

Hazard Mitigation Plan

Update 2023



Town of Dunbarton

New Hampshire

**Adopted by the Dunbarton
Board of Selectmen
April 13, 2023**

**Approved by FEMA
April 18, 2023**



Town of Dunbarton, NH

Hazard Mitigation Plan Update 2023

Selectmen Adopted April 11, 2023

FEMA Approved April 18, 2023



Town of Dunbarton

1011 School Street

Dunbarton, NH 03046

Phone: (603) 774-3541

<https://www.dunbartonnh.org>

Central NH Regional Planning Commission (CNHRPC)

28 Commercial Street, Suite 3

Concord, NH 03301

Phone: (603) 226-6020

www.cnhrpc.org



NH Department of Safety (NHDOS)

NH Homeland Security and Emergency Management (NHHSEM)

33 Hazen Drive

Concord, NH 03305 (*Mailing Address*)



Incident Planning and Operations Center (IPOC)

110 Smokey Bear Blvd

Concord, NH 03301 (*Physical Address*)

Phone: (800) 852-3792 or (603) 271-2231

www.nh.gov/safety/divisions/hsem

<https://prd.blogs.nh.gov/dos/hsem>



US Department of Homeland Security

Federal Emergency Management Agency (FEMA)

99 High Street, Sixth Floor

Boston, Massachusetts 02110

Phone: (617) 223-9540

www.fema.gov



FEMA

April 18, 2023

Natasha Cole, State Hazard Mitigation Officer
New Hampshire Department of Safety, Homeland Security and Emergency Management
33 Hazen Drive
Concord, New Hampshire 03303

Dear Natasha Cole:

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region I Mitigation Division has approved the Town of Dunbarton, New Hampshire Hazard Mitigation Plan Update 2023 effective **April 18, 2023** through **April 17, 2028** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the jurisdiction is eligible to apply to New Hampshire Homeland Security and Emergency Management for mitigation grants administered by FEMA. Requests for funding will be evaluated according to the eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in this community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

The plan must be updated and resubmitted to the FEMA Region I Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Jay Neiderbach at (202) 285-7769 or josiah.neiderbach@fema.dhs.gov.

Sincerely,





Dean Savramis
Mitigation Division Director
DHS, FEMA Region I

DS:jn

cc: Lynne Doyle, State Hazard Mitigation Planner, New Hampshire

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1 PLANNING PROCESS

The Town's Hazard Mitigation Committee reformed to rewrite the Plan into a more concise format and to incorporate the newest material required by FEMA in addition to updating the Town's newest information since 2017. This Planning Process Chapter contains information previously available in the Introduction Chapter of the **Plan Update 2017**. Expanded public participation steps were taken and a new plan development procedure was used as documented in the Methodology section.

Certificate of Adoption, 2023

Town of Dunbarton, NH
Board of Selectmen
1011 School Street
Dunbarton, NH 03046

A Resolution Adopting the Dunbarton Hazard Mitigation Plan Update 2023

WHEREAS, the Town of Dunbarton 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 2023** 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 Dunbarton has developed and received conditional approval from the NH Homeland Security and Emergency Management (NHHSEM) for its **Hazard Mitigation Plan Update 2023** under the requirements of 44 CFR 201.6; and

WHEREAS, public and Committee meetings were held between April 2022 through November 2022 regarding the development and review of the **Hazard Mitigation Plan Update 2023**; and

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

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

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

1 PLANNING PROCESS

RESOLVED by Town of Dunbarton Board of Selectmen:

The **Hazard Mitigation Plan Update 2023** is hereby adopted as an official plan of the Town of Dunbarton; 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;

The adoption includes the addition of any insubstantial review and update requirements identified by FEMA or NH HSEM after the Plan's adoption by the Board until the date of the five-year Formal Approval letter;

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 Board of Selectmen by the Emergency Management Director or designee.

IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Dunbarton this 13th day of April 2023.

Board of Selectmen

 4/13/23
Michael Kaminski, Selectmen date
Chair

 4/14/23.
Justin Nault, Selectman date

 4/12/23
David Nault, Selectman date



ATTEST

Received and recorded by the

Dunbarton Town Clerk April 17, 2023

Book 9, page 36

Town Clerk


Linda L. Landry, Town Clerk

Plan Process Acknowledgments

The Board of Selectmen-appointed Hazard Mitigation Committee was comprised of these individuals on behalf of their respective Departments, Boards or Committees who met between **April 2022** through **November 2022** to develop the **Dunbarton Hazard Mitigation Plan Update 2023**:

- **Line Comeau**, Dunbarton Town Administrator
- **Jeffrey Crosby**, Dunbarton Highway Department Road Agent
- **Donna White**, Building Department Coordinator
- **David Nault**, Dunbarton Board of Selectmen
- **Christopher Remillard**, Dunbarton Police Department Chief
- **Kenneth Swayze**, Dunbarton Planning Board Member
- **Jonathan Wiggan**, Dunbarton Fire Chief, Emergency Management Director
- **Patrick “Woody” Bowne**, Dunbarton Transfer Station
- **Michael Cumings**, Dunbarton Building Inspector, Code Enforcement (Former)
- **Mary Girard**, Dunbarton Public Library, Director
- **Alison Vallieres**, Dunbarton Historical Society President

The following Central NH Regional Planning Commission (CNHRPC) staff contributed to the development of the Hazard Mitigation Plan Update:

- **Stephanie Alexander**, CNHRPC Senior Planner
- **Matthew Baronas**, CNHRPC Regional Planner

Several other 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* participate in the same manner as fully appointed members in the Hazard Mitigation Committee meetings during the meetings they attended.

- **John Stevens**, Dunbarton Energy Committee
- **Jeff Trexler**, Dunbarton School Board
- **Clement Madden**, Dunbarton School Board
- **Tim O’Neil**, Dunbarton Resident*
- **USACOE Ranger Matt Hackett**, Hopkinton Everett Reserve
- **John Marcel**, NH Homeland Security and Emergency Management Representative

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 Dunbarton, 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.

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, Flood Mitigation Assistance Program, and Pre-Disaster Mitigation 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 Dunbarton is required to submit for FEMA approval a revised **Hazard Mitigation Plan Update** every five years.

The New Hampshire Homeland Security and Emergency Management (NH HSEM) produced its latest approved [State of New Hampshire Multi-Hazard Mitigation Plan 2018](#) in **October 2018**. The development of the State's Plan allows for New Hampshire to receive funding programs to provide to communities in the event of disasters or for mitigation.

Prior versions of the Town's Hazard Mitigation Plan are noted in the [Final Plan Dates](#) section. A **2020** 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 **Dunbarton Hazard Mitigation Plan Update 2023** has been developed in accordance with the Disaster Mitigation Act of **2000** and the [FEMA Local Mitigation Plan Review Guide, October 1, 2012](#) and effective one year later. The most recent Plan development standards provided by FEMA Region I have also been incorporated. The planning effort of the Town is a regular process and this Plan is considered a "living document."

The new Dunbarton Hazard Mitigation Committee was established by the Board of Selectmen to begin meeting **April 2022** and guided the development of the Plan. The Committee consisted of the Town's Police and Fire Departments, Town Administration, Highway Department, Building Department, Planning Board, Transfer Station Staff, Energy Committee, Town Library, School Board, and Historical Society. Likely because of the lingering COVID-19 pandemic issues, few public participants were active with Committee activities although the meetings and survey were advertised appropriately.

The attendees of the meeting process are noted in the [Acknowledgements](#). The Central NH Regional Planning Commission, of which Dunbarton 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 **Dunbarton Hazard Mitigation Plan Update 2023** was developed over a seven-month period with a group of Town staff members and volunteers, open to public participants, and the CNHRPC comprising the Hazard Mitigation Committee. The **2022** methodology for Plan development is summarized in this section. The **Hazard Mitigation Plan** is designed differently from the **2017 Plan** with the intent to better conform to the current approvable Central NH Region format and incorporating the new **2018 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, 2013** by using its terminology and some of its tasks, ensuring **Dunbarton's Plan Update 2023** begins to follow a standardized approach to Plan construction and content endorsed by FEMA. Many of the vital sections of the **2023 Plan Update** will be contained in the chapter **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**. Work Sessions were designed to accomplish what could not be completed at meetings due to time constraints and additional information to process. All meetings were publicly accessible by Zoom.

Table 1
Meeting Schedule and Agenda Activities

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public
Meeting 1 <i>Remotely held via Zoom Webinar</i>	04-19-22	Discuss Process and Schedule; Review Declared Disasters and Public Assistance Funding to Dunbarton; Develop New Hazard Identification and Risk Assessment (HIRA), Begin to Identify Potential and Past Hazard Locations 2017-2021; Prepare for Maps 1-2 Revisions; Schedule Meetings	Citizen TO- worked on agenda items with HMC
Work Session 1 <i>Remotely held via Zoom Webinar</i>	05-10-22	Finish Identifying Recent Past Hazard Events 2017-2021; Update Critical and Community Facilities Vulnerability Assessment and Develop Problem Statements; Revise Maps 1-2	N/A
Work Session 1.2 <i>Remotely held via Zoom Webinar</i>	05-24-22	Finish Identifying Recent Past Hazard Events 2017-2021; Update Critical and Community Facilities Vulnerability Assessment and Develop Problem Statements; Revise Maps 1-2	N/A
Meeting 2 <i>Remotely held via Zoom Webinar</i>	06-14-22	Finalize Problem Statements and Identify Those to Utilize as NEW 2021 Mitigation Actions; Begin Department Roundtable- Review & Update of Capability Assessment	N/A

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

1 PLANNING PROCESS

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public
Work Session 2 <i>Remotely held via Zoom Webinar</i>	06-21-22	Complete Problem Statements and Identify Those to Utilize as NEW 2022 Mitigation Actions; Continue Department Roundtable- Review & Update of Capability Assessment	N/A
Work Session 2.2 <i>Remotely held via Zoom Webinar</i>	07-12-22	Complete Department Roundtable- Review & Update of Capability Assessment	N/A
Meeting 3 <i>Remotely held via Zoom Webinar</i>	07-19-22	Determine Status of the 2015 Mitigation Actions; Begin to Develop Mitigation Action Plan 2023; Schedule New Meetings	N/A
Work Session 3 <i>Remotely held via Zoom Webinar</i>	08-09-22	Develop Mitigation Action Plan 2023; Begin to Prioritize Mitigation Action Ranking Scores for Action Achievability	N/A
Work Session 3.2 <i>Remotely held via Zoom Webinar</i>	08-16-22	Complete Mitigation Action Plan 2023; Prioritize Mitigation Action Ranking Scores for Action Achievability; Overview of Meeting 4/Work Session 4 and Public Information Meeting	N/A
Meeting 4 <i>Remotely held via Zoom Webinar</i>	09-28-22	Review Draft Hazard Mitigation Plan Update 2023; Overview of Work Session 4 Tasks; Schedule Public Information Meeting	N/A
Work Session 4 <i>Remotely held via Zoom Webinar</i>	10-11-22	Review Draft Hazard Mitigation Plan Update 2023; Review Draft Community Survey for Haz Mit and Severe Weather Events; Interim Hazard Mitigation Plan Implementation 2022-2026; Prepare for Public Information Meeting; Review Plan Approval Process; Prepare for Board of Selectmen Adoption Meeting	N/A
Public Information Meeting (PIM) <i>Held in-person</i>	10-27-22	HMC members present sections of the Plan to the public in a brief question and answer format meeting. Describe hazards and mitigation Actions. Maps will be available.	Unknown public attendees of the Board of Selectmen-held PIM – no public input was provided.

Source: Dunbarton Hazard Mitigation Committee Agendas, 2022

For all meetings, since the meetings were held 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 and attendance sheets 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**. CNHRPC staff facilitated the Committee Meetings and Work Sessions. Information needed on the Agenda Tasks indicated above was collected from any attendees present, including any members of the public, by CNHRPC, during discussions among attendees. The new and updated information was described in each Chapter under the **2023 Plan Update** section. Maps were reviewed and updated by the Committee and guests and revised using a Geographic Information System (GIS) by CNHRPC.

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 **2018 State Multi-Hazard Mitigation Plan**. ---

Public Outreach Strategy

Many individuals were personally invited to attend and participate in the Dunbarton Hazard Mitigation Plan Committee meetings. They included Town Boards and Committees, Town Departments, Dunbarton School District, NH Homeland Security and Emergency Management (NHHSEM) Representatives, and others, along with general email invitations through the Town's public notification email list. In addition, an online and highly publicized Severe Weather and Hazard Mitigation Survey yielded 24 responses.

The Hazard Mitigation Committee itself was comprised of Town Department staff and volunteers, including Police and Fire Departments, Town Administration, Highway Department, Building Department, Planning Board, Transfer Station Staff, Energy Committee, Town Library, School Board, and Historical Society. Other staff members or volunteers may have occasionally participated on behalf of their Departments.

The public process for this Plan included posting the meeting information on the Town's online calendar and website at <https://www.dunbartonnh.org/>. Meetings were held remotely via the secure Zoom Webinar platform. For the first meeting, the Town advertised by sending a mass email to the Town's notification list and posting flyers and meeting announcements at the Town Hall. Notices were posted on the outdoor and indoor Town bulletin boards. Copies of publicity for the Plan are included in **APPENDIX C**.

The Central NH Regional Planning Commission staff facilitated the Hazard Mitigation Committee meetings, guided the planning process, compiled new and old data, updated information, and prepared the 2023 Plan documents, Appendices, and Maps.

As a final attempt to obtain additional public input, a specially noticed Public Information Meeting was held on October 27, 2022 at a Board of Selectmen's meeting at which many members of the public participated. This meeting was publicly noticed on the Town website and calendar, and on the Board of Selectmen's Agenda. 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

OPPORTUNITY FOR PUBLIC PARTICIPATION

Public Input from the Hazard Mitigation Committee Meetings

The public notification is described in the Public Outreach Strategy sidebar. Few members of the public attended the HMC meetings as indicated in the **Acknowledgements** and by the Attendance Sheets in **APPENDIX C Meeting Information**, in addition to Public Information Meeting attendees.

Table 1A

Public Invitees to HMC Meetings and Participation Opportunity

MUNICIPAL INVITEES	How Invited	Participation (see Attendance Sheets)
General Public Residents Businesses	Town website, Meetings Calendar, https://www.dunbartonnh.org Online Survey Personal email or call invitations from Town staff	Completed Online Survey Few-none attended HMC Meetings (see Attendance Sheets) Some HMC Dept/Board attendees were small business owners in town
Town Boards (volunteer) Board of Selectmen Energy Committee Planning Board Fire Department – Fire Chief/EMD	Appointed by Board of Selectmen	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
Town Staff Police Department- Chief Planning & Zoning --Building Inspector/Code Enf, Planner Town Administrator Library- Director Highway Dept – Road Agent	Appointed by Board of Selectmen	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
Transfer Station- Supv	Appointed by Board of Selectmen	None
Non-Municipal Local Stakeholders	How Invited	Participation (None or How)
Dunbarton School District	Appointed by Board of Selectmen	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
Historical Society Director	Appointed by Board of Selectmen, Personal email from Town staff	Attended HMC Meetings (see Attendance Sheets)
US Army Corps of Engineers - Ranger	Personal email from Town staff	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
GSI Utilities, Dunbarton Telephone Co	Personal email from Town staff	None
Abutting Community EMDs:	How Invited	Participation (None or How)
Bow EMD Hopkinton EMD Weare EMD Hooksett EMD Goffstown EMD Concord EMD	Emailed Stakeholder invitations by CNHRPC	None of the others attended. Gilmanton requested to be removed from email lists.
Capital Area Public Health Network	Emailed Stakeholder invitations by CNHRPC	None
Concord Monitor Town Crier (media)	Announcement emailed by Town	None

MUNICIPAL INVITEES	How Invited	Participation (see Attendance Sheets)
Regional & State Stakeholders	How Invited	Participation (None or How)
Central NH Regional Planning Commission	Contracted by Board of Selectmen	Facilitated Plan update on behalf of community
NH Homeland Security and Emergency Management	Received all HMC Meeting Emails	Attended some meetings

Members of the public, residents, agency representatives and Hazard Mitigation Committee members 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 **12** posted meetings or to contact the Town Administrator/Emergency Management Director for more information prior to the Board of Selectmen adoption of the Plan.

Public Input from the Public Information Meeting

The **Public Information Meeting (PIM)** was held on October 27, 2022. The Hazard Mitigation Committee members presented portions of the Plan and had the Maps available for display. The agenda and draft minutes are included in **APPENDIX C**. Held during a scheduled Board of Selectmen meeting, the PIM offered additional opportunity for the public to listen to presentations, ask questions and had the opportunity to review the final draft Plan document, Appendices and Maps.

Dunbarton Community Survey for Hazard Mitigation and Severe Weather Events

In an attempt to obtain broad public input on hazard mitigation and severe weather events, an online community survey posted on Survey Monkey was developed in **May 2022** and remained open through the **October 27, 2022** PIM. 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 **23** responses was received from the community at large.

The Hazard Mitigation Committee read and discussed the survey results. Because the findings assisted Departments with their priorities and were consistent with **Hazard Mitigation Plan 2023** content, no specific updates were made to the **Plan**. The survey is considered a supplement to the Plan that provides information to Departments to affect change not described or undertaken in the Plan.

➤➤ **Q1** Which road(s) or areas are you most concerned about in Dunbarton when severe weather or other hazard events occur? Check all that apply.

Respondents were concerned about many roads and areas in town. Most frequently, respondents noted Pages Corner Intersection (NH 13 & NH 77), Stark Highway South (NH 13), Clinton Street (NH 13), and Stark Highway North (NH 13). Multiple residents

also noted Concord Stage Road (NH 77), Black Brook Road, Robert Rogers Road, and Grapevine Road. Additionally, Mansion Road, Gorham Pond Road, Twist Hill Road, Montalona Road, Guinea Road, and Stark Lane were all roads also noted by one respondent each.

- **Q2** How concerned are you about the following natural hazards, severe weather events, or human/technological hazards impacting Dunbarton? (On a 1 [not concerned at all] to 5 [extremely concerned] scale)

Respondents were most concerned about high wind events, public health hazards, severe winter weather, drought and aging infrastructure. Secondary priorities were wildfire, long term utility and outage. Public Health was most frequently rated in the extremely concerned category.

- **Q3** Natural hazards can have a significant impact on a community but planning for or mitigating these events can help lessen the impacts. Planning 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 mitigation planning priorities are for Dunbarton: (on a 1-5 Importance scale).

Mitigation planning priorities were strengthening emergency services; limiting development in natural areas such as floodplains wetlands, steep slopes; protecting Town facilities and operations; and protecting and reducing damage to utilities. Respondents also heavily prioritized protecting public facilities and operations (like Schools) and protecting historical and cultural Landmarks.

- **Q4 & Q6** Can you describe any hazard events or severe weather events you experienced in Dunbarton? If yes, please provide brief comments on up to 2 events by describing what happened (What), the location (Where), the approximate month and year of the occurrence (When), and how bad the event was from 1 [not bad] to 5 [extremely bad] (Impact scale).

For Event 1, respondents most frequently recalled the ice storm 2008 with the related power/utility outages during these times, and more contemporary windstorms with power/utility outages. Flooding and lightning were also frequently noted.

For Event 2, respondents discussed events in the more recent past, such as power outages, trees down on roads, and COVID.

- **Q5 & Q7** How bad would you rate Event 1 & 2?

The average respondent impact was about 55% on the Impact scale for Event 1 and about 60% for Event 2.

- **Q8** In your household, has anyone done any of the following preparedness or mitigation activities? Check all that apply.

Regarding mitigation and preparedness, respondents most frequently chose removed hazardous trees at their home (about 85%)and talked about what to do in case of severe weather emergency or natural disaster (about 55%). The next most frequent activities (fewer than 30%) were made a 72-hour emergency kit, prepared a family emergency plan and attended disaster trainings or workshops.

- **Q9** What are the best ways for you to receive information about disasters and severe weather events in Dunbarton? Please pick up to 3:

Respondents preferred Town E-Alerts Notification Emails (sign up on Town website homepage), Local Television (WMUR 9), CodeRed/NH Alerts (Cellular), and Internet New Media, as the best ways to receive severe weather and disaster information.

- **Q10** Please feel free to provide any other information related to severe weather and hazard mitigation in in the space below.

Few respondents added comments, but those who did mentioned the need for intersection improvements at Page's corner, maintenance of dirt roads in town, a lack of cell service in town, updates to the fire and police department buildings, additional town and emergency response staff, and high energy costs leading into the winter. The summary of survey responses are provided in **APPENDIX F**.

How Public and Community Input was Incorporated into the Plan

The general public has shown little interest in updating the **Hazard Mitigation Plan**. 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 Dunbarton to retain volunteers for their regular municipal committees. Department staff and Board members participating in the Plan update process are often Dunbarton residents.

Anyone who participated in developing the **Hazard Mitigation Plan 2023**, 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**, 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

After the updated Plan was drafted, on October 27, 2022 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 November 9, 2022, 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, also known as conditional approval from FEMA.

On April 13, 2023, the Board of Selectmen **adopted the Hazard Mitigation Plan Update** for the Town at a duly noticed public meeting. Copies were available at the Town Office and on the Town website for public review. The Board permitted public comment prior to adoption although Plan changes could not be made at this time. Discussion was held prior to the unanimous adoption of the Plan by the Board. The public notice and flyers are included in **APPENDIX C**. The signed Certificate of Adoption was sent to NHHSEM/FEMA.

On April 18, 2023, Dunbarton received a **Letter of Formal Approval** from FEMA. The next Hazard Mitigation Plan update is due five (5) years from this date of approval, on **April 18, 2028**.

Final Plan Dates

The following is a summary of the required dates which guide the adoption and update of the **Dunbarton Hazard Mitigation Plan**. Included is the history of the Plan approvals and lapsing dates as shown in **Table 2**.

Table 2
Dunbarton's Hazard Mitigation Plan Adoption History

Year of FEMA-Approved Hazard Mitigation Plan	Adoption by Dunbarton Board of Selectmen	NHHSEM/ FEMA's Formal Approval	Plan Lapse
Original 2005	10-20-05	December 2005	December 2010
Update 2011	09-15-11	10-14-11	October 14, 2016
Update 2017	06-15-17	07-14-17	July 14, 2022
Update 2023	04/13/23	04/18/23	04/18/28

Source: Plan Adoption History

2 COMMUNITY PROFILE

It has been over five 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 Dunbarton. The former **Relation to Natural Hazards** section has been updated within **4 HAZARD RISK ASSESSMENT** as **Built Environment Changes**. 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**.

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.

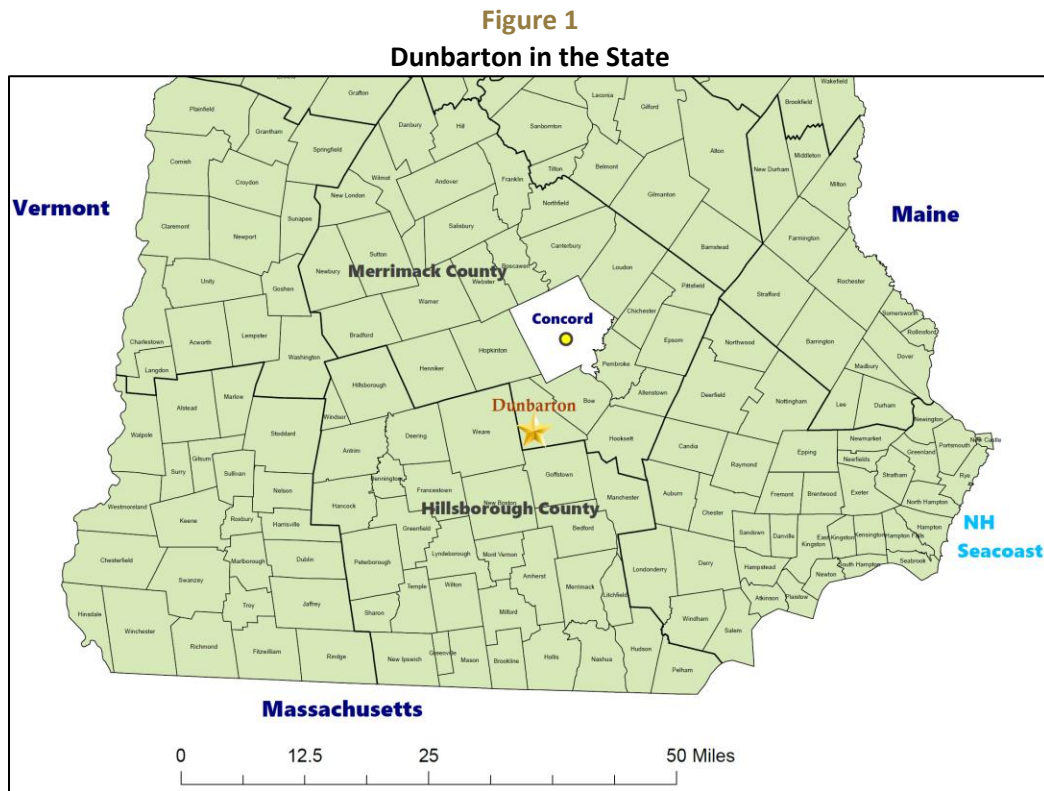
Geographic Context

The Town of Dunbarton is in Central New Hampshire within Merrimack County on the border of Hillsborough County. The Town is bordered by the Towns of Bow and Hooksett to the east, Goffstown to the south, Weare to the west, and Hopkinton and Concord to the north. The State's capital City of Concord nearly abuts the Town along its northern boundary, with just a narrow section of Bow in between. Route 77 brings traffic from Concord into the northern section of Town and into Weare. Intersecting Route 77 is Route 13, traveling directly south the entire length of Town. These routes are light commuter traveling corridors compared to other routes in the region. The Town is host to the North Dike and East Dike of the Hopkinton-Everett Flood Control Reservoir which covers much of the northwestern section of Town.

DUNBARTON'S LOCATION IN NH

Merrimack County in which Dunbarton 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 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.

Concord and Dunbarton are located about **50** miles from the Massachusetts state border, the Vermont state border, the Maine state border, and the seacoast. New Hampshire's many Interstates, US Routes, NH Routes, and local roadways generally enable travel and commute from Central NH to most of these points in about one hour. Geographically, Dunbarton is situated about **5** miles southwest of Concord, about **15** miles to downtown Concord from the Town Hall. The Town of Dunbarton's context within Merrimack County and the State of New Hampshire is shown in **Figure 1**.



DUNBARTON'S LOCATION IN CENTRAL NH

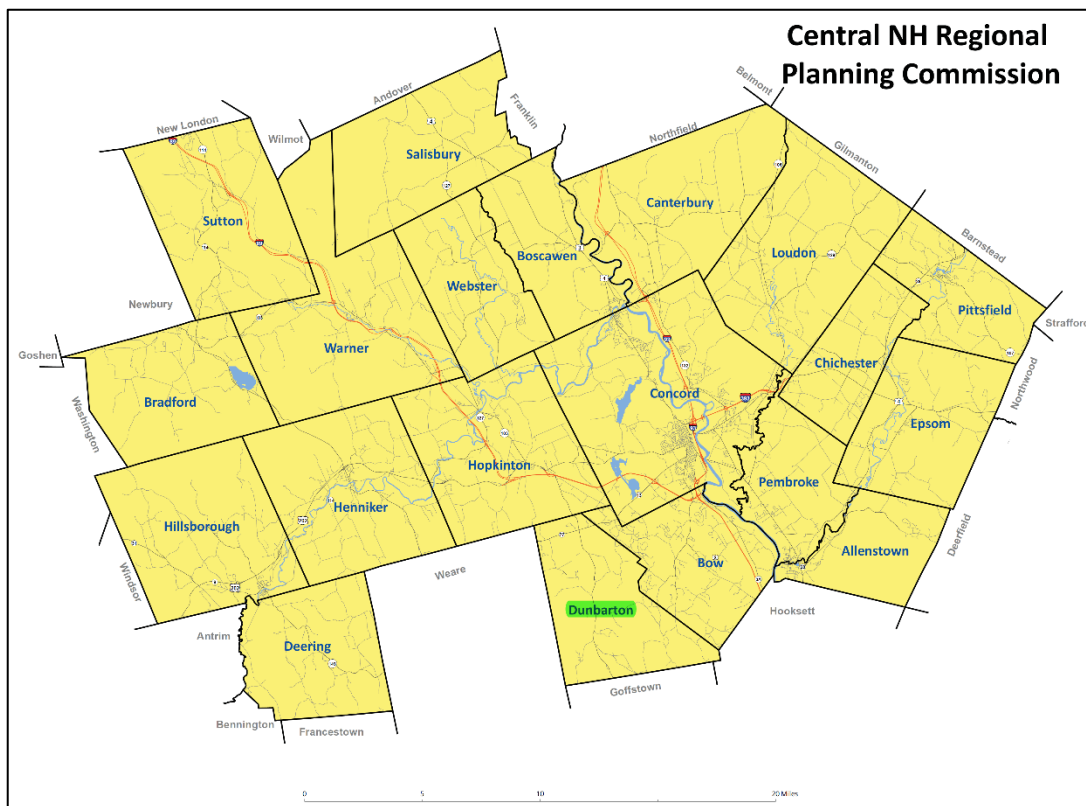
The Town is a voluntary member of the Central New Hampshire Regional Planning Commission. The **19** Towns and **1** City comprising the Central NH Region contain several major rivers and New Hampshire and Interstate highways. Dunbarton's historically rural identity, commuting difficulty, available services, and unmaintained range roads and border by three rivers, could ensure regular future development within the community that borders Concord.

The **Blackwater River** (Salisbury, Webster, Hopkinton) and the **Warner River** (Bradford, Sutton, Warner, Webster, Hopkinton) flow south into the **Contoocook River**. The **Contoocook River** flows in a north-easterly direction through Hillsborough, Henniker, Hopkinton, Concord and Boscawen until its confluence with the **Merrimack River** in Boscawen/Penacook (Concord). The **Contoocook River** and the

Merrimack River effectively bisect the region into three sections. The **Soucook River** flows south through Dunbarton 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 too converges with the **Merrimack River** in Bow/Hooksett.

In the Central NH Region, Interstates 89, 93 and 393 stretch in north, northwest, east, and south directions, meeting in Concord and Bow. Major traffic routes of US 3 flow north-south and US 4/202 traverses in an east-west direction. Dunbarton can be accessed via Route 13 where it originates at its intersection with Route 77 (Clinton Street). Dozens of NH state highways crisscross the entire region. A map of the Central NH Region in which Dunbarton is situated, with the region's major routes, is displayed in **Figure 2**.

Figure 2
Dunbarton in the Central NH Region



Source: Central NH Regional Planning Commission

Population and Housing Growth

The **2019 Dunbarton Master Plan** was adopted by the Planning Board in **2019**. The goal for future updates is annual review and revision of one or two Chapters. Chapters from the **2019 Master Plan** to update include Vision, Implementation, Housing, Economic Development, Community Facilities, Land Use, Transportation, Energy (new), and Natural Resources. The **Hazard Mitigation Plan 2023** could be adopted as an Appendix or a Chapter to the **2019 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 Dunbarton.

POPULATION AND HOUSING TRENDS

The following tables contain the newest consistent data on housing and population growth which depict development trends over time. Minimal **2020** Census figures were available. Shown in **Table 3**, Dunbarton's population and housing boomed during the **1980-1990** decade (**+50%** people, **+63%** homes). Beginning with the **1990-2000** decade (**+27%** people and **+25%** homes), population and housing trends slowed dramatically. The **2000-2010** decade which included a series of significant natural disasters and an economic recession but still experienced similar growth (**+24%** people and **+26%** homes). The new **2020** Census population and ACS 2016-2020 housing unit figures calculated **+9%** people and **+7%** housing units in indicating the slowest growth period in **50** years.

Table 3

Overall Population and Housing Growth Trends in Dunbarton, 1970-2020

Growth	Population	Net Change		Housing Units	Net Change	
		#	%		#	%
1970 Census	825	N/A	0	302	N/A	0
1980 Census	1,174	349	42.3%	421	119	39.4%
1990 Census	1,759	585	49.8%	685	264	62.7%
2000 Census	2,226	467	26.5%	858	173	25.3%
2010 Census	2,758	532	23.9%	1,077	219	25.5%
2020 Census	3,005	247	9.0%	1,148	71	6.6%
Total Change from 1970 – 2020 Census	---	2,180	264.2%	---	846	280.1%

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 2019 Group Quarters.

US Census 2020 Population, ACS 2016-2020

Population and Housing Data

In total, the Town has grown by **+2,180** people and **+846** housing units by confirmed Census counts and estimates from **1970-2020**. In **Table 3**, Dunbarton's confirmed **2020** Census population of **3,005** shows an overall increase of about **+264.2%** in population over the previous five decades, up from **825** people in **1970**. The **2020** Census housing units (**+71**) displays an overall increase of about **+280.1%** (**846** units) since **1970** to total **1,148** units by **2020**. The Town began with a population of **825** in **1970**, and after growth booms between **1970-1990**, the population and housing increases tapered off significantly. Between **2000-2020**, the Town's population increased by **+1,246** people while during the same time housing units increased by **+463** units.

Overall growth trends seem to be slowing over the current partial **2010-2020** decade, with a population growth of **+9.0%** (**+247** people) and **+6.6%** housing units growth (**+71** units) to date. Over the nearly five decade timeframe of **1970-2020**, this is by far the smallest amount of growth seen in Dunbarton. The overall growth rate by percentage in Dunbarton since **1970** is higher than other than the 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 **2.7** people per housing unit in **1970** to its steady low of **2.62** people per housing unit between **2000-2020**. Overall, these numbers are higher than other small-sized population Central NH Region towns and likely indicate an aging population living together or Group Quarters cohabitation. This people per housing unit figure has remained very constant since **1970**, which is unusual for the region.

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 Dunbarton encompasses a total land area of **30.8** square miles (**19,734** acres), an additional **0.5** square miles (**320** acres) is water area (**31.3** total square miles). Over the **50-year** period between **1970-2020**, the data for population density is displayed in **Table 4**.

Table 4

Population Density in Dunbarton, 1970-2020

Municipality Size		Persons per Square Mile					
Land Acreage	Land Area in Square Miles	1970	1980	1990	2000	2010	2020
19,734	30.8	29	46	55	64	76	98

Sources: **Table 3**, NH Office of Planning and Development GIS acreage calculations, 2013

From **Table 4**, the overall population density between **1970** and **2020** increased **+236%**, from **29** people per square mile in **1970** to a high of **98** people per square mile in **2020**. Dunbarton is a geographically small-sized community in the Central NH Region at **31.3** total square miles (including water acreage).

Dunbarton has a comparatively moderate number of people per square mile as compared to other small-sized Central NH Region communities and communities statewide.

NEW CONSTRUCTION

Table 5 displays Dunbarton’s estimated new home and new building construction permits issued by the Building Inspector between **2017-2022**. During this **6**-year period, a total of **83** new construction permits for homes and housing units have been issued, but were not necessarily built.

Table 5
New Construction Permits Issued by Building Type, 2017-2022

Building Type	2017	2017	2018	2019	2020	2022**	6-Year Totals
Single Family Homes	20	12	11	11	6	11	71
Accessory Dwelling Units	0	1	3	2	4	2	12
Multi-family Homes	0	0	0	0	0	0	0
Manufactured Homes	0	0	0	0	0	0	0
Non-Residential Buildings	0	0	0	0	0	0	0
Totals	20	13	14	13	10	13	83

Source: Dunbarton Town Reports, Permits Logs 09-22

** to date 09-22

From **Table 5**, **71** permits were issued for new single family homes, with **12** permits for new accessory dwelling units over the last **6** years. Dunbarton had 0 permits for multi-family homes, manufactured homes, and non-residential buildings during this time. The most active year was **2017** when a total of **20** new single family home 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, Dunbarton had the same amount of construction between **2017-2022**.

Land Use and Zoning

According to NH Office of Planning and Development's **2013** geographic information system (GIS) calculations, Dunbarton has a total land area of **19,734** acres, or **30.8** square land miles. An additional **320** acres (about **0.5** square miles) is water area, to total **20,032** Town acreage within its political boundaries. The GIS land acreage figure is larger than the most recent **MS-1 2022** assessing reporting calculation of **19,006** total Land Use acres for the Town, a **728** acres difference. 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, Dunbarton is considered a geographically small-sized community in terms of land area and contains smaller than usual population and housing figures. Dunbarton's proportion of residential land is higher than most towns in the Central NH Region, likely because of its multi-family developments. The northern-central section of the Town of Dunbarton is highly rural, forested, has little commercial development while the southern-western section hosts commercial, industrial, residential, and tax-exempt development. With current commuter traffic and development activity, there seems to be more of an incentive to begin the process for enabling developments in the northern section in the future.

LAND USE TYPES AND ACREAGE

Table 6 provides a snapshot of the Town's **2022** land use acreage from the Town's MS-1 reporting. Land use categories were combined for ease of summary. All types of forested land is the most extensive land use type, comprising **38.8%** of the Town's land area. All types of residential land use at **29.6%** is the next highest. Exempt land is at **24.2%** of the Town's land area. All types of farm land (**3.8%**) and unproductive land of all types (**2.8%**) round out the next highest land uses in Dunbarton.

Table 6
Land Use Acreage, 2022

Land Use Category 2022	Acres	% of Town
Residential	4,857.0	25.6%
Residential Vacant	726	3.8%
Residential Mobile Home	19	0.1%
Residential Apartments	28	0.1%
Commercial Improved	27	0.1%
Commercial Vacant	7	0.0%
Industrial Improved	52	0.3%
Utilities	18	0.1%
Exempt	4,600	24.2%
Farm Land	443	2.3%
Farm Land Recreation	288	1.5%
Forest Land	3,142	16.5%
Forest Land with Stewardship	547	2.9%
Forest Land Recreation	3,221	16.9%
Forest Land Rec & Stewardship	464	2.4%
Unproductive	266	1.4%
Unproductive Recreation	259	1.4%
Wet	42	0.2%
Total	19,006	100.00%

Source: Dunbarton MS-1 2022, Vision Assessing Database

The total number of Dunbarton parcels is **1,545** in **2022**, up by **45** parcels from **2017**.

DUNBARTON ZONING

The perspective of the Town's Zoning Districts offers another way to view how the land is utilized within Dunbarton in **Table 7**. Several tables of dimensional and density regulations pertaining to water and septic, lot frontages, setbacks, buffers and lot sizes, etc. are available within the Zoning Ordinance. The ordinance includes a table of uses for each district, indicating what types of facilities are permitted. Several commercial and residential districts fall within Dunbarton, over which aquifer, floodplain, shoreland and wetland protection overlay districts apply further regulation.

Table 7
Dunbarton Zoning Districts, 2022

Zoning District	Abbreviation	Acreage
Low-Density Residential	LDR	17,343
Medium-Density Residential	MDR	2,687
Village District	VD	92
Total		20,122
Zoning Overlay District and Other Zoning Ordinances	Abbreviation	
Multi-Family Residential Housing District	MFD	N/A
Wetland Conservation District	WCD	N/A
Floodplain Development Ordinance	---	N/A
Workforce Housing Ordinance	---	N/A
Open Space Subdivisions	---	N/A
Excavation Regulations	---	N/A

Source: Town of Dunbarton Zoning Ordinance and AxisGIS, 2022

The overlay districts are superimposed upon the zoning districts so additional regulations shall apply. For any conflicting regulation, the more restrictive shall apply. The Zoning Ordinance has sections amended every year at the annual March Town Meeting and is used and applied by the Land Use Department, Building Inspector and Planning Board.

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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 following Dunbarton **Goals** were initially developed in the previous **Dunbarton Hazard Mitigation Plans** and thus were reviewed and updated as applicable by the Hazard Mitigation Committee during a public meeting for the **2023 Plan**. While the hazard incidents have remained essentially the same as from the **2017 Plan** with a few disaster additions over the course of the last five years, it was important to reassess the continued relevancy of **Goals** and **Objectives** to influence the development of the best and most relevant hazard mitigation **Actions**. Lastly, with the most recent change in hazard types utilized in the *State of New Hampshire Multi- Hazard Mitigation Plan 2018*, it was necessary to revise some of the main hazard groups for the **General Hazard Mitigation Objectives** identification.

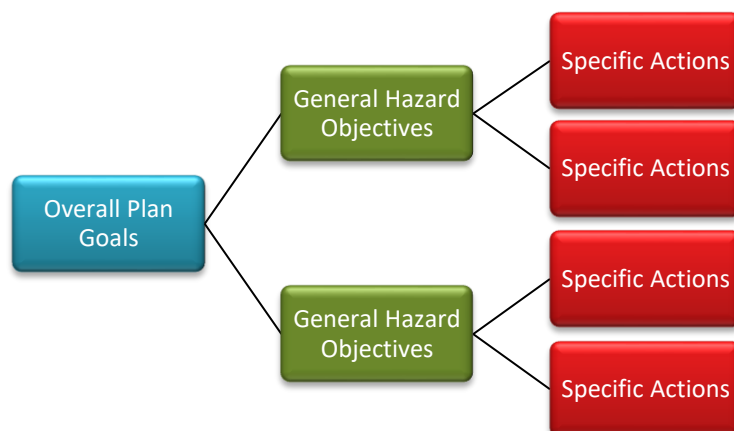
What Are Goals, Objectives and Actions

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

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

Relationship of Goals, Objectives and Actions



HAZARD CATEGORIES

From the [Hazard Identification and Risk Assessment](#), the individual natural, technological and human hazards under consideration have been grouped into similar event types for simplification, the Main Hazard categories in [Table 8. 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 8
Main Hazard Categories for Objectives

Main Hazard Category	Specific Hazards Included		
EARTH	DROUGHT	EARTHQUAKE	LANDSLIDE Soil, Rockslide or Excavation Areas
EXTREME TEMPERATURES	EXTREME TEMPERATURES Excessive Heat, Heat Wave, Cold or Wind Chill		
FIRE	WILDFIRE Brushfire, Outdoor Fires or Accidental		LIGHTNING
FLOOD	INLAND FLOODING Rains, Snow Melt, or Flash Floods	DAM FAILURE Water Overtop, Breach or Beaver	RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris
HEALTH	PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral or Tick-borne		
SOLAR	SOLAR STORMS AND SPACE WEATHER Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout		
WIND	HIGH WIND EVENTS Wind, Thunderstorms, Hail, Downbursts, Tornadoes or Debris		TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms or Tree Debris
WINTER	SEVERE WINTER WEATHER Snow, Ice, Blizzard or Nor'Easter		AVALANCHE <i>appears in 2018 State HMP but is not relevant to Dunbarton's geography and development.</i>
TECHNOLOGICAL	AGING INFRASTRUCTURE Bridges, Culverts, Roads, Pipes or Underground Lines		FIRE Vehicle, Structure, Arson or Conflagration
	LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications or Live Wire Danger		HAZARDOUS MATERIALS Haz Mat Spills, Brownfields or Trucking
HUMAN	TRANSPORTATION CRASH Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle		MASS CASUALTY INCIDENT As a result of any hazard event

Main Hazard Category	Specific Hazards Included	
	TERRORISM/ VIOLENCE Active Shooter, Hostage, Public Harm, Civil Disturbance/Unrest, Politically Motivated Attacks, Incendiary Devices, Sabotage or Vandalism	CYBER EVENT Municipal Computer Systems Attack, Cloud Data Breach, Identity Theft, Phishing, Ransomware or Virus

Source: Dunbarton Hazard Identification and Risk Assessment (HIRA)

Not all these main natural hazard categories may be important for Dunbarton to develop as Plan **Objectives**, and these would be noted at the end of the **3 GOALS AND OBJECTIVES**.

Overall Hazard Mitigation Plan Goals

The following **3** Goals for the **Hazard Mitigation Plan 2023** 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 revised from the **2017 Plan** to emphasize hazard mitigation instead of preparedness, response and recovery which are covered in the **Emergency Operations Plan**. The **Hazard Mitigation Goals** are displayed in **Figure 4**.

Figure 4
Hazard Mitigation GOALS

1. To reduce the risk of injury in the Town from all natural hazards, severe weather and disasters and from the impacts of human and technological hazards.
2. To reduce the risk of potential damage in Town to public and private property, critical facilities, infrastructure, historic resources, and the natural environment from all natural hazards, severe weather, and from the impacts of 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: Dunbarton Hazard Mitigation Committee

General Hazard Mitigation Objectives

Main hazard event categories of **Earth, Extreme Temperatures, Fire, Flood, Public Health, Solar Storms, Wind, Winter, Technological,** and **Human** are intended to encompass their respective full sub-hazards range described in this Plan. The **General Objectives** are developed by addressing the primary hazard events that could impact Dunbarton. 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. Eighteen **(18) General Hazard Mitigation Objectives** were crafted for the **Dunbarton Hazard Mitigation Plan 2023** as displayed in **Figure 5**.

Figure 5
Hazard Mitigation OBJECTIVES

EARTH HAZARDS

1. Minimize the threat of potential landslide or rockslide areas along local roads and excavation areas.
2. Engage in public awareness of local earthquake activity and safety precautions.
3. Minimize the impact of drought events to agricultural areas, private and municipal wells, and other locations through public awareness.

EXTREME TEMPERATURE HAZARDS

4. Minimize the damages 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.

FLOOD HAZARDS

5. Minimize the damage to life, property, and infrastructure from floodwaters or erosion from the Harry Brook, Black Brook, Army Corps of Engineers Hopkinton Everett Reservoir conservation land, Gorham Pond, Kimball Pond and floodplains, and from the dams, ponds, wetlands, and streams in Town.
6. Minimize the damage to life property and infrastructure caused by snow-melt and precipitation resulting in erosion and flooded roads; culvert washouts, dam failures, or debris (tree limbs, leafy material/sediment, beaver dam breakage, etc.)

FIRE HAZARDS

- 7.** Minimize the damage to life, property, and infrastructure, including the conservation properties, areas of Kuncanowet Town Forests, Kimball Pond Conservation Area, Clough State Park, woodlands, and communication towers, caused by wildfires, brushfires, other outdoor fires, and lightning.

PUBLIC HEALTH HAZARDS

- 8.** 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), arboviral (mosquito) and tick-borne diseases, addiction, etc.

SOLAR STORMS

- 9.** Minimize the impact to life, property and infrastructure from solar storms and space weather, including solar winds, geomagnetic storms, solar radiation, and radio blackout.

WIND HAZARDS

- 10.** Minimize the damages to life, property and infrastructure from heavy wind events, thunderstorms, hail, downbursts, tornadoes hurricanes, and tropical storms, including damages caused by resulting tree debris.

WINTER HAZARDS

- 11.** Minimize the damages to life, property and infrastructure from winter weather events, including storms, snow, ice and minimize damages from utility failure, blocked transportation routes, and roof collapses.

HUMAN HAZARDS

- 12.** Minimize the risk of impact and damage to life, property and infrastructure resulting from transportation crashes and fires involving transport trucks, vehicles, pedestrians, bicycles, airplanes, helicopters, drones, etc., along the flightpaths, State roadways (NH 77, NH 13, Robert Rogers Road) and local Dunbarton roads, especially during severe weather events.
- 13.** Minimize the risk of damage and injury to life, property and infrastructure from human terrorism and violence threats, such as active threat incidents, hostage situations, civil disturbance/riots, politically motivated attacks, incendiary devices, sabotage, vandalism or other public harm.

TECHNOLOGICAL HAZARDS

- 14.** Minimize the risk of cyber events, including overall systems takeover, takeover of the Town website, telecommunications rerouting, cloud data breach, phishing, malware, ransomware, virus installation, on Town computer systems to maintain essential operations, and provide education to minimize cyberattack risk to residents and businesses, including identity theft and telephone scams.
- 15.** Minimize the damages from multiple hazards to the aging infrastructure of the community, including bridges, culverts, dams, local roads, lines, and seek to maintain operational efficiency.
- 16.** Minimize the damage to life, property, and infrastructure and the impact to Dunbarton residents caused by the risks of various utility outages, such as Eversource lines, Unitil lines and National Grid live wire dangers and long-term outages in electrical power, internet, and telecommunications services.
- 17.** Minimize the impact of fire conflagration and explosion, especially near densely populated areas, subdivisions, or buildings, caused by fuel tanks, Eversource lines, Unitil lines and National Grid high tension power lines, and vehicles.
- 18.** Minimize the damages to life, property, and infrastructure from hazardous materials exposure, chemical spills, trucking accidents, and radiological materials incidents, including damages, impacts and exposures caused by brownfields sites, leaking underground storage tanks, and occupational sites.

Source: Dunbarton Hazard Mitigation Committee

4 HAZARD RISK ASSESSMENT

Natural disasters and technological, and human hazards that have occurred in Dunbarton 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. The major disasters declarations covering the Central NH Region (Hillsborough County and Merrimack County) were inventoried and additional hazard events occurring in Dunbarton 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.

The [State of New Hampshire Multi-Hazard Mitigation Plan 2018](#) recommends that municipalities examine multiple natural hazards, including several new hazards. Two hazards, avalanche and coastal flooding, are not discussed in Dunbarton's Plan because they have no ascertained relevance to the Town. The former human hazards of Civil Disturbance/ Public Unrest, Sabotage/ Vandalism, and Hostage Situation are absorbed into the [Terrorism/ Violence](#) hazard category. The opportunity was available to combine several of the former flood-related hazards into the new [Inland Flooding](#). Likewise, several former wind-related hazards are compiled within [Wind](#). No natural hazards from the [2017 Plan](#) have been removed, only placed into other groupings for evaluation. Within the [Hazard Mitigation Plan 2023](#), the [14](#) evaluated natural hazards and the [8](#) evaluated human or technological hazards have been incorporated under these basic categories, also displayed in [3 GOALS AND OBJECTIVES Table 8](#):

- | | |
|--------------------------------------|--------------------------------|
| ➡ Earth Hazards | ➡ Solar Storm Hazards |
| ➡ Extreme Temperature Hazards | ➡ Wind Hazards |
| ➡ Fire Hazards | ➡ Winter Hazards |
| ➡ Flood Hazards | ➡ Human Hazards |
| ➡ Public Health Hazards | ➡ Technological Hazards |

Within these basic hazard categories are numerous related subcategories, all 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**, **Hazard Magnitude**, and **Overall Risk** 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 hazards discussed 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 Dunbarton 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 Dunbarton 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 **2022** 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 2023**. 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 a **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	CONCERN SUMMARY	Numeric Overall Risk Score
1	LOW	1 – 4.9
2	MEDIUM	5 – 7.9
3	HIGH	8 – 11.9
4	HIGH	12 - 16

OVERALL 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** while the lowest score a hazard could be ranked is **1**. 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 **Probability of Occurrence in 10 Years** and **Severity of Impact to the Town**.

Out of the **14** ranked natural hazards, Dunbarton's highest ranking hazards scored an **Overall Risk** between **10.7 – 1.0** (out of a possible Risk score of **16**), displayed with calculated decimals in **Table 9**.

