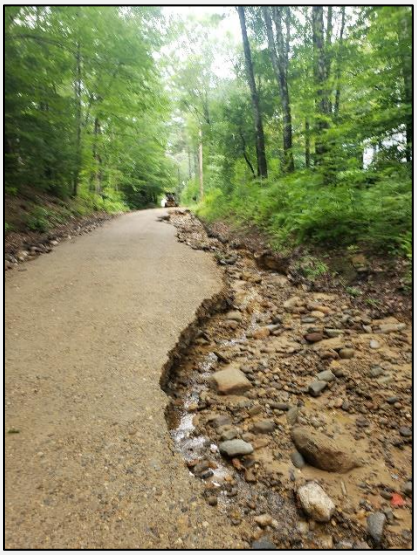
Hazard Mitigation Plan
Update 2023

Town of Loudon

New Hampshire

Adopted by the Loudon
Board of Selectmen
April 17, 2023

Approved by FEMA
April 18, 2023



Cover photos courtesy of
Town Departments, through 2022

Town of Loudon, NH

Hazard Mitigation Plan Update 2023

Selectmen Adopted April 17, 2023

FEMA Approved April 18, 2023

Town of Loudon
55 South Village Road
Loudon, NH 03307
Phone: (603) 798-4541
https://www.loudonnh.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

U.S. Department of Homeland Security
FEMA Region I
99 High Street, Sixth Floor
Boston, MA 02110-2132

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 Loudon, 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

Table of Contents

Fluvial Geomorphic Assessment 2015 Maps (in 2017 Plan)

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 Loudon, NH
Board of Selectmen
55 South Village Road
Loudon, NH 03307

A Resolution Adopting the Loudon Hazard Mitigation Plan Update 2023

WHEREAS, the Town of Loudon 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 Loudon 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 Loudon; and

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

RESOLVED by Town of Loudon Board of Selectmen:

The **Hazard Mitigation Plan Update 2023** is hereby adopted as an official plan of the Town of Loudon; 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 Loudon this 17th day of April 2023.

Board of Selectmen

Roger A. Maxfield
Roger Maxfield, Chair date

Jeff Miller, Member 4/17/2023 date

John Storrs 4/17/2023
John Storrs, Member date

ATTEST

Ashley Simonds
Town Clerk
Ashley Simonds

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 **Loudon Hazard Mitigation Plan Update 2023**:

- **Tom Blanchette**, Loudon EMD, Fire Department Chief
- **Kris Burgess**, Loudon Police Department Chief
- **Dana Flanders**, Loudon Sergeant Police Department
- **William Lake**, Loudon Deputy EMD, Fire Department Deputy Chief
- **Roger Maxfield**, Loudon Board of Selectmen Chair
- **Deana Norman**, Loudon Maxfield Public Library Director (former)
- **Emily Fay**, Loudon Maxfield Public Library Director
- **Brenda Pearl**, Loudon Town Administrator
- **Russ Pearl**, Loudon Highway Department Road Agent
- **Julie Robinson**, Loudon Conservation Commission Chair
- **Anne Marie Zube**, Loudon Fire Department Office Assistant

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 residents, public employees, and/or other agency representatives attended one or more Committee meetings and 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.

- **Lynne Doyle,** NH Homeland Security and Emergency Management Representative
- **Rose Marie Giambalvo**, Loudon Citizen*
- **Vince Giambalvo**, Loudon Citizen*
- **Geoffrey Higman**, Loudon Citizen*
- **Chris Daignault**, New Hampshire Motor Speedway, Operations*
- **Fred Reagan**, MVSD Facilities Director
- **John Marcel,** NH Homeland Security and Emergency Management Representative (former)

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 Loudon, 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 Loudon 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 **Loudon 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 Loudon 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, Public Library, Merrimack Valley School District, and Conservation Commission. 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 Loudon 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 **Loudon 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 similarly to 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 **Loudon'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 *Remotely held via Zoom Webinar and in-person*	04-12-22	Discuss Process and Schedule; Review Declared Disasters and Public Assistance Funding to Loudon; Develop New Hazard Identification and Risk Assessment (HIRA), Begin to Identify Potential and Past Hazard Locations 2017-2022; Prepare for Maps 1-2 Revisions; Schedule Meetings	Citizens RG/VG/GH-worked on agenda items with HMC
Work Session 1 *Remotely held via Zoom Webinar and in-person*	05-03-22	Finish Identifying Recent Past Hazard Events 2017-2022; Review and Finalize Loudon Hazard Mitigation and Severe Weather Survey; Update Critical and Community Facilities Vulnerability Assessment and Develop Problem Statements; Revise Maps 1-2	Citizens RG/VG/GH-worked on agenda items with HMC
Meeting 2 *Remotely held via Zoom Webinar and in-person*	05-17-22	Post Loudon Hazard Mitigation and Severe Weather Survey; Finish Problem Statements and Identify New 2022 Actions	Citizens RG/VG/GH-worked on agenda items with HMC
Work Session 2 *Remotely held via Zoom*	06-07-22	Finish Problem Statements and Identify New 2022 Actions Review and Update Goals and Objectives	Citizens RG/VG/GH-worked on agenda items with HMC

Meeting	Date	Agenda Activities – See APPENDIX C	Attended by Public
Webinar and in-person			
Work Session 2.2 *Remotely held via Zoom Webinar and in-person*	06-21-22	Review and Update Department Roundtable- Review & Update of Capability Assessment; BRIC 2020 Grant Status and Schedule New Meetings	Citizens RG/VG/GH/CD- worked on agenda items with HMC
Work Session 2.3 *Remotely held via Zoom Webinar and in-person*	08-09-22	Review and Update Department Roundtable- Review & Update of Capability Assessment; Capability Assessment Do's and Don'ts	Citizens RG/VG/GH- worked on agenda items with HMC
Meeting 3 *Remotely held via Zoom Webinar and in-person*	08-16-22	Determine Status of the 2017 Mitigation Actions; Review Mitigation Action Resources (per hazard); Begin to Develop Mitigation Action Plan 2023	Citizens RG/GH- worked on agenda items with HMC
Work Session 3 *Remotely held via Zoom Webinar and in-person*	09-07-22	Complete Last Capability Assessment Items; Develop Mitigation Action Plan 2023; Reminder of Mitigation Action Resources (per hazard); Begin Prioritize Mitigation Action Ranking Scores for Action Achievability Using Enhanced STAPLEE	Citizens RG/VG/GH- worked on agenda items with HMC
Work Session 3.2 *Remotely held via Zoom Webinar*	09-14-22	Develop Mitigation Action Plan; Reminder of Mitigation Action Resources; Prioritize Mitigation Action Ranking Scores for Action Achievability Using Enhanced STAPLEE; Review Next Steps	Citizens RG/VG/GH- worked on agenda items with HMC
Meeting 4 *Remotely held via Zoom Webinar and in-person*	10-18-22	Review Draft Hazard Mitigation Plan 2023; Overview of Work Session 4 Tasks	Citizens RG/VG/GH- worked on agenda items with HMC
Work Session 4 *Remotely held via Zoom Webinar and in-person*	10-26-22	Review Draft Hazard Mitigation Plan Update 2023; Interim Hazard Mit Plan Implementation; Schedule & Prepare for Public Information Meeting; Review Plan Process Steps Leading to Formal Approval; Next Steps	Citizens RG/VG/GH- worked on agenda items with HMC
Public Information Meeting *Held in-person*	11-15-22	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: Loudon 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 Loudon Hazard Mitigation Plan Committee meetings. They included Town Boards and Committees, Town Departments, Merrimack Valley 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 **37** responses.

The Hazard Mitigation Committee itself was comprised of Town Department staff and volunteers, including Town Police and Fire Departments, Town Administration, Highway Department, Public Library, Merrimack Valley School District, and Conservation Commission 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.loudonnh.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. 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 November 15, 2022 at a Board of Selectmen's meeting to review the draft Hazard Mitigation Plan. This meeting was publicly noticed on the Town website and calendar, and on the Board of Selectmen's Agenda. The draft meeting minutes are included in **APPENDIX C**. All documents were available for review on the Town's website in advance of the meeting. The attendees and publicity of the public planning process are noted in the **Acknowledgements**.

OPPORTUNITY FOR PUBLIC PARTICIPATION

Public Input from the Hazard Mitigation Committee Meetings

The public notification is described in the Public Outreach Strategy sidebar. Several 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.loudonnh.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 Parks and Recreation Planning Board	Appointed by Board of Selectmen	None
Town Boards (volunteer) Conservation Commission	Appointed by Board of Selectmen	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
Town Staff Fire Dept – Chief, EMD, Deputy EMD Police Department- Chief Planning & Zoning --Building Insp Town Administrator Library- Director Highway Dept – Road Agent	Appointed by Board of Selectmen	Hazard Mitigation Committee Attended HMC Meetings (see Attendance Sheets)
Town Staff Transfer Station- Supv	Appointed by Board of Selectmen	None
Non-Municipal Local Stakeholders	**How Invited**	**Participation (None or How)**
Merrimack Valley School District	Appointed by Board of Selectmen, Personal email from Town staff, Emailed Stakeholder invitations by CNHRPC	None
NH Motor Speedway	Personal email from Town staff, Emailed Stakeholder invitations by CNHRPC	Attended HMC Meetings (see Attendance Sheets)
Pleasant View Gardens	Personal email from Town staff Emailed Stakeholder invitations by CNHRPC	None
Canterbury Shaker Village	Emailed Stakeholder invitations by CNHRPC	None
Abutting Community EMDs:	**How Invited**	**Participation (None or How)**
Canterbury EMD Concord EMD Chichester EMD Pittsfield EMD Pembroke EMD	Emailed Stakeholder invitations by CNHRPC	None of the others attended. Gilmanton requested to be removed from email lists.

MUNICIPAL INVITEES	How Invited	Participation (see Attendance Sheets)
Gilmanton EMD Barnstead EMD		
Capital Area Public Health Network	Emailed Stakeholder invitations by CNHRPC	None
Merrimack Valley Voice (media)	Emailed Stakeholder invitations by CNHRPC	None
Concord Monitor Town Crier (media)	Announcement emailed by Town	None
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 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 November 15, 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.

Loudon Community Survey for Hazard Mitigation and Severe Weather Events

To obtain broad public input on hazard mitigation and severe weather events, an online community survey posted on Survey Monkey was developed in **April 2022** and remained open through the November 15, 2022 Public Information Meeting. 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 **37** 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. Following the HIRA hazard list, the survey asked respondents the following questions:

- **Q1** Which road(s) or areas are you most concerned about in Loudon when severe weather or other hazard events occur?

  Respondents were concerned about many roads and areas in town. Most frequently respondents noted NH 106 followed by NH 129, Village Road, and School Street. Multiple residents also noted Oak Hill Road, Chichester Road, Old Shaker Road, Currier Road, Clough Hill Road, Lovejoy Road and Lower Ridge Road. Additionally, Loudon Ridge Road, Staniels Road, Pleasant Street, Iris Lane, Morning Glory Road, Lesmersis Road, and Lovering Avenue were all roads noted by one respondent each.

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

  Respondents were most Extremely Concerned to Concerned (over 50% of responses) about Drought, Public Health, Aging Infrastructure, and High Wind Events, and Long Term Utility Outage. Winter Weather and Extreme Temperatures were the next highest priorities.

- **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 Loudon: (on a 1-5 Importance scale).

  Mitigation planning priorities were to protect public facilities and operations (such as schools) and reducing damage to utilities. Respondents also heavily prioritized protecting emergency and Town services and improving the transportation network.

- **Q4 & Q6** Can you describe any hazard events or severe weather events you experienced in Loudon? 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 windstorms, snowstorms, and floods resulting in power/utility outages during these times, focusing on transportation and electricity.
  For Event 2, respondents discussed winter storms and power outages, ice and wind events.

- **Q5 & Q7** How bad would you rate Event 1 & 2 (from 1-100)?

  The average respondent impact was about 40% on the Impact scale for Event 1 and about 28% 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 removal of hazardous trees at their home, talked about what to do in case of severe weather emergency or natural disaster, and researched disaster information online or obtained brochures on disaster public education as the mitigation and preparedness activities they have done.

- **Q9** What are the best ways for you to receive information about disasters and severe weather events in Loudon? Please pick your top 4:

  Respondents preferred Town E-Alerts, Local Television, Town Website, and the Electronic Newsletter, 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 improved cellular and broadband service as well as improving culvert condition especially along driveways.

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 Loudon to retain volunteers for their regular municipal committees. Department staff and Board members participating in the Plan update process are often Loudon 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

On November 15, 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 21, 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.

On April 17, 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, Loudon received a **Notification of Formal Approval** from NHHSEM, with the Plan approval granted effective that day. A **Letter of Formal Approval** from FEMA confirming the notification will be forthcoming. The next Hazard Mitigation Plan update is due five (5) years from this date of approval, on **April 18, 2028**.

Final Plan Dates

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

Table 2

Loudon's Hazard Mitigation Plan Adoption History

Year of FEMA-Approved Hazard Mitigation Plan	Adoption by Loudon Board of Selectmen	NHHSEM/ FEMA's Formal Approval	Plan Lapse
Original 2005	10/18/05	12/05	12/10
Update 2010	08/09/11	08/19/11	08/19/16
Update 2017	03/07/17	03/17/17	03/17/22
Update 2023	**04/17/23**	**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 Loudon. 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 Loudon is located in Central New Hampshire within Merrimack County. It is bordered by the City of Concord and the Town of Pembroke to the south, the Towns of Chichester and Pittsfield to the east, the Town of Barnstead to the northeast, the Town of Gilmanton to the north and the Town of Canterbury to the west. Within Merrimack County, Loudon is located on the northeastern border on the other side of Belknap County.

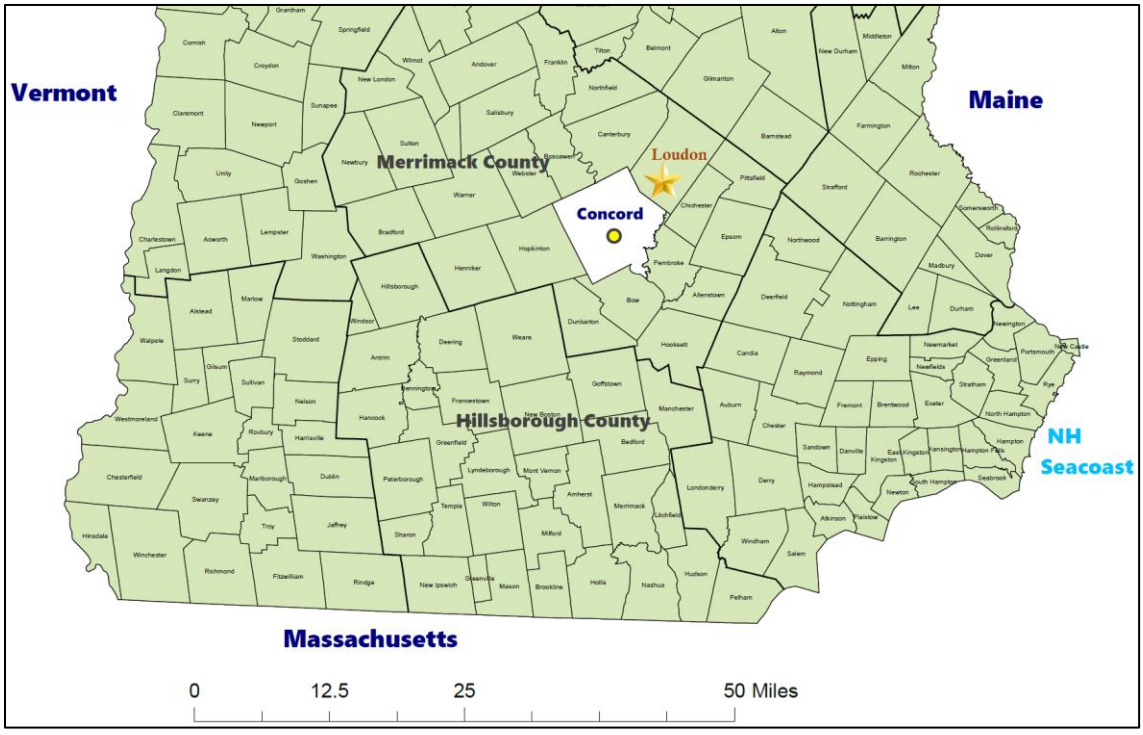
New Hampshire Route 106 is the primary roadway in the community, bisecting the Town in a south-north direction. Route 106 begins in Pembroke at the US Route 3 intersection, traveling north through Concord, Loudon, a small section of Canterbury, and into Gilmanton. The Soucook River roughly flows parallel to Route 106. Route 129 begins at South Village Road and continues through the Route 106 intersection in Loudon Village, the heart of the community, before traveling northeast into Gilmanton. Many large brooks and wetland areas are found in Loudon. Other local Town roads are important commuter travel routes, such as Chichester Road and School Street. Much of the Town, considered a growing bedroom community to Concord, is forested beyond the main roadways.

LOUDON'S LOCATION IN NH

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

Concord is 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, Loudon borders northeastern Concord, about **9** miles to downtown Concord from the Town Hall and about **55** miles east of the Vermont state border, the mid-way point between Concord and Keene on NH 9/US 202. The Town of Loudon's context within Merrimack County and the State of New Hampshire is shown in **Figure 1**.

Figure 1
Loudon in the State



Source: Central NH Regional Planning Commission

LOUDON'S LOCATION IN CENTRAL NH

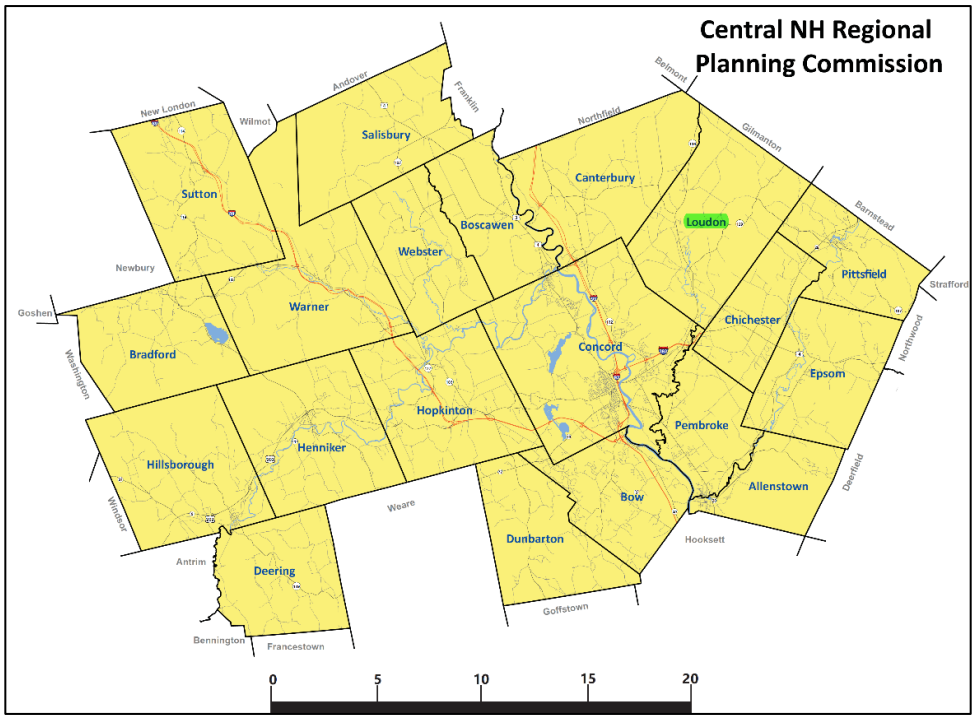
The Town is a voluntary member of the Central New Hampshire Regional Planning Commission. The **19** Towns and **1** City comprising the Central NH Region contain several major rivers and New Hampshire and Interstate highways. Loudon's historically rural identity, commuting access, available services, and the Soucook River could ensure regular future development within this 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 Loudon along the Concord/Pembroke border and enters the **Merrimack River**. The **Suncook River** originates in Belknap County, flowing south through Pittsfield, Chichester, Epsom, Pembroke, and Allenstown until it 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. Loudon is located on NH Route 106, also an important regional transportation corridor. Dozens of state highways crisscross the region. In Loudon, NH Route 106 and NH Route 129 travel through Town. A map of the Central NH Region in which Loudon is situated, with the region's major routes, is displayed in **Figure 2**.

