, Pfeiffle Lot, Massasecum Timber Corps Lot [Bishop], Nelson Farm Home & Lot [Brownson], Goodwin Hill Land LLC [Blitzer].

LOTS IN BRADFORD FOR SALE 05-24: lots for sale during this snapshot include: Alder Plains Road Lot North Ridge Road Lot, Rosewood Country Inn (commercial), Mock NH 114 Unit 4979492.

Assessed valuation for the Potential/Approved PB Developments (LAND) Legacy Parcels (LAND) and Lots for Sale properties (LAND) totals \$2.2m.

COMMUNITY FACILITY PROBLEM STATEMENTS AND EVALUATION

During discussion of these Community Facilities, the Hazard Mitigation Committee identified specific issues or problems that could be further evaluated. **Problem Statements** were developed after ascertaining the **Primary Hazard Vulnerabilities** to the sites and known existing issues. These potential hazards were typically those from the **Hazard Risk Assessment**. The Committee also evaluated these statements to determine whether mitigation actions could be developed. See **APPENDIX A CRITICAL AND COMMUNITY FACILITIES VULNERABLE ASSESSMENT** for the referenced Tables:

Vulnerable Populations Table

- ⊙ Major snowstorms and windstorms could affect picking up and dropping off of children (buses). Fallen trees, road washouts, wildfires. These storms typically cause widespread power outages. Some have long driveways (no turnaround for apparatus).
- ⊙ High water issues at Lake Massasecum campground have been experienced; flooding, septic system overflow, water quality (drinking and swimming). Move people out from RV-type or semi-permanent RV trailer units during flood.
- ⊙ The northeast end of Lake Mass cabins are only accessible by boat or by foot. Residents (12 or more homes) of East Shore Drive parking at end only have accessibility to Bradford via frozen lake, footpath or boat if emergency response is needed. For residents, an increase of insurance would be needed (or insurance for mortgage). Footpath goes over other resident's decks. This group of homes would be in an WUI because of the power line. Fire Dept has a Zodiac boat but it would be ideal to have a dock on Lake Massasecum. Not a very navigable lake. Steep elevated walkways.
- ⊙ There are a couple of islands on the Lake with homes. Underground electric lines (Eversource) under the lake. Hazardous for snowmobiling (underground springs) during the winter.
- ⊙ INFO: PB will review permeability, Cons Comm rain gardens to reduce rapid flow – something is required. Lake Massasecum Protective Association monitoring data, makes recommendations for owners, does outreach.

Economic Assets Table

- ⊙ Drought, erosion, and severe storms, wind events and winter weather would damage many of the agricultural and forestry enterprises in Bradford, both by ruined crops and economically.
- ⊙ Eversource sends out notifications to local EMDs. Town resends out HSEM/NOAA/utility notifications. HSEM – made a WebEOC event in advance, NWS.

Sent to Depts. Eversource will meet with Bradford on critical infrastructure & areas/fuel & supply, before end of summer 2024.

- Severe storms, wind events and winter weather impact businesses and Bradford's local economy.

Hazardous Materials Table

- Bradford has several haz mat facilities and the potential for haz mat incidents. Floods, fires, severe storms or human incidents involving hazardous materials would require assistance beyond local control. Local Fire Dept can handle small spills and cleanup, but a large incident requires more expertise. Anything over 5 gallons is a large spill (diesel, gas, other) reportable to the state.
- Lightning strikes, flooding, erosion, at hazardous materials facilities are concerns, like at the Lumber Barn, O&E Trucking, Naughton's.
- Nearly any weather event, wind or winter/ice or extreme cold/heat, power failure, could create an impact at Ayer & Goss (Dead River) fuel (propane, home heating fuel, gasoline, diesel, nitrogen) haz mat facility. They do not have a backup generator. On Eversource critical facility list. Concern is transportation accident or accident during transfer of fuel. ½ mile to 1 mile evacuation zone. The facility is not staffed, no attendant on premises.
- Rainstorms can inundate Ayer & Goss (Dead River) and carry off any residual spills as runoff into the waterways.
- Lightning strike has occurred at the NH 103 and Main Street stoplight.

Cemeteries & Churches Table

- The cemeteries are in remote areas and are vulnerable to erosion, earthquakes, wind and vandalism. More prone to vandalism than other hazards. Regular mowing should occur.
- Materials used for preserving remains over time have been toxic and some may be leaching into groundwater. Town regulations for concrete vault and cover are required.
- INFO: Sunny Plains Cemetery is an existing cemetery not yet full, and it has an empty parcel available for future burials. One of two Town cemeteries open for new burials, the second at Lake Massasecum.
- INFO: Town regulations for Bradford cemeteries: No plastic flowers. Cremated remains permitted, using the same size regulations as full burials., concrete vault with

a cover. Cemetery Commission Trustees in charge. Purchasing a plot is not easy or straight forward in Bradford.

Historic Sites & Buildings Table

- ⊙ Some local historic sites and buildings are located in remote areas. As a result, vandalism is a problem.
- ⊙ Historic buildings are vulnerable to wildfires and lightning. Since these structures are in remote locations, the structures may not be able to be saved by the time emergency response arrives.
- ⊙ A lot of private houses are dated from before 1850. They are not inventoried.

Recreation & Gathering Sites Table

- ⊙ Some of the Town's recreational and gathering sites are potential areas for vandalism and civil disturbances. In summer 2024, within a ½ mile radius of Town Hall are repainting road lines, have placed movable speed limit warning signs, monitored by PD.
- ⊙ Recreational sites attract both residents and visitors and contribute to the local economy. Should facilities be damaged by flooding, wildfire, lightning, or wind events, the Town would lose these important community assets.
- ⊙ Bradford Pines, Bradford Bog, Lake Massasecum, French's Park (has a seasonal attendant).
- ⊙ Milfoil continues to be a problem in Lake Massasecum although the Town regularly engages in treatment methods. A long-term plan with NHDES helps guide the process. E. coli in the Lake can occur during high flood conditions, shutting down the park/beach. Lake Todd sometimes experiences growth of cyanobacteria, causing shutdown of public beaches and overall danger for swimmers. Town funds annually for milfoil remediation.
- ⊙ If Lake Massasecum or Lake Todd experience severe flooding, erosion or drought, Bradford would lose the economic value brought by visitors and the Town would lose money on boat and OHRV registrations. Homeowners along these lakes could suffer great individual losses and may be unable to leave their homes due to flooding. Many homes rented by AirBnb.
- ⊙ Parking along NH 114 for the boat launch is dangerous. Parked cars and boats cause a significant traffic and crash issue. The boat launch is along the curve.

- ⊙ At the Bement Covered Bridge off Center Road/NH 103, crashes can occur. Bicyclist sections can be dangerous. Consider a one-way traffic pattern. The bridge deck is 12-16' wide, a one lane bridge, 40mph speed. Lots of local traffic in the winter & summer times. Rain quickly impacts the West Branch Warner River height.

Future Development Table

- ⊙ Town services and the School system could not accommodate development of the large lot legacy properties at current Town service levels. Significant upgrades to services, buildings, infrastructure, equipment and staff would need to occur. Some of the lots could be placed under conservation. What is the current capacity that could be handled?
- ⊙ Bradford is a rural, forested community. These large lots are agricultural and forested. Natural disasters such as lightning, wildfire, erosion and severe storms can damage properties. Many of these locations would be difficult to reach by fire apparatus.

Some of these problem statements were developed into Actions discussed later in **7 PRIOR ACTION STATUS** and **8 MITIGATION ACTION PLAN**.

Potential Losses from Natural Disasters

Natural disasters, including floods, wind events, severe winter storms and ice storms, secondary disasters as a result of the natural disasters (such as power loss) and to a lesser degree, human and technological hazards as documented in **4 HAZARD RISK ASSESSMENT** have occurred in Bradford. This section estimates Town-wide structure/building damage in Town from natural hazard events. It is difficult to ascertain the amount of damage caused by a hazard because the damage will depend on the hazard's location and magnitude, making each hazard event somewhat unique. Human and technological hazards are typically even more incalculable. Human loss of life was not included in the potential loss estimates for natural hazards, but could be expected to occur, depending on the severity of the hazard.

While this Plan focuses on being pro-active in those geographic areas of Bradford most prone to recurring hazards (like flooding), some initial estimates of measurable property damage and building damage have been discussed by utilizing simple techniques such as the numbers of structures and assessed valuation. This two-dimensional approach of calculating dollar losses from tangible structures offers a basic yet insightful tool to begin further loss estimation analyses.

TOOLS FOR COMMUNITIES WITH GIS

For gauging more three-dimensional estimation of damages, FEMA has developed a software program entitled HAZUS-MH (for multi-hazard), which is a powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest Geographic Information Systems (GIS) technology to produce estimates of hazard related damage before, or after, a disaster occurs. Developed for ARCGIS which produced the *Maps* for this Plan, HAZUS-MH models various effects of a hazard event such as:

- Physical damage: damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- Economic loss: lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts: impacts to people, including requirements for shelters and medical aid.
- Cost effectiveness of common mitigation strategies: like retrofitting or elevating structures.

Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Distribution Center. Bradford should first ascertain whether a municipal geographic information system (GIS) of hardware and software is appropriate, and if so, consider training staff to perform models. With many Town existing and under-development infrastructure GIS data layers available, HAZUS-MH could prove very helpful for estimating losses for the community on a disaster-specific basis. However, much staff time is necessary to train staff and maintain a GIS system. Official map generation is typically subcontracted out to other agencies now, including the mapping and appraisal

companies used by the Town and the Central NH Regional Planning Commission who developed the *Maps* for this **Hazard Mitigation Plan**.

CALCULATIONS OF POTENTIAL DOLLAR LOSSES BY NATURAL HAZARDS

A more manageable technique was used for loss estimation for the purposes of this **Hazard Mitigation Plan Update**. Natural hazard losses are calculated based on dollar damage ranges over the entire community, or in the case of flooding, buildings in the Special Flood Hazard Areas (SFHAs) are counted and their value is collected. The number of total parcels in the community as of **2024** is **1,447**. Using Bradford's MS-1 **2024** valuation data, **the total assessed value of all residential and non-residential structures ONLY in Bradford (\$250,825,600) is the basis for loss estimation calculations. Land and utilities are not included here.**

Potential Building Dollar Losses by SFHA Flooding

Beginning with the **2018 Plan's** base data, the value of parcels with potential buildings within the floodplain were updated using Bradford's online digital tax maps. The Preliminary **2023** DFIRM SFHAs were not used in this evaluation because they remain subject to revision as of **May 1, 2025**. No geospatial analysis with the **2010** FEMA Digital Flood Insurance Rate Maps (DFIRMs) digital map was possible, but a manual examination had been undertaken to try to identify all parcels with buildings in the SFHAs, although this evaluation does not determine whether the building itself is situated within floodplain boundaries. **Building Type** was characterized into one of four categories, single-family homes, multi-family homes, manufactured homes, and non-residential buildings. Building number and value were excerpted from the assessing database. **Table 5.4** summarizes this data, identifying **306** primary buildings by address in the SFHA. **Land value, building contents value and infrastructure were not considered in these calculations.**

Table 5.4
Building Value in the Special Flood Hazard Areas (SFHAs)

Building Type	Number of Buildings	Total Value of Buildings in SFHA	Average Replacement Value
Single Family Homes	274	\$65,753,800	\$239,977
Multi-family Homes	6	\$2,529,100	\$421,517
Manufactured Homes	7	\$136,600	\$19,514
Non-Residential Buildings	19	\$11,561,800	\$608,516
Totals	306	\$79,981,300	----

Sources: Hazard Mitigation Plan 2018 with 2010 DFIRM data, updated with Town Assessing Data, 2025

In **Table 5.4**, within the Bradford are **274** single family residential homes and **19** non-residential building which may be situated within the 2010 Special Flood Hazard Areas (SFHAs). In addition, **6** multi-family homes and **7** manufactured homes are believed to be located within the floodplain. Using the Town's estimated number of **2020** Census housing unit count (**906**), about **31%** of Bradford's residences seem to be located in a floodplain area. The average replacement value is **\$240k** for a single-family home or **\$608k** for a non-residential building in the SFHA. The total value of all buildings in the Special Flood Hazard Areas from this analysis is about **\$80m**.

There are alternative ways to calculate potential SFHA losses. In the following tables, the average building replacement value was calculated by adding the assessed values of all structures in the special flood hazard areas and dividing by the number of structures. The Federal Emergency Management Agency (FEMA) has developed a process to calculate potential loss for structures during flooding. The potential loss was calculated by multiplying the average replacement value by the percent of damage expected from the hazard event, and then by multiplying that figure by the number of structures.

The costs for repairing or replacing infrastructure such as bridges, railroads, power lines, roads, drainage systems, telephone lines, or natural gas pipelines, land destruction, and the contents of structures are not included in these building damage estimates.

Table 5.5 represents the **worst case scenario of all** single-family homes, multi-family homes, manufactured homes, and non-residential buildings within the Special Flood Hazard Area that are damaged by a flood hazard event.

Table 5.5

Total Buildings Dollar Damage Ranges in Special Flood Hazard Areas (SFHAs)

Building Type	Total Value of Buildings in SFHA	Total Value of Potential Damages in SFHAs by Respective Building Type		
		Eight-Foot Flood 49% Damage	Four-Foot Flood 28% Damage	Two-Foot Flood 20% Damage
Single Family Homes	\$65,753,800	\$32,219,362	\$18,411,064	\$13,150,760
Multi-Family Homes	\$2,529,100	\$1,239,259	\$708,148	\$505,820
Manufactured Homes	\$136,600	\$66,934	\$38,248	\$27,320
Non-Residential Buildings	\$11,561,800	\$5,665,282	\$3,237,304	\$2,312,360

Sources: See **Table 5.4**; FEMA calculations used

If **all 274** single family homes were damaged by a **Two-Foot Flood (20% Damage)**, the dollar damage to the *buildings* could be **\$13.2m** while an **Eight-Foot Flood (49% Damage)** could cause **\$32.2m** in *building* damage. If (**all**) **19** nonresidential building in the SFHA were damaged by a **Two-Foot Flood**, the dollar damage to the *buildings* only could be **\$2.3m** while an **Eight-Foot Flood** could cause **\$5.7m** in *building*

damage. Dollar damage estimations vary according to the standard percentages of damage levels associated with flooding levels set by FEMA.

Table 5.6 also represents the **worst case scenario, but of individual** single-family homes, multi-family homes, manufactured houses, and non-residential buildings within the Special Flood Hazard Area that are damaged by a flood hazard event.

Table 5.6

Individual Building Dollar Damage Ranges in Special Flood Hazard Areas (SFHAs)

Building Type	Average Value of Individual Buildings in SFHA	Individual Value of Potential Damages in SFHAs by Respective Building Type		
		Eight-Foot Flood 49% Damage	Four-Foot Flood 28% Damage	Two-Foot Flood 20% Damage
Single Family Homes	\$239,977	\$117,589	\$67,194	\$47,995
Multi-Family Homes	\$421,517	\$206,543	\$118,025	\$84,303
Manufactured Homes	\$19,514	\$9,562	\$5,464	\$3,903
Non-Residential Buildings	\$608,516	\$298,173	\$170,384	\$121,703

Sources: See **Table 5.4**; FEMA calculations used

One (1) single family home averages **\$48k** when damaged by a **Two-Foot Flood** while an **Eight-Foot Flood** could cause **\$118k** in *building* damages only. One (1) non-residential building in the SFHA is could have **\$121k** in *building* damages for a **Two-Foot Flood**, while experiencing **\$298k** in *building* only damages for an **Eight-Foot Flood**.

Although not an accurate assessment, these dollar damage ranges for **Inland Flooding** in the designated floodplains (SFHAs) provide a general sense of the scale of potential disaster and financial need in the community during flooding events.

Potential Building Dollar Losses by Other Natural Hazards

Flooding is often associated with heavy rains and flash floods, hurricanes, ice jams, rapid snow melting in the spring, and culvert washouts. These are all types of flooding hazards discussed or evaluated previously but can also occur outside of the SFHAs.

Building damage by natural disasters in New Hampshire is not limited to SFHA flooding alone, which is easier to quantify and predict. Simple calculations can be made based upon generalizations of a disaster impacting a certain percentage of the number of buildings in the Town. **The MS-1 2024** pre-revaluation data, **the total assessed value of all residential and non-residential structures ONLY in Bradford (\$250,825,600)** is the basis for loss estimation calculations on **1,447** parcels. **Land and utilities are not included here.** Disaster damages are often illustrated in the following section utilizing a percentage range

of town-wide building damage. At **906** housing units in Bradford counted in the preliminary **2020** US Census, any type of disaster impacting **10%** of Bradford housing units would yield **91** damaged homes.

The inventory of Town sites or buildings in **APPENDIX A CRITICAL AND COMMUNITY FACILITIES VULNERABILITY ASSESSMENT** indicates which hazards each site is most susceptible to and provides its assessed valuation. This dollar value can be used as a damage estimate from the natural hazard events listed below. Yet the potential losses discussed in this section involve all buildings across the community to provide a more distinct portrait of potential losses using the assessed valuation of all town buildings. Damages from natural hazards to anything other than buildings, such as infrastructure, land, humans or building contents, are not examined here. Specific individual studies would be needed to assess more detailed scenarios. Following are potential building-only dollar damages from select natural hazards.

Drought

Drought is often declared on state-wide or region-wide basis, and sometimes by individual community. Dollar damage caused by drought would be difficult to quantify but would most likely impact the agricultural and economic base of a community. Although everyone could be charged to conserve water, agriculture and forestry operations would be most affected and the risk of wildfire increases.

As physical damage is usually isolated to specific locations, the effects of potential disasters at certain facilities could be researched utilizing the Town's assessor's database for valuation on targeted land. Agricultural and forested lands may be among the most affected by drought. Many farm operations have been inventoried in Bradford. Some people who rely on private well water have found their dug wells running dry in **2015-2016** and again in **2018** and **2022** and have needed to dig bedrock wells. Agricultural operations run the risk of high damage from **drought** which also brings economic consequences. In Bradford, these areas include maple tree crops, orchards, tree farms and hay fields. Conservation land forests in Town are also susceptible to loss and fire during **drought** conditions. Groundwater yield in Bradford is a concern to the municipality and drought conditions would make yield worse.

These lands could be physically vulnerable to **droughts** and may become economically damaged by these long-term droughts. A dollar estimate is incalculable.

Earthquake or Landslide

Earthquakes can cause buildings and bridges to collapse, disrupt water supplies, electricity and phone lines and are often associated with **landslides** and **flash floods**. Buildings that are not built to a high seismic design level or are large in size could be susceptible to structural damage. Large facilities or historic buildings including the Town Hall, cemetery headstones, bridges, bridges, many historic homes, Bradford Main Street, Elementary Schools, remote neighborhoods on cul-de-sacs, and densely populated locations are particularly at risk because of building sizes, building age, and/or their large numbers of people contained within or nearby. Important local highways NH 103 and NH 114 and many other primary travel ways drive over major bridges.

Loss of infrastructure or other community buildings or highways could result in fewer services available to residents or reduce the ability to evacuate. Buildings which are located on or near the sides of river and stream banks or that are located on a hill over **15%** could be subject to **landslide** triggered by rains or **erosion**. The Central NH Region area of Boscawen, Webster, Concord, Hopkinton (Contoocook), Henniker, Hillsborough, Salisbury, and Warner (Davisville) hosts frequent epicenters of deep earthquakes.

With a scenario range of **0.5%** to **1%** of buildings damaged throughout the Town, an **earthquake** or **landslide** could potentially cause up to **\$1.3m** to **\$2.5m** in building-only damage costs, not including contents, infrastructure, or land.

Extreme Temperatures

Excessive heat and **extreme cold** can harm property, such as landscaping and agriculture, or infrastructure. People will draw more water from their wells to help alleviate these conditions. Extreme heat can sicken people, causing sunstroke, heat exhaustion and dehydration if the environment is not cool enough or water intake is too low. Conversely, extreme cold can cause hypothermic conditions. In this manner, neither extreme heat nor cold is measurable for dollar damage. Bradford has many vulnerable populations, including public schools, age restricted communities, remote neighborhoods on cul-de-sacs, and more. A detailed inventory of **Vulnerable Populations** can be undertaken by the Town and regularly updated which can be used by emergency responders to ensure susceptible people remain healthy. Dollar damage estimates are not feasible for **extreme temperature** hazards.

High Wind Events, Downburst, Tornado, Storm or Tropical and Post-Tropical Events

The high wind event storms include the **wind events**, **flooding** and **lightning**, but can also just be simply severe winds, downbursts, tornadoes, or hurricanes. When summer **rainstorms** or **thunderstorms** occur, they are often regional in nature, but could just as commonly be localized in some areas, easily identifiable when one section of a roadway is dry and another section of the same road is wet. Sometimes **hail** accompanies these storms. **Thunderstorms** and **rainstorms** are more likely to damage trees, powerlines or crops than buildings, which are more readily damaged by downbursts, tornadoes and hurricanes. These storms typically cover most of, if not the entire, Town, as **winds** and **storms** are large enough and blow through to impact multiple New Hampshire counties. High wind events could be particularly fierce in areas at higher elevations or along transportation corridors such as NH 103 and NH 114 and the **Wests Branch Warner River** or **Warner River**. The Town typically clears trees along roads for each storm (wind, snow, ice, etc), working with Unitol or Eversource to get electricity reconnected.

With a scenario range of **1%** to **5%** of buildings damaged by wind events throughout the Town, a wind event could potentially cause up to **\$2.5m** (for more localized **downburst**, **high winds** and **hail**, or **tornadoes**) to **\$12.5m** (for more damaging and widespread **tropical storms** and **hurricanes**) in building-only damage costs, not including contents, infrastructure, or land.

Lightning

Damage caused by **lightning** would not be Town-wide because it typically strikes in smaller areas. Few places in Bradford are at specific risk, yet higher elevations, telecommunications towers, tall trees are vulnerable and lightning strikes can cause fires. Damages will vary according to the value of the structure and home and the contents inside, and dollar amounts would depend on if the hazard hit an area with a high density of buildings. Specific sites which would cause the greatest impact if struck by **lightning** include conflagrations in the Main Street/Downtown area, Lake Massasecum, Lake Todd, high density neighborhoods around the wildland urban fire interface areas, cul-de-sac neighborhoods, and densely populated buildings. The Schools and Town facilities are necessary for governmental function and provision of basic services which could be interrupted during lightning events.

The Town's utilities, including powerlines, high tension powerlines, telecommunications towers, switching stations, telephone lines and broadband cable internet service, gas lines, water and wastewater facilities and their software control systems, as well as the municipal and School computer systems, are vulnerable to **lightning strike**. Tall buildings could be vulnerable regardless of the presence of lightning rods and grounding systems.

With a scenario of **0.5%** of buildings damaged throughout the Town, a **lightning strike** could potentially cause up to **\$1.3m** in building-only damage costs alone, not including contents, infrastructure, land, or additional damage through fire spreading.

Public Health

Dollar damage estimates are not feasible for **public health** hazards, with such a variety of potential issues, locations, and populations.

River Hazards

Ice jams on the **Warner River** or one of the major brooks could cause of inland inundation **flooding**. Woody material causing **debris impacted infrastructure** may be more likely to impact bridges than ice jams, especially the structurally deficient State or Town bridges. Several bridges or roads span across the rivers, named brooks and many unnamed brooks. Small brooks culverts and drainage systems offer additional opportunity for ice jams, debris blockage, and more.

This average figure of **\$1,000,000** can be used for one (**1**) local small bridge *replacement* in Bradford due to the physical damage caused by **river ice jams** or **debris impacted infrastructure**. The same bridge damaged by **ice** or **debris** which only requires *rehabilitation* could cost **\$500,000**.

Another way to view potential **river hazard** damages is if half (**137**) of the **274** single family homes in the floodplain were damaged by **Two-Foot Flooding (20% Damage)** resulting from **river ice jams** or **debris impacted infrastructure**, there could be up to **\$6.6m** in *building* damage costs.

Winter Weather (Snow, Ice)

Heavy **snow loads**, **icy conditions**, **extreme cold**, **wind chill**, and the secondary hazards (including **power failure**, **transportation accidents** and **debris impacted infrastructure**) are result of **winter storms**. Storms with these conditions have been felt in Bradford in the past. These hazards and secondary impacts are a risk to the community, including isolation, more falls and personal injury (especially by the older residents), and the potential for roof collapse. The most remote locations in Bradford, wooded and forested sections vulnerable to tree fall, include the entire Town and locations along roads. Damage caused by this type of hazard varies according to wind velocity, snow accumulation, tree/limb fall and duration.

With a scenario range of **1%** to **5%** of buildings damaged throughout the Town, **severe winter storms** could potentially cause up to **\$2.5m** to **\$12.5m** in building-only damage costs.

Solar Storms and Space Weather

Dollar damages to structures are not measurable from **solar winds**, **radio blackout**, or **geomagnetic storms**. These hazards impact utilities such as communication systems, antenna arrays, electrical grids, and technology. The Town, School, and public and private utility equipment, along with state and county technology, are vulnerable to **solar storms**, such as antennas and repeaters computer systems, emergency response dispatch systems, electricity, internet, satellite dishes, and software programming interruption that upkeeps essential functions. Although a potential natural hazard, dollar damage estimates are not feasible for solar storms and space weather.

Wildfire

The risk of **wildfire** is difficult to predict based on location. Forest fires are more likely to occur during years of **drought**. In addition, areas and structures that are surrounded by dry vegetation that has not been suitably cleared are at high risk. Humans can contribute by accidents in the woods or dry fields, or by the deliberate setting of **fire** in a structure. The heavily forested woodlands of Town are often remote locations and difficult to access by emergency vehicles. Subdivisions in remote hilltop locations and on private, cul-de-sac or one egress roads are especially vulnerable.

The public access conservation lands and their trails offer wonderful recreational opportunities for residents and visitors. Forests and woodlands are particularly vulnerable to **wildfire** because accidental human-caused fires could occur. Remote fires might not be reported until they become large enough to be spotted. Dollar damage would depend on the extent of the fire, the number and type of buildings burned, and the amount of contents destroyed within the buildings.

With a scenario of **1.0%** of buildings damaged in the Town, a **wildfire** could potentially cause up to **\$2.5m** in *building-only* damage costs, not including contents, infrastructure, or land.

National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities such as Bradford agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding. For more information on the National Flood Insurance Program, visit <https://www.floodsmart.gov/why/why-buy-flood-insurance>.

The initial identification of the Special Flood Hazard Areas (SFHAs) occurred in **June 1974** with the first Flood Hazard Boundary Map on **August 27, 1976** and provisional Maps in **1987**. The first Flood Insurance Study (FIS) and the first FIRMs were developed on **April 15, 1992**. Records indicate Bradford has been a participant in the National Flood Insurance Program (NFIP) since **April 15, 1992**. Unlike many other Central NH region communities, no amended FIS or FIRMs were developed for the Town until almost four decades later.

In the present day, Bradford's effective FIRMs are digital (DFIRMs) dated **April 19, 2010** as is the Merrimack County Flood Insurance Study (FIS) which includes Bradford (community #330106); individual community FIS are no longer being developed. These **2010** newest documents were adopted by the Select Board, supersede all previous NFIP documentation, and are placed into the Town Zoning Ordinance. **Table 5.7** summarizes the historical background of the Town's NFIP effective dates.

Table 5.7
NFIP History of Bradford – Effective Dates

FIS Version	#330107	Flood Insurance Study (FIS)	Flood Insurance Rate Maps (FIRMS)
Original Bradford Town		April 15, 1992	April 15, 1992
Current Merrimack County		April 19, 2010	April 19, 2010
Preliminary Merrimack County, NH	33013CV001B	October 12, 2022	October 12, 2022
Preliminary Merrimack County, NH	33013CV001C	May 25, 2023	May 25, 2023

Source: FEMA Merrimack County Flood Insurance Study (FIS) Table 9 & Bibliography, 2010;
Preliminary 2022 & 2023 Merrimack County FIS

The Preliminary **October 12, 2022** Merrimack County Flood Insurance Study (FIS) contains some revised Digital Flood Rate Insurance Maps (DFIRMs) for eastern section of the county, but did not include Bradford. The FIS is not yet effective, so it remains notable but not included within the table. Further, a new **May 25, 2023** Merrimack County FIS was produced for the western half of Merrimack County that does include Bradford. As of **June 1, 2024** neither FIS has been approved. See section on **DFIRMS** in this Chapter for more detailed information.