Table 9

Highest Overall Risk Hazards and Hazard Events Since the Last Plan

Natural Hazard Event	HIRA Overall Risk 1-16	CONCERN	Notable Hazard Events Within the Last 5 Years?*(See Table 12)	Mitigation Actions Developed For MEDIUM & HIGH Hazards? (See Mitigation Action Tables)
Severe Winter Weather	10.7	HIGH	Yes	Yes
Public Health	9.3	HIGH	Yes	Yes
High Wind Events	9.3	HIGH	Yes	Yes
Solar Storms and Space Weather	9.0	HIGH	Yes	Yes
Drought	8.0	HIGH	Yes	Yes
Extreme Temperatures	8.0	HIGH	Yes	Yes
Wildfire	8.0	HIGH	Yes	Yes
Tropical and Post-Tropical Cyclones	7.3	MEDIUM	Yes	Yes
Inland Flooding	6.0	MEDIUM	Yes	Yes
Lightning	5.3	MEDIUM	Yes	Yes
Dam Failure	4.0	LOW	No	
Earthquake	4.0	LOW	No	
River Hazards	4.0	LOW	No	
Landslide	1.0	LOW	No	
<p>*NO = No notable impacts since the last Plan. Stated in Table 10 as "NO Event(s) Within Last 5 Years."</p> <p>YES = Notable impact events added to Table 12. Stated in Table 10 as "Event(s) Within Last 5 Years."</p> <p>ANNUAL = Annual occurrence with variable impacts; any notable impacts added to Table 12. Stated in Table 10 as "Annual Occurrence Within Last 5 Years" whether or not a notable event was added to Table 12.</p>				

Source: Compilation of Dunbarton HMC Data

HAZARD IDENTIFICATION AND RISK ASSESSMENT RATINGS

Included with the **Table 10 Hazard Identification Risk Assessment (HIRA)** is whether each hazard event occurred within the last **5** years in Dunbarton. This is indicated by either ***Events(s) Within Last 5 Years***, ***ANNUAL Occurrences Within Last 5 Years*** or ***NO Event(s) Within Last 5 Years*** beneath each *Hazard Category*. Dates and descriptions of the new hazard impacts within the last **5** years are provided in a later table, **Table 12 Local and Area Hazard Event and Disaster History (Sequential)**. The existing potential hazard locations, or those locations in Dunbarton which could be currently at present day susceptible to each of the hazard categories, are provided within **Table 10** since these locations contribute to the **Severity of Impact** ratings determinations of Committee. The **HIGH**, **MEDIUM** or **LOW** Concern for each *natural* hazard is provided in the **Overall Risk** column.

Table 10

Hazard Identification and Risk Assessment (HIRA)

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
DAM FAILURE Water Overtop, Breach, Beaver, etc. *NO Event(s) Within Last 5 Years*	<p>♦ 2 High Hazard (H) dam: 070.09 Everett Lake East Dike P1 on Stark Brook 070.13 Everett Lake North Dike P2 on Stark Brook 0 Significant Hazard (S) dam. 4 Low (L) Hazard dam: 070.01 Stark Pond Dam on Stark Brook, 070.02 Kimball Pond Dam on Black Brook 070.18 Flintlock Estates Fire Pond Dam on an unnamed brook 070.20 Belanger Recreation Pond Dam on an unnamed brook.</p> <p>♦ Dams in other Towns could have a serious downstream impact should they fail or release too much water.</p> <p>♦ Other recreation ponds, Non-Menace dams and regular beaver dams could breach and flood roadways. NM dams are found along Stark Brook, Black Brook, Natural Swales, at detention ponds and recreation ponds all of which are unlikely to flood but still have potential. (See APPENDIX A for list).</p> <p>♦ Beaver dams carry a high probability of flooding and potential for breakage. Beaver dams are located throughout Dunbarton, and depending on size and location, could cause significant damage to roads if the natural dams breach.</p>	4	1	1	1	4.0 LOW
DROUGHT *Event(s) Within Last 5 Years*	<p>♦ Entire Town. Areas susceptible to drought and dry conditions include farms and orchards, nurseries, and maple sugar operations including Carter Stables and others.</p> <p>♦ Farm animals, hay fields, produce, vegetable gardens are negatively impacted by drought. When hayfields die off and wells go dry, livestock animals in Town cannot easily be locally fed or watered. Larger farms become economically impacted when their products are unable to grow.</p>	3	3	3	2	8.0 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<ul style="list-style-type: none"> Water Supplies: Private water supplies for the outside the Water Works District and public water supplies serving 25+ people. Dug wells are known to go dry. Drought means increased risk of brush fire with dry vegetation (see Wildfire). Gravel roads (Class V) can be affected because Town is unable to grade them when water is low. Class VI gravel roads may become fire hazards with overhanging dry growth. Fire ponds/ dry hydrant water supplies can run dangerously low; see APPENDIX A for a list of the dry hydrants and large cisterns. When fire ponds or dry hydrants are low, response time increases as the Department needs to draw from the Rivers, brooks, and ponds (see Inland Flooding). 					
EARTHQUAKE <i>*NO Event(s) Within Last 5 Years*</i>	<ul style="list-style-type: none"> Entire Town. The Central NH Region is seismically active and earthquakes are regularly felt from area epicenters. Locations with high density population or potential gathering sites to evacuate include: Dunbarton schools, boat access, Hopkinton Everett OHRV Parking Lot, and municipal buildings. Damage to utility poles and wires, roadways and infrastructure could be significant. Aboveground poles, underground electric lines, underground water, sewer and natural gas lines could be susceptible. Fuel storage locations such as Dunbarton Fuel Services, Heven's Gas Station, Nichol's Garage, and other facilities store underground or aboveground fuel tanks which may be vulnerable during a strong earthquake. Areas with the old, historic buildings are particularly susceptible to earthquake including public and private buildings (historic homes), Dunbarton Historical Society, Molly Stark House, Old Town Hall-Library, Town Pound, and about 5 cemeteries throughout Town. 	2	2	2	2	4.0 LOW
EXTREME TEMPERATURES <i>Excessive Heat, Heat Wave, or Cold, Wind Chill</i> <i>*Heat Event(s) Within Last 5 Years*</i>	<ul style="list-style-type: none"> Entire Town. Groups most susceptible to extreme heat or cold include those located at: Dunbarton Schools, Town Offices, manufactured housing neighborhoods, School Street apartments. Senior residences assisted living or those dwellings without air conditioning or those receiving fuel assistance are especially vulnerable to high heat or extreme cold events. Residents should be moved to air conditioned (cooling) or warming facilities. Youth groups and schools such as Dunbarton Elementary School (K-6) [~230 Students + ~50 	4	2	2	2	8.0 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
Cold Event(s) Within Last 5 Years	Staff] need to be protected from hot and cold temperatures . <ul style="list-style-type: none"> ♦ Extreme cold or heat may be experienced by recreationalists in remote conservation lands, Town Forests, and other outdoor places. ♦ Areas vulnerable to effects of extreme heat or cold include agriculture and farms (see list above in Drought) ♦ See APPENDIX A for the list of vulnerable facilities or groups. 					
HIGH WIND EVENTS Wind, Thunderstorms, Hail, Downbursts, Tornadoes, Debris *Event(s) Within Last 5 Years*	<ul style="list-style-type: none"> ♦ Entire Town. Most high wind -vulnerable areas include populated buildings, high-density locations and aboveground utilities serving residents & businesses. ♦ Utilities at risk of failing during high wind events include Dunbarton Telephone Company, Eversource Electrical, National Grid Power Transmission Lines, SBA Tower, Unitil Electric, and US Cellular Cell Tower. ♦ High density developed areas can have greater impacts from high winds: Dunbarton Schools, Town Offices, St. John the Evangelist Episcopal Church and First Congregational Church, manufactured home neighborhoods, apartments and independent living, childcare facilities. ♦ Construction, manufacturing, or industrial-like areas like those along NH 77 and open land/excavation pits are collectively vulnerable to the effects of high wind events. ♦ Downbursts are occurring with greater regularity. The Town's highest elevation points (see Map 1 Potential Hazards) may experience the greatest high wind impacts, including the steep slopes and hillsides. Many town roads, private roads and Class VI roads lead up and through these hills. ♦ Most of the Town is wooded and forested and sections would be difficult to access with trees and power lines down on the gravel, hilly residential roads. They could be difficult to access with treefall and power lines down from high wind events. Remote neighborhoods include manufactured housing parks and neighborhoods on roads with only one egress. ♦ Outdoor recreation spots such as Boat Launches, Town Forests, Range Roads, rail trails, conservation lands, and current use lands utilize large amounts of tree cover. During high wind events, people recreating in the Town Forests and trail systems could experience unfavorable conditions during high wind events and may 	4	2	3	2	9.3 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<p>require rescue assistance in difficult to access locations.</p> <p>♦ Agricultural operations are vulnerable to damage from High Winds (see list above in Drought)</p> <p>♦ Older, or historical buildings are vulnerable to high wind damage include public and private buildings (historic homes), Dunbarton Historical Society, Molly Stark House, Old Town Hall-Library, Stark Mansion, Town Pound, historical monuments and cemeteries (headstones) throughout Town could be especially vulnerable to high winds.</p> <p>♦ Floods are also possible with severe windstorm events (see Inland Flooding).</p>					
INLAND FLOODING Rains, Snow Melt or Flash Floods *Event(s) Within Last 5 Years*	<p>♦ Entire Town, Floodplains of Kimball Pond, Everett Lake bordering town in Weare, and Several Brooks. <u>Major watercourses</u> include One Stack Brook, Bela Brook, Stark Brook, Harry Brook, and Black Brook are the most prominent waters flowing in Town.</p> <p><u>Major waterbodies</u> include wildlife and recreation ponds which are among the main standing bodies of water along with Stark Pond, Stark Pond Marsh, Purgatory Pond, Groham Pond, Long Pond, Kimball Pond, Great Meadows Wetlands, and Hopkinton-Everett Flood Control Reservoir.</p> <p>♦ Flooding could occur from breached High, Significant, and Low Hazard Dams within and connected to Dunbarton. Other recreation ponds, Non-Menace dams and regular beaver dams can breach and flood roadways. See Dam Failure hazard above.</p> <p>♦ Any of these waters could flood local roads, homes, buildings and waterfront properties.</p> <p>♦ Runoff from roadways or heavy rain or snowmelt can cause floods and washouts over the Entire Town. Regular washout locations occur. (See also Aging Infrastructure)</p> <p>♦ Roads, bridges, drainage systems and related areas can flood, creating flooded infrastructure for many travelers. Although bridge flooding has not yet occurred, there is potential of Dunbarton's bridges.</p>	3	1	3	2	6.0 MEDIUM
LANDSLIDE Soil, Rockslide or Excavation Areas	<p>♦ Slopes greater than 15%, which is much of the community (see Map 1) including roads with steep ditching or embankments are most vulnerable to landslide. The Town has numerous hills over 1,000' in elevation, many of them with roads or trails.</p>	1	1	1	1	1.0 LOW

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
NO Event(s) Within Last 5 Years	<ul style="list-style-type: none"> Roads with steep ditching or embankments are most vulnerable to landslide. No roads were identified by the HMC as having landslide vulnerability. (see Inland Flooding). Landslide is an uncommon hazard but one that could have devastating effects, including property damage. There are several known excavation sites in Town, some of which may have the potential of landslide/ rockslide. Many areas are reclaimed and vegetated. 					
LIGHTNING *Event(s) Within Last 5 Years*	<ul style="list-style-type: none"> Entire Town. Areas of particular concern to lightning include critical facilities, high density areas, high elevations. The Town & cultural facilities including Town Offices, Old Town Hall-Library, Police and Fire Departments, First Congregational Church and St. John the Evangelist Episcopal Church, are tall buildings. (see also High Wind). Several municipal buildings do not have lightning rods. Numerous outdoor recreational and gathering places such as School fields, Town Forests, and the various trails on conservation lands could be vulnerable to lightning. Other locations containing large numbers of people include Dunbarton Schools, Town Offices, and high density housing. Lightning and Wildfire and potential conflagration could result in these densely populated areas. Businesses with potentially hazardous materials onsite such as fuel, gasoline, used fluids (various automotive repair shops, construction and lumber yards, salvage yards), Dunbarton Fuel Services, Heven's Gas Station, Nichol's Garage, Stone's Farm, Voydatch Junkyard could each be vulnerable to lightning and fire. Outdoor utilities and antennas would have high impacts should lightning strike, such as the Eversource Electrical Lines, National Grid Power Transmission Lines, SBA Tower, Unitil Electrical Lines, and US Cellular Cell Tower. Old, historic or wooden structures and those structures without lightning rods would be more susceptible to damage from a strike than those buildings with the rods. Old wooden buildings at high elevations within forested areas could be especially vulnerable to lightning. Remote, forested areas, parks, public Town Forests, conservation areas, open recreation fields, boat launch areas, points of higher elevation can be dangerous to people and 	4	1	1	2	5.3 MEDIUM

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	property if struck by lightning , including the many conservation lands and trail systems.					
PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral, or Tick-borne *Event(s) Within Last 5 Years*	<p>♦ Entire Town. Congregated populations, older and younger residents, medical facilities and social settings can be more vulnerable to infectious diseases:</p> <p>♦ Schools or Child Care Facilities including, Dunbarton Elementary School (K-6) [~230 students + ~50 staff].</p> <p>♦ Manufactured housing neighborhoods, Gorham Pond Area (Lake Gorham Association): Gorham Drive [~10 homes], Gary Road [~16 homes], Karen Drive [~19 homes], Stephanie Drive [~10 homes], Holiday Shore Drive [~35 homes], Black Brook Road [~4 housing units], Belanger Stark Highway North (rental) [~4 units], Condos on Twist Hill Road (~4 housing units), Montalona Road [~4 housing units], Stark Highway North [~4 apartments & 1 business].</p> <p>♦ Independent living facilities or apartment buildings including, school Street [~6 apartments] and Multi-family housing developments throughout Town.</p> <p>♦ Local stores and eateries increase the risk of exposure to and transfer of food-borne illness, causing potential public health concerns.</p> <p>♦ Dunbarton is a member of the Capital Area Public Health Network.</p> <p>♦ The many forests, conservation areas, agriculture, wooded areas, and ponds can support ticks (Tick-borne) hosting bacterial diseases (Lyme, Anaplasmosis, Leptospirosis, more) and mosquitos (Arboviral) can host many bacteria (West Nile, EEE, Equine Infectious Anemia, etc) which transmit diseases. The conservation lands and trail systems attract people, which can also enable disease transmission. Lyme disease rates are increasing according to NH Health WISDOM, with no indication of decline.</p> <p>♦ Waters and beaches susceptible to high bacteria counts in the summer include banks of the various brooks in town as well as public or private beaches, including Gorham Pond Beach and the various boat ramp locations throughout Dunbarton. Ponds especially are prone to high cyanobacteria (blue-green algae) counts that are</p>	4	3	3	1	9.3 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	harmful to people, or host e. coli counts from people or wildlife. ♦ Some of the largest sources of local air pollution are vehicular traffic of NH 77 and NH 13. Air pollution regularly reaches the Central NH region from Canada or the US Midwest.					
RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris *Event(s) Within Last 5 Years*	♦ Entire Town, Floodplains of Kimball Pond, Everett Lake bordering town in Weare, and Several Brooks. <u>Major watercourses</u> include the One Stack Brook, Bela Brook, Stark Brook, Harry Brook, and Black Brook are the most prominent waters flowing in Town. <u>Major waterbodies</u> include wildlife and recreation ponds which are among the main standing bodies of water as well as Stark Pond, Stark Pond Marsh, Purgatory Pond, Gorham Pond, Long Pond, Kimball Pond, Great Meadows wetlands and Hopkinton-Everett Flood Control Reservoir. ♦ Erosion of banks could occur along locations of the many brooks throughout town (see Map 5 Fluvial Geomorphic Location 2015 series). ♦ Ice jams could endanger the dams, bridges and nearby infrastructure and have the potential to recur, endangering travelers. ♦ Floating debris down the rivers and brooks can accumulate at bridges and dams.	4	1	1	1	4.0 LOW
SEVERE WINTER WEATHER Snow, Ice, Blizzard or Nor'Easter *Event(s) Within Last 5 Years*	♦ Entire Town. Particular areas of concern during winter weather include high density areas as listed in High Wind Events . ♦ Utilities at risk of winter weather include Eversource electrical lines, National Grid Power transmission lines, SBA Tower, Unitil electrical lines, US Cellular cell tower, and cable lines; water and sewer pumping stations. Telecomm tower antenna arrays as well as Town Department antennas could receive significant impacts from snow, ice, and blizzards . ♦ The schools close during inclement weather and have automatic messaging alerts sent to parents about status updates. ♦ The entire Dunbarton road network is susceptible to winter conditions, including the state roads (NH 77 and NH 13). Local Town roads are also often difficult to travel. Many accidents occur town roads and intersections during storms . Many local roads and the hilly gravel roads have sharp incline/ decline or cars have trouble traveling the road during winter conditions.	4	3	3	2	10.7 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<ul style="list-style-type: none"> ◆ Neighborhoods at higher elevation include the hilly roads which can be difficult to keep clear of snow and tree fall. ◆ Much of the Town is wooded and forested with most sections vulnerable to snow, ice effects and power failure. Homes are difficult to access with trees and power lines down on the hilly residential roads. They could be difficult to access with treefall and power lines down from winter storm events. Remote housing could become isolated by treefall, especially those with only one egress. The manufactured housing parks have homes less capable of withstanding snow load. ◆ These roads and especially the one-egress roads are often blocked by fallen trees or powerlines, and residents cannot access their homes or leave their homes until the road is clear. ◆ Local government operations in the Dunbarton Town Offices, Fire Department, Police Department, and Highway Department conduct essential business and make decisions during winter weather conditions that keep residents safe. These vital personnel may not live in Town or may have commuting difficulties getting to work to perform these duties. 					
SOLAR STORMS AND SPACE WEATHER Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout *NO Event(s) Within Last 5 Years**	<ul style="list-style-type: none"> ◆ Entire Town. Should a solar event impact the Region, it is likely most electrical and radio systems will become unavailable. The Town's critical facilities must be operational to support residents Dunbarton Town Offices, Fire Department, Police Department, and Highway Department, Schools, telecomm towers, high tension power lines, underground water, sewer, and gas lines, pumping and switching stations. The aurora borealis is regularly seen on Mount Kearsarge to the northwest in Warner and could likely be spotted from Pat's Peak (Henniker), indicating geomagnetic storms are present without noticeable effects. ◆ The Town's technology is most vulnerable to space weather, especially communications systems (internet, cable, cellular, landline) and the electrical grid. Private wells and private septic serve most residents but municipal water and sewer lines serve thousands of residents and businesses. Gas lines may be operational. Electricity (powerlines & substations) may be interrupted, which could cause automated backup systems to operate. ◆ Alternate support or communications systems available in the event of blackout or equipment 	3	1	4	4	9.0 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	failure include: Town Department back-up generators and resident generators can temporarily provide power alternatives, and the Capital Area Fire Mutual Aid Dispatch could provide regional communications, and local ham radio operators could provide assistance.					
TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms or Tree Debris <i>*Event(s) Within Last 5 Years*</i>	<p>♦ Entire Town. Most Tropical Events would impact vulnerable areas including populated buildings, high-density locations, and utilities serving residents and business, antennas, and telecommunications towers (See listed under Earthquake & High Wind).</p> <p>♦ 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. They could be difficult to access with treefall and power lines down from Tropical events. Many of the remote neighborhoods could be difficult to access when tropical cyclone events occur. (See remote areas listed under High Wind).</p> <p>♦ Agricultural areas are vulnerable to damage from Tropical Events: (See listed under Drought).</p> <p>♦ Older, or historical buildings are vulnerable to Tropical wind damage.</p>	2	3	4	4	7.3 MEDIUM
WILDFIRE Brushfire, Outdoor Fires or Accidental <i>*Event(s) Within Last 5 Years*</i>	<p>♦ Entire Town. Locations most susceptible to Wildfire include vulnerable populations and buildings as identified in Lightning. Backyard burning without a permit is often the cause of brushfires throughout Town. The Oak Hill Fire tower in Concord at the Dunbarton town line is seasonally staffed.</p> <p>♦ Remote, forested areas, parks, public Town Forests, conservation areas, open recreation fields, points of higher elevation than surrounding area can be dangerous to people and property during Wildfire.</p> <p>♦ The public conservation lands and trail systems, Class VI Range Roads, could experience difficult to access wildfires on these lands, with people in proximity or possible danger.</p> <p>♦ Much of the Town is privately owned wooded and forested lands which could be difficult to access in case of wildfire. There are dozens of backlot or undeveloped parcels in Town which are 50 acres or greater located on unmaintained Town roads, indicating potentially difficult access by fire apparatus. Many of the high elevation roads could be difficult to evacuate should wildfire encroach.</p> <p>♦ Several extremely large, undeveloped parcels are located around town (See APPENDIX A)</p>	4	2	1	3	8.0 HIGH

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<ul style="list-style-type: none"> ♦ Slash and brush are found on the ground on throughout Dunbarton. As people venture into the woods, potential wildfires are waiting to happen. 					
SECONDARY TECHNOLOGICAL AND HUMAN HAZARDS						
AGING INFRASTRUCTURE Bridges, Culverts, Roads, Pipes or Underground Lines <i>*Event(s) Within Last 5 Years*</i>	<ul style="list-style-type: none"> ♦ Entire Town. Most dams, culverts, and bridges could experience impacts of aging infrastructure. Many bridges have been threatened (but not damaged) by high water debris or ice floes. ♦ Dunbarton shares many of its bridges with neighboring communities. The Town owns multiple red listed bridges including 070.09 Everett Lake East Dike P1 on Stark Brook (Hopkinton-Everett Reservoir) and 070.13 Everett Lake North Dike P2 on Stark Brook (Hopkinton-Everett Reservoir). ♦ Many old or undersized culverts remain vulnerable, although the Highway Department replaces many annually. The main washout locations yet to be repaired include Guinea Road @ Black Brook, Barnard Hill Road, Black Brook Road, Country Road, Grapevine Road, Kimball Pond Road, Long Pond Road, Montalona Road, Morse Road, Tenney Hill Road, Twist Hill Road, gravel roads (ditching, flood over road, washouts), Guinea Road, Olde Mill Brook Road (Harry Brook), and others. ♦ The Town's roads are becoming more difficult to maintain and rehabilitate because of lack of funding and over 43 miles of Town Class V roads. Weight limits need to be posted and enforced during the spring. ♦ Underground electric utilities, water, sewer, gas or telephone lines are often old and subject to breakage during earthquake or aging materials. See also Earthquake for known roads over lines. ♦ Utility stations including any water & sewer pumping stations require maintenance and upgrade. 	not scored	not scored	not scored	not scored	not scored
FIRE Vehicle, Structure, Arson or Conflagration <i>*Event(s) Within Last 5 Years*</i>	<ul style="list-style-type: none"> ♦ Several locations around Town are potential sites for explosions and serious fires and numerous other sites that have the potential for prolonged burning. They include above ground fuel tanks, high tension power lines, areas away from cisterns or hydrants; vacant buildings, foreclosed homes or seasonal buildings; or buildings in densely populated areas or agricultural operations because of fertilizers and 	not scored	not scored	not scored	not scored	not scored

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<p>pesticides. See Drought for an agricultural operation list.</p> <p>♦ High Density neighborhoods in Dunbarton, Manufactured housing neighborhoods (Gorham Pond Area (Lake Gorham Association): Gorham Drive [~10 homes], Gary Road [~16 homes], Karen Drive [~19 homes], Stehanie Drive [~10 homes], Holiday Shore Drive [~35 homes], Black Brook Road [~4 housing units], Belanger Stark Highway North (rental) [~4 units], Condos on Twist Hill Road [~4 housing units], Montalona Road [~4 housing units], and Stark Highway North [~4 apartments & 1 business]), Independent living facilities or apartment buildings (School Street [~6 apartments], Former Multi-family housing developments throughout Town and other higher density areas could be subject to conflagration (see also Lightning).</p> <p>♦ Dunbarton is home to several commercial and industrial activities, mills, excavation, auto repair businesses and other flammable activities. School laboratories and other facilities could catch fire through occupational event, accident, or arson. Other businesses could be vulnerable to fire and may utilize hazardous materials in their work. See APPENDIX A for hazardous materials and business lists.</p> <p>♦ Vehicle fires could occur anywhere, in parking lots, driveways, or roadways. NH 77 From Concord to Weare is the most highly traveled route, followed by NH 13 (Jewett Road) from Hopkinton to Goffstown. Robert Rogers Road is used as a detour by commuters. The Dunbarton Fire Department and Tri-Town Ambulance respond to crashes. See also APPENDIX A.</p> <p>♦ Perhaps the greatest rural concern for human-started fires are the forested trails, Range Roads and conservation lands which would be difficult for fire response. See Lightning and High Wind for other remote area lists.</p>					
HAZARDOUS MATERIALS Haz Mat Spills, Brownfields or Trucking *Event(s) Within Last 5 Years*	<p>♦ Most likely routes of vehicular traffic transport of hazardous materials include NH 77 From Concord to Weare, NH 106 from Concord to Dunbarton, and NH 13 from Hopkinton to Goffstown. Other local roads like Robert Rogers Road, Everett Dam Road, and Mansion Road could have serious transportation accidents involving hazardous materials.</p> <p>♦ Vulnerable areas for targeted mass evacuation/shelter in place from hazardous</p>	not scored	not scored	not scored	not scored	not scored

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	<p>materials spills NH 17 and NH 13 area residences and facilities, and the Schools.</p> <p>♦ The largest or most dangerous stationary sites that store and/or handle haz mat on site (fertilizer, pesticides, fuel, etc) are listed in APPENDIX A but include Dunbarton Fuel Services, Heven's Gas Station, Nichol's Garage. Stone's Farm, and Voydatch Junkyard. See also list of agriculture operations in Drought. Occupational stationary haz mat sites where spills could occur include schools, manufacturing, industry, of which there are many in Town. Key sites would include excavation sites, automotive businesses, construction businesses, and the Public Works Garage and Transfer Station.</p> <p>♦ Possible brownfields sites to be aware of include any old mill sites, former rail lines, and parcels with suspected soil contamination. There could also be properties with "illegal" long term, non-permitted junkyard use or salvage yard use occurring before the Town is notified.</p>					
<p>LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications or Live Wire Danger *Event(s) Within Last 5 Years*</p>	<p>♦ Entire Town. Electrical outages are often town wide, but high density areas or vulnerable populations are of greatest concern: the high density neighborhoods and Schools (see Public Health for a list).</p> <p>♦ Power outages (Eversource, Unitil) may last for several days in the most remote areas before service is restored from a large event. Systems failures could affect Town businesses and local government on an isolated scale. The internet Xfinity/Comcast enables alternative communication options, and many rely on VOIP for telephones instead of landlines.</p> <p>♦ Communications failure would be worse if it occurred during a holiday or inhibited emergency dispatch and EOC operations. Some Town radios are interoperable, and they are used in more than one location. Local antennas are located on Town Department buildings. Other towers on Route 13 Stark North and Powell Lane provide cellular services.</p> <p>♦ The Town is serviced by the Capital Area Mutual Aid Fire Compact which handles all emergency medical service and Fire dispatching. They have redundant capabilities and are regularly upgrading their systems.</p> <p>♦ Many businesses in town provide propane, natural gas, and oil services locally and statewide.</p> <p>♦ Other utility systems, such as LP gas, natural gas, generators, oil tanks, wood fuel and more, are</p>	not scored	not scored	not scored	not scored	not scored

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	used by residents as both back up and primary heating. See also Aging Infrastructure and APPENDIX A . <ul style="list-style-type: none"> ♦ Much of the Town is wooded and forested and sections would be difficult to access with excessive power lines down. See also High Wind or Winter Weather). ♦ The agricultural farms (feeding or dairy animals) should be monitored (See Drought) during extended utility outage. 					
TRANSPORTATION CRASH Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle *ANNUAL Occurrences Within Last 5 Years*	<ul style="list-style-type: none"> ♦ NH 77 from Concord to Weare and NH 13 from Hopkinton to Goffstown are the main highways through Town and have the most reported crashes. Rerouting traffic can be dangerous resulting in other potentially severe crashes. Some of the more frequent crash locations occur along hilly intersections. ♦ Crashes also occur throughout the community at rural intersections, along hills and s-curves. All gravel roads have a low speed limit. Winter and summer months are of particular concern. See also MAPS 1-4. ♦ Crashes increase during hazard events, winter weather, spring snow melt (washouts) and windstorms. Few areas in Town are suitable for safe bicycle and pedestrians use. The Class VI Range Roads and the local trail system could have the potential for serious crashes or conflict of use crashes. ♦ The Town has alternative crash potential, such as air traffic. The Manchester-Boston Regional Airport is nearby and supports large-engine plane traffic which have the potential of crashing in nearby communities. Nearby Concord Municipal Airport and Concord's NH National Guard have regular small plane and helicopter traffic. Dunbarton has potential to be in the flightpath of all of these facilities.(See also Map 1) ♦ Increased use of personal drones creates additional hazard for those on the ground. 	not scored	not scored	not scored	not scored	not scored
MASS CASUALTY INCIDENT As a result of any hazard event *NO Event(s) Within Last 5 Years*	<ul style="list-style-type: none"> ♦ Unlikely, but Possible. A mass casualty event could occur as a possible secondary effect of a large scale event, such as Terrorism/Violence, Public Health, Transportation Crash, or High Wind Event. These could occur throughout the Town. ♦ Any mass casualty event could be localized to a certain area. Locations and occasions of potential public unrest include: Town & School Meetings, voting day, local board meetings, visits from 	not scored	not scored	not scored	not scored	not scored

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
	political candidates, School sports events, political rallies. ♦ Dunbarton is a member of the Capital Area Public Health Network (CAPHN) and other regional emergency groups. The Town's local primary shelter is located at the Town Community Center designed in 1988 and can accommodate many residents and higher load capacity for wind, earthquake, and snow. Fire & Rescue ambulance could provide EMS and transport to Concord Hospital in 20 minutes.					
TERRORISM/ VIOLENCE Active Shooter, Hostage, Public Harm, Civil Disturbance/ Unrest, Politically Motivated Attacks, Incendiary Devices, Sabotage or Vandalism *Events(s) Within Last 5 Years*	♦ Possible. Terrorism/ violence could possibly occur anywhere in Entire Town and could result in mass casualty . Most susceptible non-municipal sites could include the Dunbarton Village Area, Town & School Meetings, or the Churches: St. John the Evangelist Episcopal Church or First Congregational Church. ♦ All municipal facilities in Dunbarton, Old Town Hall-Library, Town Offices, Fire Department, Police Department, Highway Department, and Transfer Station have a risk of terrorism or violence . ♦ Private manufacturing or industrial businesses with large quantities of hazardous materials could be possible terrorism targets. ♦ Sabotage would be most likely to occur at Town, School, State or governmental facilities to halt operations or computer systems, including the telecomm towers & antennas, switching stations, the Town Hall computer systems, and water works or pumping stations. ♦ Vandalism could occur at dams, under bridges, wooden covered bridges, telecommunications or tower, cemeteries, vacant buildings, beaver dams, recreation areas, boat launches, Gorham Pond Beach, etc. ♦ Hostage and active shooter situations might most likely occur domestically anywhere in the Town, in municipal buildings, Churches, Schools, high density housing (see Public Health). ♦ Sites of local significance (historic markers) or other public places could become potential sites of Terrorism/ Violence .	not scored	not scored	not scored	not scored	not scored
CYBER EVENT Municipal Computer Systems Attack, Website Overtake, Cloud Data	♦ Entire Town . Cyberattack could target Town or School websites, computer systems, cloud data systems, archival records, email phishing, etc. Town Offices, Police Department, Fire Department, Transfer Station, Highway Department, Library and Historical Society records would be high-value targets.	not scored	not scored	not scored	not scored	not scored

4 HAZARD RISK ASSESSMENT

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)</i>	PROBABILITY of Occurrence in 10 Years	SEVERITY of Impact			OVERALL RISK (1-16)
			Human Injury Impact	Essential Services or Infrastructure Impact	Property Damage or Economic Impact	
Breach, Telephone Rerouting, Identity Theft, Phishing, Ransomware, Virus or Phone Scams <i>*ANNUAL Occurrences Within Last 5 Years*</i>	<ul style="list-style-type: none"> ✦ Email scams and identity theft are likely regular problems for residents and businesses. Towns often post known attempts on websites to inform residents. The large businesses in Dunbarton (See APPENDIX A) would need to be aware of the risks. ✦ The Police Department receives phone calls from residents about internet and email scams and reports them to the appropriate authorities. 					

Source: Dunbarton Hazard Mitigation Committee

Central NH Region Major Disaster Declarations, 1973-2022

The Central NH region, which encompasses parts of Merrimack County (**18** communities) and Hillsborough County (**2** communities), has been damaged by **30** presidentially-declared major disasters [DR-] and presidentially-declared emergencies [EM-] in the last **48** years between **1973-2022**.

Although a natural disaster typically befalls multiple counties in New Hampshire, only those presidentially-declared or emergency declarations 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 **16** years (**2005-2022**), the Central NH region containing communities within Merrimack and Hillsborough Counties experienced **17** 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

For the global COVID-19 pandemic DR-4516 from **2020**-ongoing, the Town obtained about **\$190,000** in CARES and First Responder Stipend funding while the Dunbarton School District received another **\$106,000**. The last weather disaster declared in Merrimack County in which Dunbarton is located was the wind and rainstorm event in **October 2017** however, Dunbarton did not receive any federal Public Assistance funding. The town last applied and received **\$12,201** in **February 2013** for a declared disaster event snowstorm. Details of Central NH region declared disasters and emergency declarations since **1973** and federal funding provided to the Town of Dunbarton are displayed in **Table 11**. Most of these disasters will be described within the following **Past Disasters and Severe Weather Events** section.

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 is one of several relief bills and funding pots for COVID-19. The GOFERR is making these funds available through various programs. Municipalities, businesses, and individuals can apply to several funding programs through GOFERR.

Table 11

Central NH Region Major Disaster Declarations, 1973 to 2022

FEMA DR-	Local Disaster Name	Incident Period	FEMA Disaster Name	Includes County*		FEMA Public Assistance (PA) Funding To Dunbarton**
				Merr	Hill	
	TOWN ADD NEW DISASTER ROWS HERE-					
4516	2021 COVID-19 Pandemic	Apr 3, 2020 – TBD	COVID-19 Novel Coronavirus Pandemic (national, global)	M	H	N/A PA, see below
4355	2017 Oct Wind and Rainstorm	Oct 28-20, 2017	Severe Storm and Flooding from Tropical Storm Phillippe	M	---	\$0
4209	2015 January Blizzard	Jan 26-28, 2015	Severe Winter Storm and Snowstorm	---	H	\$0
4105	2013 February Snowstorm	Feb 8-10, 2013	Severe Winter Storm and Snowstorm	M	H	\$12,201
4095 EM-3360	2012 Hurricane Sandy Emergency	Oct 26-Nov 8, 2012	Hurricane Sandy	EM-M	EM-H	\$3,829
4049 EM-3344	2011 Halloween Snowstorm Emergency	Oct 29-30, 2011	Severe Storm and Snowstorm	EM-M	H	\$0
4026 EM-3333	2011 Tropical Storm Irene	Aug 26-Sep 6, 2011	Tropical Storm Irene	M	EM-H	\$2,927
1913	2010 March Flooding & Winds	Mar 14-31, 2010	Severe Storms and Flooding	M	H	\$0
1892	2010 Winter Storm	Feb 23-Mar 3, 2010	High Winds, Rain, Snow	M	H	\$10,431
1812	2008 December Ice Storm	Dec 11-23, 2008	Severe Winter Storm	M	H	\$27,986
1799	2008 September Flood	Sep 6-7, 2008	Heavy Rains and Floods	M	H	\$0
1782	2008 July Tornado	Jul 24, 2008	Tornado, Severe Winds, Heavy Rains	M	---	\$0
1695	2007 April Spring Flood	Apr 15-23, 2007	Severe Storms and Flooding	M	H	\$0
1643	2006 Mother's Day Flood	May 12-23, 2006	Severe Storms and Flooding	M	H	\$36,378
1610	2005 Columbus Day Flood	Oct 7-18, 2005	Severe Storms and Flooding	M	H	\$0

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4 HAZARD RISK ASSESSMENT

FEMA DR-	Local Disaster Name	Incident Period	FEMA Disaster Name	Includes County*		FEMA Public Assistance (PA) Funding To Dunbarton**
				Merr	Hill	
EM-3211	2005 Snow Emergency	March 11-12, 2005	Snowstorm	---	EM-H	\$0
EM-3207	2005 Snow Emergency	Jan 22-23, 2005	Snowstorm	EM-M	EM-H	\$5,079
EM-3193	2003 Snow Emergency	Dec 6-7, 2003	Snowstorm	EM-M	EM-H	\$8,447
EM-3177	2003 Snow Emergency	Feb 17-18, 2003	Snowstorm	EM-M	EM-H	\$0
EM-3166	2001 Snow Emergency	Mar 5-7, 2001	Snowstorm	EM-M	EM-H	\$4,763
1231	1998 Flooding	Jun 12-Jul 2, 1998	Severe Storms and Flooding	M	H	\$0
1199	1998 December Ice Storm	Jan 7-25, 1998	Ice Storms	M	H	\$0
1144	1996 Storms and Flooding	Oct 20-23, 1996	Severe Storms and Flooding	M	H	\$0
1077	1995 Flood	Oct 20-Nov 15, 1995	Storms and Floods	M	---	\$0
EM-3101	1993 Blizzard	Mar 13-17, 1993	Blizzards, High Winds and Record Snowfall	EM-M	EM-H	\$0
917	1991 Hurricane Bob	Aug 18-20, 1991	Severe Storm	---	H	N/A
876	1990 Flooding and Severe Storm	Aug 7-11, 1990	Flooding and Severe Storm	M	H	No data
789	1987 Storms and Flooding	Mar 30-Apr 11, 1987	Severe Storms and Flooding	M	H	No data
771	1986 Storms and Flooding	Jul 29-Aug 10, 1986	Severe Storms and Flooding	---	H	N/A
399	1973 Storms and Flooding	Jul 11, 1973	Severe Storms and Flooding	M	H	No data
Weather Disasters DR- & EM-		Total Public Assistance to Dunbarton 1993-2022**				\$112,041
Pandemic Funds DR-4516		Total GOFERR/CARES Assistance to Town 2020-2022**				\$191,196
Total Funding to Dunbarton, 1993-2022**						\$303,237
Does NOT Includes 2020-2022 CARES/GOFERR Funding to Dunbarton School District \$						\$105,079

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>.

To help reclaim some of the costs these disasters wrought on town property and infrastructure and for additional staff time, Dunbarton 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 (2022). Dunbarton in Merrimack County was eligible for reimbursement for up to a total of 26 disasters and emergency declarations. Disaster funding was sought for and received by Dunbarton for 4 of the 17

[DR-] and for 6 of the 9 [EM-] during this period. All funding awarded to Dunbarton appearing in the Public Assistance database between 1993-2017 totals \$112k. This detail is displayed previously in Table 11 and is summarized to \$100/\$1000 in the forthcoming Table 12 for each disaster.

The most expensive disaster for Dunbarton in terms of FEMA Public Assistance (PA) funds received for recovery was the **Mother's Day Flood of 2006** after which Dunbarton received \$36k for 6 applications for project funding to help repair local Town roads and several bridges. Additional monies for the 2020-2022 COVID-19 funding was provided by the Town and totals \$303,000 to date.

Past Disasters and Severe Weather Events

The Town of Dunbarton 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 Dunbarton and its residents. Public Assistance disaster funding opportunities open to communities when a disaster is declared within a county. The Town of Dunbarton applied for and received this funding for several recently declared disasters.

Although New Hampshire experienced more disasters than those shown in Table 12, 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 Dunbarton, will be included. Refer to the [State of New Hampshire Multi-Hazard Mitigation Plan 2018](#) 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 12 **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 Dunbarton in the last 5 years, this means the Hazard Mitigation Committee did not recall an event of significance since the **2017 Plan**.

COLOR KEY for Table 12:

Declared Disasters (DR-) or Emergency Declaration (EM-) in Hillsborough County or Merrimack County in Central NH Region M= Merrimack County H= Hillsborough County	PA Funding \$ Received by Dunbarton	Other Dunbarton Local Hazard Event	Regional Hazard Event with Dunbarton Impacts
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Table 12

Local and Area Hazard Event and Disaster History (Sequential)

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Hazard Events 2017-2022 (Since Last Plan)								
TOWN TO ADD NEW EVENT ROWS HERE								Dunbarton Hazard Mitigation Committee
TOWN TO ADD NEW EVENT ROWS HERE								Dunbarton Hazard Mitigation Committee
Regional Geomagnetic Storm Apr 2022	No	2022	4-April	N/A	Many surrounding town communication systems were also affected impacting emergency dispatch and communication between mutual aid companies.	A geomagnetic storm solar event impacted Fire Dispatch. No known damages or injuries in the Town occurred because redundant capabilities were used. However, the receiver site was down and both Clinton Street and Concord State Road receivers were impacted. Portable radios would not work.	Geomagnetic Storm	CNHRPC, Dunbarton Hazard Mitigation Committee
Dunbarton Residential Fire Jan 2022	No	2022	Jan	N/A	Surrounding towns including Goffstown, Weare, Bow, Hooksett, and Henniker Fire departments provided assistance in fighting the fire.	A two alarm residential fire ignited from homeowners thawing frozen water pipes. There were no injuries, but the home sustained structural damage.	Fire	CNHRPC, Dunbarton Hazard Mitigation Committee
New Hampshire Statehouse Vaccine Protest Sep 2021	No	2021	14-Sep	N/A	Protest at New Hampshire State House in Concord. Rally against vaccine mandates.		Human (Civil Disturbance)	CNHRPC, WebEOC, Concord Monitor

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Regional Geomagnetic Storm G3 Watch Oct 2021	No	2021	30-31-Oct	N/A	NOAA issued a G3 “strong” geomagnetic storm watch. A storm of this capacity can cause voltage irregularities on protection devices, potentially harmful currents in power grids, disruptions in global positioning systems (GPS), as well as the potential to cause high frequency radio blackouts. Visible effects of a geomagnetic storm include enhancing the visibility of the aurora borealis across large parts of the United States and Europe. A geomagnetic storm of this capacity likely reaches large portions of the earth, including the entire northeast of the United States and the Central New Hampshire Region	There were no known impacts in town, but predictions had noted potential radio interference, potential harmful currents in the power grid, and potential disruptions to global positioning systems (GPS).	Solar Storm, Space Weather, Power Failure	CNHRPC, NOAA, CNN
Seabrook Nuclear Unusual Events Alerts Oct 2021	Site Area Emergency	2021	22-23-Oct	N/A	N/A, Most of the Central NH Region is outside the 50-mile EPZ, but radiation may expand beyond this line.	Dunbarton was not impacted but should remain aware of the possibility of any radiation breaches.	Public Health, Power Outage	CNHRPC, WebEOC
Regional Arboviral Risk Oct 2021	No	2021	6-Oct	N/A	Towns in Merrimack County experienced higher arboviral risk levels	Dunbarton experienced medium arboviral risk and had positive cases of Jamestown Canyon Virus in human and mosquitos.	Public Health	CNHRPC, WebEOC, NHDHHS
Regional Tropical Storm Henri Aug 2021	No	2021	19-27-Aug	N/A	Strong tropical storm with flash flooding, high winds 30-40 mph, power outages, tree damage, heavy rain between 2 and 4 inches.	Dunbarton likely felt similar effects as the rest of the state including heavy rain, high winds, potential flooding, tree damage, and power outages	Heavy Rain, Flooding, Wind, Power Failure	CNHRPC, WebEOC, NH SEOC

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Regional Air Quality Advisory Aug 2021	No	2021	12-13-Aug	N/A	NHDES expected ground-level ozone concentrations to rise to levels that are unhealthy for those who are sensitive.	Dunbarton potentially had the same increased concentrations of fine particle air pollution that could be harmful.	Public Health	CNHRPC, WebEOC, NHDES
Regional Flash Flooding Aug 2021	No	2021	1-Aug	N/A	Heavy rainfall 0.5-2 inches in areas throughout the state sufficient to produce flooding and road closures.	Dunbarton likely experienced heavy rainfall and flooding	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM
Regional Heavy Rainstorm Jul 2021	4624	2021	30-Jul	N/A for Dunbarton	Heavy rainfall 0.5-2 inches in areas throughout the state sufficient to produce flooding. This event was not a declared disaster in Merrimack or Hillsborough Counties	Dunbarton experienced heavy rainfall and likely flooding.	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM
Regional Air Quality Advisory Jul 2021	No	2021	26-27-Jul	N/A	NHDES expected concentration of fine particle air pollution to reach unhealth levels for those who are sensitive throughout the entire state.	Dunbarton likely had increased concentrations of fine particle air pollution that could be harmful.	Public health	CNHRPC, WebEOC, NHDES
Regional Smoke Advisory Jul 2021	No	2021	20-Jul	N/A	NHDES declared smoke advisory expecting concentrations of fine particle air pollution from smoke to reach levels that could cause respiratory health effects for those who are sensitive throughout the state.	Dunbarton likely experienced the possibly dangerous air quality.	Public Health	CNHRPC, WebEOC, NHDES
Regional Severe Storm and Flooding Jul 2021	4622	2021	18-July	N/A for Dunbarton	Heavy rainfall 0.5-2 inches in areas throughout the state sufficient to produce flooding. This event was not a declared disaster in Merrimack or Hillsborough Counties	Dunbarton experienced heavy rainfall and likely flooding.	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM
Regional Extreme	No	2021	29-Jun	N/A	Heatwave experienced throughout the state. Extreme temperatures	Dunbarton experienced extreme temperatures with high heat and	Extreme Temp	CNHRPC, WebEOC, NH WMUR

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Temperatures Jun 2021					from 90-100 degrees recorded at various times throughout the summer.	humidity. Temperatures reached 90-100 degrees. Much of the locally grown produce failed due to the heat.		
Dunbarton Fire on Jean Drive May 2021	No	2021	19-May	N/A	Neighboring towns may have provided mutual aid in response to the fire.	A fire on Jean drive destroyed a house and garage. The fire spread to the woods and burned 2-3 acres of forest.	Fire	CNHRPC, Dunbarton Hazard Mitigation Committee
Regional Drought May 2021	Mo	2021	4-May	N/A	Much of Merrimack and Hillsborough counties experienced moderate levels of drought.	Dunbarton likely experienced moderate drought conditions.	Drought	CNHRPC, WebEOC, NCEI/NOAA
Regional Snowstorm Feb 2021	No	2021	1-2-Feb	N/A	Severe snowstorm impacting the state resulting in 3-16 inches of snow.	Dunbarton likely experienced heavy snow and potential tree damage, and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH WMUR
Regional Christmas Rain and Windstorm Dec 2020	No	2020	25-Dec	N/A	Heavy rain and strong winds throughout the state. 1.5-2.5 Inches of rain and gusts of wind from 45-55 mph. Combined with snowmelt the storm caused flooding.	Dunbarton likely felt strong winds and heavy rains potentially causing flooding, tree damage, and road closures.	Heavy rain, wind, flooding	CNHRPC, WebEOC, NH WMUR
Regional Snowstorm Dec 2020	No	2020	17-Dec	N/A	Severe snowstorm impacting the state resulting in 5-25 inches of snow.	Dunbarton experienced heavy snow causing tree damage, and power outages. Road travel was difficult resulting in spinouts. Weather conditions resulted in damage along roadways including a downed stop sign on Jewett Road. Gorham Pond Road and Stark Highway South both had vehicle accidents and cars were stuck on Grapevine Road.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, manchesterinklink.com
Regional Drought Dec 2020	No	2020	1-Dec	N/A	Drought conditions in Merrimack and Hillsborough counties ranging from D1	Dunbarton likely experienced moderate or severe drought conditions.	Drought	CNHRPC, WebEOC, NCEI/NOAA

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					Moderate Drought to, D2 Severe Drought, and further east D3 Extreme Drought.			
Regional Drought Oct 2020	No	2020	27-Oct	N/A	Moderate, severe, and extreme drought conditions affecting the state, very high fire danger declared.	Dunbarton likely experienced severe or extreme drought conditions	Drought	CNHRPC, WebEOC
Regional Drought Sep 2020	No	2020	1-Sep	N/A	Drought conditions in Merrimack and Hillsborough counties ranging from D1 Moderate Drought to, D2 Severe Drought.	Dunbarton likely experienced severe drought conditions.	Drought	CNHRPC, WebEOC, NCEI/NOAA
Regional Tropical Storm Isaias Aug 2020	No	2020	3-6-Aug	N/A	Tropical storm with extreme wind gusts, flash flooding, high rainfall, tree damage, and power outages.	Dunbarton experienced the same storm effects including high wind, flooding, rainfall, tree damage, and power outages. Large trees and power lines were downed on Ray Road, Ordway Road, and Montalona Road.	Tropical storm, High wind, power failure, flooding	CNHRPC, WebEOC, NH SEOC, NHPR.org
Dunbarton Windstorm and Tree Damage Jul 2020	No	2020	23-Jul	N/A	Surrounding towns likely experienced heavy storm conditions that could cause tree damage.	High winds and heavy storm causing tree damage throughout town. Including downed tree blocking Ray Rd.	Wind, Rain, Power Failure	CNHRPC, Dunbarton Police Dept.
Regional Drought Jul 2020	No	2020	10-Jul	N/A	Much of the state including the Concord area experienced moderate levels of drought.	Dunbarton likely experienced moderate drought conditions.	Drought	CNHRPC, WebEOC, NHDES
Dunbarton Island Fire Jun 2020	No	2020	9-Jun	N/A	Neighboring towns may have provided mutual aid in response to the fire.	A fire burned on a Montalona Road Island. The fire could only be reached by boat taking three days to put out.	Fire	CNHRPC, Dunbarton Hazard Mitigation Committee
COVID-19 Pandemic Apr 2020 - TBD	4516 M-H	2020	3-Apr – TBD	\$191,196	The NH Governor issued social activities restrictions, minimal public meetings, remote meetings held, social distance practices in April 2020 for all counties. Cases closely	The Town follows the Governor's order on meetings, masks, social distancing. Hand sanitizing/masking station is available, signs are posted, front door is often locked. Multiple	Public Health, Pandemic infectious	CNHRPC, NH HSEM, NH DHHS, WMUR

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					tracked by NH Division of Health and Human Services and NH HSEM. The State EOC was activated.	funding programs were applied for and Dunbarton received \$191,196 to date.		
Regional Winter Weather and Wind Chill Feb 2020	No	2020	13-Feb	N/A	Wind Chill advisory with temperatures of 15-25 below zero during the night. Snow showers also occurred throughout the state.	Dunbarton likely experienced extreme cold temperatures and windchill as well as snowfall.	Extreme Temperatures, Snow	CNHRPC, WebEOC, NH WMUR
Regional Storm and Power Outages Feb 2020	No	2020	7-8-Feb	N/A	Regional storm with many hours of snow, freezing rain, sleet, and rain across the state. Resulting in ice accumulation. Just under 27,000 power outages were reported.	Dunbarton experienced heavy winter storm precipitation, ice accumulation, and many power outages. Trees and telephone poles were downed due to storm conditions. Travel on roads was limited and dangerous resulting in spinouts and accidents including a trailer sliding on ice and blocking part of the roadway in one instance. Montalona Road and Gorham Pond Road had cars off the road and powerlines were down on Grapevine Road and Guinea Road.	Snow, Heavy Rain, Freezing Rain, Ice, Power Failure	CNHRPC, WebEOC, NH WMUR
Regional Air Quality Advisory Jan 2020	No	2020	22-Jan	N/A	NHDES expected concentration of fine particle air pollution to reach unhealth levels for those who are sensitive. Especially in the southwestern region of the state.	Dunbarton potentially had increased concentrations of fine particle air pollution that could be harmful.	Public health	CNHRPC, WebEOC, NHDES
Regional Snowstorm Dec 2019	No	2019	29-Dec	N/A	Severe snowstorm impacting the state resulting in 6-10 inches of snow mixed with rain in the central part of the state.	Dunbarton experienced heavy snow, ice, tree damage, and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, NH SEOC