Figure 2
Loudon in the Central NH Region

Source: Central NH Regional Planning Commission



Population and Housing Growth

The *2018 Loudon Master Plan* was adopted by the Planning Board in **November 2018**. The goal for future updates is annual review and revision of one or two Chapters. Chapters from the *2018 Master Plan* to update include Vision, Implementation, Housing, Economic Development, Community Facilities, Land Use, Transportation and Natural Resources. The **Hazard Mitigation Plan 2023** could be adopted as an Appendix or a Chapter to the *2018 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 Loudon.

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**, Loudon's population and housing boomed during the **1980-1990** decade (**+68%** people, **+68%** homes). Beginning with the **1990-2000** decade (**+9%** people and **+19%** homes), population and housing trends slowed dramatically. The **2000-2010** decade which despite including a series of significant natural disasters and an economic recession did not experience slowed growth (**+19%** people and **+18%** homes). The new **2020** Census population and ACS 2015-2019 housing unit figures calculated **+5%** people and **+7%** housing units in indicating the slowest growth period in **50** years.

Table 3

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

Growth	Population	Net Change #	Net Change %	Housing Units	Net Change #	Net Change %
1970 Census	1,707	N/A	0	568	N/A	0
1980 Census	2,454	747	43.8%	880	312	54.9%
1990 Census	4,114	1,660	67.6%	1,476	596	67.7%
2000 Census	4,481	367	8.9%	1,762	286	19.4%
2010 Census	5,317	836	18.7%	2,081	319	18.1%
2020 Census	5,576	259	4.9%	2,234	153	7.4%
Total Change from 1970 – 2020 Census	---	**3,869**	**226.7%**	---	**1,666**	**293.3%**

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 **+3,869** people and **+1,666** housing units by confirmed Census counts and estimates from **1970-2020**. In **Table 3**, Loudon's confirmed **2020** Census population of **5,576** shows an overall increase of about **+226.7%** in population over the previous five decades, up from **1,707** people in **1970**. The **2020** Census housing units (**+153**) displays an overall increase of about **+293.3%** (**1,666** units) since **1970** to total **2,234** units by **2020**. The Town began with a population of **1,707** 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 **+1,095** people while during the same time housing units increased by **+472** units.

Overall growth trends slowed over the **2010-2020** decade, with a population growth of **+4.9%** (**+259** people) and **+7.4%** housing units growth (**+153** units) to date. Over the nearly five-decade timeframe of **1970-2020**, this is the smallest amount of growth seen in Loudon. The overall growth rate by percentage in Loudon since **1970** is smaller 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 **3.0** people per housing unit in **1970** to its steady low of **2.5** people per housing unit between **2000-2020**. Overall, these numbers are similar in comparison to other small-sized population Central NH Region towns and likely indicate an aging population living together or Group Quarters cohabitation.

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 Loudon encompasses a total land area of **46** square miles (**29,452** acres), an additional **0.56** square miles (**358.4** acres) is water area (**46.7** 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 Loudon, 1970-2020

Municipality Size		Persons per Square Mile					
Land Acreage	Land Area in Square Miles	1970	1980	1990	2000	2010	2020
29,452	**46**	37	53	89	97	116	121

*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 **+227%,** from **37** people per square mile in **1970** to an estimated high of **121** people per square mile in **2020**. Loudon is a geographically medium-sized community in the Central NH Region at **46** square miles. Loudon has a comparatively low number of people per square mile as compared to both other medium-sized Central NH Region communities and communities statewide.

NEW CONSTRUCTION

Table 5 displays Loudon'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 **108** new construction permits for homes and housing units have been issued, but not necessarily built.

Table 5

New Construction Permits Issued by Building Type, 2017-2022

Building Type	2017	2018	2019	2020	2021	2022*	6-Year Totals
Single Family Homes	30	17	16	24	7	4	**98**
Accessory Dwelling Units			1	1	2	1	**5**
Multi-family Homes							**0**
Manufactured Homes		2	1		1	1	**5**
Non-Residential Buildings**	36	49	49	22	30	18	**204**
Totals	**66**	**68**	**67**	**47**	**40**	**24**	**312**

Source: Loudon Assessing Database, 10-22

** to date 10-22 **NRB includes porches, sheds, barns, garages*

From Table 5, **98** permits were issued for new single family homes, with **5** permits for new accessory dwelling units (ADUs) within or alongside single family homes over the last **6** years. Five **5** new construction permit for manufactured homes were issued during the period. This period was also active for the construction of new non-residential buildings, totaling **204** new commercial/ industrial/ exempt permits, although this figure is inflated with the inclusion of sheds, barns, garages, porches, etc. The most active year was **2017** when a total of **30** 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, Loudon had more construction between **2017-2022** than other towns.

Land Use and Zoning

According to NH Office of Planning and Development's **2013** geographic information system (GIS) calculations, Loudon has a total land area of **29,452** acres, or **46** square land miles. An additional **444** acres (about **0.17** square miles) is water area, to total **29,896** Town acreage within its political boundaries. The GIS land acreage figure is larger than the most recent **MS-1 2022** assessing reporting calculation of **28,957** total Land Use acres for the Town, a **938.5** 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, Loudon is considered a geographically medium-sized community in terms of land area and contains larger than typical population and housing figures. Loudon'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 Loudon 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. Forested land use with and without stewardship are the most extensive land use types, comprising **51%** of the Town's land area. Residential land use at **25%** is the next highest, followed by farmland (**7%**) and commercial improved (**6%**) acreage. Wet land (**5%**), exempt land use (**4%**), discretionary easement (**2%**) and unproductive land (**<0.5%**) comprise the smallest land uses situated in Loudon.

Table 6
Land Use Acreage, 2022

Land Use Category 2022	Acres	% of Town
Residential	7,278	25.10%
Commercial Improved	1,799	6.20%
Exempt	1,152	4.00%
Farm Land	1,948	6.70%
Forest Land	12,988	44.90%
Forest Land with Stewardship	1,686	5.80%
Discretionary Easement	574	2.00%
Unproductive	121	0.40%
Wet	1,411	4.90%
Total	**28,957**	**100.00%**

Source: Loudon MS-1 2022, Assessing Database

The total number of Loudon parcels is **2,756** in **2022**, up by **34** parcels from **2017 (2,722)**.

LOUDON ZONING

The perspective of the Town's Zoning Districts offers another way to view how the land is utilized within Loudon 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 Loudon, over which floodplain, wetland protection, and steep slope overlay districts apply further regulation.

Table 7

Loudon Zoning Districts, 2022

Zoning District	Abbreviation
Rural Residential	RR
Village	V
Agriculture/Forestry Preservation	AFP
Commercial/Industrial	C/I
Commercial/Recreational	C/R
Zoning Overlay District	
Wetlands Conservation Overlay	
Steep Slope Overlay	
Elderly Housing Overlay	
Cluster Housing (i.e. Villages)	
Floodplain Development	
Other Zoning Ordinances	
Work Force Housing	
Small Wind Energy	
Manufactured Housing Parks & Subdivisions	
Open Space Development	

Source: Town of Loudon Zoning Ordinance, 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.

THIS PAGE INTENTIONALLY LEFT BLANK

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 Loudon **Goals** were initially developed in the previous **Loudon 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.

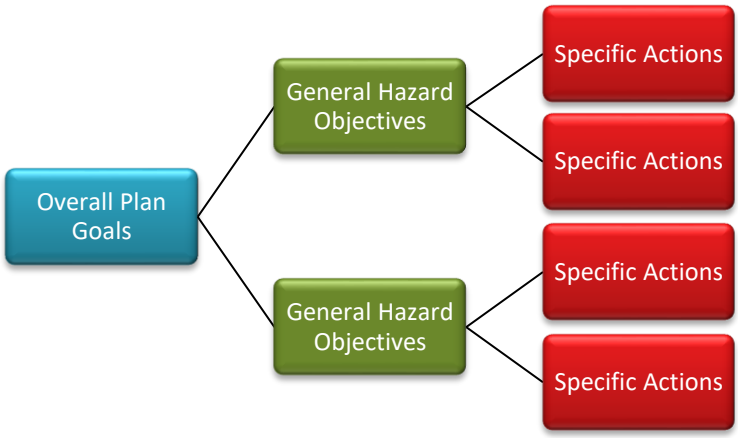
What Are Goals, Objectives and Actions

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 *appears in 2018 State HMP but is not relevant to Loudon's geography and development.*
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: Loudon Hazard Identification and Risk Assessment (HIRA)

Not all of these main natural hazard categories may be important for Loudon 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 the impacts of natural hazards, severe weather, and disasters and technological, and human hazards.**
2. **To reduce the risk of potential damage in Loudon to public and private property, infrastructure critical facilities, historic resources, and the natural environment from the impacts of natural hazard, severe weather, disasters, and from 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 from human and technological hazards.**

Source: Loudon 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 Loudon. 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. Nineteen (**19**) **General Hazard Mitigation Objectives** were crafted for the **Loudon 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 damage from both severe cold events such as winter weather storms, snow, ice, and wind chill events and from heat events such as heat waves, drought, energy consumption, air and water quality, and climate warming to life, property and infrastructure.**

FLOOD HAZARDS

5. **Minimize the damage to life, property, and infrastructure from floodwaters of Soucook River, Academy Brook, Shaker Brook, Gues Meadow Brook, Sanborn Brook, Beehole Brook, Clough Pond, Hoit Pond, Crooked Pond, Sanborn Pond and other ponds, wetlands, or brooks.**
6. **Minimize the damage to life, property, and infrastructure caused by flooded roads, culvert washouts or debris impacted infrastructure.**

FIRE HAZARDS

7. **Minimize the damage to life, property, and infrastructure including the conservation properties, areas of Town Forests, woodlands, and other communication towers from 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 impact from severe wind events, including thunderstorms, downbursts, hail, hurricanes and tropical storms, and tornadoes to life, property and infrastructure.**

WINTER HAZARDS

11. **Minimize the damages to life, property and infrastructure from winter weather events, including storms, snow, ice, and tree debris 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, motorcycles, OHRVs, pedestrians, bicycles, airplanes, helicopters, drones, etc., along flightpaths, State roadways (NH 106, NH 129) and local Loudon roads, especially during severe weather events.**

13. **Minimize the risk of damages 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.**

14. **Minimize the risk and impact of mass casualty and any other hazard events to better protect Loudon's citizens, guests, and businesses.**

TECHNOLOGICAL HAZARDS

15. **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.**

16. **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.**

17. **Minimize the impact to Loudon residents from the risks of various utility outages, such as live wire dangers and long-term outages in electrical power, internet, natural gas, propane, and telecommunications services.**

18. **Minimize the impacts of fire conflagration and explosion, especially near densely populated areas of buildings, from fuel tanks, natural gas transmission lines, high tension power lines, and vehicles.**

19. **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 and aboveground storage tanks, and occupational sites.**

Source: Loudon Hazard Mitigation Committee

4 HAZARD RISK ASSESSMENT

Natural disasters and technological, and human hazards that have occurred in Loudon 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 Loudon 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 Loudon'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**
- **Extreme Temperature Hazards**
- **Fire Hazards**
- **Flood Hazards**
- **Public Health Hazards**
- **Solar Storm Hazards**
- **Wind Hazards**
- **Winter Hazards**
- **Human 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 Loudon 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 in 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 Loudon 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
2	MEDIUM	5 - 7
3	HIGH	8 - 11
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, Loudon's highest ranking hazards scored an **Overall Risk** between **16.0** – **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)
Public Health	16.0	HIGH	Yes	Yes
Lightning	16.0	HIGH	Yes	Yes
High Wind Events	14.7	HIGH	Yes	Yes
River Hazards	13.3	HIGH	Yes	Yes
Severe Winter Weather	13.3	HIGH	Yes	Yes
Drought	12.0	HIGH	Yes	Yes
Wildfire	12.0	HIGH	Yes	Yes
Tropical and Post-Tropical Cyclones	10.7	HIGH	Yes	Yes
Extreme Temperatures	7.0	MEDIUM	Yes	Yes
Inland Flooding	6.7	MEDIUM	Yes	Yes
Solar Storms and Space Weather	6.0	MEDIUM	Yes	Yes
Dam Failure	5.0	MEDIUM	No	Yes
Earthquake	2.0	LOW	No	
Landslide	1.0	LOW	No	

***NO =** No notable impacts since the last Plan. Stated in Table 10 as "NO Event(s) Within Last 5 Years."
YES = Notable impact events added to Table 12. Stated in Table 10 as "Event(s) Within Last 5 Years."
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.

Source: Compilation of Loudon 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 Loudon. 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 Loudon 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 *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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***	✦ **2 High Hazard (H) dam**: 143.010 Sanborn Pond Grist Mill Dam (Sanborn Mills Inc) on Sanborn Brook 143.011 Sanborn Sawmill Dam (Sanborn Mills Inc) **0 Significant Hazard (S) dam**. **3 Low (L) Hazard dam**: 143.018 O'Brien Recreation Dam (O'Brien) on Pine Island Brook 143.022 Hold Meadow Pond Dam (Highview Meadows LLC) on Clark Brook 143.031 Country Club 12th Hole Pond (The Ledges Golf Links Inc). D143.005 Soucook River I Dam, also known as the Village Dam, is owned by the Town of Loudon and is considered **Exempt**, impounding 5 feet deep of **Soucoook River** ponded water. ✦ **Dams** in other Towns could have a serious downstream impact should they fail or release too much water. ✦ Other recreation ponds, **Non-Menace dams** and regular beaver dams could breach and flood roadways. NM dams are found along the Soucook River, Gues Meadow Brook, Giddis Brook, at detention ponds and recreation ponds all of which are unlikely to flood but still have potential. (See **APPENDIX A** for list). ✦ **Beaver dams** carry a high probability of flooding and potential for breakage. Beaver dams are located throughout Loudon, and depending on size and location, could cause significant damage to roads if the natural dams breach.	**3**	1	2	2	**5.0 MEDIUM**
DROUGHT ***Event(s) Within Last 5 Years***	✦ **Entire Town.** Areas susceptible to **drought** and dry conditions include farms and orchards, nurseries, and maple sugar operations: DS Cole Growers, Meadowledge Farm, Miles Smith Farm and Inn, Pleasant View Gardens, Red Manse Farm Organic Produce, Sanborn Mills Farm and others.	**4**	3	3	3	**12.0 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	✦ 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. ✦ Water Supplies: Private water supplies for the Town (wells) 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 ***NO Event(s) Within Last 5 Years***	✦ **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 the NHMS, Loudon Elementary School, American Legion Post 88, Cascade Park, Landry Field, Loudon Village, Maxfield Public Library, Town Beach, and Town offices. ✦ 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 the Beanstalk Convenience and Gas, Big Apple Store Loudon Shell, Eastern Oil and Propane, E-Z Stop Gas Station, Huckleberry Propane and Heating, Z-1 Express Gas Station, 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), Town Hall and Church – National Register, Barlie's Barn / Historical Society / Community Building, Town Pound, William Maxfield Monument, Oak Hill Fire Tower, Sanborn Farm and Mill buildings, and North East Motor Sports Museum at NHMS.	**2**	1	1	1	**2.0 LOW**
EXTREME TEMPERATUR	✦ **Entire Town.** Groups most susceptible to **extreme heat or cold** include those located at:	**3**	2	2	3	**7.0 MEDIUM**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
ES Excessive Heat, Heat Wave, or Cold, Wind Chill *Heat Event(s) Within Last 5 Years* *Cold Event(s) Within Last 5 Years*	Loudon Schools, Town Offices, manufactured housing neighborhoods, Senior Residences, The Villages of Loudon, and NHMS during race events. ✦ 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 could include Community Bridges, Inc. – Home for Disabled [~4 beds], NeuroRestorative – Assisted Home [~3 beds], and Volunteers of America – Independent Living Elderly Apartments [~32 units], and the Villages at Loudon. Residents should be moved to air conditioned (cooling) or warming facilities. ✦ Youth groups and schools such as the Loudon Elementary School need to be protected from **hot and cold temperatures.** ✦ **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*	✦ **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 Telephone Switching stations, Liberty Utilities Facilities, Eversource and Unitil Electrical Lines. ✦ **High density developed areas** can have greater impacts from **high winds**: Loudon Schools, Town Offices, churches in Loudon, manufactured home neighborhoods, apartments and independent living, childcare facilities. ✦ **Construction, manufacturing, or industrial-like areas** like those along NH 106 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 northeast of development on NH 106 is **wooded and forested** and sections would be difficult to access with trees and power	**4**	3	4	4	**14.7 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	lines down on the gravel, hilly residential roads. They are 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 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 require rescue assistance in difficult to access locations. ✦**Agricultural** operations are vulnerable to damage from **High Winds** (see list above in **Drought**) ✦Older, or historical buildings are vulnerable to high wind damage include public and private buildings (historic homes), Town Hall and Church – National Register, Charlie's Barn / Historical Society / Community Building, Town Pound, William Maxfield Monument, Oak Hill Fire Tower, Sanborn Farm and Mill Buildings, North East Motor Sports Museum at NHMS and cemeteries (headstones) throughout Town could be especially vulnerable to high winds. ✦ Floods are also possible with severe windstorm events (see **Inland Flooding**).					
INLAND FLOODING **Rains, Snow Melt or Flash Floods** ***Event(s) Within Last 5 Years***	✦ **Entire Town, Floodplains of the Soucook River.**. Major watercourses include the Soucook River, Academy Brook, Bumfagon Brook, Clarke Brook, Pine Island Brook, Bee Hole Brook. Giddis Brook, Gues Meadow Brook, and Shaker Brook are the most prominent waters flowing in Town. Major waterbodies include wildlife and recreation ponds which are among the main standing bodies of water as well as Rocky Pond, Crooked Pond, Hoit Marsh, Clough Pond, Hothole Pond, and Sanborn Pond. ✦ Flooding could occur from breached **High, Significant, and Low Hazard Dams** within and connected to Canterbury. Other recreation ponds, Non-Menace dams and regular beaver dams can breach and flood roadways. See **Dam Failure** hazard above. ✦ Any of these waters could **flood** **local roads**, homes, buildings and properties along the Soucook river including the Loudon Village Area.	**4**	1	2	2	**6.7 MEDIUM**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	✦ 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**) ✦ 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 for this hazard especially along the larger Soucook river.					
LANDSLIDE **Soil, Rockslide or Excavation Areas** ***NO Event(s) Within Last 5 Years***	✦ **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. ✦ 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, including the active Benevento Aggregates, some of which may have the potential of **landslide/ rockslide**. Many areas are reclaimed and vegetated.	**1**	1	1	1	**1.0 LOW**
LIGHTNING ***Event(s) Within Last 5 Years***	✦ **Entire Town.** Areas of particular concern to **lightning** include critical facilities, high density areas, high elevations. ✦ The **Town & cultural facilities** including Town Offices, Maxfield Public Library, Fire and Police Departments, Churches, and Monuments are structures of concern from lightning. (see also **High Wind**). ✦ Numerous **outdoor recreational and gathering** places such as the Elementary School Fields, Cascade Park, Landry Field, Loudon Village Recreation Fields, Recreational Skate Park, Town Beach, Town Forests, and the various trails on conservation lands could be vulnerable to **lightning**. ✦ Other locations containing **large numbers of people** include NHMS, Loudon Schools, 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), Environmental Soil Management Inc and Huckleberry Propane	**4**	4	4	4	**16.0 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	and Heating could each be vulnerable to **lightning** and **fire**. ✦ Outdoor utilities and antennas would have high impacts should **lightning** strike, such as the telecommunications towers, high transmission lines, Eversource electric lines, AT&T Cell Tower, NHMS Cell Towers, Sprint-Nextel Cell Tower, and telephone switching stations. ✦ 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, points of higher elevation can be dangerous to people and property if struck by **lightning**, including the conservation lands and trail systems.					
PUBLIC HEALTH Infectious Diseases, Air & Water Quality, Biological, Addiction, Arboviral, or Tick-borne *Event(s) Within Last 5 Years*	✦ **Entire Town**. Congregated populations, older and younger residents, medical facilities and social settings can be more vulnerable to **infectious diseases**: ✦ New Hampshire Motor Speedway ✦ Schools and Childcare facilities throughout town including Loudon Elementary School. ✦ Manufactured housing neighborhoods, Freedom Hill Co-op [~148 homes], Presidential Pine Enterprises [~57 homes], Scotch Pines [~57 homes]. ✦ Independent living facilities or apartment buildings: The Villages of Loudon [~100 units], Volunteers of America – Independent Living Elderly Apartments [~32 units]. ✦ Multi-family housing developments throughout Town . ✦ Medical facilities: Health Heart Veterinary Clinic and NHMS Infield Hospital (drivers only, during races). ✦ Local stores and eateries increase the risk of exposure to and transfer of **food-borne illness**, causing potential public health concerns. ✦ The Town's local Point of Dispensing (POD) is located at the NH Technical College in Concord. Canterbury is a member of the Capital Area Public Health Network. ✦ 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	**4**	4	4	4	**16.0 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	(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. ✦ Waters and beaches susceptible to **high bacteria** counts in the summer include banks of the Soucook River and any locations used as public or private beaches including the Town Beach. Ponds especially are prone to high cyanobacteria (blue-green algae) counts 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 106 and 129. 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 the Soucook River**. Major watercourses include the Soucook River, Academy Brook, Bumfagon Brook, Clarke Brook, Pine Island Brook, Bee Hole Brook, Giddis Brook, Gues Meadow Brook, and Shaker Brook are the most prominent waters flowing in Town. Major waterbodies include wildlife and recreation ponds which are among the main standing bodies of water as well as Rocky Pond, Crooked Pond, Hoit Marsh, Clough Pond, Hothole Pond, and Sanborn Pond. ✦ **Erosion** of banks could occur along locations of the Soucook River (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**	2	4	4	**13.3 HIGH**
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 Electric Lines and Stations, Fairpoint Telephone Switching Stations, Liberity Uitilies Natural Gas Stations, TDS Telephone Switching Stations, and various public and private water systems 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.	**4**	3	4	3	**13.3 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	✦ The entire Loudon road network is susceptible to winter conditions, including the state roads (NH 106 and NH 129). Local Town roads are also often difficult to travel. Many accidents occur on town roads and at busy 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. ✦ 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 snowload. ✦ 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 Loudon Town Office, Fire and Police Department buildings, Community Building, and Transfer Station 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****	✦ **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 Loudon Town Office, Fire and Police Department buildings, Community Building, and Transfer Station, 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	**3**	1	3	2	**6.0 MEDIUM**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	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 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 *Event(s) Within Last 5 Years*	✦ **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**). ✦ Much of the Town northeast of development on NH 106 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**). ✦ Agricultural areas are vulnerable to damage from **Tropical Events**: (See listed under **Drought**). ✦ Older, or historical buildings are vulnerable to **Tropical** wind damage.	**4**	2	2	4	**10.7 HIGH**
WILDFIRE Brushfire, Outdoor Fires or Accidental *Event(s) Within Last 5 Years*	✦ **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 Loudon town line is seasonally staffed. ✦ 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**. ✦ 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. ✦ Much of the Town is privately owned wooded and forested lands which could be difficult to	**4**	2	3	4	**12.0 HIGH**