FLOOD INSURANCE STUDY
FEDERAL EMERGENCY MANAGEMENT AGENCY


VOLUME 1 OF 4

**MERRIMACK COUNTY,
NEW HAMPSHIRE**
(ALL JURISDICTIONS)

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
ALLENSTOWN, TOWN OF	330103	NORTHFIELD, TOWN OF	330118
ANDOVER, TOWN OF	330104	PEMBROKE, TOWN OF	330119
BOSCAWEN, TOWN OF	330105	PITTSFIELD, TOWN OF	330120
BOW, TOWN OF	330107	SALISBURY, TOWN OF	330121
BRADFORD, TOWN OF	330106	SUTTON, TOWN OF	330122
CANTERBURY, TOWN OF	330108	WARNER, TOWN OF	330123
CHICHESTER, TOWN OF	330109	WEBSTER, TOWN OF	330236
CONCORD, CITY OF	330110	WILMOT, TOWN OF	330124
DANBURY, TOWN OF	330111		
DUNBARTON, TOWN OF	330202		
EPSOM, TOWN OF	330112		
FRANKLIN, CITY OF	330113		
HENNIKER, TOWN OF	330114		
HILL, TOWN OF	330214		
HOOKSETT, TOWN OF	330115		
HOPKINTON, TOWN OF	330116		
LOUDON, TOWN OF	330117		
NEW LONDON, TOWN OF	330230		
NEWBURY, TOWN OF	330228		

REVISED: **PRELIMINARY**
10/12/2022

FLOOD INSURANCE STUDY NUMBER
33013CV001B
Version Number 2.6.3.6

 **FEMA**

2022 Table 1: Listing of NFIP Jurisdictions with DFIRM Panels (Bradford only)

Bradford, Town of	330106	01070003	33013C0240E ¹ , 33013C0245E, 33013C0265E, 33013C0266E, 33013C0268E, 33013C0269E, 33013C0435E, 33013C0455E, 33013C0460E
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FLOOD INSURANCE STUDY
FEDERAL EMERGENCY MANAGEMENT AGENCY


VOLUME 1 OF 4

**MERRIMACK COUNTY,
NEW HAMPSHIRE**
(ALL JURISDICTIONS)

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
ALLENSTOWN, TOWN OF	330103	NORTHFIELD, TOWN OF	330118
ANDOVER, TOWN OF	330104	PEMBROKE, TOWN OF	330119
BOSCAWEN, TOWN OF	330105	PITTSFIELD, TOWN OF	330120
BOW, TOWN OF	330107	SALISBURY, TOWN OF	330121
BRADFORD, TOWN OF	330106	SUTTON, TOWN OF	330122
CANTERBURY, TOWN OF	330108	WARNER, TOWN OF	330123
CHICHESTER, TOWN OF	330109	WEBSTER, TOWN OF	330236
CONCORD, CITY OF	330110	WILMOT, TOWN OF	330124
DANBURY, TOWN OF	330111		
DUNBARTON, TOWN OF	330202		
EPSOM, TOWN OF	330112		
FRANKLIN, CITY OF	330113		
HENNIKER, TOWN OF	330114		
HILL, TOWN OF	330214		
HOOKSETT, TOWN OF	330115		
HOPKINTON, TOWN OF	330116		
LOUDON, TOWN OF	330117		
NEW LONDON, TOWN OF	330230		
NEWBURY, TOWN OF	330228		

REVISED: **PRELIMINARY**
5/25/2023

FLOOD INSURANCE STUDY NUMBER
33013CV001C
Version Number 2.6.3.6

 **FEMA**

2023 Table 1: Listing of NFIP Jurisdictions with DFIRM Panels (Bradford only)

Bradford, Town of	330106	01070003	33013C0240F, 33013C0245F, 33013C0263F, 33013C0264F, 33013C0266F, 33013C0268F, 33013C0269F, 33013C0435F, 33013C0455F, 33013C0456F, 33013C0457F, 33013C0460F
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BRADFORD NFIP STATISTICS

In **Table 5.8** is a cumulative history of the trends and overall totals of flood insurance policies and losses of those property owners utilizing the NFIP insurance in the Town. Four snapshots in time, one from each of Bradford's previous **Hazard Mitigation Plans** and from the **2025 Plan** period display the number of NFIP policies in force and paid loss statistics between **Nov 2006 – Feb 2024**, the last date of accessible data.

Table 5.8
History of NFIP Policy and Paid Loss Statistics

Report Date	Policies in Force	Insurance in Force	Number of Paid Losses Since 1992	Total Losses Paid Since 1992	Type of Current NFIP Policies in Force*			
					Single Family	2-4 Family	Other Residential	Non-Residential
Nov 2006	25	\$4,191,400	14	\$160,453				
Nov 2011	30	\$5,678,700	19	\$196,997				
Jun 2018	27	\$6,446,600	20	\$247,334				
Feb 2024	25	\$6,008,000	22	\$292,910	19	--	--	--

Source: Bradford Hazard Mitigation Plans; Floodsmart.gov Feb 2024;
NH Office of Planning and Development Floodplain Management April 2023* (may not match Floodsmart PIF figures as dates differ)

From **Table 5.8**, in the beginning of the severe flooding event period of **2005-2008**, **25** properties in Bradford were covered by NFIP flood insurance in **Nov 2006**, followed by an increase to **30** properties by **Nov 2011**. This was the highest snapshot on record, since beginning **Jun 2018** a decline in policies began (**27**). Most recently in **Feb 2024**, there are **25** policies in Town for **\$6.m** in coverage. As of April 2023, the last time building type data was available, **19** policies were for single family residences. Since **1992**, **22** paid losses totaling **\$293k** have been claimed in Bradford to date.

Since the **2018 Plan**, the number of properties (policies) covered by flood insurance fell to **25** total policies in the community in **2024**, covering **\$6.0** million in damage. Normally, the number of policies would fluctuate influenced by the number of current severe flooding events, recent changes in flood insurance regulation, the higher cost of insurance, uncertainty about exact floodplain location, mortgage requirements, the changing real estate market, and assumptions that flood insurance is unnecessary if one's property is outside of the floodplain. Since there has been no recent severe flooding, small fluctuations in the number of policies have occurred in Bradford and remain relatively consistent.

Table 5.8 also illustrates that while the property owners anywhere in the entire Town of Bradford are eligible to purchase flood insurance for their property, still **25** properties out of the **1,447** total parcels in the entire community are insured against flooding. As described previously, a total of **306** parcels with homes and non-residential buildings seem to be at least partially situated in the Special Flood Hazard Areas (SFHA).

*Assuming the **25** NFIP policy properties are located within the 2010 SFHA floodplains, then about **8%** of buildings in the floodplain are insured against flooding.*

All of Bradford's buildings and properties are uninsured for when the next flooding event occurs. **Inland Flooding** conditions can occur anywhere in the community due to runoff, debris impacted infrastructure (culverts), drainage overflow, rapid snowpack melt, road washouts, beaver dam breaks, heavy rains, etc. which are not limited to the floodplain (SFHAs) areas and are not covered by homeowner's insurance or any other insurance than National Flood Insurance Program (NFIP) flood insurance. Buildings and properties are especially vulnerable to **West Branch Warner River** or **Warner River flooding**.

Repetitive Loss Properties

A specific target group of properties is identified and serviced separately from other NFIP policies when repetitive losses occur on the same properties. The group includes every NFIP-insured property that, since **1978** and regardless of any change(s) of ownership during that period, has experienced four or more paid flood losses of more than **\$5,000** each or two or more separate claim payments (building payments only) where the total of the exceeds the current value of the property. Two of the claim payments must have occurred within **10** years of each other. The loss history includes all flood claims paid on an insured property, regardless of any changes of ownership, since the building's construction or back to **1978**. Bradford joined the NFIP in **1992**.

As of **Apr 2023**, Bradford had a total of **4** repetitive loss buildings according to records kept by the Federal Emergency Management Agency and supplied by the NH Office of Planning and Development (NH OPD) in the NH Business and Energy Administration (NH BEA). This number has increased since the last **2018 Plan**, from **3** repetitive loss properties. **Table 5.9** displays the general, known existing repetitive loss data in **2023**:

Table 5.9
Number of Repetitive Loss Properties

Building Type	Number of Repetitive Loss Properties as of 04-23
Single Family	--
Multi-Family	--
Non-Residential	--
Bldg Type Not Identified by NHOPD/ NHBEA	4
Total Repetitive Losses	8
Total Repetitive Loss Payments	\$200,813

Source: NH Office of Planning and Development (NH OPD) on behalf of FEMA, April 2023

These RPL data records are confidential for the property-specific information they contain. No further information was provided per privacy laws. Repetitive losses are determined by any repetitive damage claims on those properties that hold flood insurance through the NFIP. Should repetitive losses occur, the Town could consider participating in voluntary property acquisition (“buyouts”) which would eliminate the threat to several homes by incorporating newly vacant land into the Town’s flood storage capacity.

FLOODPLAIN ORDINANCE

A major objective for floodplain management is to continue participation in the National Flood Insurance Program. Communities that agree to manage Special Flood Hazard Areas shown on NFIP maps participate in the NFIP by adopting minimum standards. The minimum requirements are the adoption of the Floodplain Ordinance and Subdivision Regulation / Site Plan Review requirements for land designated as Special Flood Hazard Areas (SFHAs). Flood insurance is available to any property owner located in a community participating in the NFIP.

Community Assistance Visits in Bradford

A Community Assistance Visit (CAV) is a process required by the National Flood Insurance Program (NFIP) as a way of reviewing a town’s compliance with established floodplain regulations to be sure that they meet NFIP requirements. If the Town is not in compliance with regulations in any way, the officials that conduct the CAV provide assistance and guidance to assist with correcting any violations.

Bradford is classified as a Tier 1 community through its repetitive losses. For a Tier 1 community that has experienced repetitive losses, a new CAV will be undertaken every five years or if there is a severe flooding event. For towns without any repetitive losses, they are classified as Tier 2 where a telephone call may be made to the Town every **5-10** years or otherwise as needed when so classified.

The last technical Community Assistance Visit was undertaken in **2018**, according to NH Office of Planning and Development’s (NH OPD). Any minor problems with the floodplain management regulations or process was rectified at that time. In **Sep 2023**, NH OPD provided “housekeeping” revisions to Bradford’s Zoning Ordinance in time for Town Meeting approval as well as amendments for the Planning Board Subdivision Regulations and Site Plan Review Regulations to maintain NFIP compliance. The Subdivision Regulations were deemed compliant at that time. These revisions were identified for anticipated compliance with the Preliminary Merrimack County **May 2023** FIS/DFIRMs.

Bradford was identified is a repetitive loss community although there have been no recent significant flooding events. To ensure continuation of safe policies, a follow-up regulation/ ordinance review should be undertaken by NH OPD to review Building Department procedures and the contents of the Floodplain Ordinance, Subdivision Regulations and Site Plan Review Regulations remain compliant with NFIP policies prior to **2030**, when this Plan expires.

Floodplain Development District Ordinance

The Town of Bradford has a Floodplain Ordinance that currently contains the required FEMA regulations to remain eligible for the NFIP. Bradford approved their first Floodplain Ordinance in **March 8, 1988** along with the FIRM, although neither were included within the Zoning Ordinance until **April 2002**. Prior to **2002**, the Floodplain Ordinance had been modified in **March 1992, 1993 and 1994**.

The Zoning Ordinance does generally indicate all revision dates, but a few revision dates are noted according to prior **Hazard Mitigation Plans**.

The last major revision was **March 2010** to adopt the new **2010 Merrimack County Flood Insurance Study (FIS)** and the accompanying **April 19, 2010 Digital Flood Insurance Rate Maps (DFIRMs)** although smaller housekeeping items have been adopted over the years.

Mar 8, 1988	Adopted Floodplain Ordinance RSA 674:17
Mar 10 1992, Mar 9 1993, Mar 8, 1994	Amended Floodplain Ordinance
April 2002	Incorporated into Zoning Ordinance
Mar 9, 2010	Revised to adopt new April 2010 FIRM and necessary language, adopted as Floodplain Development Ordinance, authority provided to Selectmen
TBD - 2025	Pending: Preliminary October 2022 Floodplain DFIRMs/FIS and Preliminary May 2023 Floodplain DFIRMs/FIS for Merrimack County

The **2025** Bradford Floodplain Development Zoning Ordinance will contain the elements requested to date by FEMA and the NH Office of Planning and Development's Floodplain Management Program. A Floodplain Development Overlay District map is available at the Town's Assessing Office. An excerpt of the Floodplain Ordinance is displayed in **Figure 5.A**.

Figure 5.A
Latest Floodplain Development Ordinance

<p>Article IX FLOODPLAIN DEVELOPMENT ORDINANCE</p> <p>A. This ordinance, adopted pursuant to the authority of RSA 674:16, shall be known as the Town of Bradford Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Bradford's Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeals under state law. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall be controlling.</p> <p>B. The following regulations in this ordinance shall apply to all lands designated as special flood</p> <p>Page 37 of 51 Zoning Ordinance Approved March 14, 2023</p>

NFIP Familiarity in Bradford

Source: Section of Bradford Zoning Ordinance March 2023

According to NFIP policies, when an applicant files a request for a building permit in the floodplain, the applicant must include an elevation certificate to be in compliance. In addition, if an applicant intends to fill onsite, a letter of map of revision must be submitted along with the application. According to NFIP requirements in the Floodplain Ordinance, building permits should be reviewed to assure sites are reasonably safe from flooding and require anchoring to prevent flotation, collapse, or lateral movement and construction out of flood resistant materials.

Ongoing attention and familiarity with the NFIP will keep Town staff and volunteers in top form. To reduce flood risks, the Building Inspector, Town Assessor, Town Manager, Community Development Director, Zoning Compliance Officer, volunteer Planning Board members, and other Town staff whose duties include review/inspection of development or construction, should be familiar with the Floodplain Ordinance and the NFIP.

Because of their unique position to ensure development conforms with ordinances prior to approval, the Planning Board should be familiar with NFIP policies, especially those regulations that are required to be incorporated into the Subdivision and Site Plan Review regulations. A workshop sponsored by the NH Homeland Security and Emergency Management (NH HSEM) or the NH Office of Planning and Development (NH OPD) would be appropriate to educate current staff and volunteers. New online courses by FEMA for floodplain management, mapping, elevation certificates and more are available at no charge. For online training taken at the convenience of the individual, see the [FEMA Emergency Management Institute's](#) current training course index for flooding:
<https://training.fema.gov/is/searchis.aspx?search=NFIP>.

An essential step in mitigating flood damage is Town and property owner participation in the NFIP. Bradford should work to consistently enforce NFIP compliant policies to continue its participation in this program. Town staff field property owners asking for assistance because their mortgage lenders are requiring proof that the properties in question are not located in a Special Flood Hazard Area to determine whether NFIP flood insurance is required. The only way to rectify this issue is to have a survey completed of the property to complete a Certificate of Elevation to keep on file at the Town Office. If the property is shown to be located out of the floodplain, a Letter of Map Amendment should be completed by the owner or by the Town to ensure future flood maps are corrected.

When possible, Town staff should try to promote flood insurance to property owners in Town; recall **16** properties out of the **1,447** parcels in Bradford are protected by flood insurance and currently take advantage of the NFIP insurance opportunity. Informational links for the public on flood topics could be located on the Town's website at www.bradfordnh.org.

Association of State Floodplain Managers

www.floods.org

NFIP SUBSTANTIAL DAMAGE/SUBSTANTIAL IMPROVEMENT

A goal of National Flood Insurance Program (NFIP's) is to reduce flood risk after a flood event occurs. The program does this through substantial damage/substantial improvement rules. Whenever a structure in the FEMA Special Flood Hazard Area (**1%** chance flood, or **100-year** floodplain) has been damaged by any origin (flood, fire, tornado, blizzard, etc.), the community is responsible for determining whether or not the cost of repairs to the structure is equal to or exceeds **50%** of the market value of the structure. If it is, then the entire structure must be brought into compliance with the current building code.

Substantial damage/substantial improvement determinations allow communities to require owners of structures built before the community joined the NFIP (before **Apr 1992** for Bradford) to comply with current construction standards. Communities are responsible for making substantial damage/substantial improvement determinations and notifying property owners.

In Bradford, the Building Inspector/Code Enforcement Officer staff (www.bradfordnh.org/departments/building-deptcode-enforcement) is responsible for making substantial damage/substantial improvement determinations. The Town alternately uses the skills of the volunteer Fire Department Chief (www.bradfordnh.org/departments/fire-rescue) to assist.

Currently, there are adequately trained staff and volunteers available to undertake these determinations. The current Building Inspector/Code Enforcement Officer has spent decades in the construction industry and has served as Bradford's Building Inspector since 2013. The Fire Chief has more than 30 years of experience in the fire safety and law enforcement fields. The Building Inspector/Code Enforcement Officer and the Fire Chief work collaboratively to enforce Bradford's building code and zoning ordinances. The Fire Chief has made safety a focus of his efforts. Both are qualified and experienced in evaluating a situation and determining the appropriate response. Both the Building Inspector/Code Enforcement Officer and the Fire Chief would commit to additional training and benefit from review of updated regulatory practice and recent revision of the Flood Plan Mapping.

The Building Inspector/Zoning Compliance Officer and Fire Chief are empowered to investigate and inspect damage claims, which would then be forwarded to appropriate parties, and sign off on determinations.

The process for determination of substantial damage/substantial improvement in Bradford is as follows:

- As part of the building permit process, it is determined whether the property is in the floodplain. The Building Inspector shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding.
- The Building Inspector/Code Enforcement Officer shall determine the 100-year flood elevation, using the most recent Floodplain Maps and site verification with an

engineer/surveyor as required. The 100-year flood elevation is the basis used for requiring all new construction and substantial improvement to adhere to Bradford's Floodplain Ordinance. Beyond specific reconstruction standards and use of appropriate materials, substantial improvement is defined as any combination of repairs, reconstruction, alteration or improvements to a structure in which the accumulative cost equals or exceeds 50% of the market value of the structure.

- The Town of Bradford Floodplain Development Zoning Ordinance Article IX defines Substantial Damage and Improvement and describes the criteria to be met by different structures. The ordinance is referenced on the Town website at www.bradfordnh.org.
- The Building Inspector or consulting engineer will follow up with a letter or email to the applicant as needed. While e-mail is a primary source of information dissemination to individual property owners, final determinations are made in writing to the owner and any known representatives.
- The Town can refer to FEMA P-758 as a guide when making substantial damage/substantial improvement determinations. This is helpful when applying the standards of the Town's Floodplain Development District.
- The Town of Bradford's Floodplain Development Ordinance can be found on the Town's website at www.bradfordnh.org under Forms and Documents. The paper version of the Floodplain Development Ordinance is available at the Town Office. The Floodplain Development Ordinance was last updated in 2025.
- Bradford has a large digital sign used for making public safety information announcements. This sign located in front of the Police Department, but can be moved if required. Bradford also uses its website to post safety notices and has discussed implementing emergency notification functionality via text or email. Communicating flood risk before a flooding is an initiative Bradford should embrace. The EMD works in conjunction with the Select Board to distribute risk management advice for Bradford residents.
- Individuals inquiring about building or rebuilding in the floodplain are directed to review the Town's Zoning Ordinance. The information is available online and in printed form in the Town Office. The Building Inspector/Code Enforcement Officer fields any additional questions that arise.

DIGITAL FLOOD INSURANCE RATE MAPS FROM FLOOD INSURANCE STUDY

Flooding is a more easily locatable hazard as waterbodies can be used to approximate the range of future potential flooding areas. The Special Flood Hazard Areas (SFHA), waterbodies, and road washout locations are listed in detail below for Bradford.

Special Flood Hazard Areas (SFHA)

Base Flood Elevations (BFEs) are abundant within Central NH along the **Merrimack River**, **Contoocook River**, **Blackwater River**, **Soucook River** and **Suncook River** on the DFIRMs of **2010**. In **October 2022**, a new Merrimack County Preliminary Flood Insurance Study (FIS) was completed for the eastern half of Merrimack County with a focus on the sub-watersheds (Version E FIRM panels). In **May 2023**, the FIS was modified again to incorporate revisions to the western half of the county with a similar focus on the sub-watersheds (Version F FIRM panels). As of **June 2025**, both of these sets of revisions remain Preliminary. Both sets of draft Preliminary DFIRMs include current aerial photography. More specific locations of the SFHAs are displayed in a clearer color scheme, and new **Zone A** and **Zone X** areas are identified. New, specific BFEs measurements were plotted and the Regulated Floodway areas **Zone AE** are slightly adjusted.

The primary DFIRMs (Version F) identifying floodplains in Bradford (**330106**) are along the **West Branch Warner River** on **#0245**, **#0263**, **#0264** and along **Lake Massasecum** on **#0268**, **#0456**, and **#0457** display the updated flood zones. Other SFHAs without the Regulated floodway display the **Lake Todd**, **Lake Massasecum**, **Hoyt Brook**, **Ayers Pond**, **Bradford Springs** and other local ponds and brooks on more DFIRMs. Other brooks and waterbodies, most unnamed, are included in these floodplains.

Collectively, these **12** DFIRMs include **Zone AE** floodways and **BFEs** (**1%** annual risk of flooding), **Zone A** (**1%** annual risk of flooding) or **Zone X** (**0.2%** annual risk of flooding) locations in Town. The DFIRMs with Floodways are highlighted blue in **Table 5.10**, and all DFIRMs are described.

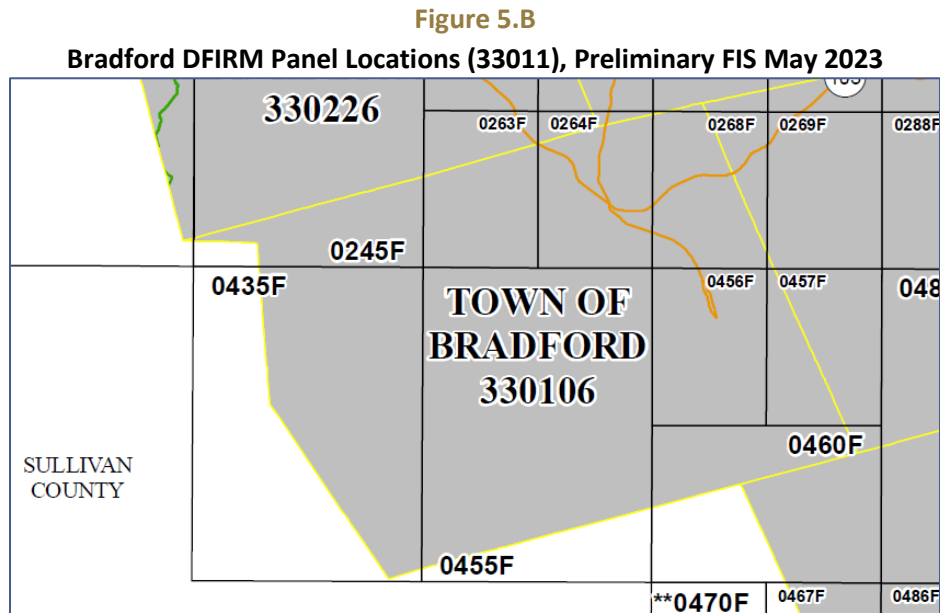
Table 5.10

Locations of Bradford Special Flood Hazard Areas (SFHA) on May 2023 Preliminary DFIRMS

Panel NH 33013C Suffix F	Flood Zones in Bradford 330106	New PRELIM 10-23 BFEs	Water Body Areas in Floodplains	2010 Base Flood Elevations (BFEs)	Community of Bradford Geographic Location
#0240	X	N/A	Wetlands	N/A	Northwest edge of Bradford bordering Goshen.
#0245	A, X	N/A	West Branch Warner River	N/A	Northwestern section of Bradford bordering Newbury and Washington (Sullivan County). Fortune Road, Fairgrounds Road, West Road, Pleasant View Road
#0263	A, X	N/A	West Branch Warner River, Wetlands	N/A	Northern border with Newbury, containing Pleasant View Road, Old Fairgrounds Road
#0264	A, X	N/A	West Branch Warner River, Lake Todd, Wetlands	N/A	Northern border with Newbury and Sutton, containing NH 103, NH 114, Old Warner Road, Center Road
#0266	N/A	N/A in Brad	None in Bradford	N/A	Northeastern corner with Sutton and Warner.
#0268	AE, A, X	WR: 643, 629, 615, 607, 595. LM: 644	Warner River, Lake Massasecum	Warner River: 643	Eastern border, abutting Warner to the east. NH 103 West, Melvin Mills Road, Bagley Hill Road, NH 114, Breezy Hill Road.
#0269	N/A	N/A in Brad	None in Bradford	N/A	Eastern edge section bordering Warner.
#0435	A, X	N/A	Ayers Pond, Hoyt Brook, Hoyt Brook Tributary, Bradford Bog, Unnamed Brooks	N/A	Western section of town to southwestern corner, abutting Washington. Old Mountain Road, Deer Valley Road, East Washington Road, West Road.
#0455	A, X	N/A	Mud Pond, Hoyt Brook, Unnamed Ponds, Unnamed Brook, Bradford Springs, Sand Brook	N/A	Central southern section of town bordering Hillsborough. Low State Forest. Alder Plains Road, Rowe Mountain Road, Forest Street, Jewett Road, County Road, Cressy Street, West Road.
#0456	A, AE, X	644	Lake Massasecum, Unnamed Wetlands, Unnamed Brooks	N/A	Near the eastern edge of Town with Lake Massasecum. Jackson Road, West Shore Lane, Howlett Road, Crittendon Road, NH 114, Rowe Mountain Road.
#0457	A, AE, X	644	Lake Massasecum, Unnamed Wetlands, Unnamed Brooks	644	Eastern edge of Town with Lake Massasecum adjoining Warner. East Shore Road, NH 114, Massasecum Avenue.
#0460	A, X	N/A	Unnamed Ponds, Unnamed Wetlands, Unnamed Brooks	N/A	Southeastern corner of Town abutting Henniker and Warner. Low State Forest. Rowe Mountain Road, Carter Hill Road, Day Pond Road.

Source: FEMA NFIP DFIRM Map Panels Version Number 2.6.3.6, Map Numbers 33013C Suffix F

Figure 5.B displays the relative location of each of the DFIRM panels in the community used in Table 5.10. This set of DFIRMs is excerpted from the *Preliminary Merrimack County Flood Insurance Study (FIS) of May 2023*. The graphic illustrates the numbering system of the DFIRMs and how they are not consecutive.

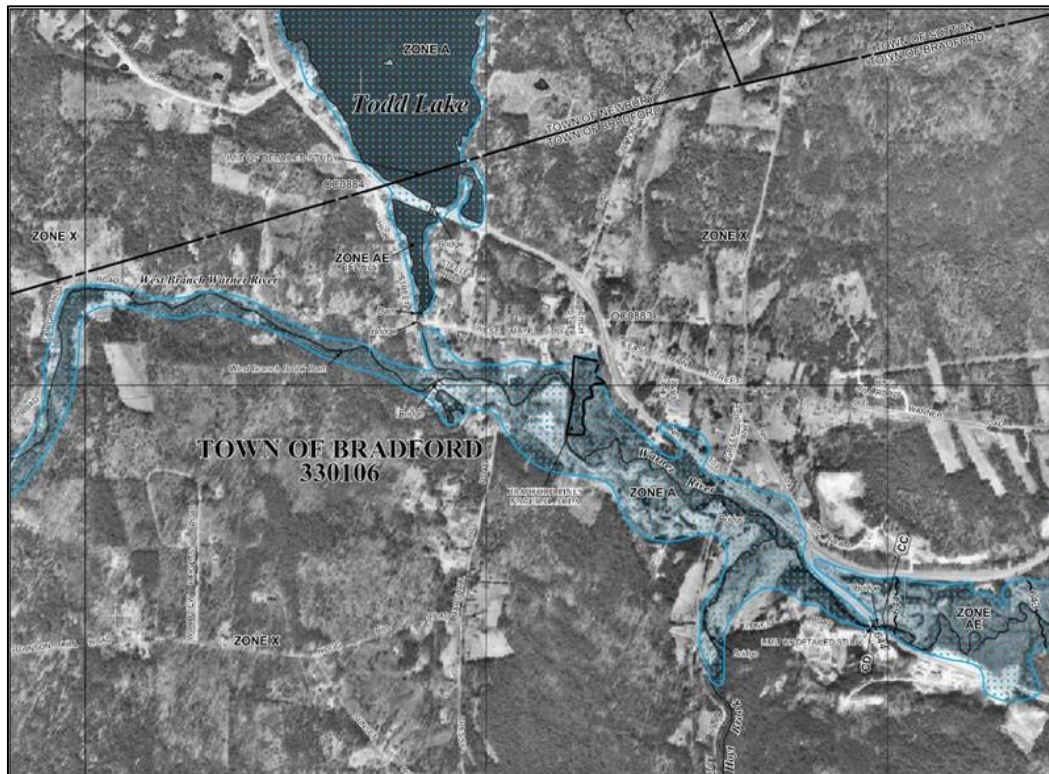


Sources: FEMA Map Center <https://msc.fema.gov/portal/home> (last accessed 06-24)
FEMA Flood Insurance Study Merrimack County, NH PRELIMINARY 05/25/2023, 33013CV001C
Version Number 2.6.3.6

A zoomed-in view in **Figure 5.C** displays the DFIRM's zoomed-in view of the **Warner River's**, **West Branch Warner River's** and Lake Todd's influence along Old Fairgrounds Road, NH 103, NH 114, and side roads. The **West Branch Warner River** converges with **Hoyt Brook** at Center Road to become the **Warner River**. Although the road and waterbody labels shown below may be a bit inaccurate, there are many active floodplains along the busiest highways and one of the most populated areas in Bradford.