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Regional Merrimack Station Protest Dec 2019	No	2019	8-Dec	N/A	Protest at Merrimack Station in Bow. Rally against the functions of the station for environmental reasons.	Dunbarton personnel and resources may have been required for safety.	Human (Civil Disturbance)	CNHRPC, WebEOC, Bow Incident Action Plan
Regional Snowstorm Dec 2019	No	2019	2-Dec	N/A	Severe snowstorm impacting the state resulting in 1-12 inches of snow.	Dunbarton experienced heavy snow likely causing tree damage and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, WMUR
Dunbarton Wind Driven Farm Oct 2019	No	2019	Oct	N/A	Neighboring towns may have provided mutual aid in response to the fire.	A large wind driven fire ignited and burned a historic barn and farmhouse on Twist Hill Road.		
Regional Merrimack Station Protest Sep 2019	No	2019	28-Sep	N/A	Protest at Merrimack Station in Bow. Rally against the functions of the station for environmental reasons.	Dunbarton personnel and resources may have been required for safety.	Human (Civil Disturbance)	CNHRPC, WebEOC, Bow Incident Action Plan
Regional Heatwave Jul 2019	No	2019	19-Jul	N/A	High heat and humidity temperatures ranging from 90-100 degrees Fahrenheit	Dunbarton likely experienced the same high temperatures as the rest of the state	Extreme Temp	CNHRPC, WebEOC
Regional Severe storm and Flooding Jul 2019	4457	2019	11-12-Jul	N/A for Dunbarton	Repeated severe thunderstorms resulted in flash flooding throughout regions of New Hampshire. This was not a declared disaster in Merrimack or Hillsborough Counties.	Dunbarton experienced storms producing heavy rain causing flooding. The heavy rain caused a road washout on Route 13 between Heavens Gas and Dunbarton Historical Society.	Heavy Rain, Flooding	CNHRPC, WebEOC, FEMA, Boston Globe
Regional Hepatitis A Outbreak May 2019	No	2019	May	N/A	A significant increase in the number of people in the state diagnosed with Hep A. 10 Cases diagnosed in Merrimack County including one death. 36 Cases in Hillsborough County.	No known impact on Dunbarton, although some residents may have been sickened.	Public Health	CNHRPC, WebEOC, DHHS
Regional Spring Flooding Apr 2019	No	2019	19-22-Apr	N/A	Warmer weather, snowmelt, and heavy rain causes regional spring flooding.	Dunbarton experienced heavy rain, warm weather, and snowmelt producing flooding. Trees were downed on Mansion Road, and	Heavy Rain, Flooding	CNHRPC, WebEOC, NBC Boston, NHDOT Twitter

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						blocked the intersection with Everett Dam Road.		
Concord Fire at Murray Farm Apr 2019	No	2019	10-April	N/A	Mutual aid companies were required in response to a fire at Murray Farm in Concord.	Dunbarton provided aid in fire response at Murray Farm in Concord.	Fire	CNHRPC, Concord Monitor
Regional Winter Storm Feb 2019	No	2019	12-13-Feb	N/A	Snow and wintery mix storm throughout the state. 6-12 inches of snow mixing with sleet, freezing rain, and rain throughout the storm	Dunbarton likely experienced heavy snow and other precipitation causing potential for tree damage and power outages	Snow, Heavy Rain, Freezing Rain, Ice, Power Failure	CNHRPC, WebEOC, WMUR
Regional Snowstorm Jan 2019	No	2019	20-Jan	N/A	Severe snowstorm impacting the state resulting in 4-12 inches of snow.	Dunbarton experienced heavy snow, and likely freezing rain, high wind, tree damage, and power outages	Wind, Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC NH HSEM, NOAA, WMUR
Dunbarton Windstorm and Tree Damage Nov 2018	No	2018	14-Nov	N/A	Surrounding towns likely experienced heavy storm conditions that could cause tree damage.	High winds and heavy storm causing tree damage throughout town. Including downed tree and wires blocking Mansion Rd.	Wind, Rain, Power Failure	CNHRPC, Dunbarton Police Dept.
Dunbarton Fire on Hiking Trails Jul 2018	No	2018	4-Jul	N/A	Neighboring towns may have provided mutual aid in response to a fire.	In the Town Forest off Gorham Pond on hiking trails two fires started. Fireworks and a campfire ignited the two fires. They required response to put them out.	Fire	CNHRPC, Dunbarton Hazard Mitigation Committee
Regional Snowstorm Mar 2018	4371	2018	13-Mar	N/A for Dunbarton	Severe snowstorm impacting the state resulting in 8-25 inches of snow. This was not a declared disaster in Merrimack or Hillsborough Counties	Dunbarton experienced heavy snow resulting in tree damage, power outages, and car accidents. Vehicles slid off the road on Gorham Pond Road, Mansion Road, and Farrington Road.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, WMUR
Regional Storm and flooding Mar 2018	4370	2018	2-8-Mar	N/A for Dunbarton	Severe storm, rain, and wind causes flooding and near 60,000 state residents experiencing electrical outages. This was not a declared	Dunbarton likely experienced the heavy rain and wind causing electrical outages.	Wind, Rain, Flooding, Power Failure	CNHRPC, WebEOC, FEMA

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					disaster in Merrimack or Hillsborough Counties			
Dunbarton Storm and Power Outages Oct 2017	No	2017	30 Oct	N/A	Surrounding towns likely experienced heavy storm conditions that could cause tree damage, power outages, or fire.	High winds and heavy storm causing tree damage throughout town, downed powerlines, and fires started from damaged lines. Many roads were closed throughout Dunbarton.	Wind, Rain, Power Failure, Fire	CNHRPC, Dunbarton Police Dept.
Dunbarton Windstorm and Tree Damage Mar 2017	No	2017	9 Mar	N/A	Surrounding towns likely experienced heavy storm conditions that could cause tree damage.	High winds and heavy storm causing tree damage throughout town. Including downed tree blocking Tenney Hill Rd and tree fallen on a house on Montalona Rd.	Wind, Rain, Power Failure	CNHRPC, Dunbarton Police Dept.
Regional Snowstorm Mar 2017	No	2017	Mar	N/A	Neighboring town also had heavy amounts of snowfall leading to road closures, tree and powerline damage, and potential power outages.	Dunbarton received more than 24 inches of snow resulting in tree damage, road closures, potential power outages, and the first ever cancellation of Town Meeting. There were voting concerns, but the event was rescheduled.	Snow, Power Failure	CNHRPC, Dunbarton Hazard Mitigation Committee
Dunbarton Emerald Ash Borer Feb 2017	No	2017	Feb	N/A	The Emerald Ash Borer (EAB) is found in Merrimack County. Other surrounding counties are vulnerable or also infected (Belknap, Hillsborough, and Rockingham). The EAB was found in New Hampshire in Concord on March 2013. EAB attacks ash trees and is responsible for the death of millions of ash trees in the Midwest. A quarantine of all hardwood firewood, ash wood-products and	Although there are no active efforts by the Town, Dunbarton falls within the infested emerald ash borer management zone. The first infestation in Dunbarton was reported in 2015	Biological, Invasive Species Infestation	UNH Cooperative Extension Merrimack County website, report sightings to nhbugs.org

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					all ash nursery stock is in effect for the above 4 counties.			
Dunbarton/Merrimack County Drought Severe Emergency Feb 2017	No	2017	Feb 21	N/A	Severe Drought (D2) intensities are found in all communities of Merrimack County and all but the western edge of Hillsborough County in Central NH. The State's counties have been experiencing levels of drought for over a year. The NH DES has issued a series of statements and tips for homeowner water conservation. As of September 2016, residents and municipalities are requested to voluntarily conserve water. Some communities or water precincts have enacted water restrictions or bans for certain water usage. More restrictions may be enacted or may eventually be required by the State if conditions remain the same or worsen.	The Severe Drought (D2) conditions as of 02/17 continue to cover the entire community of Dunbarton. Reports have been made of dry wells.	Drought	US Drought Monitor NH, NH DES
Hazard Events 2005-2016								
Earthquake 2.8M Warner Epicenter Mar 2016	No	2016	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, Dunbarton, Concord, and Hillsborough	Reports were made to the USGS from Dunbarton residents feeling the earthquake as a rumble or loud noise.	Earth, Earthquake	Dunbarton Hazard Mitigation Committee, USGS

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Earthquake 2.6M Epsom Epicenter Aug 2015	No	2015	2-Aug	N/A	Epicenter around Epsom in the Central NH Region in Merrimack County, felt in nearby locations including Concord, Hopkinton, Allenstown, Loudon Chichester and Pittsfield	Reports were also likely made to the USGS from Dunbarton residents feeling the earthquake, 3 communities to the southwest.	Earth, Earthquake	Earthquackrack.com
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.	N/A, although Warner is 2 communities to the northwest of Dunbarton	Severe Wind, Tornado, Thunderstorm	WMUR
Dunbarton Beaver Dam Failure Apr 2015	No	2015	April	N/A	N/A	Beaver dam on Long Pond failed and caused Harry Brook to flood. The flooding washed out parts of Long Pond Road and Black Brook Road	Dam Failure, Flooding, Erosion	Dunbarton Hazard Mitigation Committee
Severe Winter Storm and Snowstorm - Blizzard Jan 2015	4209	2015	Jan 26-28	N/A for Dunbarton	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. There was no declaration for Merrimack County The closest reporting	Dunbarton did not apply for/receive funding. Normal snow fall, nothing extraneous out of the budget. Stranded motorists overnight on Kimball Pond Road. No power outages (Eversource & Unitil)	Severe Winter Weather, Extreme Temp, Snow, Ice, Power Failure, Severe Winds, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee, fema.gov, Boston Globe

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					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>			
Dunbarton 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.	Dunbarton reports the power out from all over town, heavy snow and wind toppled trees. Route 77 was blocked. Many roads completely blocked by powerlines, trees and snow.	Extreme Temp, Snow, Power Failure	Dunbarton Hazard Mitigation Committee, Concord Monitor
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, Webster, Concord, Salisbury, Franklin	Reports were made to the USGS from Dunbarton residents feeling the earthquake as a rumble or loud noise.	Earthquake	USGS
Severe Winter Storm and Snowstorm - Winter Storm NEMO Feb 2013	4105	2013	Feb 8-10	\$12,201	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.	Dunbarton received \$12,201 in FEMA Public Assistance funding for protective measures (snow removal). Extra snowfall and Police Patrols, tree limbs down	Severe Winter Weather, Extreme Temp, Snow, Ice, Wind	FEMA, Dunbarton Hazard Mitigation Committee, CNHRPC

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					Disaster declaration received for emergency protective measures in eight counties of the State.	and power outages. Mansion Road (State Road) difference Eversource line and Everett Dam Road (Dunbarton-Goffstown Road), other end comes in from Weare line.		
Hurricane - Hurricane Sandy Oct-Nov 2012	4095 EM-3360	2012	Oct 26- Nov 8	\$3,829	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.	Dunbarton received \$3,829 in FEMA Public Assistance funding. Dunbarton reports trees down, Eversource called to clean up debris and restore electricity. Trees down, power out on Robert Rogers, punctured PD tires from downed trees. Governor request to stay off the roads. Opened the EOC and the School for water source.	Wind, Flood, Severe Storm, Hurricane, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee , FEMA, Nashua Telegraph
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 Dunbarton with an earthquake of this magnitude as it was felt around the Central NH Region.	Earthquake	Concord Monitor, Earthquaketrack.com
Snowstorm-Halloween Snow Storm Oct 2011	4049 EM-3360	2011	Oct 29-30	N/A for Dunbarton	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	Dunbarton did not apply for/receive funding. Storm was not expected. Cancelled trick or treating. Everdam Road wire burnt a birch tree,	Extreme Temp, Snow	FEMA, Dunbarton Hazard Mitigation Committee

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					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.	everyone on road lost power, restring wires.		
Tropical Storm- Tropical Storm Irene Aug 2011	4026 EM-3333	2011	Aug 26-Sep 6	\$2,927	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 capita (146,455 people in 2010), a total of \$11m was allocated. Disaster was not declared for Hillsborough County.	Dunbarton received \$2,927 in FEMA Public Assistance funding for protective measures and debris removal. Trees down from heavy winds. Long Pond & Mansion Road are most heavily hit when storms for power outages.	Wind, Flood, Severe Storm, Rainstorm, Tropical Storm, Debris Impacted Infrastructure	FEMA, Dunbarton Hazard Mitigation Committee
April Fool's Snowstorm Apr 2011	No	2011	1-Apr	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.	N/A, but Dunbarton likely experienced some snow and inconvenience	Extreme Temp, Snow	CNHRPC wmur.com
Dunbarton Hazardous Materials Contamination 2010	No	2010	--	N/A	N/A	The Dunbarton Country Store gas station's leaking underground storage tanks were removed. The NH Department of	Hazardous Materials Spill, Water Quality (Public Health)	Dunbarton Hazard Mitigation Committee

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						Environmental Services (NHDES) performed substantial cleanup of the contaminated site, working in concert with the new owner. After the area was cleaned, the gas station was rebuilt as part of the new Barkie's Trailside Convenience Store. The facility is on the edge of a wetland		
Earthquake 3.4M Boscawen Epicenter Sep 2010	No	2010	26-Sep	N/A	"A magnitude 3.4 earthquake rattled buildings and nerves across much of New Hampshire Saturday night. The quake occurred 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 felt all over the state, Southern Maine and Massachusetts, but most reports were received from the Central NH region.	Reports may have been made to the USGS from Dunbarton with the epicenter less than 5 miles to the northeast in Boscawen. Dunbarton is to the south of Boscawen.	Earth, Earthquake	Union Leader, USGS
Dunbarton Milfoil Summer 2010	No	2010	Summer	N/A	N/A, although milfoil invasive plants are notorious "hitchhikers" that appear in area and NH water bodies after a	Milfoil was found in Gorham Pond and Fire Station Pond. Chemical application occurred four years ago at	Biological, Invasive Species Infestation	Dunbarton Hazard Mitigation Committee

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					boat or other vehicle introduces the invasive from an infested water body. Other communities such as Bradford and Dunbarton were experienced similar surges of milfoil infestation.	Gorham Pond but the problem still exists. NH Fish & Game determined the presence in Gorham Pond through a study that found the milfoil was extensive. Water from the Fire Pond is collected and used to spray on fires		
Severe Storms and Flooding Mar 2010	1913	2010	Mar 14-31	No	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)	Dunbarton did not apply for/receive funding. Wind Storm caused power/utility failures, road closures from downed power lines and trees, home and property damage. Some resident's homes were without power for several days.	Severe Winds, Flooding, Power Failure, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee, FEMA
Severe Winter Storm Storm and Flooding Feb-March 2010	1892	2010	Feb 23-Mar 3	\$10,431	FEMA-1892-DR. 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 Unitil customers were out of	Dunbarton received \$10,431 in FEMA Public Assistance funding for protective measures and debris removal. Widespread power outages occurred Town-wide as well as personal property damage. Roof damage from shingles or roofing being blown off occurred, car damage and further roof damage occurred from downed trees. No known injuries occurred.	Extreme Temp, Snow, Wind, Flood, Wind Chill, Dam Failure	Dunbarton Hazard Mitigation Committee, FEMA, Unitil

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					power at the peak outage period.			
Severe Winter Storm – Ice Storm Dec 2008	1812	2008	Dec 11-23	\$27,986	FEMA-1812-DR. 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. The weight of the ice caused branches to snap, and trees to either snap or uproot, and brought down power lines and poles across the region. About 400 thousand utility customers lost power during the event, with some customers without power for two weeks. Property damage across northern, central and southeastern New Hampshire was estimated at over \$5 million. Event was the largest power outage in New Hampshire's history.	Dunbarton received \$27,986 in FEMA Public Assistance funding for debris removal and protective measures for this severe ice storm.. Ice Storm with heavy icing caused power/utility failures, road closures from downed power lines and trees, damage to homes and property. During the ice storm, widespread power outage occurred, with roads blocked by trees and fallen power lines. People could not exit the Town since Mills Hills Road (Stark Highway North) was not passable for nearly a day. Road conditions were slippery; accidents were typical of a winter storm, but residents generally did not or could not leave their homes. Some homes were out of power for over two weeks. The Town's emergency shelter was opened.	Extreme Temp, Ice, Wind, Technological, Power Failure, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee, FEMA, CNHRPC

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Severe Storms and Flooding - Patriot's Day Flood Sep 2008	1799	2008	Sep 6-7	No	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 2010) for town reimbursement. Hillsborough County's damage was much higher at \$6.90 per capita (400,721 people in 2010)	Dunbarton did not apply for/receive funding. It is likely swamps and wetlands overflowed culverts and washed out some gravel roads.	Flood, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee, FEMA
Severe Winds, Heavy Rains Tornado Jul 2008	1782	2008	Jul 24	No	An F2-F1 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	Dunbarton did not apply for/receive funding. The path of the tornado did not travel through Dunbarton, although it was only about 3 towns to the northeast.	Wind, Tornado, Downburst, Severe Storm, Debris Impacted Infrastructure	FEMA, Epsom Hazard Mitigation Committee, CNHRPC

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					37 suffering major damage. Damage was estimated to exceed \$10 million. Declared in Merrimack County, not Hillsborough County.			
Severe Storms and Flooding - Spring Flood Apr 2007	1695	2007	Apr 15-23	No	Extensive flooding caused by severe storms impacted seven counties. Indirect peak discharge measurements on stream gages on the Suncook River at Short Falls Road in Epsom were 14,100 ft ³ , 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..	Dunbarton did not apply for/receive funding.	Flood, Wind, Debris Impacted Infrastructure, Rapid Snow Pack Melt	FEMA, USGS Flood of 2007, Dunbarton Hazard Mitigation Committee
Suncook River Avulsion in Epsom May 2006	1643	2006	May 14-17	N/A	The Suncook River through Epsom changed its course during this recent heavy rain event and its resultant flooding. The River shifted hundreds of	Area event N/A to Dunbarton, see storm effects on Dunbarton below.	Flood, Earth, Landslide, Erosion, Debris Impacted Infrastructure	Concord Monitor

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					meters, flowing around two dams, creating about a mile of new river through a sand pit a half mile from its original course, and leaving a similar length of dry riverbed. The water carved through peat bogs and tore away a corner of a sand excavation pit. Local communities of Epsom, Allenstown, and Pembroke later dealt with siltation and erosion issues from the new river course		re, Channel Movement	
Severe Storms and Flooding – Mother's Day Flood May 2006	1643	2006	May 12-23	\$36,378	Extensive flooding caused by severe storms impacted seven counties including Merrimack and Hillsborough. 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.	Dunbarton received \$36,378 in FEMA Public Assistance funding for road & drainage repair. Undersized culverts resulted in flooding that lasted for several hours, but overall it was short lived. Roads that were closed included Kimball Pond Road, which was closed for several months while repairs were completed. Ray Road closes on an annual basis. No widespread flooding was reported, only localized.	Flood, Wind, Debris Impacted Infrastructure, Erosion, Landslide	Dunbarton Hazard Mitigation Committee, FEMA, USGS, CNHRPC
Severe Storms and Flooding - Columbus Day Flood Oct 2005	1610	2005	Oct 7-18	No	Extensive flooding caused by severe storms impacted five counties, including Merrimack and Hillsborough. Alstead experienced several fatalities as the result of dam failure.	Dunbarton did not apply for/receive funding.	Flood, Wind, Debris Impacted Infrastructure, Erosion	Dunbarton Hazard Mitigation Committee, FEMA
Regional Thunderstor	No	2005	12-Jun	N/A	During a thunderstorm, lightning struck and	Dunbarton likely experienced the	Thundersto	CNHRPC, Dunbarton

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
ms and Lightning Jun 2005					severely damaged the historic Loudon Town Hall on Clough Hill Road. Winds from a severe thunderstorm knocked down trees and power lines down in the towns of Warner, Hopkinton, Concord, Bow, Loudon, and Hopkinton in Merrimack County.	thunderstorm and lightning event	Lightning, Severe Winds	Hazard Mitigation Committee, Area Hazard Mitigation Committees
Snow Emergency Jan 2005	EM-3207	2005	Jan 22-23	\$5,079	Record and near record snowstorm for 8 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	Dunbarton received \$5,079 in FEMA Public Assistance funding for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
Hazard Events 1973-2004								
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 from Dunbarton residents feeling the earthquake as a rumble or loud noise. The epicenter was only 1-2 communities away from Dunbarton.	Earth, Earthquake	Concord Monitor, January 2004, USGS, Earthquake Monitor
Snow Emergency Dec 2003	EM-3193	2003	Dec 6-7	\$8,447	Record snow fall event impacting much of New England. In NH, 8 counties received emergency protective measures, including Merrimack and Hillsborough.	Dunbarton received \$8,447 in FEMA Public Assistance funding for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
Snow Emergency Feb 2003	EM-3177	2003	Feb 17-18	No	Record and near record snowstorm for 5 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	Dunbarton did not apply for/receive funding, although the Town likely performed snow removal	Extreme Temp, Snow	FEMA

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
NH Drought Emergency Aug 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.	N/A, although Dunbarton was likely affected by dug wells going dry	Drought, Extreme Temperatures, Earth, Fire	Concord Monitor 8/20/02
Hopkinton Suspicious Powder Mailings 2002	No	2002	---	N/A	There were several reports of a powder substance being mailed to prominent State and/or Federal officials living in Dunbarton. Due to the heightened level of security for the US, the substances were tested for biological or chemical substances and the results were negative.	N/A, although Hopkinton abuts Dunbarton to the north	Sabotage, Terrorism	Hopkinton Hazard Mitigation Committee
Snow Emergency Mar 2001	EM-3166	2001	Mar 5-7	\$4,763	Record and near-record snowfall from late winter storm, emergency declaration was issued for protective measures. Merrimack, Hillsborough and 5 other counties were declared eligible.	Dunbarton received \$4,763 in FEMA Public Assistance funding for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
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 Pill building in Concord is blown off during a storm. The downburst was designated a macroburst (at least 2.5 miles in diameter).	N/A, although Concord abuts Dunbarton to the south	Severe Wind, Downburst	Concord Monitor, NH HSEM

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					Other communities in the Central NH Region experienced damages, including Hopkinton			
Dunbarton Severe Winds Mar 1999	No	1999	Mar 23	N/A	The region likely experienced high winds too.	Dunbarton was hit hard by high winds. The Union Leader reported that in Dunbarton “high winds bent a two-story metal flagpole and shredded the American flag flying on it in front of Town Hall.”	Severe Winds	Union Leader
Severe Storms and Flooding Jun-Jul 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.	Dunbarton did not apply for/receive funding. As Dunbarton is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood, Wind, Debris Impacted Infrastructure	FEMA
Ice Storm of Jan 1998	1199	1998	Jan 7-25	No	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 left without electricity, and	Dunbarton did not apply for/receive funding. Power was lost for a few hours and there was some limb damage to trees. Car accidents occurred due to ice covering the roads.	Extreme Temp, Ice Storm, Power Failure, Communications Failure	FEMA, US Army Corps of Engineers NH Storms database, Dunbarton Hazard Mitigation Committee, Bow Times

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4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					2,310 people without phone service.			
Dunbarton Windstorm/ Downburst Mar 1997	No	1997	March 6	N/A	Likely the entire region experienced high winds.	Although not specifically identified as a downburst, a strong windstorm struck the town of Dunbarton causing one severe injury. A Dunbarton police officer was on duty during the March 6, 1997 windstorm when a tree, weakened by a previous ice storm, was knocked over by the strong winds and fell onto his vehicle	Severe Winds, Downburst, Microburst	Dunbarton Hazard Mitigation Committee
Dunbarton Severe Winter Weather Dec 1996	No	1996	Dec	N/A	The region likely experienced similar snowfall.	Heavy snowfall hit the State of New Hampshire December 1996. Residents of Dunbarton lost power for several days. The Community Center in Dunbarton was opened as an emergency shelter to provide a place for people to get warm, sleep, eat or take a shower. Two dozen residents utilized the shelter	Severe Winter Weather, Extreme Temp, Snow, Ice, Power Failure, Severe Winds, Debris Impacted Infrastructure	Dunbarton Hazard Mitigation Committee
Severe Storms and Flooding Oct 1996	1144	1996	Oct 20-23	No	Heavy rains caused flooding in six counties, including Merrimack and Hillsborough Counties. Damage totaled \$2.3m for all counties.	Dunbarton did not apply for/receive funding. As Dunbarton is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood	FEMA, NH HSEM
Storms and Floods Oct-Nov 1995	1077	1995	Oct 20-Nov 15	No	Four NH counties were damaged by excessive rain, high winds and flooding, including Merrimack (not Hillsborough).	Dunbarton did not apply for/receive funding.	Flood	FEMA, Federal Register
Dunbarton Lightning Strike 1995	No	1995	Sep 23	N/A	Storms likely raged across the region.	Lightning had struck a tree in Dunbarton which burned inside for	Lightning, Wildfire	Bow Times

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
						several days before the tree ignited the surrounding woodlands in the western end of Dunbarton.		
Severe Storm-Hurricane Bob Aug 1991	917	1991	Aug 18-20	N/A for Dunbarton	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 Dunbarton is within Merrimack County, it likely experienced heavy rains, wind gusts, tree debris, power outages and possibly some flooding.	Wind, Hurricane	FEMA
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 Dunbarton is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	Flood, Wind	FEMA, NH HSEM
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.	Spring snowstorm with wet, heavy snow resulted in power/utility failures for 5-7 days.	Flood, Wind	FEMA, NH HSEM
Dunbarton Radon Testing 1986-1987	No	1986-1987	---	N/A	Radon is found throughout Central NH and the state.	In Dunbarton, a citizen initiative of well water testing, primarily around the Town Center, found that the radon levels in the community exceeded all levels in the country. The Elementary School well tested fine, but the church had a very high concentration, as well as the rest of the area at the top of the hill around the Town Offices. Residents placed filtration systems	Radon, Public Health, Hazardous Materials	Dunbarton Hazard Mitigation Committee

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
						in their homes and public buildings. The information garnered interviews with WMUR Channel 9 and a series of public meetings to raise the awareness of Town residents		
Severe Storms and Flooding Aug 1986	771	1986	Jul 29-Aug 10	N/A for Dunbarton	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).	It is likely Dunbarton experienced heavy rains and possibly some flooding.	Flood, Wind	FEMA, NH HSEM
Earthquake 4.5M Sanbornton Jan 1982	No	1982	18-Jan-82	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.	With a quake of this size, it is highly likely Dunbarton experienced some strong shaking and noise	Earthquake	Earthquaketrack.com
Concord Beaver Meadow Tornado Jul 1979	No	1979	Jul 27	N/A	In Concord, a small twister was sighted at Beaver Meadow, where 13 trees were toppled, including a 100-foot tall pine. The duration was about 15-20 seconds.	N/A, although Concord is a short distance, located north of Dunbarton	Wind, Tornado	Concord Monitor
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	Although it is unknown what Dunbarton experienced, it is likely many of the same depths and effects occurred across the Town.	Extreme Temperatures, Severe Snow Storms, Windchill, Power Failure	American Meteorological Society, Northeast States Emergency Consortium

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					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.			
Quebec Earthquake 4.8M Jul 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 the State.	N/A, although some Dunbarton residents may have felt the effects	Earthquake	Northeast States Emergency Consortium
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	Flood, Wind	FEMA
Hazard Events Before 1973								
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, 1954, Donna on April 12, 1960 (heavy flooding), Doria	Downed trees, wind damage, and flooding was likely experienced in Dunbarton during many of these hurricanes.	Wind, Flood, Hurricane, Tropical Storm, Debris Impacted Infrastructure	NH Homeland Security and Emergency Management, Dunbarton Hazard Mitigation Committee

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
					on August 28, 1971, Bell on August 10, 1976, Gloria on September 27, 1985, and Bob in 1991.			
10 Severe Snowstorms 1940-1978	No	1940	to 1978	N/A	Ten severe snowstorms are documented in south-central New Hampshire during this time span, February 14-15, 1940 (depths over 30" and high winds), February 14-17, 1958 (20-33"), March 18-21, 1958 (22-24"), March 2-5, 1960 (up to 25"), January 18-20, 1961 (up to 25", blizzard conditions), January 11-14, 1964 (up to 12"), January 29-31, 1966 (up to 10"), February 22-28, 1969 (24-98", slow-moving storm), December 25-28, 1969 (12-18"), January 19-21, 1978 (up to 16").	Although it is unknown what Dunbarton experienced, it is likely many of the same depths occurred.	Extreme Temperatures, Severe Snow Storms, Ice, Windchill, Power Failure	American Meteorological Society
Dunbarton 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	Although high winds produced by the hurricane proved to be most destructive, it is unknown whether any areas of the community experienced flooding. One non-flooding effect of the 1938 hurricane was the dumping of logs in Kimball Pond and Stark Pond to preserve them until they could be processed. This was a common way to store logs during the hurricane. The presence of mercury in the logs had an unknown effect on the water quality and aquatic environment.	Wind, Hurricane, Flood, Debris Impacted Infrastructure	Wikipedia, Concord Monitor, Dunbarton Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Dunbarton	Local Effects Occurring in Dunbarton	Hazard Category	Source
Dunbarton 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 flooding of 1936 resulted from heavy rains and rapid snow pack melt. Snow north of Concord contributed to the higher waters in the Winnepesaukee, Contoocook and Pemigewassett rivers that were largely responsible for the destruction in Concord and the surrounding area. NH issued boil water warnings to everyone.	Houses and three covered bridges being destroyed by the flood in other towns but no major damage in Dunbarton due to its elevated location.	Flood, Ice Jams, Rapid Snow Pack Melt	Concord Monitor, Union Leader, Army Corps of Engineers Ice Jam Database, Dunbarton Mitigation Committee

Source: Compilation of Events by Dunbarton Hazard Mitigation Committee; CNHRPC

Description and Magnitude of Hazards

A compilation of past hazards that have occurred in Dunbarton 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.

Each hazard is generally described and then is noted how and where it could occur in Dunbarton. For all hazards examined in this Plan, a table of the **Hazard Locations in Town** and the **Potential Future Hazards** is provided at the end of this Plan Chapter.

Cumulative hazard events were researched using a wide variety of sources for the **original Dunbarton Hazard Mitigation Plan 2005** and the **2011** and **2017 Plan Updates** which were the basis for many of the past disaster events and then were updated to the present day. The **2017 Plan** provided recent information on many of the extreme disasters experienced between **2005-2008**. Sources and techniques included interviewing local townspeople, researching Town Histories and related documents, and collecting information from governmental or non-profit websites. Presidentially declared disasters or other significant hazard events are described for the surrounding area or Merrimack County for the **Hazard Mitigation Plan Update 2023** and some of them may have affected the community. These disasters were also considered by the Committee when determining the risk evaluation.

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.

Numeric of Probability and Severity	CONCERN SUMMARY	Numeric of Overall Risk Score
1	LOW	1 - 4.9
2	MEDIUM	5 - 7.9
3	HIGH	8 - 11.9
4	HIGH	12 - 16

EARTH HAZARDS

Earth hazards include geologic events such as the small earthquake NH residents experience. The Central NH area is seismically active and small earthquakes (less than **2.5** magnitude on the Richter Scale) occur about **1-2** times per year. Landslides can occur because of earthquakes, rain, flooding and result in erosion along roadways and watercourses.

Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire, seeping into homes from basements. Radon may also enter homes dissolved in drinking water from drilled wells. High levels of radon in water from individual drilled wells is a common occurrence in New Hampshire. Radon is no longer being addressed by the [State of New Hampshire Multi-Hazard Mitigation Plan 2018](#) as no new studies have made specific data available. It is generally known that radon exists throughout in the State and in communities, including the Central NH Region. Arsenic is a new concern that often co-occurs with radon. Radon is known to be present throughout New Hampshire and is addressed on an individual basis, no longer addressed in the **Dunbarton Hazard Mitigation Plan** because of the lack of State monitoring and available action.

There are several types of **EARTH** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included		
EARTH	DROUGHT	EARTHQUAKE	LANDSLIDE Soil, Rockslide or Excavation Areas

Drought

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
DROUGHT	3 HIGH	3 HIGH	3 HIGH	2 MEDIUM	8.0 HIGH

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are becoming less rare in New Hampshire that they have been in the past. They have different, widespread damages compared with floods and are more difficult to define. 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) and Town water supplies would be threatened. The Town has the capability to implement or recommend volunteer water restrictions during dry conditions within the district area. The remaining 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 **2015-2020** drought period, 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 farms, 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 larger water sources for pumping into tankers.

Magnitude of Drought

Table 13 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](https://droughtmonitor.unl.edu/AboutUSDM/AbouttheData/DroughtClassification.aspx) 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 13
US Drought Monitor Intensity Scale

Category	Description	Description of Possible Impacts	Palmer Drought Severity Index (PDSI)
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 or less

Source: <https://droughtmonitor.unl.edu/AboutUSDM/AbouttheData/DroughtClassification.aspx>
as compiled by CNHRPC, accessed 02-22-19

Earthquake

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
EARTHQUAKE	2 MEDIUM	2 MEDIUM	2 MEDIUM	2 MEDIUM	4.0 LOW

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 Dunbarton'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.

Magnitude of Earthquake

Earthquake hazard magnitude can be measured by the Richter Scale as shown in **Table 14**, just as its 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 14** 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 14

Modified Mercalli and Richter Magnitude Scales

Approx Richter Magni- tude Scale	Mercalli Instru- mental Intensity Scale	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 great earthquakes at distances beyond which the quakes are 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.	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.
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	N/A

4 HAZARD RISK ASSESSMENT

Approx Richter Magni- tude Scale	Mercalli Instru- mental Intensity Scale	Damage Category	Perceived Shaking	Potential Impacts			
				People's Reaction	Furnishings	Built Environment	Natural Environment
						severe in historic or some poorly built structures. Widespread fall of chimneys, walls and monuments. Powerlines fallen.	
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				Total damage. Lines of sight and level are distorted. Objects thrown into air.	Waves seen on the ground

Source: National Oceanic and Atmospheric Administration (NOAA), USGS and other sources compiled by CNHRPC Feb 2021

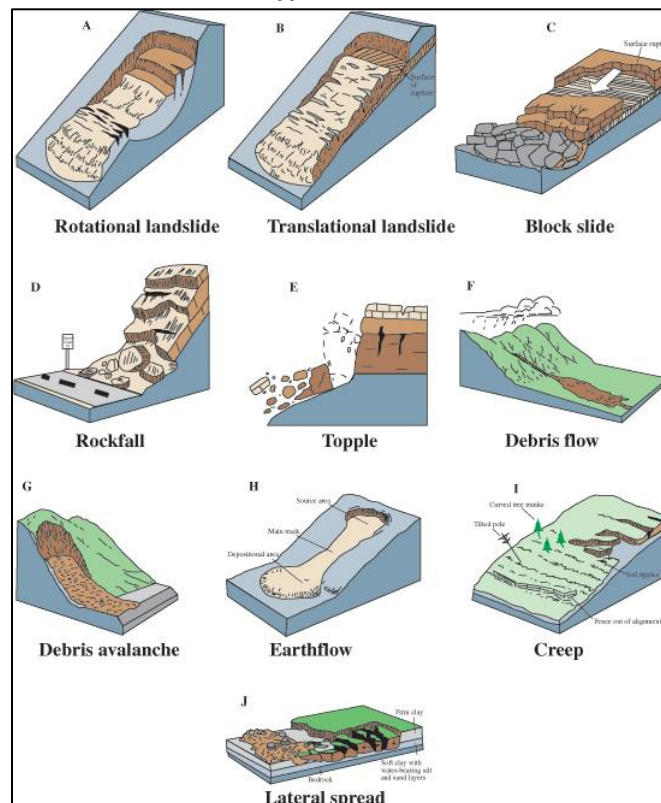
Landslide

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
LANDSLIDE	1 LOW	1 LOW	1 LOW	1 LOW	1.0 LOW

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. A display of different types of landslides is shown in **Figure 6**.

Figure 6
Basic Types of Landslides



Source: US Geological Survey (USGS)

Magnitude of Landslide

There is no known standardized measurement of landslide magnitude available.

EXTREME TEMPERATURE HAZARDS

Extreme temperature hazards include diverse hazards such as severe cold or windchill, excessive heat, and heatwaves. Excessive heat or extreme cold can create other hazards such as public health issues, utility outages. The severity of these hazards is influenced by New Hampshire’s changing climate and severe weather systems. This category is meant to encompass all the hazards which can be influenced by the extreme weather temperatures that New England, New Hampshire, the Central NH Region, and Dunbarton are experiencing.

There are several types of **EXTREME TEMPERATURE** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included
EXTREME TEMPERATURES	EXTREME TEMPERATURES Excessive Heat, Heat Wave, Cold or Wind Chill

The environmental temperature spectrum is addressed under extreme temperatures, from very cold to very hot.

The overall ratings of **Extreme Temperatures** in Dunbarton from the **HIRA** are:

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
EXTREME TEMPERATURES Excessive Heat, Heat Wave, or Cold or Wind Chill	4 HIGH	2 MEDIUM	2 MEDIUM	2 MEDIUM	8.0 HIGH

Extreme Heat or Heatwave

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**.

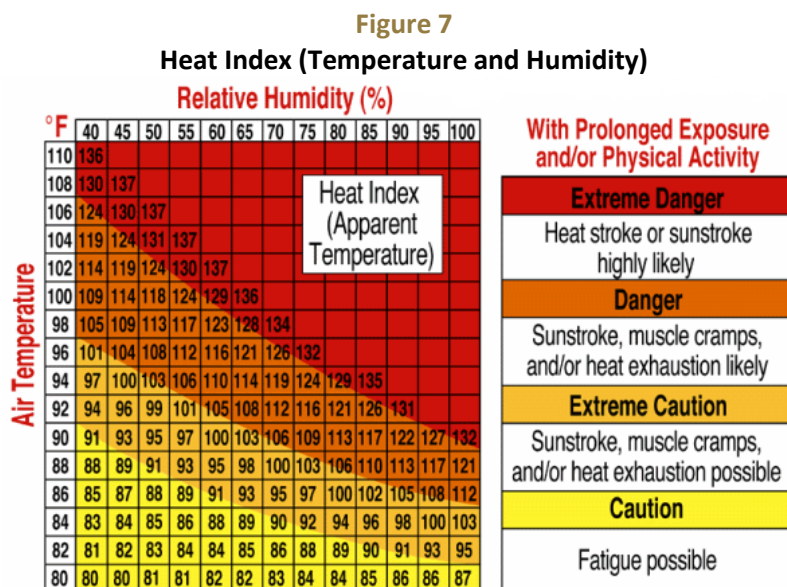
The National Weather Service categorizes a **Hot Day** when temperatures reach **90°** or warmer. An official **Heat Wave** is defined as three or more consecutive days with the temperature reaching or exceeding **90°**.

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.

<p>🌡️ Excessive Heat Watch</p> <p>BE PREPARED</p>	<p>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.</p>
<p>🌡️ Excessive Heat Warning</p> <p>BE AWARE</p>	<p>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.</p>
<p>🌡️ Heat Advisory</p> <p>TAKE ACTION</p>	<p>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</p>

Magnitude of Excessive Heat of Heat Wave

Excessive heat is measured by the [NWS Heat Index and the NWS 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 **Figure 7**.



Source: weather.gov

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**. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

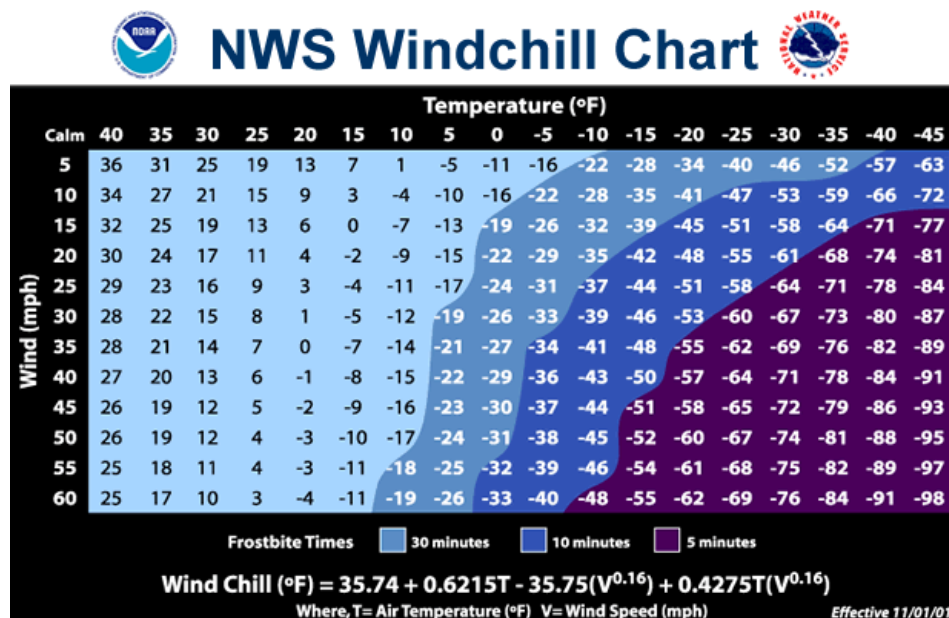
Extreme Cold or Wind Chill

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.

Magnitude of Extreme Cold or Wind Chill




Extreme cold magnitude can be measured for **windchill** using the **NWS Windchill Temperature (WCT) Index** as displayed in **Figure 8**, 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.

Figure 8
Windchill Temperature (WCT) Index







Source: [National Weather Service](https://www.weather.gov/eaa/windchill)

Cold weather warnings incrementally warn people of the dangers of **extreme cold**. The [National Weather Service](#) provides watches, advisories, and warnings.

 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 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 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 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.

FIRE HAZARDS

Fire can be caused by several agents and can spread rapidly to consume property and endanger lives. This **2023 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**.

There are several types of natural **FIRE** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included	
FIRE	WILDFIRE Brushfire, Outdoor Fires or Accidental	LIGHTNING

Wildfire

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
WILDFIRE Brushfire, Outdoor Fires or Accidental	4 HIGH	2 MEDIUM	1 LOW	3 HIGH	8.0 HIGH

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 has decreased capability to extinguish wildfires. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure and cultural and economic resources.

Magnitude of Wildfire






Although there are several potential indices, the current standard of measuring wildfire magnitude is utilizing the National Wildfire Coordinating Group (NWCG)'s wildfire classification scale. **Table 15** displays the wildfire classification size per the number of acres burned.

Table 15
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 information in a prominent location, at the Fire Station. The **National Fire Danger Rating System (NFDRS)** categories are as follows:

 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.

Lightning

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
LIGHTNING	4 HIGH	1 LOW	1 LOW	2 MEDIUM	5.3 MEDIUM

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 more provides information about [lightning safety](#).

Magnitude of Lightning

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 [Lightning Activity Level \(LAL\)](#) measures the magnitude of lightning strikes as displayed in **Table 16**.

Table 16
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

Source: National Weather Service

FLOOD HAZARDS

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 farm and by enriching 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.

There are several types of **Flood Hazards** examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included	
FLOOD	INLAND FLOODING Rains, Snow Melt, or Flash Floods	RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris
	DAM FAILURE Water Overtop, Breach, Beaver, etc.	

Inland Flooding

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
INLAND FLOODING Rains, Snow Melt or Flash Floods	3 HIGH	1 LOW	3 HIGH	2 MEDIUM	6.0 MEDIUM

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.

Magnitude of Inland Flooding

Flooding magnitude, or how severe flooding could occur in Dunbarton, can be measured by the following SFHA Flood Zone scale in **Table 17**. “Flood” encompasses all types of flooding including **Rains, Snow Melt, Floods and Flash Floods** and is often the result of other natural hazards, such as **Tropical and Post Tropical, Severe Storms**, etc.

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 DFIRMs of **2009** (Hillsborough County) and **2010** (Merrimack County). In Dunbarton (**#330202**) 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 Dunbarton are now set on an aerial photography background that displays roads, buildings, forested areas, waterbodies and watercourses. Dunbarton’s Zoning Ordinance references the **2010** maps appropriately as the official DFIRMS. The general Flood Zone types appear in **Table 17**.

Table 17
Special Flood Hazard Area (SFHA) Zones on 2010 DFIRMS

Special Flood Hazard Areas on Dunbarton 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

Dunbarton DFIRMs can be viewed online at and downloaded from the [NH Geographically Referenced Analysis and Transfer System \(NH GRANIT\)](#) website. Alternatively, the DFIRMs' respective paper FEMA 2010 Floodplain Maps in the Town Office could be consulted. 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.**

Rapid Snowpack Melt

Warm temperatures and heavy rains cause rapid snowmelt. The water cannot seep into the frozen ground in early spring and so it runs off into streets and waterways. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

There is the possibility of damages from the rapid snowpack melt because of the flooding from the various brooks along the roads, roadside wetlands, and from the culverts directing the watercourses. Locations in Dunbarton that may be vulnerable to rapid snowpack melt include undersized or unmaintained culverts, roads, driveways, slopes, yards or fields, or any of the Town's fast-moving brooks or drainage areas. Damage to roads is expected.

Magnitude of Rapid Snowpack Melt

Rapid snowpack melt is a type of flooding. On its own, it has no known magnitude measurement. However, the hazard can share **Flooding's** Special Flood Hazard Areas (SFHAs) table, or the list of road washouts found later in this **4 HAZARD RISK ASSESSMENT** chapter.

River Hazards

There are several types of **RIVER** hazards examined in the **Hazard Identification and Risk Assessment:**

Main Hazard Category	Specific Hazards Included
RIVER	RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris

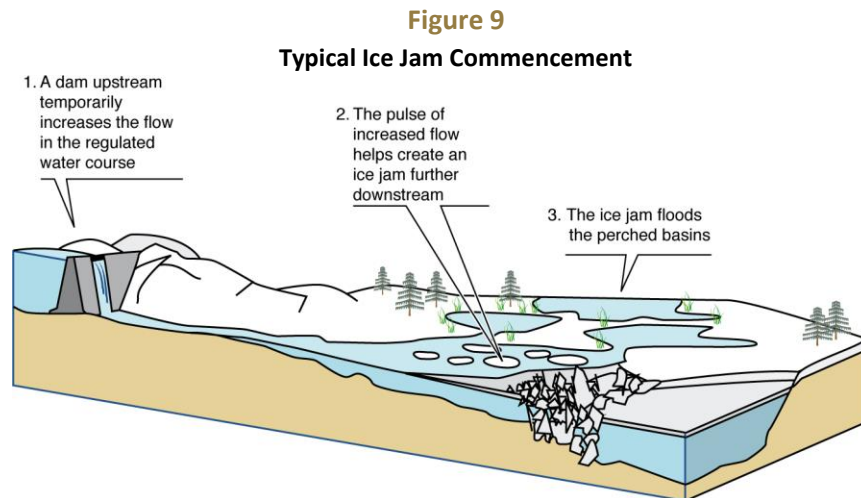
River hazards are considered different from flooding in this **Hazard Mitigation Plan**. They include ice jams, scouring of banks and infrastructure, erosion of banks and shoreline, channel movement, and woody material debris. These types of incidents could occur on large brooks or other watercourses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

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris	4 HIGH	1 LOW	1 LOW	1 LOW	4.0 LOW

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. A visual of how ice jams often form is displayed in **Figure 9**.



Source: USGS, Internet Accessed May 2015

Magnitude of River Ice Jams

There is no known widely-used magnitude scale for **river ice jams**. River ice jams can cause debris impacted infrastructure when they apply pressure to bridges and dams.

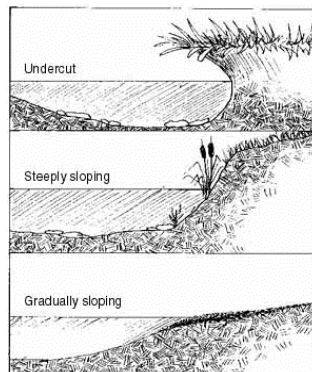
The US Army Corps of Engineers (ACOE) maintains the [Ice Jam Database, Bulletins & Surveys](#) website which locates where known ice jams are presently occurring and where they have occurred in the past. Reports can be generated in various formats so emergency responders can identify the locations of 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. **Figure 10** displays visual bank erosion characteristics. In Dunbarton, fluvial geomorphology is most pertinent to the larger brooks.

Figure 10
Bank Erosion Characteristics



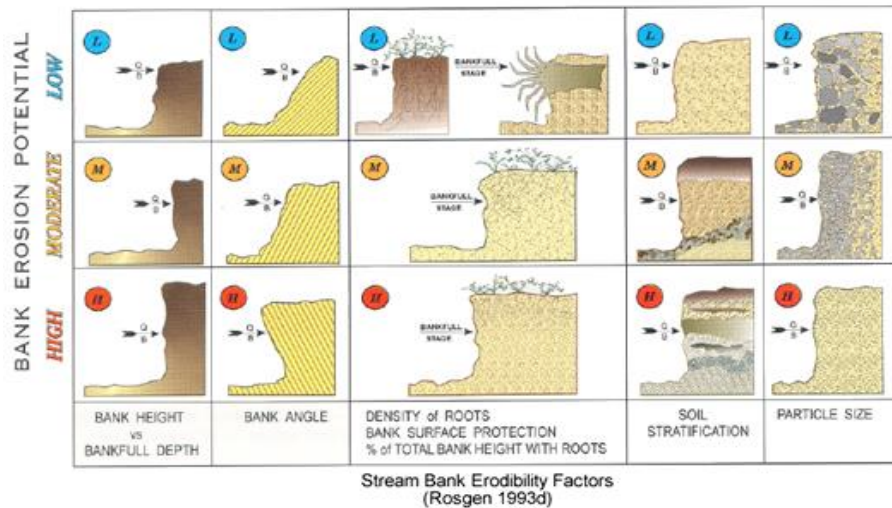
Source: US Geological Survey (USGS)

Magnitude of (Fluvial) Riverbank Erosion

River and streambank erosion magnitude can be measured by the US EPA Bank Erosion Prediction Index (BEHI), which is used with the Near Bank Stress (NBS) quantification. Taken into consideration for the BEHI are the bank height versus bankfull depth, bank angle, density of roots, soil stratification, and particle size at a river reach. **Figure 11** displays the visual version of the index.

Figure 11

Bank Erosion Prediction Index (BEHI)



Source: US Environmental Protection Agency (US EPA)

Dam Failure

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.

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
DAM FAILURE Water Overtop, Breach, Beaver, etc.	4 HIGH	1 LOW	1 LOW	1 LOW	1.0 LOW

Magnitude of Dam Failures

Although dam failure is considered a **Technological Hazard**, it 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](#) shown in **Table 18**.

Table 18
New Hampshire Dam Hazard Classifications

Dam Classification		
NON-MENACE Structure		Inspection
NM	Means 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 six 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	Means 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 two-acre-feet and is located more than 250 feet from a water body or water course. ○ Reversible environmental losses to environmentally-sensitive sites. 	
SIGNIFICANT Hazard Structure		Inspection
S	Means 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. ○ 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	Means 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:	Every 2 years
	<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. 	

Source: NH Department of Environmental Services (NHDES) Dams Bureau [Fact Sheet WD-DB-15](#), 2012

PUBLIC HEALTH HAZARDS

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 could occur in Dunbarton. 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 **deer 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.

There are several types of **PUBLIC HEALTH** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included
PUBLIC HEALTH	PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral or Tick-borne

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 Dunbarton. The Town of Dunbarton is an active member of the [Capital Area Public Health Network](#) and has a designated Point of Dispensing (POD) location at the NH Technical Institute Community College in Concord.

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral, or Tick-borne	4 HIGH	3 HIGH	3 HIGH	1 LOW	9.3 HIGH

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 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.

The NH Department of Health and Human Services maintains a [COVID-19 dashboard website](#) with current information, statistics, legislation, and testing locations, and resources. Social distancing (staying at least **6** feet away from people outside of one's household), wearing cloth 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. Two years into the pandemic (**Mar 2020-Mar 2022**), people throughout the state and United States were feeling stifled and restrictions eased, a surge of new cases occurs even as vaccines are administered. Home testing and self-quarantining became possible.

Within the last **14** days **September 13-27**, **3** Dunbarton cases were reported. Cumulatively, as of **September 26, 2022**, **693** Town of Dunbarton cases tested/reported positive for the deadly respiratory coronavirus COVID-19. During this same time, **923** Merrimack County cases tested positive. In New Hampshire, new cases total **7,276** within the last **14** days.