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	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. ✦ Several extremely large, undeveloped parcels are located around town (See **APPENDIX A**) ✦ Slash and brush are found on the ground on throughout Loudon. 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** ***Event(s) Within Last 5 Years***	✦ **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. ✦ Many old or undersized culverts remain vulnerable, although the Highway Department replaces many annually. ✦ The Town's roads are becoming more difficult to maintain and rehabilitate because of lack of funding and over 71 **miles of Town Class V roads and sidewalks**. Town roads with the highest maintenance priority include Village Rd, School Street, and Shaker Rd. 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** or 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** ***Event(s) Within Last 5 Years***	✦**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; or agricultural operations because of fertilizers and pesticides. See **Drought** for an agricultural operation list. ✦ **High Density neighborhoods** such as The Villages of Loudon, Manufactured housing neighborhoods (Freedom Hill Co-op, Presidential Pine Enterprises, and Scotch Pines), Independent living facilities or apartment buildings (Volunteers of America) and other higher density areas could be subject to conflagration (see also **Lightning**).	**not scored**	not scored	not scored	not scored	not scored

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	✦ Loudon is home to several commercial and industrial activities, mills, excavation, auto repair businesses and other flammable activities (Benevento Aggregates, Environmental Soil Management Inc, and Huckleberry Propane and Heating). 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. Businesses on NH 106 possess perhaps the greatest risk for fire, crash, or explosion. See **APPENDIX A** for hazardous materials and business lists. ✦ Vehicle fires could occur anywhere, in parking lots, driveways, or roadways. NH 106 from Concord to Belmont and NH 129 from Concord to Gilmanton are the most highly traveled routes. School Street, Old Shaker Road, and Currier Road are used as a detour by commuters. The Loudon Fire Department and Rescue Ambulance respond to crashes. See also **APPENDIX A**. ✦ 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.					
HAZARDOUS MATERIALS **Haz Mat Spills, Brownfields or Trucking *Event(s) Within Last 5 Years***	✦ **Most likely** routes of vehicular traffic transport of **hazardous materials** include NH 106 from Concord to Belmont and NH 129 from Concord to Gilmanton. Other local roads like Old Shaker Road and School Street could have serious transportation accidents involving hazardous materials. ✦ Vulnerable areas for targeted **mass evacuation/shelter in place** from **hazardous materials spills** include NHMS, residential and business facilities along NH 106, and the Schools. ✦ 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 Beanstalk Convenience and Gas, Big Apple Store Loudon Shell, Eastern Oil and Propane, Environmental Soil Management Inc, E-Z Stop Gas Station, Huckleberry Propane and Heating, Z-1 Express Gas Station, and many Auto Repair Shops. 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,	**not scored**	not scored	not scored	not scored	not scored

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
	construction businesses, and the Highway Department and Transfer Station. ✦ Possible **brownfields** sites to be aware of include any old mill sites along the Soucook River, 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.					
LONG TERM UTILITY OUTAGE Power, Water, Sewer, Gas, Internet, Communications or Live Wire Danger *Event(s) Within Last 5 Years*	✦ **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). ✦ Power outages (Eversource) 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 TDS enables alternative communication options, and many rely on VOIP for telephones instead of landlines. ✦ 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 Pleasant St and NH 106 provide cellular services. ✦ 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. ✦ Many businesses in town provide propane, natural gas, and oil services locally and statewide. ✦ Other utility systems, such as LP gas, natural gas, generators, oil tanks, wood fuel and more, are used by residents as both back up and primary heating. See also **Aging Infrastructure** and **APPENDIX A**. ✦ 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.	**not scored**	not scored	not scored	not scored	not scored

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
TRANSPORTATION CRASH **Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle** ***ANNUAL Occurrences Within Last 5 Years***	✦ **NH 106 From Concord to Belmont and NH 129 from Concord to Gilmanton** 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. Loudon could 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***	✦ **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 New Hampshire Motor Speedway during race events, Town Hall, Academy, Town & School Meetings, voting day, local board meetings, visits from political candidates, School sports events, political rallies. ✦ Loudon is a member of the Capital Area Public Health Network (CAPHN) and other regional emergency groups. The Town's local primary shelter with CAPHN is located at the Loudon Elementary School. Loudon Rescue Ambulance could provide EMS and transport to Concord Hospital in 15 minutes.	**not scored**	not scored	not scored	not scored	not scored

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
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 New Hampshire Motor Speedway, Town & School Meetings, or the Churches: Faith Community Bible Church, Loudon Congregational Church, Loudon Free Will Baptist Church, Advent Christian Family Bible Church, Church of the Nazarene, Landmark Baptist Church. ✦ All municipal facilities in Loudon, Town Hall and Offices, Library, Police and Fire Department Buildings, Highway Department, Transfer Station, and Loudon Community Building 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 or pumping stations. ✦ **Vandalism** could occur at dams, under bridges, wooden covered bridges, telecommunications or tower, cemeteries, vacant buildings, beaver dams, recreation areas, the Town 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, Village area) 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 Breach, Telephone Rerouting, Identity Theft, Phishing, Ransomware, Virus or Phone Scams**	✦ **Entire Town**. Cyberattack could target Town or School websites, computer systems, cloud data systems, archival records, email phishing, etc. Town Hall, Police Department, Fire Department, Transfer Station, Public Works Department, Library and Historical Society records would be high-value targets. ✦ 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 Loudon (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.	**not scored**	not scored	not scored	not scored	not scored

Natural, Technological, Human Hazard Categories	Potential/Susceptible (Existing) Hazard Locations in the Town *See also Appendix A. Critical Community and Facility Vulnerability Assessment (CCFVA)*	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	
ANNUAL Occurrences Within Last 5 Years						

Source: Loudon 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 **$355,076** in CARES and GOFERR funding programs, much of it reimbursement for Town costs. The last weather disaster declared in Merrimack County in which Loudon is located was the snowstorm event in **February 2013** for which Loudon applied for and received **$14,160** in federal Public Assistance funding. Details of Central NH region declared disasters and emergency declarations since **1973** and federal funding provided to the Town of Loudon 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 GOEFRR.

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 Loudon**
				Merr	Hill	
	TOWN ADD NEW DISASTER ROWS HERE-					
4516	**2020-2022** COVID-19 Pandemic	Apr 3, 2020 – TBD	COVID-19 Novel Coronavirus Pandemic (national, global). Multiple funding programs, but not PA. --> **$133,732 GOFERR** **$53,443 First Responder Stipend** **$8,910 Elections** **$43,858 DOJ COVID Emergency Grant** **$115,133 Vaccination Aid**	M	H	N/A PA **Total $355,076**
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	**$14,160**
4095 EM-3360	**2012** Hurricane Sandy Emergency	Oct 26-Nov 8, **2012**	Hurricane Sandy	EM-M	EM-H	**$2,581**
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	**$3,439**
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	**$7,854**
1812	**2008** December Ice Storm	Dec 11-23, **2008**	Severe Winter Storm	M	H	$0
1799	**2008** September Flood	Sep 6-7, **2008**	Heavy Rains and Floods	M	H	$0

FEMA DR-	Local Disaster Name	Incident Period	FEMA Disaster Name	Includes County*		FEMA Public Assistance (PA) Funding to Loudon**
				Merr	Hill	
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	**$20,031**
1643	**2006** Mother's Day Flood	May 12-23, **2006**	Severe Storms and Flooding	M	H	**$693,422**
1610	**2005** Columbus Day Flood	Oct 7-18, **2005**	Severe Storms and Flooding	M	H	**$26,128**
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	**$10,508**
EM-3193	**2003** Snow Emergency	Dec 6-7, **2003**	Snowstorm	EM-M	EM-H	**$11,931**
EM-3177	**2003** Snow Emergency	Feb 17-18, **2003**	Snowstorm	EM-M	EM-H	**$8,814**
EM-3166	**2001** Snow Emergency	Mar 5-7, **2001**	Snowstorm	EM-M	EM-H	$0
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
Total Public Assistance to Loudon 1993-2022**			Weather Disasters DR- & EM-			**$798,868**
Total GOFERR Assistance to Loudon 2020-2022**			Pandemic Funds DR-4516			**$335,076**
Total Federal Disaster Funding to Loudon 1993-2022**			**CARES Act/NH Governor's Office for Emergency Relief and Recovery (GOFERR) 2020-2022 https://www.goferr.nh.gov/welcome**			**$1,153,944**

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, Loudon 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**). Loudon in Merrimack County was eligible for reimbursement for up to a total of **24** disasters and emergency declarations. Disaster funding was sought for and received by Loudon for **5** of the **15** [DR-] and for **6** of the **8** [EM-] during this period. All funding awarded to Loudon appearing in the Public Assistance database between **1993-2017** totals nearly **$799,000**. 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 Loudon in terms of FEMA Public Assistance (PA) funds received for recovery was the **Mother's Day Flood in April 2006** for which Loudon received **$693,422** for **10** 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 **$335,076** to date.

Past Disasters and Severe Weather Events

The Town of Loudon 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 Loudon and its residents. Public Assistance disaster funding opportunities open to communities when a disaster is declared within a county. The Town of Loudon 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 Loudon, 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 Loudon 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 Loudon	Other Loudon Local Hazard Event	Regional Hazard Event with Loudon Impacts

Table 12

Local and Area Hazard Event and Disaster History (Sequential)

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Hazard Events 2017-2022 (Since Last Plan)								
TOWN TO ADD NEW EVENT ROWS HERE								Loudon Hazard Mitigation Committee
TOWN TO ADD NEW EVENT ROWS HERE								Loudon Hazard Mitigation Committee
Loudon Currier Road Culvert Collapse Sep 2022	No	2022	25-Sep	N/A	N/A, but regional traffic impacts have occurred on NH 106.	On Currier Road a large culvert collapsed. The road was closed for four days. This aging culvert allows a small steam to flow under the road.	Aging Infrastructure	CNHRPC, Loudon Hazard Mitigation Committee
Loudon Cyanobacteria at Clough Pond Aug 2022	No	2022	Aug 9	N/A	N/A. Few non-residents use the Town beach at Clough Pond. Advisories are issued when cyanobacteria cell concentrations exceed 70,000 cells/mL.	The bloom was first observed 8/9/22, appearing as green clouds in the water, and green surface streaks along shorelines. Samples collected and reviewed on 8/9/22 revealed cyanobacteria (Dolichospermum) in concentrations up to 673,600 cells/mL in areas of highest observed accumulations. Town website was posted with this information and signage was posted at Clough Pond. 2022 advisories were also issued in June.	Public Health	CNHRPC, WebEOC, NHDES, Clough Pond Association http://www.cloughpondnh.org/vlap/cyanobacteria
Loudon NHMS NASCAR Race Jul 2022	No	2022	17 Jul	N/A	This event has regional impacts felt in Concord, Canterbury, Gilmanton, Pembroke and beyond. NH 106 lanes are closed off to direct traffic in one direction.	NHMS hosted a race during rain shower conditions. Low lightning risk reported. WebEOC maintained situational awareness with periodic check-ins.	Human (Civil Disturbance), Health& Safety, Crash, Rain	CNHRPC, WebEOC, Town of Loudon, NHMS
Loudon Hazardous Material Spill June 2022	No	2022	15-June	N/A	Regional response teams including New Hampshire Department of Environmental Services and Central New Hampshire Hazmat	Two 275 gallon kerosene tanks filled but one ruptured. 150-250 gallons spilled into the ground, around 300 gallons was captured.	Public Health, Hazardous Materials	CNHRPC, Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					Team responded to the kerosene spill.	Loudon Fire and Police Department, NHDES, and Central NH Hazmat Team all provided response.		
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.	Not specific to Loudon, but emergency responders may have been on hand.	Human (Civil Disturbance)	CNHRPC, WebEOC, Concord Monitor
Loudon Fire and Police Antenna Damage **Sep 2021**	No	2021	Sep	N/A	N/A.	Rodents chewed through the Fire and Police Department Antenna Wire. This damage to communication systems could be dangerous, but a backup antenna was used until the damage was fixed.	Aging Infrastructure	CNHRPC, Loudon Hazard Mitigation Committee
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	Site Area Emergency	2021	22-23-Oct	N/A	N/A. Although most Central NH towns are just outside the 50-mile	Loudon is outside the 50-mile EPZ, although	Nuclear, Technologi	CNHRPC, WebEOC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Unusual Events Alerts Oct 2021					EPZ, situational awareness is preferred.	situational awareness is preferred.	cal, Public Health	
Regional Arboviral Risk Oct 2021	No	2021	6-Oct	N/A	Towns in Merrimack County experienced higher arboviral risk levels	Loudon experienced moderate arboviral risk and a positive case of Jamestown Canyon Virus in a human.	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 30-40mph, power outages, tree damage, heavy rain between 2 and 4 inches.	Loudon 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
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.	Loudon potentially had the same increased concentrations of fine particle air pollution that could be harmful.	Public Health	CNHRPC, WebEOC, NHDES
Loudon Arboviral Case JCV Summer 2021	No	2021	Summer	N/A	Regionally and statewide, arboviral (mosquito-borne) diseases like Jamestown Canyon Virus (JCV) are identified in humans. Some of these diseases are crossovers from animals.	One human case of Jamestown Canyon Virus (JCV) was reported in Loudon in 2021.	Public Health	CNHRPC, Loudon HMC
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.	Loudon likely experienced heavy rainfall and flooding	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM
Regional Heavy Rain and windstorm Jul 2021	4624	2021	30-Jul	N/A for Loudon	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.	Loudon experienced torrential rain and 4 road closures; Gilmanton Road had the most damage. Many driveways and private roads experienced washouts. Erosion occurred on Gilmanton Road, Old Shaker Road, Currier Road. Tree debris was found throughout Loudon. Eversource and Unitil provided assistance in response to the damage.	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM, Town of Loudon

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
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.	Loudon 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.	Loudon 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 Loudon	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.	Loudon experienced heavy rainfall and likely flooding.	Heavy Rain, Flooding	CNHRPC, WebEOC, NH HSEM
Loudon NHMS NASCAR Race Jul 2021	No	2021	17-18 Jul	N/A	This event has regional impacts felt in Concord, Canterbury, Gilmanton, Pembroke and beyond. NH 106 lanes are closed off to direct traffic in one direction.	NHMS hosted a double header event. Facilities host over 50,000 people which required many resources for logistics, health, and safety	Human (civil disturbance), Public Health	CNHRPC, WebEOC, Town of Loudon, NHMS
Regional Extreme Temperatures Jun 2021	No	2021	29-Jun	N/A	Heatwave experienced throughout the state. Extreme temperatures from 90-100 degrees recorded at various times throughout the summer.	Loudon experienced extreme temperatures with high heat and humidity. Temperatures hit 90-100 degrees Fahrenheit. Loudon Fire Department assisted twelve senior residents with air conditioning placement.	Extreme Temp	CNHRPC, WebEOC, NH WMUR
Loudon Cyanobacteria at Clough Pond Jun 2021	No	2021	4-Jun	N/A	N/A. Few non-residents use the Town beach at Clough Pond.	Cyanobacteria bloom occurred at Clough Pond. Cyanobacteria exceeded safe threshold, NHDES issued advisory. The Town website was posted with this information and signage was posted at Clough Pond.	Public Health	CNHRPC, WebEOC, NHDES

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Regional Drought May 2021	No	2021	4-May	N/A	Much of Merrimack and Hillsborough counties experienced moderate levels of drought.	Loudon experienced drought conditions. In 2021 the lasting drought effects resulted in many wells drying up. In Loudon public water systems at manufactured housing park Freedom Hill had to have thousands of dollars' worth of water transported from Manchester. Additionally, all 18 fire ponds and hydrants were dried up. There was impact on agricultural operations (produce and maple syrup).	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.	Loudon likely experienced heavy snow and potential tree damage, and power outages. (concord 7 inches of snow)	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 45-55mph. Combined with snowmelt the storm caused flooding.	Loudon 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.	Loudon experienced heavy snow likely causing tree damage, and power outages.	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 Moderate Drought to, D2 Severe Drought, and further east D3 Extreme Drought.	Loudon likely experienced moderate or severe drought conditions.	Drought	CNHRPC, WebEOC, NCEI/NOAA
State General Election Nov 2020	No	2020	3-Nov	N/A	The NH general election occurred hosted at 307 polling locations across the state, involving 185 town police	Loudon hosted election sites and town authorities were required for logistics and safety	Human (Civil Disturbance)	CNHRPC, WebEOC, NH State Police