Figure 5.C

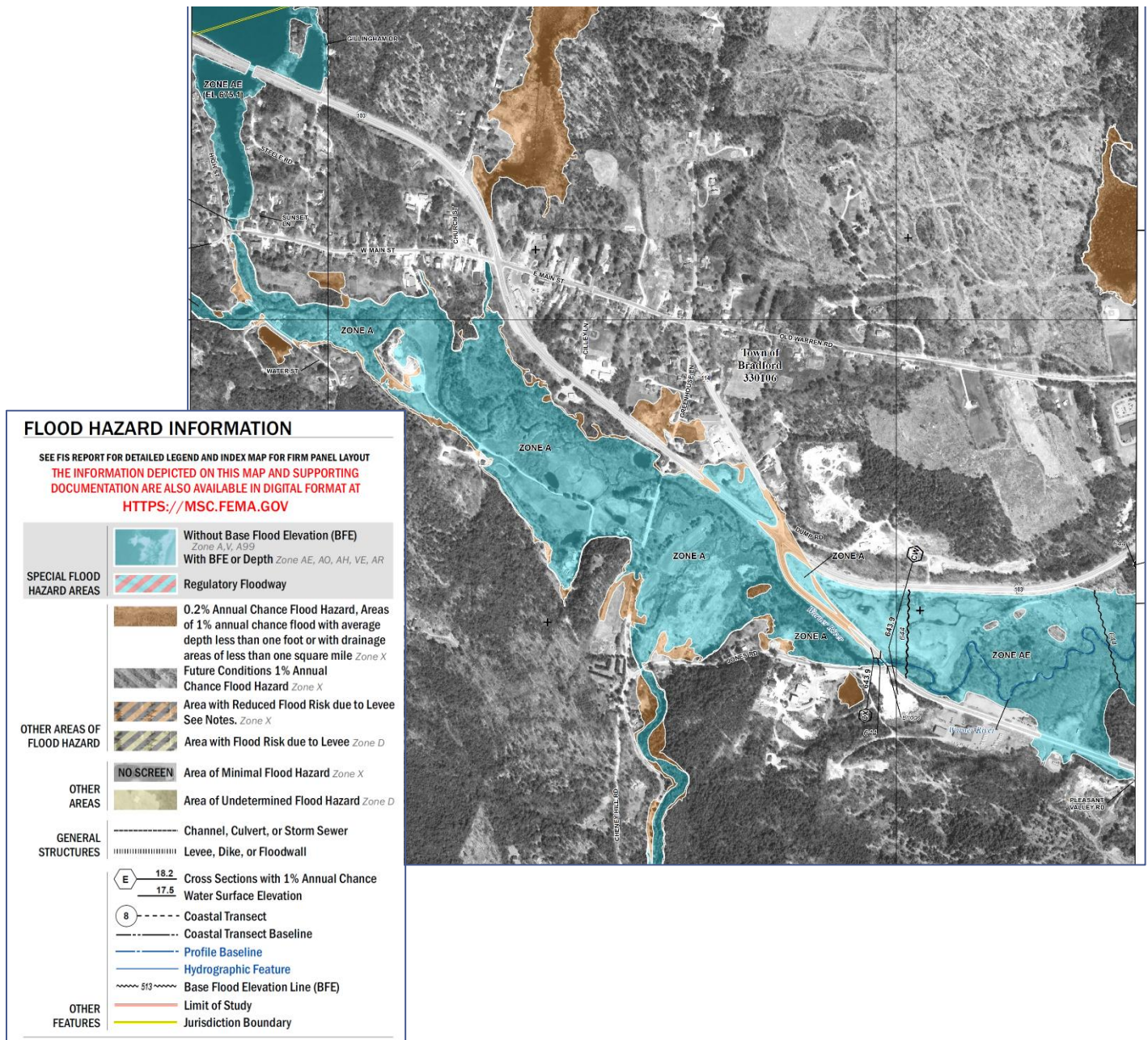
Zoom View of Bradford FEMA DFIRM Panel Location #0263 (2010)



The Preliminary **2023** Panel map of the a shifted location roughly compares with the **2010** DFIRM with better, and more current aerial imagery. The new DFIRM provides greater clarity and adjustments made to the Special Flood Hazard Areas (SFHAs). Small changes to Base Flood Elevations (BFEs) and the **West Branch Warner River** revisions are shown in **Figure 5.D**.

Figure 5.D

Zoom View of Bradford 2023 FEMA Preliminary DFIRM Panel Location #0264F



Community Vulnerability and Loss Resource Links:

- ☐ Town of Bradford
<https://www.bradfordnh.org/>
- ☐ FEMA Map Center
<https://msc.fema.gov/portal/home>
- ☐ FEMA Emergency Management Institute Training (NFIP)
<https://training.fema.gov/is/searchis.aspx?search=NFIP>
- ☐ Floodsmart.gov NFIP/FEMA Sponsored
<https://www.floodsmart.gov/>
- ☐ National Association of Floodplain Managers
<https://www.floods.org/>

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6 CAPABILITY ASSESSMENT

Local mitigation capabilities are existing authorities, plans, ordinances, policies, mutual aid, programs, staffing, technical skills and assets, funding, outreach, public education, and resources that reduce hazard impacts or that could be used to help implement hazard mitigation activities. These capabilities were inventoried for the **Bradford Hazard Mitigation Plan Update 2025**.

The **Capability Assessment** contains an inventory of locally-important existing mitigation support activities, or capabilities, which have a positive impact on the way hazard events are handled within the community. Most capabilities are not hazard mitigation Actions but support the Action Plan and help decrease the community's hazard risk. These community-strengthening capabilities are not STAPLEE-rated (Social Technical Administrative Political Legal Environmental and Economics questions) like the Actions, but instead the capabilities serve to sustain and assist the community to maintain and accomplish its hazard mitigation Actions and priorities. Selected **Future Improvements** (mitigation-oriented) to some of these capabilities have the potential to be considered as Actions in **7 POTENTIAL ACTION EVALUATION** and **8 MITIGATION ACTION PLAN**.

There are four overall Capabilities considered for which an inventory of mitigation support items was identified by the Hazard Mitigation Committee, **Planning & Regulatory, Administrative and Technical, Financial Resources, and Education and Outreach**.

Each Capability had inventoried the latest version or adoption Date; a Description of the item; the location of the capability in Town; the Level of Effectiveness of the Capability; which Department, Board or other has Responsibility for the capability; what Changes were made to the capability since the **2018 Hazard Mitigation Plan**; and Future Improvements to the Capability.

FOUR CAPABILITY ASSESSMENT TABLES

Planning and Regulatory

- Plans and Planning Documents
- Building Codes, Permitting, Inspections
- Land Use Ordinances, Regulations

Administrative and Technical

- Administrative Programs, Policies, Mutual Aid Agreements, Partnerships, Operations, Procedures
- Staff and Volunteers
- Technical Skills, Training, Drills
- Assets, Security, Resources (Specialized Equipment)

Financial Resources

- Financial Programs or Funding Resource for Hazard Mitigation Projects
- Future Financial Resources to Explore for Haz Mit Projects

Education and Outreach

- Public Outreach Program, Educational Activity, Notifications

Town Capabilities and Review of Existing Plans

A summary of the items within the four Capability tables is provided here to offer a portrait of resources Bradford has at hand to assist with mitigation. Careful consideration of each Capability's **Level of Effectiveness** helped the Departments to determine any clear **Future Improvements** to undertake. Many of the Town's Capabilities involved existing plans, procedures, reports, policies, regulations, and resource documents from individual Departments. These plans and documents were reviewed and incorporated into the **Capability**

Assessment. **Future Improvements** to these documents were identified and many later became Action items in **8 MITIGATION ACTION PLAN**. Capabilities of all Town Departments and the School District as related to hazard mitigation are detailed within the following tables.

Level of Effectiveness	Description
High	Capability is working well and is regularly followed
Moderate	Capability could use some revisions but is followed
Low	Capability is not working and needs revisions

During the Hazard Mitigation process and the identification of existing mitigation **Capabilities**, the Hazard Mitigation Committee used their knowledge of the existing plans, policies, procedures and other documents utilized for their Department duties to develop Capability **Future Improvements**. However, several additional documents not listed in the **Capability Assessment** are also utilized by the community and have a positive relationship to the **Hazard Mitigation Plan 2025**.

DEPARTMENT ABBREVIATION KEY:

BI/CE	Building Inspector/ Code Enforcement
BOS	Select Board
CC	Conservation Commission
EM	Emergency Management
FD	Fire & Rescue Department
HD	Highway Department
HO	Health Officer
LI	Library
PB	Planning Board
PD	Police Department
PRI	Private or Non-Town
SD	Kearsarge Regional School District
TA	Town Administration
	Primary Mitigation Department

PLANNING AND REGULATORY CAPABILITIES

The planning and regulatory capabilities displayed in **Table 6.1** are the plans, policies, codes, and ordinances that reduce the risks or impacts of hazards. There are **3** categories: **Plans and Planning Documents; Building Codes, Permitting, and Inspections;** and **Land Use Ordinances, Regulations, and Town Ordinances.** Most of the documents listed below are the Town's documents, but others are School, local, regional, state and federal which support the Town's hazard mitigation goals, objectives, and/or Actions.

Table 6.1

Planning and Regulatory Capabilities

Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
Bradford PLANS AND PLANNING DOCUMENTS							
2024	CC Adopt a Road Class VI Road Report 2024	Monitoring report from Fall 2018 to present documenting the condition and usage of Class VI Town unmaintained roads. Photos included. Use of roads seasonally by recreation and by emergency response is a consideration. Some are rocky, some are severely eroded and non-navigable.	Class VI roads	High	Cons Comm	Updated in July 2024, particular concerns from erosion, motorized travel during wet conditions. Currently in discussions between CC, HD/EMS regarding documentation of fire rescue access.	Develop recommendations for Select Board and Highway Department. Consider the need for documenting Class VI beginning and ends (ex. Blaisdell Hill Road Road), as well as possibility of implementing "fire lanes" on some Class VI roads.
2012	CC Bradford NRI	Natural Resource Inventory	Entire Town	High	Cons Comm	Documents natural resources (i.e., soils, agriculture, wetlands, etc.) available to the community. Last updated in 2012.	Next version might include recommendations specific to use of these resources to prevent or respond to hazards.
2023	EM Vulnerable	Develop a plan vulnerable occupants	Entire Town	High	Emergency Mgt	Regular holiday calls	Reactivate the list (place into

Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
	Occupant List	requiring additional assistance during a severe winter weather event and evacuate those residents to safer locations. List is in EOP, but options to be kept by Town staff.				and welfare checks during bad weather and seasonally. Visits seniors at BACC for sign up. Updated those with oxygen in July 2023 with Eversource.	Excel for posterity) for regular update and advertise it to make it easier for residents to sign up for the service. The EOP might not be the best place to keep this list.
2017	EM Local Emergency Operations Plan 2017	Describes who's responsible for what actions during an emergency, includes evacuation plan. Includes general warning systems, chain of command, lists of resources. Updated to latest State ESF format in 2017. Personnel, budgets, equipment and technology impacts the EOP.	Entire Town	High	Emergency Mgt	Attempted updates by a consultant but this has not proved timely. EMGP obtained to revise the Town update and the funding is nearly expiring, grant will lapse. (2023 Valley Transportation explosion)	Make an electronic copy available to all in the organizational chart, easy accessibility. Personnel in a small Town like Bradford are difficult to keep active. Have a Town server/ cloud available to those outside the Town Hall Facility.
2018	EM Hazard Mitigation Plan 2018	Hazard Mitigation Plan is updated every 5 years. Document used by Depts to guide long term projects	Entire Town	High	Emergency Mgt	Updating Plan in 2024-2025 to current standards	Complete the priority Actions, complete 2025 Plan update
2017 (newer ones available)	EM Dam Emergency Action Plans	Have several H, S, L or NM private dam plans on record that need to be reviewed. Most plans are done by engineers. Beaver dams can have very significant impacts too with flooding damage.	Dams	High	Emergency Mgt	High Haz - Lake Todd Dam is owned by Lake Todd Association. Beaver flowage – 3 or 4 locations have problems. An expert tried to eliminate them, but continual	Obtaining the latest High and Significant Hazard Dam EAPs from NH DES. Review the dam plans annually for maintenance and hold regional drills. Address beaver dam problems

Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
						issues at Massasecum outlet, flooding concerns.	(Massasecum outlet, flooding concerns.)
2020	PB Master Plan 2020	Master Plan is the basis for the Town's regulations and zoning ordinance and CIP. Possibilities for future building opportunities, CIP approved.	Entire	High	Planning Board	Updated the Master Plan with CNHRPC in 2020. PB referred to the Master Plan during plan review activities.	Use MP to update regulations and Zoning Ordinance. Update chapters annually on a rotating basis.
2025	PB Capital Improvements Program CIP 2025-2034	Lists capital expenditures over the next six years. Many capital projects can mitigate natural hazards, such as drainage, bridge, culverts and road reconstruction.	Entire Town	High	Planning Board	Updated in 2017 for 2018-2023. PB completed 2025 CIP.	Review and revise CIP on an annual basis. Add Haz Mit projects as needed.
July 2024	SD School Emergency Operations Plan (KRSD Strategic Plan Goals and Objectives 2022-23)	The EOP contains information for fire drills, what students, parents, and teachers will do in the event of an emergency. All schools in the School District are operating under the same procedure.	Elementary School	High	School District	Held regular drills with staff and students. Bradford EMD attended KRSD LEOP, met with all Principals, Fire Depts, Police Dept. New EOP in July 2024.	Produce Annexes on mapping of buildings. Drill the new EOP, review and revise. Work closely with the Town EMD to hold drills and exercises.
Bradford BUILDING CODES, PERMITTING, INSPECTIONS							
2022	BI State Building Code (International Building Code IBC 2018)	Contains a suite of residential, commercial, plumbing, electrical, mechanical, energy, and existing buildings. Includes International Residential Code (IRC).	Entire Town	High	Building Inspector	State adopted the new 2018 code in 2022. Town applies codes to new construction. 2020 Code is coming in Aug 2024. Last building ordinance was in 1990, BOS	Apply the new 2020 codes. Inspect when necessary. When State adopts new codes, Bradford will vote to adopt all of the new state codes instead of when they

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						needs to adopt the state codes as is.	are approved by the state one year at a time.
2022	BI State Life Safety Code 2018, Construction	New construction is continually evaluated during the process with the final inspection conducted by both the Fire and Building Officials prior to the issuance of a certificate of occupancy.	Entire Town	High	Building Inspector with Fire Dept assistance	State adopted the new 2018 code in 2022. Town applies codes to construction. Following the Fire Marshal's codes, Governor's Office signed.	Apply the new 2020 codes. Inspect when necessary. When State adopts new codes, Town will too.
2022	FD NFPA 101 Life Safety Codes Occupancy Inspections	Contains 15 types of occupancies that may be inspected by Fire Departments <u>- Places of Assembly</u> - Mercantile - Business - Health Care - Ambulatory Health Care - Residential Board and Care <u>- Day Care</u> <u>- Educational</u> - Apartment Buildings - Lodging or Rooming Housing - Hotel or Dormitory - 1 and 2 Family Dwellings - Industrial - Storage - Detention and correctional	Places of Assembly, Day Cares, and Educational sites, Large Residential	High	Fire Department	Conducted life safety inspections. State adopted the new 2018 code in 2022. FD issued permits for 2015 code until 2018 code applied.	Apply the new 2018 codes. Inspect when necessary. When State adopts new codes, Town will too.
2022	FD NFPA 1 Fire Codes and Permitting	Section 1:12, and Table 1.12.7a specifically outline instances when permits are required	Select Structures	High	Fire Department	State adopted the new 2018 code in 2022.	Apply the new 2020 codes. Inspect when necessary. When State adopts new codes, Town will too.
Apr 19, 2010	PB FEMA Flood Insurance Rate Maps	Adopted by Town, used for River, streams, brooks. Necessary for compliance with and	Floodplains	High	Planning Board/ Bldg Dept Staff	Received and reviewed Preliminary FIRMs	Reference maps in Town offices and note any

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Preliminary Maps May 2023		membership in the National Flood Insurance Program (NFIP).				developed by FEMA for a floodway. Noted in July 2023, that flooded in Massasecum was definitively in the 100 year FP zone.	substantial deviations on LOMR, LOMA. Use the FEMA online flood maps for most current information. Adopt final (May 2023 Preliminary) Floodplain Maps
Bradford LAND USE ORDINANCES, TOWN ORDINANCES, REGULATIONS							
2024	BOS Class VI Policy	Developing a Class VI policy to provide guidance for property owners wanting to build a home on a Class VI road. Need a separate policy for owner permission to build on Class VI roads. Used many ideas from Cons Comm Class VI report. Select Board will accept the road if meets criteria.	Class VI Roads	TBD	Select Board, assisted by Planning Board, Conservation Commission, Highway Dept, CNHRPC	In development presently, policy intended for adoption by Dec 2024.	Perambulation (required every 7 years) of the town boundaries is needed after the other surrounding towns initiate. Incorporate results into policy.
2024 /2025	HD Class V Road Improvement/ Construction Standards	Trying to adopt a format to use for Class V buildable, intended for Class VI road upgrades for homeowners to maintain and build. Can also be used for new development accepted by the Town.	Class V Road	TBD	Highway Department, adopted by Select Board	In development presently, policy intended for adoption by Dec 2024 or at March 2025 Town Meeting as required.	Make the standards applicable to new subdivision roads (as opposed as just for Class VI improvement roads)
2024	HD Class V Seasonal Maintenance Road Policy	Between Dec-April, some roads are not maintained. Will have signs on the roads. States that the roads are not winter maintained Dec 10 – April 15.	Class V Seasonal	TBD	Highway Dept, adopted at Town Meeting	In development presently, policy intended for adoption by Dec 2024 or at March 2025 Town Meeting as required.	Apply the new policy, revise where needed.

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2023	PB Zoning Ordinance	The Town's ordinances and regulations are all continually under review and changes are made when appropriate. Zoning ordinance changes include provisions to Residential Rural Districts, Sign Regulations, and a new Accessory Dwelling Units Ordinance in 2020	Entire	High	Planning Board	Adopted Accessory Dwelling Units in 2020. Minor changes made annually.	Review the ZO; revise and update as needed.
2025 Town Meeting vote	PB Surface Water Overlay District Zoning Ordinance	To reduce silt, pollution, and enhance water quality. Classifications of surface water and which ones might be protected, boundaries of buffers. Stream identification and protection levels. Types of restrictions in the buffers being looked at.	Brooks and streams, waters	TBD	Planning Board with Conservation Commission assistance	Attempted to pass at Town Meeting 2024 but needed more work and public education.	Plan to reintroduce the Surface Water Overlay District with consideration to property owners.
2023	PB Floodplain Ordinance	The Town last updated its Floodplain ordinance in April 2010, when new FEMA maps were available. Homeowners insurance requiring certificates of elevation. Town working with NH OSI NHDRA to supply FEMA with new Base Flood Elevations (BFEs). The location of Warner River floodplain is changing in Bradford due to BFEs. The Ordinance itself has not been revised since 2010	Floodplains	High	Planning Board	Removed several homes from floodplain using BFEs, worked with FEMA and NH DRA. Warrant 2025 with NH OPD revisions.	Changes will be incorporated as determined by the NFIP regulations and FEMA. Work with homeowners to revise BFE.
2015	PB SFHA Flood Subdivision Regulations	These SFHA Flood regulations require more stringent regulations for subdivisions. SFHA subdivision regulations have not been revised or amended since 2015.	Floodplains	High	Planning Board	Supported informed action and determination during application review.	Review and revise where applicable
2002	PB Wetlands Ordinance	Guides the use of land areas saturated or subjected to high water tables including	Wetlands	High	Planning Board	Supported informed action and determination	Review and revise where applicable

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		established and seasonal wetlands and buffers. The Wetlands Ordinance was incorporated into the Zoning Ordinance in 2002.				during application review.	
2015	PB Fire Protection Standards in Regulations	Fire Department can require onsite water storage, hydrant, etc. Fire protection for new developments in Subdivision Regulations and Site Plan Review Regulations (last reviewed/amended in 2015).	Entire Town	High	Planning Board with Fire Department	Supported informed action and determination during application review	Review to ensure compliance with current state laws. Revise where applicable.
2023	PB Large Lot Zoning	A larger lot may be required for topographical reasons, soil, or adequate sewage. Lots located on Class VI roads used Agriculture. Forestry has a minimum area requirement of 10 acres. Lots on Class V roads for seasonal cottages also have a 10-acre minimum.	Town Roads	High	Planning Board	Supported informed action and determination during application review.	Review and revise where applicable
2023	PB Shoreland Ordinance	Cites the Shoreland Water Quality Protection Act 483-B. Last amended in 1996.	Shorelands and Great Ponds	High	Planning Board	Supported informed action and determination during application review.	Review and revise where applicable
2015	PB Road Design and Construction Standards (Subdivision Regulations)	Access, Arrangement, dead-end streets, street names, signage, guardrails, right of way, alignment & grading	Entire Town	High	Planning Board	Supported informed action and determination during application review	Review and revise Site Plan regulations where applicable; add provisions from Subdivision regulations.
2015	PB Stormwater Construction and Maintenance Standards (Subdivision)	Storm drainage computations and design runoff, drainage structures and driveway culverts in Subdivision Regulations. Erosion and Sedimentation plan and	Entire Town	High	Planning Board	Supported informed action and determination during application review	Review and Revise Site Plan regulations to be in closer conformance with

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	/Site Plan Regulations)	stormwater management control in site plan review.					Subdivision regulations.
2015	PB Earth Excavation Regulations	Includes operational standards, expansion, abandoned excavation and reclamation standards. 2015 EERR amendments include updates to definitions for <i>Agricultural use</i> , <i>Commercially Useful</i> , and <i>Normal Landscaping</i> . Changes were also made to permitting requirements and criteria, fee schedules, Inspections and others.	Excavation Areas	High	Planning Board	Supported informed action and determination during application review	Review and revise where applicable.
2024	PB Driveway Permit Application	Includes 911 addressing and culverts, road width, turning radius, width, height, turn around radius, emergency vehicle capacity.		TBD	Planning Board, assisted by, Highway Select Board, Dept, CNHRPC	In development presently, adopted by PB 2024. Includes 911 addressing and culverts, road width, turning radius, width, height, turn around radius, emergency vehicle capacity.	Use the new applications and educate property owners about the required features.

ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capabilities in **Table 6.2** include policies, mutual aid agreements, partnerships, standard operating procedures, training, skills and tools that can be used for mitigation planning and to implement specific mitigation actions. Smaller jurisdictions without local staff resources often rely on public or shared resources. There are **3** categories: **Administrative Programs, Policies, and Partnerships; Technical Skills, Training and Drills;** and **Assets, Security and Resources.**

Table 6.2

Administrative and Technical Capabilities

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Bradford ADMINISTRATIVE PROGRAMS, POLICIES, MUTUAL AID AGREEMENTS, PARTNERSHIPS, OPERATIONS, PROCEDURES							
2023	BOS Policy Updates	Board is undertaking many policy updates or new policies, including: fund balance policy, investment policy, personnel policy, purchasing policy, credit card policy.	Entire Town	High	Select Board	Adopted purchasing policy and credit card policy.	Finish with the Fund balance policy, investment policy, personnel policy. Consider others in the future.
2012, TBD for update	EM Lake Todd Dam Emergency Action Plan	Discuss the private dam with the owners and determined the contact person and requested copies of their dam plans and inspection reports. Dam is now a part of Lake Todd Village Dist.	Lake Todd basin	High	Emergency Mgt	Bradford will reach out to Lake Todd Association for latest DEAP. Review and revise where applicable.	Obtain Dam Emergency Action Plans and Inspection Reports to check for hazards or mitigation steps
2024	FD Water Supply Projects (Dry Hydrants, Cisterns)	Water Supply projects are situated in town based upon availability of sites. Some subdivisions or commercial applications must supply a cistern. Regulations state that they must meet the Fire NHPA standards.	Entire Town	High	Fire Dept	No new ones have been added since 2019. Some are being reallocated for parts to fix others – Fairgrounds Rd -> Jones Rd. Water supply for private property	Secure easements for dry hydrants on private property. Locate them with metal detectors.
2021	FD NFPA Standard	Use NFPA for standard operating guidelines (SOG), not the SOPs.	Entire Town	High	Fire Dept	Town updated and followed the NFPA	Update the Fire Department Standard

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	Operating Guidelines	Constantly reviewing new materials for relevancy to Bradford.				guidelines. Follow policy for SCBA, truck turnover, etc.	Operating Guidelines (SOGs)
2023	FD Call "Response Cards"	Call "Response Cards" indicate who responds to which emergencies or disasters within the Mutual Aid (MAC) Compact. Town was rezoned into 6 different fire protection zones for MAC towns coming in. Member of both Capital Area Mutual Aid and Kearsarge Mutual Aid.	Entire Town	High	Fire Dept	New CAD system in 2023 at Capital Area. Will run new response cards for Bradford in 2024 for update.	As Bradford grows, reevaluate the effectiveness of the 6 protection zones.
2007	FD Sand-Bagging of Dams Procedure During Periods with Potential for Flooding	Sandbagging activity is jointly undertaken by Fire Dept, Highway Dept, Police Dept and volunteers with materials provided by the NH HSEM. Policy is written in EOC under potential breaching of Lake Todd.	Dams	High	Emergency Management	Policy not used since 2007. No sandbags in Town.	Work with NH HSEM and NH DES for guidance on sandbag storage and usage.
2022	FD Standard Operating Guidelines (SOGs)	Contains standard safety provisions. Recently revised in 2017 for off-gassing of uniforms. Have a new washer and dryer, placed drainage systems at Fire Dept, uniforms kept in different area.	Entire Town	High	Fire Dept	Revised in 2022, including response matrix, hiring, COVID and EMS response.	Review and update to current specifications and standards
2024	FD Kearsarge Mutual Aid Agreement	Mutual Aid Agreement (MAA) – Kearsarge Mutual Aid which has 3 different dispatches. Includes Sutton, Newbury, Wilmot, Sunapee, Weare, Webster, Henniker, Hillsborough, Warner. Never seen a bill for any service rendered. The MA towns meet monthly, but they do not have their own dispatch. Kearsarge is a subset of	Entire Town	High	Fire Dept	Worked and met monthly, held joint trainings, rotate among stations - Bradford hosted in July 2024. Pay annually for this service. Work with New London Hospital,	Recruit new members and sponsor training, retain existing members. Cadet/ Explorer program initiated with young people.