Since **March 2, 2020**, a total of **128,047** NH cases tested positive for COVID-19. Of these, **13,128** cases are those who reside in Merrimack County. Vaccinations began in **December 2020** over a planned phasing process for New Hampshire residents. As of October 2022, **65.5%** of the state's population completed vaccinated and **75.3%** of those obtained a booster. See **Figure 12** and **Figure 13** for case details. With home testing available, only those people consulting a doctor will be counted toward a coronavirus case; as such, cases are sure to be under-reported

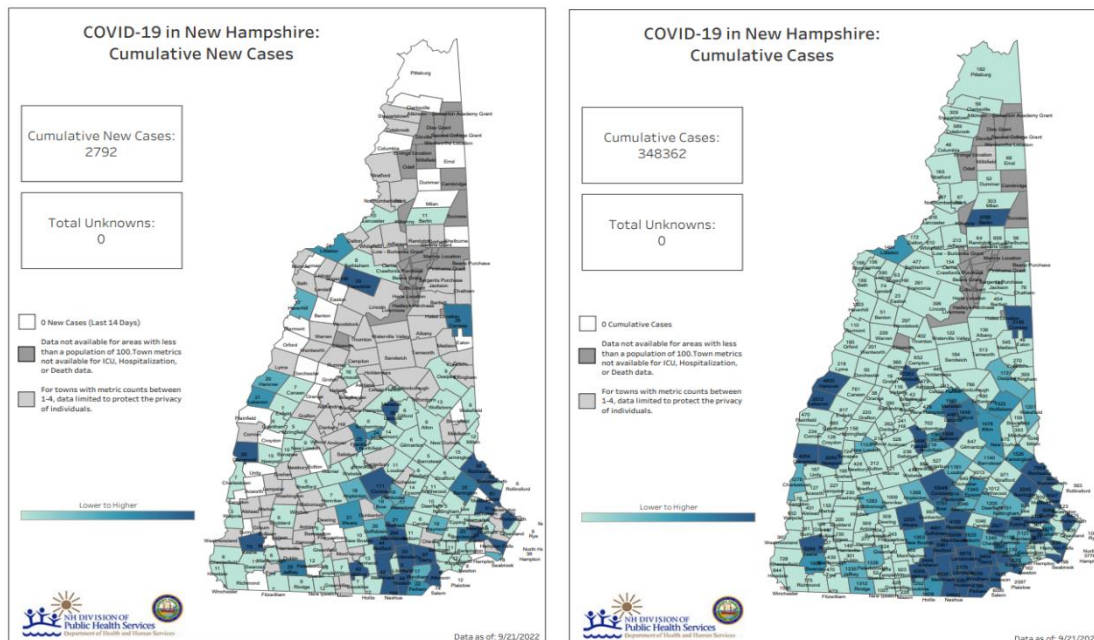
Vaccinations began in **December 2020** over a planned phasing process for New Hampshire residents. As of September 2022, **65.5%** of the state's population completed vaccinated and **75.3%** of those obtained a

booster. See **Figure 12** and **Figure 13** for case summaries. With home testing available, only those people consulting a doctor will be counted toward a coronavirus case; as such, the number of cases are sure to be under-reported and under-counted.

To date as of **September 2022**, with over **96 million** positive cases in our country, over **1.1 million** people have died in the United States alone from COVID-19 complications. Globally, nearly **613 million** people have tested positive and nearly **6.5 million** people have died to date per the [Johns Hopkins Coronavirus Resource Center](https://www.jhu.edu/coronavirus). The pandemic is ongoing as of the writing of this **Plan** and will be a serious long-term problem for humans, especially as new variants in the coronavirus emerge and coronavirus may be becoming endemic.

Figure 12

Current New 14 Days NH COVID-19 Cases and Cumulative (Total) NH COVID-19 Cases through 09-22-22

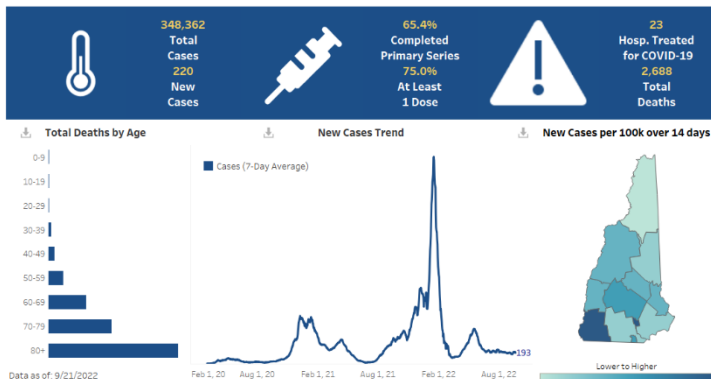


New Hampshire announced **220 cases** on September 21. There were an average of **193 cases per day** over the most recent 7-day period (September 15 to September 21). This is a **6% decrease** compared to the previous 7-day period.



Figure 13

NH COVID-19 Statistics Overview to 09-22



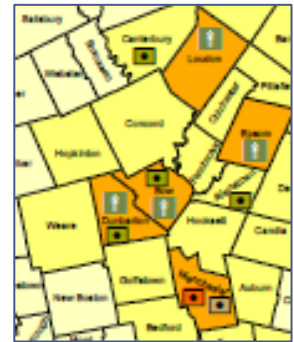
Source for Figures: NH Division of Health and Human Services Dashboard COVID-19
<https://www.nh.gov/covid19/>

Influenza (Respiratory Infectious)

A magnitude scales for **Pandemic Severity Index (PSI) for Influenza** and resulting Community Mitigation Strategies is available from the US Center for Disease Control (US CDC). The [State of New Hampshire Influenza Pandemic Public Health Preparedness and Response Plan 2007](#) included the **PSI for Influenza** classification system and the Community Strategies. As a growing high-density community, Dunbarton may be particularly vulnerable to influenza.

Arboviral Transmission Diseases

New Hampshire developed guidelines for phased response to the arboviruses (mosquito-borne) Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV) and Jamestown Canyon Virus (JCV). Annually, the [NH DHHS publishes the State of New Hampshire Arboviral Illness Surveillance, Prevention, and Response Plan 2021](#) and its associated [Arboviral Risk Map 2021](#). Risk Categories determine human illness probability and the recommended response to outbreaks. Regionally, cases of Jamestown Canyon Virus (JCV), human Jamestown Canyon Virus (JCV), and West Nile Virus (WNV) have made appearances in 2020 and 2021.



The new [State of New Hampshire Zika Virus Response Plan 2018](#) describes Response Phases **0** to **3** and is written like an Emergency Operations Plan Annex for emergency responders to follow.

The NH DHHS and the Capital Area Public Health Network should be notified of all public health emergencies, no matter the type of threat. One Dunbarton resident tested positive in 2021 for Jamestown Canyon Virus.

Tick-borne Transmission Diseases

Tick-borne diseases are increasing in New Hampshire, and now include Lyme Disease, Anaplasmosis, Babesiosis, Powassan Virus, and more. These are all carried by the black legged tick in New Hampshire. The State has currently stopped producing annual maps and updates of tick-borne disease locations, but they have other resources available such as the [2015 State of NH Tickborne Diseases Prevention Plan](#). Check back here at the NH Department of Health and Human Services for future updates: <https://www.dhhs.nh.gov/dphs/cdcs/lyme/index.htm>. No increase in Lyme Disease in Dunbarton residents has been noted.

Air and Water Quality Decline

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.

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. Various publications describe the NHDES efforts understand how damage to infrastructure from natural hazards such as **Inland Flooding** and spring **snow melt** runoff can occur to create more resilient water systems.

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 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 is impacted by industries and wildfires across the United States and Canada. Greenhouse gases from industrial pollution and manufacturing contributes to poor **air quality**.

The NH DHHS maintains [NH Health WISDOM](#), a database 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.

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 AP 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. Cyanobacteria have toxins that attack the human nervous system. Freshwater beach standards for e. coli is 1 sample > 158 counts/100 ml.

Dunbarton should be concerned about **milfoil** infestation especially at Gorham Pond, but also at the Hopkinton-Everett Reservoir. Rivers can carry invasive species like **zebra mussels**. The public beaches on Gorham Pond could be subject to such biological hazards. The [NHDES OneStop](#) data resource center can be accessed to provide reports on potential water hazards.

Opioid Endemic

New Hampshire has seen a rise in the number of heroin and opioid deaths over the last few years. Even Dunbarton 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 made national headlines in 2014, 2015 and 2016 for its problems with overdoses and its public recognition of the problem. A particular concern to Dunbarton officials and the Dunbarton Police Department workers is the illegal drug manufacture, usage and overdose that continues to occur in the community. By 2022, misuse of opioids had declined slightly in comparison with previous years, not as prevalent in the public eye because of COVID-19. The [New Hampshire Drug Monitoring Initiative](#) is an online map and data viewer portraying the state's and counties' statistics for EMS drug overdose or abuse incidents, EMS Narcan administration, opioid-related emergency department visits, drug overdose deaths, and other metrics. The data available to the public is aggregated, but health care personnel and emergency responders have more specific figures available for communities. The age group of **30-39** years old has the greatest number of drug overdose/abuse incidents.

Magnitude of Public Health

The [2018 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.

The magnitude and severity of infectious diseases are described by its 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:

§ 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.

SOLAR STORMS HAZARDS

Solar storms and space weather is a new addition to the **Hazard Mitigation Plan** and 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.

There are several types of **SOLAR STORMS** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included
SOLAR STORMS	SOLAR STORMS AND SPACE WEATHER Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout

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.

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
SOLAR STORMS AND SPACE WEATHER Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout	3 HIGH	1 LOW	4 HIGH	4 HIGH	9.0 HIGH

Magnitude of Solar Storms

Many in residents in the Central NH region enjoy the aurora borealis viewed from Mount Kearsarge, visible to Dunbarton in the north, although when this phenomenon occurs a geomagnetic storm is reaching New Hampshire. 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 Dunbarton. NOAA's Space Weather Prediction Service <https://www.swpc.noaa.gov/> provides 3-day outlooks on solar storms. Magnitude scales for **Radio Blackout (R)**, **Geomagnetic Storms (G)** and **Solar Radiation Storms (S)** are provided in **Table 19**.

Table 19
Solar Storms Magnitude Scales

Magnitude Scale	Description	Effect of Space Storm	Average Frequency (1 cycle = 11 years)
GEOMAGNETIC STORM (G)			
G1 Geomagnetic	Minor	<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). 	1700 per cycle (900 days per cycle)
G2 Geomagnetic	Moderate	<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	<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)
G4 Geomagnetic	Severe	<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	<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)
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	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. 	10 per cycle

4 HAZARD RISK ASSESSMENT

Magnitude Scale	Description	Effect of Space Storm	Average Frequency (1 cycle = 11 years)
Solar Radiation		<ul style="list-style-type: none"> ✦ 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. 	
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. ✦ Other systems: Complete blackout of HF (high frequency) communications possible through the polar regions, and position errors make navigation operations extremely difficult. 	Fewer than 1 per cycle
RADIO BLACKOUT (R)			
R1 Radio Blackouts	Minor	<ul style="list-style-type: none"> ✦ 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. 	2000 per cycle (950 days per cycle)
R2 Radio Blackouts	Moderate	<ul style="list-style-type: none"> ✦ 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	<ul style="list-style-type: none"> ✦ 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	<ul style="list-style-type: none"> ✦ 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	<ul style="list-style-type: none"> ✦ 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

Source: <https://www.swpc.noaa.gov/noaa-scales-explanation>

WIND HAZARDS

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 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.

There are several types of **WIND** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included	
WIND	HIGH WIND EVENTS Wind, Thunderstorms, Hail, Downbursts, Tornadoes or Debris	TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms or Tree Debris

High Wind Events

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

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
HIGH WIND EVENTS Wind, Thunderstorms, Hail, Downbursts, Tornadoes or Debris	4 HIGH	2 MEDIUM	3 HIGH	2 MEDIUM	9.3 HIGH

Severe Wind, Rainstorms and Thunderstorms

More commonly experienced are **severe windstorms**, **rainstorms** and **thunderstorms**. The severe windstorms occur during all months of the year while the 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 in addition to severe winds and flooding.

There are several **types of thunderstorms**: **ordinary cell** – short lived and not severe, brief rain and lightning; **multi-cell cluster** – several cells working as one, garden-variety storms lasting up to an hour with hail, strong winds, brief tornadoes, and/or flooding; **multi-cell line (squall line)** – group of thunderstorms extending laterally for hundreds of miles long but only 10-20 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.

Magnitude of Severe Wind and Thunderstorms

The majority of the severe wind events Dunbarton experiences are not hurricanes but are severe windstorms or thunderstorms. Thunderstorms are common in New Hampshire, particularly during the hot weather months. The National Weather Service (NWS) has recently revised its storm warning criteria to better convey the severity and potential impacts from thunderstorm, winds, and hail. The new Impact-Based Warning format uses bullet points issued by the NWS for Severe Thunderstorm Warnings (SVR), Severe Weather Statements (SVS), and Tornado Warnings (TOR) to organize and consolidate public warnings to identify the Hazard, Source, and Impact & Location of hazards in these alerts. A summary of the thunderstorm damage threats is provided in **Table 20**.

Table 20
Damage Threats for Severe Thunderstorm Warnings


Thunderstorm Damage Threat	Wind >	Hail Diameter >	Wireless Emergency Alert (WEA)	Impact
Base (Normal Severe Thunderstorm)	> 58 mph (60 mph will appear in the warning)	>1" Inch (US Quarter)	No	Damage expected to be at base level.
Considerable	> 70 mph	>1.75" (Golf-ball)	No	People and animals outdoors will be injured. Hail damage to vehicles is expected. Expect considerable tree damage. Wind damage is also likely to mobile homes, roofs, and outbuildings, and powerlines.
Destructive	> 80 mph	>2.75" (Baseball)	Yes	People and animals outdoors will be severely injured. People should move to an interior room on the lowest floor of a building. Expect shattered windows, extensive damage to roofs, siding, and vehicles. Expect downed trees and powerlines.

Source: National Weather Service [New Damage Threat Categories for Severe Storm Warnings](#), 2021

The NWS Storm Prediction Center issues [Day 1, 2 and 3 severe weather outlook](#) forecasts with risk categories up to 3 days out. They consist of 6 categories: 0- Thunderstorm, 1-Marginal, 2-Slight, 3- Enhanced, 4-Moderate and 5-High and are color-coded from an easy green to an escalated pink. A Level 1 Marginal risk consist of isolated and short-lived severe thunderstorms that have limited intensity; usually these storms will have winds between 40-60 mph, hail up to 1" and is a low tornado risk. A Level 2 Slight risk involves scattered severe storms that are also short-lived with isolated intensity; that consist of 1-2 tornadoes possible, strong winds and wind damage. A Level 3 Enhanced risk deals with numerous and persistent severe storms with a few intense ones; that produce a few tornadoes and several reports of wind damage. A Level 4 Moderate risk thunderstorm will have widespread and long-lived severe storms that are long-lived and intense; that include strong tornadoes, widespread wind damage and large hail. A Level 5 High risk thunderstorm is widespread, long-lived and are very intense storms involved in a tornado outbreak or significant wind damage such as straight-line winds (derechoes). **Figure 14** displays these categories:

Figure 14
Severe Thunderstorm Risk

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.



National Weather Service

www.spc.noaa.gov



Source: <https://www.spc.noaa.gov/> 2021

Tornadoes

Significantly high winds that 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 be in excess of one-mile wide and **50** miles long. Violent winds and debris slamming into buildings cause the most structural damage.

Magnitude of Tornadoes

A tornado occurring in Dunbarton 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. Tornado magnitude is measured by the [Enhanced Fujita \(EF\) Scale](#), a 2007 update from the original F-scale (Fujita Scale) and is provided in **Table 21**.

Table 21

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

Source: National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center

<https://www.weather.gov/oun/efscale>

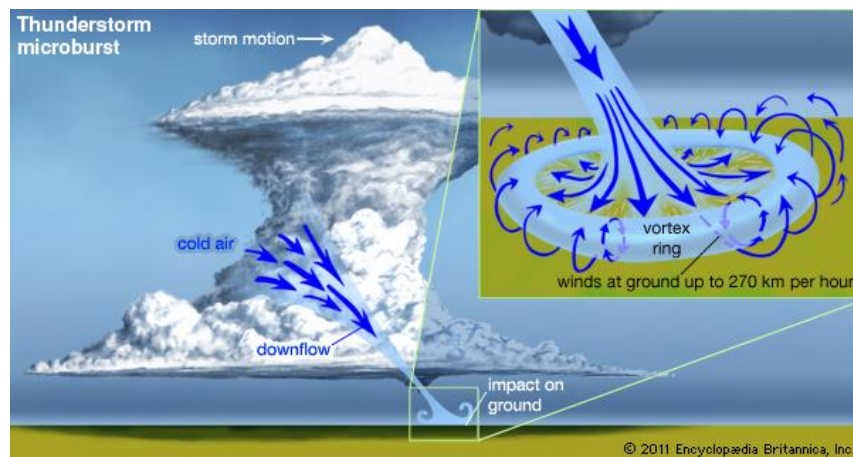
The center and northern sections of the Town are forested and its Class V and Class VI gravel roads run the risk of isolation through **debris impacted infrastructure** (trees down on roads and powerlines) after a **tornado**, resulting in **power failure** with little emergency access until the way is cleared. Wooded and forested sections of Town are vulnerable to tree fall. One-egress roads and remote neighborhoods are especially at risk to the impacts of high wind events, including tornadoes.

Downbursts

A downburst is a severe localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts can produce winds of up to **175** 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 of both sizes 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, shown in **Figure 15**.

Figure 15



Microburst Forming from Thunderstorm Clouds

Source: Internet (Encyclopedia Britannica)

Another wind with thunderstorm squall lines is a **derecho**. Derechos are straight-line winds associated with a downburst. They blow out in front of the squall line and are the strongest winds created by the downburst. This happens because the movement of the storms is already in that direction. Derechos can be as large as **200** miles wide 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.

Magnitude of Downbursts

Downburst magnitude is rated on the same **Enhanced Fujita (EF)** scale as tornadoes. In addition, downbursts fall into two categories:

- microburst, which covers an area less than **2.5** miles in diameter and
- macroburst, which covers an area equal to or greater than **2.5** miles in diameter.

Debris Impacted Infrastructure

The immediate result of severe wind events becomes another hazard, **debris impacted infrastructure**. The infrastructure could include roads, culverts, powerlines, utility lines, water towers, bridges or dams. Infrastructure could also be the natural infrastructure, such as rivers, ponds, lakes and brooks.

Typically, trees and woody material and debris are blown down from **severe wind events** causing **debris impacted infrastructure**. Watercourses, including the rivers, brooks, intermittent streams, and ditches alongside roads, and stationary waterbodies such as lakes, ponds, wetlands, swamps, bogs, and wet meadows receive trees, leafy material and other debris and can then **flood** their banks, **overflow culverts**, or cause **road washouts** during certain conditions. Trees and limbs falling on power lines, substations, or communications towers cause **power failure** and **live wire danger**. Trees and limbs falling onto roadways can **road blockages** and **transportation crashes**. Debris from wind could include roofs, siding, shingles, and more from buildings which can cause potential human injury as well as **road blockages**, **power failure** and **live wire danger**.

These features inventoried in **APPENDIX A Critical and Community Vulnerability Assessment** are those which should be watched carefully before and after storms and should be checked and maintained regularly to reduce the risk of significant **debris impacted infrastructure** events. **Erosion** along the rivers can cause scouring to infrastructure such as bridge abutments, and woody debris can flow downstream to become hazards to the landowners who have shoreland frontage.

Most dams and bridges could experience **debris impacted infrastructure**. Debris generated during storms and winds could continue for many years. This woody material debris is a concern during and after storm events. For emergency removal, the Town could contact the NH Department of Environmental Services and remove the trees right away, obtaining a “retroactive permit” during emergency situations.

Bridges vulnerable to debris dislodged during storm events may be eligible for NH Bridge Aid funding to help rehabilitate these bridges. All outlying roads are susceptible to tree fall and downed powerlines from **severe wind events**.

Magnitude of Debris Impacted Infrastructure

There is no standardized scientific scale for debris impacted infrastructure. However, the [US Federal Highway Administration](#) rates the potential for river/brook debris delivery to the infrastructure site and for river/brook accumulation across an infrastructure span. These can be utilized for hydrologic debris impacted infrastructure measurements.

Tropical and Post-Tropical Cyclones

Hurricane season 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 Dunbarton during hurricanes. Numerous hurricane events in recent history have occurred in the State, region, and the local area surrounding Dunbarton that may have also had an impact on the Town.

The overall ratings of **Tropical and Post Tropical Cyclones** in Dunbarton from the [HIRA](#) are:

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms or Tree Debris	2 MEDIUM	3 HIGH	4 HIGH	4 HIGH	7.3 MEDIUM

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 Dunbarton 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.

Magnitude of Hurricanes and Tropical Storms

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 22](#).

Table 22

Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph	Very dangerous winds will produce some 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	Extremely dangerous winds will cause extensive 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.
3 <i>major</i>	111-129 mph	Devastating 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 <i>major</i>	130-156 mph	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 <i>major</i>	157 mph or higher	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.

Source: National Oceanic and Atmospheric Administration (NOAA)

WINTER HAZARDS

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 Dunbarton 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.

There are several types of **WINTER** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included
WINTER	SEVERE WINTER WEATHER Snow, Ice, Blizzard or Nor'Easter

Although avalanche appears in the *State of New Hampshire Multi-Hazard Mitigation Plan 2018*, this winter hazard is not believed relevant to Dunbarton's geography and development.

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

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
SEVERE WINTER WEATHER Snow, Ice, Blizzard or Nor'Easter	4 HIGH	3 HIGH	3 HIGH	2 MEDIUM	10.7 HIGH

Severe Winter Storms

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, oftentimes blizzard conditions 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.

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 in **Figure 16**:










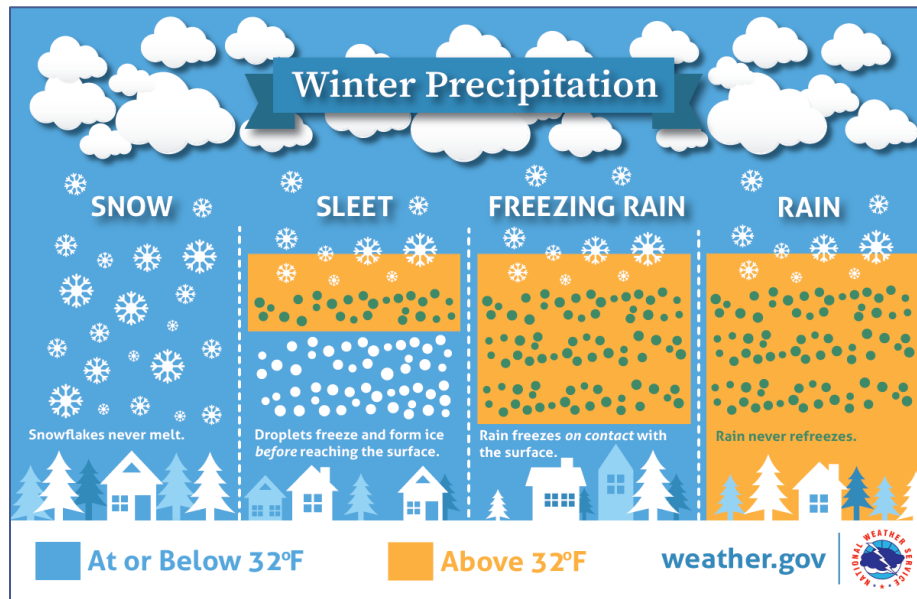
-  **Blizzard:** Winds of 35 mph or more with snow and blowing snow reducing visibility to less than $\frac{1}{4}$ mile for 3 hours or more.
-  **Blowing Snow:** Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
-  **Snow Squalls:** 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 .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.

Figure 16
Types of Winter Precipitation



Source: https://www.weather.gov/bou/winter_wx_preparedness_week

Recent Severe Winter Weather in New Hampshire

In March **2018**, New Hampshire was hit by **4** cyclonic Nor'easters in a row over a **2-** week period because of the changing climate, in a recurring snow-and-melt cycle. These storms have the potential to inflict more damage than many hurricanes because the high storm surge and high winds can last from **12** hours to **3** days, while the duration of hurricanes ranges from **6 to 12** hours.

- March 2-3, 2018 – Seacoast flooding, Concord wind gusts 36 mph, about 1"
- March 7-8, 2018 – Concord 11"
- March 12-14, 2018 – Concord 11", Epsom 23"
- March 22, 2018 – Concord 3"

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.

Magnitude of Severe Winter Weather

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.

Figure 17 displays the [NOAA Weather Prediction Center's 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. Users are advised the WSSI does not depict official warnings.

Figure 17

Potential Winter Storm Impacts

Winter Storm Severity Index (WSSI)

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

The [Regional Snowfall Index \(RSI\) for the Northeast](#) is used to categorize significant snowstorms. The 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. The RSI differs from these other indices because it includes population, a social component. The RSI is based on the spatial extent of the storm, the amount of snowfall, and the juxtaposition of these elements with population. The Regional Snowfall Index (RSI) displayed in **Table 23** is a measurement of the magnitude of a snowstorm in the Northeast, which includes New Hampshire.

Table 23

Regional Snowfall Index (RSI) for the Northeast

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

Source: www.ncdc.noaa.gov/snow-and-ice/rsi/
(adapted by CNHRPC)

Several types of public alert warnings are issued to people 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 24**.

❄ 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 24

Winter Weather Warning Events

Warning Type	Criteria	Description for Next 12-36 Hours
Blizzard Warning	Gusts >= 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	½" 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), 2021

TECHNOLOGICAL HAZARDS

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**.

One of the technological hazards has been rated along with the natural hazards within the **Hazard Identification and Risk Assessment**. There are several specific hazards of the **TECHNOLOGICAL** hazard category examined in the **HIRA**:

Main Hazard Category	Specific Hazards Included			
TECHNOLOGICAL	AGING INFRASTRUCTURE Bridges, Culverts, Roads, Pipes or Underground Lines	DAM FAILURE Water Overtop, Breach, Beaver, etc.	FIRE Vehicle, Structure, Arson or Conflagration	HAZARDOUS MATERIALS Haz Mat Spills, Brownfields or Trucking
	LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications or Live Wire Danger			

Magnitude of Technological Events

The magnitudes of technological hazards are not addressed in this Plan. Technological events could have rating systems within their sphere of influence, but these are outside the scope of this **Hazard Mitigation Plan**. More information is provided for reference as needed for some of these technological hazards.

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 for NH 13 and NH 77 in Dunbarton. The Town is responsible for **50 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 **floodings** 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 also 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 Dunbarton are constructed using ditching instead of storm drains. The Town is required to develop and maintain MS4 stormwater regulations, which it has done. 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**.

Fire (Arson, Vehicle, Structure)

Fires which are not natural hazards are often associated with vehicles, structures or hazardous materials spills, or sometimes an explosion. These 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.

Hazardous Materials

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 environmental for Dunbarton's residents.

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. Nuclear power plants produce roughly **20%** of the nation's power, they exist in nearly all states and 3 million Americans live within **10** miles of a nuclear power plant. 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. 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 Dunbarton 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 conduct welfare checks for many residents known to be in need.

As a rule of thumb, 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 Bow, 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. The Merrimack Station is the largest coal-fired electrical generating station and when it was operating around the clock, supplied power to 190,000 households. Coal fuel generated only 7% of the State's electricity in 2016. Much of the State's electricity (56% in 2016) is provided by the Seabrook nuclear power reactor.

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. Dunbarton is served by Eversource and Unitil.

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.

HUMAN HAZARDS

Events of human nature include terrorism (ecological, cyber and chemical), sabotage/vandalism, hostage situations, and civil unrest. These are often “behind the scenes” hazards that local Police Departments handle on a regular basis. These events are all caused by direct human action. Mass casualty incidents, caused by any number of hazards, would also be addressed as a human hazard. Cyber events, while a technological hazard, are considered another type of artificial, human-developed hazard.

There are several types of **HUMAN** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included			
HUMAN	TRANSPORTATION CRASH Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle	MASS CASUALTY INCIDENT As a result of any hazard event	TERRORISM/VIOLENCE Active Shooter, Hostage, Public Harm, Civil Disturbance/Unrest, Politically Motivated Attacks, Incendiary Devices, Sabotage or Vandalism	CYBER EVENT Municipal Computer Systems Attack, Cloud Data Breach, Identity Theft, Phishing, Ransomware or Virus

Human Hazards are examined by descriptions of the types of hazards and in the **Potential Future Hazards**. Scientific measures of magnitude are not available for individual human hazards.

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 use the same limited space.

In the 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

NH 28 or US 3 in about 30 minutes. Air traffic can also be hazardous to the region's citizens. Small local sites such as JBI Helicopter and other helipads in Dunbarton 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 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 Dunbarton is Concord Hospital. 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 has an 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 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, Dunbarton's local government and residents should be prepared to address **cyber events** in the various and growing forms they take.

Potential Future Hazards

After the inventory of hazard types and past hazards in Town, a list of hazards which currently exist or need to be monitored in Dunbarton has been completed along with potential future hazards that could occur in the same or other areas. This unique listing of **Potential Future Hazards** was compiled so the Town can be aware of areas that might need to be watched for recurring hazardous problems or that may experience some of these hazards for the first time. The listing was developed by knowledge of the Hazard Mitigation Committee and past experiences of hazards. Past locations of hazard events, where they exist for each hazard, are listed under the individual hazard narratives in the previous section. The existing and susceptible hazard locations are taken from the **Hazard Identification and Risk Assessment (HIRA)**. With this existing and potential future knowledge listed side by side, it becomes easier for a community to plan mitigation measures for the most prominent hazard events in Town.

Potential future hazards in **Table 25** indicate locations in the community where a hazard event could occur and how that hazard could impact the Town. The **Overall Risk** score between **1-16** for the **14** rated hazards from the **HIRA** is provided to understand the scale of risk to Dunbarton from all natural hazards. Also from the **HIRA** is whether or not each hazard event occurred within the last **5** years in Dunbarton, indicated by either ***Events(s) Within Last 5 Years***, ***ANNUAL Occurrences Within Last 5 Years***, or ***NO Event(s) Within Last 5 Years*** beneath each *Hazard Category*. The magnitude or extent scale where available from previous **4 HAZARD RISK ASSESSMENT** descriptions enable possible effect measurement of the noted Dunbarton locations.

Table 25
Potential Future Hazards

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
DAM FAILURE Water Overtop, Breach, Beaver, etc. *NO Event(s) Within Last 5 Years*	4.0 LOW	<ul style="list-style-type: none"> There are few constructed dams in Dunbarton with potential for future flooding damage if breached or failed. The High Hazard (H), Significant (S) Hazard and the Low (L) Hazard dam may be unlikely to flood or breach but still have the potential during a strong flooding event. Several Non-Menace dams are located on are found along Stark Brook, Black Brook, and other unnamed brooks and natural swales. No significant dam breach issues have occurred in the community or upstream. Both High Hazard (H) dams in Dunbarton are located on the Hopkinton-Everett Reservoir on Stark Brook Beaver dams carry a high probability of flooding and potential for breakage. Beaver dams are located throughout the Town and depending on size and location, could cause significant damage to roads if the natural dams breach. The Public Works Department regularly breaks up smaller, temporary dams and relocates the beavers. 	<ul style="list-style-type: none"> NHDES Dam Classifications
DROUGHT *Event(s) Within Last 5 Years*	8.0 HIGH	<ul style="list-style-type: none"> During future drought events, agricultural farms, orchards, nurseries tree farms run the risk of high damage from droughts which also bring economic consequences. Some farms are homestead farms which provide food and income for owners. Crop and livestock loss are consequences of droughts in these locations. In Dunbarton, agricultural operations include multiple farms, orchards, nurseries, livestock, including), and others. When hayfields die off, livestock animals in Town cannot easily be locally fed. See APPENDIX A for the list. While drought has been a continuing problem and is expected to periodically occur in the future, areas in Dunbarton with municipal water supply can have mandatory restrictions enacted. The entire community has private, individual wells. In future drought conditions, private homeowner wells will continue to go dry especially at the higher elevations. When this occurs, the owners typically have a new well dug. Town fire ponds and dry hydrants are found throughout the community, but over time they may dry up from drought. The Fire Department uses an alternate source of water such from the rivers instead of drawing from the water hydrants. Customers of the municipal water supply might need to follow voluntary or required water restrictions to conserve the supply. The Town has a Watershed Protection Overlay District to help reduce the impact of different threats to the Town's drinking water wells. 	<ul style="list-style-type: none"> US Drought (D-scale) Monitor Intensity Scale
EARTHQUAKE *NO Event(s) Within Last 5 Years**	4.0 LOW	<ul style="list-style-type: none"> Since Dunbarton is located within an active but mild seismic region, residents are expected to feel the larger future earthquakes, but any damages should be minor. Locations to watch include historic buildings and essential Town facilities. Although the buildings may receive little damage from earthquakes, they should be carefully monitored because the buildings are structurally larger, typically contain numerous people, may contain vulnerable populations, and are critical to the Town's operations and culture. 	<ul style="list-style-type: none"> Richter Magnitude Scale Modified Mercalli Intensity Scale

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		<ul style="list-style-type: none"> • Damage to utility poles and wires, roadways and infrastructure could be significant. Aboveground poles, underground electric lines, underground gas, water and sewer lines could be susceptible. 	
EXTREME TEMPERATURES Excessive Heat, Heat Wave, or Cold, Wind Chill *Heat Event(s) Within Last 5 Years* *Cold Event(s) Within Last 5 Years*	8.0 HIGH	<ul style="list-style-type: none"> • Excessive heat and extreme cold will continue being problematic for Dunbarton residents. There are many group facilities, multi-family housing, manufactured housing parks, and the schools, all containing seniors, children, vulnerable and/or marginalized populations. The Fire Department and Police Department should continue to check on at-risk residents when possible. • Should the temperature remain high (or low), the Community Center at Elem School Lunchroom could be opened as a temporary cooling (or warming) center without formal School District, Red Cross, and/or Capital Area Public Health Network assistance. The Community Center is the town facility for recreation and Town Meetings as well as sheltering during day or night. It has a capacity for around 500 and is equipped with a generator, kitchen, and showers. 	♦ NWS Heat Index ♦ NWS Excessive Heat Warnings ♦ NWS Windchill Index ♦ NWS Freeze Warnings
HIGH WIND EVENTS Wind, Thunderstorms, Hail, Downbursts, Tornadoes, Debris *Event(s) Within Last 5 Years*	9.3 HIGH	<ul style="list-style-type: none"> • All of Dunbarton will experience future severe wind, rainstorms, and thunderstorms often with lightning, particularly common in the summer months. In addition, tornadoes and downbursts are anticipated in the future based on past areal events. Flooding, debris, and property damage will accompany these events. Electrical power (Eversource & Unitil) is disrupted during most wind-related events. The main telecommunications tower and antennas on NH 13 and, water and sewer pumping stations, Eversource and Unitil electric lines and substations, and transmission lines could be damaged by High Wind events. • The whole Town could be impacted by a tornado or downburst. Winds along NH 13 and NH 77 could be strong, as tornadoes travel through flat areas and valleys. These cover much of the geography of the Town, where people and vulnerable facilities would be at risk. • Future high wind events will likely endanger roadways and utility lines from falling trees and limbs. NH 13, NH 77, and Robert Rogers Road are critical local routes that lead to hundreds of residences. Other Class V town roads may be suitable for temporary commuter detour traveling but most of them are gravel and hilly and are in danger of tree fall during high wind events. Others lead to unmaintained Class VI roads. These steep slopes and hillsides leading to homes. • The majority of the Town is wooded and forested. The defined historic Town Center is in at the intersection of NH 13 and Robert Rogers Road with essential Town services and historic facilities. Sections of town would be difficult to access with trees and power lines down on the residential roads. Should a downburst or tornado run through the recreational areas and current use lands, recreationalists would likely need assistance if a severe weather event was unexpected. • Older historic or wooden buildings include public and private buildings (historic homes), the three buildings associated with the Dunbarton Historical Society, Molly Stark House, Old Town Hall and Library, Stark 	♦ Enhanced Fujita (EF) Tornado Scale ♦ NWS Thunderstorm Risk Categories ♦ NWS Damage Threats for Severe Thunderstorm Warnings

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		Mansion, Robert Rogers Homestead Site, Caleb Stark Monument at Town Center, and cemeteries throughout Town may be more vulnerable to wind damage because of their age and type of construction.	
INLAND FLOODING Rains, Snow Melt or Flash Floods <i>*Event(s) Within Last 5 Years*</i>	6.0 MEDIUM	<ul style="list-style-type: none"> • Future flooding is expected in Dunbarton, whether from storm events or snowpack melt. The Stark Brook, Bela Brook, Black Brook, Harry Brook, unnamed streams, and culverts have the potential to flood their banks. The MHP units in Dunbarton may be old and not meet current codes but are also all part of the Gorham Pond Area which could make them more susceptible to flood. • Some of the Town’s roads have steep slopes and tend to washout during storm events. The community has unnamed brooks that flow under roads that would become impassible during heavy rainfall and resultant flooding conditions. Regularly washout locations are identified and are anticipated to do so in the future from spring snow melts or heavy rainfall at least until repaired. Rain events are concurrent with beaver dam events and culvert washouts, a compounded problem. • Although bridge flooding has not yet occurred, there is potential as water flows just below the decking at times. Newer bridges are elevated from the banks, so flooding would have to be significant to overtop. See also the Special Flood Hazard Areas (floodplains), Waterbodies, and Road Washouts sections for details. The SFHAs and road washout areas are anticipated to flood in the future during extreme events. 	<ul style="list-style-type: none"> ◆ Special Flood Hazard Areas (SFHAs) on 2010 Digital Flood Rate Insurance Maps (Zones A, AE, X) ◆ Flood Action Stages (River Gages)
LANDSLIDE Soil, Rockslide or Excavation Areas <i>*NO Event(s) Within Last 5 Years*</i>	1.0 LOW	<ul style="list-style-type: none"> • Generally, vegetation and best operational practices of excavation sites in Dunbarton are good at preventing landslides or rockslides. Sites include the commercial excavation operations, some of which has been reclaimed. Potential future landslides are not expected to occur at the excavation sites in Town, although slides are possible under the right conditions. • The Town has numerous hills over 800’ in elevation or on slopes greater than 15%, most of them with roadways leading to homes. • Roads with steep ditching or embankments will remain vulnerable to landslide in the future. Road washouts and flash-flooding of gravel or paved roads could cause landslides. Gravel roads with ditching in Dunbarton could be subject to landslide conditions (see Inland Flooding). Blasted State or US Routes can have landslide (small rocks land on the roadway occasionally). Landslide is an uncommon hazard but one that could cause property damage, otherwise the Town is not particularly susceptible. 	<ul style="list-style-type: none"> ◆ No known widely-used scale measuring the magnitude of landslides
LIGHTNING <i>*Event(s) Within Last 5 Years*</i>	5.3 LOW	<ul style="list-style-type: none"> • Future lightning strikes may cause the damage at the Old Town Hall and Library, Stark Mansion, Molly Stark House, Caleb Stark Monument, and other important Town and School facilities. The large tax exempt facilities and buildings without lightning rods may also be susceptible in cleared areas or on the high hills. Conflagration could start at these denser facilities as a result of lightning strike and be most dangerous. • Other structures and homes located in the populated areas would be most vulnerable to the power surges and outages caused by these strikes, especially those high density populations in proximity to wooded 	<ul style="list-style-type: none"> ◆ Lightning Activity Level (LAL)

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		<p>and forested areas. The potential for resulting wildfire and conflagration is high in these densely populated areas.</p> <ul style="list-style-type: none"> • Town essential facilities buildings, construction/lumber businesses, and the haz mat or fuel businesses (businesses with potentially hazardous materials onsite such as fuel, gasoline, natural gas, propane) and used fluids (various automotive repair shops) could each be vulnerable to lightning and fire. The higher elevations in town generally may be more susceptible to lightning. • Outdoor utilities and antennas are highly vulnerable to future lightning strike, such as the telecommunications tower, electric lines, and telephone switching stations, repeaters, and other communications equipment. • Forested areas and open recreation fields can be dangerous to people and property. Trees are constantly struck. These include the public Town lands and State Forests, conservation areas, town trail systems, and points of higher elevation which can be dangerous to people and property if struck by lightning. Outdoor recreational and gathering places could be vulnerable to lightning. Some locations cannot be easily accessed by emergency vehicles, whether to fight the fire or remove people from harm's way. 	
PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral, or Tick-borne <i>*Event(s) Within Last 5 Years*</i>	9.3 HIGH	<ul style="list-style-type: none"> • Public health issues may occur in the community in the future during warm or cold months. For indoor contamination, the highest risk facilities for pick-up or transfer of viruses and bacteria can include the: Dunbarton Elementary School, Community Center, Churches, and Town Hall. The only health service in town is Dunbarton Family Dental Care and there are no dedicated senior housing facilities. Food-borne illness can be transferred at any local eatery. All winter long, people of Dunbarton in close quarters get sick from different viruses. • Outdoor susceptibility to arboviral and tickborne diseases is expected to grow. Dunbarton is a highly rural community with many waterbodies, wetlands, and other swampy areas for these arthropods to thrive. The wet areas, vernal pools and the many public trails on conservation lands can also enable transmission. Several horse farms are in the area and can contribute to infection. • Air quality warnings from Canadian fires and drifting smog do little to prevent particulate inhalation by Dunbarton more vulnerable populations and outdoor enthusiasts. • Banks of any brook in town, Kimball Pond, Gorham Pond and any other watercourse or waterbody used as beaches may expose people to cyanobacteria. The public canoe launches/ beaches can be shut down in the future due to high cyanobacteria levels, and this situation is one to watch during the warm season in July-August. The Town has a Watershed Protection zoning ordinance surrounding the Dunbarton Water Works wells watershed to preserve water quality and public health. 	◆ CDC Infectious Disease Levels Scale

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		<ul style="list-style-type: none"> The Capital Area Public Health Network, which will assist the Town in times of public health crisis. 	
RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris <i>*Event(s) Within Last 5 Years*</i>	4.0 LOW	<ul style="list-style-type: none"> Future ice jams in any of the Brooks in Dunbarton could be possible. Roads within the watercourses floodplain areas could in the future be subject to ice jam damage. River ice jams, may have future potential to occur on Everett Dam Road, Robert Rogers Road, Black Brook Road, Kimball Pond Road. Floodplains could become inundated and evacuations might be necessary. Erosion/washout of certain Town roads along the numerous brooks in town is anticipated to continue due to flooding and heavy rains. Floating debris down the Rivers can accumulate at bridges and dams during future flooding events. 	<ul style="list-style-type: none"> EPA Bank Erosion Risk Index
SEVERE WINTER WEATHER Snow, Ice, Blizzard or Nor'Easter <i>*Event(s) Within Last 5 Years*</i>	10.7 HIGH	<ul style="list-style-type: none"> It is extremely likely that Dunbarton will be impacted by severe winter weather in the future. Damage and serious conditions can result in all areas of the community. Areas above 800 feet (See Map 1), the remote, forested and difficult to access areas are among the most vulnerable areas to ice and snow conditions. As severe winter conditions are expected to continue in the future and to increase in severity, concerns remain regarding safety on roads, especially in narrow, straight areas and at intersections. Many local roads have a sharp incline/decline and cars have trouble traveling the roads during winter conditions, especially when icy. See the Table of One Egress/Cul-de-Sac Roads in Town. Public Works Department keeps up with the snowfall on the Town roads, but ice storms require more time and resources to keep the roads safe. During the winter months, the crew sees regular severe warming and snowmelt which then freezes to ice. With the changing climate, this situation is anticipated to grow in the future. Areas of concern during winter weather include the more highly traveled roads – NH 13, NH 77, Robert Rogers Road, Montalona Road, and Twist Hill Road. Power outages and isolation may occur from heavy snow loads and downed trees on roads. The Town facilities buildings, Fire Department, Highway Department, Police Department, Town Offices, and Transfer Station must be able to function during severe winter events. Personnel driving to and from these facilities must travel on the main roads. During future storms, some historic buildings or Town facilities with large or flat roofs, barns or sheds, and older manufactured homes may be vulnerable to heavy snow loads or other events that could cause the roof to collapse. Flat roofs can be a problem with snow-loading. The NH 13, Powell Lane, and Ray Road telecommunications towers and antennas, Eversource & Unitil electric lines, and switching stations as well as Department building antennas could be highly impacted from future snow, ice, and blizzards. 	<ul style="list-style-type: none"> Potential Winter Storm Severity Index (WSSI) NCDC Regional Snowfall Index (RSI) for Northeast NWS Winter Weather Warning Events

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
SOLAR STORMS AND SPACE WEATHER Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout *NO Event(s) Within Last 5 Years**	9.0 HIGH	<ul style="list-style-type: none"> The aurora borealis has been photographed on nearby Mount Kearsarge in Warner 20 miles to the north due to geomagnetic storms. These types of events are likely to recur. At this time, the Town is aware of potential impacts to its communications and electrical systems to its Town and School facilities but has rated the hazard unlikely to cause damages. The telecommunications arrays, Eversource or Unitil high tension power lines or telephone/fiber switching stations could be impacted in the future by a geomagnetic event as could Town Department radios, base station, cellular phones, and VOIP that use emergency communications. Dunbarton is a member of Capital Area Mutual Aid Fire Compact dispatch which in 2020 combined with Lakes Region Mutual Aid dispatch. The Police Department uses the Merrimack County Sheriff's Office dispatch. Other Town staff (Highway, Town Office, and residents) relies on non-locally owned cell towers with national service provider antennas. Repeaters on the tower require backup generator maintenance and operation, which is out of local control. Recently Fire Dispatch was impacted by a solar event. The receiver site required repair. During the event the Town utilized redundant capabilities including a secondary Police Department receiver site inside the Transfer Station. 	<ul style="list-style-type: none"> NOAA Geomagnetic Storms Scale NOAA Solar Radiation Storms Scale NOAA Radio Blackouts Scale
TROPICAL AND POST-TROPICAL CYCLONES Hurricanes, Tropical Storms or Tree Debris *Event(s) Within Last 5 Years*	7.3 MEDIUM	<ul style="list-style-type: none"> In 2020 tropical storms impacted Dunbarton with high winds which break trees and limbs. Tree debris often falls on roadways and/or utility lines. As Dunbarton is a highly rural community with woods and trees along most of its roads, high winds will continue to impact the entire town, blocking roads and causing power and internet failure. Hurricane Sandy in 2012 impacted Dunbarton. Although the vulnerable areas are spread all over Town instead of more site- specific, the facilities and locations at greatest risk are shared with High Wind Events and Inland Flooding above. 	<ul style="list-style-type: none"> Saffir-Simpson Hurricane Wind Scale
WILDFIRE Brushfire, Outdoor Fires or Accidental *Event(s) Within Last 5 Years*	8.0 HIGH	<ul style="list-style-type: none"> Substantial wildfires have impacted Dunbarton since the last plan including a wind driven fire that destroyed a historic barn and farmhouse and a fire on Montalona Road Island that had to be reached by boat and took multiple days to put out. The potential continues to exist for large fires in remote or difficult to access locations in the future. Drier foliage, slash on the ground, one-egress roadways, in the conservation lands and in private woodlots could mean both future severe fires and difficulty accessing these fires should the need arise. As a member of the Concord Area Fire Mutual Aid Compact, the Town regularly provides other communities with mutual aid for wildfires and would receive aid in turn. The public conservation lands and trail systems are heavily used and may be the primary concern for future wildfires. Numerous neighborhoods with about 1,500 people are surrounded by woods and have only one egress/access route. The Town is dotted 	<ul style="list-style-type: none"> NWCG Wildfire Classification National Fire Danger Rating System

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		<p>with these cul-de-sac and one-egress residential roads (Class V, Class VI and private) in the Wildland Urban Interface which have limited emergency access.</p> <ul style="list-style-type: none"> Dunbarton is heavily wooded, with difficult, remote areas and many slopes. 2020 land use indicates the forest areas are declining, but additional lands are residential with wooded unbuilt area. Any residential area within Town could be particularly prone to wildfire since all are situated in rural and wooded locations. Most new subdivisions which are approved occur on sloped wooded areas, but most are required to have an adequate cistern or flowing water supply for firefighting. A lot of slash remains on the ground. An aircraft crash in the flightpaths of JBI Helicopter, Concord Municipal Airport, NH Army National Guard, or Manchester-Regional Airport could result in a wildfire. Some of the lots on private roads or Class VI unmaintained roads could be particularly vulnerable to wildfire as they might not be readily accessible for fire apparatus, either not maintained or not constructed to town road standards. The Fire Department is lightly staffed (volunteer) until needed and relies on mutual aid assistance. See also Lightning. 	
TECHNOLOGICAL AND HUMAN HAZARDS			
AGING INFRASTRUCTURE Bridges, Culverts, Roads, Pipes or Underground Lines <i>*Event(s) Within Last 5 Years*</i>	not scored	<p>Most of the Town's infrastructure is aging and only able to be replaced on a priority basis. Therefore, any future natural hazard could render the culverts, ditching, and drainage systems vulnerable. Both bridges in Dunbarton are aging and one is redlisted. These bridges could be subject to future floods, ice, transportation crashes or debris impacted infrastructure. See APPENDIX A for the list.</p> <ul style="list-style-type: none"> There are municipal water lines, wastewater lines, stormwater lines, and natural gas lines. Future hazard events such as earthquakes, floods, hard freezing and continued aging infrastructure will make any existing problems worse. See list of Road Washouts for a list of culverts susceptible to future floods, ice jams, debris, and other hazards as well as the Action Plan to address them. The Town's 44 miles of roads often difficult to maintain, upgrade and rehabilitate because of lack of funding. Only the priority roads are upgraded. The Town Budget will only stretch to the immediate priorities, while flooding events and severe winter weather are anticipated to increase and impact multiple roads during each event. Asset management and inventories are available for most Town infrastructure, including RSMS for roads. 	N/A
FIRE Vehicle, Structure,	not scored	<p>Any higher density areas could be subject to potential conflagration which would have devastating effects on the entire community. Drought conditions increase dryness and flammability.</p>	N/A

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
Arson or Conflagration *Event(s) Within Last 5 Years*		<ul style="list-style-type: none"> • Serious vehicular fires resulting from crashes could occur, especially on NH 13, and NH 77 where speeds are faster and more delivery vehicles travel. Some delivery vehicles carry fuel (gasoline, diesel, propane, natural gas, flammable haz mat) to local businesses. • The multiple construction, excavation, lumber, automotive and fuel businesses in Town could be subject to potential explosions or fires (see APPENDIX A for the list). • Vacant structures, vacant housing units, housing run by absentee landlords, unmaintained housing, or similar commercial structures run a greater risk of arson than occupied or well-kept premises. • Conservation areas and public trails may carry the significant risks and damages of any future arson or accidental fire. 	
HAZARDOUS MATERIALS Haz Mat Spills, Brownfields or Trucking *Event(s) Within Last 5 Years*	not scored	<ul style="list-style-type: none"> • Transportation of hazardous materials on NH 13 and NH 77 could be a frequent occurrence through Dunbarton. In the future, delivery trucks could rollover to spill their contents (fuel, liquids, propane, solids, etc) onto these significant roadways. High traffic volumes would contribute to secondary crashes and long detours. • Should a future haz mat spill occur in Dunbarton, not only could the contents of the spill reach the local brooks, but also populations located along NH 13 and 77 would need to be immediately evacuated or the decision to shelter in place would need to be made and conveyed to occupants. • Several occupational facilities in Town handle, store, or use hazardous materials. Any of these facilities could have a spill at their site or during transport which could result in a spill. Key sites include any fuel stations, auto repair shops, excavation sites, and construction businesses See APPENDIX A for the full list. • Existing and future potential brownfields sites such as old mill, vacant or former industrial properties, salvage yards and illegal junkyards may exist and pose future danger to new property owners or outdoor recreationists in the area. The Town should be aware of and inventory these locations. 	N/A
LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications or Live Wire Danger *Event(s) Within Last 5 Years*	not scored	<ul style="list-style-type: none"> • Aboveground electric lines in Dunbarton make the Town particularly vulnerable to outage during future disaster events. High tension transmission lines run through the Town. Utilities (Eversource, Unitil, internet, cable) may be restored to the most critical areas first, the Town facilities, before the more remote locations in Dunbarton have utilities restored. • Most of the Town facilities have backup generator when electricity fails, but long term solutions are necessary when outages over 3 days occur. 	N/A

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		<ul style="list-style-type: none"> • There are several miles of underground water, gas, and sewer lines in Dunbarton from which a strategic break could isolate all those connections at the far end of the line. • Long-term future electricity outages may impact the rural residents and the schools most heavily. Many Dunbarton residences own generators for their homes or have solar panels and are prepared for several days of no utilities to their homes during future storms. • The telecommunications towers located on NH 13 and Powell Lane contain cellular antennas, CAFMAC, County, State, and federal repeaters may be disrupted during future storm events. Local antennas are located on Town Department buildings and are especially vulnerable. Essential communications may be paused until redundant capabilities are reestablished in the region. 	
TRANSPORTATION CRASH Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle *ANNUAL Occurrences Within Last 5 Years*	not scored	<ul style="list-style-type: none"> • With NH 13 and NH 77, the Town's Fire Dept and Police Department are often the first to respond to the vehicle crashes experienced on these State roadways as well as all the local roads. These routes are used heavily by commuters as they travel through Dunbarton to their destinations. Crashes may increase over time, especially when conditions become icy from winter snow melt for the fast highways and greater numbers of vehicles use the roads. The intersection of NH 13 Jewett Rd with Clinton St and NH 77 Concord Stage Road, Pages Corner, is notoriously dangerous with frequent crashes. • The Town maintained roads, Class VI unmaintained roads and private roads can have elevation changes that will continue to make travel difficult in the future in snowy, icy, flooded, or debris blockage conditions. See Winter Hazards for the list. Any time of year, dangerous intersections become more difficult to navigate with heavy winds, rain, treefall, or flooding hazards and could cause crashes. • Dunbarton Town Center along NH 13 is one area where vehicle/pedestrian or bicycle crashes could occur in the future. Including areas by Dunbarton Elementary school and its accompanying field on Robert Rogers Road. With high speeds in most of the areas, bikes and pedestrian have the potential for serious crashes with vehicles. • The Town also has alternative future crash potentials, such as airplanes, helicopters, and drones. The Town could be in the flightpath of both JBI Helicopter and the Concord Municipal Airport, NH Army National Guard air traffic. The Manchester-Boston Regional Airport is nearby and supports large-engine plane traffic which have the potential of crashing in nearby communities. With the increased usage of private drones for personal or commercial use, the future potential for their crashing in populated areas or causing vehicular crashes is anticipated to rise. 	N/A
MASS CASUALTY INCIDENT As a result of any hazard event	not scored	<ul style="list-style-type: none"> • Large groups of people are regularly located at the Town Hall and Library, the School, or Community Center which may be where a future mass casualty event (incidents exceeding ambulance capacity) could occur because of any other type of hazard event. 	N/A

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
NO Event(s) Within Last 5 Years		<ul style="list-style-type: none"> Dunbarton is a vibrant community with active groups and social calendars. Events such as political candidate visits, School District and sporting events, School Board meetings, Town Meeting, Old Home Day, Veteran’s Parades, Church events, and other community gatherings could set the location for future mass casualty incidents. Concord Hospital is 15 minutes from Dunbarton and is the closest hospital with a trauma center. There are few private practice doctors and dentists in Town to assist with mass casualty incidents. During times of mass casualty, it is likely the communications network will be overloaded. Residents may not be able to telephone and emergency responders could have difficulty reaching assistance. The Town Hall, Schools, Fire Department, Tri-Town Ambulance, and Police Department phone lines could be jammed with callers. During this time, the Town website should be updated regularly. 	
TERRORISM/ VIOLENCE Active Shooter, Hostage, Public Harm, Civil Disturbance/ Unrest, Politically Motivated Attacks, Incendiary Devices, Sabotage or Vandalism *Events(s) Within Last 5 Years*	not scored	<ul style="list-style-type: none"> It is possible the Town could be the target of an act of terrorism based on current national trends. Possible susceptible non-municipal targets could include strategic facilities like Churches or the School. The municipal facilities in Dunbarton, Town Hall and Library, Town Offices, Highway Department, Fire Department, Police Department, or Transfer Station, have a risk of terrorism or violence. Vandalism of Town cemeteries may occur. Future hostage situations are isolated events and are nearly impossible to predict. The sites where this potential exists could include those listed above under Terrorism, the high density housing neighborhoods (see Severe Winter Weather) and everyday domestic situations. Isolated incidents of violence could occur in the remote forested areas and trails of those Forests, state lands, and conservation lands listed in the Lightning section. Large scale incidents of civil disturbance and public unrest are possible in Dunbarton, but unlikely based upon the local facilities. However, the Town’s participation in the Central NH Special Operations Unit enables Dunbarton’s mutual aid assistance where needed. Bomb threats at the schools are a possibility based on current attitudes and trends. The bridges, dams and cultural landmarks could be subject to terrorist threats or bombs that disrupt major travel routes. Any future sabotage of local utilities, Eversource & Until lines, high tension power lines, stormwater systems, water and sewer lines, gas lines, pump stations, telecommunications towers, telephone and internet substations, or the local High, Significant and Low Hazard dams could cause an immense amount of damage in Dunbarton. 	N/A
CYBER EVENT Municipal Computer Systems Attack, Website Overtake, Cloud	not scored	<ul style="list-style-type: none"> The entire Town – residents, businesses, municipal, School District, and state facilities- could be subject to future cyber events. Cyberattacks could target their websites, computer systems, cloud data systems, archival records, or use email phishing or related techniques to install ransomware, etc. The Town Hall and Library, Municipal Departments, 	N/A

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
Data Breach, Telephone Rerouting, Identity Theft, Phishing, Ransomware, Virus or Phone Scams *ANNUAL Occurrences Within Last 5 Years*		<p>Schools any technology businesses would be high-value targets for their software and their archival systems.</p> <ul style="list-style-type: none"> Email scams, phone scams, door-to-door canvassing, and identity theft are likely to continue in the future, causing regular problems for residents and businesses. These scams are more likely to impact the Town’s senior residents. Significant future damage could be done to municipal and School systems, in addition to tech businesses and other facilities located in Town. Private businesses targeted could create a negative economic impact on the community. 	