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					departments and state police.			
Regional Drought Oct 2020	No	2020	27-Oct	N/A	Moderate, severe, and extreme drought conditions affecting the state, very high fire danger declared.	Loudon 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.	Loudon 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.	Loudon experienced the same storm effects including high wind, flooding, rainfall, tree damage, and power outages. Road closure occurred on Asby Road	Tropical storm, High wind, power failure, flooding	CNHRPC, WebEOC, NH SEOC, NHPR.org
Loudon NHMS NASCAR event Aug 2020	No	2020	2 Aug	N/A	This event has regional impacts felt in Concord, Canterbury, Gilmanton, Pembroke and beyond. NH 106 lanes are closed off to direct traffic in one direction.	NHMS hosted a double header event. The event attendance was limited to 18,00 people which required many resources for logistics, health, and safety. Potentially dangerous situations arise but intense scenario planning occurs. NIAC, BFBI, SP State Intelligence, and other State and federal resources are onsite and help mitigate any danger as it arises.	Human (civil disturbance), Public Health	CNHRPC, WebEOC, Town of Loudon, NHMS
Regional Drought Jul 2020	No	2020	10-Jul	N/A	Much of the state including the Concord area experienced moderate levels of drought.	Loudon likely experienced moderate drought conditions.	Drought	CNHRPC, WebEOC, NHDES
Loudon Lovejoy Road Brush Fire Apr 2020	No	2020	Apr	N/A	Surrounding town's fire departments likely provided mutual aid in response to the fire.	A brush fire on Lovejoy Road burned four acres of road. Requiring response by Fire department.	Wildfire	CNHRPC, Loudon Hazard Mitigation Committee
COVID-19 Pandemic Apr 2020 - TBD	**4516**	**2020**	**3-Apr – TBD**	**$335,076**	The NH Governor issued social activities restrictions, minimal public meetings, remote meetings held, social distance practices	The Town follows the Governor's order on meetings, masks, social distancing. Hand sanitizing/masking station is available, signs	Public Health, Pandemic infectious	CNHRPC, NH HSEM, NH DHHS, WMUR, Town of Loudon

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					in April 2020 for all counties. Cases closely tracked by NH Division of Health and Human Services and NH HSEM. The State EOC was activated.	are posted, front door is often locked. Multiple funding programs were applied for and **Loudon received $355,076** 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.	Loudon 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.	Loudon likely experienced the winter storm precipitation, ice accumulation, and many power outages.	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.	Loudon 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.	Loudon experienced heavy snow, ice, tree damage, and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, NH SEOC
Regional Merrimack Station Protest Dec 2019	No	2018	2-Dec	N/A	Protest at Merrimack Station in Bow. Rally against the functions of the station for environmental reasons.	No impact on Loudon, although emergency responders may have been called in.	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.	Loudon experienced heavy snow likely causing tree damage and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, WMUR
Regional Snowstorm Oct 2019	No	2019	16-17	N/A	Regional Noreaster with snow, freezing rain, and high winds caused tree damage and power outages.	Loudon experienced snow, freezing rain, and heavy winds resulting in multiple road closures due to tree and utility pole damage, power outages occurred.	Extreme Temp, Snow, Freezing Rain, Power Failure	CNHRPC, WebEOC, Town of Loudon

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
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.	No impact on Loudon, although emergency responders may have been called in.	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	Loudon experienced high heat and humidity. Temperatures reached 90-100 degrees Fahrenheit. The heatwave occurred during NASCAR Race weekend. More than fifty heat exhaustion or heat stroke calls were made to Mutual Aid. A cooling tent is used on site at the NHMS but many cases were too severe requiring medical transport. There were not enough ambulances to respond to the demand.	Extreme Temp	CNHRPC, WebEOC
Regional Severe storm and Flooding Jul 2019	4457	2019	11-12-Jul	N/A for Loudon	Repeated severe thunderstorms resulted in flash flooding throughout regions of New Hampshire. This was not a declared disaster in Merrimack or Hillsborough Counties.	Loudon likely experienced storms producing heavy rain causing the potential of flooding.	Heavy Rain, Flooding	CNHRPC, WebEOC, FEMA, Boston Globe
Loudon Windstorm and Hail Jul 2019	No	2019	Jul	N/A	Surrounding towns likely experienced similar high winds and damage.	High wind, potential microburst, and hail impacted Loudon. Significant damage to trees and property occurred near Loudon Country Club. Central NH Trailers on NH 106 North (near International Drive) also experienced significant damage from the storm. The storm caused so much debris NHDOT had to plow NH 106 so that it was safe to drive.	High Wind Event, Hail, Power Outages	CNHRPC, Loudon Hazard Mitigation Committee
Loudon Potential Active	No	2019	Summer	N/A	N/A, although responders from the Central NH Special Operations Unit, NH	Potential active shooter situation had to be deescalated at the public library. Incident	Active Shooter	CNHRPC, Loudon Hazard

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Shooter Situation 2019					State Police or mutual aid responders may have participated.	was a one-off caused by a miscommunication with a patron with known mental health challenges.		Mitigation Committee
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 impact on Loudon, although some residents may have been impacted.	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.	Loudon likely experienced flood conditions from the rain and its rivers.	Heavy Rain, Flooding	CNHRPC, WebEOC, NBC Boston, NHDOT Twitter
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.	Loudon 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	Loudon 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.	Loudon 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
Regional Snowstorm Mar 2018	4371	2018	13-Mar	N/A for Loudon	Severe snowstorm impacting the state resulting in 8-25 inches of snow. This was not a declared disaster in Merrimack or Hillsborough Counties.	Loudon experienced heavy snow likely resulting in tree damage and power outages.	Extreme Temp, Snow, Power Failure	CNHRPC, WebEOC, NH HSEM, WMUR
Regional Storm and flooding Mar 2018	4370	2018	2-8 Mar	N/A for Loudon	Severe storm, rain, and wind causes flooding and near 60,000 state residents experiencing electrical outages. This was not a declared disaster in Merrimack or Hillsborough Counties.	Loudon likely experienced the heavy rain and wind causing electrical outages.	Wind, Rain, Flooding, Power Failure	CNHRPC, WebEOC, FEMA

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Hazard Events 2005-2016								
Merrimack County Drought Severe Emergency **Sep 2016**	No	2016	15-Sep	N/A	Extreme Drought (D3) intensities are found in northern Hillsborough and southern Merrimack Counties. Some of the communities in the Central NH Region are experiencing Severe Drought (D2) or Moderate Drought (D1) conditions. 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 (D3) conditions as of 12/13/16 cover the entire community of Loudon. The Fire Department reports all of the water holes and ponds the Fire Department uses for water supply and suppression are very low. Gues Meadow Brook completely dried up, water table 3" below normal according to Concord Monitor. Water Precinct fees in the area have increased. Wells in Town have not yet run dry, but it is almost expected to occur in the future. Lots of fuel and undergrowth on the ground, fire conditions.	Earth, Drought	US Drought Monitor NH, NH DES, Loudon Hazard Mitigation Committee
Merrimack County Emerald Ash Borer **Apr 2016**	No	2016	April	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 all ash nursery stock is in effect for the above 4 counties.	UNH Extension Service for Merrimack County reports the EAB has been found in Concord, Bow, **Loudon** and Canterbury. Firewood needs to be bought and burned locally and not transferred outside the county. Biological controls are being tried in nearby Canterbury in 2016.	Biological, Invasive Species Infestation	NH Department of Agriculture, UNH Cooperative Extension Merrimack County website, CNHRPC, report sightings to nhbugs.org

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Earthquake 2.9M 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, Loudon, Concord, and Hillsborough	Reports were made to the USGS from Loudon residents feeling the earthquake as a rumble or loud noise.	Earth, Earthquake	Loudon Hazard Mitigation Committee, USGS
Earthquake 2.2M 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 Loudon residents feeling the earthquake.	Earth, Earthquake	Earthquake-track.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 4 communities to the west of Loudon	Wind, Tornado	WMUR
Loudon Thunderstorm Jul 2015	No	2015	July	N/A	Part of the same severe thunderstorm /rainstorm/ severe wind storm that beseiged the Central NH Region on July 31, 2015.	NH Motor Speedway reported a wild thunderstorm with lightning strikes to northeast of stadium (within 1 mile of center of track), 100,000 people evacuated at conclusion of race. Rain, wind, lightning. Followed Emergency Action Plan- first time used weather plan. For preparedness, NHMS has a lighting service on call, is in contact with Gary ME during races using SKYPE, uses Ready Alert software -	Wind, Lightning (Fire), Rain	Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
						stakeholders alerted in tiered format when needed, then notify general public. In process of installing other hardware and software to better automate process, done 2016. All hazards EAP. Weather will be automatic during a storm.		
Concord Wildfire May 2015	No	2015	4-May	N/A	A six-alarm blaze in the western part of **Concord** off Little Pond Road/Lake View Drive and Long Pond Road along an old logging road in the northern part of Marjory Swope Park. Over 70 fire fighters responded from all over the area and battled windy, dry conditions. The fire burned more than 40 acres and required a helicopter from JBI Helicopter Services to reach the more remote areas of the fire. There was no threat to homes or need to evacuate. This incident was thought to be one of the biggest brush fires the city has seen in about 10 years.	N/A, but Concord abuts Loudon to the southwest	Fire, Wildfire	WMUR, Concord Patch, CNHRPC
Concord Wildfire Apr 2015	No	2015	25-Apr	N/A	In **Concord** on Rattlesnake Hill above the state prison quarries and between the Call Street and Little Pond Road access roads, three separate brush fires were reported, total damage over several acres. All Concord fire fighters were actively fighting the blazes, crews from surrounding towns were called in and NH	N/A, but Concord abuts Loudon to the southwest	Fire, Wildfire, Human	Concord Fire Dept, Concord Patch, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					State Div of Forest and Lands personnel assisted. No injuries. Human causation highly suspected.			
Severe Winter Storm and Snowstorm - January Blizzard 2015	4209	2015	Jan 26-28	N/A for Loudon	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 weather station, Concord Airport (CON), had accumulated 29" of heavy snow, 50 mph whiteout wind conditions in the region.	**Loudon did not apply for/receive funding** since the Town did not qualify (Merrimack County). As Loudon abuts Concord, the Town likely experienced similar problems as described. Power outages occurred. A later result of the storm in February: Damage at the Fire Station on the north side caused by massive ice dam formation from outside wall. It damaged inside wall, insulation, carpets. Insurance claim filed. Now, need to shovel the roof every storm to prevent from happening again, perhaps will place heat coil in the gutter.	Extreme Temp, Snow, Power Failure, Severe Winds	Loudon Hazard Mitigation Committee, fema.gov, Boston Globe, CNHRPC
Loudon 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	Loudon reports this was a significant storm. FD has 111 calls for service in 3 days, whole town without power for about 2-5 days. Trees were down everywhere, extensive property damage experienced.	Extreme Temp, Snow, Power Failure, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, Eversource/ PSNH, Concord Monitor, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					not a presidentially declared disaster in NH.			
Hopkinton Public Health EEE in Human **Fall 2014**	No	2014	Fall	No	The New Hampshire Department of Health and Human Services (DHHS) is announcing the second human case of Eastern Equine Encephalitis (EEE) this season in New Hampshire, in an adult from Hopkinton. The first human case of EEE in New Hampshire this season was confirmed on August 22nd in Conway, NH. The disease has also appeared in a horse in **Hopkinton.** Other EEE positive tests this year include 6 mosquito batches and a mule; there have been no positive test results so far for West Nile Virus (WNV).	N/A, although Hopkinton is 2 communities southwest of Loudon. Due to this human case, the risk level for human illness in Loudon will be raised to high, and the surrounding towns to moderate risk.	Extreme Temp, Public Health, Epidemic	NH Div of Health and Human Services, Hopkinton Town website, CNHRPC
Loudon Suspicious Brushfire **May 2014**	No	2014	May	No	Fire also burned from **Loudon** into neighboring Canterbury to the west	Loudon reports a dual fire with Canterbury in the northwest corner. Suspicious fire on a small marijuana plantation.	Wildfire, Fire, Human	Loudon Hazard Mitigation Committee
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 Loudon 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	**$14,160**	Winter Storm "Nemo". FEMA-3360-DR. Blizzard conditions with winds gust of 50-60 MPH and over 20 inches snow hit New Hampshire and the New England area. Disaster declaration received for emergency protective measures in eight counties of the	**Loudon received $14,160** in FEMA Public Assistance funding for protective measures. School district applied for FEMA funds (**$34,000**) for entire district for snow load removal from roofs (7 schools & Washington	Severe Winter Weather, Extreme Temp, Snow, Ice, Wind	Loudon Hazard Mitigation Committee, Merrimack Valley School District, FEMA, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					State including Merrimack and Hillsborough.	Street School Learning Center).		
Hurricane - Hurricane Sandy **Oct –Nov 2012**	4095 EM-3360	2012	Oct 26-Nov 8	**$2,581**	Merrimack and Hillsborough Counties received an emergency 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.	**Loudon received $2,581** in FEMA Public Assistance funding for protective measures under the emergency declaration.	Wind, Flood, Severe Storm, Hurricane, Debris Impacted Infrastructure	Loudon 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 Loudon with an earthquake of this magnitude as it was felt around the Central NH Region.	Earthquake	Concord Monitor, Earthquake-track.com
Loudon Downburst **Fall 2012**	No	2012	Fall	No	N/A	A strong downburst blew into Loudon. Damages included: Clough Hill Road, down from Bumfagon- trees blew down, 1 across the road blocked traffic until removal. Moore Cemetery & Mount Hope Cemetery on Church Street, downburst crossed over Oak Hill Road, came down Lovejoy Road.	Wind, Debris Impacted Infrastructure, Downburst	Loudon Hazard Mitigation Committee
Snowstorm-Halloween Snow Storm **Oct 2011**	4049	2011	Oct 29-30	N/A for Loudon	FEMA-4049-DR. Towns in Central NH were impacted by this shocking, early severe	Loudon did not apply for/receive funding. Loudon had power	Extreme Temp, Snow, Debris	Loudon Hazard Mitigation Committee,

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					snowstorm, although a major disaster declaration was *not declared in Merrimack County*. Halloween festivities were cancelled in most communities, to the heartbreak of young children. In Hillsborough County, damages were at the equivalent of $5.11 per capita (400,721 people in 2010). The storm was also declared in Rockingham County.	outages in certain areas and normal clean up.	Impacted Infrastructure	FEMA, CNHRPC
Tropical Storm-Tropical Storm Irene Aug 2011	4026	2011	Aug 26-Sep 6	**$3,439**	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*.	**Loudon received $3,439** in FEMA Public Assistance funding for debris removal of fallen trees and limbs. At Village Street dam, Town had spent $150,000 to rebuild an engineered new higher/improved concrete abutments to prevent flooding. NHMS Flood Emergency Response Plan displayed the Speedway's flooding pictures and mitigation projects from this event.	Wind, Flood, Severe Storm, Rainstorm, Tropical Storm, Erosion, Debris Impacted Infrastructure	FEMA, Loudon Hazard Mitigation Committee
Bow Route 3A Downburst Sep 2011	4026	2011	Sep 5	N/A	In nearby Bow**,** a 60mph microburst damaged or destroyed a dozen campers in the area of Route 3A between Grandview and Down Road. No injuries were reported. Telephone service at the Town's Police dispatch center was also disrupted.	N/A, although Bow is 2 communities to the south of Loudon in the Central NH Region	Wind, Downburst, Debris Impacted Infrastructure	Union Leader
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	N/A, but Loudon likely experienced some snow and inconvenience	Extreme Temp, Snow	wmur.com

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					8", but stopped by noon. Although dozens of accidents were reported, no serious injuries were reported.			
Concord Hospital Bomb Threats Oct 2010	No	2010	1-Oct	N/A	A bomb threat was called in to Concord Hospital as a result of a child custody issue and the group known as the "Oathkeepers." The FBI was contacted, but nothing was found in the Hospital during a bomb sweep. Phone lines were flooded with calls by the Oathkeepers to inhibit using the landlines. The incident was determined to be harassment instead of an actual event.	N/A, although Concord abuts Loudon to the southwest. People from all over Central NH use Concord Hospital for services.	Human, Terrorism	Concord Hazard Mitigation Task Force 2011
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 Loudon with the epicenter less than 5 miles to the northeast in Boscawen. Boscawen is 2 communities to the west of Loudon.	Earth, Earthquake	Union Leader, USGS