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		the Capital Area Mutual Aid Agreement member. Every town has to host 1 town per year.				provides backup.	
2024	FD Capital Area Mutual Aid Fire Compact	Bradford is a member of Capital Area Mutual Aid, which also sponsors haz-mat team. Fire Department trained in first-responder and awareness. Can recognize and stabilize the scene until haz-mat team arrives. Has a part-time area coordinator. Brings in specialized equipment. Concord Hospital protocol review of TEMSIS, hospital choice, and monthly training for certification.	Entire Town	High	Fire Dept	Pay annually for this service, mostly for dispatching (\$20,000/yr). Participated in drills and exercises, met monthly at different stations. Bradford received equipment and haz mat training.	Recruit new members and sponsor training, retain existing members. Undertake training and drills with the Capital Area Mutual Aid towns.
2021	HD Plow Route Designation	Every employee has an area they are responsible to plow including sanding and salting. Roadwork completed will improve the quality of the roads, equipment is better, so less staff time used. Designated areas mapped and written.	Roadways	High	Road Agent	Slight shift in the allocated areas to crew. Have 4 FT & 1 PT. Improved the equipment.	Annually modify routes and maps for effectiveness.
2024	HD Public Works Abutting Community Mutual Aid	Neighboring towns help out as needed. No formal or written agreements. Develop communication between all these towns for radio communication for road blockages/routes.	Entire	Moderate	Highway Dept	Reciprocate when neighboring towns need equipment or labor.	Forge relationships with other towns and join the NH Public Works Mutual Aid.
2024	HD Shared Abutting Town Road Maintenance and Emergency Services	Bible Hill – Warner, Blaisdell Lake/Farm Road – Sutton, Latvian Lutheran, Gillingham Drive, Old Sutton Road-Brad, Newbury, Sutton; Bagley – Warner, Day Pond Rd– Warner, etc. Have some of them as winter maintenance. Regional communications	Shared Roads in Neighboring Towns	High	Highway Dept	Provide Fire & Rescue & Highway maintenance service automatically to these locations if needed for timely service.	Find a way to communicate with all surrounding Towns. Bradford does not have cell service or radio service in all sections of town. Regional

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		is necessary with the limited service in Town.					interoperability is needed.
2024	HD Town Road Policy	Indicates which uses are permitted on which roads, road maintenance procedures	Roadways	High	Highway Dept	Class VI Road policy under review; Road standards update underway; improve road signage indicating Class V seasonal or Class VI	Formalize, expand and adopt the Town Roads Policy.
2024	HD Procedure to Communicate with Utility Companies to Cutback Overgrown Limbs	Removing overhanging limbs near power-lines will reduce that potential hazard in the Town. Communicate regularly with Eversource and other utility companies to make sure that branches are cut back from power lines to reduce the potential hazards from wind.	Roadways	High	Highway Dept	Ongoing review and renewal; frequent communication with Eversource	Communicate to utilities when trees are identified, be proactive to ensure elimination of hazardous limbs before they fall; work within Eversource's web-based reporting tool when downed limbs, fires etc occur
2024	HD Town Road Weight Limit Ordinance	This policy was adopted to help control the damage to the road infrastructure	Roadways	High	Highway Dept	Annual Postings	Review and update to meet current needs of town.
2024	PD Standard Operating Procedures	Last revised in 2022. Follow Active Shooter, Bombs Threats, Haz Mat. Any aspect that has an SOP or SOG that is identical to the CALEA goal. All updates done in-house.	Entire	High	Police Dept	All updated 2022 when new Chief was hired. Laurie SOP updated to reflect new EES.	Review and update when necessary or every so many years
2024	PD Mutual Aid Agreement	With Sutton, Warner, Henniker, Sunapee, New London, Hopkinton, Concord. With approximately 22 other towns, as far away as	Entire	High	Police Dept	When Chief was changed, agreement was redone, review to see	Remain in compliance with Attorney General and IACP to update

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		Woodstock. Renewed every time there is a new Chief. Concord is backup dispatch center. Have updated members of MOU with all Depts, so can muster more than 40 people. The Town is a member of a Special Operations Unit				if any clauses are needed.	MAA. Reviewed annually.
2024	PD Procedures for Event Traffic Control	Police provide security traffic control for fires, or other events, enabling the Fire Department to concentrate on fire suppression. Respond to calls. Works in cooperation with other departments to ensure safe responses.	Entire	Moderate	Police Dept	Fulfilled new mandate from NHDOT, met new guidelines. Use of signage board and social media to notify residents. Dept has up-to-date high visibility gear to protect officers.	Annually review and update traffic control events as necessary
2024	PD Procedure to Call Senior Citizens	Dept keeps an updated and ongoing list of individuals/resident that are checked on during weather, and other, events.	Entire	High	Police Dept	List is constantly updated. Works with other first responders to identify individuals.	Dept communicates this service through medial (social, printed) to make folks aware of this service and keep list updated.
2024	PD Member of Central NH Police Special Operations Unit (SOU)	Member of Central NH Special Operations Unit for high-risk warrants, missing persons, barricaded subjects, hostage situations. Don't have to participate in real event often, but when the Town does, it is a severe event.	Town-wide	High	Police Dept	Police Chief is commander of CNH SOU.	Town of Bradford will continue to be the fiscal agent for Federal Grants for this organization to improve the unit's capabilities.
2024	SD Bradford School Evacuation Procedures	In Bradford Elementary School, EOP contains evacuation procedures and drills.	Elementary School	High	Kearsarge Regional School District	Police and Fire Chiefs have been participation in SAU safety	Participate in drills and meetings with the school district.

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						meetings to provide input to enhance EOP.	
2024	FD Bradford School Inspections	Annual School inspections done by Fire Dept	Elementary School	High	Kearsarge Regional School District and Fire Dept	Inspections are done per requirements of Homeland Security. Allows for grants to that school.	Participate in inspections.
Bradford TECHNICAL SKILLS, TRAINING, AND DRILLS							
2024	BOS Planning Board Coordination with Town Depts	PB Technical Review Committee is successful. Includes Building Inspector, Health Officer, and Road Agent, and Conservation Commission are involved in PB business. Increase the communication to ensure PB developments are reviewed by all Departments. Coordinated through Select Board.	Entire	High	Select Board/Town Admin	Through Technical Review Committee, all Boards & Depts met to review Planning Board apps.	Encourage PB coordination with other Town Departments.
2024	BOS Employee Safety at the Town Hall	Town Office is located in the Bradford Town Hall. For employee and building safety, there are security cameras covering entrances, hallways, public areas etc. Office transaction windows are bullet resistant. Office staff have panic buttons.	Bradford Town Hall	High	Select Board with Police Dept	Updated security measures were installed as part of major Town Hall renovation in 2023.	Police Dept and Fire Dept will be given functionality to allow them to monitor security cameras.
2024	EM WebEOC	Login on internet, Dept heads have the ability to sign in for Bradford. Real time communication with State EOC to obtain assistance during emergencies. Drills and monthly logins. Multi-Dept	Town wide	High	Emergency Mgt, PD, FD, TA	Used routinely for weather events, flooding, road closures to call in barricades and other needs.	Ensure logins are active to use during emergencies.

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30 & first responders people/ 2024	EM ICS / NIMS Training	Incident Command System (ICS) Training National Certification for Town emergency personnel.	Town wide	High	Emergency Mgt	Departments obtained updated ICS certification.	Ensure new personnel complete required trainings whatever is required of their job description. Existing employees continue to complete mandated updates.
2024	Town of Bradford Interdepartmental Communication	Town Depts have working relationship with each other.	Entire Town	High	Emergency Mgt	Dept Heads have regular meetings to discuss dept happenings. Social and printed media are used to reach residents.	Cooperatively work and communicate on a regular basis.
2024	FD Specialized Equipment	Fire Dept maintains equipment to be suitable for incidents that occur within Bradford and surrounding communities.	Entire Town	High	Fire Dept	Continue to work and train with other towns to fulfill regional needs via mutual aid agreements and provided them with Bradford's specialized equipment when requested	Use capital reserve funds to replace aging equipment to maintain a successful Fire Department capable of meeting the community's needs.
2024	FD EMS Mass Casualty Training	FD must train to maintain its certification by training members and volunteers.	Entire Town	High	Fire Dept	Continue to stay current with state and national training requirements	Stay current with state and national training requirements.
2024	FD Specialized Training	Town pays for volunteer training, and individuals share the training they receive. Constantly reviewing new materials	Entire Town	High	Fire Dept	Bradford FD trains monthly to keep all Fire and EMS skills up-to-date.	Train successful program to recruit and retain volunteers.

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		to consider for training. Each individual is responsible for own EMS and Firefighting training					
2024	FD Dry Hydrant and Fire Pond Maintenance Program	The program will aid in fire suppression abilities in established areas.	Areas with Dry Hydrants and Fire Ponds	High	Fire Dept	Replaced some dry hydrants as bridges are replaced	Try to use a harder plastic produce, now are vulnerable to hit by vehicle or snowplow.
2024	FD Capital Area Public Health Network Member	Town will coordinate with DHHS for any new or ongoing communicable diseases, biological problems.	Entire Town	High	Fire Dept	Fire Dept is in constant contact with DHHS and relays information to Dept Heads.	Ensure situational awareness of events at State level to provide assistance to town residents.
2024	HD Equipment, Construction, Safety and Installation Training	T2 training for grading, backhoe, loader, and chainsaw safety. T2 Training Classes – gravel road maintenance, culvert installation, road signage, asphalt. Look for other training opportunities including Primex.	Entire	High	Highway Dept	Annual training for each employee. Annual physicals as required by DOT. Random drug testing.	Keep Highway Department personnel current with technique training for safety and efficiency.
2024	PD Bradford Elementary School Active Shooter Protocol	Use CopSync, working on safety locks, evacuation drills, lockdowns, cameras.	Kearsarge Regional School District, Bradford Elementary School	High	Police Dept, with School District, Principals	PD has been attending SAU safety meetings.	Attend SAU safety meetings.
2024	PD 24/7 Police Coverage	PD provides 24/7 coverage through active patrol and on-call.	Entire	High	Police Dept	More active patrol and less on-call per day.	Add an extra person on coverage by better use of scheduling.
2024	PD DARE and ALICE Training	The Police Dept provides DARE training at the Elementary School and support School District in their transition to ALICE.	Entire Town	High	Police Dept	New certified DARE officer and ALICE instructor.	Drill with School and act as resource for SAU.
2024	PD Child DNA Testing Program	Child DNA kits are available at PD for residents to register their children in a national database.	Entire	High	Police Dept	Not many parents take advantage.	Advertise and offer kits to residents

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2024	PD/FD/HD/EM/TA Department Radios with Interoperability	Current Radios allow for interoperability. These were received through older grants, technology is starting to decline. Radio replacement is high priority.	Entire Town	High	Police Dept/ Fire Dept/ Highway	Some radios have been replaced through grants or purchases to utilize new technology.	Seek grants and make purchases to make sure radios for all departments are up-to-date.
2024	TA Safety Training for Employees	Clerical, safety. Formal classes through State, Primex, etc.	All	High	Town Administration	Staff takes regular training offered by Primex. Town Hall renovation included additional safety measures.	Ensure all staff are trained on safety procedures.
2024	TA First Aid Training	Basic first aid and CPR, AED training at the Town Hall.	All	High	Town Administration	Purchased an AED for Town Hall.	Train staff in AED and CPR with instruction offered by FD.
Bradford ASSETS, SECURITY, AND RESOURCES (SPECIALIZED EQUIPMENT)							
2004	BOS Building Renovation at Town Hall	Town Hall underwent a major renovation in 2023. Energy efficiency and personal safety protection for town employees and the public were a priority in the planning.	Town Hall	Low	Select Board	Underwent a major renovation in 2023. Personal safety protection for town employees and the public; sprinkler system was installed; security cameras; bullet resistant service windows were installed.	Appropriately maintain the building to protect it against deterioration, maintain safety systems.

Latest Adoption or Version Date	Capability Assessment : Administrative and Technical	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
2024	EM BACC, PD, FD, HD, School Generators	Generator in Bradford Area Community Center (BACC) has 1,000 gallon propane tank, tests this week. This will keep emergency operations functioning during a disaster event.	Town Office and Police Dept	High	Emergency Mgt	Generator at BACC needs repair.	Generators are tested and maintained to ensure operability. The Town seeks to add a generator to Town Hall when grant opportunity arises.
2024	FD Upgraded Security/Fire Alarm System at the Fire Department	Fire Dept is now equipped with a Fire Alarm system to protect the building and apparatus, monitored by an outside service.	Fire Station	High	Fire Dept	System is maintained and inspected annually.	Improve system with door monitoring and security cameras.
2024	FD Water Rescue Capabilities, Zodiac Boat	The Town has a boat to use for water rescue in response to the extreme flooding Bradford experienced. More equipment was obtained to facilitate rescue during flooding conditions: trailer, ice rescue suits, ropes, personal flotation devices, and water rescue helmets	Loval water bodies	High	Fire Dept	Used as needed for training, rescue and fire. Also have access to the Mutual Aid for Swiftwater Rescue.	Train and maintain equipment. Training includes mutual aid partners.
2024	FD UTV	John Deere gator equipped with 100 gallon slip on and rescue, with wheels and tracks.	Entire Town	High	Fire Dept	Maintained and serviced annually. Members train on use of the vehicle.	Regular upkeep of vehicle and use in search & rescue and Fire.
2024	PD OHRV Vehicle	Department has a four-wheeled OHRV to use in search and rescue operations.	Entire	High	Police Dept	Used as needed.	Regular upkeep of vehicle and use in search & rescue

FINANCIAL CAPABILITIES

The financial resources in **Table 6.3** available for hazard mitigation projects are those the Town has access to, has used in the past, or may be eligible to use in the future for hazard mitigation projects. These often include FEMA Public Assistance Grants (Disaster Recovery Costs), Warrant Articles, Town Capital Improvements Program (CIP) Project Funding, Department Operating Budgets, Bonds and FEMA and NH Department of Transportation grants. There are **2** categories, **Financial Programs or Funding Resources**; and **Potential Funding Programs** for hazard mitigation projects.

Table 6.3
Financial Capabilities

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment</u>	<u>Description</u> Related to hazard mitigation planning and coordination	<u>Location of Capability</u> Entire Town or Selected Areas	<u>Level of Effectiveness</u>	<u>Responsibility</u>	<u>Changes or Progress Since Last Haz Mit Plan (2018)</u> If none, how was it used?	<u>Future Improvements to Capability (2025-2030)</u> Desired or planned
Bradford FINANCIAL PROGRAM OR FUNDING RESOURCE FOR HAZARD MITIGATION PROJECTS							
2024	BOS, NH Department of Transportation (NH DOT) Bridge Program, other Federal and State agencies.	Town continuously seeks grants and other financial assistance to help with its aging infrastructure. Using the CIP Capital Reserve Funds, communities can set aside money for the several years it takes for the state to undertake the local bridge project. Working on the Town's redlisted bridges and failing culverts.	Culverts on West Main Street, Deer Valley Road, West Road, East Shore Drive. Bridges on Blaisdell Lake Road (2), Johnson Hill Road.	Medium	Town Admin	Work is being done to gather realistic estimates for these projects and formulate a plan for their repair/replace ment.	Use the NHDOT Bridge funding program, grants and other forms of funding. Set aside Town match funding
TBD	BOS/ EM FEMA HMGP	Funding to be used for large-scale construction and infrastructure improvements to town facilities and roads.	Town Roadways and Buildings	TBD	Select Board, Emergency Management	Ideas are being obtained for potential projects	Set aside 25%-50% of anticipated project costs into a Capital Reserve Fund
Bradford FUTURE FINANCIAL RESOURCES TO EXPLORE FOR HAZ MIT PROJECTS							
2004	CC Land Conservation Fund	The Land Conservation Fund can be used to protect water supplies through purchase of conservation easements.	Priority locations	High	Conservation Comm	Deposits to the fund when current use land converted to developed uses.	Consider using fund for water and flood protection

Latest Adoption or Version Date	Capability Assessment: Financial	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
Not used yet	EM Emergency Management Operating Budget	Budget can contain funding for outreach programs, mitigation projects	Entire Town	High-TBD	Emergency Mgt	Could be used as a repository for some haz mit projects	Use Emergency Management Operating Budget to finance future hazard mitigation improvements
Not used yet	PB Town Capital Improvements Program (CIP) Project Funding	Sets aside funds for large equipment/ projects.	Entire Town	High-TBD	CIP Committee	Could be used to set aside funding for large projects	CIP could include expensive or long-term hazard mitigation projects

EDUCATION AND OUTREACH CAPABILITIES

In **Table 6.4**, identifying Town Departments have **Public Outreach Programs, Educational Activities and Notification** methods already in place or those which could be implemented can supplement or encourage mitigation activities and communicate hazard-related information to residents, businesses and the general public.

Table 6.4

Education and Outreach Capabilities

Latest Adoption or Version Date	Capability Assessment : Education and Outreach Programs	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
Bradford PUBLIC OUTREACH PROGRAM, EDUCATIONAL ACTIVITY, NOTIFICATIONS							
2024	CC Conservation and Wetland Maintenance and Education	Conservation Commission maintains open space, trails and conservation lands and wetlands through data collection. The data includes Class VI Roads. This project helps mitigate the effects of natural disaster events	Entire Town	High	Conservation Comm	Maintained easements and wetlands. Maintained trails, worked with organizations to increase joint efforts.	May update Wetlands Inventory of wetlands over ten acres in area.
Jan 2024	EM (New) Reverse 911 Notification System for Use in Bradford	New State system (Genasys) enacted Jan 2024. Access to new reverse 911 will allow Town Officials to send emergency notification to anyone in Bradford using a mapping system as identified by EM for landlines only. Cell phones need sign up. Replaces State's CodeRed.	Entire Town	Moderate	Emergency Mgt	New State system (Genasys) enacted Jan 2024 for enlisted landline phones. Bradford had not used service prior.	Attend training in use of system. Encourage cell phone users to sign up for Genasys – include how on Town website (sign up @ www.readynh.gov). Consider landline benefits as an emergency service.
2024	FD Annual Open House and Fire Prevention Week	Fire prevention events/talks through the year for local organizations including Fire Prevention Week in School.	Entire Town, General Public	Low	Fire Dept	Visited schools and local businesses; FD writes monthly article for Bradford Bridge.	Work to get Fire Prevention message into the community.

Latest Adoption or Version Date	Capability Assessment : Education and Outreach Programs	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes or Progress Since Last Haz Mit Plan (2018) If none, how was it used?	Future Improvements to Capability (2025-2030) Desired or planned
2024	PD Community Outreach	The Police Dept. regularly does outreach with other community partners, such as the Bradford Area Community Center, Elementary School, senior group, etc. The goal is to be part of the community, offer familiarization to residents, and promote trust in the Dept. Officers are involved with BACC & Parks and Recreation	Entire	High	Police Dept	Actively participates in communicating with residents through social media, message board. Participates in public activities.	Provide the outreach to the community through different partners.
2024	PD Firearm Safety Courses	Partner with Bradford Fish & Game to hold Firearm Safety Course	Entire	High	Police Dept	Moving forward with training.	Collaborate with Bradford Fish & Game
2024	PD Drug Take Back Box & Drug Days	People can drop off unused narcotics or prescription medication.	Police Station	Moderate	Police Dept	The PD has a drug take back box available in the lobby 24/7.	Make public aware of this service.
Feb 2024	SD School District Automated Calling System	Used only for school emergencies. Automated phone, text, email service to parents for alert. Used for snow delays and snow days- Blackboard Connect	Entire Town	High	Kearsarge Regional SAU 65	2023 Sep Update Blackboard Connect contact information	District is reviewing potential new system to replace the Blackboard Contact system.
Current 06-24	TA Town Website	Existing town website is used for public information and notification.	Entire Town	High	Town Admin/BOS/IT	Regular updates to material and calendar	Upgrade the website to a common template format for easier location of information.

Source: Bradford Hazard Mitigation Committee

7 PRIOR ACTION STATUS

The **Hazard Mitigation Plan Update 2018** provided a basis to begin Action development, many of which originated from prior **Plans**. A review of the **2018** Actions is provided by the Hazard Mitigation Committee, determining which Actions have been **Completed**, **Deleted**, or **Deferred** to the **2025 Plan**.

Action Status Determination

The status of all Hazard Mitigation Plan Actions varies. Priorities over the previous five years can change, budgets are uncertain, and staff are allocated time for certain tasks. Actions developed, evaluated and implemented across Hazard Mitigation Plans accommodate existing, new, and future development (buildings and infrastructure). To accommodate the **2018 Plan's deferred** Actions in addition to the **New** Actions from the **2025 Plan**, there are four designated Action types to describe the detailed Actions following within the **7 PRIOR ACTION STATUS** and/or **8 MITIGATION ACTION PLAN**:

Completed
Deleted
Deferred

Actions which were **Completed** from the **2018 Plan** are listed in **Table 7.1** along with completion dates.

Actions which were **Deleted** from the **2018 Plan** might have been no longer necessary or a priority to the Town, no longer relevant to the Town's situation or objectives, could not realistically be undertaken, were not financially feasible, were modified and incorporated into other existing Actions, or duplicated existing efforts of Bradford's activities. Deleted Actions are listed in **Table 7.2**.

Actions which were **Deferred** from the **2018 Plan** are still important to the Town but were not completed because they did not have the staff capability or the funding to undertake them, other Actions took higher priority, more time was required for completion, or they may need to be repeated to be effective. These **Deferred** Actions are in **Table 7.3** and have been re-prioritized with the **New** Actions in the **Mitigation Action Plan**.

Changes in priority of the **Deferred 2018** Actions occurred over the last five years. The **2025 Plan** included both a **Ranking Score** and an **Action Timeframe** to determine priorities with a more useful **15-75 Priority Score enhanced STAPLEE** system. Both methods are described.

New Actions are described later in **8 MITIGATION ACTION PLAN**.

DEFINITIONS

The following definitions were used to ascertain which Actions should be considered *mitigation* Actions versus which should be considered *preparedness* Actions more suitable for incorporation into the *Town Emergency Operations Plan*. The mitigation Actions are those which are carried forth in this **2025 Plan** into the **Mitigation Action Plan**.

Action Type	Duration	Definition or Characteristics
Mitigation	Long Term	Action supports sustained risk prevention or reduces long-term risk to people, property and infrastructure. ↳ Best suited for <i>Town Hazard Mitigation Plan</i> .
Preparedness	Short Term	Action assists or supports planning, protective activities, public education, training and exercise. ↳ Best suited for <i>Town Emergency Operations Plan</i> .
Response, Recovery, Other Related	Short Term	Action supports preventative, response, recovery-related, repeated or deferred maintenance activities. ↳ Best suited for <i>Town Emergency Operations Plan</i> .

Review of 2018 Actions

Bradford's mitigation Actions from the **2018 Plan**, which included Actions from the Town's previous Plans, were allocated **Action Numbers** and each **Project's** status was determined by the Hazard Mitigation Committee as either **Completed**, **Deleted** or **Deferred**. Over the previous Plans, the Actions numbers denoted by years were recorded as such. Actions from the first **Plan** which were **Completed** or **Deleted** and identified as such in the **2018 Plan** were not given numerical identifiers (**#NA**).

HMP	Action # Range	
2007 Plan	#01- 2007 to	#33- 2007
2012 Plan	#34- 2012 to	#54- 2012
2018 Plan	#55- 2018 to	#70- 2018
2025 Plan	#71- 2025 to	#106- 2025

A total of **18** mitigation Actions were **Completed** from the previous **Hazard Mitigation Plans** as shown in **Table 7.1**.

Table 7.1
Completed Mitigation Actions

Priority Score (2018)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
COMPLETED AFTER 2025 Plan (from CHAPTER 8)						
		See Chapter 8 – HMC to add completed Actions				
COMPLETED BY 2025 Plan						
54	#18-2007	Rehabilitate and Restore the Town Hall to Functional Capacity, Including Safety Measures to Protect from Human Hazards, Wind, Storms, Winter and Lightning	May 2024	Select Board	\$861k Phase 1 \$1.3m Phase 2 Unknown \$ Phase 3	Wind, Storms, Winter and Lightning, Human
66	#33-2007	Educate Homeowners on Private Culvert Maintenance to Reduce Impact of Floods, Debris and Storms	2024	Highway Department	\$0	Flood, Scouring & Erosion, Storms, Debris
70	#49-2012	Install a Cistern on the Town Hall Property for Fire Suppression	2023/2024	Select Board	\$30,000 - \$70,000	Lightning, Wildfire, Drought, Hazardous Materials, Fire
70	#53-2012	Update the 2006 Master Plan to Support the	April 2020	Planning Board	\$20,000	Flood, Ice Jam, Scouring & Erosion, Wind, Storms,

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Town of Bradford, NH Hazard Mitigation Plan Update 2025

7 PRIOR ACTION STATUS

Priority Score (2018)	Action Number	Action	Complete d By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
		Development of Zoning Ordinances and Regulations that Help Protect the Town from Natural Hazards				Lightning, Wildfire, Winter, Drought, Heat, Earthquake, Landslide, Dam Failure, Debris, Hazardous Materials, Public Health
75	#61-2018	Rehabilitate the Redlisted Bement Covered Bridge on Center Road to Mitigate Flooding of the Warner River	June 2021	Select Board	\$140,000	Flood, Scouring & Erosion, Storms, Debris
72	#67-2018	Purchase and Install Beaver Deceiver Devices to Prevent Beaver Culvert Debris and Flooding	2019	Conservation Commission	\$5,000	Debris Impacted Infrastructure, Dam
COMPLETED BY 2018 Plan						
30	#01-2007	Develop and Adopt Steep Slope Ordinance	Mar 2008	Planning Board	\$0	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris, Dam Failure or Release, Earthquake, Landslide
24	#02-2007	Develop Vulnerable Occupant and Evacuation Plan	Sep 2008	Police Department	\$50	Flood, Wind, Lightning, Wildfire, Rapid Snow Pack Melt, Storms, Winter, Debris, Power Failure, Communications Failure, Public Health
36	#03-2007	Develop Subdivision Regulation for Fire Protection	Oct 2008	Planning Board	\$0	Fire, Wildfire, Lightning, Storms, Wind, Hazardous Materials
35	#04-2007	Upgrade Security Alarm System at the Fire Department	Apr 2009	Fire Department	\$15,000	Storms, Wind, Wildfire, Lightning, Fire, Sabotage, Human
31	#05-2007	Develop Driveway Standards	Dec 2008	Planning Board	\$0	Flood, Scouring & Erosion, Wind, Rapid Snow Pack Melt, Storms, Debris, Earthquake, Traffic Accidents, Landslide, Wildfire
36	#06-2007	Establish Dry Hydrant and Fire Pond Maintenance Program	July 2010	Fire Department	\$1,000/year	Fire, Wildfire, Lightning, Storms, Wind, Hazardous Materials
36	#07-2007	Collect Lake Todd Dam Information	Oct 2011	Emergency Management	\$0	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris, Dam Failure or Release, Earthquake
35	#34-2012	Upgrade Center Road Culvert	Spring 2013	Highway Department	\$5,000	Flood, Scouring & Erosion, Wind, Rapid Snow Pack Melt, Storms, Debris, Dam Failure or Release

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7 PRIOR ACTION STATUS

Priority Score (2018)	Action Number	Action	Complete d By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
33	#35-2012	Upgrade East Main Culverts Drainage Project	Spring 2015	Highway Department	\$175,000	Flood, Scouring & Erosion, Wind, Rapid Snow Pack Melt, Storms, Debris, Dam Failure or Release
27	#36-2012	Remove Debris from the Warner River and the West Branch	Sep 2013	Select Board	\$50,000	Flood, Scouring & Erosion, Wind, Rapid Snow Pack Melt, Storms, Debris, Dam Failure or Release, Landslide
33	#37-2012	Educate Homeowners on Fire Extinguisher Use	Sep 2014	Fire Department	\$500	Fire, Wildfire, Storms, Wind, Hazardous Materials
30	#38-2012	Update the Emergency Operations Plan	Oct 2017	Emergency Management	\$0	Flood, Scouring & Erosion, Wind, Lightning, Wildfire, Rapid Snow Pack Melt, Storms, Winter, Debris, Earthquake, Traffic Accidents, Landslide, Sabotage, Public Health, Power Failure, Communications Failure, Winter, Ice Jam

The pink highlighted rows indicate the total Deleted Actions in Table 7.2 from previous Hazard Mitigation Plans which will not be incorporated into the 2025 Plan as Deferred Actions. Many of the first set of Actions were Deleted because they were preparedness, response or recovery items and more appropriately belonged in the Town's Emergency Operations Plan.