Source: Dunbarton Hazard Mitigation Committee

Although there are many potential hazards in Dunbarton’s future, the community is knowledgeable about where some of the worst occurrences might result with this descriptive **Potential Future Hazards** inventory. A comprehensive, specific community facility inventory that indicates each site’s **Primary Hazard Vulnerabilities** is found next in **5 COMMUNITY VULNERABILITY ASSESSMENT**.

INLAND FLOODING

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, waterbodies, and road washout locations are listed in detail below for Dunbarton.

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 Dunbarton (#330202), New Hampshire (D33013C), there are few DFIRMs identifying floodplains. There are **7** DFIRMS in Dunbarton of which only **3** contain small areas of floodplain: **#0520** (One Stack Brook), **#0540** (Bela Brook) and **#0660** (Unnamed Pond). These (**3**) DFIRMs do not include BFEs.

These DFIRMs display the Special Flood Hazard Area (SFHA) **Zone A** (1% annual risk of flooding) or **Zone X** (0.2% annual risk of flooding) locations in Town. These are highlighted gray in **Table 26**.

Four (**4**) other DFIRMs, **#0635**, **#0645**, **#0655**, and **#0665** either have no panel printed or do not display floodplains within Dunbarton. When panels are not printed, it means floodplains are not present. Panel **#0655** only displays the floodplains in abutting communities. **Table 26** also provides this information.

Table 26

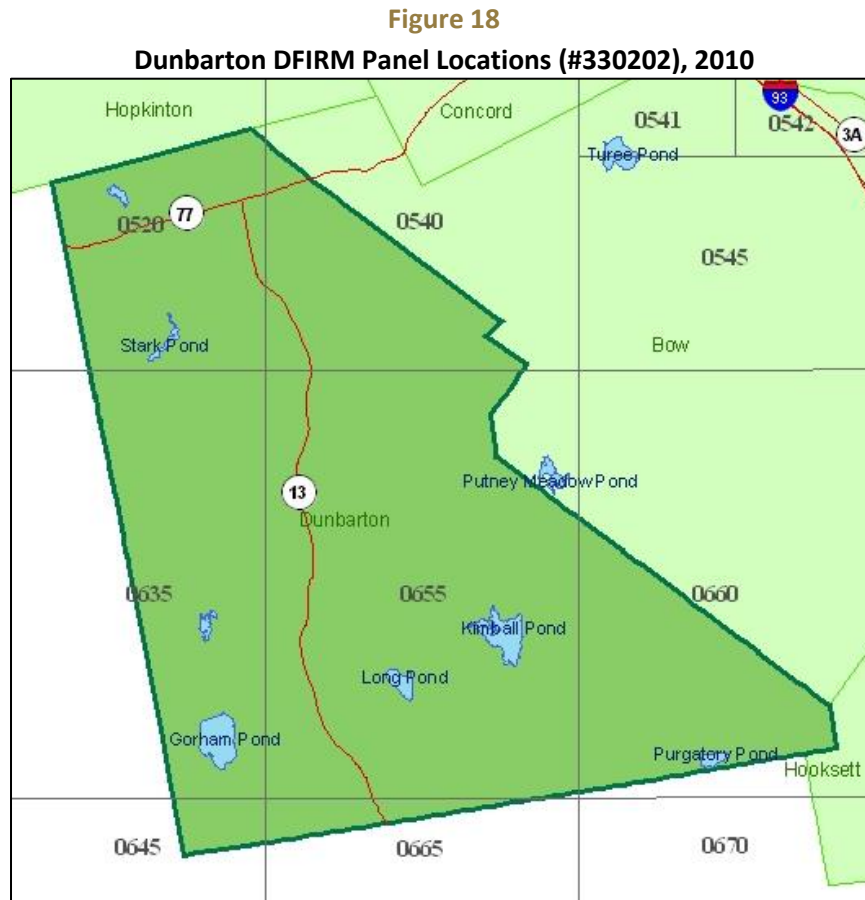
Locations of Dunbarton Special Flood Hazard Areas (SFHA) on 2010 DFIRMS

Panel NH (D33013C)	Flood Zones in Dunbarton #330202	Base Flood Elevations (BFEs)	Water Body Areas in Floodplains	Community of Dunbarton Geographic Location
0520	A (small area)	N/A	One Stack Brook, Stark Pond, Stark Pond Marsh, Stark Brook, Hopkinton-Everett Flood Control Reservoir	Northwest section abutting Hopkinton and Weare. Route 77, Route 13.
0540	A (small area)	N/A	Bela Brook, Hopkinton-Everett Flood Control Reservoir	Northeast section abutting Bow and Hopkinton. Route 13, Route 77, Tenney Hill Road, North Bow Road.
0660	X (very small area)	N/A	Unnamed Pond, Purgatory Pond	Southeast corner abutting Bow and Goffstown. Twist Hill Road, Morse Road, Purgatory Pond Road, Kimball Pond Tract.
0635	None – no panel printed	N/A	Gorham Pond	Western section abutting Weare
0645	None– no panel printed		None	Southwestern corner abutting Weare and Goffstown
0655	None	N/A	Long Pond, Kimball Pond, Harry Brook, Black Brook, Great Meadows wetlands	Geographic center of community. Route 13, Robert Rogers Road, Mansion Road, Long Pond Road, Black Brook Road, Kimball Pond Tract.
0665	None-no panel printed	N/A	None	Center of town along the boundary with Goffstown. Route 13

Sources: FEMA and [NH Geographically Referenced Analysis and Transfer System \(NH GRANIT\)](#) websites

However, a new set of Preliminary DIRM for Dunbarton, as part of the Upper Merrimack Watershed, has been under development by FEMA after holding community meetings around 2020. The draft Preliminary DFIRMS were published on **October 12, 2022** and include current aerial photography. More specific locations of the SFHAs are displayed in a clearer color scheme. New floodplains (Zone A) are indicated for Dunbarton and the **2010** “null” panels in **2022** each now have floodplain (Zone A) designations. The **2022** Preliminary DFIRMS are under review and are subject to further revision. An accompanying **2022** Preliminary Merrimack County Flood Insurance Study has also been developed.

Figure 18 displays the relative location of each of the DFIRM panels in the community used in **Table 26**. This set of DFIRMs is excerpted from the *Merrimack County Flood Insurance Study (FIS) of 2010*. The graphic illustrates the numbering system of the DFIRMs and how they are not consecutive.



Source: Dunbarton DFIRMS can be downloaded at <https://granit.unh.edu/dfirms>, last accessed 10-21

Figure 19 displays an example of a DFIRM’s zoomed-in view of Dunbarton’s geographic center with a view of Long Pond and Kimball Pond, and NH 13 to the west and Robert Rodgers Road to the north. No floodplains are designated on this **2010** DFIRM panel **#0655E**. Normally, DFIRMs illustrate the location of floodplains as a significant upgrade from the previous series of paper maps. These **2010** maps are set on an aerial photography background that displays roads, buildings, forested areas, waterbodies and watercourses.

Figure 19
Zoom View of Dunbarton Zone A 2010 DFIRM Panel Location #0655E

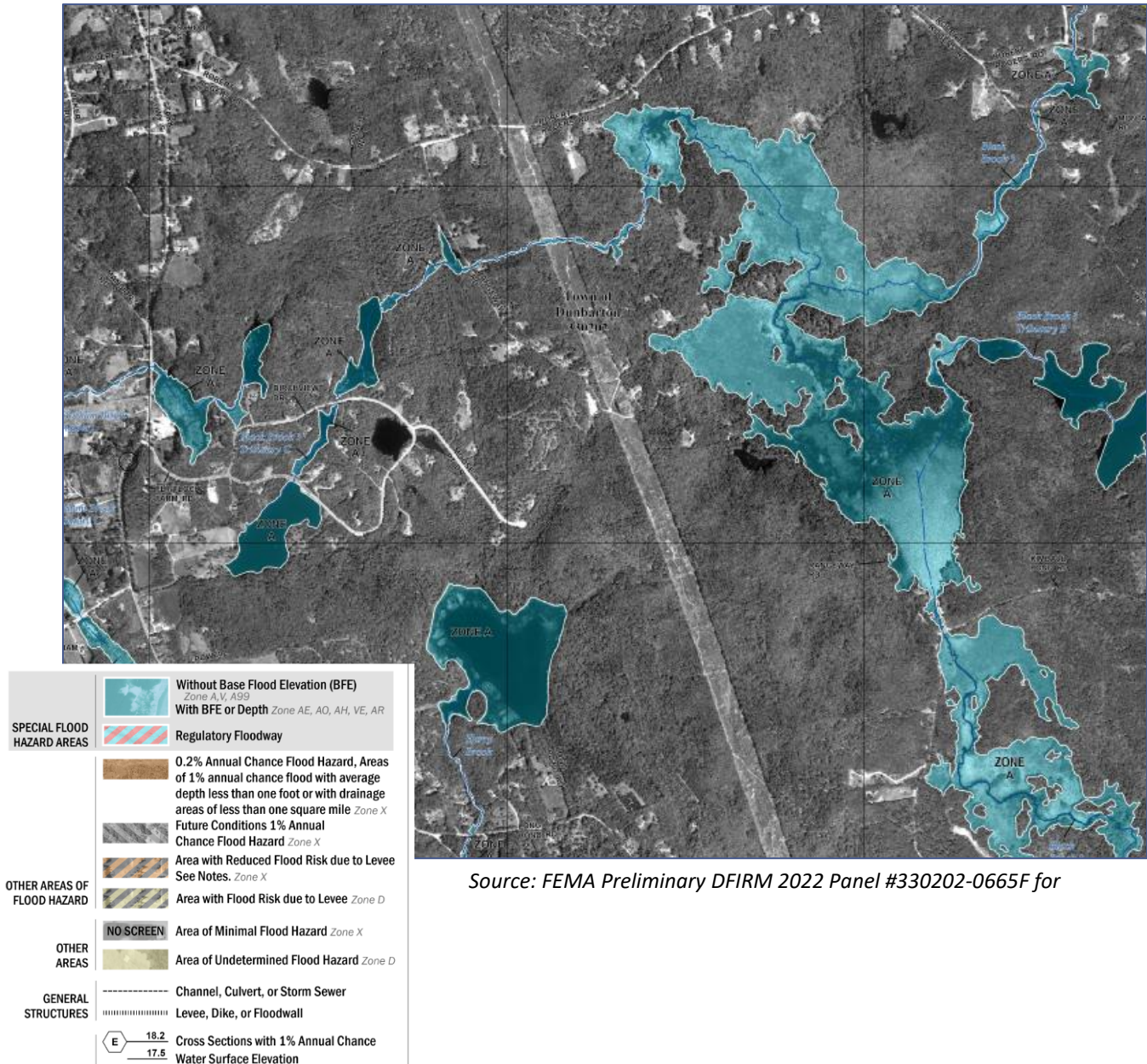


Source: FEMA DFIRM 2010 Panel #330202-0665E for Dunbarton, NH

In comparison to the **2010** DFIRMs, the Preliminary **2022** Panel maps of the same locations provide greater clarity and adjustments made to the Special Flood Hazard Areas (SFHAs). The largest revision to Dunbarton's panel set is the designation of more floodplain Zone A areas within Town, including designation Zone A around Long Pond and Kimball Pond as well as Black Brook and its tributaries. **Figure 20 #0655F** Preliminary panel displays significant new designation of floodplains in Dunbarton than in 2020.

Figure 20

Zoom View of Dunbarton Zone A 2022 Preliminary DFIRM Panel Location #0655F



Waterbodies

Dunbarton has few areas particularly susceptible to flooding. Rapid pack snow melt affecting roadways, beaver dam breaches and the controlled US Army Corps of Engineer flooding are the most likely flood events. There are many hilly roads in Town that could washout during flash flooding and heavy rain events. Some key culvert pipes need to be up-sized to address the increased water. These small brooks, ponds and wetlands in Dunbarton contribute to flooding these and other areas in Town:

➡ **Watercourses:** Stark Brook, Bela Brook, Harry Brook, Black Brook, and several unnamed brooks.

➡ **Waterbodies:** Stark Pond, Stark Pond Marsh, Purgatory Pond, Gorham Pond, Long Pond, Kimball Pond, Great Meadows wetlands and Hopkinton-Everett Flood Control Reservoir and several unnamed ponds and wetlands.

Road Washouts

Some of the local Town Class V maintained roads in Dunbarton are constructed using ditching. About **44 miles** of the Town maintained (Class V) roads are located throughout Dunbarton. Many gravel roads are susceptible. Regular road washouts currently include:

- | | |
|--------------------------------------|--------------------|
| ➡ Barnard Hill Road | ➡ Montalona Road |
| ➡ Black Brook Road | ➡ Morse Road |
| ➡ Country Road | ➡ Tenney Hill Road |
| ➡ Grapevine Road | ➡ Twist Hill Road |
| ➡ Kimball Pond Road | ➡ Guinea Road |
| ➡ Long Pond Road | |
| ➡ Olde Mill Brook Road (Harry Brook) | |

Many of the above culvert upgrades have been developed into Actions, with many culvert and drainage projects undertaken annually.

Dam Breach Susceptibility

There are many human-built and natural beaver dams along the brooks in Dunbarton. Two **(2) High Hazard** dams owned by the US Army Corps of Engineers ACOE (North Dike and East Dike) could have catastrophic consequences if a dam failure occurred, particularly downstream. As needed, the USACOE releases water in a controlled flooding to prevent a dam breach. The following areas have been identified by the Hazard Mitigation Committee as being immediately susceptible to **dam breach flooding** impacts:

- ➡ Hopkinton-Everett Flood Control Reservoir
- ➡ Hopkinton-Everett Flood Control Reservoir East Dike (Dam)
- ➡ Hopkinton-Everett Flood Control Reservoir North Dike (Dam)
- ➡ Long Pond, Black Brook, Harry Brook beaver dam areas
- ➡ Stillson beaver dam at Stark Highway South and Great Meadows Swamp (Kimball Pond)

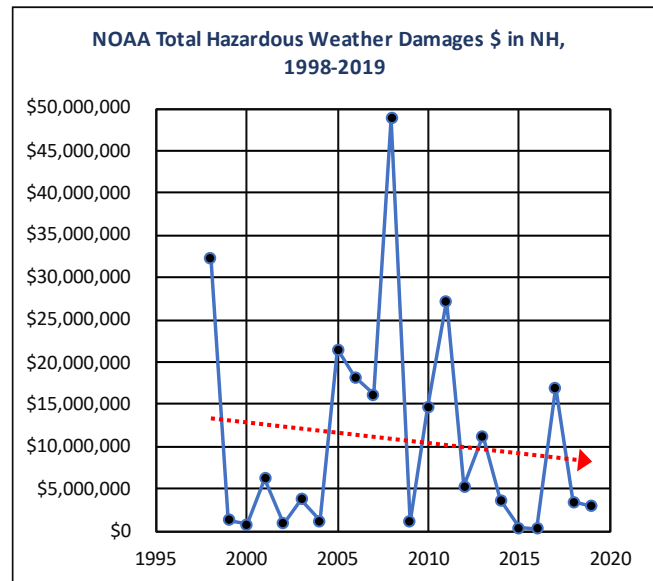
Local Climate and Extreme Weather

In the State and the Central NH Region, like any other areas, exist our own “micro-climate” areas that can be analyzed for future susceptibility to disasters and hazard events. New Hampshire has obtained high costs of damage over time due to hazardous weather and declared disasters. A review of the state and area history can provide a perspective on what Dunbarton can expect to see in terms of extreme weather in the future.

Table 27

Summary of Hazardous Weather Fatalities, Injuries, and Damage Costs in NH, 1998-2019

Year	Fatalities	Injuries	Total Damages \$ in Million
2019	0	0	\$2.98
2018	2	9	\$3.4
2017	0	0	\$17.0
2016	1	1	\$0.27
2015	2	34	\$0.37
2015	0	2	\$3.7
2013	0	30	\$11.3
2012	1	4	\$5.28
2011	1	2	\$27.3
2010	1	6	\$14.63
2009	1	0	\$1.13
2008	2	5	\$48.9
2007	0	3	\$16.15
2006	1	9	\$18.2
2005	4	9	\$21.5
2004	0	11	\$1.2
2003	2	29	\$3.8
2002	0	7	\$0.9
2001	0	2	\$6.2
2000	2	6	\$8.0
1999	3	17	\$1.3
1998	1	23	\$32.4



Source: National Oceanic and Atmospheric Administration, last accessed 03/21.

Adjusted for inflation [Consumer Price Index CPI]

<https://www.weather.gov/hazstat/>

Injuries to people and the costs of damages in New Hampshire have slightly decreased from hazardous weather over the last 20 years according to the trendline displayed in the associated chart for Table 27. Between 1998-2008, this slight decline in injuries and damages can be generally applied to the major disasters declared in the State. The highest damage costs

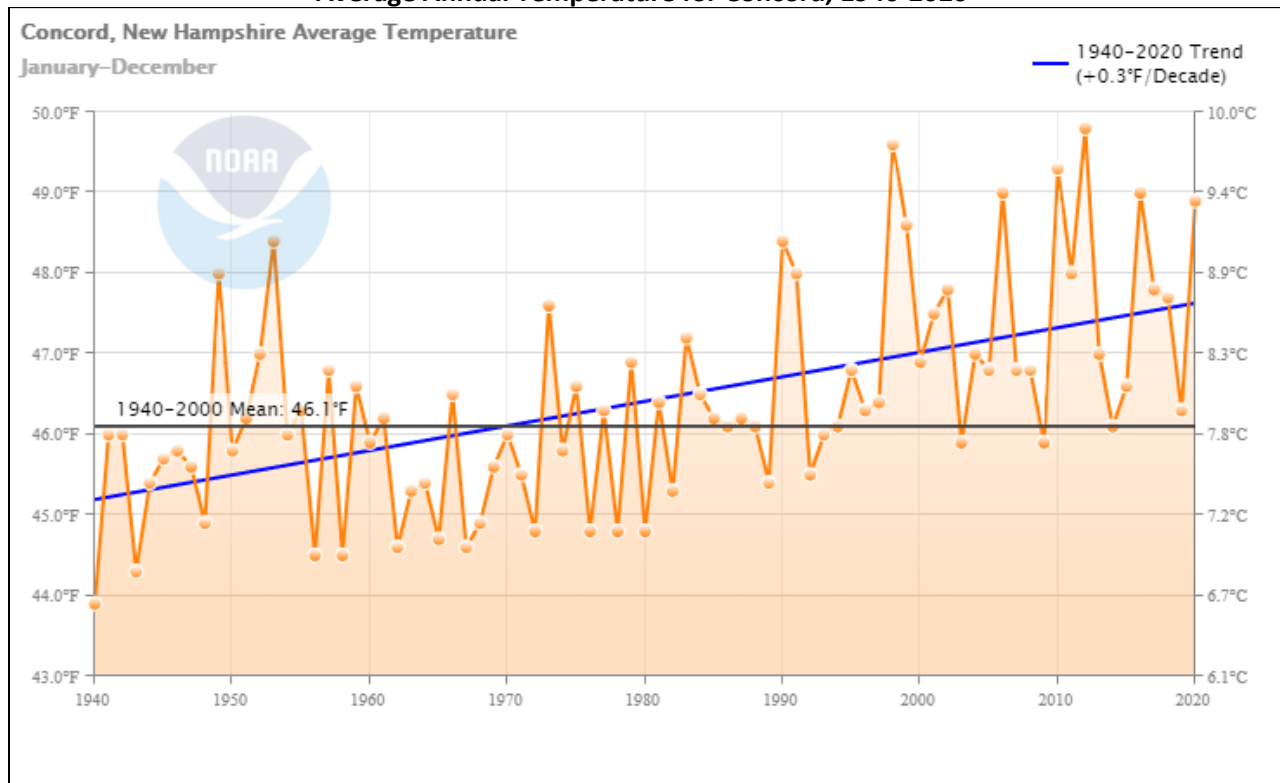
correlate to the 1998 (\$32m) and 2008 (\$49m) ice storms. The number of injuries and fatalities have a less distinct association, with the highest casualties shown in 2015 (36), 2013 (30) and 2003 (31). However, the single greatest number of fatalities during this time period occurred in 2005 (4), likely during the time of the Oct 2005 Columbus Day Floods that struck the southwestern section of the State very hard.

The Central NH Region's weather history is summarized to provide a view of the trends around the Concord area where some weather measurements have been taken at the Concord Airport since 1868. Dunbarton is geographically close to the City of Concord (within 5 miles) and these measurements should have some reasonable basis in Dunbarton, while small unique microsystems are found throughout the region particularly at higher elevations. As the closest large and longest active weather station, and for CNHRPC region continuity, the Concord measurements will be used for Dunbarton.

Figure 21 displays Concord's average annual temperature (Jan-Dec) between 1940 (43.7°F) and 2020 (48.9°F) with a mean temperature over the 1940-2020 period of 46.1°F. The warmest years were 2012 with a 3.7°F departure from normal, 1998 at 3.5°F departure, 2010 at 3.2°F departure, followed by 2016 at 2.9°F departure from the normal mean 46.1°F. As with typical New Hampshire weather, the seasonal temperatures can vary year after year and without obtaining an average, changes are difficult to see. The coolest years were 1940 at 43.9°F, 1943 at 44.3°F, 1956 and 1958 at 44.5°F, followed by 1962 and 1967 tied at 44.6°F. The displayed trend line allows a definitive way of averaging all temperatures and illustrates an average +0.3°F temperature increase trend per decade and the increase of about 2.4°F total during this 80-year period in Concord.

Figure 21

Average Annual Temperature for Concord, 1940-2020



Source: National Oceanic and Atmospheric Administration, last accessed online 03-31-21

https://www.ncdc.noaa.gov/cag/city/time-series/USW00014745/tavg/12/12/1940-2020?base_prd=true&begbaseyear=1901&endbaseyear=2000&trend=true&trend_base=10&begtrendyear=1895&endtrendyear=2021

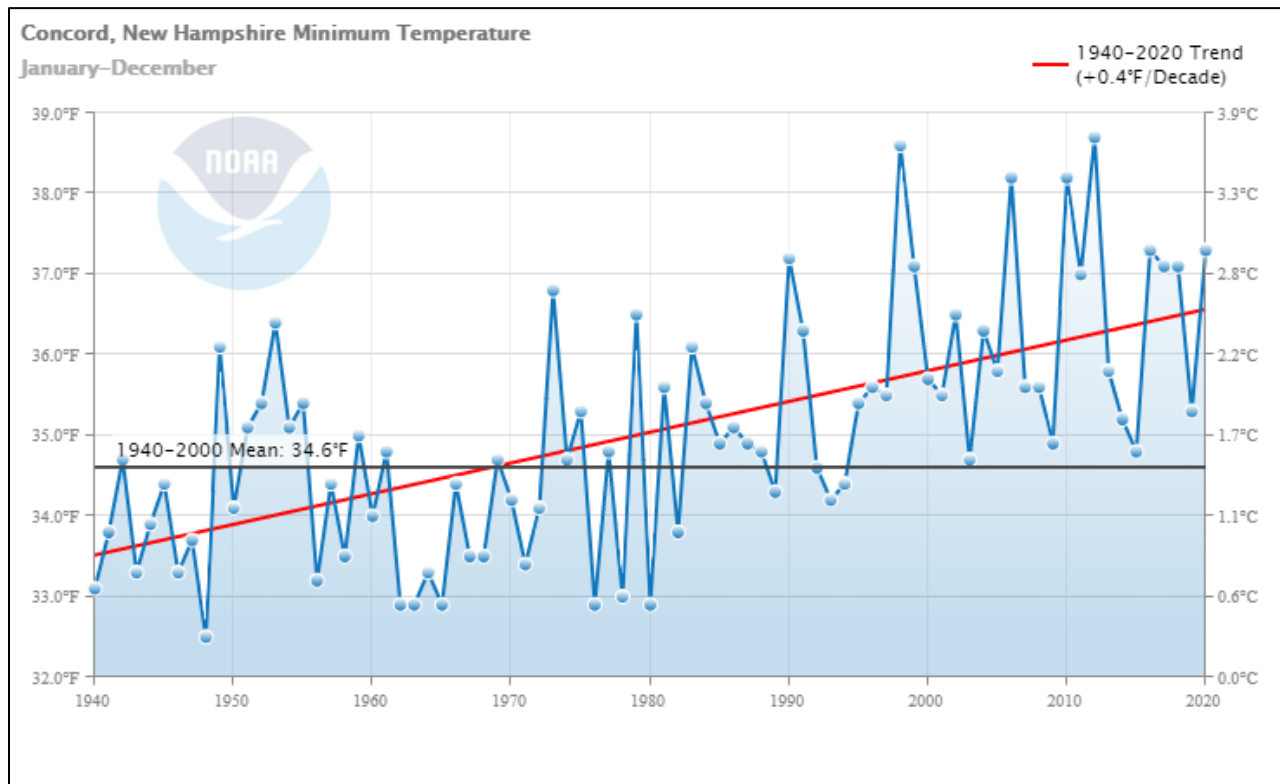
Another way to evaluate how the temperatures is to measure the minimum annual temperatures and maximum annual temperatures are changing. Both the coldest and the hottest temperatures are growing warmer in the Central NH region, which includes Dunbarton.

Figure 22 displays the *minimum* average temperatures for Concord, with a mean (average) of **34.6° F** for **1940-2020**. In **2020**, the *minimum* average temperature was **37.3° F**, as compared to the **1940** *minimum* average temperature of **33.1° F**. Within this 80-year period, the *lowest* minimum was **32.5° F** in **1948**, followed by **32.9° F** (1962, 1963, 1965, 1976, 1980), **33.07° F** (1978), followed by **33.1° F** (1940). The *highest* minimums were in **2012** (**38.7° F**), **1998** (**38.6° F**), tied in **2006** and **2010** (**38.2° F**), followed by **2016** and **2020** (**37.3° F**). In fact, the top **10** highest *minimums* have occurred since **1990** during the nearly **80**-year data span, indicating the coldest temperatures are growing warmer.

The trend line indicates a **+0.4° F** increase per decade between **1940-2020**, about a **+3.2° F** increase in minimum average temperatures.

Figure 22

Minimum Average Temperatures for Concord, 1940-2020



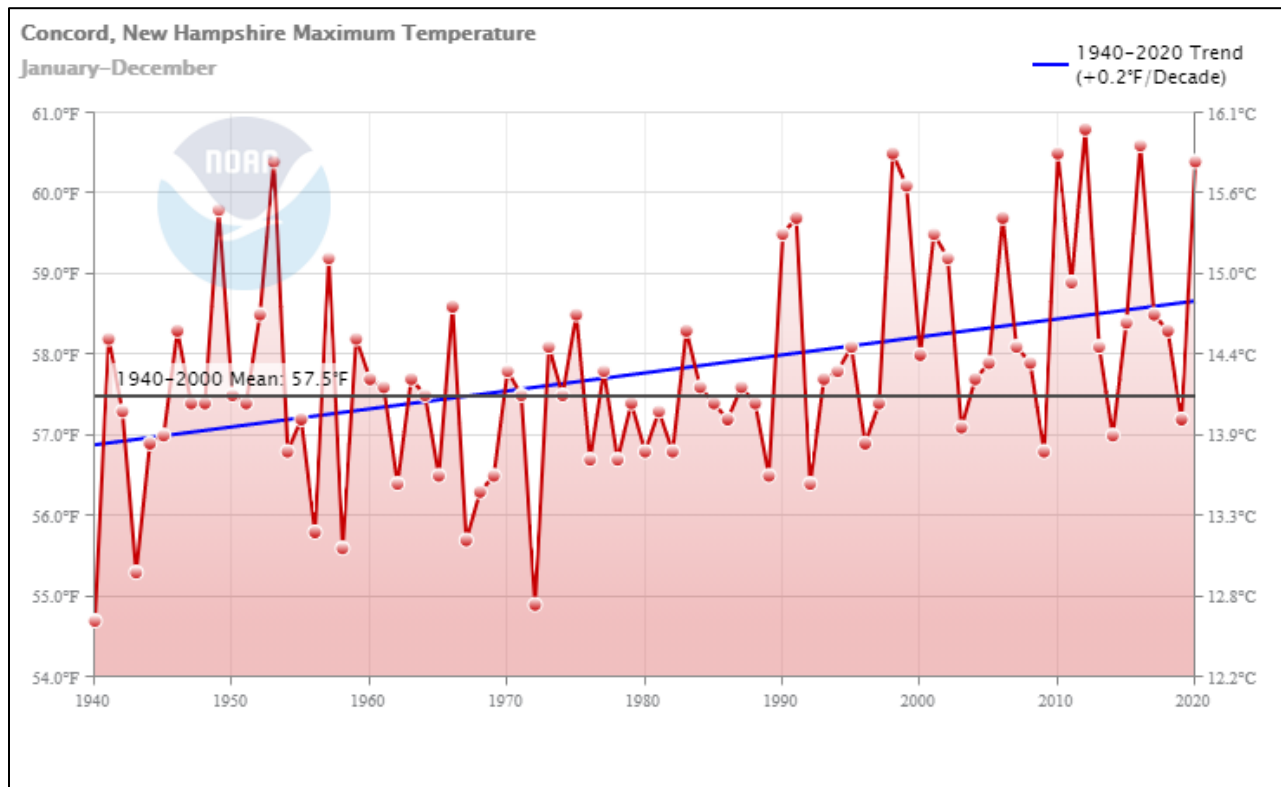
Source: National Oceanic and Atmospheric Administration, last accessed online 03-31-21

Figure 23 displays the *maximum* average temperatures between **1940-2020**, with a mean (average) of **57.5° F** annually. In **1940**, highest *maximum* average temperature was **54.7° F** while in **2020** the highest *maximum* was **60.4° F**. The lowest *maximums* were **54.7° F** in **1940**, **54.9° F** in **1972**, **55.3° F** in **1943**, **55.6° F** in **1958**, **55.7° F** in **1967** followed by **55.8° F** in **1956**. The highest *maximums* in Concord were **60.8° F** in **2012**, **60.6° F** in **2016**, **60.5° F** in **1998** and **2010**, **60.4° F** in **1953** and **2020**, followed by **60.1° F** in **1999**. Eight (**8**) of the top **10** highest *maximums* have occurred since **1990** during the **80-year** data span. These numbers indicate the hottest temperatures in the Central NH Region are growing warmer.

The **+0.2° F** trendline per decade results in a **+1.6° F** increase in the maximum average temperatures.

Figure 23

Maximum Average Temperatures for Concord, 1940-2020

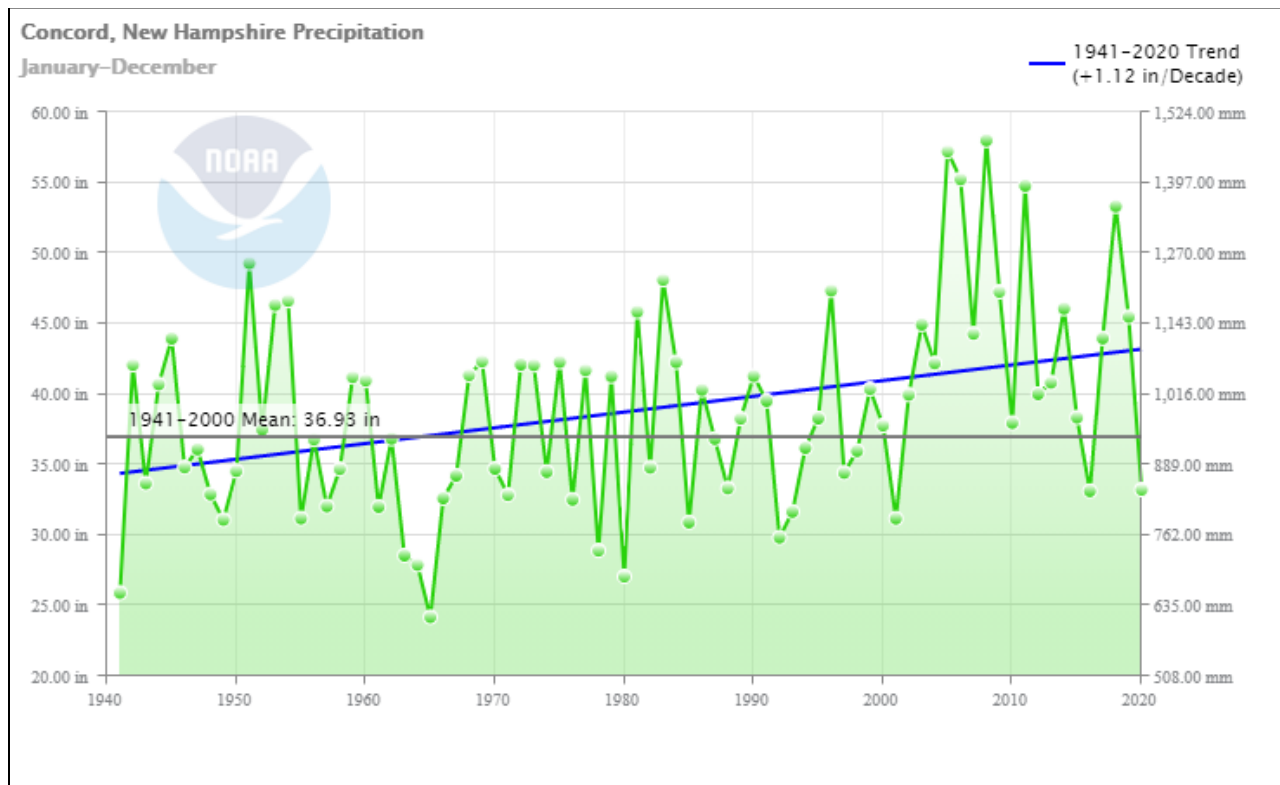


Source: National Oceanic and Atmospheric Administration, last accessed 03-31-21

For precipitation (rain) changes, **Figure 24** displays Concord's average annual Jan-Dec precipitation rates between **1941** and **2020**. Varying seasonal rainfall amounts continue over the decades. The mean annual precipitation during this period is **36.93"** annually. In **1941**, the amount of precipitation was **25.91"** while in **2020** the precipitation totaled **33.23"**. The wettest year in Concord was **2008** at **58.00"**, **2005** at **57.22"** and **2006** at **55.24"**, **2011** at **54.78"**, **2018** at **53.33"**, followed by **1951** at **49.29"**. The years with the least amount of rainfall were **1965** at **24.19"**, **1941** at **25.91"**, **1980** at **27.07"**, **1964** at **27.90"**, **1963** at **28.56"**, followed by **1978** at **28.91"**.

The trend line serves the same purpose to illustrate an increase of **1.12"** in precipitation per decade, or about a **+8.9"** increase in the annual average precipitation during this **80-year** period from **1941-2020** in Concord. Dunbarton will have experienced similar conditions.

Figure 24
Average Annual Precipitation for Concord, 1941-2020



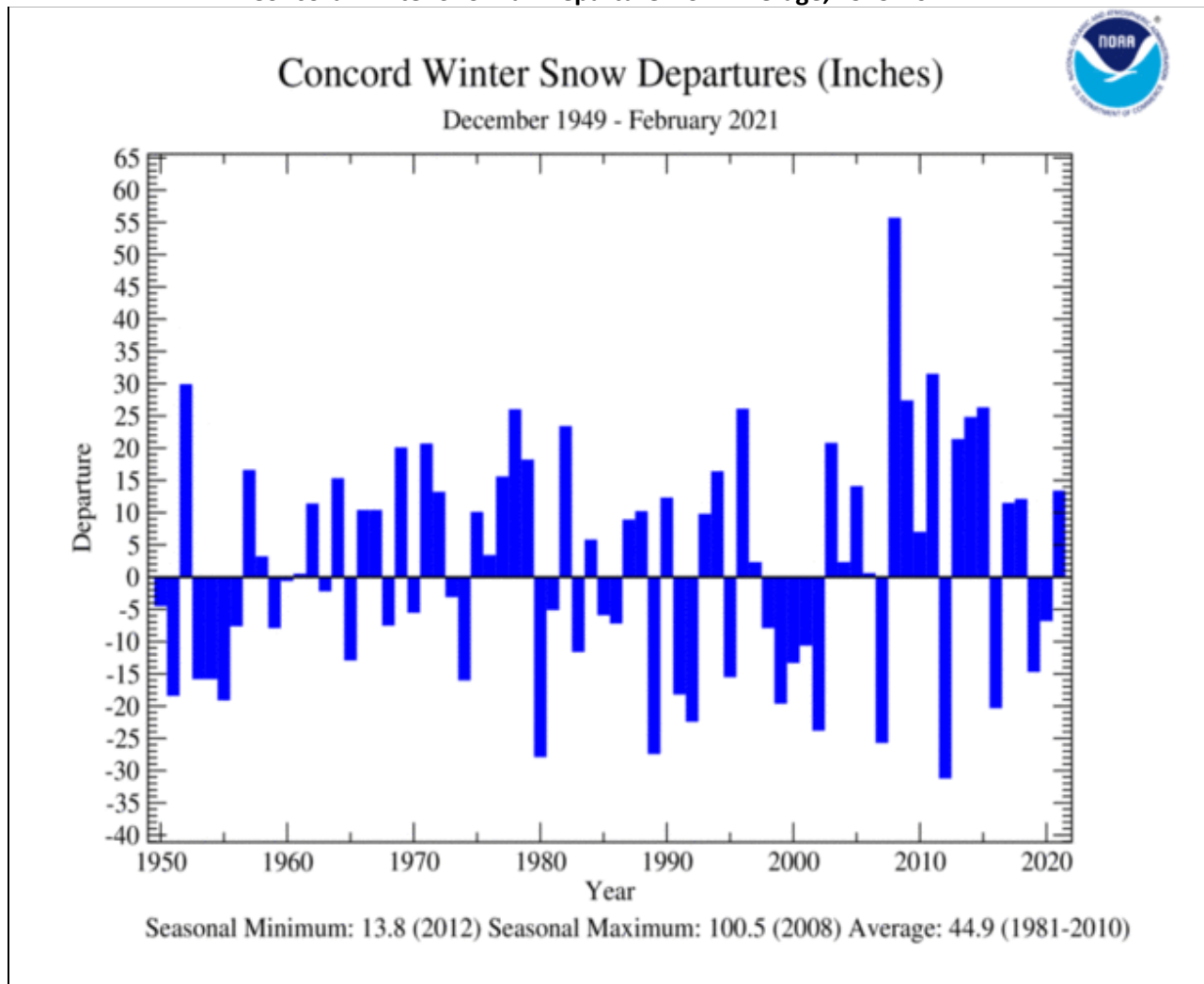
Source: National Oceanic and Atmospheric Administration, last accessed 03-31-21

Displayed in **Figure 25** is the departure from normal snowfall instead of actual inches per year, using a “30-year normal” period as the baseline, which for **1981-2010** is **44.9”** of snowfall annually in Concord.

The amount of recent annual snowfall has significant departures from normal. From **Jan-Dec 2020**, **58.2”** of snowfall occurred, which is **13.3”** higher than what normally falls (**44.9”**). Since **1949**, the year with the highest amount of snowfall was **2008** with **100.5”** and the lowest snowfall was **13.8”** in **2012**.

Figure 25

Concord Winter Snowfall Departure from Average, 1949-2021



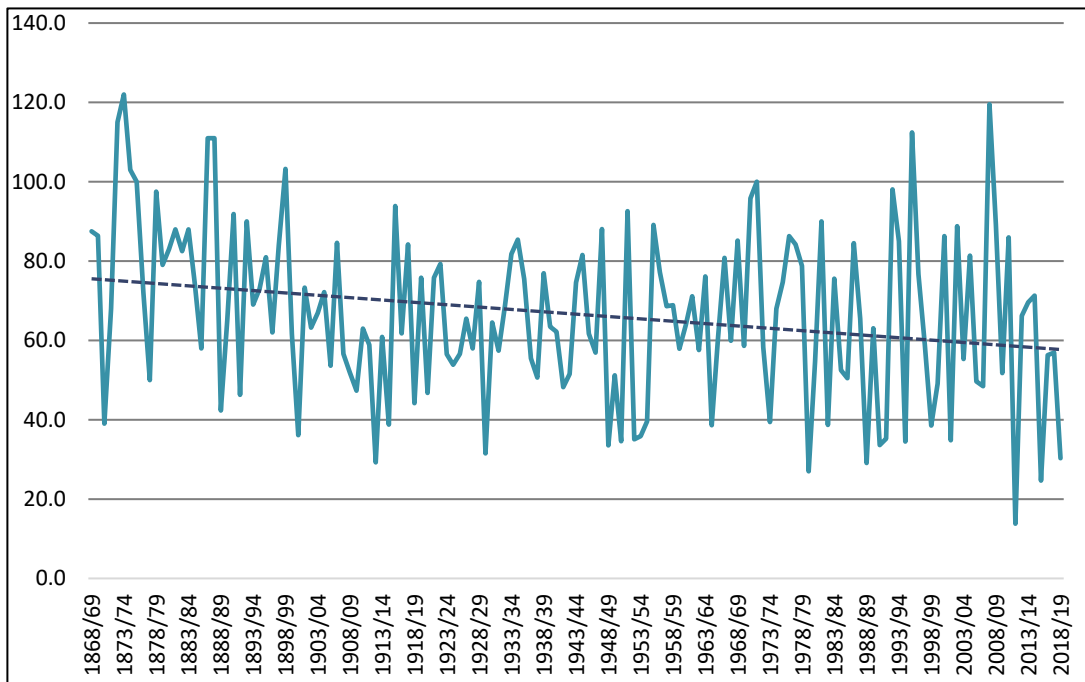
Source: National Oceanic and Atmospheric Administration, National Climate Report February 2021

<https://www.ncdc.noaa.gov/sotc/national/202102/supplemental/page-5>

<https://www.ncdc.noaa.gov/monitoring-content/sotc/national/2021/feb/Concord.gif> last accessed 03-31-21

The National Oceanic and Atmospheric Administration (NOAA) seasonal snowfall totals were compiled by CNHRPC for Concord, where snowfall data gathering began in **1868**. **Figure 26** displays the snowfall every **5** years and includes a trendline that indicate annual seasonal snowfall has decreased by nearly **20"** since **1868**. The years with the highest snowfall accumulations were **1873/74 (122.0")**, **2007/08 (119.5")**, **1872/73 (115.0")** and **1995/96 (112.4")**. The years of lowest accumulations were **2011/12 (13.8")**, **2015/16 (24.7")**, **1979/80 (27.0")**, and **1988/89 (29.1")**.

Figure 26
Seasonal Snowfall Totals for Concord, 1868-2019



Source: National Oceanic and Atmospheric Administration Data as compiled by CNHRPC, 03-19

Five (5) of the top 10 lowest snow accumulations occurred since 1990. The **2018/19** season ended with **30.3"**, ranking **6th** out of **151** years of records. Dunbarton is geographically close to Concord (**5** miles) and likely shares similar snowfall accumulation trends over time.

IMPACTS OF CLIMATE CHANGES IN SOUTHERN NEW HAMPSHIRE

This climate data may certainly be relevant to the entire Central NH Region which includes the Town of Dunbarton. The Central NH region climate summation is that the **temperature is getting warmer**, the **precipitation is increasing**, and the **snowfall is decreasing** according to the National Oceanic and Atmospheric Administration's data collection at the Concord airport. There are no indications to see these trend lines reverse in the future.

The Southern NH Climate Change Assessment, formally entitled *Climate Change in Southern New Hampshire: Past, Present, and Future, 2015* by Climate Change Solutions of New England under the University of New Hampshire, reviewed current climate conditions and projected future conditions of Southern New Hampshire under potential low and high emission scenarios. The Central NH Region and the Town of Dunbarton are within southern

Figure 27









Southern NH Climate Assessment Projections

illustrated in Figure 27.




As a result of anticipated extreme weather continuing and climate changes in Central NH and Dunbarton, consideration should be given for potential impacts to the community. Several new issues are considered, including public health, natural environment disruption, declining forest health, fewer recreational opportunities, risks to the built environment, transportation system maintenance, aging stormwater infrastructure, decreasing water resources and changing food and agriculture, which may result from climate change. For more information on these topics, refer to the *Central NH Regional Plan 2015*.

Past Data and Future Climate Overview	
SOUTHERN NH CLIMATE ASSESSMENT Projections	
TEMPERATURE	
What have we seen since 1970?	
→ Average maximum temperatures have warmed by 2.0°F (spring, fall and summer) and 2.9°F (winter)	
→ Average minimum temperatures have warmed by 3.2°F (spring, fall and summer) and 6.1°F (winter)	
What can we expect in the future?	
→ Summers will be hotter: 16-47 days above 90°F	
→ Winters will be warmer: 20-45 fewer days below 32°F	
RAINFALL	
What have we seen since 1970?	
→ Annual precipitation has increased by 8-22%	
→ Frequency and magnitude of extreme events	
What can we expect in the future?	
→ Precipitation annual average will increase: 15-20%	
→ More frequent and severe flooding	
SNOW	
What have we seen since 1970?	
→ Fewer days with snow cover	
→ Lake ice-out dates occurring earlier	
What can we expect in the future?	
→ Significant decrease of 20-50% in number of snow covered days	
Source: UNH Climate Solutions of New England, 2015	




More Human Health Emergency Events

-  Illnesses such as heatstroke, fainting, and heat exhaustion.
-  Excess heat especially dangerous for the aging population and residents without air conditioning.
-  Increase in greenhouse gas emission, energy demand, and air conditioning use and cost.
-  More favorable conditions for insects carrying viruses and diseases, such as West Nile Virus.
-  Increases risk of waterborne illnesses caused by pollutants entering the town's water supply, commonly through stormwater runoff and sewage overflow.
-  Infrastructure failure by adding additional stress, leading to potential injury or loss of life.
-  More air pollution, leading to asthma and breathing disorders.
-  Vulnerable populations require more assistance.