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Canterbury Milfoil Summer 2010	No	2010	Summer	N/A	Milfoil invasive plants are notorious "hitchhikers" that appear in Central NH area and NH water bodies after a boat or other vehicle introduces the invasive from an infested water body. Milfoil was found on Lyford Pond, New Pond, and Rocky Pond, which are actively being chemically treated. Three Towns in the area received money from NHDES to treat for milfoil.	N/A, although Loudon waterbodies are at risk when boaters from abutting Canterbury or other communities launch boats without checks	Biological, Invasive Species Infestation	Canterbury Hazard Mitigation Committee
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)	**Loudon did not apply for/receive funding.** The Town did not have an issue with the storm, but there were problems in all the surrounding towns.	Flood, Wind, Power Failure	Loudon Hazard Mitigation Committee, FEMA, CNHRPC
Loudon Oak Hill Fire Mar 2010	No	2010	4-Mar-16	N/A	N/A	Oak Hill Tower watchman's cabin burned completely to the ground. Arson was suspected. A wildfire could have resulted	Fire, Human, Arson, Wildfire, Lightning	Loudon Hazard Mitigation Committee
Severe Winter Storm and Flooding Feb-Mar 2010	1892	2010	Feb 23-Mar 3	**$7,854**	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	**Loudon received $7,854** in FEMA Public Assistance funding for debris removal. Power outages, with trees down on wires, roads, minor inconvenience. The ice storm of the same time felled many trees, and powerlines were down. As a result, many roads were closed. Oak Hill had a tree down across a	Extreme Temp, Snow, Wind, Flood, Wind Chill, Dam Failure	Loudon Hazard Mitigation Committee, FEMA, Unitil, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					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 power at the peak outage period.	powerline on Hardy Road, and chronically ill residents could not leave due to a live line down across the road. Eventually, the residents were removed with great care, but the line was still live at the time.		
Loudon Pleasant View Greenhouse Fire **Jan 2010**	No	2010	21-Jan	N/A	N/A although the facility is on the **Loudon** town line with Pittsfield	Pleasant View Gardens suffered a fire which destroyed about 30,000 square feet of greenhouses, plus a building. The cause is undetermined.	Fire	Loudon Hazard Mitigation Committee
Loudon Dam Failure **Dec 2009**	No	2009	29-Dec	N/A	**Loudon** dam breach also affected Pittsfield and Chichester in the Central NH Region.	On Sanborn Road, the private dam breached during renovations to the grist mill and saw mill. During the heavy water time, the dam breached. NH DES requested that the owner use rocks to try to quell the breach. The dam would affect the swamp in Pittsfield and Chichester, and the hazard would be significant. The dam is repaired, but is considered a (S) Significant hazard.	Flood, Dam Failure, Erosion	Loudon Hazard Mitigation Committee 2010
Loudon Thunderstorm and Downburst **May 2009**	No	2009	May 10	N/A	A fierce storm with heavy rains and strong winds was reported around the Region in **Merrimack** and Belknap counties. Trees, limbs and wires were down.	NHMS reported displays, golf carts turned over, tractor trailers with awning flipped over, about 37 cars flooded with water over the roofs, multiple trees down in camping lots. Heavier objects were tied down. Happened quickly, no warning.	Wind, Downburst, Flood, Lightning (Fire), Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, NH Motor Speedway, Fosters.com, CNHRPC
Loudon Hazardous Materials Gas Leak **Apr 2009**	No	2009	2-Apr	N/A	N/A	There was a natural gas leak in a residential neighborhood. The area was evacuated and the gas company was notified.	Evacuation, Hazardous Materials Vapor, Public Health	Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Severe Winter Storm - December Ice Storm **Dec 2008**	1812	2008	Dec 11-23	No	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.	**Loudon did not apply for/receive funding.** Minor damage occurred during the ice storm, including power outages of 5 or more days in several areas s and downed trees. The Fire Department went door to door to check on elderly residents.	Extreme Temp, Ice, Wind, Technological, Power Failure, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, FEMA, Unitil
Loudon Hazardous Materials Gasoline Spill **Nov 2008**	No	2008	11-Nov	N/A	N/A	There was a spill of approximately 100 gallons of gasoline while offloading from delivery truck. Location not identified during discussions.	Hazardous Materials Spills, Public Health, Water Quality	Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	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)	**Loudon did not apply for/receive funding.** As part of Merrimack County, Loudon likely suffered similar damages.	Flood, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, FEMA, CNHRPC
Severe Winds, Heavy Rains **Jul Tornado 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 37 suffering major damage. Damage was estimated to exceed $10 million. *Not Hillsborough County*	**Loudon did not apply for/receive funding.** The damage path did not travel through Loudon. In nearby Epsom, only 2 towns southeast of Loudon, 84,000 acres were destroyed and there was significant damage to personal property, destroying or damaging 9 homes.	Wind, Tornado, Downburst, Severe Storm, Debris Impacted Infrastructure	FEMA, Epsom Hazard Mitigation Committee, Loudon Hazard Mitigation Committee, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Loudon Snow Load Roof Collapse **Feb 2008**	No	2008	Feb	N/A	N/A	There were several residential roof/structure collapses and one garage collapse at NHMS due to snow load.	Extreme Temps, Snow, Building Collapse	Loudon Hazard Mitigation Committee
Severe Storms and Flooding - April Spring Flood **Apr 2007**	1695	2007	Apr 15-23	**$20,031**	Extensive flooding caused by severe storms impacted seven counties, including Merrimack and Hillsborough. Indirect peak discharge measurements on stream gages on the Suncook River at Short Falls Road in Epsom were 14,100 ft3, which was determined to be greater than 100-year flood discharge levels. Rain developed across New Hampshire Sunday morning and spread northward. The rain became heavy during the afternoon and overnight. By morning, 3 to 5 inches of rain had fallen over much of southeastern New Hampshire and 1 to 3 inches across much of the remainder of the state. In the mountains of New Hampshire, 3 to 11 inches of snow had fallen. Although the heaviest precipitation fell from Sunday afternoon into Monday afternoon, precipitation persisted into Tuesday. Flooding: 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	**Loudon received $20,031** in FEMA Public Assistance funding for roads and bridges assistance. Impacts were far less than the 2005 Mother's Day Flood.	Flood, Wind, Debris Impacted Infrastructure, Rapid Snow Pack Melt	FEMA, USGS Flood of 2007, Loudon Hazard Mitigation Committee, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					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. Power outages persisted, and stream and river flooding continued across the region.			
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 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 Hillsborough later dealt with siltation and erosion issues from the new river course	Area event N/A to Loudon, see storm effects on Loudon below	Flood, Earth, Landslide, Erosion, Debris Impacted Infrastructure, Channel Movement	Concord Monitor
Severe Storms and Flooding – Mother's Day Flood **May 2006**	1643	2006	May 12-23	**$693,422**	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,	**Loudon received $693,422** in FEMA Public Assistance funding for roads and bridges. Cross Brook bridge washed out completely, had to use a Class VI road as a bypass for 30 homes. Chichester Road bridge washed out too, the section of road closed until new bridge	Flood, Wind, Debris Impacted Infrastructure, Erosion, Landslide	Loudon Hazard Mitigation Committee, FEMA, USGS, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					and Piscataquog in Goffstown.	established. Caused by beaver dam washout. Multiple roads and drainage areas washed out.		
Concord Statehouse Iraq Public Unrest **Mar 2006**	No	2006	18-Mar	N/A	A reported 400 citizens marched in Concord to recognize the 3 year anniversary of the beginning of the war in Iraq. The protestors marched around downtown Concord and finished in front of the statehouse.	N/A although Concord abuts Loudon to the southeast.	Human, Public Unrest, Civil Disturbance	NH Independent Media Center
Severe Storms and Flooding - Columbus Day Flood 2005	1610	2005	Oct 7-18	**$26,128**	Extensive flooding caused by severe storms impacted five counties, including Merrimack and Hillsborough. Alstead experienced several fatalities as the result of dam failure.	**Loudon received $26,128** in FEMA Public Assistance funding for roads, bridges and culverts.	Flood, Wind, Debris Impacted Infrastructure, Erosion	Loudon Hazard Mitigation Committee, FEMA
Loudon Thunderstorm and Lightning Strike **Jun 2005**	No	2005	12-Jun	N/A	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.	During a thunderstorm, lightning struck and severely damaged the historic Loudon Town Hall on Clough Hill Road.	Thunderstorm, Lightning, Severe Winds, Rainstorm	CNHRPC, Loudon Hazard Mitigation Committee, Area Hazard Mitigation Committees
Snow Emergency **Jan 2005**	EM-3207	2005	Jan 22-23	**$10,508**	Record and near record snowstorm for 8 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	**Loudon received $10,508** in FEMA Public Assistance funding for snow removal (protective measures).	Extreme Temp, Snow, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, FEMA, CNHRPC
Hazard Events 1973-2004								
Loudon NHMS Camper Explosion **2004**	No	2004	19-Sep	N/A	N/A	At NHMS, an explosion occurred in a camper due to gas leaks. Two people were burned.	Fire, Explosion, Technological, Hazardous Materials, Public Safety	Loudon Hazard Mitigation Committee
Earthquake 2.2M Henniker-Hopkinton	No	2004	20-Jan	N/A	An earthquake measuring 2.2 on the Richter Scale was centered in the	Reports were likely made to the USGS from Loudon residents feeling the earthquake as a	Earth, Earthquake	Concord Monitor, January 2004, USGS,

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
Epicenter Jan 2004					Henniker- Hopkinton area. Shaking and noise were reported, but no damage occurred.	rumble or loud noise. The epicenter was only 2-3 communities away from Loudon, to the west.		Earthquake Monitor
Snow Emergency Dec 2003	EM-3193	2003	Dec 6-7	**$11,9310**	Record snow fall event impacting much of New England. In NH, 8 counties received emergency protective measures, including Merrimack and Hillsborough.	**Loudon received $11,931** in FEMA Public Assistance funding for snow removal (protective measures).	Extreme Temp, Snow, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, FEMA, CNHRPC
Snow Emergency Feb 2003	EM-3177	2003	Feb 17-18	**$8,814**	Record and near record snowstorm for 5 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	**Loudon received $8,814** in FEMA Public Assistance funding for snow removal (protective measures).	Extreme Temp, Snow, Debris Impacted Infrastructure	Loudon Hazard Mitigation Committee, FEMA, CNHRPC
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 Loudon 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 Loudon. 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 is only 2 communities away from Loudon to the southwest	Sabotage, Terrorism	Hopkinton Hazard Mitigation Committee
Snow Emergency Mar 2001	EM-3166	2001	Mar 5-7	No	Record and near-record snowfall from late winter storm, emergency declaration was issued for protective measures.	**Loudon did not apply for/receive funding.** As part of Merrimack County, Loudon likely suffered similar damages.	Extreme Temp, Snow, Debris Impacted	Loudon Hazard Mitigation Committee, FEMA, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					Merrimack, Hillsborough and 5 other counties were declared eligible.		Infrastructure	
Loudon/ Regionwide Downbursts 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). Other communities in the Central NH Region experienced damages, including Hopkinton.	A wind shear occurred through the Village from Lovejoy Road, Oak Hill Road, School Street, and Route 106. Pines were snapped off, wires were down, the roads were closed, and damage in the cemetery was extensive.	Wind, Downburst, Debris Impacted Infrastructure	Concord Monitor, NH HSEM, Loudon Hazard Mitigation Committee, CNHRPC
Concord Library and NHTI Bombs Oct 1998	No	1998	Oct	N/A	The lit fuse of a bomb left in the Concord Library stacks set off smoke alarms that may have saved the lives of many people. The individual allegedly responsible for the bomb scare left notes complaining about state government. About a dozen buildings were evacuated after the New Hampshire Technical Institute in Concord received an anonymous call warning that three bombs had been placed on campus. This event followed the bomb scares at the Concord Library.	N/A, although Concord abuts Loudon to the southwest. People from all over Central NH use the Concord Library and go to school at NHTI.	Human, Terrorism, Public Health, Public Unrest	AP Online 11/01/98, NH Homeland Security and Emergency Management, CNHRPC
Hopkinton Gould Hill & Putney Hill Tornado Jul 1998	No	1998	July	N/A	A tornado touched down in the **Hopkinton** Gould Hill and Putney Hill areas impacting approximately five acres causing trees to be downed and roads to be closed. No injuries were reported.	N/A, although Hopkinton is only 2 communities from Loudon to the southwest	Wind, Tornado	Hopkinton Hazard Mitigation Committee, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
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.	**Loudon did not apply for/receive funding.** As Loudon is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood, Wind, Debris Impacted Infrastructure	FEMA, CNHRPC
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, all 10 counties including Merrimack and Hillsborough. 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 2,310 people without phone service.	**Loudon did not apply for/receive funding.** As the entire state and Central NH region experienced the ice storm, it is very likely Loudon did as well in a similar fashion.	Extreme Temp, Ice Storm, Power Failure, Communications Failure	FEMA, US Army Corps of Engineers NH Storms database, CNHRPC
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.	**Loudon did not apply for/receive funding.** As Loudon is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood	FEMA, NH HSEM, Federal Register, CNHRPC
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 County *(not Hillsborough)*.	**Loudon did not apply for/receive funding.** As Loudon is within Merrimack County, it is likely experienced heavy	Flood	FEMA, Federal Register, CNHRPC

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
						rains, winds and possibly some flooding.		
Severe Storm-Hurricane Bob **Aug 1991**	917	1991	Aug 18-20	N/A for Loudon	Public assistance was available for Hillsborough County and 2 other counties *(not Merrimack County)* as a result of damages caused by Hurricane Bob. The 2 seacoast counties fared the worst.	As Loudon is within Merrimack County, it likely experienced heavy rains, wind gusts, tree debris, power outages and possibly some flooding.	Wind, Hurricane	FEMA, NH HSEM, CNHRPC
Flooding and Severe Storm **Aug 1990**	876	1990	Aug 7-11	No data available	Moderate to heavy rains caused flooding in eight counties, including Merrimack and Hillsborough Counties. Damage totaled $2.3m for all counties	As Loudon is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	Flood, Wind	FEMA, NH HSEM, CNHRPC
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.	As Loudon is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	Flood, Wind	FEMA, NH HSEM, CNHRPC
Severe Storms and Flooding **Jul-Aug 1986**	771	1986	Jul 29-Aug 10	N/A for Loudon	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 Merrimack County*).	It is likely Loudon experienced heavy rains and possibly some flooding.	Flood, Wind, Tornadoes, Severe Winds	FEMA, NH HSEM, CNHRPC
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 Loudon experienced some strong shaking and noise	Earthquake	Earthquake-track.com

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
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 abuts Loudon to the southwest	Wind, Tornado	Concord Monitor
Blizzard of Feb 1978	No	1978	Feb 5-7	N/A	RSI Index of Category 5 (Extreme). This snowstorm is described as "a natural disaster of major proportions" and stunned all of New England. The storm was caused by an intense coastal Nor'easter that produced winds in excess of hurricane force and very high snow totals. Most of southern New England received more than three feet of snow, 25-33" in NH and higher throughout New England. Abandoned cars along roadways immobilized infrastructure and blocked major interstates. For over a week, New England remained paralyzed by the storm. All of New Hampshire was impacted. Governor Meldrim Thomson Jr. declared a state of emergency.	During the winter snow storm of 1978, Loudon residents along Loudon Ridge Road were without power for several hours while falling limbs broke power lines. In addition, several barns throughout Loudon sustained damage as wind tore doors from their hinges.	Extreme Temperatures, Severe Snow Storms, Windchill, Power Failure	Loudon Hazard Mitigation Committee, American Meteorological Society, Northeast States Emergency Consortium, Concord Monitor
Loudon Flooding Mar 1977	No	1977	14-Mar	N/A	N/A, although no doubt area and County effects were felt.	With the peak record of the Soucook River, areas experienced flooding in area communities. Many families became stranded in Loudon as a result of road washout. The Concord Monitor (March 14, 1977) indicated that Bear Hill Road, Flagg Road, Bee Hole Road, Ricker Road, Beck Road, Gilmanton	Flood, Debris Impacted Infrastructure, Road Washouts	Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
						Road, Currier Road, and parts of NH 129 sustained considerable damage as a result of the high water levels		
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 Loudon 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.	N/A, although Loudon may have experienced heavy rains, trees down, power outages and possibly some flooding.	Flood, Wind, Severe Storms	FEMA, NH HSEM, CNHRPC
Hazard Events Before 1973								
Loudon Wildfire May 1965	No	1965	12-May	N/A	N/A	In May of 1965 a wildfire occurred along Clough Hill Road resulting in the loss of a large section of forest, about 100 acres.	Fire, Wildfire	Loudon Hazard Mitigation Committee, Town Historian
Loudon Wildfire May 1956	No	1956	9-May	N/A	N/A	A fire of unknown origin burned 90 acres near Hardy's Place on North Village Road, which was then Route 106.	Fire, Wildfire	Loudon Hazard Mitigation Committee
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 on August 28, 1971, Bell on August 10, 1976, Gloria on September 27, 1985, and Bob in 1991.	Downed trees, wind damage, and flooding was likely experienced in Loudon during many of these hurricanes.	Wind, Flood, Hurricane, Tropical Storm, Debris Impacted Infrastructure	NH Homeland Security and Emergency Management, Loudon Hazard Mitigation Committee
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	Although it is unknown what Loudon experienced, it is likely many of the same depths occurred.	Extreme Temperatures, Severe Snow Storms, Ice, Windchill, Power Failure	American Meteorological Society

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					(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”).			
Loudon 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	Trees and pines filled Clough Pond with the fallen lumber. Many are still at the bottom of the pond. Those that were excavated out are still as solid as the day they were sunk. Trenches were dug across Village Road so the water could escape more quickly so the road would not succumb to the flooding of the Soucook River.	Wind, Hurricane, Flood, Debris Impacted Infrastructure	Wikipedia, Concord Monitor, Loudon Hazard Mitigation Committee
Loudon 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 Winnipesaukee, Contoocook and	The effects of the Flood of 1936 on Loudon are unknown. The Town's only river is the Soucook River which is relatively small and undeveloped compared to other Central NH rivers.	Flood, Ice Jams, Rapid Snow Pack Melt	Concord Monitor, Union Leader, Army Corps of Engineers Ice Jam Database, Loudon Hazard Mitigation Committee

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Loudon	Local Effects Occurring in Loudon	Hazard Category	Source
					Pemigewassett rivers that were largely responsible for the destruction in Concord and the surrounding area. NH issued boil water warnings to everyone.			

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

Description and Magnitude of Hazards

A compilation of past hazards that have occurred in Loudon 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 Loudon. 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 Loudon Hazard Mitigation Plan 2005** and the **2010** 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.

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

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.

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 **Loudon 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 Loudon 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	**4** **HIGH**	**3** **HIGH**	**3** **HIGH**	**3** **HIGH**	**12.0** **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 like rivers 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 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 of 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	-5.0 or less

		- Shortages of water in reservoirs, streams and wells creating water emergencies	

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

Earthquake

The overall ratings of **Earthquake** in Loudon 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	1 LOW	1 LOW	1 LOW	2.0 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 Loudon'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 Magnitude Scale	Mercalli Instrumental 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

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

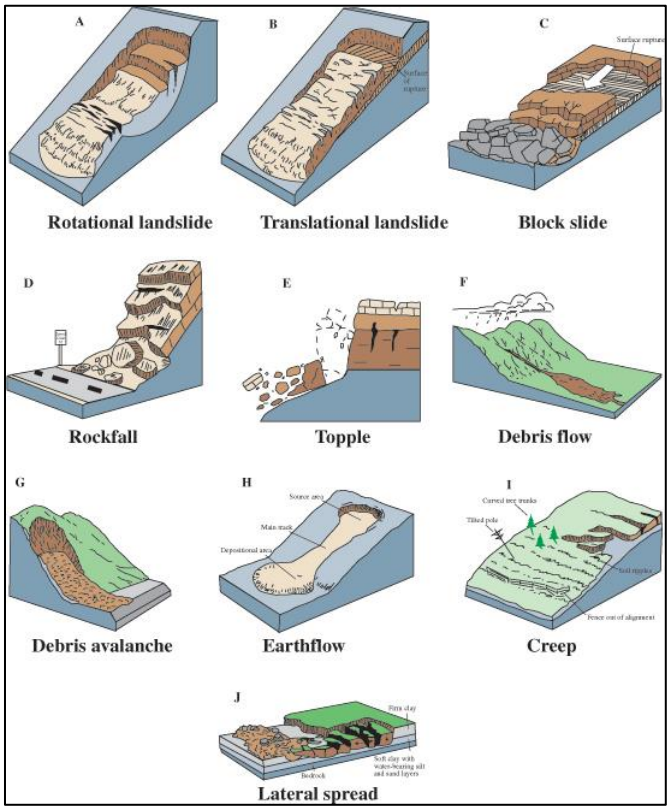
The overall ratings of **Landslide** in Loudon from the **HIRA** are:

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 Loudon 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 Loudon 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**	**3** **HIGH**	**2** **MEDIUM**	**2** **MEDIUM**	**3** **HIGH**	**7.0** **MEDIUM**

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.

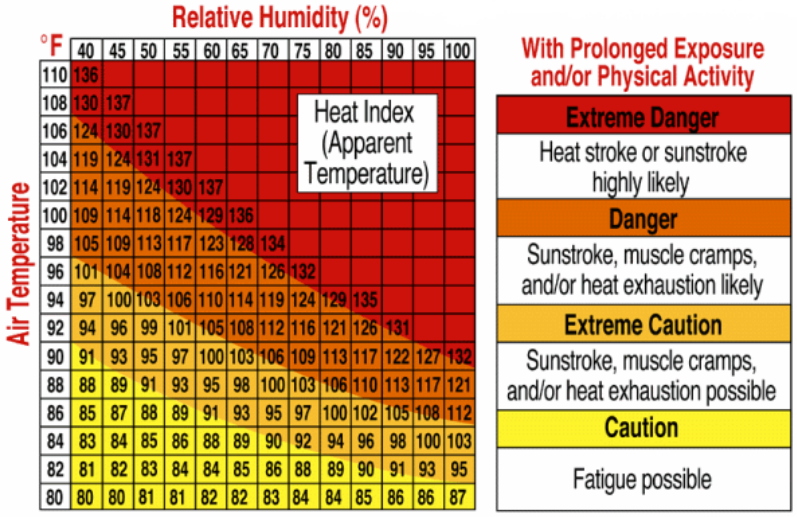
Excessive Heat Watch **BE PREPARED**	A **Heat Watch** is issued when conditions are favorable for an excessive heat event in the next **24** to **72** hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
Excessive Heat Warning **BE AWARE**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

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**.

Figure 7

Heat Index (Temperature and Humidity)



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.