Table 7.2
Deleted Mitigation Actions

Priority Score (2018)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
DELETED AFTER 2025 Plan (from CHAPTER 8)						
		See Chapter 8 – HMC to add deleted Actions				
DELETED FROM 2025 Plan						
75	#54-2012	Update the Zoning Ordinance to Comply with NFIP Requirements	Sep 2024	Planning Board	\$0	Is Ongoing and will be placed in the Capability Assessment

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Town of Bradford, NH Hazard Mitigation Plan Update 2025

7 PRIOR ACTION STATUS

Priority Score (2018)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
		Regulate Building in the Floodplain				
74	#57-2018	Develop and Maintain a Community Database to Track Vulnerability to Severe Wind Events	Sep 2024	Emergency Management	\$0	Was unrealistic, No Longer a Priority
69	#51-2012	Install Dry Hydrant on Rte 114 North of Massasecum Lake Road for Fire Suppression	Sep 2024	Fire Department	\$5,000	Was Infeasible. Bad proximity, nearby hydrants. Could use boat launch.
75	#58-2018	Install a Dry Hydrant and Bubbler at Lake Todd Route 103 Bridge for Fire Suppression	Sep 2024	Fire Department	\$13,000	Duplicates existing. Have a dry hydrant at High Street/West Main St Dam and 1/2 mile in other direction
48	#62-2018	Purchase the Kearsarge Fitness Building to Serve as a Emergency Shelter and Backup Town Hall, with Meeting Space, Parking, Showers	Sep 2024	Emergency Management	\$300,000	Was infeasible. Now a commercial business.
66	#64-2018	Reduce Warner River Flooding Potential by Assisting Trout Unlimited with Removing Dams Upstream of Lake Massasecum	Sep 2024	Emergency Management	\$0	Was unrealistic,
67	#65-2018	Continue to Support Milfoil Control Efforts in Lake Massasecum and Reduce the Impact of Invasive Species	Sep 2024	Select Board	\$6,000 annually	Is Ongoing and will be placed in the Capability Assessment
64	#68-2018	Consider Purchase of Residential Lot on Center Road off Warner River to Obtain Flood Storage	Sep 2024	Conservation Commission	\$90,000 last known lot sale price	Is financially infeasible. Lot was privately purchased.
DELETED BY 2018 Plan						
27	#08-2007	Purchase of Ladder or Bucket Truck	Feb 2012	Fire Department	\$500,000	Was not relevant to the Town's current situation or objectives
33	#09-2007	Replace Culverts	Feb 2012	Highway Department	\$300 to \$3,000	Was modified and incorporated into another activity
31	#10-2007	Dredge of Warner River	Feb 2012	Highway Department	\$0	Was modified and incorporated into another activity
36	#11-2007	Install Dry Hydrant on Forrest Street	Feb 2012	Fire Department	\$2,000	Was modified and incorporated into another activity

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Priority Score (2018)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
28	#12-2007	Provide More Coverage for Building Inspector	Mar 2012	Building Inspector	\$0	Was modified and incorporated into another activity
36	#13-2007	Map Wood Roads	Mar 2012	Fire Department	\$10,000	Was an unrealistic activity
35	#14-2007	Develop Disaster Response Plan for Town Hall Employees	Mar 2012	Select Board	\$0	Duplicated existing efforts
32	#15-2007	Develop List of Local Equipment and Transportation Resources	Mar 2012	Highway Department	\$0	Was no longer a priority or necessary to the Town
35	#16-2007	Work with NH RC&D on Water Supply Issues	Mar 2012	Fire Department	\$0	Duplicated existing efforts
36	#17-2007	Provide Police Department Access to Knox Boxes	Apr 2018	Fire Department	\$100	Was a preparedness, response or recovery activity
36	#19-2007	Maintain Culverts at Various Locations in Town	Apr 2018	Highway Department	\$8,000	Was a preparedness, response or recovery activity
36	#20-2007	Hire Certified Building Inspector/Code Enforcement Officer	Apr 2018	Select Board	\$50,000	Was a preparedness, response or recovery activity
32	#21-2007	Establish Health and Safety Officer Position	Apr 2018	Select Board	\$50,000 annually	Was a preparedness, response or recovery activity
20	#22-2007	[Continue Policy...] Trim Trees of Damaged Limbs	Apr 2018	Highway Department	\$6,000 annually	Was an unrealistic activity
18	#23-2007	Install Bullet Proof Glass in Town Hall	Apr 2018	Select Board	\$8,000	Was modified and incorporated into another activity
36	#24-2007	Barricade the Site of Downed Power Lines and Downed Trees	Apr 2018	Highway Department	\$5,000	Was a preparedness, response or recovery activity
25	#25-2007	Utilize Reverse 911 Notification to Residents	Apr 2018	Select Board	\$35,000	Was a preparedness, response or recovery activity
36	#26-2007	Train First Responders	Apr 2018	Fire Department	\$3,250	Was a preparedness, response or recovery activity
36	#27-2007	Promote Interdepartmental Communication and Cooperation Among All Boards and Departments	Apr 2018	Select Board	\$100	Was a preparedness, response or recovery activity
36	#28-2007	Recruit Volunteers for Fire and Rescue Department	Apr 2018	Fire Department	\$2,000	Was a preparedness, response or recovery activity
31	#29-2007	Undertake Interdepartmental Training	Apr 2018	Select Board	\$100	Was a preparedness, response or recovery activity

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7 PRIOR ACTION STATUS

Priority Score (2018)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
18	#30-2007	Train Fire Department for Water Resource Issues	Apr 2018	Fire Department	\$500 - \$5,000	Was a preparedness, response or recovery activity
35	#31-2007	Include Water Resources Funding in CIP for FD Dry Hydrants	Apr 2018	Fire Department	\$1,000	Was a preparedness, response or recovery activity
32	#32-2007	Review and Use Water Resource Plan	Apr 2018	Fire Department	\$0	Was a preparedness, response or recovery activity
36	#39-2012	Continue Senior Call Safety Program	Apr 2018	Police Department	\$0	Was a preparedness, response or recovery activity
29	#40-2012	Discuss 911 Calls with Switching Station to Directly Send to EOC	Apr 2018	Police Department	\$0	Was a preparedness, response or recovery activity
28	#41-2012	Continue DNA Sampling of Children	Apr 2018	Police Department	\$600	Was a preparedness, response or recovery activity
36	#42-2012	Continue Police Community Outreach to Assist with Resident Safety	Apr 2018	Police Department	\$0	Was a preparedness, response or recovery activity
26	#43-2012	Promote Resident Education through Various Media	Apr 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
36	#44-2012	Participate in National Flood Insurance Program (NFIP) Training	Apr 2018	Building Inspection	\$0	Was a preparedness, response or recovery activity
34	#45-2012	Develop Tabletop and Field Drills on Relevant Topics	Apr 2018	Emergency Management	\$1,000	Was a preparedness, response or recovery activity
28	#46-2012	Revise Town Roads Policy for Snow & Ice	Apr 2018	Highway Department	\$0	Was a preparedness, response or recovery activity
24	#47-2012	Update the Fire Department Standard Operating Guidelines (SOGs)	Apr 2018	Fire Department	\$0	Was a preparedness, response or recovery activity

The tan highlighted rows in **Table 7.3** indicate the **10 Deferred** mitigation Actions from the **2018 Plan** which also appear in the forthcoming **2025 Plan's Mitigation Action Plan**. Many **Action** titles were revised to update the Action and to reflect the new focus on mitigation although the principle for each remains the same. The **Approximate Cost** may rise. They will all be reevaluated to accommodate **2025** standards in later sections.

Table 7.3
Deferred Mitigation Actions

Priority Score (2018)	Action Number	Action	Deferred Date	Who is Responsible	Approx \$ Cost	Why Deferred? Because...	Hazards Addressed
66	#55-2018	Develop Underground Utility Regulations for the Site Plan Review and Subdivision Regulations for New and Upgraded Developments to Reduce the Impact of Storms, Wind and Winter Events	Sep 2024	Planning Board	\$600	Lower priority	Wind, Storms, Lightning, Wildfire, Winter, Earthquake, Debris, Sabotage, Vandalism
62	#56-2018	Develop Surface Water Buffer Restrictions 50' for Non-Class 4 Waters	Sep 2024	Planning Board, assisted by Conservation Commission	\$1,000	More time was needed	Flood, Rapid Snow Pack Melt, Scouring & Erosion
54	#48-2012	Reconstruct Fairground Road at Dodge's Corner to Reduce Effects of Floods, Erosion and Scouring	Sep 2024	Highway Department	\$275,000	Lower priority	Flood, Scouring & Erosion, Storms, Debris
63	#50-2012	Upgrade West Main Street Culverts and Sidewalk Rebuilt to Protect from Floods and Erosion	Sep 2024	Highway Department	\$5,000	More time, More Funding	Flood, Scouring & Erosion, Storms, Debris
67	#52-2012	Upgrade West Main Street Bridge and High Street Culverts Drainage System to Protect from Floods, Scouring and Erosion	Sep 2024	Highway Department	\$2,000,000	More time, More Funding	Flood, Scouring & Erosion, Storms, Debris
70	#59-2018	Install a Fire Alarm System at the Remote, Historical Bradford Meetinghouse for Fire Suppression	Sep 2024	Fire Department	\$20,000	More time, More Funding	Lightning, Wildfire, Drought, Hazardous Materials, Fire
50	#60-2018	Improve the Class VI Crittenden Road Footpath to Davis Road as an	Sep 2024	Emergency Management	\$250,000	More time. Location of footpath is	Floods, Winter, Storms, Wind, Debris, and Wildfire

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Town of Bradford, NH Hazard Mitigation Plan Update 2025

7 PRIOR ACTION STATUS

Priority Score (2018)	Action Number	Action	Deferred Date	Who is Responsible	Approx \$ Cost	Why Deferred? Because...	Hazards Addressed
		Emergency Fire Lane to Provide Alternative Evacuation for Floods, Winter, Storms, Wind, Debris, and Wildfire				difficult to find and access	
69	#63-2018	Shim and Repair Asphalt Roads in Town to Design Them for Water Movement, Protecting from Pooling and Standing Water	Sep 2024	Highway Department	\$50,000 annually	Progress annually on the roads (repeat/ongoing)	Flood, Scouring & Erosion, Storms, Debris, Rapid Snow Pack Melt
61	#66-2018	Hold Annual Household Hazard Waste Collection Days in Town at the Transfer Station to Reduce Illegal Dumping and Protect Water Quality	Sep 2024	Select Board, with Transfer Station	\$8,000 - \$10,000 est.	More Time – participate in another Town's HHW	Hazardous Materials, Fire, Water Quality, Public Health
66	#70-2018	Educate the Public to Gather Emergency Kits for 72 Hours and to Plan a Secondary an Escape Route to Reduce the Impact of Human Injury from Natural Hazard Events	Sep 2024	Emergency Management	\$0	More Time	Flood, Winter, Storms, Wind, Scouring & Erosion, Debris, Wildfire, Lightning, Hazardous Materials, Public Safety, Water Quality (Public Health)

8 MITIGATION ACTION PLAN

The Chapter provides a summary discussion of the Actions the community can consider completing to help mitigate the effects of hazard events.

The **Mitigation Action Plan** is the culmination of the work of the previous Assessments, inventories, and evaluations from the previous Chapters. Actions to help Bradford mitigate the damages caused by disasters have been developed and prioritized by Hazard Mitigation Committee consensus in consideration of both existing and new development.

SOURCES OF ACTIONS

After determining the status of the existing Actions, **New** Actions can be determined. **New** Actions were evaluated by Hazard Mitigation Committee the using the **Problem Statements** determined during discussion of critical facility and community facility sites' potential vulnerability to hazards in the **Critical Facility and Community Vulnerability Assessment**. Many of these problems were further evaluated and developed into **New** mitigation Actions.

The **Capability Assessment** yielded a wealth of information from the **Future Improvements** of the plans, programs, ordinances, policies, agreements, technical skills, financial resources, and other resources the Town Departments, School District, and Stakeholders had available. These activities are important to the community. They assist Departments with the procedures, training, regional coordination, mutual aid, planning and purchases needed to perform their duties effectively. These activities in turn increase the capability for mitigating hazard events. For the **2025 Plan**, most of the **Capability Assessment's Future Improvements** activities were not utilized as Actions since they are more appropriate for the Town's **Emergency Operations Plan** recommendations.

Other community ideas were introduced to or by the Hazard Mitigation Committee as a result of Department, Board, Commission or Town discussions. Where appropriate, supported activities were introduced as New mitigation Actions.

Mitigation Actions developed emphasize both new and existing buildings and infrastructure to better protect populations of Bradford.

Several uncompleted **Deferred (2018)** Bradford mitigation Actions have been carried forward into the **2025 Plan** with the updates to the evaluation, cost, prioritization, etc.

DESCRIPTION OF ACTION MATRIX

A listing of **10 Deferred** mitigation Actions from **2018** and **36 New** mitigation Actions from **2025** important to the Town of Bradford was developed for evaluation. Each Action identifies at least one **Hazard Mitigated** which correlates to **3 GOALS AND OBJECTIVES**, describing how it can mitigate these identified natural hazard objectives. A short **Description and Evaluation** is provided and the **Affected Location** is listed to ensure easier understanding and reassessment of the Actions in the future during implementation.

The Actions are numbered for easier tracking over the years with this practice beginning in this **2025 Plan**. The **2025** Actions begin where the prior Actions left off, **#71- 2025** through **#106- 2025**. Over time, the Actions can be tracked to see which have been **Deferred** and to organize the **Completed** or **Deleted** Actions, placed into **7 PRIOR ACTION STATUS**. For those with funding needs, the ability to reference an Action within the Capital Improvements Program or in a Warrant Article can alleviate confusion and further support the mitigation Actions.

Each Action is sorted into one of these four mitigation Action categories, although it might identify with several:

Local Planning and Regulation
Structure and Infrastructure Projects
Natural Systems Protection
Education and Awareness

Within the **Mitigation Action Plan**, the **Deferred 2018** Actions and the **New 2025** Actions are evaluated by the relative ease of completion using a numeric **Ranking Score** generated by the enhanced STAPLEE prioritization, by the **Action Timeframe** by which the Hazard Mitigation Committee would like to see the Action implemented, and by a basic **Cost to Benefit Analysis** as contained within the STAPLEE.

The **Responsible Department** is indicated for each Action as the party who will ensure the Action gets completed. An **Approximate Cost** is provided, although no definitive cost estimates or quotes have been obtained now. Ways the Action can be **Funded** is identified and offered as an avenue to explore during implementation. The purpose is to offer an idea of how much funding is provided for each Action and how it may be paid for using a cost range estimate using symbology. These estimates are thought to prove more useful since the costs have not been quoted, and inflation may cause the project costs to rise by the time the Action has been completed.

\$0	\$0 direct cost
\$	< \$10,000
\$\$	\$10,000 - \$24,999
\$\$\$	\$25,000 - \$49,999
\$\$\$\$	\$50,000 - \$99,999
\$\$\$\$\$	\$100,000 >

Bradford's Mitigation Action Plan 2025

At the meetings, the Hazard Mitigation Committee identified by consensus these mitigation Actions from the various **Assessments** and evaluations conducted. The process for Action development has been described in previous Chapters and sections. Combined with the visual *Maps 1-4* of the **Hazard Mitigation Plan 2025**, the **Mitigation Action Plan** shown in **Table 8.1 Planning and Regulatory**; **Table 8.2 Structure and Infrastructure**; **Table 8.3 Natural Systems Protection**; and **Table 8.4 Education and Outreach** should be able to guide future hazard mitigation efforts in the Town through an annual implementation process.

MITIGATION ACTION PLAN

Ten (10) **Deferred** Actions from **2018** and **36 New** Actions from **2025** combine to develop the **46** Actions of the **2025 Mitigation Action Plan**. The **Deferred** Actions' cells are highlighted in tan.

The **Actions** (projects) for the Town to work on and/or complete over the duration of this Plan include:

Table 8.1

Local Planning and Regulation Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#55-2018	Develop Underground Utility Regulations For The Site Plan Review And Subdivision Regulations For New And Upgraded Developments To Reduce The Impact Of Storms, Wind And Winter Events.	<u>Short Term</u> <u>1-2 Years</u>		Planning Board, with help of Fire Dept and Highway Dept		\$ Power lines regularly fail, community-wide, due to winter weather, heavy wind events and lightning strikes. The power companies have a more rigorous tree trimming schedule but Bradford is a rural, forested community. Residents can be isolated for days until power is restored. Severe storms, wind events and winter weather also impact businesses and Bradford's local economy. Some utilities are underground, but are on private roads. 'Lower Priority. Bradford has no requirements yet. Not yet amended (2015)	Wind, Storms, Lightning, Wildfire, Winter, Earthquake, Debris, Sabotage, Vandalism, Crash	New and Upgraded Developments	Cost is for contractual labor agreement to develop regulation language and for public noticing.	Planning Board Budget
#56-2018	Develop A Surface Water Overlay District For The Zoning Ordinance To Limit New Development And Uses Near The Rivers And Ponds.	<u>Short Term</u> <u>1-2 Years</u>		Planning Board, assisted by Conservation Commission		\$ Erosion, stormwater flooding, rapid snow melt, flash floods and ice jam damages regularly occur from the large, Class 3 waters of Hoyt Brook and West Branch Warner River. They cause more damage in Town than the Warner River, a Class 4 waterway. Planning and zoning regulations should be considered to buffer these two and other identified non-Class 4 watercourses in Bradford to keep future infrastructure and development out of the regular damage perimeter. Implement standard BMPs within water buffers. 'More Time. Proposal was drafted for 2024 TM, but was	Flood, Rapid Snow Pack Melt, Scouring & Erosion	Hoyt Brook, West Branch Warner River	Cost is for contractual labor agreement to develop regulation language and for public noticing.	Planning Board Budget

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						incomplete and unworkable. New proposal to PB in Oct 2024 with Order 3 & 4 streams, Lakes & Pond buffers and restrictions with a delineated map, 250' setback from Warner River, Lakes Todd and Massasecum. 150' for other locations, 75' to smaller brooks. For Town Meeting in March 2025.				
#71-2025	Update The Bradford Telecommunications Zoning Ordinance To Attract Other Cellular Providers For Enhanced Communications During Weather Events.	Medium Term 3-4 Years		Planning Board, helped by Select Board	\$	Limited cell service in Bradford. Highway Dept is the first line of defense and radios are difficult to operate with topography. I-89 corridor is not built up to AT&T FirstNet communications standard that I-93 is constructed to. Attract more towers and entice companies to invest in Bradford. Seek alternative mountaintop communication towers, maintain rural character.	Winter/Ice, Wind/Tropical, Wildfire, Public Safety	Entire Town	Cost is for contractual labor agreement to develop regulation language and for public noticing.	Planning and Zoning Budget, Warrant Article
#72-2025	Update Subdivision Regulations To Ensure Fire Suppression For Larger Subdivisions To Reduce The Impact Of Rural Wildfire And Lightning Events.	Short Term 1-2 Years		Planning Board, with help of Fire Dept and Select Board	\$	Identify future dry hydrant/cistern needs based on new home development. NFPA requires subdivisions of 5+ homes needing fire protection. Cisterns are owned by private developments and they are supposed to maintain them. Fire Dept is following up on the maintenance for public safety. More effective to have them deeded to the for maintenance. Bradford has tourism to Lake, Mt. Sunapee but does not have cell service and this is unexpected. Many homes do not have landlines. Airbnb renters do not realize there	Wildfire, Lightning, Fire	New and Upgraded Developments	Cost is for contractual labor agreement to develop regulation language and for public noticing.	Planning Board Budget

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						is no service. Economic impact, public safety impact without cellular and radio service. Highway Dept relies on towers and cell service but there is no service and tourists/residents are unable to call in if there is an issue, or worse are unable to call 911. Fire Dept uses lamresponding app, limited availability for dispatching if there is no cell/data service, bars differ depending on location. Lots of dead spots. Winter 2024 FD submitted application for FEMA SAFER fire grants for booster repeaters in vehicles for better service. NH Fire Marshal assistance did not have FirstNet coverage during June fire 2024. NH 114 south in Henniker helped by Liberty Hill Rd tower.				
#73-2025	Develop Policies For All-Season Identification And Maintenance Of Dry Hydrants To Reduce The Impact Of Rural Wildfire And Lightning Events.	<u>Short Term 1-2 Years</u>		Fire Department	\$0	In the winter, frozen fire ponds are not easily cut through to access water, so the fire tanker truck must make longer runs to an easier access. Some access to dry hydrants needs to be plowed (snow depth). Fire Ponds are listed on 911, lamResponding, all emergency response maps	Wildfire, Lightning, Fire	Entire Town	Cost is in-staff and volunteer labor.	N/A
#74-2025	Develop Class V Road Standards For The Town Which Enable The Town To Maintain New Roads To Reduce The Impact Of Severe Weather Events.	<u>Medium Term 3-4 Years</u>		Highway Department , with Select Board help	\$	There are many privately maintained roads constructed to Class V standards. Plowing access or emergency access might be unavailable. (When subdivision is approved, ensure deeds reflect agency responsible for maintaining road. May have to contract for	Winter, Wildfire, Erosion and Sedimentation, Storms	New Development	Cost is for Class V regulation development and legal review of the regular legal and	Select Board Administration or Legal Budget

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Town Engineer services. Need to accept new developments' private roads and provide options for Town public acceptance of new Class V roads. (Step 1, See #77 & #78)			expense. Consider potential or Town Engineer oversight of the construction (paid for by developer)	
#75-2025	Update Driveway Standards And Permitting To Reduce Erosion, Sedimentation, And Landslide.	<u>Short Term 1-2 Years</u>		Planning Board, with Fire Dept and Highway Dept	\$0	Major snowstorms and windstorms could affect picking up and dropping off of children (buses). Fallen trees, road washouts, wildfires. These storms typically cause widespread power outages. Some have long driveways (no turnaround for apparatus). Work to update driveway standards and permitting with Planning Board and Highway Dept and Fire Dept. Width of road, culvert sizing, slope for apparatus, height, distance in, turnaround radius for new residences.	Winter, Wildfire, Erosion and Sedimentation, Landslide, Earthquake, Storms	New Development	Cost is in-staff and volunteer labor.	N/A
#76-2025	Review Zoning Ordinances, Subdivision Regulations, Site Plan Review Regulations To Evaluate The Need For Planned Unit Developments, Phased Developments, Conservation Open Space, Zoning Lot	<u>Medium Term 3-4 Years</u>		Planning Board, with Fire Dept and Highway Dept, Select Board	\$\$	Bradford is a rural, forested community. These large lots are agricultural and forested. Natural disasters such as lightning, wildfire, erosion and severe storms can damage properties. Many of these locations would be difficult to reach by fire apparatus.	Storms, Wildfire, Winter/Ice, Wind/Tropical	New Development	Cost is for a consultant to develop new ordinances and regulations, legal fees, public notices, and printing.	Warrant Article

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	Sizing, And Two-Way Egress To Reduce The Impact Of Natural Disasters.									
#77-2025	Adopt The New Development Roads As Class V Town Maintained Roads Constructed According To Town Road Standards To Improve Response To Rural Areas During Disaster Events.	<u>Long Term</u> <u>4-5 Years</u>		Select Board (Town Meeting)	\$0	Bradford is a rural, forested community. These large lots are agricultural and forested. Natural disasters such as lightning, wildfire, erosion and severe storms can damage properties. Many of these locations would be difficult to reach by fire apparatus. Many Class V town roads have no winter maintenance. (Step 2, See #74 & #78)	Storms, Wildfire, Winter/Ice, Wind/Tropical	New Development	Cost is in-staff and volunteer labor.	N/A
#78-2025	Change Town Meeting Vote On Road Acceptance To Select Board Vote On Road Acceptance To Improve Response To Rural Areas During Disaster Events.	<u>Long Term</u> <u>4-5 Years</u>		Town Meeting	\$	Bradford is a rural, forested community. These large lots are agricultural and forested. Natural disasters such as lightning, wildfire, erosion and severe storms can damage properties. Many of these locations would be difficult to reach by fire apparatus. (Step 3, See #74 & #77)	Storms, Wildfire, Winter/Ice, Wind/Tropical	New Development	Cost is for legal fees, public notices, and printing.	Select Board Administration or Legal Budget
#79-2025	Classify Several Class VI Roads Or Trails As Emergency Lanes To Reduce The Impact Of Wildfire And Lightning.	<u>Medium Term</u> <u>3-4 Years</u>		Select Board (Town Meeting)	\$	See NH RSA 231:59-a Repair of Highways by Towns-Emergency Lanes. Bradford is a rural, forested community. These large lots are agricultural and forested. Natural disasters such as lightning, wildfire, erosion and severe storms can damage properties. Many of these locations would be difficult to reach by fire apparatus. Currently, no fire lanes exist in Bradford. Trying to determine the housing situation at Lake Massasecum for fire safety.	Storms, Wildfire, Winter/Ice, Wind/Tropical	Some Class VI roads	Cost is for legal fees, public notices, and printing.	Select Board Administration or Legal Budget

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						(see Towns of Washington or Warner as examples)				
	HMC ADD NEW ACTION HERE after 2025									
	HMC ADD NEW ACTION HERE after 2025									

Source: Bradford Hazard Mitigation Committee

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Table 8.2
Structure and Infrastructure Projects

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#48-2012	Reconstruct Fairground Road At Dodge's Corner To Reduce Effects Of Floods, Erosion And Scouring.	<u>Long Term</u> <u>4-5 Years</u>		Highway Department	\$\$\$\$\$	If there's a flood under the bridge and at Dodge's Corner, it floods in two locations with residents trapped in the middle of Fairground Road with no evacuation possible. If that section of road can be raised three to four feet, it will not flood anymore. Last flooded in Oct 2017, the intersection needs to be reconstructed. Repaved in 2014. Brook is funneled, embankment funneled out, homes nearby. 'Lower Priority, More Funding. Will not be an easy fix, not in the road reconstruction plan for upgrade yet, bridges involved, road profile raised. New bank cutting, riprap placed. See Leighton Brook project in Epsom.	Flood, Scouring & Erosion, Storms, Debris	Fairground Road at Dodge's Corner	Cost is for contracted labor, design, permitting, materials, paving. Extensive structural work was found to be necessary prior to minor upgrades. A new architect has been hired.	HMA Grant, Warrant Article for Matching Funds, NH DES (program used for Leighton Brook in Epsom)
#50-2012	Upgrade West Main Street Stone Culverts And Sidewalk Rebuild To Protect From Floods And Erosion.	<u>Long Term</u> <u>4-5 Years</u>		Highway Department	\$\$\$\$\$	Replace the existing West Main Street stone culvert by Colonial Stairs company with a 15" culvert. Bridge on both ends of the road, one is It is rusted and failing. This upgrade project would be preventative in nature to ensure road washouts during flooding conditions do not occur as frequently. This is been a problem for several years. 'More time, More Funding. Plans for TAP grant - Hoyle & Tanner has info Summer 2024. Permitting is expensive, need to	Flood, Scouring & Erosion, Storms, Debris	West Main Street	Cost is for the materials for the upgrade of the culvert using in-kind staff labor.	Highway Department Culvert Budget Line Item, TAP Grant

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						find contractor. Currently no funding, but important.				
#52-2012	Upgrade West Main Street Bridge And High Street Culverts Drainage System To Protect From Floods, Scouring And Erosion.	Medium Term 3-4 Years		Highway Department	\$\$\$\$	This culvert has flooded and eroded, and there was a hole in the road. Connects multiple streets, a 4-way intersection. Drivers would have to go around town if this intersection was blocked. FEMA funds have been used in the past numerous times for emergency road openings. This project to upgrade the culvert would be preventative in nature. There about 30 culverts in that location. Problems have included collapsing/ failing/ rusting older culverts blocking the water, water coming up through the road, roadway sinkholes. All culverts are failing. To shut down the drainage system would shut down half of the town. This is been a problem for several years. 'More Time, More Funding, Lower Priority. Still needs to be completed, very large and complex project. Erosion issues on High Street. Had been at least \$2 million. Need a grant writer.	Flood, Scouring & Erosion, Storms, Debris	West Main Street and High Street	Cost is for the materials for the upgrade of the culvert using contracted labor.	Warrant Article or Bond, FEMA Hazard Mitigation Grant Program (HMGP)
#59-2018	Install A Fire Alarm System At The Remote, Historical Bradford Meetinghouse For Fire Suppression.	Medium Term 3-4 Years		Fire Department	\$\$	Some local historic sites and buildings are located in remote areas. As a result, vandalism and fire concern is a problem. Bradford Meetinghouse on Rowe Mountain is remote only 1 neighbor around. Town Hall is vulnerable but is installing an fire alarm system to be completed in 2018. In	Lightning, Wildfire, Drought, Hazardous Materials, Fire	Bradford Meetinghouse (Town owned but not maintained by Town)	Cost is for contracted labor and the alarm system for the Meetinghouse.	Warrant Article, seek historical grants

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Meetinghouse, have summer concerts and church services several times per year. 'More Time, More Funding. Now have 911 addressing. Include Old Schoolhouse. Town took over most responsibilities. Town land. Electricity in Schoolhouse. Historical funding could be evaluated. Building maintained by Meetinghouse Association, not the Town.				
#60-2018	Work With The Owners To Identify And Document The Crittenden Road / East Shore Road Footpath To Davis Road As A Blazed Trail To Provide Alternative Evacuation For Floods, Winter, Storms, Wind, Debris, And Wildfire.	Short Term 1-2 Years		Emergency Management with Lake Association	\$	Town services are needed but there are no standards of maintenance, difficult to access. If Lake Massasecum or Lake Todd experience severe wind events causing trees down on roads, flooding, wildfire, erosion or drought, Bradford would lose the economic value brought by visitors and the Town would lose money on boat and OHRV registrations. Homeowners along these lakes could suffer great individual losses and may be unable to leave their homes because the lack of a secondary means of egress. Emergency response is difficult at this location and often requires individual evacuation of residents via carrying or by boat. 'Location of footpath is difficult to find and access in event of emergency. Porches and decks. Change to -> Identify location of Footpath & Maintain for Emergency Access	Floods, Winter, Storms, Wind, Debris, and Wildfire	Lake Massasecum community	Cost is for NH DES permitting (Shoreland protection & floodplain), materials for constructing a standard walking bridge for OHRV access over the wetland, and contracted labor, legal assistance.	Warrant Article, seek Fire Grants

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						(Lake Mass Assn). Parking is limited. Legal access is unknown. Need blazes, all designation.				
#63-2018	Shim And Repair Asphalt Roads In Town To Design Them For Water Movement, Protecting From Pooling And Standing Water.	<u>Short Term</u> <u>1-2 Year,</u> <u>Then</u> <u>Ongoing</u>		Highway Department	\$\$\$\$ annually	All local Class V gravel and pavement roads in Bradford have ditching along the side and many of these have related problems during flooding and storm events where water does not flow properly into ditches or cannot be accommodated. Roads should shimmed to crown at the centerline to inhibit road flooding and divert water adequately. 'REPEAT. Progress annually on the roads. Example - Massasecum Avenue recently (Sep 2024) shimming. Follows RSMS program.	Flood, Scouring & Erosion, Storms, Debris, Rapid Snow Pack Melt	Priority Roads are Fairground s Road, Center Road, Old Warner Road, and West Road	Cost is for materials and in-kind staff labor.	Highway Department Budget Line Item (annual), Capital Improvement Program (CIP), from RSMS
#80-2025	Install Generators At The Town Hall And Bradford Area Community Center For Emergency Sheltering.	<u>Short Term</u> <u>1-2 Years</u>		Emergency Management and Fire Department	\$\$\$\$\$	Town Hall needs a generator for the COOP. Bradford does not have a Town Shelter with showers when natural disasters or power outages occur. BACC serves as a warming/cooling shelter with kitchen & restrooms, areas for cots to be set up. People travel to New England College and Colby College if they are open, potential for school buses to be used for greater area communities. More residents have generators now, are self-sustaining. Logistics of relocation for warming / cooling center without mass transit, MOU, exercise with neighboring towns. Warner, Henn, Sutton, New London, Newbury & Bradford would	Extreme Temps, Wind, Winter, Ice, Utility Outage, Lightning, Storms, Crash			FEMA Emergency Management Performance Grant (EMPG 50/50), CIP Project, Grant Budget Line Item, Warrant Article