Natural Environment Disruption

-  Too much water and/or lack of water can disrupt trees and plants natural growing cycle, potential leading the tree, plant, and surrounding area to die.
-  Additional water and drought conditions affect wetland discharge, stream flow, and water quality, affecting the habitat's quality of life and species' health within the area.
-  Debris will be a result of harsh flooding, including trash and downed trees, polluting waters, harming habitats, and damaging property and infrastructure.






Declining Forest Health

-  Large weather events such as heat stress, drought, and periods of winter thaw followed by intense cold can lead to loss of trees.
-  Become susceptible to invasive species and diseases, such as the Hemlock Woolly Adelgid.
-  Loss of trees can have a direct impact on portions of the region's economic components, including declining tourism.




Fewer Recreation Opportunities

-  Weather Impacts on Recreational Trails such as debris, flooding and erosion.
-  Snowmobiling, ice fishing, snow shoeing, skiing and snowboarding provide numerous sources of winter recreation and winter tourism, enhancing the quality of life and economy, will be affected with shorter seasons.





Risks to the Built Environment

-  Critical infrastructure such as roads, bridges, culverts, stormwater drainage systems, water and wastewater treatment facilities, natural gas lines, electric lines and poles might be at risk of severe damage or failure if the anticipated extreme weather events occur.
-  Damaged infrastructure cannot provide services to homes and businesses, disrupting the economy and may endanger public health.
-  Culverts are at risk to extreme precipitation events, including rain, snow, and ice.
-  Residents who experience damage with flooding to their homes and personal belonging may lack proper flooding insurance, placing the resident in financial hardship.
-  Dams with High Hazard and Significant Hazard classifications are the most likely to cause the largest amount of damage or loss of life. Dam operators may quickly release water without notification to municipalities.



Increasing Municipal Transportation Systems Maintenance Needs





-  Volume of flooding is expected to increase, potentially closing roads and increasing the travel time for drivers and increasing the cost and energy use.
-  Flooding can also cause damage to pavement and embankments, increasing maintenance, repair, and replacement costs to municipalities.
-  Extreme precipitation will also increase erosion, decreasing certain infrastructure components design life span.

Aging and Inadequate Stormwater Infrastructure






-  Stormwater infrastructure such as catch basins, pipes, discharge points, and culverts that redirect stormwater runoff can be impacted by flooding and cannot perform their function.
-  Blocking of water can lead to flooding of the area and roadways, potentially leading to the closure of nearby roads.
-  Components of stormwater infrastructure are outdated, and increased flows are added stress to the system, more money to maintain and higher replacement costs.
-  Increased development with increased amounts of impervious surface adds the volume of stormwater runoff within more urban area.

Decreasing Water Resources

-  Water quality and quantity are both threatened by projected changing weather events, with threats of flooding, drought, erosion and stormwater runoff.
-  By preventing groundwater from replenishing, additional runoff and sediments can lead to intensify flows in rivers and streams with higher contamination levels of unwanted nutrients and pathogens.

-  Additional water treatment may be necessary, potentially overloading treatment systems.
-  Contamination can pollute sewage, threatening the performance of wastewater treatment facilities.
-  Increased occurrences in flooding can also intensify flows, causing overloading of treatment system.
-  When the ground is frozen, rapid snow melt from warm days or intense rain is not able to infiltrate the ground, leading to drought conditions.

Changing Food and Agriculture Production

-  Merrimack County is the top county in the State for agriculture sales of higher temperatures will promote a longer growing season for most crops, benefiting a larger number of local crops.
-  Negative impacts can potentially alter the region to a climate not suitable for growing valuable local crops such as apples and blueberries.
-  Temperature are expected to slow weight gain and lower the volume of milk produced by dairy cows.
-  Higher overnight temperatures are anticipated to prevent the dairy cows and cattle from recovering from heat stress.
-  Warmer temperatures and increase in carbon dioxide in the air creates a more ideal environment for pests and weeds, potentially increasing the use of herbicides and pesticides on crop.

This is a sampling of how changing climate and severe weather impacts can affect communities in New Hampshire, in the Central NH Region and in Dunbarton. Consideration should be given to applicable items during the development and update of the **Hazard Mitigation Plan**, as Actions are completed, and as new Actions are developed for the **Mitigation Action Plan**.

Dunbarton's Hazard Vulnerability Changes Since the 2017 Plan

The locations of where people and buildings are concentrated now or where new lands may be developed have been considered as compared to the changing locations of potential natural hazards in order to best mitigate potential property damage, personal injury or loss of life. These factors assist the community with determining whether Dunbarton's vulnerability to natural hazard events has changed in any way since the **2017 Plan**. Facilities and their locations with vulnerabilities to specific natural hazards are listed in

APPENDIX A Critical and Community Facilities Vulnerability Assessment.

There have been limited population and housing increases over the last **5** years from **2 COMMUNITY PROFILE**, but aging residents and individuals with limited access and functional needs require more services and assistance. Traffic continues to increase within Town because of the NH 13 and NH 77 commuter routes through Dunbarton. The need for volunteers increases annually as fewer younger people are joining Town Boards and Committees and finding new people to volunteer to serve is difficult. Existing volunteers typically continue their service for many decades. Membership in the Capital Area Fire Mutual Aid Compact (CAFMAC) Dispatch has enabled for faster emergency response for Fire Department and Rescue needs. The Town has access to the Central NH Hazardous Materials Response Team and the Central NH Special Operation Unit for special incidents, which creates more training opportunities and resources. Membership in the Capital Area Public Health Network enables organized public health assistance while membership in the NH Public Works Mutual Aid program enables shared Highway Department labor and equipment from across the State during times of need.

THE TOWN'S STATEMENTS OF VULNERABILITY CHANGE

2022

Natural Disasters Vulnerability The Town's overall vulnerability to natural disasters **is believed to have STAYED THE SAME over the last 5 years**. Factors considered include its low but steady population growth and aging population, the changing climate and weather impacts, and continuing disasters and hazard events. These factors are offset by less road flooding, less debris, faster damage repair, regular infrastructure improvements, low development, good preparation and mitigation to date, and a positive sense of community.

Changing Climate

The Town is experiencing increasing temperatures, more rain, less snow, and storms are bigger. The frequency of torrential downpours has increased which impacts the watercourses in town such as One Stack Brook, Stack Brook,, Bela Brook, Stark Brook, Harry Brook, and Black Brook, as well as other waterways in. This results in frequent wash outs or erosion of portions of gravel roads, ditches, and drainage systems. Additionally, the increase impact the large regional rivers such as the Merrimack River,

Soucook River, Contoocook River, and Suncook River which all could yield large flood conditions. The Hopkinton-Everett Reservoir protects the entire region. Yet floods have not *recently* reached the **100**-year storm event level. The torrential downpours and fast snow melt washes out some of the Town maintained roads. Increased traffic accidents result from the weather and road conditions.

More rain is falling more quickly, and although the roads are mostly good now, washout issues remains the same. Tree debris remains the same because of Eversource and Unifit trimming activity. The Town has upgraded culverts underneath roads yet has been experiencing drought conditions as opposed to flooding over the last five years.

As a mostly forested community, a significant future concern to Dunbarton is the large die-off of trees (including ash trees) along the roadways. These trees help hold the water supply, serve as carbon storage, maintain a healthy local hydrologic cycle (tree transpiration), and guard against erosion on the hills to the roads.

Town Demographics and Housing Changes

The changing population characteristics in Dunbarton will impact its future sustainability. More seniors are living in their full-sized homes. There are no manufactured home parks in Dunbarton, no senior 55 and older developments, and no assisted living facilities. Only one area around Gorham Pond contains a high density of homes and residents. There is a low inventory of single family homes for sale in Town. The younger generation leaves the local school system for college and greater employment opportunities and does not often return to the Town after completing their college degrees. Few of Dunbarton's young college-educated professionals (Millennial Generation) are moving back to live locally. Housing costs are very high and there are few jobs in Dunbarton and the surrounding area available for highly educated young people.

There is a higher demand for Accessory Dwelling Units (ADU) on single family homes, with adult children (Generation X) sharing living space with their parents, usually with parents in the ADU. In the Central NH region, smaller, multifamily units have been fully built-out and are in high demand. With lower market rates, the elderly/retired residents, lower-income earners, and young families compete for this housing.

The townspeople are aging and the need for services increases while there is little availability to downsize to the single-level, ranch style homes that the aging population prefers in the area. The Town offers emergency Fire, Ambulance, and Police services seven days per week and with on-call, 24 hours per day availability. Dunbarton continues to have a strong volunteer ethic for Town Committees and Boards and organizations.

Economic Changes

Years when the economy is good, housing growth will occur as many new business develop. Dunbarton has few active commercial or industrial businesses, not even along NH 13 and NH 77. An unknown number of home-based businesses are believed to be in operation and in general, home businesses are encouraged in the community. The lack of a diverse tax base makes it difficult to afford long-term mitigation planning projects or enhancements to Department budgets. Class VI gravel roads and conservation land trails are used for bicycling and walking but generally do not attract people from outside the immediate area.

Dunbarton residents can commute 15 minutes to work in Concord or can reach Manchester within 25 minutes. Today, the option to telecommute is growing stronger. Most workers commute using NH 77, NH 13 to access jobs in Concord, Hooksett, or travel to I-93 and I-89 to access Lebanon, Manchester, Plymouth, and greater Boston metro area locations.

Infrastructure Changes

With an aging population, the Town of Dunbarton may be challenged to raise taxes for mitigation projects. Currently, the infrastructure is believed to meet the Town's needs. For instance, limited funding is available to upgrade or improve the Town's Class V roads, including drainage.

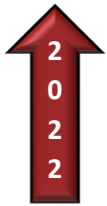
The Town Office fulfills Department operational needs. The Safety Complex houses the Fire and Police Departments. The Highway Department operates out of a contracted local business. For all Departments, budgets are limited for infrastructure upgrades. The Town has multiple Capital Reserve Funds (CRFs) and Expendable Trust Funds (ETFs) and the Town has a CIP. Yet because funding comes from taxation, budgets are limited to approval from residents at annual Town Meetings, and the occasional state funding and state and federal grant opportunities.

The burden on the Town's aging infrastructure will continue to increase. The high costs of upkeep and rehabilitation of Town roads, buildings, and the services provided by Departments may not be sustainable in the long term without significant changes and/or tax increases.

Overall Natural Hazards Vulnerability

Despite these risks, **Dunbarton is also better protected from natural hazards now than in the past.** These protections arise from select infrastructure and service improvements to past vulnerable areas which were identified and mitigated where feasible by the Highway Department, Emergency Management, Police Department, Fire Department, and Town Administration. The Town was assisted by the State of New Hampshire and

memberships agreements with organizations and neighboring towns for aid. Balancing the changing climate and potential for hazard events, **Dunbarton’s overall natural hazards vulnerability has REMAINED THE SAME over the last 5 years.**



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. Although the Town is **better protected than in the past** through partnerships and best practices, updated SOPs, and tightened informational technology services and updates protecting data, the Town has an ongoing struggle to contain the many facets of human and technological hazards. Town must stay in a reactive position to these events instead of a proactive position due to costs, staffing, and practicality.

Human Hazards Vulnerability

Human hazards are unpredictable to a large degree, but preparedness can enable faster, more appropriate emergency response. The School District conducts active threat drills (2x per year), fire drills (10x year), and bus evacuation drills periodically during normal operation years. The District likely reviews its Emergency Operations Plan and procedures annually. The Town emergency responders (Emergency Management, Fire & Rescue, Police) often participates in municipal drills and the School drills. All emergency response personnel regularly participates in the newest training related to human hazards, at least during non-pandemic years.

The Fire Department call volume and Police Department call volume have increased since **2017**. More incidents have been recorded in the Town, including the alarming illegal backlot meth labs, illegal drug seizures, and finding drug syringes along roadways. The increased use of social media is believed to increase volatile situations and bullying handled by emergency response personnel responding to an increase in mental health crisis calls by younger residents.

Stress levels in the community have increased as noticed by Departments and the School District. The COVID-19 pandemic helped to polarize residents by decisions mandated for health and safety. Mental health and substance abuse issues need to be addressed. Higher stress can result in serious human hazard events such as active threat, kidnapping, hostage situations, civil disturbance, or public harm.

Technological Hazards Vulnerability

The Town’s core financial business software operates “in the cloud” with multiple redundant backups available as a safeguard. Most Department files are saved to a local server and backed up to the cloud. A contracted IT company is responsible for maintaining the Town’s local server. The files, email, internet, website, and cloud data

are maintained by software provider. The Town system is fairly safe from cyber-attack because their technology is automated under highly secure software and hardware.

While the Town and School cybersecurity has increased, like anti-phishing and malware installation, new technological hazards will continue to be developed and utilized and may be directed toward Dunbarton, which is not anticipated to be able to keep pace with advanced, changing technological risks. Valid concerns include Town database and website hacking although Departments have redundant back-up systems to the cloud by using outside software providers. While use of technology increases efficiency, the increased reliance on cell phones, electronics, electricity, and technology also makes Dunbarton's population and Schools more vulnerable to the effects of cyberattacks.

Overall Human and Technological Hazards Vulnerability

The Town itself is **better protected** from most human hazards by partnerships among Town Departments, Dunbarton School District, mutual aid agreements, and emergency response and membership with the Capital Area Mutual Aid Fire Compact (CAMACF). However, with the future technological factors considered, **the Town's vulnerability to these hazards has INCREASED** and is anticipated to continue increasing to **2027** and perhaps indefinitely.

FUTURE DEVELOPMENT IN DUNBARTON

Most of the Town's roads and homes are located in remote locations, but many are located along the major state roads and a few in residential communities (Gorham Pond). Few homes were newly constructed since the **2017 Plan** (only **71** between **2010-2020**). Dunbarton is accessible via the primary NH 77 and NH 13 corridors and local roads such as Robert Rogers Road, Montalona Road, Twist Hill Road and connector roads. Residents are aging and employed adults either work from home or commute to Concord, Keene, Hooksett, Manchester, or Lebanon or points within or beyond. Since much of the easily developable land in Town has already been built or subdivided, future developments may occur on the (upgraded) Class VI Range Roads, much is built on backlands, near **wetlands** or **steep slopes**. **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 **washout** roads.

Village mixed use development between existing built areas at the Village Center could guide residential and light commercial/retain development as mixed-use in the community. Many conservation easements and state and federal land protect Dunbarton's land from development. **Small-scale commercial** and **small scale residential developments** are expected to occur in Dunbarton in the future, but likely not much multi-unit housing.

The most remote Class VI locations are not protected against severe impacts of **wildfire** and **lightning**, and all wildland urban interface housing could be vulnerable to **wildfire**, **severe winter weather**, **storms**, and **flooding of local roads**. There remains 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 is highly preferable by the Town.

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 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**, **severe wind events**, **severe winter weather**, **debris impacted infrastructure** (trees down on powerlines and trees/powerlines down on roads), **aging infrastructure** and **utility failures**. 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**.

5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

The Hazard Mitigation Committee developed and/or updated as needed each of the asset 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 **Dunbarton Hazard Mitigation Plan 2017**.

The identification of Critical and Community Facilities within Dunbarton 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 Dunbarton 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 the technological (and secondary disasters) such as power failure and communications systems failure or 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 [Apr 2022 assessing software](#) and the [2022 MS-1 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 the Dunbarton 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.

Facility Name	Street Address (911)	Phone	Structure Replacement Value* \$	Primary Hazard Vulnerabilities
---------------	----------------------	-------	---------------------------------	--------------------------------

Potential structure damage loss is also provided. The detailed information is available in **APPENDIX A Critical and Community Facilities Vulnerability Assessment**:

Critical Facilities

Critical Facilities are categorized as those Town or State buildings or services that are first-responders in a disaster or that are required to keep the community running during a disaster. The personnel in the Dunbarton Town Department facilities, the Town Offices, Fire Department & Police Department (Safety Complex), Highway, Transfer Station, and Library provide the services necessary for coordinating everyday activities and for emergency response. Other critical partners such as the Schools District provide essential services. 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, (future) gas lines, (future) water & sewer lines, and electric transmission lines are included because of the essential communication and utility services provided, and their significant impact on Dunbarton residents when they fail. Other **Critical Facilities** would include educational facilities, medical facilities, and emergency shelters.

Many critical facilities are located in Dunbarton. 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 Department, Highway Department, Police Department, Town Offices, Transfer Station. **Assessed structure (only) valuation for these essential facilities total \$1.1m.**

Utilities include: Dunbarton Telephone Company, Eversource, National Grid Power Transmission Lines, Unitil, SBA Tower, US Cellular Cell Tower, Microwave Communications Tower. **Assessed structure (only) valuation for these utility structures total \$13.1m.**

Dams include: **2 High Hazard (H) Dams:** 070.09 Everett Lake East Dike P1, 070.13 Everett Lake North Dike P2. **0 Significant Hazard (S) Dam;** **4 Low Hazard (L) Dam:** 070.01 Stark Pond Dam (flood control dam), 070.02 Kimball Pond Dam (Town, recent repairs), 070.18 Flintlock Estates Fire Pond Dam, 070.20 Belanger Recreation Pond Dam (private); and **Exempt Dams (from classification):** 070.06 Dunn Farm Pond Dam, 070.07 Wildlife Pond, 070.11 Recreation Pond, 070.12 Wildlife Pond, 070.14 Wildlife Pond Dam II, 070.15 Recreation Pond, 070.16 Recreation Pond, 070.17 Recreation Pond, 070.19 Cohen Fire Pond, 070.21 Zeller/Vaal Recreation Pond. **Estimated structure (only) repair values for these dams total \$7.55m.**

Bridges include: **0 TOWN BRIDGES;** **1 STATE BRIDGE:** 109/141 Grapevine Road over Bela Brook. **1 FEDERAL-ARMY CORPS BRIDGE:** 055/132 Mansion Road over Stark Brook. **Estimated structure (only) rehabilitation values for these bridges total \$1.5m.**

Shelters, Schools, and Medical Facilities include: SCHOOLS: Dunbarton Elementary School (K-6) (~230 students + ~50 staff), Community Center at Elem School Lunch Room, Town Facility for recreation and Town Meetings, Sheltering [~500 Capacity]. MEDICAL: Dunbarton Family Dental Care. **Assessed structure (only) valuation for these schools, medical facilities, and shelters (Town Office only) total \$2.6m.**

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**. Some supporting information for the facilities was identified as INFO: statements. 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

- ⊙ The Town Office lacks a generator to keep essential governmental services operational.
- ⊙ The Town's important documents such as paper records and historic Library documents may not be protected from fire or water. These documents are stored in many locations including the old Town Hall and the Library archives, but most are stored in a vault in the Town offices.
- ⊙ Dunbarton's Town Offices and Police Department do not have sprinkler systems and there is no space for a cistern in the Town Offices. Many Town buildings are old making it too expensive to retrofit with effective fire suppression systems.
- ⊙ Town buildings are aging, donated, or built upon structures, making them not compliant with current ADA and building codes. All buildings need upgrades such as electrical updates or new roofs. When buildings are upgraded, ADA accessible features are required.
- ⊙ The Dunbarton school is compliant with most building codes except for snow load requirements. Additionally, the Town Office, Police Department, and Fire Department were constructed prior to current codes.
- ⊙ Police Department vehicles are not under cover, making them susceptible to quicker deterioration. In addition to coverage, protective measures would be useful such as oil undercoating. Secondary equipment issues occur during freezing weather and could be combatted by equipping the cars with remote start and conducting linex undercoating to keep salt, sand, and water out.
- ⊙ The Police and Fire Departments do not have enough space to conduct their business without additional challenges. The Police Department does not have space for a sally port

and the Fire Department garage doors do not fit modern fire equipment. Expansion of the Fire and Police Safety Complex is limited by real estate availability.

- ⊙ **INFO:** When enacted The Town’s emergency shelter is the Community Center which was designed in 1988 to accommodate higher load capacity for wind, earthquake, and snow. However, it does have some code issues and a roof failure could be a significant hazard.

Utilities Table

- ⊙ Cold winters and drought conditions cause problems with fire suppression equipment. Dry hydrant connections can freeze in cold weather. During all drought years, the fire department has lost the use of the dry hydrant on Grapevine Road. Additionally, the Fire Pond behind the Fire station and brooks used to pull water for suppression become critically low. Cisterns are reliable but are expensive and require maintenance. Fire suppression is required with new development.
- ⊙ **INFO:** There currently are no utility issues – poles have been upgraded, fiber optics have been installed, constant improvements have been made. Trees are regularly cut back by utility companies. Older and more fragile telephone poles still need to be replaced.
- ⊙ **INFO:** Goffstown dispatches for Dunbarton Police, using ARPA a new repeater will be placed on Powell Lane to boost all emergency communications. In the past the Powell Lane tower has been burglarized. Police department will monitor location and it is secured.

Dams Table

- ⊙ **INFO:** There are no current dam issues – all properties were removed by eminent domain out of the US Army Corps of Engineers High Hazard dams’ area, no properties in the watershed or floodplain.
- ⊙ **INFO:** Many of the unofficial dams or ponds in Town are the result of beaver activity. To stay ahead of all beaver activity requires constant work by the Highway Department. The Town has an agreement with a trapper to remove the beaver problem.
- ⊙ **INFO:** The main issue for the Town is culver blockages causing overtopping, a frequent occurrence on Guinea Road, Armand’s Way, Flintlock Road, Gorham Pond Road, NH Route 13, Moose Point, Black Brook Road, and behind Dunbarton Elementary School.

Bridges Table

- ⊙ **INFO:** New structures including a box culvert at the former golf course and a bridge on Grapevine Road have been constructed recently. The Grapevine Road Bridge is technically registered as a bridge because it is 10’ wide, but by design functions as a culvert.

Shelters, Schools and Medical Facilities Table

- ⦿ The Elementary School is lacking fire suppression sprinklers. A retrofit may be too expensive, or the water source may not be feasible.
- ⦿ INFO: The Elementary School has emergency drills and active threat response practice several times per year. There are established plans to evacuate or lock down in place. These plans are updated annually.
- ⦿ INFO: Dunbarton Elementary School is secure and equipped with cameras but has had no issues. The police department is located next to the school acting as a deterrent of potential crime.
- ⦿ INFO: The Dunbarton Police Department completed ALICE (Alert, Lockdown, Inform, Counter and Evacuate) training at NHDES in May 2022. DPD also continues to participate in NHDES Safety Team Meetings and safety drills.

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 once within this section and within the **Mitigation Action Plan 2023**. 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 Dunbarton has hundreds of culverts and is not known to have a mapped inventory. The Highway Department maintains multiple Town culverts daily (debris removal, clearing, repairs) and attempts to keep pace with culvert upgrades. Yet upgrading all culverts that require this action in the next 5 years would be unrealistic. A prioritization of the culverts in greatest need of upgrade is necessary.

Table 28 displays Dunbarton’s initial listing of culverts in need of most urgent upgrade and approximately when the upgrades should occur. The intent is to upgrade all of these failing culverts with either open box culverts or appropriately-sized PVC culverts, respectively. The estimated cost for these projects may reach well over **\$300,000** 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 **2023-2028** which is within the span of this **2023 Plan**.

Table 28
Town-Owned Culverts in Need of Upgrade Through 2027

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
#03-2011	Black Brook Road	1	Harry Brook	Too Small	36"	2023	\$18,000
#02-2011	Montalona Road	2	Brook	Too Small	TBD	2025	\$250,000
	Birchview Drive	1	Run Off	Rusted	36"	2023	\$25,000
	Totals						\$283,00

Source: Dunbarton 2022 Mitigation Action Plan, Highway Department Oct 2022

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 28** 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. The Town is currently working to transcribe these notebook-written locations into an editable Excel document, with the goal of developing a Culvert Maintenance Plan.

MOST VULNERABLE ROADS AND NEIGHBORHOODS

The Town of Dunbarton has about **67.3** total miles of roadway including **44** miles of Town maintained Class V (both paved and unpaved roads), **8** miles unmaintained Class VI roads, private roads and State highways. 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. Dunbarton residents reside in neighborhoods, such as Gorham Pond Area, subdivisions, 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 29**.

Table 29

Town Road Length and Classification

Dunbarton Roads Legislative Classification	Total Length in Miles	Percentage of Road Network
Class I (State Primary Highway)	10.09	15.0%
Class II (State Secondary Highway)	5.26	7.8%
Class III (State Recreational)	0.0	0.0%
Class IV (Urban Maintained)	0.0	0.0%
Class V (Town Maintained)	43.96	65.3%
Class VI (town Unmaintained)	7.98	11.9%
Private	0.0	0.0%
Totals	67.28	100.0%

Source: NHDOT Mileage by Town and Legislative Class, released 2021

The Town of Dunbarton is responsible for **51.94** miles of Town owned roads, some of which are paved and some of which are unpaved. Compared to other small-sized Central NH region communities, the Town of Dunbarton hosts fewer than average roadway miles.

ONE-EGRESS ROADS AND CUL-DE-SACS

The Town of Dunbarton has about **14** miles of roadway, including Town maintained Class V, unmaintained Class VI and private roads, that are dead-end roads or cul-de-sacs with only one way in and one way out. Hundreds of people live in approximately **221** homes - about **600** people- along roads which have no secondary means of egress. 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 30**.

Table 30

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 Hazards of Concern	Condition (Good, Fair or Poor)	Approx. Length in Feet	Approx. # of Homes on Rd	Neighborhood Name (If Applicable)
Alexander Road	Class V	Tree Fall, Winter	Good	2,845	8	
Armand's Way	Class V	Winter	Good	2,225	10	
Birchview Drive	Class V	Tree Fall, Winter	Good	3,253	14	Flintlock Farms
Blueberry Trail	Private	unknown		1,493	2	
Caleb's Way	Class V	Winter	Good	1,202	4	
Clifford Farm Road	Class V	Tree Fall, Winter	Good	3,593	12	
Country Club Lane	Private	unknown		1,067	2	
Fairway Drive	Class V	Winter	Good	3,167	0	Countryside Estates (new)
Farrington	Class V, VI	Tree Fall, Winter	Good/Fair	2,346	0	
Flintlock Farm Road	Class V	Tree Fall, Winter	Good	5,459	18	Flintlock Farms
Gile Hill Road	Class V	Tree Fall, Winter	Fair	3,950	7	
Hawk Lane	Private	unknown		849	2	
Hilltop Lane	Class V	Winter	Good	2,767	0	Countryside Estates (new)
Holmes Road	Class V	Winter	Fair/Poor	828	3	
Jacqueline Drive	Class V	Winter, Flooding	Good	1,200	4	
Jean Drive	Private	unknown		1,084	4	
Kelsea Road	Class V	Tree Fall, Winter	Fair	1,831	5	
Line Hill Road	Class VI	Winter	Poor	1,128	1	
Millie's Way	Private	unknown		1,427	4	
Moose Point	Class V	Winter	Good	2,307	6	Flintlock Farms
North Woods Road	Class V	Winter	Good	2,400	10	North Woods Estates
Old Fort Road	Class V	Tree Fall, Winter	Good	4,701	25	Old Fort Estates
Old Hopkinton Road	Class V	Tree Fall, Winter	Good	4,515	20	
Overlook Drive	Class V	Winter	Good	3,989	24	Overlook Estates
Rangeway Road	Class V, VI	Tree Fall, Winter	Fair	6,300	19	
Story Hill Road	Class V, VI	Tree Fall, Winter	Good/Fair/Poor	4,670	7	
Town Farm Lane	Private	unknown		746	2	
Zachary Drive	Class V	Winter	Good	2,800	8	
Total Feet One-Egress Roads:				74,142.0	221	Vulnerable Homes
Total Miles One-Egress Roads:					14.0	

Source: Dunbarton Highway Department Road Agent (Road & Resident Lists), Sep 2022

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: ASSISTED LIVING OR GROUP QUARTERS; CHILD CARE FACILITIES; MANUFACTURED HOUSING NEIGHBORHOODS: Gorham Pond Area (Lake Gorham Association): Gorham Drive (~10 homes), Gary Road (~16 homes), Karen Drive (~19 homes), Stephanie Drive (~10 homes), Holiday Shore Drive (~35 homes). APARTMENTS AND INDEPENDENT LIVING: School Street (~6 apts), Black Brook Road (~4 housing units), Belanger Stark Highway North (~4 units), Condos on Twist Hill Road (~4 housing units), Montalona Road (~4 housing units), Stark Highway North (~4 apts & 1 business). **Assessed structure (only) valuation for these vulnerable population facilities total \$9.3m.**

Economic Assets include those LARGE BUSINESSES and **services** that employ a large number of people or contribute to the local economy: Industrial Communications, Capital Well Company, Dirt Doctors/Northeast Develop Holdings – Excavation Pit, Page’s Corner Store, J&J Landscaping, American Tree Service, Crosby’s Construction, School Street Cafe. AGRICULTURAL: Carter Stables, Blue Sky Equestrian Stables, Donnelly Blueberry (PYO), Langley Blueberry (PYO), Sowle Xmas Tree Farm, Oris Vegetable CSA, Thorbechon Riding Area and Camp, Brigg Horse Boarding and Riding, Hodgman Sugar House, My Three Sons Sugar House and Xmas Trees, Nowell Sugar House, Fellbaum Sugar House, Rubin Apiary Bees and Hardscaping, Stillson Blueberry. See also **Hazardous Materials** facilities. **Assessed structure (only) valuation for these economic asset facilities total \$3.3m.**

Hazardous Materials Facilities include: Dunbarton Fuel Services, Haeven’s Gas Station, Voydatch Junkyard, Chabot Welding Shop LLC, Propane Filling Facility, Nichol’s Garage. See also **Economic Asset** facilities. **Assessed structure (only) valuation for these hazardous material facilities total \$703k.**

Cemeteries and Churches include: CHURCHES: St. John the Evangelist Episcopal Church, First Congregational Church. CEMETERIES: Page’s Corner Cemetery, Stark Cemetery, Dunbarton Center Cemetery, East Dunbarton Cemetery. **Assessed structure (only) valuation for church facilities and headstone replacement estimates for cemeteries total \$831k.**

Historic Sites and Buildings include: Dunbarton Historical Society (3 buildings), Molly Stark House, Old Town Hall – Library, Stark Mansion, Town Pound, Historic Marker – Old Site of Stark Cemetery, Robert Rogers Homestead Site, Caleb Stark Monument at Town Center. See also **Recreational and Gathering Sites**. **Assessed structure (only) valuation for these historic facilities total \$1.3m.**

Recreational and Gathering Sites of both land and buildings include: Purgatory Pond Boat Ramp (NH Fish & Game), Long Pond Boat Access (Town), Kimball Pond Boat Ramp (Town), Gorham Pond State Boat Ramp (NH Fish & Game), Hopkinton Everett OHRV Parking Lot [~100 car capacity]. Dunbarton School Fields [~300 capacity]. **PRIVATE RECREATION:** Pioneer Sportsmen Club [~unk capacity], Gorham Pond Beach [~50 capacity], 20th Skeet and Clays. **EASEMENTS, CONSERVATION LANDS, and TRAILS:** Kuncanowet Town Forest and Trails [925 acres], Mill Pond Trail [1.2 miles], Lost Lake Loop [0.9 miles], Gum Tree Trail [2.2 miles], Gorham Pond Trail [0.3 miles], Hobble Bush Trail [0.5 miles], Stone Wall Trail [0/1 miles], Kimball Pond Conservation Land and Trails, Kimball Pond Loop Trail [2.4 miles], East Side Trail [1.4 miles], Bela Brook Conservation Land and Trials, Cellar Hole Trail [0.5 miles], Jim Stone Trail [0.9 miles], Green Trail [0.1 miles], Stark Pond Recreation Area (snowmobile, dirtbike) Part of Clough State Forest, Natalie and Wilcox Brown Forest. Some of these sites can be **Economic Assets** to the Town even if the land is untaxable. Only some structure valuations were available. **Assessed structure (only) valuations for the recreational facilities for land and/or structures total \$322k.**

Future Development includes both residential and commercial development potential in Dunbarton. There are several **APPROVED/UNBUILT** developments or potential developments according to the Planning Board: Burchell Lot, Starace Lot, Pike Lot, Countryside Golf Course. **LEGACY PARCELS** (large lots with development potential): Crosby Trust Lot, Englund Trust, Morin Lot Swindlehurst Trust, Trexler & Allens Lot, Slocum Lot, Lokar Lot, Colter Lot, Dugrenier Lot, Carlisle-Stadelmann Lot, Burnham Lots, Cohen Lot, Doucet Lot, Nault Lot. **LOTS IN DUNBARTON FOR SALE 05-22:** lots for sale during this snapshot include: Jewett Road Landlocked Lot [44 acres], Montalona Road Lot [10 acres], Gorham Pond Lot [48 acres], Stark Hwy Single Family Home and Lot [18.5 acres], Gorham Pond Single Family Home and Lot [14.9 acres]. **Assessed valuation for the Potential/Approved PB Developments (LAND) Legacy Parcels (LAND) and Lots for Sale properties (LAND) only totals \$5.3m.**

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**. . Some supporting information for the facilities was identified as **INFO:** statements. 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

- ⦿ Wildfire, flooding, and evacuation are concerns for the Gorham Pond Area due to heavy population concentration and 3 egress: Gorham Drive, Gary Drive, and Karen Drive. State officials have access for a boat ramp in the area.
- ⦿ Large increases in Accessory Dwelling Units (ADUs) as part of a single family dwelling can cause confusion for address and emergency response evacuations. About 5 ADUs per year have permits completed and are assigned the same address as the single family dwelling but with a “B” signifier included. Address identification and signage at all homes is an issue. The number of residents in the structure is unknown and the names of residents is unknown.
- ⦿ INFO: Gorham Pond Association for homeowners may not be deeded, residents only can use the beaches.

Economic Assets Table

- ⦿ All businesses should have chemical handling requirements and MSDS sheets for reporting at Tier 1 to Central NH Haz Mat for annual registration.
- ⦿ INFO: Town zoning regulations permit agriculture throughout the entire Town, leading to many farmstands but farm buildings require permits.
- ⦿ INFO: Oris CSA has a driveway off NH 13 and Story Hill Road that is used as their main entrance and address. A solar farm will soon be installed at the Story Hill Road location.
- ⦿ INFO: Drought is harmful to agricultural operations in Town. Pesticides and fertilizer use on the farms can runoff and cause soil degradation. Too much nitrogen in the water can percolate into groundwater supplies.

Hazardous Materials Table

- ⦿ With wetlands located behind the V----- property there is potential for stored vehicles to leach hazardous materials into water supplies. Other properties in Town have vehicles stored and may be in proximity to wetlands. Complaints about excess numbers of vehicles located in yards must be filed.
- ⦿ Heavens Gas Station is regularly flooded with an overflowing pond and wetlands behind the location. An accompanying rental housing unit can also be flooded. The fire suppression and drainage at these properties may be inadequate. The gas tanks should be inspected on a regular basis and their potential flood radius defined. The tanks and pumps were recently replaced. The tier 2 facilities of chemicals onsite should be reported to the Central NH Regional Haz Mat Team.

- ⊙ Daily transportation of hazardous materials on NH 77 and NH 13 Stark Highway poses a high risk of spill. MSDS sheets should be readily available for chemicals and placards should be posted on all transport trucks.
- ⊙ The increase of home occupation development throughout town such as auto body and repair shops, welding, salvage yards, dentists, etc. pose a potential increased risk of hazardous materials. Some businesses have gases on site and dentist offices require holding tanks for liquid waste. Permitting and inspections may need to occur for some facilities.
- ⊙ INFO: Tier 2 reporting to the Fire Department may be needed. The Planning Board enforces zoning ordinances and table of uses for small businesses. The Fire Department performs inspections for spill containment and NHDES for emergency shut off capabilities.
- ⊙ INFO: Central NH Haz Mat Team can assist with Dunbarton incidents. Volunteer Dunbarton Fire Department members on call are not usually available leading to a higher response time.
- ⊙ INFO: Many “heavy” businesses are located on residential property, with construction equipment stored on the property (6-12 properties). There are no anticipated changes to the zoning.

Cemeteries & Churches Table

- ⊙ The East Dunbarton Cemetery gravesites reside on top of a hill and have been subject to erosion along the hillside.
- ⊙ The Dunbarton Center Cemetery experiences sinkholes and natural root systems of trees impact the graves. These Graves are located directly adjacent to the Town Office. Divots are regularly filled by the Cemetery Commission.
- ⊙ INFO: Similar to several New Hampshire towns, Dunbarton has relocated old graves from Stark Cemetery located near Stark Pond to Mansion Road. A historic marker was placed at the Stark site.

Historic Sites & Buildings Table

- ⊙ There is a town-wide problem of retaining and protecting important records. Cemetery Trustees, Library, and other group’s records are all potentially in danger in the event of a hazardous event.
- ⊙ INFO: The Library has older paper volumes that are not protected in a vault and are copies of the originals, many are also digitized. There are no special collections, but there are Historical Awareness committee notes and family genealogy. Certain humid conditions could be potentially damaging to documents. The fire suppression system has 30, 300

gallon tanks in the basement of Town Hall. The system is considered “dry suppression” because pipes are filled with compressed air and water is pulled in when activated.

- ⦿ INFO: The Town has a locked records room and vault on the second floor of the Town Hall building. There are no other secure locations. An inventory should be completed to determine if all the documents included in the vault should be.

Recreation & Gathering Sites Table

- ⦿ E.Coli contamination could be present and impact the health of recreationalists swimming in any of the Town’s body of waters. Algae blooms (cyanobacteria) are occurring more frequently than in the past. There is no Town Beach, but swimming takes place at Great Pond, boat launches, and smaller ponds may have unofficial access.
- ⦿ Invasive milfoil required treatment at Gorham Pond. NHF&G Stark carry in boat access, Purgatory carry in boat access, and NHF&G Kimball Ponds boat launch are all checked regularly to ensure it does not spread to these ponds. A lake host was hired at Gorham Pond and volunteers to monitor boats.
- ⦿ Unauthorized recreational “party areas” occur at Kimball Pond, Stark Pond, and Purgatory Pond. Dangers exist for wildlife and human injury from carelessness, or hazards like intense storms or lightning strikes. The Dunbarton Police Department continue to frequently patrol these areas.
- ⦿ Illegal drug (meth) labs have been found and shut down on Stark Pond and Purgatory Pond. Chemical reactions could cause significant hazards. Residents should be encouraged to be watchful for suspicious behavior. The Dunbarton Police Department continues to patrol these areas frequently. Additionally, information about drug use and what to do if needles are found has been published to residents.
- ⦿ Illegal dumping including tires, appliances, mattresses, and other trash takes place at Kimball Pond posing environmental risks. The Dunbarton Conservation Committee has cleaned up the property several times. Trailheads and back roads in isolated areas are also often used as dumping grounds.
- ⦿ The large swaths of forested land in town are prone to forest fires from vehicles, fuel spillage, sparks and more. Some fires occur on water. Trails at Clough State Park are prone to fires due to dry land and ash trees dying.

Future Development Table

- ⊙ There are too many potential future developments lots to identify without an inventory. Dunbarton's town area is large, rural, and has significant potential for future development. The school system, fire department, police department, roads, library, and recreation areas would all be impacted with development. Town buildings would need to be expanded, additional staff, services, vehicles, and equipment would be required.
- ⊙ When the Countryside Golf Course development is built the impact to existing Town services will be severe.
- ⊙ Without an increase in staffing and equipment, emergency response services will be quickly overcome during any natural hazard (winter weather), mass casualty incident, or emergency.
- ⊙ Zoning is primarily 5 acres, with legal pressure to decrease lot sizes there could be too much development for the Town and School to accommodate.
- ⊙ INFO: About 54 new lots approved to June 2022. 25 lots are new roads. 13 lots are new roads or open space subdivisions (12.5 acres for OS Town). 9 lots on Class V narrow, substandard scenic roads, exaction frees \$69,000 for road and utility improvements.
- ⊙ INFO: The Town Planning Board remains aware of the need for Town services. The Town should fund their CRF and redo its Capital Improvements Program.
- ⊙ INFO: The Dunbarton School District maintains an annual CIP at a fixed rate each year, eventually funding larger projects in the future. Using CRFs to fund projects, keeping the budget level.

Many 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 Dunbarton. 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 Dunbarton 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 takes into account 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.

Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Distribution Center. Dunbarton 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**.

METHODS 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 **September 2022** is **1,545**. Using Dunbarton's MS-1 **2022** valuation data, **the total assessed value of all residential and non-residential structures ONLY in Dunbarton (\$291,351,400)** is the basis for loss estimation calculations. *Land and utilities are not included here.*

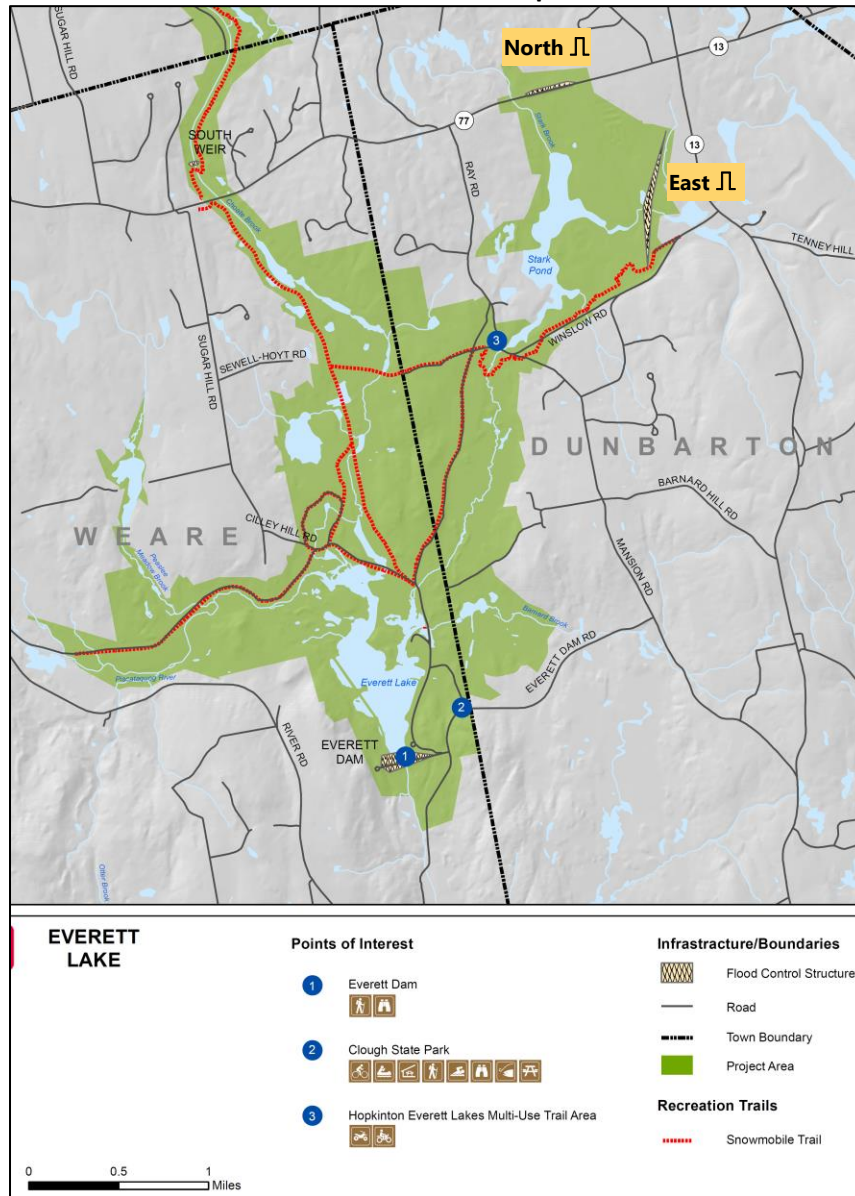
Potential Building Dollar Losses by Hopkinton-Everett Flood Reservoir Dikes: North and East

The following technical information is excerpted directly from the USACOE's website at www.nae.usace.army.mil. The dam at Hopkinton Lake, located on the **Contoocook River** in Hopkinton, and the dam at Everett Lake, located on the Piscataquog River in Weare, are connected by a two-mile long canal and in moderate to severe flooding are operated as a single flood damage reduction project. The Hopkinton-Everett Lakes project provides flood protection to residential, commercial, and industrial property downstream on the Contoocook and Piscataquog rivers, which are tributaries of the Merrimack River. Hopkinton Lake protects the communities of Concord (including the Contoocook and Penacook sections), Boscawen, Dunbarton, and Bow, while Everett Lake protects Manchester (including the Riverdale section) and Goffstown.

Most flooding on the **Contoocook River** is either minor or moderate and does not require the transfer of excessive floodwaters through the canals. Since the project's completion in December 1962, the diversion of Contoocook River floodwaters from behind the dam at Hopkinton Lake to the flood storage area behind the dam at Everett Lake has occurred only seven times, the last in April 1987 when the combined reservoir area of the two dams was filled to 95 percent of capacity, its highest level ever.

The flood storage area behind Hopkinton Lake totals 3,700 acres and extends about 8.5 miles upstream through Henniker to the Contoocook Valley Paper Company. This acreage includes areas that are normally empty and areas that have permanent bodies of water. Some of the larger bodies of water behind the dam at Hopkinton Lake include the 220-acre permanent pool on the **Contoocook River**, which has a maximum depth of 14 feet; the 456-acre Elm Brook Pool; the 47-acre Drew Lake, which makes up the upper 2,000 feet of Canal II; and two lakes, approximately 87 and 35 acres respectively, located within the confines of Stumpfield Marsh. The flood storage area behind Everett Lake totals 2,900 acres and extends westerly up the Piscataquog River in Weare; northerly up Choate Brook, which lies mostly in Weare with a small portion lying in Dunbarton; and northerly up **Stark Brook** in Dunbarton. This acreage includes a 130-acre permanent pool with a maximum depth of 15 feet. Together, the flood storage areas behind both dams can hold 52.6 billion gallons of water, which would cover approximately 8,000 acres (12.5 square miles). This is equivalent to 6.8 inches of water covering its drainage area of 446 square miles. The lakes and all associated project lands cover 9,945 acres. The Dunbarton Everett Lake area is shown in **Figure 28**.

Figure 28
USACOE Everett Lake Map Section



Source: US Army Corps of Engineers Everett Lake Map, accessed 02-16

Two dikes of the Hopkinton-Everett Reservoir are located in Dunbarton, East and North as shown in **Figure 28**. Hydrologically, the water would flow downstream in the event of a dike breach and would likely not impact the Dunbarton buildings within a half-mile radius as displayed in **Table 31**. There is excellent, significant dam control by the US Army Corps of Engineers. Historically, there has been little evidence of a potential dam breach. Overall, if a dike did breach, most of the damage would be downstream in Weare. **Table 31** should be viewed as informational only and is an academic exercise discussing a hypothetical situation.

Table 31

Building Value within ½ Mile of the Hopkinton-Everett Flood Control Dikes

Location	Number of Buildings	Total Value of Buildings	Average Replacement Value
North Dike Everett Reservoir	57	\$12,703,000	\$222,860
East Dike Everett Reservoir	62	\$11,829,400	\$190,797
Totals	119	\$24,532,400	-----

Sources: AxisGIS Town Assessing, Sep 2022, www.axisgis.com/DunbartonNH

The Town has full confidence in the ability of the USACOE and in its engineering of the dike structures. Within a half-mile range of the Hopkinton-Everett dikes, displayed on [Map 3. Assets and Risks, 119](#) buildings are located within the area as noted in [Table 31](#). The average replacement value of one building within the vicinity, likely single-family is **\$223,000**. If either one of the dikes washes through all of the buildings within their respective area, the full replacement value of the buildings would be about **\$24.5m** for each dike's ½ mile area. **Land value, building contents value and infrastructure were not considered in these calculations**

Potential Building Dollar Losses by SFHA Flooding

Parcels with buildings within the floodplain were approximated using Dunbarton online digital tax maps and assessing data, where parcels within the 2010 FEMA Digital Flood Insurance Rate Maps (DFIRMs) areas were identified. 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. [Table 32](#) summarizes this data, identifying **56** primary buildings by address in the SFHA. **Land value, building contents value and infrastructure were not considered in these calculations**. Dunbarton parcels and assessing data can be found at www.axisgis.com/DunbartonNH.

Table 32

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	46	\$9,761,140	\$212,199
Multi-family Homes	3	\$1,103,600	\$367,867
Manufactured Homes	0	\$0	\$0
Non-Residential Buildings	4	\$985,500	\$246,375
Totals	53	\$11,850,240	-----

Sources: AxisGIS Town Assessing, Sep 2022, www.axisgis.com/DunbartonNH

In **Table 32**, digital analysis and human interpretation identified **46** single family residential homes, **3** multi-family homes, **0** manufactured homes, and **4** non-residential buildings are situated within the Special Flood Hazard Areas (SFHAs). As the Town's total number of **2022** housing units is estimated at **1,148**, about **4%** of Dunbarton's residences seem to be located in a floodplain area. The average replacement value is **\$213k** for a single-family home or **\$368k** for a multi-family home, and **\$246k** 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 **\$11.9m**.

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-only damage estimates.

Table 33 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 33

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

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	\$9,761,140	\$4,782,959	\$2,733,119	\$1,952,228
Multi-Family Homes	\$1,103,600	\$540,764	\$309,008	\$220,720
Manufactured Homes	\$0	\$0	\$0	\$0
Non-Residential Buildings	\$985,500	\$482,895	\$275,940	\$197,100

Sources: See **Table 31**; FEMA

If **all 53** single family homes were damaged by a **Two-Foot Flood (20% Damage)**, the dollar damage to the buildings could be **\$2.0** while an **Eight-Foot Flood (49% Damage)** could cause **\$9.8m** in building damage. If all **3** multi-family homes identified in the SFHA were damaged by a **Two-Foot Flood (20% Damage)**, the damage could be **\$221k** for buildings only, while an **Eight-Foot Flood** could cause **\$1.1m** in building damage. If **all 4** nonresidential buildings in the SFHA were damaged by a **Two-Foot Flood**, the dollar

damage to the *buildings* only could be **\$97k**, while an **Eight-Foot Flood** could cause **\$986k** in *building* damage. Dollar damage estimations vary according to the standard percentages of damage levels associated with flooding levels set by FEMA.

Table 34 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 34

Dollar Damage Ranges for Individual Buildings in Special Flood Hazard Areas (SFHA)

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	\$212,199	\$103,977	\$59,416	\$42,440
Multi-Family Homes	\$367,867	\$180,255	\$103,003	\$73,573
Manufactured Homes	\$0	\$0	\$0	\$0
Non-Residential Buildings	\$246,375	\$120,724	\$68,985	\$49,275

Sources: See **Table 32**; FEMA

One (1) single family home averages **\$42k** when damaged by a **Two-Foot Flood** while an **Eight-Foot Flood** could cause **\$103k** in *building* damages only. One (1) multi-family home compares at **\$74k** for a **Two-Foot Flood** in *building* damages only and at **\$368k** for an **Eight-Foot Flood**. One (1) non-residential building in the SFHA is could have **\$49k** in *building* damages for a **Two-Foot Flood**, while experiencing **\$246k** 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 2022 assessed value of all residential, commercial, and industrial structures in Dunbarton is \$291,351,400 (no land) on 1,645 parcels.** Disaster damages are often illustrated in the following section utilizing a percentage range of town-wide building damage. At **1,148** housing units in Dunbarton counted in the preliminary 2020 US

Census, any type of disaster impacting **10%** of Dunbarton housing units would yield **115** damaged homes (**\$24.4m** in structure damage).