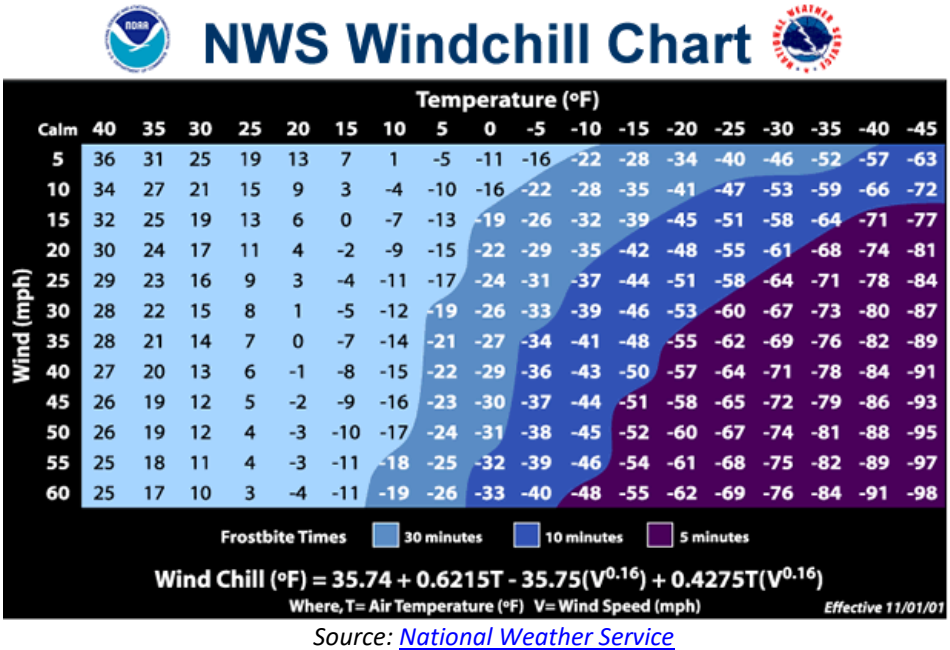
Extreme Cold or Wind Chill

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

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 Loudon 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**	**3** **HIGH**	**4** **HIGH**	**12.0** **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 Loudon 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	4 HIGH	4 HIGH	4 HIGH	16.0 HIGH

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 Loudon 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**	**4** **HIGH**	**1** **LOW**	**2** **MEDIUM**	**2** **MEDIUM**	**6.7** **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 Loudon, 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 Loudon (**#330117**) New Hampshire (**33011C**), there are several DFIRMs identifying floodplains, especially along the **Soucook River**. 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 Loudon are now set on an aerial photography background that displays roads, buildings, forested areas, waterbodies and watercourses. Loudon'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 Loudon DFIRMs	
Zone A	**1% annual chance of flooding** • **100-year** floodplains *without* Base Flood Elevations (BFE)
Zone AE *(with or without floodways)*	**1% annual chance of flooding** • **100-year** floodplains *with* 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** • **500-year** floodplain *without* 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

Loudon 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 **Soucook River** and the various brooks along the roads, roadside wetlands, and from the culverts directing the watercourses. Locations in Loudon 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 Loudon from the **HIRA** are:

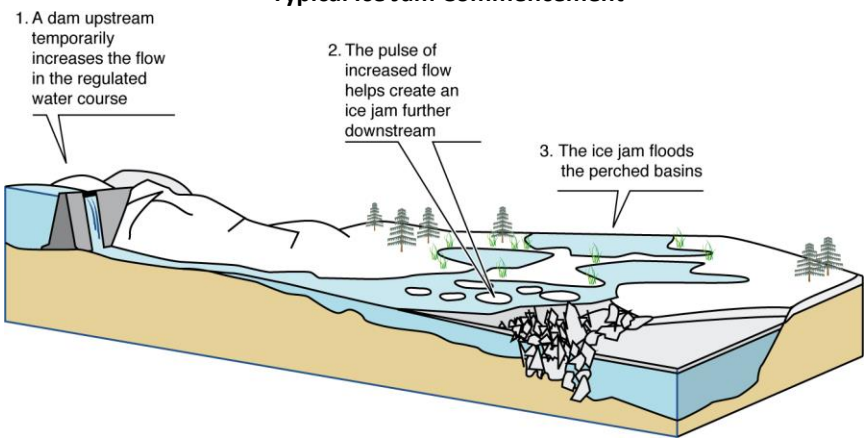
Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
RIVER HAZARDS Ice Jams, Scouring, Erosion, Channel Movement or Debris	4 HIGH	2 MEDIUM	4 HIGH	4 HIGH	13.3 HIGH

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.

Figure 9

Typical Ice Jam Commencement



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.

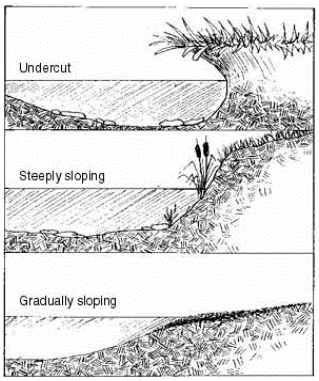
The US Army Corps of Engineers (ACOE) maintains the Ice Jam Database, Bulletins & Surveys website which locates where known ice jams are presently occurring and where they have occurred in the past. Reports can be generated in various formats so emergency responders can identify the locations of prior 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 Loudon, fluvial geomorphology is most pertinent to the **Soucook River.**

Figure 10
Bank Erosion Characteristics

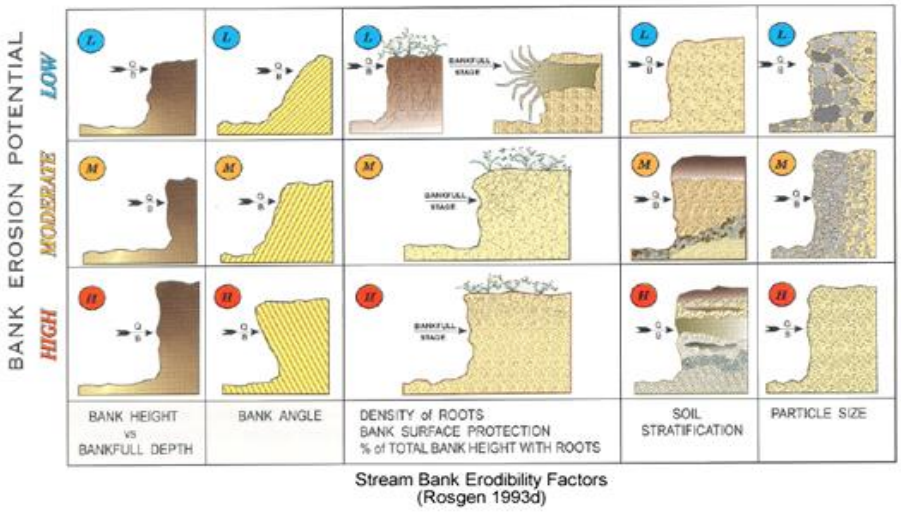


Source: US Geological Survey (USGS)

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 Loudon 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.	**3 HIGH**	**1 LOW**	**2 MEDIUM**	**2 MEDIUM**	**5.0 MEDIUM**

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 *
	❍ 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
	❍ 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
	❍ No probable loss of lives. ❍ Major economic loss to structures or property. ❍ Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services. ❍ Major environmental or public health losses, including one or more of the following: ♦ Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair. ♦ The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more. ♦ Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.	
HIGH Hazard 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
	❍ 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 Loudon. 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 Loudon. The Town of Loudon 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 Loudon 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**	**4 HIGH**	**4 HIGH**	**4 HIGH**	**16.0 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 (**October 1-14, 2022**), **5** Loudon residents were reported to have tested positive for the deadly respiratory coronavirus COVID-19. During this same time, **361** Merrimack County residents were reported to have tested positive. In New Hampshire, new cases totaled **3,235** within the last **14** days.

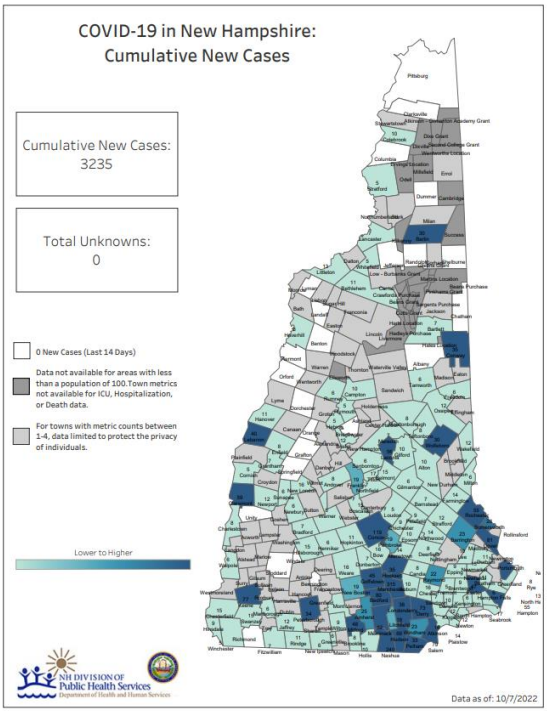
Since **March 2, 2020**, a total of **1,188** cases have tested positive in Loudon to date. Within this period, over **351,000** New Hampshire cases tested positive for COVID-19. Of these, **37,310** cases are Merrimack County residents. Over **2,700** New Hampshire residents have died through **October 2022**. The numbers change daily and should be reviewed on the state's COVID dashboard at https://www.nh.gov/covid19/index.htm.

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 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 **October 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 **621 million** people have tested positive and nearly **6.6 million people** have died to date per the Johns Hopkins Coronavirus Resource Center. 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 10-07-22



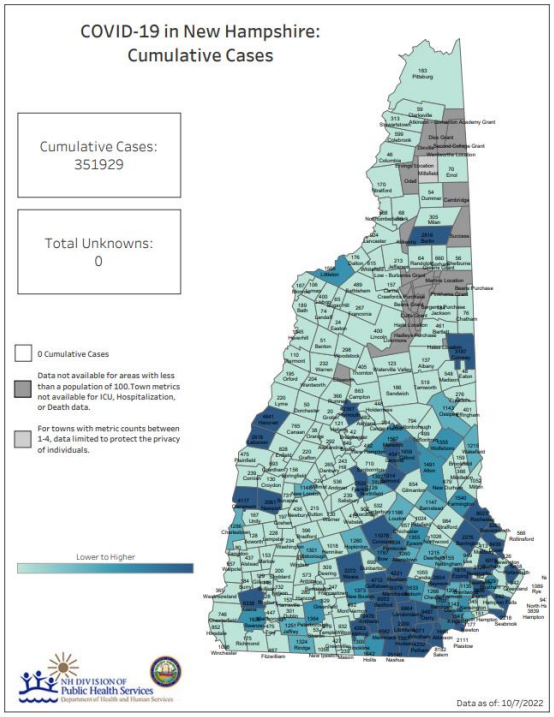
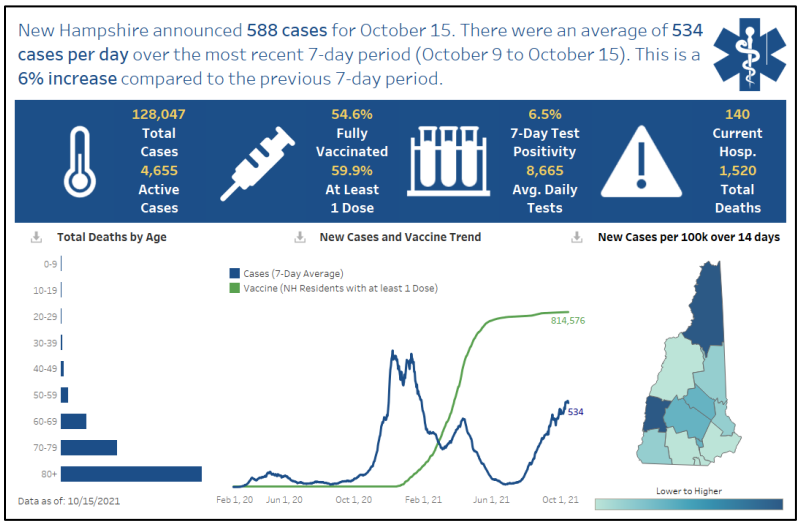


Figure 13

NH COVID-19 Statistics Overview

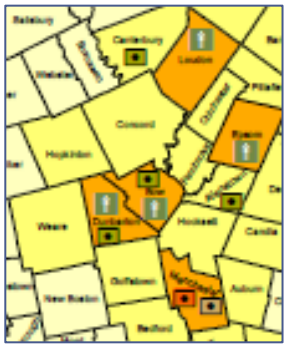


Source for Figures: NH Division of Health and Human Services Dashboard COVID-19 https://www.nh.gov/covid19/

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, Loudon may be particularly vulnerable to influenza. With concentration on COVID-19, the flu has been largely ignored in the last three years, making conditions amenable for a possible pandemic if people do not obtain flu shots.

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. One (**1**) case of JCV was reported in Loudon in **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.

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 Loudon 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

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 bacterias, like cyanobacteria and e. coli, and dangerous species like jellyfish. Cyanobacteria advisories are issued when there are blooming conditions and cyanobacteria cell concentrations exceed 70,000 cells/ml in recreational waters. Freshwater beach standards for e. coli is 1 sample > 158 counts/100 ml.

Loudon does not have to worry about **milfoil** infestation because it does not have public ponds of 10 acres or greater. Rivers can carry invasive species like **zebra mussels**. The public beach at White Sands on the Merrimack River 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 Loudon has been subject to additional calls for service for overdose. Along with the use of these substances is a commensurate amount of buying and/or making of illegal drugs. The State has made national headlines in 2014, 2015 and 2016 for its problems with overdoses and its public recognition of the problem. A particular concern to Fire & Rescue and Police personnel is the illegal drug usage and overdosing that is occurring 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.

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 Loudon 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**	**3** **HIGH**	**2** **MEDIUM**	**6.0** **MEDIUM**

Magnitude of Solar Storms

Many in residents in the Central NH region enjoy the aurora borealis viewed from Mount Kearsarge, visible to Loudon 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 Loudon. 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**	✦ 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**	✦ 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**	✦ 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**	✦ 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**	✦ 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**	✦ Biological: None. ✦Satellite operations: None. ✦Other systems: Minor impacts on HF radio in the polar regions.	50 per cycle
S2 Solar Radiation	**Moderate**	✦ 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**	✦ 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

Magnitude Scale	Description	Effect of Space Storm	Average Frequency (1 cycle = 11 years)
Solar Radiation		✦ 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**	✦ 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**	✦ 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**	✦ 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**	✦ HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. ✦ Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	350 per cycle (300 days per cycle)
R3 Radio Blackouts	**Strong**	✦ HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. ✦ Navigation: Low-frequency navigation signals degraded for about an hour.	175 per cycle (140 days per cycle)
R4 Radio Blackouts	**Severe**	✦ HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. ✦ Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	8 per cycle (8 days per cycle)
R5 Radio Blackouts	**Extreme**	✦ HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. ✦ Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	Less than 1 per cycle

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 Loudon 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**	**3** **HIGH**	**4** **HIGH**	**4** **HIGH**	**14.7** **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 Loudon 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 wind hazards in these alerts. A summary of the thunderstorm damage threats is provided in **Table 20**.

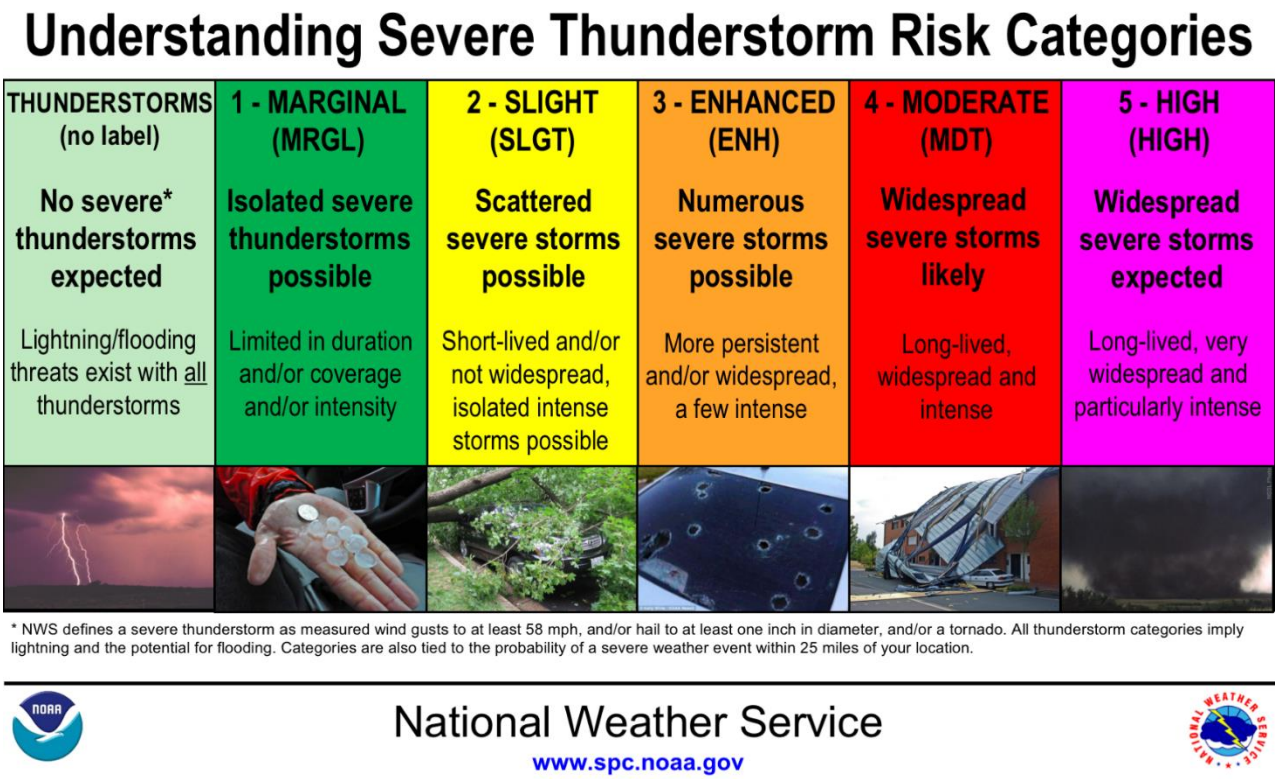
Table 20
Damage Threats for Severe Thunderstorm Warnings

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



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 Loudon 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.

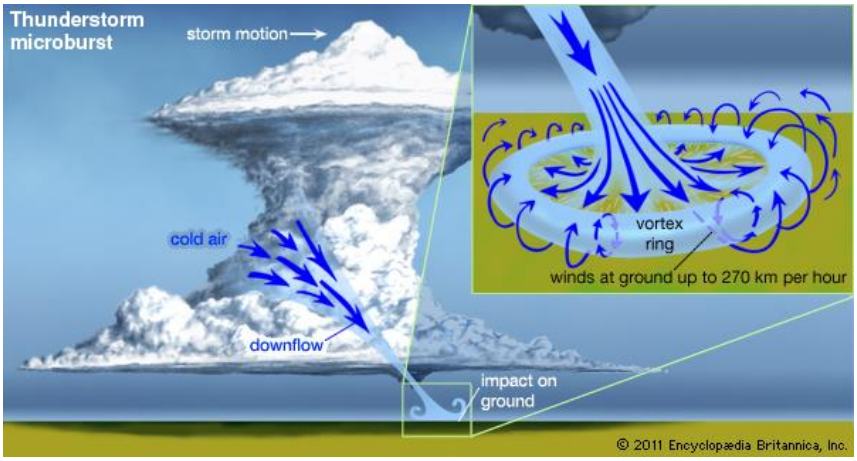
Downbursts

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 are capable of producing 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 Brittanica)

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

The overall ratings of **Tropical and Post Tropical Cyclones** in Loudon 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	**4 HIGH**	**2 MEDIUM**	**2 MEDIUM**	**4 HIGH**	**10.7 HIGH**

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 Loudon 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 *major*	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 *major*	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 *major*	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 Loudon 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 Loudon's geography and development.

The overall ratings of **Severe Winter Weather** in Loudon 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**	**4** **HIGH**	**3** **HIGH**	**13.3** **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.

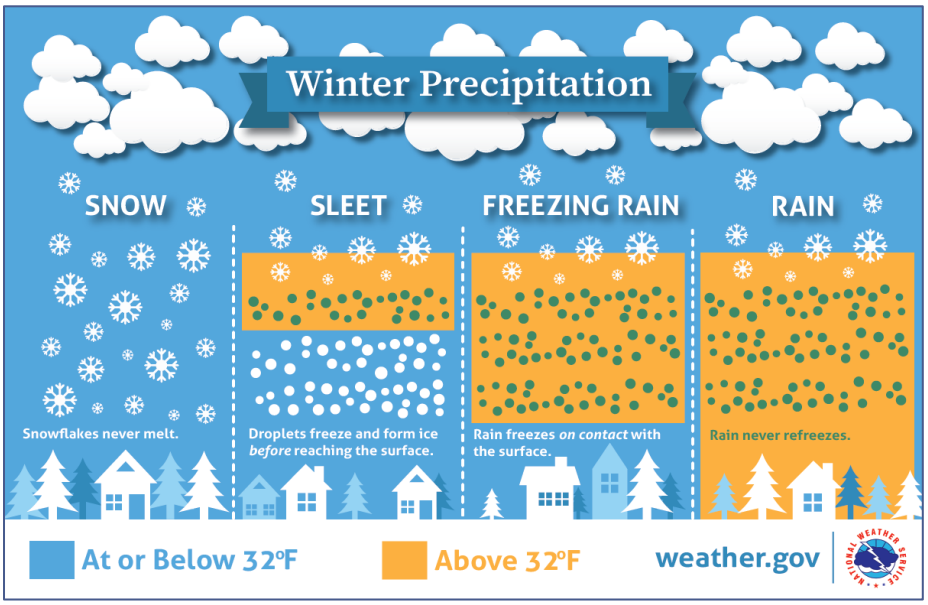
Heavy snow can immobilize a region, strand commuters, stop the flow of supplies, and disrupt emergency responders. Accumulations of snow can knock down trees and power lines and cause some roofs to collapse. Homes and farms may be isolated for days and unprotected livestock may be lost while businesses 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 ¼ 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 t**o **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, 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 106, NH 28, and US 3 in Loudon. The Town is responsible for **71 miles** of local Class V gravel and paved roadways, sidewalks, as well as the bridges and culverts. Communities in New Hampshire are faced with the dilemma of poor conditioned infrastructure with not enough funding to pay for rehabilitation, even with grants from the NH Department of Transportation (NHDOT) for roads and bridges and revolving loans from the NH Department of Environmental Services for water infrastructure.