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						be difficult. BACC generator is being fixed in Jan 2025.				
#81-2025	Work With TDS/Other Providers To Install Wireless Network Wi-Fi Around Bradford Locations To Enhance Communications During Severe Weather Events.	<u>Short Term</u> <u>1-2 Years</u>		Select Board with Emergency Management	\$0	Cellular and emergency communication is hit or miss in Bradford. Has improved since 2014, but is still inadequate cell coverage in Bradford. Jones Road tower does not cover much except for NH 103 East and NH 114, boat launch area. Tower in South Sutton has no antennas yet. Henniker Liberty Hill "fake sequoia" tower may be running by June 2024, coverage slightly improved. I-89 AT&T First Net and US 202 not covered. lamResponding application used by Fire Dept but if no cell service are unable to provide or receive updates. Despite coverage, cell phones are integral communication measure in Town. Many homes do not have landlines. Ice storms take down towers, so no radio or cell service. (like Xfinity in downtown Concord)	Wind, Winter, Ice, Utility Outage, Lightning, Storms, Crash	Main Street area, NH 103, NH 114	Cost is working with TDS to ascertain infrastructure needed and costs (costs to be determined after initial investigation s).	NA
#82-2025	Seek A Desirable Property Where A Telecomm Tower Could Be Constructed To Accommodate The Fire Station/ Highway Antenna, And Apply Ice Shield Technology To Reduce The Impacts Of Winter And Wind Storms.	<u>Short Term</u> <u>1-2 Years</u>		Emergency Management, with Fire Dept, Highway Dept, and a new Telecomm Committee	\$0	Jones Road antenna has more than cell dishes. Ice builds up on Capital Area Fire Mutual Aid Compact, Merrimack County and Bradford municipal antennas. If the Bradford Fire Station's 40' antenna (affixed to the roof) is destroyed by a severe wind or winter event, the Town would lose emergency communication to Capital Area and most other locations. Have Repeaters on towers - Craney Hill in	Wind/Tropical, Winter, Ice, Lightning, Storms	High Elevation	Cost is in-staff and volunteer labor.	N/A

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Henniker, Wolf Hill in Deering or Mt Kearsarge. Ice build up is huge on the mountaintop towers. Potential for colocation at the shared tower that contains the Police Dept antenna. Need a Telecommunications Committee to work on issues.				
#83-2025	Upgrade The Metal Dry Hydrant Pipes To PVC For Permanent Dry Hydrant Drafting Sites To Reduce The Risk Of Wildfire	<u>Short Term 1-2 Years, Then Ongoing</u>		Fire Department	\$	Dry hydrants are vulnerable to many types of hazards. RC&D funded originally, have restrictions for upgrading. Drought dries up the water access to the hydrants, fed by the fire ponds, brooks and rivers, making wildfires more dangerous. Many fall out of service because of ice flow (like Jones Road at the bridge). Dry hydrants are now wrapped with Scotch-Lite to illuminate them better, on state 9-11 addressing. Categorize dry hydrant list PVC vs metal, added Dry Hydrant Budget for 2025. Better protection from stream erosion.	Drought, Flood, River, Wildfire, Debris, Ice Damage, Erosion	Dry Hydrant Locations at high flow stream areas like Center Road	Cost is for labor and materials for drafting sites.	CIP Project - > New Town Expendable Trust Fund for Dry Hydrant maintenance
#84-2025	Upgrade Deer Valley Red Listed Culvert To A Box Culvert Or Bridge To Reduce The Impact Of Flood, Erosion, And Scouring.	<u>Short Term 1-2 Years</u>		Highway Department	\$\$\$\$\$	Deer Valley on a Class V road, homes are nearby. Previous 100-year floods might be now undersized based on current storm conditions. Not beaver, floods occasionally. West Road near Pleasant View Dodge's Corner flood occasionally at West Branch River, Deer Valley culvert upgrade. East Washington Road (every 5 years). Beaver can make the problem worse.	Flood, River, Dam, Storm, Erosion/ Scouring, Ice	Deer Valley Road	Cost is for engineering, permitting, construction , and labor.	FEMA HMGP, CIP Project

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#85-2025	Upgrade Blaisdell Lake Two Red Listed Bridges To Reduce The Impact Of Winter, Flood, Erosion, And Scouring.	<u>Medium Term 3-4 Years</u>		Highway Department	\$\$\$\$\$	On Class V seasonal road, two bridges. The Town should continue to monitor the red listed bridges to review and prioritize their rehabilitation. Deficient bridges can be dangerous to travelers in any weather and may not hold up well during significant flooding events. Some new development is seeking access, coming in from Sutton in the meantime. Bridge has a metal deck plate to be replaced.	Flood, River, Dam, Storm, Erosion/ Scouring, Ice	Blaisdell Lake Road	Cost is for engineering, permitting, construction , and labor.	CIP Project
#86-2025	Upgrade Johnson Hill Road Red Listed Bridge To Reduce The Impact Of Winter, Flood, Erosion, And Scouring.	<u>Long Term 4-5 Years</u>		Highway Department	\$\$\$\$\$	On Class V seasonal road. Good access off Sunset and Hogg Hill. Bridge has a metal deck plate to be replaced.	Flood, River, Dam, Storm, Erosion/ Scouring, Ice	Johnson Hill Road	Cost is for engineering, permitting, construction , and labor.	CIP Project
#87-2025	Assess The Town-Owned Public Facilities, Open Space Properties, And Historical Properties For WUI Protection.	<u>Short Term 1-2 Years</u>		Fire Department , with Conservation Commission and Historical Society	\$0	Some local historic sites and buildings (like the Meetinghouse) are located in remote areas. As a result, vandalism is a problem. Next step is establish a fire alarm monitoring system in the historic buildings, like smoke detectors hard wired to central alarm system, and provide a periodic “wellness check” to ensure buildings are safe and not vandalized or occupied. The Town has a number of open space properties which should be evaluated, Town forests, open lands, public use lands, recreational lands - Bradford Springs, Bradford Pines (State Forest/Park), Bement Covered Bridge, Casino, etc. WUI assessment to include clearance,	Drought, Wildfire	Wildland Urban Interface areas	Cost is in-staff and volunteer labor.	N/A

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						water source, access, street numbering, fire resistant materials.				
#88-2025	Work With The Lake Todd Dam Regulator On The Placement Of Splashboards To Keep The Water Levels Constant During Drought Or Flooding Conditions.	<u>Short Term</u> <u>1-2 Years</u>		Emergency Management Director, with NH DES	\$0	If Lake Massasecum or Lake Todd experience severe flooding, erosion or drought, Bradford would lose the economic value brought by visitors and the Town would lose money on boat and OHRV registrations. Homeowners along these lakes could suffer great individual losses and may be unable to leave their homes due to flooding. Many homes rented by Airbnb.	Drought, Flood, Storms, Debris	Lake Todd	Cost is in-staff and volunteer labor.	N/A
#89-2025	Encourage The Location Of A Nearby Alternative Parking Area For The NH 114 Town-Owned Boat Launch To Curb Parking Along The Highway And Lake Massasecum.	<u>Short Term</u> <u>1-2 Years</u>		Select Board with Emergency Management, Parks and Recreation, with NH DOT and NH Fish and Game	\$	Parking along NH 114 (50' row) for the south side of Lake Massasecum boat launch causes a significant traffic and crash issue. The boat launch is along the curve. Many people park overnight on NH 114, neighbors complain. Traffic hazards. Organizations draw additional use of the boat launch. Some park out there for weeks. Signage for High Impact Zone, Caution, Slow. NH F&G may hold the easement on the boat launch, they do improvements to facilities. Lake Association calls the Highway Dept when maintenance is needed. Work with NH DOT to post signage for slow turning, reduce speed limit, to enhance safe access to the Lake.	Crash, Public Safety	NH 114 at Massasecum Boat Launch	Cost is for study of the area, evaluation of options, easements for parking, enforcement, signage.	Highway Budget, funding by NH Fish & Game, NH DOT for study & evaluation, easements
	HMC ADD NEW ACTION HERE after 2025									

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	HMC ADD NEW ACTION HERE after 2025									

Source: Bradford Hazard Mitigation Committee

Table 8.3
Natural Systems Protection Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#66-2018	Seek a NHDES Grant to Hold and Advertise an Annual Household Hazard Waste Collection Day for Bradford Alone or with a Neighboring Town (Warner, Sutton or Newbury) to Reduce Illegal Dumping and Protect Water Quality.	<u>Short Term</u> <u>1-2 Years</u>		Select Board, with Transfer Station, help by Conservation Commission. Could work with UVLSRPC (Newbury)	\$	Have participated in past years in Bradford in a joint effort with Warner. Bradford has several hazardous materials facilities. Former Bowie Store MtBE monitoring on Main Street, underground leaking tanks and material scraped. Any floods, fires, severe storms or human incidents involving hazardous materials would require assistance beyond local control. There are currently brownfields contaminated sites in Bradford. One site is capped behind the BACC and has monitoring wells. Homeowners purchase materials for cleaning or fuel and remnants are stored onsite. Now, HHW collections are organized for surrounding communities in which Bradford participates and are held in Henniker, Warner, and other nearby places. A collection should be held at least once at the Transfer Station in Bradford to encourage more homeowners to participate. 'CHANGE- participate in another town's HHW collection. Will have to approach local towns to find out new partnership opportunities. Common items like antifreeze, oil, light bulbs, batteries. Option to work with UVLSRPC with Newbury	Hazardous Materials, Fire, Water Quality, Public Health	Entire Town (shared with a neighboring)	Cost is for in-kind filing for the HHW grant in February each year. NHDES pays the town. May have extra costs since this is the first time holding the event. https://www.des.nh.gov/waste/household-hazardous-waste	Town Budget Allocation, NH DES HHW Grant (matching)

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#90-2025	Obtain Todd/Massasecum/Lyndon DEAPs By NHDES To Reduce The Impact Of Dam Breach And Flooding.	<u>Short Term</u> <u>1-2 Years</u>		Emergency Management	\$0	Collect current Dam emergency Action Plans in the Fire Station/Emergency Management library for ready access. If Loch Lyndon dam failed in Newbury, significant downstream water pressure on Lake Todd dam. Lake Todd dam- Water Street and houses along, Main Street, Fairgrounds Road access blocked. The Lake Todd Dam has breached in the 20 year+/- past on the High Street side and breaches may recur similarly in the future. Extensive roadwork whenever a large dam breaches. Most fearful potential – a breach would magnify existing flooding conditions downstream, roadways, bridges, homes. Inspect for earthquake susceptibility, develop exercises to shut down state & local roads, evacuations.	Dam, Flood, River, Earthquake, Tropical, Storms, Debris, Earthquake	Lake Todd, Loch Lyndon, Massasecum Dams	Cost is in-staff and volunteer labor.	N/A
#91-2025	Review The Bow Beaver Management Policy To Be Able To Provide A List Of Options For Bradford Property Owners For Public Safety And Biodiversity And To Be Able To Guide The Town On When Dam Removal Is Necessary.	<u>Short Term</u> <u>1-2 Years</u>		Highway Department with Conservation Commission help, Select Board	\$	Beaver dams cause a lot of problems in Bradford. Many problem areas have been identified - West Road, Forest Street, Davis Road, NH 114 by Pleasant Valley, and Lake Todd high water under covered bridge to meadow. Flood annually. (Town takes responsibility when road impacted) Public education - Knowing who is responsible for installation and maintaining beaver deceivers, beaver dams– private land and water bodies. Highway Department working with Cons Comm, NH Fish	Flood, Dam, River, Storms, Debris	Beaver Dams in multiple locations (mostly private land)	Cost is for determining solutions, cost per beaver.	Highway Department Operating Budget

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						& Game, and Trout Unlimited for fish friendly culverts.				
#92-2025	Develop A Policy About Recreational Water Testing After Floods At Lake Todd And Lake Massasecum To Reduce The Risk Of A Public Health Event.	<u>Short Term</u> <u>1-2 Years</u>		Parks and Recreation & Health Officer	\$	Write up the policies and procedures for the testing and notification at public areas. Check on other testing operations. Parks and Recreation & Health Officer are responsible for opening of beaches. Water testing is done after floods at French's Park for public beaches. High water issues at Lake Massasecum campground have been experienced: flooding, septic system overflow, water quality (drinking and swimming). Move people out from RV-type or semi-permanent RV trailer units during flood. Cyanobacteria and milfoil testing by NH DES Lake Host and Lake Massasecum Association. NH 103 inlet of Lake Todd in Bradford as an opportune, unofficial site. [Lake Host milfoil]	Flood, Public Health, Storms	French's Park, Lake Todd, Lake Massasecum	Cost is for comparison of testing, writing a policy/procedure. Currently there is \$0 in the Health Officer budget.	Health Officer Budget
#93-2025	Contact The Lake Massasecum Association To Locate, Document And Identify The Maintenance Responsibility For The Footpath For Public Safety Purposes.	<u>Short Term</u> <u>1-2 Years</u>		Fire Department, Emergency Management	\$0	Northeast end of Lake Mass cabins accessible by boat or by foot. Residents (12 or more) of East Shore Drive parking at end only have accessibility to Bradford via frozen lake, footpath or boat if emergency response is needed. For residents, an increase of insurance would be needed (or insurance for mortgage). Footpath goes over other resident's decks. This group of homes would be in an WUI because of the power line. Fire Dept has a Zodiac boat but it would be ideal to	Flood, Wildfire, Public Safety	Lake Massasecum	Cost is in-staff and volunteer labor.	N/A

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8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						have a dock on Lake Massasecum. Not a very navigable lake. Steep elevated walkways. A significant and unanswered questions is: Who is responsible for boardwalk maintenance for emergency access? After documentation responsibility, request the maintenance of the footpath with a trail marking system (may be an informal trail). People park at end of East Shore and walk in.				
#94-2025	Conduct A Survey Of The Older Cemeteries And Stones To Identify Who Is Buried In The Most Historic Locations And Flag For Repair Historic Stones To Ensure They Remain Whole And Readable For Historic Preservation.	<u>Short Term</u> <u>1-2 Years</u>		Cemetery Trustees or Cemetery Committee	\$	The cemeteries are in remote areas and are vulnerable to erosion, earthquakes, wind and vandalism. More prone to vandalism than other hazards. Regular mowing. Some policies were recently revised. Sunny Plains Cemetery and New Pond take new burials, the other 16 are not known to. See www.findagrave.com	Historic and Cultural Preservation	Oldest Cemeteries	Cost is for completing the inventory, most of which is through volunteer labor.	Cemetery Grounds and Trust Funds, Volunteer labor
#95-2025	Ensure Town Recreational Parking Areas Are Safe From Human And Technological Hazards.	<u>Long Term</u> <u>4-5 Years</u>		Emergency Management, Highway Department, Parks and Recreation Department	\$	Some of the Town's recreational and gathering sites are potential areas for vandalism and civil disturbances. Example is new barricade at the Lake Massasecum French Park beach, new fencing at Brown Shattuck Park, signage, curbs, and embankment. Stakes and tape as a temporary measure	Crash, Flood, Vandalism	Town recreational Areas	Cost is for signage, posts, fencing, jersey barriers, grounds cleanup, gravel.	Highway Department Operating Budget
#96-2025	Fund Milfoil Remediation Annually In Concert With The Efforts Of Lake Massasecum	<u>Short Term</u> <u>1-2 Years,</u> <u>Then</u> <u>Ongoing</u>		Lake Association (Massasecum), Parks	\$ annually	Milfoil continues to be a problem in Lake Massasecum although the Town regularly engages in treatment methods. A long-term plan with NHDES helps guide the	Public Health (Biologic)	Lake Massasecum	Cost is for annual milfoil remediation contribution	Parks and Recreation Budget

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	Association And Upgrade The Existing Milfoil Signage That Educates Boaters To Reduce The Impact Of Biological Contamination.			and Recreation		process. E. coli in the Lake can occur during high flood conditions, shutting down the park/beach. Lake Todd sometimes experiences growth of cyanobacteria, causing shutdown of public beaches and overall danger for swimmers. Town funds annually for milfoil remediation. Lake Host was onsite checking boats, providing brochures and in person education.			- staffing for Lake Host, and upgrade signage.	
#97-2025	Encourage NHDES To Make A Public Mapper Available Of The Bradford Sites Of Known Milfoil To Help Encourage People To Not Place Their Boats In Massasecum Or In Lake Todd Which Does Not Have Milfoil.	Short Term 1-2 Years		Emergency Management, Parks and Recreation, and Lake Association	\$0	May be difficult to enact with economy. Lake Association tracks and presents information to the public/residents related to best practices and conditions. Request is to map the locations in each of body water where the milfoil is present, not to simply map the lakes with milfoil. Request NHDES produce a public mapper like a Health Swimmer but for milfoil. Concentrate on Bradford area if needed.	Public Health (Biologic)	Lake Massasecum	Cost is in-staff and volunteer labor.	N/A
	HMC ADD NEW ACTION HERE after 2025									
	HMC ADD NEW ACTION HERE after 2025									

Source: Bradford Hazard Mitigation Committee

Table 8.4
Education and Awareness Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#70-2018	Educate The Public To Gather Emergency Kits For 72 Hours And To Plan A Secondary An Escape Route To Reduce The Impact Of Human Injury From Natural Hazard Events.	<u>Short Term</u> <u>1-2 Years</u> <u>then</u> <u>Ongoing</u>		Emergency Management	\$0	The lack of secondary means of egress for homes limits the ability to self-evacuate during a natural hazard (storms, wind events, winter weather, wildfire, floods, etc). Emergency response can also be delayed if the developments' roadway is blocked. Residents should plan ahead for emergencies, for isolation up to three days and a personal evacuation plan. Print out list of items, have a display in public places. Place on website, social media. See www.readynh.gov	Flood, Winter, Storms, Wind, Scouring & Erosion, Debris, Wildfire, Lightning, Hazardous Materials, Public Safety, Water Quality (Public Health)	Entire Town, Dead-End Roads & Cul-de Sacs	Cost is for in-kind staff and volunteer labor. Partner with the Elementary School, provide students and teachers with information to take home. Provide information to community church, senior center lunches.	N/A Future Expenditures from the Fire Department Education and Outreach Budget, if needed.
#98-2025	Design Signage For The Fire Station Identification Location And Purchase A Non-Digital Variable Message Board To Promote Hazard Event Information.	<u>Short Term</u> <u>1-2 Years</u>		Fire Department	\$	Fire Dept building is difficult to identify. Consider signage for Fire Station - call 911 for emergencies. There may not be people at the Fire Station or Police Station even though there are vehicles in the lot. Personnel are in town vehicles. Refer to Town Website for hours, phone numbers and information. There is cell phone service there. No radio interoperability in Bradford (HD radios are different). Police Dept does have a variable message board. Pending demolition of the Mason Hall, parking lot and EDC signage.	All Hazards	West Main Street	Cost is for a large wooden signage, two signage with variable message signboard below. Make similar to the Highway sign and Brown Shattuck sign.	Fire and Rescue Association
#99-2025	Contact Dam Owners For Public Education And Outreach About	<u>Long Term</u> <u>4-5 Years</u>		Emergency Management	\$0	If Loch Lyndon dam failed in Newbury, significant downstream water pressure on Lake Todd dam. Lake Todd dam-	Dam, Flood, River,	Dams	Cost is for in-kind staff and volunteer time.	N/A

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	NHDES Inspection And Dam Emergency Action Plans, Maintenance Options To Reduce The Risk Of Dam Breach.					Water Street and houses along, Main Street, Fairgrounds Road access blocked. The Lake Todd Dam has breached in the 20 year+/- past on the High Street side and breaches may recur similarly in the future. Extensive roadwork whenever a large dam breaches. Most fearful potential – a breach would magnify existing flooding conditions downstream, roadways, bridges, homes.	Storms, Debris			
#100-2025	Develop A Town Push Notification System (311/Genasys) For Residents To Reduce The Impact Of Storms, Drought, Fire, Frost, Hail, Snow, Wind Events.	Medium Term 3-4 Years		Select Board	Annual \$	Drought, erosion, extreme cold and heat, severe storms (wind events and winter weather) would damage many of the agricultural and forestry enterprises in Bradford, both by ruined crops and economically. Multiple departments can contribute.	Wind, Winter, Ice, Extreme Heat, Extreme Cold, Wildfire, Drought	Entire Town	Cost is for 3-year with 30% discount annually with vendor.	Select Board Operating Budget
#101-2025	Develop Town Website Upgrade To Ensure Easier Location Of Rules And Regulations And Communication In Bradford.	Short Term 1-2 Years then Ongoing		Select Board	Annual \$	Drought, erosion, extreme cold and heat, severe storms (wind events and winter weather) would damage many of the agricultural and forestry enterprises in Bradford, both by ruined crops and economically. Multiple departments can contribute.	All Natural, Human & Tech Hazards	Entire Town	Cost is for 3-year with 30% discount annually with vendor.	Select Board Operating Budget
#102-2025	Encourage The Installation Of Lightning Rods And Grounding Equipment At Identified Large Commercial Properties To Reduce The Risk Of Lightning And Fire.	Long Term 4-5 Years		Fire Department	\$0	Lightning strikes, flooding, erosion, at hazardous materials facilities are particular concerns, like the Lumber Barn, O&E Trucking, Naughton's and other large commercial facilities. Check with the Fire Marshal and Building Codes to support the recommendation, any available data that shows more at risk.	Lightning, Storms, Flood, Haz Mat	Lumber Barn, O&E Trucking, Naughton's	Cost is for in-kind staff and volunteer time.	N/A

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#103-2025	Encourage Crash Protection, Lightning Rods And Grounding Systems, Fire Suppression At Ayer & Goss Fuel Facility To Reduce The Risk Of A Haz Mat Incident.	<u>Medium Term 3-4 Years</u>		Fire Department	\$0	Nearly any weather event, wind or winter/ice or extreme cold/heat, power failure, could create an impact at Ayer & Goss (Dead River) fuel (propane, home heating fuel, gasoline, diesel, nitrogen) haz mat facility. They do not have a backup generator. On Eversource critical facility list. Concern is transportation accident or accident during transfer of fuel. ½ mile to 1 mile evacuation zone. The facility is not staffed, no attendant on premises. No Tier II reporting is received. No fire protection at pumps, but have SpeedE-Dry. Ensure they have an emergency generator for fuel for emergency services, and ensure Ayer & Goss has a Spill Containment Plan in place and on file with the Town.	Lightning, Storms, Crash, Winter, Flood, Water Quality, Haz Mat	Ayer & Goss	Cost is for in-kind staff and volunteer time.	N/A
#104-2025	Encourage Rain Barrel Installation At Residences And Businesses To Reduce The Impacts Of Drought.	<u>Medium Term 3-4 Years</u>		Conservation Commission, ask Sweet Beets to work on project	\$	Available water supplies are further tapped with additional development. The water table is of regular concern. New developments can be concerning to existing residents in certain locations. The deeper a well, the larger the danger of arsenic and uranium. Public education could help alleviate some impact. Get students involved with program. Program is offered seasonally, each spring. Orders for rain barrels are taken and sold to residents. Reuse of existing educational material online and in the Conservation Commission.	Drought	Entire Town	Cost is for in-kind staff and volunteer time, unless the Town chooses to subsidize the barrels. Brochures, class, determine what it will require. See also UNH Cooperative Extension	UNH Coop-Extension Grants, NH DES Grants, Conservation Commission Operating Budget
#105-2025	Promote Solar Storm And Geomagnetic Radiation Awareness	<u>Short Term 1-2 Years</u>		Emergency Management	\$0	Provide information and/or hyperlinks on the Emergency Management Website to inform residents,	Solar, Utility,	Entire Town	Cost is for in-kind staff and	N/A

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Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	And Mitigation On The Town Website To Reduce Impacts Of Solar Storms.	<u>then Ongoing</u>				homeowners and businesses how to protect themselves and their structures against geomagnetic storms and solar radiation. NOAA	Communications		volunteer labor.	
#106-2025	Add "No Through Traffic" Signage To Each Of The One-Egress Roads In Town To Reduce The Likelihood Of Accidents And Road Erosion.	<u>Short Term 1-2 Years</u>		Public Works Department	\$	Vehicles often turn around on the narrow, one egress gravel roads, especially if trees are down after storms. This practice contributes to erosion of the roadsides and ditches.	Landslide, Wind, Winter, Erosion, Crash	One Egress Roads	Cost is for 12-24 approximately roads, \$300 for sign & post.	Highway Department Operating Budget, CIP item if all signage in compliance over 3 years
	HMC ADD NEW ACTION HERE after 2025									
	HMC ADD NEW ACTION HERE after 2025									

Source: Bradford Hazard Mitigation Committee

Action Evaluation and Prioritization Methods

A variety of methods were utilized to evaluate and prioritize the Actions. These methods include the enhanced STAPLEE (Social Technical Administrative Political Legal Environmental and Economics) criteria, designating the Action to be completed within a certain timeframe, and completing a basic **Cost to Benefits Analysis**, a later section. These prioritization methods are meant to enable the community to better identify which Actions are more important and are more feasible than others.

ENHANCED STAPLEE METHOD

An enhanced provided a better methodology for prioritization the Actions against one another. The Hazard Mitigation Committee ranked each of the mitigation Actions derived from the evaluation process. The total **Ranking Score** serves as a guide to the relative ease of Action completion by scoring numerous **societal and ethical impact questions** and does not represent the Town's Action *importance* priority. Instead, the STAPLEE process evaluates each Action and attempts to identify some potential barriers to its success. As revised in **2025**, a score of **75** would indicate that the mitigation strategy, or Action, would be relatively among the easiest Actions to achieve from a social and ethical standpoint.

There is latitude in the **2025 Plan's** enhanced STAPLEE scores to more easily identify the relatively easiest Action projects for completion. All enhanced STAPLEE answers are subjective and depend on the opinions of the Committee members discussing them. The Committee answered these **15** questions (except the three new questions regarding funding, staffing, and historic preservation) with a numeric score of "**1**" indicating a **NO** response, "**2**" indicating an **UNCERTAIN** response, "**3**" indicating a **MAYBE** response, "**4**" indicating a **LIKELY** response or "**5**" indicating a **YES** response, about whether the Action can fulfill the criteria:

- Does the action reduce damage and human losses?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Does the action offer reasonable benefits compared to its cost in implementing?
- Is the action legal?
- s the action support or protect the environment?

Action Completion Achievability	
RANKING	SCORE
Excellent	75 - 60
Good	45 - 59
Fair	44 - 30
Poor	29 - 15

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- Does the action have the funding necessary for completion?
- Does the action have the necessary staff or volunteers to undertake?
- Does the action support historic preservation?

The enhanced STAPLEE scores can range from a low of **15** to a high **75**, the highest possible ranking. Bradford's **Mitigation Action Plan** STAPLEE rating is shown in **Figure 8.A** and includes a basic benefit-cost ranking as shown in yellow.