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 town. 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 Dunbarton. People who rely on private well water have found their dug wells running dry in **2015-2016** and again in **2018** and **2020, 2021 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 Dunbarton, these areas include maple tree crops, livestock, produce, orchards, tree farms and hay fields. Conservation land forests in Town are also susceptible to loss and fire during **drought** conditions.

These lands could be vulnerable to **droughts** and physically 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 Dunbarton Historical Society, Molly Stark House, Old Town Hall-Library, Stark Mansion, Robert Rogers Homestead Site, and the manufactured housing parks, and the densely populated locations are particularly at risk because of building sizes, building age, and/or their large numbers of people contained within.

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 brooks 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, Dunbarton, Webster, 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 **\$1.5m** to **\$2.9m** 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. Dunbarton has many vulnerable populations, including public, private, and charter Schools, multi-family neighborhoods, manufactured housing parks, 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 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 along the many brooks in town, in Dunbarton center, and at higher elevations. The Town typically clears trees from the same roads each storm (wind, snow, ice, etc).

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 **\$2.9m** (for more localized **downburst**, **high winds** and **hail**, or **tornadoes**) to **\$14.6m** (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 Dunbarton are at specific risk but 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 Dunbarton center area, high density multi-family neighborhoods around the wildland urban fire interface areas, manufactured housing parks, cul-de-sac neighborhoods; high elevations; densely populated buildings including the Schools; historic buildings like the Old Town Hall-Library, historical society, Molly Stark House, Stark Mansion, Robert Rogers Homestead Site, private homes; and businesses. Town Facilities like the Fire Department & Police Department (Safety Complex), Town Offices, and Transfer Station are necessary for governmental function and provision of basic services. The Town hires out highway work to an independent contractor who brings his own equipment.

The Town's utilities, including powerlines, high tension powerlines, telecommunications tower, 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 without lightning rods.

With a scenario of **0.5%** of buildings damaged throughout the Town, a **lightning strike** could potentially cause up to **\$1.5m** 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 one of the brooks in Dunbarton could be a major cause of **flooding** which could recur in the future. Woody material causing **debris impacted infrastructure** may be more likely to impact bridges than ice jams, especially any the structurally deficient State or Town bridges. Several bridges or roads span across the named brooks and many unnamed brooks. Small brooks culverts and drainage systems offer additional opportunity for ice jams, debris blockage, and more. The **2023-2032 NH Department of Transportation Ten Year Plan (TYP)** provides many examples of basic cost estimates bridge replacement and rehabilitation.

This average figure of **\$750,000** can be used for one **(1)** local bridge *replacement* in Dunbarton 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 (**23**) of the **46** 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 **\$976k** in *building* damage costs.

Winter Weather

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 Dunbarton 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 Dunbarton, wooded and forested sections vulnerable to tree fall, include the entire Town. Trees and limbs regularly fall along roadways, especially dying ash and hemlock trees. 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 **\$2.9m** to **\$14.0m** 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, electric grids, and technology. The Town, Capital Area Fire Mutual Aid, Merrimack County, and state and federal radio equipment, antennas and repeaters technology are vulnerable to **solar storms**, such as 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 non-Town maintained 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 **\$2.9m** 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 Dunbarton 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>.

Dunbarton has been a participant in the National Flood Insurance Program (NFIP) since **March 28, 2001**. Although initial flood hazard maps were identified in **January 1975**, the Town did not qualify to be a participant in the National Flood Insurance Program since FEMA did not locate any floodplains within the community. A March 2001 letter from FEMA states this fact. However, the entire community was placed in Zone C and low-cost insurance was made available for residents to purchase. The Town enrolled in the NFIP in **March 2001**. The original Flood Insurance Study (FIS) in Dunbarton is dated **April 2010**.

In the present day, Dunbarton's effective FIRMs are digital (DFIRMs) dated **April 19, 2010** as is the Merrimack County Flood Insurance Study (FIS) which includes Dunbarton (community **#330202**); individual community FIS are no longer being developed. These **2010** newest documents were adopted by the Board of Selectmen, supersede all previous NFIP documentation, and are placed into the Town Zoning Ordinance. **Table 35** summarizes the historical background of the Town's NFIP effective dates.

Table 35
NFIP History of Dunbarton – Effective Dates

Version	Flood Insurance Study (FIS)	Flood Insurance Rate Maps
Original & Current	April 19, 2010	April 19, 2010

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

See the narrative and explanation about the **2022** Preliminary DFIRMs and Merrimack County Flood Insurance Study in **4 HAZARD RISK ASSESSMENT Potential Future Hazards** section to understand future consequences of these updated materials, if adopted.

DUNBARTON NFIP STATISTICS

In **Table 36** 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 Town. Four snapshots in time, one from each of Dunbarton's **Hazard Mitigation Plan** versions, display the number of NFIP policies in force and paid loss statistics between **December 2004 – April 2023**, the last date of accessible data.

Table 36
History of NFIP Policy and Paid Loss Statistics

Report Date	Policies in Force	Flood Insurance in Force	Number of Paid Losses Since 1979	Total Losses Paid Since 1979	Type of Current NFIP Policies in Force			
					Single Family	2-4 Family	Other Residential	Non-Residential
Dec 2004	0	\$0	0	\$0				
Mar 2010	4	\$1,400,000	1	\$0				
Dec 2016	2	\$650,000	1	\$0				
Apr 2023	4	\$969,000	1	\$0	3	0	0	1

Source: Dunbarton Hazard Mitigation Plans,
NH Office of Planning and Development Floodplain Management Office April 2023

Current information from FEMA databases on the *Policies in Force* and *Insurance in Force* are no longer easily accessible, but aggregated data is available from the NH OPD Floodplain Management Program. Public data is redacted, and the data that can be extracted are now sorted by zip code and census tract instead of by community.

From **Table 36**, in **Dec 2004** prior the severe flooding event period of **2005-2008**, **0** properties in Dunbarton were covered by NFIP flood insurance and **0** claims had been paid since **1979**. By the **2010 Plan** after the flooding period, the number of policies increased to **4** with **1** loss claim but **\$0** paid. By **Dec 2016**, policies had decreased again to **2**. By **April 2023**, Dunbarton property owners had **4** flood insurance policies in place.

The number of properties (*Policies in Force*) covered by flood insurance has historically been **<5** during any one spot check. Normally, the number of policies fluctuate slightly as 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 have been no recent severe flood disasters and the cost of policies has greatly increased for those properties in the floodplains, Dunbarton property owners have felt flood insurance is unnecessary based on their policy history.

Table 36 also illustrates that while the property owners anywhere in the entire Town of Dunbarton are eligible to purchase flood insurance for their property, **4** properties out of the **1,545** total parcels in the entire community are insured against flooding. As described previously, a total of **53** parcels with homes and non-residential buildings seem to be at least partially situated in the Special Flood Hazard Areas (SFHA).

*Assuming the **4** NFIP policy properties are within the SFHA, then **8%** of buildings in the (2010) floodplain are insured against flooding.*

All of Dunbarton'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.

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 **1979** 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 **1979**.

As of **April 2023**, Dunbarton had a total of **0** repetitive loss properties according to records kept by the Federal Emergency Management Agency and supplied to the NH Office of Planning and Development (NH OPD) Floodplain Management Office. Floodplain policy information is considered private. This data was specially requested from NH OPD to update this Plan. NH OPD can no longer provide specific information related to address or building type (residential types, non-residential, etc) and can only provide aggregate data for the Plan update. To obtain specific policy data from FEMA for the address and building data, the Town must complete Personally Identifiable Information (PII) forms stating a strong reason for the data request. This publicly aggregated data for Dunbarton as of **April 2023** information is displayed in **Table 37** as general repetitive loss data:

Table 37

Number of Repetitive Loss Properties

Building Type	Number of Repetitive Loss Properties as of 04-23	Number of Buildings Acquired by Town	Remaining Repetitive Loss Buildings
Single Family	0	0	0
2-4 Family	0	0	0
Other Residential	0	0	0
Non-Residential	0	0	0
Total Properties	0	0	0

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

These repetitive loss property data records are confidential for the property-specific information they contain. 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 Dunbarton

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 with correcting any violations. Community Assistance Visit (CAV) are conducted for education on NFIP policies; review of Town regulations, ordinances, and forms; and review of the local permitting and enforcement processes.

Since the NH Office of Planning and Development (NH OPD) did NOT identify Dunbarton as a repetitive loss community, which is based upon **Table 37** data, Dunbarton is classified as a Tier 2 community. 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 like Dunbarton 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, such as after a flood disaster declaration.

No known CAV has been undertaken. Dunbarton is not a high-risk repetitive loss community. A follow-up telephone call could be made to the Town by NHOEP before this Plan expires to review Building Department procedures and the contents of the Floodplain Ordinance, Subdivision Regulations and Site Plan Review Regulations. Following this basic community assistance schedule, one call would be anticipated before **2027**.

Floodplain Development District Ordinance

The Town of Dunbarton has a new Floodplain Development District adopted in **2000** that currently contains all the required FEMA revisions to its ordinance. With it, the Town became eligible for the NFIP. The first Floodplain Zoning regulations were adopted in **2000**. Revisions were made in **March 2011** and **March 2012** to correct and add language and insert the Town adopted the new FEMA effective Digital Flood Insurance Rate (DFIRM) maps dated **April 19, 2010**.

The **2022** Dunbarton Floodplain Development Zoning Ordinance contains the elements requested to date by FEMA and the NH Office of Planning and Development's Floodplain Management Program. A Floodplain Develop Overlay District map is available at the Town's Community Development and Planning Office. An excerpt of the Floodplain Ordinance is displayed in **Figure 29**.

Figure 29

Latest National Floodplain Development Zoning Ordinance

ARTICLE 10. FLOODPLAIN DEVELOPMENT ORDINANCE (Adopted March 14, 2000; Revised March 8, 2011 and March 13, 2012)

This Ordinance, adopted pursuant to the authority of RSA 674:16, as amended, shall be known as the Town of Dunbarton Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement to regulations in the Town of Dunbarton Zoning Ordinance, and shall be considered part of the Zoning Ordinance for the 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.

The following regulations in this ordinance shall apply to all lands designed as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its Flood Insurance Study for the County of Merrimack, N.H. dated April 19, 2010, or as amended, together with the associated Flood Insurance Rate Maps dated April 19, 2010, or as amended, which are declared to be a part of this ordinance and are hereby incorporated by reference.

A. DEFINITION OF TERMS: The following definitions shall apply only to this Floodplain Development Ordinance, and shall not be affected by, the provisions of any other ordinance of the Town of Dunbarton.

"Area of Special Flood Hazard" is the land in the floodplain within the Town of Dunbarton subject to a one-percent or greater possibility of flooding in any given year. The area is designated as zone A on the FIRM.

"Base Flood" means the flood having a one percent possibility of being equaled or exceeded in any given year.

"Basement" means any area of a building having its floor sub-grade on all sides.

"Building" - see "structure".

"Development" means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operation or storage of equipment or materials.

"FEMA" means the Federal Emergency Management Agency.

"Flood" or **"Flooding"** means a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) the overflow of inland or tidal waters, and (2) the unusual and rapid accumulation or runoff of surface waters from any source.

"Flood Insurance Rate Map" (FIRM) means an official map incorporation with this ordinance, on which FEMA has delineated both the special flood hazard areas and the risk premium zones applicable to the Town of Dunbarton.

"Flood Insurance Study" (FIS) means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e. mudflow) and/or flood-related erosion hazards.

Source: Section of Dunbarton Zoning Ordinance March 2022

NFIP Familiarity in Dunbarton

According to NFIP policies, when an applicant files a request for a building permit in the floodplain, the applicant must include an elevation certificate in order 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. In order to reduce flood risks, the Building Inspector, Town Assessor, Town Administrator, Town Planner, 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 (NHHSEM) 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. Dunbarton 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; **4** properties out of the **1,545** parcels in Dunbarton is 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 <https://www.dunbartonnh.org/>.

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 **Dunbarton Hazard Mitigation Plan Update 2023**.

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**

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

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 **2017 Hazard Mitigation Plan**; and Future Improvements to the Capability.

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 Dunbarton 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

DEPARTMENT ABBREVIATION KEY:

BI	Building Inspector
BOS	Board of Selectmen
CC	Conservation Commission
EM	Emergency Management
FD	Fire & Rescue Department
HD	Highway Department
LU	Land Use Department
PB	Planning Board
PD	Police Department
PRI	Private or Non-Town
SD	School District
TA	Town Administration
US ACOE	US Army Corps of Engineers
	Primary Mitigation Department

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**. Several additional, non-Town documents are also utilized by the community and have a positive relationship to the **Hazard Mitigation Plan 2023**. These non-Town documents support the work Departments and volunteers are undertaking, and they support the hazard mitigation goals, objectives, and/or Actions in this Plan within the following **6 CAPABILITY ASSESSMENT** tables.

PLANNING AND REGULATORY CAPABILITIES

The planning and regulatory capabilities displayed in **Table 38** 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 the hazard mitigation goals, objectives, and/or Actions.

Table 38

Planning and Regulatory Capabilities

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment: Planning and Regulatory Resources</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 Since Last Haz Mit Plan (2017)</u>	<u>Future Improvements to Capability</u>
DUNBARTON PLANS AND PLANNING DOCUMENTS							
2016-2021 Addendum to 2015-2020 CIP	BOS Capital Improvement Program	A six-year schedule of planned municipal expenditures for capital improvements. The CIP shows what, when, how, and at what cost the Town intends to expand or renovate its services and facilities over a six-year period to accommodate existing and predicted needs of the community as related to current and projected growth.	Entire Town	High	Planning Board	There have been no updates	Update the CIP and include hazard mitigation projects; maybe return the project to the Planning Dept
July 2022	EM Emergency Operations Plan	Emergency Management Plan updated yearly in-house. Updated to the new format in 2007 to meet FEMA requirements. Annual update is Town Administration component and resource section. The Elementary School/Community Center is the Town shelter with an emergency generator.	Entire Town	High	Emergency Management	Updated the signature page and material was updated	Update relevant sections of the Emergency Operations Plan on an annual basis.
July 2022	EM Capital Area Hazardous Materials Plan	Developed in late 1980's and updated continually with current information. Lists resources and how to respond to incidents.	Entire	High	Emergency Management	Updated as necessary	Update Hazardous Materials Plan as needed

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Jul 2017	EM Hazard Mitigation Plan 2017	Updated every five years, incorporates facilities, includes Mitigation Action Plan. Town has installed generator connections at the Town Office, Library, and Safety Building.	Entire	High	Emergency Management	Currently working on the 2023 Update as of 04-22	Update HMP sections & complete Actions on an annual basis, and a full update every 5 years.
Held by ACOE, not available	US ACOE Everett Lake Flood Emergency Plan	Developed by the Army Corps of Engineers. Hopkinton- Everett Lake Flood Control is within Dunbarton and Hopkinton. About four full-time ACOE Rangers monitor and occasionally patrol the reservoir. Ability to respond to a disaster is unknown. There has been limited coordination with Dunbarton. A dam breach could be the biggest natural disaster in Dunbarton. Area is managed by NHDRED, with occasional State Park Ranger monitoring.	Flood control area in Northwest Dunbarton	High (for the Plan) but Low (for the implementation/ collaboration with Town)	Army Corps of Engineers	This Plan is independent from Dunbarton activities	Seek collaboration with Army Corps for partnership in the event of an emergency at the Clough State Park dam in Weare.
2019	PB Master Plan 2019	Developed Master Plan in 2003-2004, adopted by Planning Board in Jan 2005. Lists facilities, Departments, natural & historic resources in Town. Contains recommendations to accomplish.	Entire	High	Planning Board	Added Housing & Energy chapters	Update the Master Plan. Adopt Hazard Mitigation Plan as a separate element of the Master Plan
2022	SD Dunbarton Elementary School Emergency Response Plan	This plan is updated annually and sent to the state for emergency response and archival.	Dunbarton Elementary School	High	Dunbarton Elementary School District, SAU #67	Annually updated	Review and update ERP annually
Spring 2022	SAU 67 Opening Plan regarding COVID 19 Pandemic	This plan addresses different levels of transmission within the school and area and how different phases of learning would be	SAU 67, Dunbarton Elementary School	High	SAU 67, Dunbarton School District	Newly instituted in spring 2022	Review and update as needed, or at least with each annual ERP update

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		implemented depending on those metrics.					
May 2004	BOS Recreational Parks Ordinances	Includes alcoholic beverages, curfew 11PM-5AM, parking. Vehicular restrictions to Town Common and School. Incidents have diminished since put into effect.	Town Recreational Areas: Kimball Pond Recreation al Area, Long Pond, Gorham Pond, Kuncanow et Town Forest Purgatory Pond, Stark Ponds.	High	Police Dept and Board of Selectmen	None of the ordinances have been updated although the Police Dept have applied the regulations.	Review and update the ordinances. Need proactive enforcement of restriction for Off Road Vehicles in the area. Signage for curfew & ordinance needed at Purgatory Pond & Long Pond.
May 2004	BOS Noise Ordinance	Regulates unnecessary noise and disturbance of the peace	Entire Town	Moderate	Police	None of the ordinances have been updated although the Police Dept have applied the regulations	Readopt a revised noise ordinance under state RSAs with assistance of Police Dept
DUNBARTON BUILDING CODES, PERMITTING, INSPECTIONS							
2018	BI NFPA 101 Life Safety Codes Occupancy Inspections	Contains various types of occupancies that may be inspected by Fire Departments	Entire Town	High	Building Inspector with the Fire Department	Inspections conducted; State adopted 2018 codes	Would like to see the State adopt the current version, consider adoption of requirement for sprinklers for all new residential and places of assembly.
2018	BI State Building Codes	The State has adopted statewide requirements for compliance of 2018 residential and commercial building codes and 2020 electric code.	Entire Town	High	Building Inspector	State adopted a more current version of the building codes in 07/22,	Would like to see the State adopt the current version

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
						the Town follows suit.	
June 2022	FD State NFPA Residential Sprinkler Code	Adopted through the State Fire Marshal, residential 1-family and 2-family removed.	Entire Town	High	Fire Department	Applied the codes to buildings. Added option of Cisterns for developments in non-hydrant areas.	Update as adopted by the State
June 2022	FD NFPA 1 Fire Codes Permitting	Section 1:12, and Table 1.12.7a specifically outline instances when permits are required	All New structures	High	Fire Dept	State adopted 2018 Code	Update as adopted by the State
April 19, 2010	PB FEMA Flood Insurance Rate Maps 2010	April 2010 Merrimack County FIRMSs & Flood Insurance Study. DFIRMS also available. Ratings of different flood zones	Entire Town	High	Planning Board with Building Inspector	FEMA has not provided new maps since the 2010 DFIRMS	Review and implement any new federal policy and follow any changes. Make the process as easy to possible for residents and businesses.
June 2022	NH Division of Forests and Land State Forestry Codes	RSA 147 Wildfire. Outside burning permits for open fire	Entire Town	High	Fire Warden or Agent of the State	State has made a few small updates, NHDES now involved	Use the updated sections of Code, including the new online permitting system
DUNBARTON LAND USE ORDINANCES, REGULATIONS							
October 2009	PB Site Plan Review 2009 Regulations	The purpose of Site Plan Review is to protect the public health, safety and welfare; provide adequate public services and facilities; and promote balanced growth. Revised the Site Plan Review Regulations in October 2009 to incorporate ground water protection measures.	Entire	High	Planning Board	PB is working on creating a Land Use Handbook, combining Site Plan and Subdivision Regulations. Completion to be 2023	Review and update regulations.

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
November 2010	PB Subdivision Regulations	Subdivision regulations help guide residential development. Subdivision regulations were last updated on 11/18/2010 to incorporate the 60' ROW requirement.	Entire	Moderate	Planning Board	Creating Land Use Handbook, combining Site Plan and Subdivision Regulations. Completion to be 2023	Revisions will be made to the subdivision regulations to clarify them, include new zoning provision details
November 2010	PB Road Design and Construction Standards (Subdivision Regulations)	Performance guarantee required, street design and maximum length regulated. Building access and layout.	New Town roads	High	Planning Board	Creating Land Use Handbook, combining Site Plan and Subdivision Regulations. Completion to be 2023	Review and update regulations as needed.
November 2010	PB Stormwater Construction (Subdivision Regulations)	Regulates sizes, requirements regulated by NH Standards Specs for Road and Bridge Construction	New Town roads	High	Planning Board	Creating Land Use Handbook, combining Site Plan and Subdivision Regulations. Completion to be 2023.	Review and update regulations as needed.
Mar 2022	PB Zoning Ordinance	The purpose of Dunbarton's Zoning Ordinance is to promote the health, safety and general welfare of the inhabitants of Dunbarton. Planning Board is currently revising the Zoning Ordinance to include Workforce Housing Ordinance along with revisions to definitions and legalities.	Entire	High	Planning Board	Conducted minor updates annually.	Update Zoning Ordinance with regulations supporting hazard mitigation as appropriate
March 2012	PB Floodplain Development Ordinance (#01-2011)	Floodplain Ordinance revised per FEMA requirements March 2010. Every Planning Board applicant shows proof the site is not in the floodplain. Vigilant at looking at high water possibility. Have not had	Entire	Moderate	Code Enforcement Officer	Applied the ordinance during Planning Board applications.	Review and update regulations as needed.

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		a subdivision in 10 years with a concern for flooding. References compliance with Wetlands District.					
March 1970, as amended	PB Wetlands Conservation Overlay District	Conditional Use Permit needed from Planning Board for road or utility. Structure and septic/leach field setbacks at least 125 feet.	PONDS: Gorham, Purgatory, Kimball, Long. BROOKS: Harry, Gorham, Black, Bela Purgatory .	High	Planning Board	Applied the ordinance during Planning Board applications. Revised procedural elements of ordinance in 2021	Review and update regulations as needed.
March 2005	PB Zoning Ordinance Private Residential Water Wells	To locate private on-site water wells for no more than 5 bedrooms a minimum of 75 feet from property lines, public rights of way, septic system leach beds and other contamination sources	Entire Town	High	Planning Board, with assistance of Building Inspector	Applied the ordinance during Planning Board applications	Review and update regulations as needed.
March 2017	PB Zoning Ordinance: Open Space Subdivisions	Purpose is to provide flexibility in the design and development of land to conserve open space, retain and protect important natural and cultural features	Low Density Residential District (LDR), Moderate Density Residential District (MDR)	High	Planning Board	Regulations amended.	Review and update regulations as needed.
November 2010	PB Subdivision Regulations: 60' Right-of-Way Regulations to Consider Safety instead of Aesthetics.	This regulation prioritizes safety over aesthetics when they conflict in new developments.	Roadways	Low	Planning Board	Applied the regulation to new Planning Board applications	Review and update regulations as needed.
October 2022	PB Scenic Road Improvement s Authority	Right to regulate scenic road improvements given to Conservation Commission at Town Meeting. John Stark	Roadways	Low	Planning Board, with assistance from Conservati	Applied the ordinance during Planning Board applications;	Review and update regulations as needed.

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		Scenic Byway Committee was formed.			on Commission	CC adopted Design Standards	
March 1970, as amended	PB Excavation Regulations	RSA 155:E. For earth excavation and reclamation. Contains standards and conditions of operation & reclamation, including drainage, vegetation requirements.	Entire Town	Moderate	Planning Board, with assistance of the Zoning Board of Adjustment	Applied the ordinance during Planning Board applications. Adopted the regulations into the Zoning Ordinance	Review and update regulations as needed. Remove the excavation regulations from Zoning and place into the new Land Use Handbook

Source: Dunbarton Hazard Mitigation Committee

ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capabilities in **Table 39** 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 39

Administrative and Technical Capabilities

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
DUNBARTON ADMINISTRATIVE PROGRAMS, POLICIES, MUTUAL AID AGREEMENTS, PARTNERSHIPS, OPERATIONS, PROCEDURES							
Jul 25 2019	BOS Class VI Road Improvements Minimum Standards	Outlines minimum standards required when a property owner wishes to upgrade a Class VI road for the purpose of qualifying a property for a building permit.	Class VI Town roads	High	Board of Selectmen	Updated to current standards (a significant update from 1998)	Review and update policy as needed
Current as of Jul 2022	BOS Milfoil Eradication Program (Gorham Pond) (#25-2017)	Town conducts annual mitigation of milfoil using chemical treatment and host services for boat checks at Gorham Pond. Runs about \$6,000 for 8 dives. Currently restricted to Gorham Pond. Signs for Purgatory, Stark, Kimball and Long Ponds were installed & explained the problem with milfoil in NH waterways and how to clean off boats etc.	Gorham Pond	High	Board of Selectmen	Annual chemical treatment and dives, varies per year depending on severity.	Gorham Pond. May need to include Purgatory, Stark, Kimball and Long Ponds in the future.
February 2012	EM Collaboration with School District on the Elementary School Disaster Plan	The EMD obtained a copy of this plan. Town emergency staff has been talking about working with the Elementary School for several years. The emergency staff, Dunbarton Elementary School and SAU works together during hazardous events. The school is the Town's only emergency shelter. The	Entire SAU 67, including Dunbarton	High	School District to develop, EMD to exercise	Reviewed plan since 2017	Update and exercise the Plan

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		SAU has a plan that covers the Dunbarton School.					
Current as of 7/22	FD Capital Area Mutual Aid Fire Compact (CAMAFC)	Member of the Capital Area Mutual Aid Fire Compact (CAMAFC) with 22 communities. Hopkinton, Hooksett, New Boston, Goffstown, Weare and Bow border Dunbarton. Have agreements with Weare and Goffstown.	Entire	High	Local = Fire Chief Compact = CAMAFC Coordinator	Upgraded Towers; currently simulating.	Upgrade communications
Current as of 7/22	FD Member of Central NH Haz Mat Team	The regional Haz Mat Plan has a section for each of the 22 communities (same membership as the Capital Area Fire Compact). Also includes Lakes Region towns. Training has become more frequent.	Entire	High	Local = Fire Chief Compact = Coordinator	Membership annually since last Plan, More HazMat facilities have been identified	Upgrades and haz mat facility identification
July 2022	FD Ambulance Service	Fire Department provides ambulance service to the Town. Ambulance has about 15 members, of which all are volunteers. Town owns one ambulance that is 13-12 years old.	Entire	High	Fire Chief	New protocol update and updating	New ambulance, heart monitor defibrillator.
July 2022	FD Standard Operating Guidelines (SOGs) for Rescue	Currently updating them. Topics include response policies, safety requirements (gear, etc), backing policies, smoking policies, EMS and fire policies.	Entire	High	Fire Chief	Updates have been written and implemented.	Add more guidelines such as a forestry procedure, ice rescue policy and cold water rescue. Update the existing SOGs
July 2022	FD Standard Operating Guidelines (SOGs) for Fire Department	Include response policies, safety policies, vehicle operation policies, discipline policies, incident command policies. Follows National Fire Academy Incident Command policies.	Entire	High	Fire Chief	Updated SOGs	Adding more response policies about how to handle certain incidents.

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
2016, revised in 2022	HD Plowing Procedures	Have four independent contractors to help Town with plowing.	Roadways	High	Road Agent	Used during storm events; procedures being updated as of 7/22	Review and post on Town website for the public to access
Current as of 07-22	HD Procedure to Communicate with Utility Companies to Cutback Overgrown Limbs	Removing overhanging limbs near powerlines will reduce that potential hazard in the Town. Communicate regularly with Dunbarton Telephone and other utility companies to make sure that branches are cut back from power lines to reduce the potential hazards from wind.	Roadways	High	Road Agent	Communicate with utility companies	Communicate with property owners as needed, provide brochures or information.
Current as of 07-22	HD Program to Remove Hazardous Trees or Limbs Along Town Roads (#27-2017)	Power outages caused by downed trees and limbs need clean up, power is out for days sometimes. FD to continue to inform Eversource of locations for tree removal; Eversource cuts along powerlines every 4-5 years.	Roadways	High	Road Agent	HD does limited brush cutting routinely along works within 15' of the row with powerlines and removes troublesome trees on a regular basis.	Provide more funding to the budget for more proactive hazardous tree/limb removal.
Current as of 07/22, varies by Agency signing	PD Police Mutual Aid Compacts	Have compacts with Concord, Hooksett, Bow, Hopkinton, Weare, Goffstown, New Boston, and Concord Police Departments and US Marshals	Entire	High	Police Chief	New agreements are signed when new Chiefs are hired or terms of the agreement are changed	Review and update compacts when necessary
2022 Review underway	PD SOPs for Human-caused Disasters	Have extensive policies for human-caused disasters: unusual occurrences, civil disturbances, hostage-barricaded subjects, and bomb emergencies. Member agency of the Central New Hampshire Special Operations Unit (CNHSOU) as of March 2022.	School, Town Offices, Town Center, various	High (for policies) but Low (for implementation)	Police Chief	Updated	Review and update SOPs when necessary

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
2022 Review underway	PD Standard Operating Procedures (SOPs)	Operational procedures for the Police Department. No longer participating in CALEA. State Accreditation process pending for 2022.	Entire	Very High	Police Chief	Updated as necessary	Review and update as needed
2022 Review underway	PD Standard Operating Guidelines (SOGs)	Operational guidelines for Department ensure the effectiveness and best possible practices of the officers to do their jobs. Includes civil disorder SOG for emergency management.	Entire Town	High	Police Chief	Updated as necessary	Review and update policies according to trends in police operational procedures.
Current as of 07/22	PD Member of Capital Area Public Health Network	Planning for epidemic events, H1N1 clinic programming, mass medical event planning	Entire	High	Police Chief	Membership annually since last Plan	Update membership, update materials.
2022	SD School Evacuation Procedures	Dunbarton School District works with the Dunbarton Police Department regularly to rehearse evacuation drills, train staff, and check building security	Dunbarton Elementary School	High	DES Staff work with DPD	Updated as necessary; trainings ongoing	Train staff and students, conduct drills, evaluate, and improve plan.
DUNBARTON TECHNICAL SKILLS, TRAINING, AND DRILLS							
3 people As of Jul 2022	BOS Highway Safety Committee	Members- 3 professional paid staff and volunteers	Roadways	High	Board of Selectmen	Performed duties	Upgrade policies and identifying safety issues
8 people	CC Conservation Commission	Members - #8 volunteers	Entire Town, Town Forests, Conservation Areas	High	Conservation Commission	Performed duties	Review/revise regulations
7 people As of Jul 2022	EM Hazard Mitigation Committee	Members- #7 staff and volunteers. Include a Staff Coordinator. Appointed in 2016 to update HMP	Entire Town	High	Emergency Management Director, Board of Selectmen	Updated 2017 Plan	Meet 4-6 times per year to implement Actions & update Plan components
21-26 people	FD	Staff – #1 PT Chief Volunteers - # 20-25	Entire Town	Moderate	Fire Chief	Recruited and trained	Recruit more volunteers.

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
	Fire & Rescue Department						
2.5 people As of Jul 2022	HD Highway Department	Admin Staff - Road Agent PT-elected Work Crew – 1 FT; 1 seasonal PT	Roadways and Rights of Way	High	Road Agent	Performed duties	Upgrade equipment and policies
2 people as of Jul 2022	LU Building & Land Use Department	Admin Staff – 1 FT Building Inspector -1 PT	Entire Town	High	Board of Selectmen	Performed duties	Follow regulations and perform duties
7 people As of Jul 2022	PB Planning Board	Members – 7 volunteers, 6 members and 1 ex-officio	Entire Town	High	Planning Board	Performed duties	Upgrade regulations
12 people As of Jul 2022	PD Police Department	Staff #- 5 FT (including Chief of Police), 6 PT patrol officers. Civilians - 1 (Office Administrator).	Entire Town	Moderate	Police Chief	Added 1 FT patrolman	Hire an additional (6 th) full-time patrol officer
7 people	TA Town Office	Staff – Town Admin, Admin Asst, Bookkeeper, Town Clerk, Deputy Town Clerk, Tax Collector, Deputy Tax Collector	Entire Town	High	Board of Selectmen	Performed duties	Perform duties
3 people	TS Transfer Station	Staff- 1 Supervisor, 2 attendants	Entire Town	Moderate	Transfer Station Supervisor	Performed duties	Upgrade equipment and policies
7-12-22	Civilian Response to Active Shooter Events (CRASE)	The curriculum provides fundamental knowledge, awareness, and life saving techniques to survive an active shooter event in a variety of settings by using the AVOID, DENY, and DEFEND method.	Municipal buildings	Moderate	Police	Initiated program	Provide training/refreshers for Town staff
DUNBARTON ASSETS, SECURITY, AND RESOURCES (SPECIALIZED EQUIPMENT)							
Current as of Jul 2022	BOS Town Office Safety	Have panic buttons, a safe room with phone, smoke alarms, and emergency lighting. Exits are good but there are no sprinklers. Office is a one-floor building. Joint Loss Committee meets quarterly to inspect town buildings and make	Town Office	Low	Town Administrator	Tested alarms/panic buttons, lights; had air quality testing done	Develop a long-term plan for new Town Offices

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		suggestions for safety, procedures and maintenance improvements.					
25 volunteers	EM Town Emergency Shelter at Elementary School	In case of emergency, the Dunbarton Elementary School can be opened as a shelter.	Entire Town	High	Emergency Management Director, School Principal	None since the last Plan	Obtain more equipment to fulfill all short-term sheltering needs
July 2022	EM Upgraded Command Center in Public Safety Building	The existing Command Center is a communications room in the Public Safety building, with a base radio, fire and police radios, communications, phones, antenna television, and a computer. Staffed by 6. The entire Public Safety Building is the EOC, which has a generator and a meeting room adjacent to the communications room.	Public Safety Building	High	Emergency Management Director	None since the last Plan	Purchase new & upgrade equipment—radios, satellite, etc.
Current as of 7/22	FD Wildland Fire Training and Equipment	Have 2-3 vehicles to fight wildland fires. More forestry equipment pumps, hoses, protective personal equipment (PPE) acquired through State and federal grants. Work with State Forestry Department. Written permits, along with online permit system, are obtained for burning. State class is annual, in-house training is about 6 times per year.	Wooded areas in all parts of Town	High	Fire Warden (currently Fire Chief, appointed by State)	Training, obtained 2 new vehicles — UTV and Forestry Vehicle	Seek more State involvement for training fire fighters.
20-25 people	FD Recruitment and Training	Recruitment requires medical training paid for by the Town. Need about 15-20 people, annually recruit about 3 people. Certificates need to be renewed.	Entire Town	Moderate	Fire Chief	Recruiting and training	Continue to recruit as needs increase and members retire.

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Current as of Jul 2022	HD 3-bay Open Salt Storage Shed	Salt storage shed installed in summer 2008. Sand pile is south facing. Yard paved and shed were built for storage of sanders.	Roadways	High	Road Agent	Using the shed to store material.	Perform necessary repairs and upgrades
Current as of Jul 2022	HD Highway Training	Road Agent and road crew employees take continuing education classes on driving, road maintenance and other pertinent topics.	Roadways	High	Road Agent	Participated in annual raining	Maintain certifications and education.
Current as of Oct 2022	PD/FD Fire and Police Radio Interoperability	PD has interoperability will other agencies; able to access FD channels through Capital Area Fire Alarm (fire dispatch).	Entire Town	High	Police Chief/ Fire Chief	PD updated programming & firmware; have access to radio technician for both depts.	FD will have to update radio status for full interoperability, upgrade FD radios
11 people As of Jul 2022	PD Police Officer Training	Undergo annual training in firearms, response to resistance, de-escalation, ethics, implicit bias, and other topics, as necessary. Mandated by PSTC and Department practice.	Entire Town	High	Police Chief	Added additional hours for in-service training. Created an annual Training Roadmap.	Identify topics and train as necessary
17 radios As of July 2022	PD Radios for Enhanced Communication in the Field and among Emergency Personnel	All staff and vehicles equipped with radios.	Entire Town	High	Police Chief	All patrol vehicles are outfitted with upgraded Motorola radios and all officers have or have been issued upgraded portable radios, some obtained through the CNHSOU.	Replace mobiles and portables, as needed.
Current as of 07/22	PD AEDs Defibrillators	Four patrol vehicles, Library, and Transfer Station outfitted with AEDs.	Entire Town	High	Police Chief/ Fire Chief	Changed batteries and/or serviced AEDs.	Train additional town employees and volunteers in use of AED.
Late 2022	PD/FD CodeRED	Mass emergency notification system that can reach individuals by	Entire Town	High	Police Chief/Fire Chief	Research/implement of system through	Update as necessary,

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		text, e-mail and/or telephone; can also be used in non-emergency capacity to inform residents of Town announcements.				NH Division of Emergency Services & Communications.	public awareness

Source: Dunbarton Hazard Mitigation Committee

FINANCIAL CAPABILITIES

The financial resources in **Table 40** 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) 2022 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 40
Financial Capabilities

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment:</u> Financial	<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 Since Last Haz Mit Plan (2017)</u>	<u>Future Improvements to Capability</u>
DUNBARTON FINANCIAL PROGRAM OR FUNDING RESOURCE FOR HAZARD MITIGATION PROJECTS							
Last used in Feb 2013	BOS FEMA Public Assistance Grants for Disaster Recovery	Public Assistance Categories A-G may become available when disasters are declared if the community has an unexpired approved Haz Mit Plan. Continue to utilize the FEMA funding to help recover from declared disasters.	Entire Town	High	Town Administration	Last used in Feb 2013 for PA-B Protective Measures	Utilize the FEMA PA program to help with future disaster costs
Last used in Jan 2017	BOS NH Department of Transportation (NH DOT) Bridge Program	The bridge program is an 80/20 funding opportunity, with only 20% required by towns. 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.	Bridges	High	Highway Department	Last used in 2017 to replace Ray Road/ Mansion Road Bridge with 28'x30' concrete arch culvert.	Place other municipal bridges on the NH DOT Bridge 80/20 Program list well before expected failure
DUNBARTON FUTURE FINANCIAL RESOURCES TO EXPLORE FOR HAZ MIT PROJECTS							
Not Yet Used	BOS Municipal Bonds to Incur Haz Mit Project Debt	Could be used for structural projects or land conservation projects. Bonds are for expensive mitigation strategies, pay overtime	Entire Town	N/A	Board of Selectmen	New potential financial program	Consider using bonds to fund significant mitigation projects
Not Yet Used	BOS Warrant Articles	Could be used for hazard mitigation structural projects, including	Entire Town	N/A	Board of Selectmen	Warrant articles approved	Consider using warrant articles to

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6 CAPABILITY ASSESSMENT

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		building or infrastructure or land acquisition.				annually by Town Meeting. Some indirectly provide mitigation benefits (Dept apparatus, etc)	fund mitigation projects
Not Yet Used	EM FEMA Emergency Management Performance Grant EMPG	High competition for \$, can fund mitigation projects, 50/50	Entire Town	High	Emergency Management	Not used, new potential financial program	Write grant for update of Emergency Operations Plan or for generator, equipment
Current as of 7/22	PB Exactions Fees for New Development	PB is authorized to develop and implement exaction fees to help offset the cost of road improvements necessitated by new development.	Entire Town	N/A	Planning Board	Established procedures on assessment of exaction fees in 2022.	Review and update the procedures as needed

Source: Dunbarton Hazard Mitigation Committee

EDUCATION AND OUTREACH CAPABILITIES

In **Table 41**, 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 41

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
DUNBARTON PUBLIC OUTREACH PROGRAM, EDUCATIONAL ACTIVITY, NOTIFICATIONS							
Current as of 7/22	FD Department Website	Contains updated information maintained by FD volunteers	Entire Town, General Public	High	Fire Department	Updates to the website	Utilize and post updates to Facebook page to provide current information to the public. Upload Fire docs
Current as of 7/22	FD Fire Prevention Awareness and Other Community Programs (#30-2017)	Touch-A-Truck, chicken barbecue, Fire Prevention Week activities. holds Fire Prevention Day at the Elementary school; supports the US Forestry service booth at Old Home Day; participates in National Night Out; regularly Maintains Fire Danger sign outside Public Safety Center.	Entire Town, General Public	High	Fire Department	Various community programs added/updated, including Open House	Update and add community awareness programs and activities
Current as of 07/22	PD Department Facebook Page	Town Facebook Page with Police info. Quick and easy way to communicate with the public	Entire Town, General Public	High	Police Department	Changed administrative permissions for easier posting by officers	Utilize and post updates to Facebook page to provide current information to the public
Current as of 07/22	PD School – Law Enforcement Against Drugs (LEAD) Program	Replaces the DARE program. Drug prevention program that also teaches communication skills, peer pressure resistance, relationship building, etc.	Public Schools	High	Police Department	Taught to 6 th grade students at DES during 2021-22 school year, continuing for 2022-23 school year	Update and teach the program to DES students, obtain supplies and teaching materials, as necessary

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 Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Current as of 07/22	PD Community Programs (#29-2017)	Free child passenger seat installation/ inspections; Coffee with a Cop, Touch-A-Truck, annual Bicycle Rodeo, Project Good Morning, Drug Take Back Program	Entire Town, General Public	High	Police Department	Various community policing programs continued or developed. Promotes annual Drug-Take Back event in Bow & Goffstown.	Update and add community policing programs and activities
2022	SD School District Automated Calling System	Parent Square System may be used for emergency communications withing the district. It will send an email, text, or automated phone message as chosen by parent or guardian. Regular communications and snow days are also communicated with this system.	The school district would receive these messages.	High	School District	Used regularly & successfully	Update regularly when parents require notification
Current as of 7-22	TA Town Website	Used by multiple Town Depts, available to the public, hosts events calendar, meeting information, policies & regulations, planning & zoning documents, applications, online payment of taxes & renewal of vehicle registrations. Emergency alert section. Public can sign up for notifications.	Entire Town, General Public	High	Town Administration	Updated regularly with announcements, agendas, meeting notices, more	Make ongoing improvements to Town website to accommodate user needs.
2022	TS Transfer Station Household Hazardous Waste Disposal (#28-2017)	Items such as propane tanks, dried paint cans, waste oil, batteries, and tires are accepted at the Transfer Station on a regular basis. Dunbarton partners with Bow, in Bow, once a year for a Household Hazardous Waste Day for the safe disposal of	Transfer Station	Moderate	Transfer Station	Partnered with Bow as a cost-saving measure.	Provide annual household hazardous waste disposal service

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6 CAPABILITY ASSESSMENT

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment:</u> Education and Outreach Programs	<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>	Responsibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		materials such as oil-based stains & paints, gasoline, antifreeze, pesticides, and herbicides.					

Source: Dunbarton Hazard Mitigation Committee

7 PRIOR ACTION STATUS

The **Hazard Mitigation Plan Update 2017** provided a basis to begin Action development, many of which originated from prior **Plans**. A review of the **2017** Actions is provided by the Hazard Mitigation Committee, determining which Actions have been **Completed**, **Deleted**, or **Deferred** to the **2023 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 **2017 Plan's deferred** Actions in addition to the **New** Actions from the **2023 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 **2017 Plan** are listed in **Table 42** along with completion dates.

Actions which were **Deleted** from the **2017 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 Dunbarton's activities. Deleted Actions are listed in **Table 43**.

Actions which were **Deferred** from the **2017 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 44** and have been re-prioritized with the **New** Actions in the **Mitigation Action Plan**.

Changes in priority of the **Deferred 2017** Actions occurred over the last five years. The **2017 Plan** used the **12-36 Priority Score enhanced STAPLEE** system while the **2023 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 **2023 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> .

HAZARDS CONSIDERED

With **23** individual hazards evaluated in this Plan, it is not always practical to list each one when describing location vulnerabilities or solutions. In many cases, listing the more encompassing main hazard categories from chapters **3 GOALS AND OBJECTIVES** and **4 HAZARD RISK ASSESSMENT**, which are **Flood, Wind, Fire, Extreme Temperature, Earth, Technological** and **Human**, should accurately define the issues of most of the 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.

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 storms) or **Tree Debris** from the *Wind* category, **Excessive Heat** from the *Extreme Temperature* category, or **Communications** from the *Long Term Utility Outage*, to provide the specific information needed to understand certain issues in Dunbarton.

Therefore, when the main hazard categories of **Flood, Wind, Fire, Extreme Temperature, Earth, Technological** and **Human** are not precise enough, one or more of the specific **23** hazards evaluated may be utilized for greater accuracy.

Review of 2017 Actions

The **2017 Hazard Mitigation Plan** was written in a different format and its content had to comply with less specific review guidelines before the *Local Hazard Mitigation Review Guidebook (FEMA), 2011* became standardized and tailored by each FEMA Region over the years.

Dunbarton's mitigation Actions from the **2017 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 **2004** which were **Completed** or **Deleted** and identified as such in the **2017 Plan** were not given numerical identifiers (**#NA**).

HMP	Action # Range	
2004 Plan	#NA	#NA
2011 Plan	#1- 2011 to	#21- 2011
2017 Plan	#22- 2017 to	#31-2017
2023 Plan	#32- 2022 to	#66- 2022

A total of **10** mitigation Actions have been **Completed** from the previous **Hazard Mitigation Plans** as shown in **Table 42**. This includes **3** Actions most recently **Completed** between the **2017 Plan** and **2023 Plan** and **6** Actions moved to the **6 CAPABILITY ASSESSMENT** Tables because of the ongoing nature of the projects. The **P** indicates a **Partially Completed** project which will be placed into the **2022 Mitigation Action Plan**.

Table 42
Completed Mitigation Actions

Priority Score (2017)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
COMPLETED AFTER 2023 Plan (from CHAPTER 8)						
		See Chapter 8 – Town to add completed Actions				
		See Chapter 8 – Town to add completed Actions				
COMPLETED BY 2023 Plan						
58	#05-2011	Upgrade the Robert Rogers Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion	Jul 2022	Highway Department	\$5,500	Flood, Wind/Tropical (Rainstorms) Erosion, Tree Debris, Aging Infrastructure

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7 PRIOR ACTION STATUS

Priority Score (2017)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
55	#23-2017	Rehabilitate Mansion Road/Ray Road Bridge to Reduce the Risk of Flooding and Severe Winter Impacts to Travelers	2018	Highway Department	\$65,000	Flood, Wind/Tropical (Rainstorms) Erosion, Tree Debris, Aging Infrastructure
57 (P)	#24-2017	Upgrade Three Metal Culverts on Old Hopkinton Road to Reduce the Risk of Flooding, Washouts and Erosion	1 completed in 2021	Highway Department	\$155,000	Flood, Wind/Tropical (Rainstorms) Erosion, Tree Debris, Aging Infrastructure
57	#01-2011	Update the Floodplain Zoning Ordinance to Comply with NFIP Requirements to Reduce Flooding Risk	Jul 2022 Moved to Cap Asst	Planning Board	\$0	Flood, Wind/Tropical (Rainstorms)
55	#25-2017	Continue Milfoil Eradication Efforts at Gorham Pond Through Diving Means to Reduce the Risk of Invasive Species Degradation of Water Quality and Native Flora and Fauna	Jul 2022 Moved to Cap Asst	Conservation Commission	\$10,000 annually	Public Health, Biological Control, Debris Impacted Infrastructure
59	#27-2017	Remove Hazardous Trees or Limbs Along Town Roads to Reduce the Impact of Severe Wind or Winter Weather on Utility Lines and Roadways	Jul 2022 Moved to Cap Asst	Highway Department or Hiring out	\$6,000 annually	Severe Wind Events, Rainstorms, Hurricanes or Tropical Storms, Downburst, Severe Winter Events, Debris Impacted Infrastructure
60	#28-2017	Continue the Annual Household Hazardous Waste Disposal Day Service to Reduce the Risk of Water Quality Contamination and Fires	Jul 2022 Moved to Cap Asst	Transfer Station	\$2,000	Hazardous Materials Spills, Public Health (Water Quality)
60	#29-2017	Continue Participating in the Annual Drug Take Back Day to Reduce the Risk of Water Quality Contamination	Jul 2022 Moved to Cap Asst	Police Department	\$0	Hazardous Materials Spills, Public Health (Water Quality), Human Hazard
60	#30-2017	Conduct Annual Fire Prevention Awareness Activities to Reduce the Risk of Wildfire	Jul 2022 Moved to Cap Asst	Fire Department	\$500	Wildfire, Fire, Lightning
COMPLETED BY 2017 Plan						

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7 PRIOR ACTION STATUS

Priority Score (2017)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
30	#04-2011	Improve Conditions in Town Offices	June 2013	Board of Selectmen	\$12,000	Severe winter weather, severe wind events

Source: Dunbarton Hazard Mitigation Committee

P = Project Partially Completed – Appears in **2021 Mitigation Action Plan**

The pink highlighted rows indicate the **17** total **Deleted** Actions in **Table 43** from previous **Hazard Mitigation Plans** which will not be incorporated into the **2023 Plan** as **Deferred** Actions. Many of the recent Actions were **Deleted** because they were preparedness, response or recovery items and more appropriately belonged in the Town's **Emergency Operations Plan** or within the **6 CAPABILITY ASSESSMENT** tables.

Table 43
Deleted Mitigation Actions

Priority Score (2017)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
DELETED AFTER 2023 Plan (from CHAPTER 8)						
		See Chapter 8 – Town to add deleted Actions				
		See Chapter 8 – Town to add deleted Actions				
DELETED FROM 2023 Plan						
56	#31-2017	Conduct a Public Outreach Program to Trail Users About Proper Usage of the Town Forest Properties	Jul 2022	Conservation Commission, Town Forest Committee	\$500	Duplicates existing efforts
DELETED FROM 2017 Plan						
35	#06-2011	Develop New Standard Operating Guidelines for Fire and Rescue	January 2017	Fire Chief	\$0	This is a preparedness, response or recovery item
32	#07-2011	Increase Police Department Staffing to Implement Human-Caused Disaster Policies	January 2017	Police Chief	\$60,000 - \$80,000	This is a preparedness, response or recovery item
32	#08-2011	Publicize Radon Awareness	January 2017	Health Officer	\$0	This is a preparedness, response or recovery item
32	#09-2011	Publicize the Availability of Flood Insurance	January 2017	Health Officer	\$0	This is a preparedness, response or recovery item

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7 PRIOR ACTION STATUS

Priority Score (2017)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
35	#10-2011	Conduct In-House Training on Hazardous Materials	January 2017	Fire Chief	\$250	This is a preparedness, response or recovery item
34	#11-2011	Recruit EMS Volunteers	January 2017	Fire Chief	\$3,400	This is a preparedness, response or recovery item
33	#12-2011	Hold Training Drills and Mock Exercises with Dunbarton Elementary School	January 2017	Police Chief and Fire Chief	\$1,000	This is a preparedness, response or recovery item
31	#13-2011	Encourage Volunteers to Attend State Fire Fighter Training and Capital Area Fire Compact Community Training	January 2017	Fire Chief	\$3,500	This is a preparedness, response or recovery item
31	#14-2011	Train Highway Department for Disasters and Train for Coordination with Other Departments	January 2017	Road Agent	\$0	This is a preparedness, response or recovery item
29	#15-2011	Participate in NFIP Training	January 2017	Building Inspector	\$0	This is a preparedness, response or recovery item
36	#16-2011	Update Emergency Management Plan	January 2017	Emergency Management Director	N/A	This is a preparedness, response or recovery item
35	#17-2011	Update Hazardous Materials Plan	January 2017	Emergency Management Director	\$0	This is a preparedness, response or recovery item
33	#18-2011	Continue Holding Highway Safety Committee Meetings	January 2017	Board of Selectmen	\$0	This is a preparedness, response or recovery item
36	#19-2011	Continue Meetings of the Joint Loss Committee	January 2017	Board of Selectmen	\$0	This is a preparedness, response or recovery item
34	#20-2011	Adopt Hazard Mitigation Plan as Element of the Master Plan	January 2017	Planning Board	\$100	This is a preparedness, response or recovery item
33	#21-2011	Update Existing Capital Improvement Program	January 2017	Planning Board/Board of Selectmen	\$1,500	This is a preparedness, response or recovery item

Source: Dunbarton Hazard Mitigation Committee

The tan highlighted rows in **Table 44** indicate the **5 Deferred** mitigation Actions from the **2017 Plan** which also appear in the forthcoming **2023 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 **2022** standards in later sections.