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

Bridges, Culverts, Roads

Debris impacted infrastructure regularly occurs along the Central NH Region's rivers and streams and 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 Loudon 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 Loudon'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 Loudon 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. Loudon 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 (Plausawa Hill). 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 Loudon 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 Loudon 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, Loudon'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 Loudon 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 Loudon from all natural hazards. Also from the **HIRA** is whether or not each hazard event occurred within the last **5** years in Loudon, 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 Loudon 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***	**5.0 LOW**	• There are few constructed dams in Loudon with potential for future flooding damage if breached or failed. The **High Hazard (H)**, **Significant (S) Hazard** and the **Low (L) Hazard** dams 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 the Soucook River, Giddis Brook, Sanborn Brook, Gues Meadow Brook, Pine Island Brook, Clark Brook, Clough Pond, Crooked Pond, and several other unnamed streams. • Sanborn Farm dams had breached in the past, but most have been rehabilitated. A large dam is located in the Village on the Soucook Rive and requires maintenance. Owned by the Town, the dam is historic and integral to the community. If breached, the Village Dam would flood properties downstream and along NH 106 into Concord/Pembroke. Regionally, the upstream Shaker dams in Canterbury could impact Loudon if breached. • 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.	✦ NHDES Dam Classifications
DROUGHT ***Event(s) Within Last 5 Years***	**12.0 HIGH**	• During future **drought** events, agricultural farms, orchards, nurseries tree farms run the risk of high damage from droughts which also brings 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 Loudon, 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. • Drought has been a continuing problem and is expected to periodically occur in the future. 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 cisterns 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. Public water systems customers in Loudon may have to follow voluntary or required water restrictions to conserve the supply.	✦ US Drought (D-scale) Monitor Intensity Scale
EARTHQUAKE ***NO Event(s) Within Last 5 Years***	**2.0 LOW**	• Since Loudon 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	✦ Richter Magnitude Scale ✦ Modified Mercalli Intensity Scale

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		vulnerable populations, and are critical to the Town's operations and culture. • 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***	**7.0 MEDIUM**	• Excessive heat and extreme cold will continue being problematic for Loudon residents. There are many group facilities, multi-family housing, manufactured housing parks, and the Schools 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), Loudon Elementary School could be opened as a temporary cooling (or warming) center without formal School District, Red Cross, and/or Capital Area Public Health Network assistance.	✦ 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***	**14.7 HIGH**	• All of Loudon 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) is disrupted during most wind-related events. The main telecommunications towers and antennas on Pleasant Street, NH 106, Tower Road, and at NHMS, water and sewer pumping stations, Eversource 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 alongside the Soucook River, in Loudon Village, or along NH 129 or NH 106 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 129, NH 106, South Village Road and Lovejoy 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 especially in the northeast is wooded and forested. Sections 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), Charlie's Barn and Community Building, North East Motor Sports Museum at NHMS, Oak Hill Fire Tower, Old Town Office,	✦ Enhanced Fujita (EF) Tornado Scale ✦ NWS Thunderstorm Risk Categories ✦ NWS Damage Threats for Severe Thunderstorm Warnings

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		Sanborn Farm and Mill Buildings, Town Hall and Church, Town Pound, William Maxfield Monument, 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** ***Event(s) Within Last 5 Years***	**6.7 MEDIUM**	• Future flooding is expected in Loudon, whether from storm events or snowpack melt. The Soucook River, numerous brooks, unnamed streams, and culverts have the potential to flood their banks. The MHP units are old and do not meet current codes. Manufactured homes especially those located near NH 106 and the Soucook River may be impacted by flooding and could lead to landslide. • 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 for it to occur and some of the brides have come close to flooding, with water flowing just underneath the decking. 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.	✦ 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** ***NO Event(s) Within Last 5 Years***	**1.0 LOW**	• Generally, vegetation and best operational practices of excavation sites in Loudon 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. When good land is developed, less desirable land, such as on Riverview Road, is clearcut with no controls in place leading to erosion and potential for landslide. • 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. Currier Road is known to be potentially susceptible to landslide. Gravel roads with ditching in Loudon 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.	✦ No known widely-used scale measuring the magnitude of landslides
LIGHTNING ***Event(s) Within Last 5 Years***	**16.0 HIGH**	• Future lightning strikes may cause the damage at the Town Hall and Church, Oak Hill Fire Tower, William Maxfield Monument, Charlie's Barn and other important Town and School facilities. The large tax exempt facilities and buildings without lightning rods may also be susceptible in	✦ Lightning Activity Level (LAL)

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		cleared areas or on the high hills. Conflagration could start at these denser facilities as a result of lightning strike and would be 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 and forested areas. The potential for resulting wildfire and conflagration is high in these densely populated areas. • 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 Town Highway Department Shed, Transfer Station, and aircraft operations could be vulnerable to lightning strike. The solar panel array on Pleasant Street (5 acres) with another project upcoming as well as the existing greenhouse on NH 106 North and a new greenhouse operation coming have some of the most advanced technology constructed in town. These sites may be at greater risk or cost more to fix if struck by lightning. • NH Motor Speedway grandstands are the single largest lightning attractor. A strike during one of the crowded NASCAR events would be disastrous. Significant coordination and planning including the NWS are undertaken for each race to ensure evacuation would take place if lightning is predicted. • The higher elevations and areas atop hills in Town 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, open recreation fields, and the town hiking trails can be dangerous to people and property. Trees are constantly struck, as are the recreational fields. These include the public Town lands and State Forests, conservation areas, and points of higher elevation which can be dangerous to people and property if struck by lightning. Outdoor recreational (golf club) 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** ***Event(s) Within Last 5 Years***	**16.0 HIGH**	• 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: Loudon Elementary School, New Hampshire Motor Speedway, Churches, Town Hall, Community Building, and the Town Office. The medical facilities are the Health Heart Veterinary Clinic and NHMS Infield Hospital (for drivers only during race) could have potential for infectious disease spread. Additionally assisted living and group quarters have higher propbability of public health threats inlcuidng Community Bridges, Inc – Home for Disabled and NeuroRestorative – Assisted Living home. Additionally, food-borne illness can be transferred at eateries. All	✦ CDC Infectious Disease Levels Scale

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		winter long, people of Loudon in close quarters get sick from different viruses. • Outdoor susceptibility to arboviral and tickborne diseases is expected to grow. Loudon 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 and animal 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 Loudon's more vulnerable populations and outdoor enthusiasts. • Banks of the Soucook River, the Town Beach and any other watercourse or waterbody used as beaches may expose people to cyanobacteria. The public boat 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. • Much of NH 106 and its businesses are situated atop the Soucook River aquifer. Potential environmental damage to water quality by trucking, fuel spills, and long term exposure is a concern. Thousands of Loudon and area residents others may obtain water from this aquifer. • The Town's local Point of Dispensing (POD) is located at the Concord's NH Technical Community College. Loudon is a member of 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** ***Event(s) Within Last 5 Years***	**13.3** **HIGH**	• Future ice jams in the Soucook River could be expected. Roads within the Rivers' floodplain areas could in the future be subject to ice jam damage. River ice jams, may have future potential to occur on South Village Road, Rocky Pond Road, Wales Bridge Road, Currier Road and Clough Hill Road. Floodplains could become inundated and evacuations might be necessary. • The Soucook River runs through much of Loudon including the Village area where a dam is located. Flooding, erosion, and channel movement may the potential to occur. Flooding of the Soucook could damage essential facilities in town. • Erosion/washout of certain Town roads along the Soucook River or the numerous brooks 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.	✦ EPA Bank Erosion Risk Index
SEVERE WINTER WEATHER **Snow, Ice, Blizzard or Nor'Easter** ***Event(s) Within Last 5 Years***	**13.3** **HIGH**	• It is extremely likely that Loudon 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.	✦ Potential Winter Storm Severity Index (WSSI) ✦ NCDC Regional Snowfall Index

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		• 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. • Particular areas of concern during **winter weather** include the more highly traveled roads –NH 106, NH 129, School Street, South Village Road, Old Shaker Road, and Chichester Road. Power outages and isolation may occur from heavy **snow loads** and **downed trees** on roads. • The Town facilities buildings, Town Hall, Town Office, Community Building, Fire Department, Clough Hill Road Fire Station, Highway Department, Police Department, and Town Dump 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 telecommunication towers and antennas on Pleasant Street, Tower Road, NH 106, and at NHMS, Eversource lines, and TDS switching stations as well as Department building antennas could be highly impacted from future **snow, ice, and blizzards**.	(RSI) for Northeast ✦ NWS Winter Weather Warning Events
SOLAR STORMS AND SPACE WEATHER **Solar Winds, Geomagnetic Storms (Aurora Borealis), Solar Radiation or Radio Blackout** ***NO Event(s) Within Last 5 Years****	**6.0 MEDIUM**	• 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 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. • Loudon 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) rely 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.	✦ NOAA Geomagnetic Storms Scale ✦ NOAA Solar Radiation Storms Scale ✦ NOAA Radio Blackouts Scale

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		• A geomagnetic storm has taken out microwave Fire and EMS transmissions requiring replacement of hardware on the towers. Multiple 911 calls were disrupted as a result. A more significant solar storm threatens to take the whole system down.	
TROPICAL AND POST-TROPICAL CYCLONES **Hurricanes, Tropical Storms or Tree Debris** ***Event(s) Within Last 5 Years***	**10.7 HIGH**	• In 2021, tropical storms impacted Loudon with high winds which break trees and limbs. Tree debris often falls on roadways and/or utility lines. As Loudon 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 Loudon. 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.	✦ Saffir-Simpson Hurricane Wind Scale
WILDFIRE **Brushfire, Outdoor Fires or Accidental** ***Event(s) Within Last 5 Years***	**12.0 HIGH**	• Although few substantial **wildfires** have impacted Loudon since the last Plan, the potential exists 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 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. Unmaintained Range Roads are particularly vulnerable to **wildfire**. • Loudon 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**.	✦ NWCG Wildfire Classification ✦National Fire Danger Rating System

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
TECHNOLOGICAL AND HUMAN HAZARDS			
AGING INFRASTRUCTURE **Bridges, Culverts, Roads, Pipes or Underground Lines** ***Event(s) Within Last 5 Years***	not scored	• 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. State bridges and shared bridges are aging. The Town bridges also are aging and could be subject to future floods, ice, transportation crashes or debris impacted infrastructure. The town owns one redlisted bridge on Wales Bridge Road over Soucook River that is particularly susceptible to damage. See **APPENDIX A** for the list. • There are some stormwater line, and natural gas lines (along NH 106). Liberty has an older gas line through the village area. 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 71 miles of roads often difficult to maintain, upgrade and rehabilitate because of lack of funding. Only the priority roads are upgraded. The Town Public Works Dept 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, Arson or Conflagration** ***Event(s) Within Last 5 Years***	not scored	• The previously noted higher density areas could be subject to potential **conflagration** which would have devastating effects on the entire community. Drought conditions increase dryness and flammability. • Serious **vehicular fires** resulting from crashes could occur, especially on NH 129 and NH 106 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). Significant risks include businesses along NH 106, New Hampshire Motor Speedway, and from aircraft flightpaths over Loudon. • 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**.	N/A

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		• Overall, the fire exposure is small in Loudon due to aggressive code enforcement, education in schools, and public education. Water supply is overwhelmingly the largest issues. Lack of dry hydrants and cisterns in town could be dangerous in the event of a large fire.	
HAZARDOUS MATERIALS **Haz Mat Spills, Brownfields or Trucking** ***Event(s) Within Last 5 Years***	not scored	• Transportation of hazardous materials on NH 106 and NH 129 is an everyday occurrence. In Loudon, at least three times per day a natural gas truck travels from Pembroke to Franklin. There are two large depots in town (Eastern & Huckleberry) with many shipments in and out including bulk trucks and home delivery trucks. 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 Loudon, not only could the contents of the spill reach the local Soucook River and Loudon Village Area populations 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, construction businesses, and businesses along NH 106. See **APPENDIX A** for the full list. • Existing and future potential brownfields sites such as old mills along the river and brooks, vacant or former industrial properties, salvage yards and illegal junkyards may exist and pose future danger to new property owners or river users 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	• Aboveground electric lines in Loudon make the Town particularly vulnerable to outage during future disaster events. High tension transmission lines run through the Town. There are many roads in the middle weather zone that annually experience utility outages including: Currier Road, Flagg Road, Old Shaker Road, Chichester Road, Clough Hill Road, Lower Ridge Road, NH 129, Coaster Road, Bumfagon Road, and Oak Hill Road. Utilities (Eversource, Electric and TDS, internet, cable) may be restored to the most critical areas first, the Town facilities, before the more remote locations in Loudon have utilities restored. • Most Town facilities have backup generators when electricity fails, but long term solutions are necessary when outages over 3 days occur. •There are several miles of underground water, gas, and sewer lines in Loudon 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 Loudon 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.	N/A

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		• The telecommunications towers located on Pleasant Street, Tower Road, NH 106, and at the NHMS 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	• With NH 106 and NH 129 running through Loudon, the Town's Fire Dept and Police Department are often the first to respond to the vehicle crashes experienced on these main State and local roadways. These routes are used heavily by commuters as they travel through Loudon to their destinations. Despite road widening, NH 106 and Clough Hill Road have many transportation crashes. 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 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. • The Loudon Village area is one place where vehicle/pedestrian or bicycle crashes could occur in the future. Other locations include sidewalks and crosswalks near the schools and recreational fields. With high speeds in most areas of town, 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 may be in the flightpath of Concord Municipal Airport, NH Army National Guard, and JBI Helicopter 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** ***NO Event(s) Within Last 5 Years***	not scored	• Large groups of people are regularly located at the Town Hall, the elementary school, community building, Maxfield Public Library, and most notably the New Hampshire Motor Speedway which may be where a future mass casualty event (incidents exceeding the Loudon Rescue Ambulance capacity) could occur because of any other type of hazard event. • The New Hampshire Motor Speedway has a large capacity and is one of the largest gathering sites in New England. With it comes a larger risk of mass casualty. Loudon town staff have frequent trainings in operations and response for events held at the venue. • Loudon is a vibrant community with active groups and social calendars. Events such as political candidate visits, School and sporting events, School Board meetings, Town Meeting, Church events, and	N/A

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
		other community gatherings could set the location for future mass casualty incidents. • Concord Hospital is 20 minutes from Loudon 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, Rescue 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	• 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 the elementary school, churches, or the New Hampshire Motor Speedway. • The municipal facilities in Loudon, Town Hall, Library, Fire Department, Highway Department, Police Department, and Town Office may 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 Loudon, but unlikely based upon the local facilities. However, the Town's participation in the Central NH Special Operations Unit enables Loudon'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 lines, high tension power lines, Liberty gas system, stormwater system, water and sewer 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 Loudon.	N/A
CYBER EVENT **Municipal Computer Systems Attack, Website Overtake, Cloud Data Breach, Telephone Rerouting, Identity**	not scored	• The entire Town – residents, businesses, municipal, school, 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, Library, Municipal Departments, Schools, any technology businesses would be high-value targets for their software and their archival systems.	N/A

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
Theft, Phishing, Ransomware, Virus or Phone Scams *ANNUAL Occurrences Within Last 5 Years*		• 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: Loudon Hazard Mitigation Committee

Although there are many potential hazards in Loudon'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 Loudon.

Special Flood Hazard Areas (SFHA)

There are no Base Flood Elevations (BFEs) along the Soucook River in Loudon on the Digital Flood Insurance Rate Maps (DFIRMs) of 2010. A single panel (**#0552**) shared with Concord begins the floodway and BFEs at the shared border along the **Soucook River**. The primary DFIRMs identifying floodplains in Loudon (**330117**) which are along the **Soucook River** are NH (**D33013C**) **#0552**, **#0365**, **#0355**, and **#0215**. Other SFHAs are shown on panels **#0345**, **#0360**, **#0370**, and **#0380**. These (**8**) display SFHA **Zone A** (1% annual risk of flooding).

There are no DFIRMs in Loudon which display the SFHA **Zone AE** (1% annual risk of flooding), with or without floodways, or **Zone X** (0.2% annual risk of flooding) locations. The Loudon DFIRMs displaying **Zone A** (1% annual risk of flooding) are displayed in **Table 26**.

However, a new set of Preliminary DIRMs for Loudon, 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 BFEs and regulated floodways are indicated for the Soucook River (see **Figure 20**). The **2022** Preliminary DFIRMs are under review and are subject to further revision.

Table 26

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

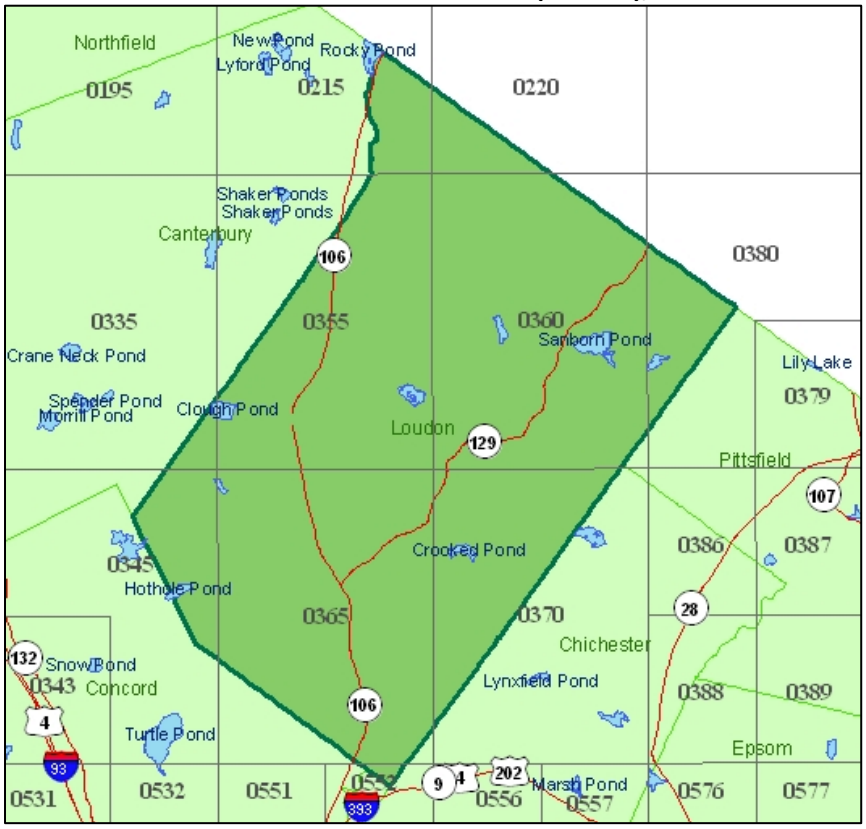
Panel NH (D33013C)	Flood Zones in Loudon (D33013C)	Base Flood Elevations (BFEs)	Water Body Areas in Floodplains	Community of Loudon Geographic Location
#0552	A, (AE, X, Floodway not in Loudon)	BFEs & Floodway begin at Concord border and run south. 315'- 284'	Soucook River	Southern-most corner of Town, bordering Concord/Chichester, Soucook River into Concord & Pembroke
#0365	A	N/A	Soucook River, Pine Island Brook, Bee Hole Brook	Begins at Soucook River at Concord border, continues into Loudon Village, north to Currier Road in south-central Loudon.
#0355	A	N/A	Soucook River, Shaker Brook, Pickard Brook, Bumfagon Brook	Western side of Town at Loudon, Route 106 crosses border. Soucook River WMA
#0215	A	N/A	Rocky Pond, unnamed brook	Northern-most tip bordering Canterbury and Gilmanton. Begins at shared Rocky Pond with Canterbury through Mitigation Tract along Route 106
#0345	A	N/A	Hoit Marsh WMA, Pine Island Brook	Western-most corner of Town at Concord/Canterbury border. Hoit Marsh WMA shared with Concord
#0360	A	N/A	Sanborn Brook, origin of Bee Hole Brook, 2 unnamed brooks	Northeastern, borders with Gilmanton
#0370	A	N/A	Bee Hole Brook, Bog Pond, Crooked Pond (not in Zone)	Southeast at border with Chichester. Contains sections of Bee Hole Brook
#0380	A	N/A	2 unnamed brooks join to #360 brooks	North central edge of Town bordering Gilmanton. Near Osborne WMA
#0220	No panel	No panel	No panel	No panel
#0335	N/A	N/A	N/A	Western edge of Town at Canterbury, south of Clough Pond

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

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.