Figure 8.A

Enhanced STAPLEE Ranking of Mitigation Actions

Action Number	Does the Action..... or is the Action.....	Reduce Damage? (or injury)	Contribute to Town Objectives? (Supported by Master Plan or long term goals?)	Meet Regulations? (if there are any)	Protect Sensitive Structures? (Buildings, roads, culverts, human-made things?)	Implemented Quickly? (See also Action Plan for Timeframe)	Socially Acceptable? (People/neighbors like project)	Politically Acceptable? (Public Officials & decision makers like project)	Administratively Feasible? (Have admin skills, permitting, other paperwork)	Technically Feasible? (Have tech skills, technology or special equipment)	Have a Reasonable Cost to Benefits Gained? (Will project save \$\$ in long term?)	Legal? (Or will be legal upon completion)	Support or Protect the Environment? (Natural resources?)	Have the Funding? (Can funding be obtained?)	Have Necessary Staff or Volunteers? (Sites, neighborhood, culture?)	Support Historic Preservation? (Sites, neighborhood, culture?)	Ranking Score 15-75
#55-2018	Develop Underground Utility Regulations For The Site Plan Review And Subdivision Regulations For New And Upgraded Developments To Reduce The Impact Of Storms, Wind And Winter Events.	5	5	5	5	4	4	5	5	5	4	5	5	4	4	4	69
#56-2018	Develop A Surface Water Overlay District For The Zoning Ordinance To Limit New Development And Uses Near The Rivers And Ponds.	5	5	5	5	4	3	3	5	5	3	5	5	5	5	3	66
#71-2025	Update The Bradford Telecommunications Zoning Ordinance To Attract Other Cellular Providers For Enhanced Communications During Weather Events.	4	5	5	2	3	3	3	5	3	4	5	2	4	4	1	53
#72-2025	Update Subdivision Regulations To Ensure Fire Suppression For Larger Subdivisions To Reduce The Impact Of Rural Wildfire And Lightning Events.	5	5	5	5	4	5	4	5	5	5	5	5	5	5	4	72
#73-2025	Develop Policies For All-Season Identification And Maintenance Of Dry Hydrants To Reduce The Impact Of Rural Wildfire And Lightning Events.	5	5	5	5	5	4	5	5	5	5	5	5	5	5	4	73
#74-2025	Develop Class V Road Standards For The Town Which Enable The Town To Maintain New Roads To Reduce The Impact Of Severe Weather Events.	3	5	5	5	2	2	3	4	3	2	5	3	2	2	2	48
#75-2025	Update Driveway Standards And Permitting To Reduce Erosion, Sedimentation, And Landslide.	5	4	5	5	5	4	5	5	5	5	5	5	5	5	3	71
#76-2025	Review Zoning Ordinances, Subdivision Regulations, Site Plan Review Regulations To Evaluate The Need For Planned Unit Developments, Phased Developments, Conservation Open Space, Zoning Lot Sizing, And Two-Way Egress To Reduce The Impact Of Natural Disasters.	2	4	5	4	2	2	2	3	4	3	5	4	2	3	2	47
#77-2025	Adopt The New Development Roads As Class V Town Maintained Roads Constructed According To Town Road Standards To Improve Response To Rural Areas During Disaster Events.	3	5	5	5	2	2	3	4	3	2	5	3	2	2	2	48
#78-2025	Change Town Meeting Vote On Road Acceptance To Board Of Selectmen Vote On Road Acceptance To Improve Response To Rural Areas During Disaster Events.	3	5	5	5	2	2	3	4	3	2	5	3	2	2	2	48
#79-2025	Classify Several Class VI Roads Or Trails As Emergency Lanes To Reduce The Impact Of Wildfire And Lightning.	4	4	5	4	3	4	3	5	5	4	5	5	5	5	5	66
#48-2012	Reconstruct Fairground Road At Dodge's Corner To Reduce Effects Of Floods, Erosion And Scouring.	5	5	5	5	2	4	4	2	4	5	5	5	2	2	2	57
#50-2012	Upgrade West Main Street Stone Culverts And Sidewalk Rebuild To Protect From Floods And Erosion.	5	5	5	5	2	5	4	3	4	5	5	5	2	2	2	59
#52-2012	Upgrade West Main Street Bridge And High Street Culverts Drainage System To Protect From Floods, Scouring And Erosion.	5	5	5	5	2	4	4	3	4	5	5	5	2	2	2	58
#59-2018	Install A Fire Alarm System At The Remote, Historical Bradford Meetinghouse For Fire Suppression.	5	5	5	5	2	2	5	3	3	5	5	3	4	4	5	61
#60-2018	Work With The Owners To Identify And Document The Crittenden Road / East Shore Road Footpath To Davis Road As A Blazed Trail To Provide Alternative Evacuation For Floods, Winter, Storms, Wind, Debris, And Wildfire.	5	5	5	5	5	2	3	2	4	4	5	4	5	5	3	62
#63-2018	Shim And Repair Asphalt Roads In Town To Design Them For Water Movement, Protecting From Pooling And Standing Water.	5	5	5	5	4	3	3	5	5	5	5	5	5	5	3	68
#80-2025	Install Generators At The Town Hall And Bradford Area Community Center For Emergency Sheltering.	5	5	5	5	5	5	5	5	5	5	5	5	3	5	2	70
#81-2025	Work With TDS/Other Providers To Install Wireless Network Wi-Fi Around Bradford Locations To Enhance Communications During Severe Weather Events.	5	5	5	5	2	3	3	2	3	2	5	4	2	3	3	52

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Action Number	Does the Action..... or is the Action.....	Reduce Damage? (or injury)	Contribute to Town Objectives? (Supported by Master Plan or long term goals?)	Meet Regulations? (If there are any)	Protect Sensitive Structures? (Buildings, roads, culverts, human-made things?)	Implement ed Quickly? (See also Action Plan for Timeframe)	Socially Acceptable? (People/ neighbors like project)	Politically Acceptable? (Public Officials & decision makers like project)	Administratively Feasible? (Have admin skills, permitting, other paperwork)	Technically Feasible? (Have tech skills, technology or special equipment)	Have a Reasonable Cost to Benefits Gained? (Will project save \$5 in long term?)	Legal? (Or will be legal upon completion)	Support or Protect the Environment? (Natural resources?)	Have the Funding? (Can funding be obtained?)	Have Necessary Staff or Volunteers?	Support Historic Preservation? (Sites, neighborhoods, culture?)	Ranking Score, 15-75
#82-2025	Seek A Desirable Property Where A Telecom Tower Could Be Constructed To Accommodate The Fire Station/ Highway Antenna, And Apply Ice Shield Technology To Reduce The Impacts Of Winter And Wind Storms.	4	5	5	5	2	2	2	2	5	4	5	1	2	3	1	48
#83-2025	Upgrade The Metal Dry Hydrant Pipes To PVC For Permanent Dry Hydrant Drafting Sites To Reduce The Risk Of Wildfire	4	4	5	5	5	4	4	5	5	5	5	4	5	5	3	68
#84-2025	Upgrade Deer Valley Red Listed Culvert To A Box Culvert Or Bridge To Reduce The Impact Of Flood, Erosion, And Scouring.	5	5	5	3	3	4	5	5	5	5	5	5	3	4	1	63
#85-2025	Upgrade Blaisdell Lake Two Red Listed Bridges To Reduce The Impact Of Winter, Flood, Erosion, And Scouring.	5	5	5	3	2	4	5	5	5	5	5	5	3	4	1	62
#86-2025	Upgrade Johnson Hill Road Red Listed Bridge To Reduce The Impact Of Winter, Flood, Erosion, And Scouring.	5	5	5	3	2	4	5	5	5	5	5	5	3	4	1	62
#87-2025	Assess The Town-Owned Public Facilities, Open Space Properties, And Historical Properties For WUI Protection.	5	5	5	5	3	5	4	5	5	4	5	5	4	5	5	70
#88-2025	Work With The Lake Todd Dam Regulator On The Placement Of Splashboards To Keep The Water Levels Constant During Drought Or Flooding Conditions.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	74
#89-2025	Encourage The Location Of A Nearby Alternative Parking Area For The NH 114 Town-Owned Boat Launch To Curb Parking Along The Highway And Lake Massasecum.	5	5	5	4	2	5	5	2	2	2	5	3	3	4	1	53
#66-2018	Seek a NHDES Grant to Hold and Advertise an Annual Household Hazard Waste Collection Day for Bradford Alone or with a Neighboring Town (Warner, Sutton or Newbury) to Reduce Illegal Dumping and Protect Water Quality.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	73
#90-2025	Obtain Todd/Massasecum/Lyndon DEAPs By NHDES To Reduce The Impact Of Dam Breach And Flooding.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#91-2025	Review The Bow Beaver Management Policy To Be Able To Provide A List Of Options For Bradford Property Owners For Public Safety And Biodiversity And To Be Able To Guide The Town On When Dam Removal Is Necessary.	5	5	5	5	1	3	3	5	5	5	5	5	5	5	3	65
#92-2025	Develop A Policy About Recreational Water Testing After Floods At Lake Todd And Lake Massasecum To Reduce The Risk Of A Public Health Event.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	73
#93-2025	Contact The Lake Massasecum Association To Locate, Document And Identify The Maintenance Responsibility For The Footpath For Public Safety Purposes.	5	5	5	5	5	2	3	2	4	4	5	4	5	5	3	62
#94-2025	Conduct A Survey Of The Older Cemeteries And Stones To Identify Who Is Buried In The Most Historic Locations And Flag For Repair Historic Stones To Ensure They Remain Whole And Readable For Historic Preservation.	5	5	5	5	3	5	5	5	5	5	5	5	3	3	5	69
#95-2025	Ensure Town Recreational Parking Areas Are Safe From Human And Technological Hazards.	5	5	5	5	3	3	3	5	5	5	5	5	3	3	3	63
#96-2025	Fund Milfoil Remediation Annually In Concert With The Efforts Of Lake Massasecum Association And Upgrade The Existing Milfoil Signage That Educates Boaters To Reduce The Impact Of Biological Contamination.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	73
#97-2025	Encourage NHDES To Make A Public Mapper Available Of The Bradford Sites Of Known Milfoil To Help Encourage People To Not Place Their Boats In Massasecum Or In Lake Todd Which Does Not Have Milfoil.	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	73
#70-2018	Educate The Public To Gather Emergency Kits For 72 Hours And To Plan A Secondary An Escape Route To Reduce The Impact Of Human Injury From Natural Hazard Events.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#98-2025	Design Signage For The Fire Station Identification Location And Purchase A Non-Digital Variable Message Board To Promote Hazard Event Information.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#99-2025	Contact Dam Owners For Public Education And Outreach About NHDES Inspection And Dam Emergency Action Plans, Maintenance Options To Reduce The Risk Of Dam Breach.	5	5	5	5	5	3	4	4	5	4	5	5	5	3	3	66
#100-2025	Develop A Town Push Notification System (311/Genasys) For Residents To Reduce The Impact Of Storms, Drought, Fire, Frost, Hail, Snow, Wind Events.	5	5	5	5	4	5	5	5	4	5	5	5	4	5	5	72
#101-2025	Develop Town Website Upgrade To Ensure Easier Location Of Rules And Regulations And Communication In Bradford.	5	5	5	5	3	5	5	5	5	5	5	5	3	5	5	71
#102-2025	Encourage The Installation Of Lightning Rods And Grounding Equipment At Identified Large Commercial Properties To Reduce The Risk Of Lightning And Fire.	5	5	5	5	2	4	5	5	5	5	5	5	5	5	5	71
#103-2025	Encourage Crash Protection, Lightning Rods And Grounding Systems, Fire Suppression At Ayer & Goss Fuel Facility To Reduce The Risk Of A Haz Mat Incident.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	71
#104-2025	Encourage Rain Barrel Installation At Residences And Businesses To Reduce The Impacts Of Drought.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	71
#105-2025	Promote Solar Storm And Geomagnetic Radiation Awareness And Mitigation On The Town Website To Reduce Impacts Of Solar Storms.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	72
#106-2025	Add "No Through Traffic" Signage To Each Of The One-Egress Roads In Town To Reduce The Likelihood Of Accidents And Road Erosion.	5	5	5	5	5	5	5	5	5	5	5	5	4	5	3	72

Source: Bradford Hazard Mitigation Committee

ACTION TIMEFRAMES

The Actions are also prioritized by an estimated **Action Timeframe** for completion based upon the other Town activities (hazard mitigation-related or not), funding potential for the Action, the need for the Action project, and possible staff time and volunteers available to complete the Action. This relative Action importance priority is measured by the **time indicated for project completion**. All Action projects within the **Mitigation Action Plan** have been assigned an **Action Timeframe**.

Those projects which are designated as **Ongoing** mean the Action should be undertaken on a regular basis throughout the five-year lifespan of the Plan. Actions that could qualify as **Ongoing** include public education, zoning ordinance or regulation revisions, essential mitigation maintenance and more. However, even **Ongoing** Actions are completed once before repetition. As a result, those Actions with an **Ongoing Action Timeframe** also include a duration (**Short, Medium or Long Term**) included.

Action Timeframe	Description of Timeframe
Ongoing	Action undertaken throughout the life of the 5-year Plan
Short Term	Action should be undertaken during Years 1-2 of the Plan
Medium Term	Action should be undertaken during Years 3-4 of the Plan
Long Term	Action should be undertaken during Years 4-5 of the Plan

Short Term projects are those which are the more important Actions and should be undertaken during **Years 1-2** of the Plan's lifespan if possible. **Medium Term** Actions are recommended by the Hazard Mitigation Committee to be undertaken during **Years 3-4** of the Plan's lifespan, while **Long Term** Actions are those which should wait until last, with suggested implementation undertaken during Plan **Years 4-5**. It is important to remember the **Action Timeframes** are relative to each other and are another indication of Action importance. If an Action cannot be completed within the **Action Timeframe**, it may still be a higher priority than other Actions but was unable to be implemented for some reason.

Both the **Action Timeframe** and the **Ranking Score** are incorporated into the **Mitigation Action Plan** to assist the Town with implementing the hazard mitigation Actions. The Actions can be sorted within their Action Category by either priority for easy display of the desired characteristic; Actions can also be sorted by **Responsible Department** to keep them all together for ease of completion.

PROJECT PHASES

Some of the Actions could be anticipated for completion after the **5-year** lifespan of this **2025 Plan**. Long Term Actions (Years **4-5** of the Plan's lifespan) may often run several years beyond **2029**. For these Actions, a series of Phases will be identified, each representing a **5-year** lifespan of the Plan. For example, a **Long Term Phase 1 of 3** Action indicates that through **2030**, **5** years of the project are expected to be worked on, plus an additional **10** years (two more **5-year** Plan lifespans) of the project are expected.

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Long Term (4-5 Years of the Plan)

Phase 1 (5 Years = lifespan of the current Plan)

Phase 2 (10 Years = 2 lifespans of the Plan)

Phase 3 (15 Years = 3 lifespans of the Plan)

Currently, the Town has not identified any projects beyond **Long Term, 4-5 Years**.

PROJECT COSTS

To simplify the potential costs of projects and Actions, the Hazard Mitigation Committee opted to use a cost range represented by a number of dollar signs (from **0-4** \$) as noted in the chart below. Few cost estimates were available at the time of this Plan, and an added advantage is inflation may be better accommodated by the time an Action is completed.

\$0	\$0 direct cost
\$	< \$10,000
\$\$	\$10,000 - \$24,999
\$\$\$	\$25,000 - \$49,999
\$\$\$\$	\$50,000 - \$99,999
\$\$\$\$\$	\$100,000 >

COST TO BENEFIT ANALYSIS

A simple **Cost to Benefit Analysis** ranking is contained within the enhanced STAPLEE criteria as displayed in the previous **Figure**.

Addressing Hazards with Actions

For the purposes of Action development, the main hazard categories of **Drought**, **High Wind/Tropical**, **Wildfire/Fire/Lightning**, **Flood/River**, **Winter**, **Extreme Temperatures**, **Earthquake/Landslide**, **Public Health/Biological**, **Solar** are considered precise enough to represent the hazards being addressed.

Many hazards overlap when an event occurs in Town. With individual, and often similar, natural hazards evaluated in this Plan, it is not always practical to list each one when describing potential Actions to address vulnerabilities. In many cases, listing the more encompassing main hazard categories should accurately define the issues of most identified Actions or locations. Using these hazard categories would often better accommodate the situation in their broadness. The categorized hazards have also been used in the **APPENDIX A CRITICAL AND COMMUNITY FACILITIES VULNERABILITY ASSESSMENT** but tailored when necessary.

Main Hazard Category	Specific Hazards Included
Drought	Drought
High Wind/Tropical/Storms	Thunderstorms, Downbursts, High Winds, Tornadoes, Tropical and Post-Tropical Cyclones, Hail
Wildfire/Fire/Lightning	Wildfire, Lightning, Fire
Flood/River/Dam	Dam Failure, Inland Flooding, River Hazards
Winter/Ice	Winter Storms, Blizzard, Ice Storm
Extreme Temperatures	Cold Wave, Heat Wave
Earthquake/Landslide	Earthquake, Landslide
Public Health/Biological	Swimming Water Quality, Air Quality, Drinking & Surface Water Quality, Infectious Diseases, Arboviral Diseases, Tickborne Diseases
Solar	Geomagnetic Storms, Solar Radiation, Radio Blackout
Hazardous Materials/Radiological	Hazardous Materials, Radiological
Human Hazard	Crash, Mass Casualty Incident, Cyber Event, Terrorism/ Violence
Technological	Aging Infrastructure, Conflagration (Fire), Long Term Utility, Outage

In some cases, further hazard detail at a specific location or to describe an Action is necessary. When needed, the specific hazards addressed in this **Hazard Mitigation Plan** could be utilized, such as **Erosion** from the **River Hazards** category, **Storm** (generally applying to warm weather, all-encompassing **Thunderstorms**, **Hail**) or **Tree Debris** from the **Wind** category, **Water Quality** from the **Public Health** category, or **Communications** from the **Long Term Utility Outage**, to provide the specific information needed to understand certain issues in Bradford.

Natural Hazards Evaluated for Which Specific Actions Were Not Identified

The Hazard Mitigation Committee assessed each of hazards and made determinations whether to specifically develop mitigation Actions for all natural hazards. Nearly all the potential Actions can be applied to multiple natural or other hazards based upon the generality of the Action's effect. Still, there could be no solutions or mitigation Actions developed for some of the more difficult to mitigate natural hazards. Many possible reasons are considered such as feasibility, prohibitive cost, jurisdiction, staff availability to develop and administer the project, lack of local support, unrealistic favorable outcome for the effort and more, all resulting in the point that for some natural hazards, potential Actions would not have worked for the Town.

Many Actions are general in nature and have the capacity to mitigate multiple types of natural hazards. From **4 HAZARD RISK ASSESSMENT**, those natural hazards rated a **LOW Concern** may not have been considered for an Action because their priority was not as important as other hazards. The **MEDIUM** and **HIGH Concern** hazards either have generalized or specific Actions associated with them in the **Mitigation Action Plan**. Otherwise, the reasons why no specific or feasible Actions were developed for the highest **Concerns** is described in **Table 8.5**.

Table 8.5

Committee Assessment of Natural Hazards with Mitigation Actions

CONCERN	Natural Hazard	Committee Assessment of Actions
LOW	Drought	See Actions related to Drought, Lightning, Extreme Temperatures, and Fire.
MED	Wildfire	See Actions for Wildfire, Tree Debris, Lightning.
HIGH	Winter	See Actions related to Winter, overall Storms, Ice, Tree Debris, Utility Outage.
MED	Ice	See Actions related to Winter, overall Storms, Snow, Utility Outage, Tree Debris.
MED	Cold Wave (Extreme Temps)	See Actions related to Drought, Climate Change, Winter Weather, Extreme Heat.
LOW	Heat Wave (Extreme Temp)	See Actions related to Drought, Climate Change, Winter Weather, Extreme Cold, Storms.
LOW	Dam Failure	See Actions related to River, Flood, Dam, Erosion, Landslide and overall Storms.
MED	Inland Flooding	See Actions related to Flood, Dam, Erosion, River, and Aging Infrastructure.
MED	River Hazards	See Actions related to River, Flood, Dam, Erosion, Landslide and overall Storms.
LOW	Earthquake	See Actions related to Earth, Landslide, Erosion, Earthquake, Aging Infrastructure.
MED	Landslide/Erosion	See Actions related to Earth, Landslide, Erosion, Earthquake, Aging Infrastructure.
HIGH	Public Health/Biologic	See Actions related to Public Health, Health (Water Quality), Infectious, Life & Safety and general natural disaster.
LOW	Solar Storms and Space Weather	See Actions related to Extreme Temperatures, Aging Infrastructure, Utility Failure.
LOW	High Wind	See Actions related to Wind/Thunderstorm/Rain, Tropical, Tree Debris, overall Storms, Utility Outage.

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CONCERN	Natural Hazard	Committee Assessment of Actions
LOW	Thunderstorms	See Actions related to Wind/Thunderstorm/Rain, Tropical, Hail, Tree Debris, overall Storms, Utility Outage.
LOW	Downburst	See Actions related to Wind/Thunderstorm/Rain, Tropical, Tree Debris, overall Storms, Utility Outage.
LOW	Lightning	See Actions related to Wildfire, Wind/Tropical (Storms), Fire, Tree Debris.
LOW	Tornado	See Actions related to Wind/Thunderstorm/Rain, Tropical, Tree Debris, overall Storms, Utility Outage.
LOW	Hail	See Actions related to Wind/Thunderstorm/Rain, Tropical, Tree Debris, overall Storms, Utility Outage.
LOW	Tropical and Post-Tropical	See Actions related to Wind, Tropical, Tree Debris, overall Severe Weather Storms, Utility Outage.

Source: Bradford Hazard Mitigation Committee

Mitigation Action Funding Resource Links:

- ☐ US Grants.gov
<https://www.grants.gov/>
- ☐ FEMA Hazard Mitigation Assistance Grants
<https://www.fema.gov/grants/mitigation>
- ☐ Grantwatch (federal, non-profit, business individual grants)
<https://www.grantwatch.com/>
- ☐ NH Department of Agriculture Markets and Food Conservation Grant Program
<https://www.agriculture.nh.gov/divisions/scc/grant-program.htm>
- ☐ NH Department of Environmental Services Business and Community Loans and Grants
<https://www.des.nh.gov/business-and-community/loans-and-grants>
- ☐ NH Department of Homeland Security and Emergency Management Resource Center
https://prd.blogs.nh.gov/dos/hsem/?page_id=839
- ☐ US Department of Agriculture Natural Resources Conservation Service Programs and Initiatives
<https://www.nrcs.usda.gov/programs-initiatives>
- ☐ US Department of Agriculture Rural Development Programs and Services
<https://www.rd.usda.gov/programs-services>
- ☐ NH Department of Transportation Community Assistance Programs
<https://www.dot.nh.gov/doing-business-nhdot/municipalities-community-assistance>
- ☐ NH State Parks Recreational Trails Program
<https://www.nhstateparks.org/find-parks-trails/find-trails-maps-clubs/grants/recreational-trails-program>
- ☐ National Park Service Community Assistance
<https://www.nps.gov/articles/community-assistance-national-regional-programs.htm>
- ☐ US Environmental Protection Agency Grant Programs
<https://www.epa.gov/grants/specific-epa-grant-programs>
- ☐ FEMA Hazard Mitigation Assistance (HMA) Programs Summary
<https://www.fema.gov/fact-sheet/summary-fema-hazard-mitigation-assistance-hma-programs>

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- ☐ **FEMA: Is a Mitigation Plan Required?** (active, non-lapsed local community Town/City HMP)
<https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/requirements>

The website contains a table which summarizes hazard mitigation plan requirements for state, tribal, territorial and local officials that are applying to FEMA for assistance, either directly or through a state as sub-applicants.

Hazard mitigation plans need to be updated and re-submitted for FEMA approval every five years to maintain eligibility.

9 ANNUAL IMPLEMENTATION AND EVALUATION

The Town received FEMA approval for the prior **Hazard Mitigation Plan** in **December 2018**. The completion of a planning document is merely the first step in its life as an evolving tool. The **Hazard Mitigation Plan Update** is a dynamic document that will be considered by all Town Departments, Boards, and Committees within their normal working environments. While evaluating the effectiveness of Actions in its everyday implementation, everyone will be able to contribute to the relevancy and usefulness of the Plan and to communicate with the Hazard Mitigation Committee where changes will be made. An annual effort will be undertaken to complete Actions and add new Actions as old tasks are completed and new situations arise. This Chapter will discuss the methods by which the Town of Bradford will review, monitor, and update its new **Bradford Hazard Mitigation Plan Update 2025**.

Implementation Challenges and Successes

Implementing a Hazard Mitigation Plan is not easy for a small New Hampshire community. No funding is available to oversee the Plan's implementation, and funding might not be available for individual projects. A permanent, volunteer Committee will be needed to control this effort on a regular basis under direction of a Town staff member. There are many aspects to be considered for implementation, whether successful or unsuccessful.

GREAT MITIGATION PROJECTS... AND THE REALITIES OF PROJECT IMPLEMENTATION IN NH

These important but costly and/or time-consuming mitigation projects identified in Bradford's **Mitigation Action Plan** represent the best case scenarios (or to some, "wish-list" items) for completion. There are many barriers to successful implementation of any project which is outside the typical duties of a Town staff member or volunteer. The annual struggle to obtain municipal funding at Town Meetings and the uncertainty of political & local support needed for hazard mitigation projects will continue.

New Hampshire relies on the **payment of property taxes** and a small selection of **limited state and federal funding opportunities** to develop annual municipal operating budgets that must be approved by voters (residents and property owners) at Town Meetings in most communities. Our population is aging and many are on a fixed income. This is especially true for the Central NH region's smaller communities that rely on voter support for staff hiring and/or hazard mitigation project budget funding, which is **19** out of **20** municipalities (excludes the Town of Bradford). Limitations for Action completion exist after the Hazard Mitigation Committee has developed its **Mitigation Action Plan**:

- ✧ **Town Meeting voters decide whether to approve new zoning ordinances** which can help mitigate hazards, and the Planning Board must first be supportive of any ordinance changes.
- ✧ **Town Meeting voters decide upon the \$ amount available to Department Operating Budgets** which often is just sustainable to enable. Voters try not to increase property taxes, which does not allow flexibility to plan ahead.
- ✧ **Town Meeting Voters decide upon expensive warrant articles and CIP items which may not include the Mitigation Action Plan** projects, and they may vote to not expend funds (Capital Reserve Fund) for, nor accept funds (grant) from, a mitigation project.
- ✧ **Town staff have much to accomplish for their normal duties and may not consider Mitigation Action Plan projects a priority.**
- ✧ **Town volunteers** are relied upon to do much of the hazard mitigation work in communities. Many volunteers are at or near retirement age and have held their positions for a decade or more. Few younger people are stepping up to take the place of exiting volunteers.
- ✧ **Town Boards and Departments set their internal priorities** which may not be the same as the **Mitigation Action Plan** projects, including regulation revisions, education and outreach, structural improvements, etc.
- ✧ **Communities often wait years to obtain grant funding for their priority projects** like bridge or road rehabilitation, stormwater upgrades, or brownfields assessments. Most funding programs require a cash match which is where most discretionary monies and Town staff time are channeled.
- ✧ **Communities do not have allocated funding for staff to review and evaluate the Plan** yearly as a Hazard Mitigation Committee, despite federal preference for this activity to occur. Many **Mitigation Actions** will be completed organically by local Departments and Boards instead of being led by a Hazard Mitigation Committee.
- ✧ **Communities feel more comfortable applying for State of New Hampshire grants than for federal grants.** Our State motto is “Live Free or Die” and this independent pride is carried over into people looking for municipal and state problem-solving funding first over federal funding. Grant administration is part of the equation, with less time available to spend administering complex funding programs.

From the outcomes of **2018 Plan**, the Hazard Mitigation Committee considered some of the specific challenges or barriers to its implementation:

2018 PLAN IMPLEMENTATION CHALLENGES

- ➔ Not enough resources. Since the last Plan was done, no staff person or volunteer carried out any implementation although some actions were done. Follow through is difficult – lack of interest? Lack of time? Does not come to fruition. Regulation adoption has not had much follow through despite good intentions.
- ➔ Are expectations realistic for a small town? Bradford is rural NH, not a city. Must prioritize staffing and volunteer efforts. Challenge is that people are not aware of what is happening at meetings in general. There is likely not a large or interested audience for the hazard mitigation. More effort could be placed into getting the public to the Selectmen Public Information Meeting presentations of the updated Plan. Public could login to streamed meetings. What percentage of residents are aware of the Hazard Mitigation Plan? 53 survey responses = about 3% of residents.
- ➔ Education and outreach improvements. Use Town Meeting presentation, Town Report insert to inform residents about hazard mitigation and natural hazards. Education and dissemination about Hazard Mitigation Plan. Bradford Bridge is a great tool to get info out- make a list of the 10 most important things from HMP. On Town website, place a new EMD webpage and upload the document.
- ➔ Few natural weather disasters since 2018. Plan has not been needed to be used. Very large, not consumable. Too much material to easily access and use. However, the Haz Mit Plan is not the EOP which is used in response to incidents. Few flood or natural hazard events have occurred since 2018 which is also why people don't pay as much attention to Plan.
- ➔ Volunteer board and Town staff tenure are not long enough to stay for the Plan's implementation and revision 5 years later. Intentions are great, people from the last 2018 Plan are no longer on staff or in Departments or on Boards and the institutional memory is lost.

Understanding the **2018 Plan** challenges enabled the Hazard Mitigation Committee to consider “lessons learned.” These lessons will become important for successful implementation of the **2025 Plan**:

2018 PLAN LESSONS LEARNED

- ➔ Organized campaign for actions implementation. A new Campaign Committee with the purposes of hazard mitigation education and outreach (website & notification), integration with Master Plan, integration with budget process, CIP should be established. The Town needs a regular process for outreach understanding and tie-in to Town Departments, plans, and activities. Both staff and volunteer labor will be necessary.

- ➔ Use the enhanced website to work with Campaign Committee, post information and notices on a regular basis. Last post related to public health was before the last Plan and was pre-pandemic. Several people must be able to post, but the information must be correct – training, editor.
- ➔ More infrastructure improvements. Ensure all have backup generators for essential Town services. Enhance the Library as a backup warming/cooling shelter. Town Hall should be kept operational. Work with Eversource, Main Street has “reliable power”, but often goes out regularly for short periods. Get BACC on reliable power too.
- ➔ Prepare the Food Bank to obtain and provide 100 backpacks for 3-day supplies.
- ➔ Consider changing internet for Town buildings to Starlink telephone/internet satellite service if communication problems remain. May be about the same cost. We need to keep pace with technology, should avoid cell towers. It would be operational if the grid went down. Improve cell service for residents, wi-fi, VOIP. Town Hall and Valley Bus company alarms go out over cellular.
- ➔ Get Town Meeting approval for a higher budget for Emergency Management (\$0 currently), and more funding for emergency management detail rate. The budget can also be used for offsetting grants. The funding could be used for the EMD to guide hazard mitigation implementation.