Table 44
Deferred Mitigation Actions

Priority Score (2017)	Action Number	Action	Deferred Date	Who is Responsible	Approx \$ Cost	Why Deferred? Because...	Hazards Addressed
55	#02-2011	Upgrade the Montalona Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion	Jul 2022	Highway Department	\$125,000	Lack of funding and staffing	Flood, Erosion, Tree Debris, Aging Infrastructure
58	#03-2011	Upgrade the One Black Brook Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion	Jul 2022	Highway Department	\$15,000	Lack of funding and staffing	Flood, Erosion, Tree Debris, Aging Infrastructure
57	#24-2017	Upgrade Three Metal Culverts on Old Hopkinton Road to Reduce the Risk of Flooding, Washouts and Erosion	Jul 2022	Highway Department	\$155,000	Lack of funding and staffing	Flood, Erosion, Tree Debris, Aging Infrastructure
52	#22-2017	Develop Culvert Replacement Program to Prioritize those at Greatest Risk of Flooding and Washout	Jul 2022	Highway Department	\$0	Lack of funding and staffing	Flood, Erosion, Tree Debris, Aging Infrastructure
58	#26-2017	Stabilize the East Dunbarton Cemetery Hillside with Landcover to Reduce the Risk of Landslide and Erosion	Jul 2022	Cemetery Trustees	\$20,000	Other actions took higher priority, no funding	Landslide/Erosion, Wind/Rainstorms, Flood

Source: Dunbarton Hazard Mitigation Committee

P = Project Partially Completed – Appears in 2021 Mitigation Action Plan

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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 Dunbarton 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 **2023 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 Dunbarton.

Several uncompleted **Deferred** (2017) Dunbarton mitigation Actions have been carried forward into the **2023 Plan** with the updates to the evaluation, cost, prioritization, etc.

ACTION MATRIX

A listing of **5 Deferred** mitigation Actions from **2017** and **35 New** mitigation Actions from **2022** important to the Town of Dunbarton 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 **2023 Plan**. The **2022** Actions begin where the prior Actions left off, **#22- 2022** through **#66- 2022**. Over time, the Actions can be tracked to see which have been **Deferred** and to organize the **Completed** or **Deleted** Actions. 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 2017** Actions and the **New 2022** 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.

Dunbarton's Mitigation Action Plan 2023

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 2023**, the **Mitigation Action Plan** shown in **Table 45 Planning and Regulatory**; **Table 46 Structure and Infrastructure**; **Table 47 Natural Systems Protection**; and **Table 48 Education and Outreach** should be able to guide future hazard mitigation efforts in the Town through an annual implementation process.

Five (5) **Deferred** Actions from **2017** and **35 New** Actions from **2022** combine to develop the **40** Actions of the **2023 Mitigation Action Plan**. The **Deferred** Actions' cells are highlighted in tan.

PROJECT PHASES

Some of the Actions are anticipated for completion after the 5-year lifespan of this **2023 Plan**. Long Term Actions (Years **4-5** of the Plan's lifespan) may often run several years beyond **2028**. 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 **2028**, **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.

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)

MITIGATION ACTION PLAN

The **Actions** (projects) for the Town to work on and/or complete over the duration of this Plan include:

Table 45

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
#22-2017	Develop Culvert Replacement Program to Prioritize those at Greatest Risk of Flooding and Washout.	<u>Long Term</u> <u>4-5 Years</u>	66	Highway Department	\$0	An Excel inventory of the culverts in Town was undertaken in 2013. After the Highway Department matches the inventory to the culverts, updates to the inventory can be made and a Culvert Replacement Plan can be developed.	Flood, Rapid Snow Pack Melt, Erosion and Bed Scouring, Debris Impacted Infrastructure	Roadways, Town culverts	Cost is for in-kind staff and volunteer labor.	N/A
#32-2022	Develop an inventory of the contents of the vault and Town Hall records currently located in various buildings for the Town Boards, Departments, and Committees, and Library to reduce the risk of cultural record destruction from floods or fires.	<u>Long Term</u> <u>4-5 Years,</u> <u>Phase 1 of 3</u>	55	Town Clerk, with help from Library and Departments	\$0	(See also #40-2022). The Library has older paper volumes that are not protected in a vault and are copies of the originals. Many are digitized (UNH digitizing Town Reports)- No special collections, but Historical Awareness committee notes and family genealogy. Can get humid conditions. Fire suppression system has 30 300-gallon tanks in basement of Town Hall, being installed in 2022. Considered a "dry suppression" system because pipes are filled with compressed air, water pulled in when activated. The Town has a locked records room and vault on the second floor of Town Hall building. No other secure location, crowded. Need an inventory of what is there, some may not be needed. (may be a good intern project or	Wind/Rainstorm, Tropical/Post Tropical, Lightning, Fire,	Town Office, Library,	Cost is for in-kind staff and volunteer labor.	N/A

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
						community service project) Town-wide problem about retaining and protecting the records. Cemetery Trustees, Library, other groups. Fireproof filing cabinets are too heavy for usage in Town. Used to have a Space Needs Committee in 1997, tried to address needs. Results – needed meeting space and space for Committee/Town records. (see #40-2022). Volunteers are needed for the project. No supervision time is available. High School community service project possibility, if supervision time could be found. Every Dept/Board needs to organize their own material.				
#33-2022	Develop an engineering assessment to determine the safe snowloads for each Town and School building to Reduce the Impact of Winter Snow and Ice Events.	<u>Short Term</u> <u>1-2 Years</u>	60	Board of Selectmen	\$10,000	School is compliant with most building codes except for snow load requirements. About 58 pounds/square foot presently. 20-23 pounds/cu3 foot is adequate. Town Office, Police Dept, & Fire Dept (1988 addition reinforcement done to code) also constructed prior to current codes. Fire & Police lateral (wind) unknown, seismic event level unknown. The older Town buildings survived the 1938 hurricane. 2 story addition Town Hall will stiffen for lateral loads for 2022. Only significant	Winter, Earthquake, Wind/Tropical	Fire Department, Police Department, Town Office, Elementary School	Cost is for consultant engineer to develop assessment.	School and Town could split. School Op Budget Building Maintenance. Town OB is Building Maintenance

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
						reinforcement or replacement to current code could be feasible. Note: when thermal increases insulation, more snow is possible. Some details available from individual building assessments. Assessment will help in a more formal capacity to monitor the snowloads on the roofs and determine when removal needs to occur before exceeding the maximums.				
#34-2022	Purchase Land for and Construct a New Safety Complex for the Fire and Police Departments to Mitigate Weather Impacts to Current Building.	<u>Long Term</u> <u>4-5 Years,</u> <u>Phase 1 of 3</u>	67	Board of Selectmen with Fire Dept and Police Dept	\$5 million est.	Fire Department garage doors don't fit the modern fire equipment. 5 bays, 3 could not be raised. 2 could be raised. Police Dept does not have a sally port. Architectural study done 10 years ago for adding on to PD & FD station, not for a new study. Land would be needed for a new public safety building. Town is trying to obtain tax deeded land or gifted through subdivision/site plan projects. (some Town support). New building will increase capability for disaster response.	Earthquake, Temperature, Wind/Rainstorm, Flood, Lightning, Health, Winter, Solar, Tropical	Fire and Police, possibly Town Office	Cost is for	Bond
#35-2022	Develop driveway construction regulations to reduce the impact of flood and erosion.	<u>Short Term</u> <u>1-2 Years</u>	73	Building Dept with Fire Dept	\$0	Regulations for new homeowners, property owners, buildings. Width, pitch, material, angle, turnaround, materials, etc permitting should have standards, even for fire and rescue apparatus.	Flood, Erosion		Cost is for in-kind staff and volunteer labor.	N/A
#36-2022	Develop ADU regulations to ensure	<u>Short Term</u> <u>1-2 Years</u>	73	Planning Board	\$1,000	flooding, winter, treefall on power lines, access for	Wildfire, Wind/Tropical		Cost is for a zoning update,	Town Office

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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
	emergency response to the address is appropriate for evacuation to reduce the risk of wildfire or wind/tropical impacts.					evacuation. Knowing the number of people living at an address can assist with appropriate emergency response.			legal review and public noticing.	Operating Budget, Planning Legal Budget
#37-2022	Develop regulations for homeowners to clear brush and firebreaks in concert with the FireWise program in the high density areas to reduce the impact of wildfire, lightning, and fire	<u>Long Term</u> <u>4-5 Years</u>	68	Planning Board with Fire Dept assistance	\$0	Rain barrels, fire breaks, brush clearing. Education first, then regulatory for new development.	Wildfire, Lightning		Cost is for in-kind staff and volunteer labor.	N/A
#38-2022	Develop a Town Public Health Plan to reduce the risk of infectious diseases.	<u>Short Term</u> <u>1-2 Years</u>	65	Health Officer & DHO	\$0	Use experience from COVID-19 pandemic to write down policies and procedures for the handling of short-term and long-term infectious diseases. Include cyanobacteria response, mosquito (arboviral) and tick-borne epidemics.	Public Health, Infectious		Cost is for in-kind staff and volunteer labor.	N/A
	ADD NEW ACTION HERE									

Source: Dunbarton Hazard Mitigation Committee

Table 46
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
#02-2011	Upgrade the Montalona Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion.	<u>Long Term</u> <u>4 to 5 Years</u>	72	Highway Department	\$125,000	Existing culverts appears not large enough to handle a large volume of water. Must perform drainage calculations to determine appropriate size & length. Two side by side now. Not failure structurally but when have a large volume of water could cause a problem. Close to the Town Line (washout could cause evac, detour issues).	Flood, Erosion, Tree Debris, Aging Infrastructure	Montalona Road, Wetland	Cost is for culvert design, contracted labor, materials, installation.	Warrant Article
#03-2011	Upgrade the One Black Brook Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion.	<u>Short Term</u> <u>1-2 Years</u>	75	Highway Department	\$15,000	Culvert appears to be undersized for the area. The 30" metal culvert is a corrugated metal pipe, has rusting issues and will be increased diameter after design. Close to the Town Line (washout could cause evac, detour issues).	Flood, Erosion, Tree Debris, Aging Infrastructure	Black Brook Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#24-2017	Upgrade Three Metal Culverts on Old Hopkinton Road to Reduce the Risk of Flooding, Washouts and Erosion.	<u>Long Term</u> <u>4 to 5 Years</u>	72	Highway Department	\$100,000	Dead end road. Culverts and rusting out, will upgrade with concrete. Nearby Pond and swampy area - drainage issues. Beaver dams are at capacity, can breach at any time. Preparing for release of beaver dams is potential factor but not driving issue for upgrade.	Flood, Erosion, Tree Debris, Aging Infrastructure	Old Hopkinton Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#39-2022	Purchase and install a generator for the Town Office to keep essential governmental services functional	<u>Short Term</u> <u>1-2 Years</u>	73	Town Administration/ Emergency Management	\$20,000	The Town Office lacks a generator to keep the essential governmental services operational.	Earthquake, Temperature, Wind/Rainstorm, Flood, Winter, Solar, Tropical	Town Office (School Street)	Cost is for electrical, installation, labor and the generator.	Selectmen Building and Maintenance OB, Warrant

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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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
	during power outages caused by wind, winter, or solar storm event.									Article if too large \$\$, HMPG/E MPG grant
#40-2022	Purchase secure storage unit in one building for essential Town records or digitize the records into a central historical database to reduce the risk of water impacts or fires.	<u>Long Term</u> <u>4-5 Years,</u> <u>Phase 1 of 2</u>	63	Town Clerk, Town Department s to assist with their materials	\$20,000 Unit, plus shredding and microfilm	(See also #32-2022). The Town Office paper records may not be protected from fire or water; they currently are located in a steel vault. The town records are stored at the town Hall/old Library docs are in multiple locations, not a central spot. Lots of records stored in many locations, including in old Town Hall, Library archives, mostly in the vault in the Town offices. Temperature, climate controlled, temperature sensitive controlled containers, but moving everything into pods is planned. Purchased 4 storage unit, not climate controlled, was over \$5,000 each. Two at HD, 2 at Transfer Station. Hope to organize and downsize records.	Fire, Wind/ Rainstorm, Flood, Winter	At Town Office if large enough lot, or could place at School.	Cost is for one climate controlled, insulated storage unit.	Warrant Article
#41-2022	Upgrade the old Transfer Station fire alarm system with current technology like the Fire and Police Dept systems	<u>Short Term</u> <u>1-2 Years</u>	70	Transfer Station	\$5,000	The Town Offices and Police Department do not have sprinkler systems. No space for cistern in Town Offices. Too old and expensive to retrofit all buildings. All buildings are upgraded for carbon	Fire, Lightning, Wildfire	Transfer Station	Cost is for installation and equipment.	Building and Maintenance OB

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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
	to reduce the impact of fire.					monoxide/fire alarm system (Transfer Station fire alarm should be upgraded). Life /fire safety maintained by compartmentalization.				
#42-2022	Renovate the Town Office entrance door and walkway to be compliant with current building and ADA codes to reduce the impact of winter weather, summer storms on vulnerable populations.	<u>Short Term</u> <u>1-2 Years</u>	73	Board of Selectmen	\$15,000	All buildings are aging, donated or built upon structures, not compliant to today's ADA and building codes. All buildings need electrical updates, new roofs. When buildings are upgraded, ADA accessible fixtures need to be installed (bathroom is mostly redone to ADA standards. The Town Office door and walkway could be reconstructed.) Automatic open door.	Winter, Wind/Rainstorms	Town Office	Cost is for walkway & doorway (Joint Loss List)	Building and Maintenance OB
#43-2022	Raise the height of two Fire Dept bays to accommodate modern apparatus heights to reduce the impact of emergency response calls to winter, wildfire, wind/tropical hazard events.	<u>Short Term</u> <u>1-2 Years</u>	75	Fire Department	\$50,000	Fire Department garage doors don't fit the modern fire equipment. 5 bays, 3 could not be raised. 2 could be raised. Architectural study done 10 years ago for adding on to PD & FD station, not for a new study.	Winter, Wildfire, Wind/Tropical	Fire Department	Cost is for construction, labor, hardware, new doors.	Building and Maintenance OB
#44-2022	Replace the dry hydrant pipe and configuration at Grapevine Road and Zachary Drive to reduce the impact of drought and wildfire, lighting, and fire.	<u>Medium Term</u> <u>3-4</u>	74	Fire Department	\$10,000	The regular droughts are impacting the feasibility of using dry hydrants to fill pumper trucks with water. Dry hydrant connections can be frozen in cold weather. During all drought years, FD lost the use of the dry hydrant on Grapevine Road (poor installation). The Fire Pond behind Fire Station becomes	Drought, Wildfire, Lightning, Fire	Grapevine & Zachary Road	Cost is for permitting, materials, labor, fencing.	Fire Dept Dry Hydrant Budget Line

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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
						critically low, hydrant cannot be used but can get some surface water. Most brooks are dry where water was pulled. Need strainers				
#45-2022	Add a new dry hydrant at Kimball Pond to reduce the impact of drought, wildfire, lighting, and fire.	<u>Long Term</u> <u>4-5 Years</u>	71	Fire Department	\$15,000	The regular droughts are impacting the feasibility of using dry hydrants to fill pumper trucks with water. Dry hydrant connections can be frozen in cold weather. Most brooks are dry where water was pulled. Land is owned by state, boat landing regulated by NHF&G, NHDES. Could try to get Cons Comm land access.	Drought, Wildfire, Lightning, Fire	Kimball Pond	Cost is for permitting, materials, labor, fencing.	Fire Dept Dry Hydrant Budget Line
#46-2022	Replace Clifford Farms Road dry hydrant to reduce the impact of drought, wildfire, lighting, and fire.	<u>Short Term</u> <u>1-2 Years</u>	74	Fire Department	\$10,000	The regular droughts are impacting the feasibility of using dry hydrants to fill pumper trucks with water. Dry hydrant connections can be frozen in cold weather. Most brooks are dry where water was pulled. Needs repair, replacement	Drought, Wildfire, Lightning, Fire	Clifford Farms Road	Cost is for permitting, materials, labor, fencing. Highway Dept assistance could cut the cost down.	Fire Dept Dry Hydrant Budget Line
#47-2022	Install a culvert grate in multiple town culverts impacted by beaver to reduce the impact of flood from tree debris, severe storms, climate change, and snow melt.	<u>Long Term</u> <u>4-5 Years</u>	70	Highway Department	1,000 each, \$6,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts. Remove the beaver is the best, but least cost effective way.	Flood, Erosion, Tree Debris, Aging Infrastructure, Beaver, Dam Failure	Guinea Road near Robert Rogers Road	Cost is for equipment, labor, and grate materials.	Highway Department Operating Budget

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
#48-2022	Upgrade the undersized culverts at Armand's Way to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Long Term</u> <u>4-5 Years</u>	73	Highway Department	\$15,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts.	Flood, Erosion, Tree Debris, Aging Infrastructure	Armand's Way	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#49-2022	Upgrade the undersized culverts at Flintlock Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Medium Term</u> <u>3-4</u>	72	Highway Department	\$10,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts. Several culverts on Flintlock Road	Flood, Erosion, Tree Debris, Aging Infrastructure	Flintlock Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#50-2022	Upgrade the undersized culverts at Gorham Pond Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Medium Term</u> <u>3-4</u>	72	Highway Department	\$10,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts. One changed this spring 2022.	Flood, Erosion, Tree Debris, Aging Infrastructure	Gorham Pond Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
#51-2022	Upgrade the undersized culverts at Flintlock Road and Moose Point reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Long Term</u> <u>4-5 Years</u>	73	Highway Department	\$15,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts.	Flood, Erosion, Tree Debris, Aging Infrastructure	NH 13 by Moose Point	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#52-2022	Upgrade the undersized culverts at Black Brook Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Long Term</u> <u>4-5 Years</u>	73	Highway Department	\$30,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts. 3-4 on Black Brook Road.	Flood, Erosion, Tree Debris, Aging Infrastructure	Black Brook Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating Budget
#53-2022	Upgrade the undersized culverts at Guinea Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	<u>Medium Term</u> <u>3-4</u>	72	Highway Department	\$10,000	Constant work by Highway Dept to stay ahead of beaver (may subcontract out). Environmental issue, contentious issue within Town. Town has an agreement with a trapper to remove the beaver problem. Undersized culverts may also be inadequate for large storm events, or floating tree/woody debris plugs the culverts. Floods the road regularly.	Flood, Erosion, Tree Debris, Aging Infrastructure	Behind Dunbarton Elementary School on Guinea Road	Cost is for culvert design, contracted labor, materials, installation.	Highway Department Operating 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
#54-2022	Replace the Fire Station Roof to reduce the risk of ice dams and water damage during the winter or during storms.	<u>Short Term</u> <u>1-2 Years</u>	75	Fire Department with Police Dept	\$60,000	Alternative to new Safety Complex #34-2022. Water damage in the Town Fire additional and main building. Where the join, the water ice dams backs up the room. Structural work cannot be done because roof not designed for insulation, supposed to shed snow load. Heat tape does not work, heat in building doesn't work. Ceiling and sheetrock water damage, near electrical panel. Two different types of metal roofing, whether joins has an issue. Will be a metal roof.	Winter, Rain Storms	Fire Station/ Safety Complex	Cost is for new metal roofing and installation.	Building and Maintained Fund and/or Warrant Article
#55-2022	Upgrade the Community Center to a Cooling Shelter by Installing Air Conditioning to Reduce the Impact of Extreme Heat.	<u>Medium Term</u> <u>3-4</u>	72	Dunbarton School District with Fire Dept and Emergency Management help	\$50,000	More bathrooms, kitchen, ADA compliant, has a generator, showers. Need an air conditioner (A/C) for the building. Could get a mini-split instead.	Extreme Temps (Heat)	Dunbarton Elementary School / Community Center	Cost is for a generator and installation, electrical wiring.	Warrant Article or Possibility of HMPG 75/25 or EMPG 50/50
	ADD NEW ACTION HERE									

Source: Dunbarton Hazard Mitigation Committee

Table 47
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
#26-2017	Stabilize the East Dunbarton Cemetery Hillside with Landcover to Reduce the Risk of Landslide and Erosion.	<u>Medium Term</u> <u>3-4 Years</u>	72	Cemetery Trustees	\$20,000	The Cemetery is on a hill. The topsoil and vegetation keeps eroding, exposing the gravel underneath and exacerbating the erosion problem. Heavy rains and snow water melt continue eroding into the cemetery hill where people are interred. Town wants to place loam on the surface and reseed with erosion control to prevent further topsoil erosion and vegetation failure.	Landslide/Erosion, Wind/Rainstorms, Flood	East Dunbarton Cemetery: End of Robert Rogers Road at the Bow town line	Cost is for hiring a contractor for erosion control.	Cemetery Operating Budget, Warrant Article
#56-2022	Consider establishing an Agricultural Commission to guide the efforts of existing operations and future farming, agriculture, tree farms, and agrotourism operations to help reduce the impact of drought, lightning, wildfire, and hazardous materials.	<u>Medium Term</u> <u>3-4 Years</u>	72	Board of Selectmen	\$0	Zoning permits agriculture over the entire Town, farmstands everywhere. Permits for farm buildings necessary. Drought is harmful to the agricultural operations in towns. Pesticides and fertilizer use on the farms can runoff and soil degradation, too much nitrogen in water, may percolate into groundwater supplies.	Drought, Health (Water Quality)	Entire Town	Cost is for	N/A
#57-2022	Seek federal funding to relocate gravesites in danger of erosion on East Dunbarton Cemetery to flatter and higher ground to reduce the risk of erosion from flood or severe storm conditions.	<u>Long Term</u> <u>4-5 Years</u>	69	Board of Selectmen, Cemetery Trustees	\$10,000	The East Dunbarton Cemetery gravesites reside on the top of a hill and have been subject to erosion along the hillside (Dunbarton Center Road in Bow). Lack of funds \$\$. Several NH towns have moved their old graves, like Stark Cemetery graves along Stark Pond (has a	Flood, Erosion, Wind/Rainstorm, Health	East Dunbarton Cemetery: End of Robert Rogers Road at the Bow town line	Cost is for a seed \$ amount for a study /survey for the site and the (tax deeded parcel) new site. The cost for relocation is	Seek National historic grants or tax deeded parcels on high elevation, flat land.

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
						historic marker instead) that were relocated to Mansion Road.			not included in the \$10,000.	
#58-2022	Review the NH RSAs for junkyards and salvage yards to inventory these properties in Dunbarton and pursue appropriate enforcement or mitigation activities to reduce the impact of water quality decline and runoff.	<u>Long Term</u> <u>4-5 Years</u>	71	Building Department	\$10,000	With wetlands at the back of the V----- property, there may be a potential for the stored vehicles to leach hazardous materials into water supplies. This situation may have increased since 2017. The Town had gone to court with the V----- property owner in the past. Unsure of current status, but likely there is an agreement when property owner no longer has use of property, it will need to be cleaned up (probably grandfathered use). One example of possibly several salvage yard-type properties in Dunbarton.	Health (Water Quality), Hazardous Materials	Entire Town	Cost is for a potential brownfields assessment.	Seek federal EPA brownfields funding
#59-2022	Monitor the trails at Kimball Pond, Stark Pond, Purgatory Pond and town forests to provide public education and awareness of appropriate activities on trails to reduce the risk of accidental fires and injury.	<u>Short Term</u> <u>then</u> <u>Ongoing</u>	75	Police Department	\$2,500	Unauthorized recreational "party areas" occur at Kimball Pond, Stark Pond & Purgatory Pond; a danger of wildfire from carelessness is present, as is danger from lightning strike and human injury during partying activities. The Dunbarton Police Department continues to patrol these areas frequently. isolated areas too. Need more signage re: trespassing. ATVs on Stark Pond. PD does not have a vehicle or bike to check the trails.	Wind/Rainstorms, Flood, Lightning, Health & Safety, Winter, Tropical, Wildfire	Town Trails	Cost is for signage on trails, a trail bike or UHV for Police Dept usage.	Seek National Park Service grant, local enforcement grant (like Clough Park)
#60-2022	Promote more public use of conservation lands and trails and construct kiosk with	<u>Short Term</u> <u>then</u> <u>Ongoing</u>	75	Conservation Commission	\$7,500	Better advertising and greater use of the trails will enable more people to report inappropriate behavior to the proper	Wind/Rainstorms, Flood, Lightning, Health &	Conservation Lands and Public Trails	Cost is for GPS location, promotion on Town website,	Conservation Commission on OB

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
	consistent maps and informational content at each of the public trailheads to ensure appropriate public usage to reduce the impact of wildfire, lightning, wind/tropical and accidental fires.			with Police Dept		authorities. Illegal dumping occurs on conservation areas and at Kimball Pond- Cons Comm has cleaned up the property several times - tires, appliances, mattresses. Trailheads are often used as dumping grounds, so kiosks at Kunccanowet, Kimball Park, and Grapevine Road will help. Dumping occurs on back roads and in isolated areas too. Unauthorized recreational "party areas" occur at Kimball Pond, Stark Pond & Purgatory Pond; a danger of wildfire from carelessness is present, as is danger from lightning strike and human injury during partying activities. The Dunbarton Police Department continues to patrol these areas frequently. Keep track of changing technologies to help solve the issue – cell phones, EMS, etc. Wayfinding markers with GPS points and blazes, trail signs, GIS trail maps. State Park has a 4-wheeler that can assist with problems on the Clough State Park trails.	Safety, Winter, Tropical, Wildfire, Fire		trail signage and waypoints, and paper maps (\$1,500). Cost is \$6,000 for labor and materials for 3 kiosks with some donated labor and materials.	
	ADD NEW ACTION HERE									

Source: Dunbarton Hazard Mitigation Committee

Table 48
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
#61-2022	Engage in public education about the NHRSA about the # of unregistered vehicles on a single property to Protect Groundwater and reduce the risk of health hazards.	<u>Short Term</u> <u>then</u> <u>Ongoing</u>	74	Building Department	\$0	Other properties in Town have vehicles stored and may be in proximity to wetlands. Complaints must be filed (online or in person) about many cars in yards, neighbors good about getting vehicles taken care of. (Can have 2 unregistered motor vehicles on property). Try to remain discreet on complaints when possible. Follow the NH RSA regulation number of stored vehicles on a property. Advertise by brochures, handouts at Transfer Station, info on Town website, etc. (people often just register their vehicles instead)	Health (Water Quality), Hazardous Materials	Entire Town	Cost is for in-kind staff and volunteer labor.	N/A
#62-2022	Visit potential Haz Mat Tier 2 facilities and encourage them to report on-site materials as required to the NHDES/Fire Dept/REPC to discourage chemical, haz mat material dumping in Town forests and raise awareness of potential danger to people and facilities.	<u>Short Term</u> <u>then</u> <u>Ongoing</u>	75	Fire Department	\$0	Dunbarton Fuel and Heaven's Gas Station are the only 2 known sites. Heaven's is regularly flooded with an overflowing pond/wetlands behind the building. There is 1 accompanying rental housing unit which can also be flooded. Have fire suppression, drainage might be inadequate. Tanks should be inspected by state on regular basis – state should identify potential flood radius. Tanks and pumps recently replaced. May be a grandfathered use. Supposed to report to Central NH Regional Haz Mat Team the Tier 2 facilities	Health (Water Quality), Hazardous Materials	Hazardous Materials Facilities	Cost is for in-kind staff and volunteer labor.	N/A

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
						of chemicals onsite. Example of other haz mat facilities in Dunbarton.				
#63-2022	Engage in targeted public outreach and education related to unsafe or illegal activities in the most rural neighborhoods to reduce the risk of water quality decline from leakage and dumping and to reduce the risk of overdose and death.	<u>Short Term then Ongoing</u>	75	Police Department	\$0	Illegal drug (meth) labs have been found and shut down on Stark Pond and Purgatory Pond. Chemical reactions could cause great harm to people. Residents should be encouraged to be watchful and to report suspicious behavior. Needles have been found on NH 77 and other local roads. The Dunbarton Police Department continues to patrol these areas frequently. We post Facebook alerts when needles are found and recently included a “what to do” if needles are found. Residents are vigilant and generally don’t hesitate to report suspicious activity. Outreach and education, PD is active with the community.	Health & Safety, Water Quality	Remote areas, Stark Pond, Purgatory Pond, Entire Town	Cost is for in-kind staff and volunteer labor.	N/A
#64-2022	Engage in a public education campaign on Town trails to post signage, develop a take in- take out policy, and signage warning of camera/monitoring to dissuade dumping appliances and materials to reduce the risk of wildfires, leakage into groundwater.	<u>Medium Term then Ongoing</u>	73	Conservation Commission with Fire Department and Police Department	\$6,000	Illegal dumping occurs on conservation areas and at Kimball Pond- Cons Comm has cleaned up the property several times - tires, appliances, mattresses. Trailheads are often used as dumping grounds. Dumping occurs on back roads and in isolated areas too. Forest fires from vehicles – fuel spillage, sparks. Huge fires in NH, some on the water. Trails at Clough State Park, erosion from vehicles. Dry	Health (Water Quality), Wildfire, Hazardous Materials, Fire, Erosion, Human	Conservation Lands and Town Trails	Cost is for signage and cameras for 6 conservation/trail areas.	Conservation Commission and/or Police Department Operating Budgets

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

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
						land, ash trees dying (more fuel load).				
#65-2022	Develop public education program for homeowners to clear brush and firebreaks in concert with the FireWise program in the high residential density areas.	<u>Medium Term 3-4</u>	73	Planning Board with Fire Dept assistance	\$1,000	Rain barrels, fire breaks, brush clearing. Education first, then regulatory for new development.	Wildfire, Lightning	New Developments	Cost is for public noticing, legal review if needed.	Legal Budget, Planning Board
#66-2022	Provide public education on how individuals can mitigate the effects of space weather.	<u>Short Term then Ongoing</u>	73	Emergency Management and Energy Committee	\$1,000	Website information postings, webpage, redirect to NOAA webpages for research. Add links, new page info	Solar Storms/Space Weather	Entire Town	Cost is for printing and distribution of materials.	Town Administration Operating Budget
	ADD NEW ACTION HERE									

Source: Dunbarton Hazard Mitigation Committee

Great Mitigation Projects... and the Realities of Project Implementation in New Hampshire

These important but costly and/or time-consuming mitigation projects identified in the [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 City of Concord). 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 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.

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 2023**, completion of Actions 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.

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 **2022**, 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.

The previous Plans *before* the **2017 Plan** had answered the same questions, except the three new questions regarding funding, staffing, and historic preservation, on a scale of **1-3**, with "**1**" indicating a **NO** response, "**2**" indicating a **MAYBE** response, and "**3**" indicating a **YES** response, for a possible highest ranking total score of **36**. The **2017** rating system enabled a total score of up to **60** (1-5 score for 12 questions).

There is more latitude in the **2023 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 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?

Action Completion	
RANKING	SCORE
Excellent	75 - 60
Good	45 - 59
Fair	44 - 30
Poor	29 - 15

- 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?
- Is the action support or protect the environment?
- 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. Dunbarton's **Mitigation Action Plan** STAPLEE rating is shown in **Figure 30** and includes a basic benefit-cost ranking as shown in yellow.

Figure 30 (below & next page)
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 current thinking?)	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 like project)	Politically Acceptable? (Public Officials like project)	Administratively Feasible? (Have admin skills or time for paperwork)	Technically Feasible? (Have tech skills 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?	Support Historic Preservation? (Sites, neighborhoods, culture?)	Ranking Score 15-75
#22- 2017	Develop Culvert Replacement Program to Prioritize those at Greatest Risk of Flooding and Washout.	5	4	5	5	3	5	5	4	5	5	5	4	4	5	2	66
#32-2022	Develop an inventory of the contents of the vault and Town Hall records currently located in various buildings for the Town Boards, Departments, and Committees, and Library to reduce the risk of cultural record destruction from floods or fires.	5	3	5	5	1	3	5	3	4	5	5	1	3	2	5	55
#33-2022	Develop an engineering assessment to determine the safe snowloads for each Town and School building to Reduce the Impact of Winter Snow and Ice Events.	5	4	5	4	4	3	3	4	5	4	5	4	3	2	5	60
#34-2022	Purchase Land for and Construct a New Safety Complex for the Fire and Police Departments to Mitigate Weather Impacts to Current Building.	5	5	5	5	1	4	5	5	5	5	5	5	4	4	4	67
#35-2022	Develop driveway construction regulations to reduce the impact of flood and erosion.	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	73
#36-2022	Develop ADU regulations to ensure emergency response to the address is appropriate for evacuation to reduce the risk of wildfire or wind/tropical impacts.	5	5	5	5	5	5	4	5	5	5	5	4	5	5	5	73
#37-2022	Develop regulations for homeowners to clear brush and firebreaks in concert with the FireWise program in the high density areas to reduce the impact of wildfire, lightning, and fire	5	5	5	5	2	3	4	5	5	5	5	5	4	5	5	68
#38-2022	Develop a Town Public Health Plan to reduce the risk of infectious diseases.	5	5	5	1	4	5	5	5	5	5	5	4	5	5	1	65
#02- 2011	Upgrade the Montalona Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion.	5	5	5	5	2	5	5	5	5	5	5	5	5	5	5	72
#03- 2011	Upgrade the One Black Brook Road Culvert to Reduce the Risk of Flooding, Washouts and Erosion.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#24- 2017	Upgrade Three Metal Culverts on Old Hopkinton Road to Reduce the Risk of Flooding, Washouts and Erosion.	5	5	5	5	2	5	5	5	5	5	5	5	5	5	5	72
#39-2022	Purchase and install a generator for the Town Office to keep essential governmental services functional during power outages caused by wind, winter, or solar storm event.	5	5	5	5	4	5	5	5	5	5	5	4	5	5	5	73
#40-2022	Purchase secure storage unit in one building for essential Town records or digitize the records into a central historical database to reduce the risk of water impacts or fires.	5	5	5	2	1	4	5	5	5	5	5	1	5	5	5	63
#41-2022	Upgrade the old Transfer Station fire alarm system with current technology like the Fire and Police Dept systems to reduce the impact of fire.	5	5	5	5	4	5	5	5	5	5	5	5	4	5	2	70

Town of Dunbarton, NH Hazard Mitigation Plan Update 2023

8 MITIGATION ACTION PLAN

Action Number	Does the Action..... or is the Action.....	Reduce Damage? (or injury)	Contribute to Town Objectives? (Supported by Master Plan or other thinking?)	Meet Regulations ? (if there are any)	Protect Sensitive Structures? (buildings, roads, culverts, home-made things?)	Implement Action Plan for Timeframe	Socially Accepted ? (People like the project)	Politically Acceptable ? (Public Officials like the project)	Admini- stratively Realistic? (Have admin skills or time for paperwork)	Technically feasible? (Have tech skills or special equipment)	Have a Reasonable Cost to Benefits Gained? (Will project save \$5 in long term?)	Legal? (It 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
#42-2022	Renovate the Town Office entrance door and walkway to be compliant with current building and ADA codes to reduce the impact of winter weather, summer storms on vulnerable populations.	5	5	5	5	4	5	5	5	5	5	5	5	4	5	5	73
#43-2022	Raise the height of two Fire Dept bays to accommodate modern apparatus heights to reduce the impact of emergency response calls to winter, wildfire, wind/tropical hazard events.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#44-2022	Replace the dry hydrant pipe and configuration at Grapevine Road and Zachary Drive to reduce the impact of drought and wildfire, lighting, and fire.	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	74
#45-2022	Add a new dry hydrant at Kimball Pond to reduce the impact of drought, wildfire, lighting, and fire.	5	5	5	5	2	5	5	4	5	5	5	5	5	5	5	71
#46-2022	Replace Clifford Farms Road dry hydrant to reduce the impact of drought, wildfire, lighting, and fire.	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	74
#47-2022	Install a culvert gate in multiple town culverts impacted by beaver to reduce the impact of flood from tree debris, severe storms, climate change, and snow melt.	5	5	5	5	2	3	5	5	5	5	5	5	5	5	5	70
#48-2022	Upgrade the undersized culverts at Armand's Way to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	73
#49-2022	Upgrade the undersized culverts at Flintlock Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	3	4	5	5	5	5	5	5	5	5	5	72
#50-2022	Upgrade the undersized culverts at Gorham Pond Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	3	4	5	5	5	5	5	5	5	5	5	72
#51-2022	Upgrade the undersized culverts at Flintlock Road and Moose Point reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	73
#52-2022	Upgrade the undersized culverts at Black Brook Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	73
#53-2022	Upgrade the undersized culverts at Gubies Road to reduce the impact of flood from tree debris (beaver and wind), severe storms, climate change, and snow melt.	5	5	5	5	3	4	5	5	5	5	5	5	5	5	5	72
#54-2022	Replace the Fire Station Roof to reduce the risk of ice dams and water damage during the winter or during storms.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#55-2022	Upgrade the Community Center to a Cooling Shelter by Installing Air Conditioning to Reduce the Impact of Extreme Heat.	5	5	5	5	3	5	5	5	5	5	5	5	4	5	5	72
#26-2017	Stabilize the East Dunbarton Cemetery Hillside with Landcover to Reduce the Risk of Landslide and Erosion.	5	5	5	5	3	5	5	5	5	5	5	5	4	5	5	72
#56-2022	Consider establishing an Agricultural Commission to guide the efforts of existing operations and future farming, agriculture, tree farms, and agritourism operations to help reduce the impact of drought, lightning, wildfire, and hazardous materials.	5	5	5	5	3	4	5	5	5	5	5	5	5	5	5	72
#57-2022	Seek federal funding to relocate gravesites in danger of erosion on East Dunbarton Cemetery to flatter and higher ground to reduce the risk of erosion from flood or severe storm conditions.	5	5	5	5	1	5	5	5	5	5	5	5	3	5	5	69
#58-2022	Review the NH RSAs for junkyards and salvage yards to inventory these properties in Dunbarton and pursue appropriate enforcement or mitigation activities to reduce the impact of water quality decline and runoff.	5	5	5	5	3	5	5	4	5	5	5	5	4	5	5	71
#59-2022	Monitor the trails at Kimball Pond, Stark Pond, Purgatory Pond and town forests to provide public education and awareness of appropriate activities on trails to reduce the risk of accidental fires and injury.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#60-2022	Promote more public use of conservation lands and trails and construct kiosk with consistent maps and informational content at each of the public trailheads to ensure appropriate public usage to reduce the impact of wildfire, lightning, wind/tropical and accidental fires.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#61-2022	Engage in public education about the NHRSA about the # of unregistered vehicles on a single property to Protect Groundwater and reduce the risk of health hazards.	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	74
#62-2022	Visit potential Haz Mat Tier 2 facilities and encourage them to report on-site materials as required to the NHDES/Fire Dept/NEPC to discourage chemical, haz mat material dumping in Town forests and raise awareness of potential danger to people and facilities.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#63-2022	Engage in targeted public outreach and education related to unsafe or illegal activities in the most rural neighborhoods to reduce the risk of water quality decline from leakage and dumping and to reduce the risk of overdose and death.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#64-2022	Engage in a public education campaign on Town trails to post signage, develop a take in- take out policy, and signage warning of camera/monitoring to dissuade dumping appliances and materials to reduce the risk of wildfires, leakage into groundwater.	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	73
#65-2022	Develop public education program for homeowners to clear brush and firebreaks in concert with the FireWise program in the high residential density areas.	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	73
#66-2022	Provide public education on how individuals can mitigate the effects of space weather.	5	5	5	5	4	4	5	5	5	5	5	5	5	5	5	73

Source: Dunbarton 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.

See the Phasing explanation in the **Mitigation Action Plan** section for Actions that span beyond the 5-year lifespan of the Plan.

COST TO BENEFIT ANALYSIS

A simple **Cost to Benefit Analysis** ranking is contained within the enhanced STAPLEE criteria as displayed in the previous **Figure**.

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 targeted Actions associated with them in the **Mitigation Action Plan** or the reason why no specific or feasible Action was developed for the highest **Concerns** is described in **Table 49**.

Table 49

Committee Assessment of MEDIUM & HIGH Natural Hazards with Mitigation Actions

CONCERN	Natural Hazard	Committee Assessment of Actions
HIGH	Winter Weather	See Actions related to Winter, overall Severe Weather Storms, Ice, Wind, Tree Debris.
HIGH	Public Health	See Actions related to Public Health, Health (Water Quality), Infectious, Life & Safety and general natural disaster.
HIGH	High Wind Events	See Actions related to Wind, Tropical, Tree Debris, overall Severe Weather Storms.
HIGH	Solar Storms and Space Weather	See Actions related to Extreme Temperatures, Aging Infrastructure, Utility Failure.
HIGH	Drought	See Actions related to Drought, Lightning, Extreme Temperatures, Wildfire, and Fire.
HIGH	Extreme (Heat-Cold) Temperatures	See Actions related to Extreme Temps, Winter, Excessive Heat, Climate Change
HIGH	Wildfire	See Actions for Wildfire, Tree Debris, Lightning.
MEDIUM	Tropical and Post-Tropical	See Actions related to Wind, Tropical, Tree Debris, overall Severe Weather Storms.
MEDIUM	Inland Flooding	See Actions related to Flood, Dam, Erosion, River, Aging Infrastructure, and Tree Debris.
MEDIUM	Lightning	See Actions for Wildfire, Tree Debris, Lightning.
LOW	Dam Failure	See Actions related to River, Flood, Dam, Erosion, Landslide and overall Severe Weather Storms.
LOW	Earthquake	See Actions related to Earth, Landslide, Erosion, Earthquake, Aging Infrastructure.
LOW	Landslide	See Actions related to Earth, Landslide, Erosion, Earthquake, Aging Infrastructure.
LOW	River Hazards	See Actions related to River, Flood, Dam, Erosion, Landslide and overall Severe Weather Storms. However, there is no River in Dunbarton

Source: Dunbarton Hazard Mitigation Committee

9 ANNUAL IMPLEMENTATION AND EVALUATION

The Town received FEMA approval for the prior **Hazard Mitigation Plan** in **July 2017**. 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 Dunbarton will review, monitor, and update its new **Dunbarton Hazard Mitigation Plan Update 2023**.

Annual Monitoring and Update of the Mitigation Action Plan

The Board of Selectmen 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 Board of Selectmen 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 will include (Committees may be established by Town in the future):

- | | |
|------------------------------------------|----------------------------------------------|
| ✓ Emergency Management Director | ✓ 1 Board of Selectmen member |
| ✓ Deputy Emergency Management Director | ✓ 1 Planning Board member |
| ✓ Town Administration | ✓ 1 Budget Advisory Committee member |
| ✓ Fire Chief or designee | ✓ 1 Dunbarton School District Representative |
| ✓ Police Chief or designee | ✓ 1 Library Representative |
| ✓ Highway Road Agent or designee | ✓ 1 Historical Society member |
| ✓ Building Inspector/ Zoning Compl. Off. | ✓ 1 Conservation Comm Representative |
| ✓ Welfare Officer/Health Officer | ✓ 1 Recreation Committee (future) |
| ✓ Transfer Station Supervisor | ✓ Community (Stakeholders) at Large |
| ✓ Town Planner | |

Stakeholders who will be solicited to attend meetings and to participate equitably in the Plan development process include representatives from Dunbarton School District, Library, Historical Society, Army Corps of Engineers, neighborhoods, local State Representatives, agricultural/farming operations, trails groups, local non-profits including the Capital Area Public Health Network, area emergency management directors, local, State or Federal agency representatives (such as NH HSEM), utility representatives, 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 50**.

Table 50

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 Board of Selectmen 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.

Meeting or Activity Month	ANNUAL Preliminary HMC Interim Meeting Agenda Items and Activities
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 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 Board of Selectmen 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: Dunbarton 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 Staff, Dunbarton School District representatives, Stakeholders, and other participants of the **2023 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 Dunbarton, and will be posted on the Town of Dunbarton website at <https://www.dunbartonnh.org/>.

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, will be retained and compiled for inclusion into **APPENDIX C**.

The Emergency Management Director and Department heads will work with the Board of Selectmen 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: Annual Implementation and Evaluation of the Plan

This Hazard Mitigation Plan will be reviewed, revised to current standards and will be adopted by the Town and formally approved by FEMA every five years. This five-year, comprehensive Plan update project has been funded through a FEMA hazard mitigation planning grant to date and is facilitated by CNHRPC. Yet, there are numerous activities the Town, through the Hazard Mitigation Committee or individual Boards and Departments, will undertake to implement the Action list and perform minor section updates to the Plan each year between now and the Plan's lapse in **2028**.

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 50**. 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 should include:

1. Document New Hazard Events that Occurred in Town.

- ➔ Redo 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** 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 **2023 Plan** for so we can track the adjustments and copy them over into the new **2027 Plan** update! The latest approved format and content will be different than the **2023 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 2027-2028.

Figure 31 is a graphic display of the repeating annual interim activities of the Hazard Mitigation Committee to update and implement the **Hazard Mitigation Plan 2023** actions and while preparing for the **2028 Plan Update**.



Figure 31
Annual Interim Plan Implementation, 2023-2028








ANNUAL INTERIM IMPLEMENTATION FILES 2023-2028

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 (**2023**) through Plan lapse (**2028**). Contact CNHRPC at 603-226-6020 or at salexander@cnhrpc.org for information about implementation assistance.

COMMITTEE ORGANIZATION AND PUBLICITY DOCUMENTS

-  Board of Selectmen: 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

The next **5**-year full Plan update will evaluate the Actions in the same manner, add new Actions, and will fulfill a complete update of the **Hazard Mitigation Plan** according to [*FEMA Local Mitigation Planning Policy Guide 2023*](#) standards and [*NH State Hazard Mitigation Plan 2023*](#) guidance.

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 **Dunbarton Hazard Mitigation Plan Update 2023** 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 2017 PLAN

As a successful, growing community, the Town of Dunbarton has a comprehensive network of plans, processes, champions, regulations, and budgets to ensure its local objectives, projects and budgets are fulfilled. The **Dunbarton Hazard Mitigation Plan 2023** is a tool for community betterment which works most effectively when partnering with existing planning mechanisms. Since the original **2005 Plan**, the overall integration and importance of the **Dunbarton Hazard Mitigation Plan** into existing Town planning mechanisms continues to grow.

Although the **2017 Plan** was not adopted into Planning Board's latest **Master Plan 2019** the opportunity exists now for incorporation of the **2023 Plan**. The **Capital Improvements Program 2016-2021** will be updated and its projects influence new funding for Departments, including the Highway Department funding for culvert upgrades in the **Mitigation Action Plan**. The **Zoning Ordinance** was revised annually since **2017** and continues to encourage natural systems protection (see **6 CAPABILITY ASSESSMENT**). The **Subdivision and Site Plan Review Regulations** are in need of review and update in **2023**. These regulations indirectly support hazard mitigation planning principles (such as excavation regulations, fire and emergency access, driveway standards, drainage, landscaping, erosion, etc.) that support all versions of the **Plan**. 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 Hydrant, etc. Drainage upgrades, culvert upgrades, and asset inventory and management are priorities of the Highway Department and are important mitigation projects in Dunbarton.

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 **2023 Plan** to be utilized.

MASTER PLAN

The latest Dunbarton Master Plan was adopted by the Planning Board in **2019**. The goal for future updates is annual review and revision of a selection of Chapters. Chapters from the **2020 Master Plan** to update include Vision, Implementation, Housing, Economic Development, Community Facilities, Land Use, Transportation and Natural Resources. New future chapters to consider could include Energy and an updated Historic and Cultural Resources.

*To support mitigation efforts, the Planning Board should consider adopting the **Hazard Mitigation Plan 2023** as a separate Chapter or Appendix to its Master Plan in accordance with **RSA 674:2.II(e)**.*

The **Hazard Mitigation Plan** should be presented to the Planning Board by the Town Planner 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

Dunbarton's last adopted **Capital Improvements Program (CIP)** is **2016-2021** as adopted in **2016**. The goal is to ensure the CIP is reviewed and updated each year by the CIP Committee. The HMC would 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 should be identified where appropriate as addressing projects in the **Hazard Mitigation Plan Update**.

Process to Incorporate Actions

The Hazard Mitigation Committee (HMC)'s representative to the Planning Board will oversee the process to begin working with the Planning Board's 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 should be appointed to sit on the CIP Committee or the HMC should 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 could be considered.

TOWN MEETING

In Dunbarton, 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 **2023 Plan Update** and **how 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 Board of Selectmen 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 Board of Selectmen 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, Dunbarton Departments and staff will be able to prioritize their tasks to work on **Hazard Mitigation Plan Update 2023** Actions. The in-kind staff work performed is assumed under the Operating Budget for that particular Department. The Emergency Management Department could benefit from a higher annual budget.

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 Dunbarton improvement projects to specific projects and objectives of the Hazard Mitigation Plan Update 2023**, 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 Administration, will be responsible for ensuring that Town Departments and the public have adequate opportunity to participate in the planning process. Administrative staff should again be utilized to assist with the public involvement process.

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, Budget Advisory Committee members, and Town Department heads;
- Provide personal invitations to abutting community emergency management directors of neighboring Towns;
- Provide personal invitations to the major businesses, agencies, neighborhoods, non-profits, and other entities listed previously in **9 ANNUAL IMPLEMENTATION AND EVALUATION**;
- Post public meeting notice flyers and press releases on the Town's website at <https://www.dunbartonnh.org/> on the Town's online calendar on the same site, and place agendas and meeting materials on a Hazard Mitigation Committee webpage (off the Emergency Management section).
- Post meeting notices in the Dunbarton Town Hall, outside on the Town Bulletin Board, at the Library, at the Safety Complex, at the Elementary School, and at local business(es);
- Submit media releases to the Concord Monitor (a paid, regional daily newspaper serving over **40** communities around the Concord 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 Dunbarton 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 Dunbarton should be considered for direct invitation for MITIGATION, which is a transparent process. EMERGENCY OPERATIONS planning should have a more selective working group.

A new section of the Town website dedicated to Hazard Mitigation Committee activities and the **2023 Plan** should be kept updated with meeting notices and materials used by the Hazard Mitigation Committee. This online location would be an optimal place to post the final **2023 Plan** and its **Maps** and **Appendices** and to continue adding materials for annual Plan updates. Additional pages should 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 would 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 Dunbarton Hazard Mitigation Plan Update 2023 Appendices

Some of these documents should 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 **2028**.

- 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 should be reviewed and updated minimally each year*. It is also highly recommended to update **4 HAZARD RISK ASSESSMENT Table 12 Local and Area Hazard Event and Disaster History** to maintain a record of the disasters, hazards, and impacts to Dunbarton. See **9 ANNUAL EVALUATION AND IMPLEMENTATION** and **Figure 31** for details.

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11 MAPS

Four (4) detailed Maps were fully updated during the development of the **Dunbarton Hazard Mitigation Plan Update 2023**. 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 2023 Maps

Map 1 Potential Hazards illustrates potential hazard event locations in Dunbarton 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 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 Dunbarton in the past, including areas of 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** on a background of aerial photography 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** on an aerial photography background and includes the **Map 1 Potential Hazards** and any realistic **Map 2 Past Hazards** locations where hazard events can occur again in Dunbarton.

-  **Map 1 - Potential Hazards**
-  **Map 2 - Past Hazards**
-  **Map 3 - Critical and Community Facilities**
-  **Map 4 - Potential Hazards and Losses**