Even with the challenges, the Town of Bradford counted many successes since the **2018 Plan**. Important projects were started or completed and new Committees are working to accomplish priorities that often enhance the capability of hazard mitigation planning:

2018 PLAN SUCCESS STORIES (INCLUDING ACTIONS COMPLETED, RELATED SUCCESSES)

- ➔ New volunteer Fire Chief, an experienced and stable in position has enabled better connection, overall protection and regulations. Stability for this position has made a positive difference. Having a PT Fire Chief/EMD makes sense through Incident Command System.
- ➔ Completed the Town Hall renovation and move in. This project has been outstanding for two decades. The Town staff has more space in an updated, original Town building. The Bradford Area Community Center had been a temporary residence for Town Office. Both groups have room to grow programs. Need a new generator for BACC, but Selectmen to date haven’t wanted to obtain grant funding for this. Space for rent could help offset cost. Community Action is still in the building.
- ➔ Eversource infrastructure – Poles from Warner to Bradford were brought in from forest to roadside NH 114. Better protection from storm events, easier to repair. Wires were reconfigured to diamond-shaped to be more resilient.

- ➔ Rowe Mountain Road now has internet, provided by TDS. Fiber optic is also available. Fire Station also upgraded from street to Fire Dept, and new Town Hall (cellular alarm system). Road is 2.2 miles long, about 20-25 houses total (estimates 50 people). County Road is a little longer, West Road are in same district. Rowe Mtn Road is representative of rural hilly areas in Bradford.
- ➔ Cellular reception is better than 5 years ago, area that is serviced is wider. Better than it used to be. Can be attributed to state/federal infrastructure initiative to suppliers to increase capacity. Thought to have a cell tower placed about 6 years and was not operational, then was activated to assist with reception downtown.
- ➔ Conservation Comm holdings have increased (easements) since 2018. One parcel on East Washington Road may help reduce the flow of water, now protected from development. Battles Farm easement. Howlett Road easement. Landowners donate some easements, others have a purchase. Bog Headwaters fundraising effort to purchase through Ausbon Sargent, contains some of the water heading into the bog, protect the watershed. Two-three more properties are in the review queue. Control of massive rain events is a focus of property purchase.
- ➔ Note list of Completed Actions in **7 PRIOR ACTION STATUS**.

New Hampshire communities do the best they can with the resources available to them to make ends meet, particularly in times of economic duress or hardship. Despite the different ways of evaluation and prioritization shown within the **Hazard Mitigation Plan 2025**, completion of Actions or implementation of the Plan may not occur within the next **5** years unless there is an urgent need such as a declared major disasters or emergency declaration (DR- or EM). A natural disaster may serve as the catalyst for project implementation and grant application, including the opening of federal grant funds.

Town Duties: Annual Monitoring and Update of the Mitigation Action Plan (CH 8)

The Select Board will vote to establish a permanent Hazard Mitigation Committee within **3 months** of receiving the FEMA **Letter of Formal Approval** as indicated in **1 PLANNING PROCESS**. The purpose is to meet on a regular basis to ensure the **Hazard Mitigation Plan's** Actions are being actively worked on and the Plan is evaluated and revised to fit the changing priorities of the Town.

The Emergency Management Director or Town Manager designee will continue to serve as Chair of the Committee for Hazard Mitigation meetings and will be officially appointed to such a capacity by the Board. Current Hazard Mitigation Committee members can be appointed to continue to participate as members of the permanent Committee. More information is provided in **APPENDIX B**.

Committee membership shall include:

- | | |
|--|---|
| ✓ Emergency Management Director | ✓ Planning Board member |
| ✓ Deputy Emergency Management Director
(if appointed) | ✓ Budget Advisory Committee member |
| ✓ Town Administrator or designee | ✓ Bradford/KRSD School District
Representative |
| ✓ Fire Chief or designee | ✓ Library Representative |
| ✓ Police Chief or designee | ✓ Parks and Recreation member |
| ✓ Highway Road Agent or designee | ✓ Conservation Commission member |
| ✓ Building Inspector/ Code Enforcement
Officer | ✓ Economic Development Committee
member |
| ✓ Human Services Director | ✓ Energy Committee member |
| ✓ Health Officer | ✓ Eversource representative (Stakeholder) |
| ✓ Select Board member | ✓ Community Stakeholders at Large |

Stakeholders who shall be solicited to attend meetings and to participate equitably in the Plan development process include representatives from Bradford or Kearsarge Regional School District, Library, neighborhoods, local State Representatives, agricultural/farming operations, trails groups like Concord to Lake Sunapee Rail Trail, business leaders, local non-profits including the Capital Area Public Health Network, area emergency management directors, local, State or other Federal agency representatives (such as NH HSEM), utility representatives (such as TDS and Eversource), and other members of the public. This composition provides a wide spectrum of potential interests and opportunities for partnership to develop and accomplish Actions.

HMC INTERIM MEETINGS AND ACTIVITIES

This Committee will aim to meet up to 4 times per year to follow these potential future meeting activities to update the **Mitigation Action Plan** and complete the Plan's annual evaluation as displayed in **Table 9.1**.

Table 9.1

Hazard Mitigation Committee Preliminary Annual Future Meetings and Activities

Meeting or Activity Month	ANNUAL Preliminary HMC Interim Meeting Agenda Items and Activities
JANUARY HMC Meeting <i>Budgets Determined</i>	Town operating budgets are determined for the next year. HMC assists Select Board and Budget Comm with getting their mitigation projects funded by Warrant Articles and written into Dept/Bd Operation budgets. Action implementation continues. HMC requests a Progress Report #2 for This Year's & Next Year's Actions from responsible Depts/Bds by beginning of February. HMC continues update to the Action Status File using the Department Mitigation Action Progress Reports .
February-March	HMC staff updates CHAPTER 8 Mitigation Action Plan Tables using the revised Action Status File from the Department Mitigation Action Progress Reports . HMC staff provides revised CHAPTER 8 Mitigation Action Plan Tables to Department Heads/Board Chairs, keeps original Word and Excel files accessible on Town computer system and backed up to cloud.
APRIL HMC Meeting <i>\$ Available</i>	Annual funding is received from March Town Meeting. HMC completes annual update of the CHAPTER 8 Mitigation Action Plan Tables , polls Depts/Bds for new Hazard Events descriptions/impacts/locations/date to add to CHAPTER 4 Local Hazard Event History Table , requests photos of Hazard Events and updates APPENDIX Photographic History . HMC reviews and revises CHAPTER 4 HIRA Table . HMC determines Action Plan items to pursue for Year, including \$0 cost items.
May	HMC members ensure Depts/Bds are provided with information to work on their Actions for the Year. HMC members meet with Depts/Bds to discuss Action priorities and requests completion of This Year & Next Year Actions. Depts/Bds begin working on Actions. HMC posts a Haz Mit/Severe Weather Survey online for widespread public input. HMC helps Depts/Bds with grants for Actions.
JUNE HMC Meeting <i>Infrastructure Projects Underway</i>	Infrastructure projects will be underway. HMC requests a Progress Report #1 for This Year's & Next Year's Actions from responsible Depts/Bds by beginning of July. HMC completes Annual Evaluation of the Plan File . HMC works with the CIP Committee to get certain projects placed into the CIP. Depts/Bds to begin placement of Next Year's high-cost Action Plan items into the CIP.
July- August	HMC assists Depts/Bds with their Operating Budget requests to include Next Year's Actions, and to determine which Actions will have Warrant Articles. HMC staff continues assistance to Depts/Bds for Action Plan items. HMC continues update to the Action Status File using the Department Mitigation Action Progress Reports . HMC staff & members ensure Haz Mit Actions are added into the CIP.
SEPTEMBER HMC Meeting <i>CIP updated, Budgets drafted</i>	HMC to review Action Status File and identify Next Year's Actions to accomplish (including \$0). HMC to review Haz Mit/Severe Weather Survey results to help guide Action priorities. HMC polls Depts/Bds for new Hazard Events descriptions/impacts/locations/date to add to CHAPTER 4 Local Hazard Event

Meeting or Activity Month	ANNUAL Preliminary HMC Interim Meeting Agenda Items and Activities
	History Table , requests photos of Hazard Events and updates APPENDIX Photographic History . HMC reviews and revises CHAPTER 4 HIRA Table if needed.
October-December	HMC attends Select Board Dept/Bd Operation Budget meetings and suggests Warrant Articles for Action Plan items. HMC attends Budget Committee meetings scheduled through January to champion Action item funding.

Sources: Bradford Hazard Mitigation Committee

For each of the Hazard Mitigation Committee implementation meetings, the Emergency Management Director (or Staff Coordinator) will invite other Department members, Board and Committee members, Town Department staff, Bradford/KRSD School District representatives, Stakeholders, and other participants of the **2025 Plan** Committee meetings. Identified and general members of the public will also be invited as indicated previously. Their purpose is to attend and participate in the meetings as full participants, providing input and assisting with decision making. Public notice will be given as press releases in local papers, will be posted in the public places in Bradford, and will be posted on the Town of Bradford website at www.Bradfordnh.gov.

The **Hazard Mitigation Plan's Mitigation Action Plan** will be updated and evaluated annually generally following the suggestions outlined within the Chapter. All publicity information, Agendas, and Attendance Sheets, shall be retained and compiled for inclusion into **APPENDIX C**.

The Emergency Management Director and Department heads will work with the Select Board to discuss the funding of Action projects as part of the budget process cycle in the fall of each year. The projects identified will be placed into the following fiscal year's budget request if needed, including the Capital Improvements Program (CIP), Town Operating Budgets, and other funding methods.

Town Duties: Implementation and Evaluation of the Plan (Ch 8)

During the Committee's annual review of the **Mitigation Action Plan**, the Actions are evaluated as to whether they have been **Completed**, **Deleted**, or **Deferred**. Those Action types are placed into their respective Tables. Any **New** Actions will be added as necessary. Each of the Actions within the updated **Mitigation Action Plan** will undergo the enhanced STAPLEE ranking as discussed in **8 MITIGATION ACTION PLAN**.

A set of **Annual Interim Plan Evaluation and Implementation Worksheets** is available to assist the community with Plan implementation in **APPENDIX B**. These worksheets are to be used during the Hazard Mitigation Committee basic meeting schedule outlined previously in **Table 9.1**. The primary implementation tasks are to be completed depending on when the Town prepares and receives its yearly operating budgets and warrant articles.

MAIN ANNUAL HMC IMPLEMENTATION TASKS

The rolling list of the Hazard Mitigation Committee's annual main tasks to update and implement the Plan sections shall include:

1. Document New Hazard Events that Occurred in Town.

- ➔ Reevaluate the Hazard Identification and Risk Assessment (**CHAPTER 4** HIRA Table in Plan, HIRA file) ratings for natural hazards.
- ➔ Add new events to Local and Area History of Disaster and Hazard Events (**CHAPTER 4** Local History Table in Plan).
- ➔ Submit photos of events to add to the **APPENDIX F** Photographic History file.

2. Coordinate Annual Completion of Priority Mitigation Actions by Assigning to Departments.

- ➔ **APPENDIX B** Mitigation Action Progress Report file.

3. Ensure Departments Acquire Funding for Actions & Document the Status of Priority Actions.

- ➔ **APPENDIX B** Mitigation Action/Project Status Tracking file.

4. Evaluate Effectiveness of the Plan Each Year.

- ➔ **APPENDIX B** Plan Evaluation Worksheet file.

5. Request Semi-Annual Progress Reports from Departments & Update Status File.

- ➔ **APPENDIX B** Mitigation Action/Project Status Tracking file.

6. Update Mitigation Action Plan, Reprioritize Actions for Current Year, Update Supporting Plan Sections.

- ➔ Update Mitigation Action Plan (**CHAPTER 8** Tables in Plan), place **Completed** or **Deleted** Actions into respective **CHAPTER 7** Prior Action Status Tables in Plan.
- ➔ Enhanced STAPLEE Prioritization (**CHAPTER 8** Figure in Plan, STAPLEE file).
- ➔ Update other sections as needed/if time permits including:
 - **CHAPTER 5** Critical and Community Facilities (narrative in Plan, Tables in file, and **APPENDIX A**),
 - **CHAPTER 5** Problem Statements narrative in Plan,
 - **CHAPTER 5** Culverts to Upgrade Table in Plan,
 - **CHAPTER 6** Capability Assessment Tables in Plan,
 - and more.
- ➔ Make note of everything added/changed in the **2025 Plan** for so we can track the adjustments and copy them over into the new **2030 Plan** update! The latest approved format and content will be different than the **2025 Plan**.
- ➔ Remember to invite the Stakeholders and public to all meetings, take minutes as needed, and keep PDF copies of publicity. Add to **APPENDIX C MEETING INFORMATION**.

7. Send Interim Files to CNHRPC & Repeat.

- ➔ Email copies of Agendas, meeting publicity, meeting minutes, Action Prioritization, Action Evaluation, other revised Plan files, and the revised Hazard Mitigation Plan itself to CNHRPC staff salexander@cnhrpc.org for archival and preparation for the next 5-year Plan update in **2030-2030**.

Figure 9.A is a graphic display of the repeating annual interim activities of the Hazard Mitigation Committee to update and implement the **Hazard Mitigation Plan 2025** actions and while preparing for the **2030 Plan Update**.

Figure 9.A
Annual Interim Plan Implementation, 2025-2030



ANNUAL INTERIM IMPLEMENTATION FILES 2025-2030

To get the permanent Hazard Mitigation Committee started on its activities during the Interim Update Meetings, **APPENDIX B Evaluation and Implementation Worksheets** are provided. These example working documents include administrative and organizational Word and Excel format files, draft Agendas, a Mitigation Action Progress Report, a file to track the progress of Actions to completion, and a file to evaluate the effectiveness of the Plan (a way to make notes for future improvement). These documents are only a starting point for Towns to help guide implementation during the interim years of Plan approval (2025) through Plan lapse (2030). Contact [CNHRPC](mailto:salexander@cnhrpc.org) at 603-226-6020 or at salexander@cnhrpc.org for information about implementation assistance.

Committee Organization and Publicity Documents

- Select Board: Motion & [Permanent] Hazard Mitigation Committee Membership
- Interim Meeting Publicity- Template Press Release and Public Notice Meeting Poster

Meetings & Working with the Mitigation Actions

- Example Agenda for Interim Meeting 1 with recommended task list
- Example Agenda for Interim Meeting 2 with recommended task list
- Mitigation Action Status Tracking Sheet
- Mitigation Action Progress Report for Departments (optional)
- Annual Hazard Mitigation Plan Evaluation Worksheet

NEXT 5-YEAR PLAN UPDATE 2030

The next **5**-year full Plan update will evaluate the existing Actions in the same manner, add new Actions, review natural hazard vulnerability, update data, and will fulfill a complete update of the **Hazard Mitigation Plan** according to approved guidelines and standards. The Town of Bradford will seek a FEMA Building Resilient and Infrastructure and Communities (BRIC) grant or equivalent to contract the services of the Central NH Regional Planning Commission (CNHRPC) to prepare the next 5-year **Plan** update.

Implementing the Plan through Existing Programs

In addition to work by the Hazard Mitigation Committee and Town Departments, several other mechanisms exist which will ensure that the **Bradford Hazard Mitigation Plan Update 2025** receives the attention it requires for optimum benefit. Incorporating Actions from the Plan is often the most common way the Hazard Mitigation Plan can be integrated into other existing municipal programs, as described below.

OVERALL IMPLEMENTATION PROGRESS THROUGH LOCAL PLANNING MECHANISMS SINCE THE 2018 PLAN

As a successful, growing community, the Town of Bradford has a comprehensive network of plans, processes, champions, regulations, and budgets to ensure its local objectives, projects and budgets are fulfilled. The **Bradford Hazard Mitigation Plan 2025** is a tool for community betterment which works most effectively when partnering with existing planning mechanisms. Since the original **2007 Plan**, the overall integration and importance of the **Bradford Hazard Mitigation Plan** into existing Town planning mechanisms continues to grow.

Although the **2018 Plan** was not adopted into Planning Board's latest **Master Plan 2020**, a better opportunity exists now for incorporation of the **2025 Plan**. The **Capital Improvements Program FY 2025-2034** and its projects will influence new funding for Capital Reserve Funds and likely has helped to upgrade culverts in the **Mitigation Action Plan**. The **Zoning Ordinance** was revised annually since **2018** and continues to encourage natural systems protection (see **6 CAPABILITY ASSESSMENT**). The **Site Plan Review and Subdivision Regulations** were last reviewed and updated in **2015**. These regulations indirectly support hazard mitigation planning principles (such as excavation regulations, fire and emergency access, driveway standards, drainage, landscaping, erosion, etc.). Annual budgets for Emergency Management have been very small but may be able to increase to consider the **Hazard Mitigation Plan** findings. By necessity of the overall tax dollars available as determined by voters, the Town budget limits funding for larger hazard mitigation projects such as box culvert upgrades or infrastructure inventories. The individual Town departmental budgets supported hazard mitigation planning where feasible or supported by voters, such as Capital Reserve Funds for Bridge Repair, Highway, Infrastructure improvements, Town Building Upgrades, Dry Hydrants, etc. Drainage upgrades, culvert upgrades and asset inventory and management are priorities of the Highway Department and are important mitigation projects in Bradford.

Moving forward, Town Boards and Departments have room for further improvement of the **Hazard Mitigation Plan's** incorporation into existing planning mechanisms. For several of these planning programs, a summary of the **Process to Incorporate Actions** as noted below offers ways for the **2025 Plan** to be utilized. See also **6 CAPABILITY ASSESSMENT**.

MASTER PLAN

The latest *Bradford Master Plan 2020* was adopted in **April 2020**, developed by the Planning Board with assistance from the CNHRPC. The Planning Board has the goal of rotating Chapter review and revision annually. Chapters updated include Vision, “Today” Housing and Demographics, History & Culture, Community Facilities, Natural Resources, Existing and Future Land Use, Housing, Transportation, and Implementation. The **Hazard Mitigation Plan 2025** will eventually be adopted as an Appendix or a Chapter to the *2020 Master Plan* by the vote of the Planning Board. The Master Plan influences the Zoning Ordinance and the Subdivision and Site Plan Review Regulations along with the Capital Improvements Program. These documents are used by local land use boards and staff to guide growth and development of Bradford.

*To support mitigation efforts, the Planning Board shall consider adopting the **Hazard Mitigation Plan 2025** as a separate Chapter or Appendix to its Master Plan in accordance with **RSA 674:2.II(e)**.*

The **Hazard Mitigation Plan** shall be presented to the Planning Board by the Town Administrator and Emergency Management Director after FEMA’s **Formal Approval**. The Plan can be considered for adoption after a duly noticed public hearing, just as any typical Chapter of a Master Plan. In addition, Actions and concerns from the Plan can be integrated into the Master Plan.

Process to Incorporate Actions

The Hazard Mitigation Committee will present the approved **Hazard Mitigation Plan** to the Planning Board within **6** months after FEMA’s **Letter of Formal Approval** is received for the Board’s consideration and adoption into the Master Plan after a duly noticed public hearing. This is the same process used to adopt other components of the Master Plan. The NH State law supporting the development of a natural hazard mitigation plan as a component of a community Master Plan is **RSA 674:2-III(e)**. The Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to ensure that the relevant **Hazard Mitigation Plan** Actions are incorporated into the Master Plan.

CAPITAL IMPROVEMENTS PROGRAM

Bradford's last **Capital Improvements Program (CIP)** was adopted for **FY 2025-2034**, but will be revised annually. The goal is to ensure the CIP is reviewed and updated each year by the CIP Committee. The HMC will like to ensure Actions requiring capital improvements funding from the **Hazard Mitigation Plan Update** will be inserted into the Capital Improvements Program for funding during the CIP's next update with specific projects and equipment replacement identified as addressing needs cited in the Update. Depending on the Town's funding needs, Capital Reserve Funds for such items as road & bridge improvements shall be identified where appropriate as addressing projects in the **Hazard Mitigation Plan Update**. The CIP in Bradford is directed by the Select Board.

Process to Incorporate Actions

The Hazard Mitigation Committee (HMC)'s representative to Select Board will oversee the process to begin working with the CIP Committee to incorporate the various Hazard Mitigation Plan projects into the updated CIP. As the CIP is amended, the representative from the Hazard Mitigation Committee shall be appointed to sit on the CIP Committee or the HMC shall submit a CIP Project Application to ensure the mitigation projects are addressed as part of the CIP update process. A new Capital Reserve Fund for Hazard Mitigation Projects will be considered.

TOWN MEETING

In Bradford, the annual Town Meeting is held in March where the voters of the Town vote to raise money for capital projects and approve the annual operating budget of the Town. This is a good, revolving opportunity to explain the importance of the mitigation actions of the **2025 Plan Update** and where the funding of specific capital projects simultaneously responds to these mitigation projects.

Process to Incorporate Actions

The Hazard Mitigation Committee (HMC)'s Town Department members will work with the Town Administrator, Budget Advisory Committee and Select Board to develop a capital budget and warrant article language for appropriate Actions for **Town Meeting vote**. The HMC members may also request deposits to appropriate Capital Reserve Funds for some of the larger projects. A representative from the Hazard Mitigation Committee will provide a copy of the current **Mitigation Action Plan** to both the Budget Advisory Committee and Select Board annually and validate the need for funding at the annual Town Meeting to accomplish the projects. The representative will work with Town Administration to write warrant article language for approval Action items if needed or to get the items placed into Department Operating Budgets.

OPERATING AND CAPITAL BUDGETS

Many of the Actions will not require specific funding but are identified as requiring in-kind Staff labor to perform the work required to undertake the Actions. Town Departments and Staff have rigorous job functions that demand their undivided attention to the tasks required to run their respective Departments. Additions to the workload to accommodate the Actions can put a strain on their ability to serve the public during performance of their normal job duties. When possible, Bradford Departments and staff will be able to prioritize their tasks to work on **Hazard Mitigation Plan Update 2025** Actions. The in-kind staff work performed is assumed under the Operating Budget for that particular Department. The Emergency Management Department will benefit from a higher annual budget if this were brought to Town Meeting.

Process to Incorporate Actions

With obtaining assistance from the HMC, the Department or Board is given the responsibility to ensure their Actions are completed, either by working on the Actions allocated to him/her when their normal job duties permit or by delegating the Action to another person. The funding for the Actions comes out of the Department's operating budget as work is undertaken by the Staff person on an as-time-permits basis unless the Action is a component of the Town staff members' normal work duties. Staff or volunteers will attempt to follow the **Action Time frame** as a guideline for completion. A yearly review of the **Mitigation Action Plan** by the Hazard Mitigation Committee will re-prioritize the Actions, and the members can report on their progress, asking for assistance or more time as needed. By connecting planned Town of Bradford improvement projects to specific projects and objectives of the **Hazard Mitigation Plan Update 2025**, the Departments can utilize their resources more effectively.

Continued Public Involvement

On behalf of the Hazard Mitigation Committee, the Emergency Management Director and the Staff Coordinator, under direction of the Town Manager, will be responsible for ensuring that Town Departments and the public have adequate opportunity to participate in the planning process. Administrative staff shall again be utilized to assist with the public involvement process.

Those representatives who chose not to participate in the **2025** Hazard Mitigation Committee plan update process will not be directly identified for privacy considerations, but their organizations will be listed so they can again be contacted for the **5**-year update.

For each interim meeting in the annual update process and for the **5**-year update process procedures that will be utilized for public involvement include:

- Provide personal invitations to Town volunteer Board and Committee Chairs, and Town Department heads, and local utility representatives like Unitil and Eversource.
- Provide personal invitations to abutting community emergency management directors of neighboring Towns: Newbury, Sutton, Warner, Henniker, Hillsborough, Washington, Goshen.
- Provide personal invitations to the major businesses, agencies, neighborhoods, non-profits, and other entities invited to participate in the **2025 Plan**: TDS, Eversource, Capital Area Public Health Network, Bradford School District, and others.
- Seek new public involvement representation from the following businesses, agencies, neighborhoods, non-profits, and other entities: Historical Society, associations listed on **APPENDIX A Critical and Community Facilities Vulnerability Assessment** through personal invitation.
- Post public meeting notice flyers and press releases on the Town's website at www.Bradfordnh.gov on the Town's online calendar on the same site, and place agendas and meeting materials on a Hazard Mitigation Committee webpage.
- Post meeting notices in the Bradford Town Hall, outside on the Town Bulletin Board, at the Library and Bradford Area Community Center, at the local schools, and at local business(es);
- Submit media releases to the InterTown Record (a paid, regional weekly newspaper serving the western Merrimack County area) and other free, regional weekly newspapers serving Central region NH communities (online newspapers and newsletters have unpredictable longevity).

In addition to previous suggestions for invitations to Hazard Mitigation Committee update meetings, review **APPENDIX A Critical and Community Facilities Vulnerability Assessment** Tables: Vulnerable Populations, Economic Assets and Recreational and Gathering Sites for further stakeholder opportunities. The NH Homeland Security and Emergency Management Field Representative for

Bradford will be invited. The Town will provide the Central NH Regional Planning Commission with Agendas, minutes and other materials for archiving, to be used when the **5-year** update again becomes necessary (email to salexander@cnhrpc.org). Any State, regional or federal interest in Bradford shall be considered for direct invitation for MITIGATION, which is a transparent process. EMERGENCY OPERATIONS planning shall have a more selective working group.

A new section of the Town website dedicated to Hazard Mitigation Committee activities and the **2025 Plan** shall be kept updated with meeting notices and materials used by the Hazard Mitigation Committee. This online location will be an optimal place to post the final **2025 Plan** and its *Maps* and *Appendices* and to continue adding materials for annual Plan updates. Additional pages shall be added for resources, information, and links to other websites for the public. Several Action Plan items which will be undertaken relate to public education and involvement and the Town website will be an exemplary method of getting the word out.

10 APPENDICES

The following **APPENDICES A-F** are included under a separate electronic or paper document to maintain the relative brevity of this **Hazard Mitigation Plan Update**.

Listing of Bradford Hazard Mitigation Plan Update 2025 Appendices

Some of these documents shall be updated annually as part of the interim Action implementation and Plan evaluation process*. The remaining **APPENDICES** could be amended with the new or revised annual information, but they are optional. It is necessary to establish a Town digital storage location for placing any new or updated hazard, Action, meeting, or Plan data over the **5-year** interim until the Plan is ready to be fully updated again. Systematic organization will facilitate annual updates and prepare for next **5-year** Plan development in 2030.

- A Critical and Community Facilities Vulnerability Assessment ***
- B Annual Plan Evaluation and Implementation Worksheets ***
- C Meeting Information ***
- D Plan Approval Documentation**
- E Photographic History of Hazard Events ***
- F Hazard Mitigation and Severe Weather Community Survey Results ***

These Appendices shall be reviewed and updated minimally each year*. It is also highly recommended to update **4 HAZARD RISK ASSESSMENT Table 4.5 Local and Area Hazard Event and Disaster History** to maintain a record of the disasters, hazards, and impacts to Bradford. See **9 ANNUAL EVALUATION AND IMPLEMENTATION** and **Figure 9.A** for details.

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11 MAPS

Four (4) detailed Maps were fully updated during the development of the **Bradford Hazard Mitigation Plan Update 2025**. Data from the previous Plan maps were used, new standardized data layers were available, and Hazard Mitigation Committee members added their own knowledge of sites and hazard events.





Plan Update 2025 Maps

Map 1 Potential Hazards illustrates potential hazard event locations in Bradford that have the possibility of damaging the community in the future. The *Map 1* legend includes (technology) infrastructure hazards such as dams, bridges, electric transmission lines and evacuation routes. Natural hazards are displayed such as new Preliminary **2023** Special Flood Hazard Areas (SFHAs), locations of potential flooding/ washout, fire/wildfire, bridge washout, ice and snow, steep slopes (>15%) and more.

Map 2 Past Hazards illustrates the locations of where hazard events have occurred in Bradford in the past, including areas of Preliminary SFHA, flooding/washout, snowmelt, dam breach, fire/wildfire, wind damage, ice damage, and more.

Map 3 Critical and Community Facilities includes the infrastructure included in *Map 1 Potential Hazards* and the SFHAs to give viewers a better, real world perspective. The locations of all critical facilities and community facilities as recorded in the **APPENDIX A Critical and Community Facilities Vulnerability Assessment** are displayed on the Map. Each of these sites is numbered on a key listing the names of each facility.

Map 4 Potential Hazards and Losses utilizes all the features of *Map 3* and includes the *Map 1 Potential Hazards* and any realistic *Map 2 Past Hazards* locations where hazard events can occur again in Bradford.

-  **Map 1 - Potential Hazards**
-  **Map 2 - Past Hazards**
-  **Map 3 - Critical and Community Facilities**
-  **Map 4 - Potential Hazards and Losses**