Figure 18

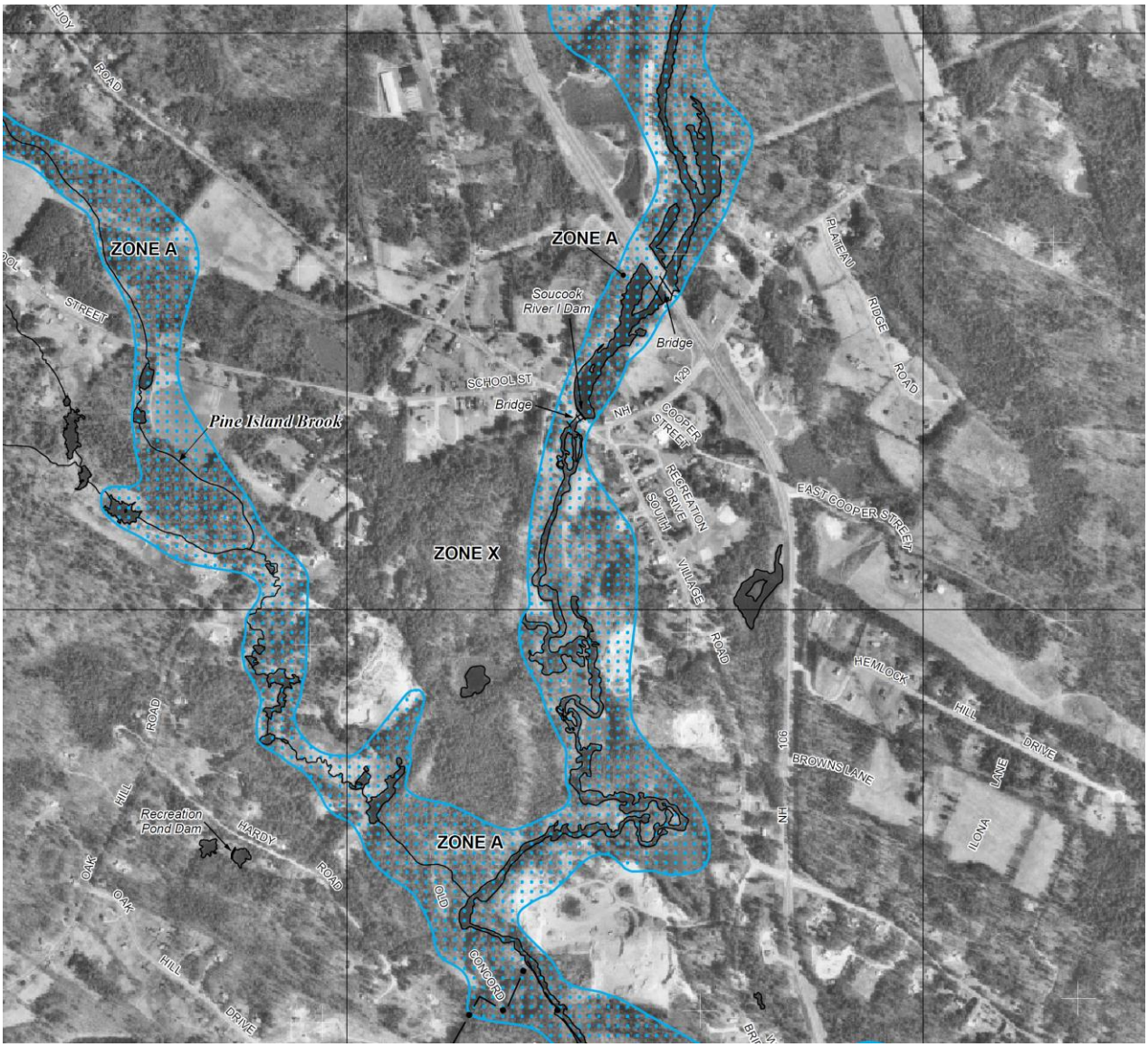
Loudon DFIRM Panel Locations (330117), 2010



Source: Loudon DFIRMS can be downloaded at https://granit.unh.edu/dfirms

Figure 19 displays an example of a DFIRM's zoomed-in view of Loudon Village's **2010** DFIRM to illustrate their appearance, a significant upgrade from the previous series of paper maps. The maps are now set on an aerial photography background that displays roads, buildings and forested areas.

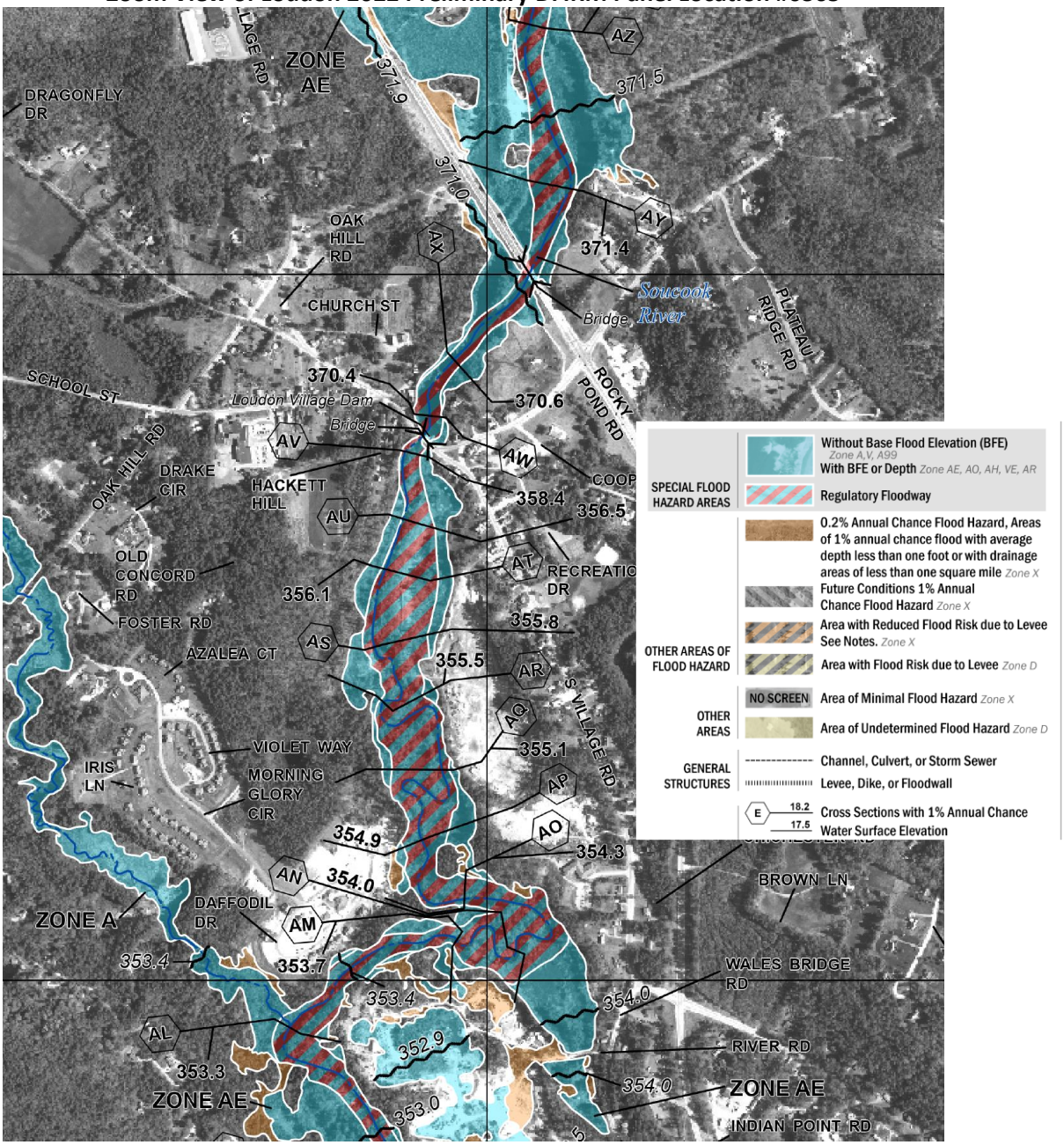
Figure 19
Zoom View of Loudon 2010 DFIRM Panel Location #0365



Source: FEMA DFIRMS 2010 for Loudon NH, Panel #0365

Figure 20 is a comparison to the 2010 DFIRM, with the Preliminary **2022** Panel map of the same location. The new DFIRM provides greater clarity and adjustments made to the Special Flood Hazard Areas (SFHAs). One of the largest revisions is the designation of Base Flood Elevations (BFEs) and the **Soucook River's** new Regulatory Floodway.

Figure 20
Zoom View of Loudon 2022 Preliminary DFIRM Panel Location #0365



Source: FEMA Preliminary DFIRM 2022 for Loudon NH, Panel #0365 with legend

Waterbodies

Loudon has several areas particularly susceptible to flooding. The Soucook River bisects the Town in a nearly perfect north-south direction. The Village Dam over the Soucook on South Village Road had a past tendency to flood before modifications were made to the south abutments. The north side of the dam also needs re-engineering of the abutments and the headwall. However, there are many hilly roads in Town that frequently washout during flash flooding and heavy rain events. Some key culvert pipes need to be up-sized to address the increased water.

- **Watercourses:** Soucook River, Academy Brook, Bumfagon Brook, Clarke Brook, Pine Island Brook, Bee Hole Brook, Giddis Brook, Gues Meadow Brook, Shaker Brook.

- **Waterbodies:** Rocky Pond, Crooked Pond, Hoit Marsh, Clough Pond, Hothole Pond and Sanborn Pond.

Road Washouts

Some of the local Town Class V maintained roads in Loudon are constructed using ditching; storm drains are found along the densely developed paved roads. About **71.3 miles** of the Town maintained (Class V) roads are located throughout Loudon. Regular road washouts currently include:

- All gravel roads
- Berry Road (Clough Pond)
- Currier Road
- Flagg Road
- Old Shaker Road
- Bumfagon Road
- Bear Hill Road on the west side
- Terry Drive
- North & South Village Road
- Pleasant Street
- Gilmanton Road

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

The meandering Soucook River make the Town particularly susceptible to flooding. The following areas have been identified by the Hazard Mitigation Committee as being immediately susceptible to the impacts to **flooding**:

- Route NH 106 and NHMS Area
- Sanborn Road and Pittsfield Road Bridges
- School Street and Oak Hill Road Crossed by Pine Island Brook

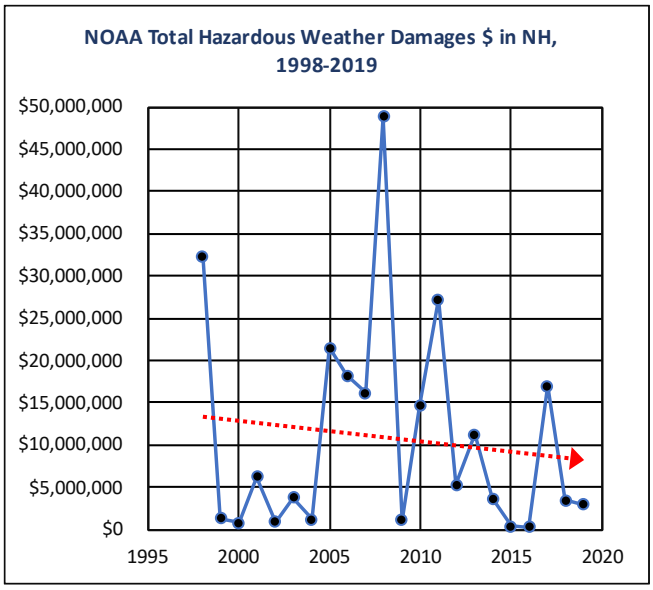
Local Climate and Extreme Weather

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 Loudon 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**



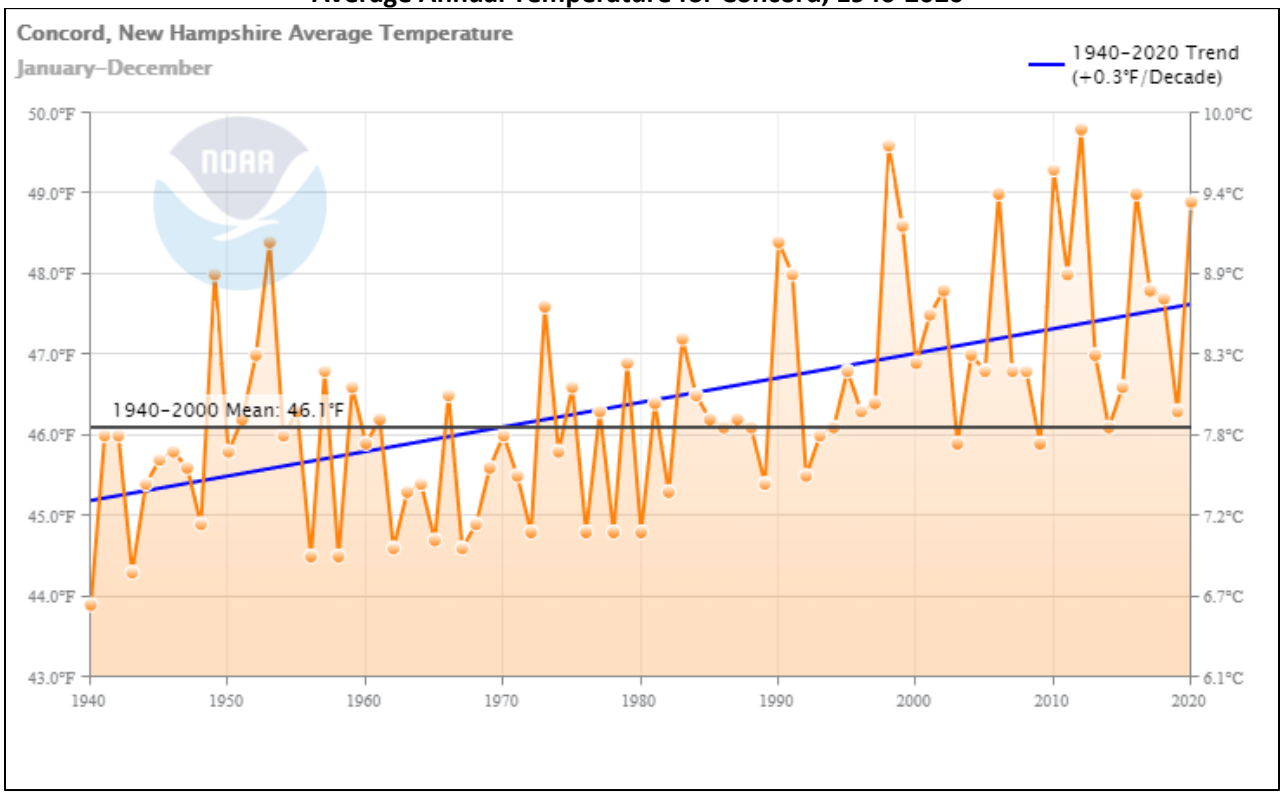
Source: National Oceanic and Atmospheric Administration, last accessed 03/21.
Adjusted for inflation [Consumer Price Index CPI)]
https://www.weather.gov/hazstat/

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**. Loudon is geographically close to the City of Concord (within **5** miles) and these measurements should have some reasonable basis in Loudon, 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 Loudon.

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

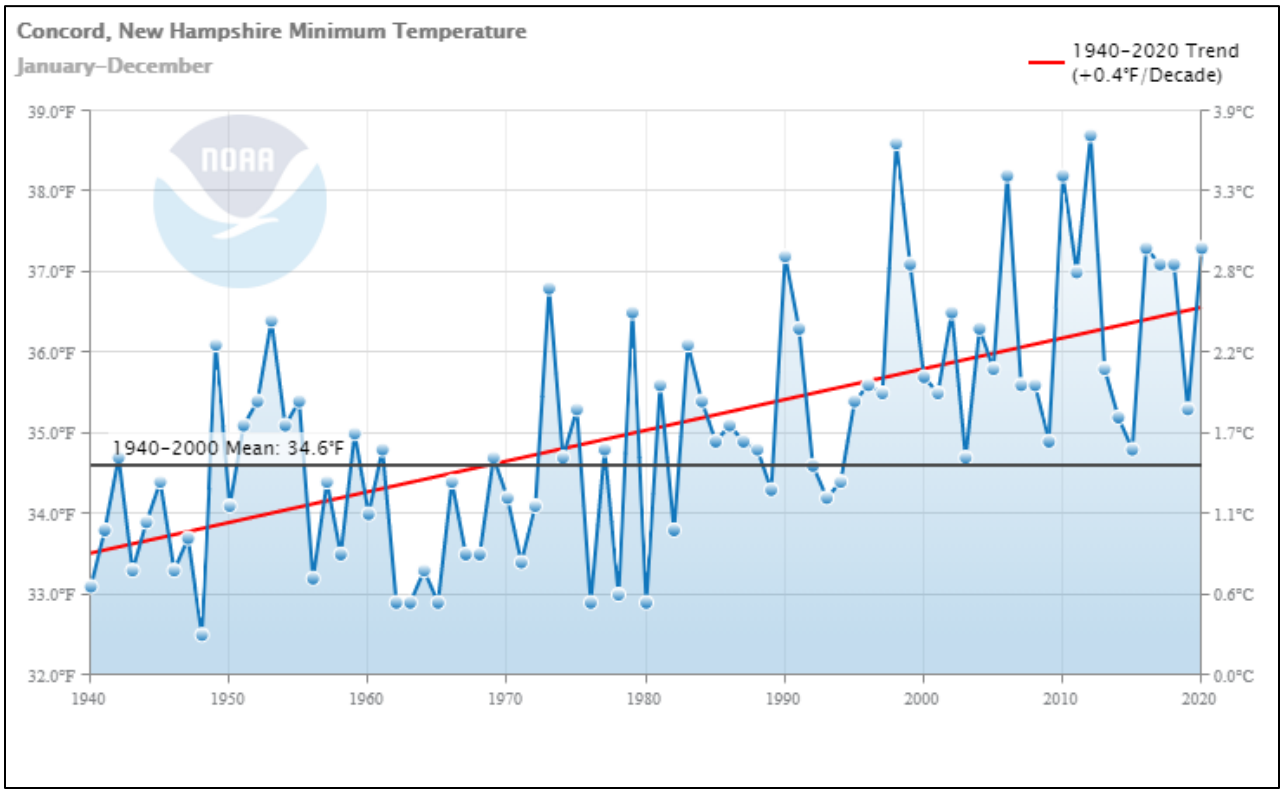
Another way to evaluate how the temperatures is to measure the minimum annual temperatures and maximum annual temperatures are changing. Both the coldest and the hottest temperatures are growing warmer in the Central NH region, which includes Loudon.

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



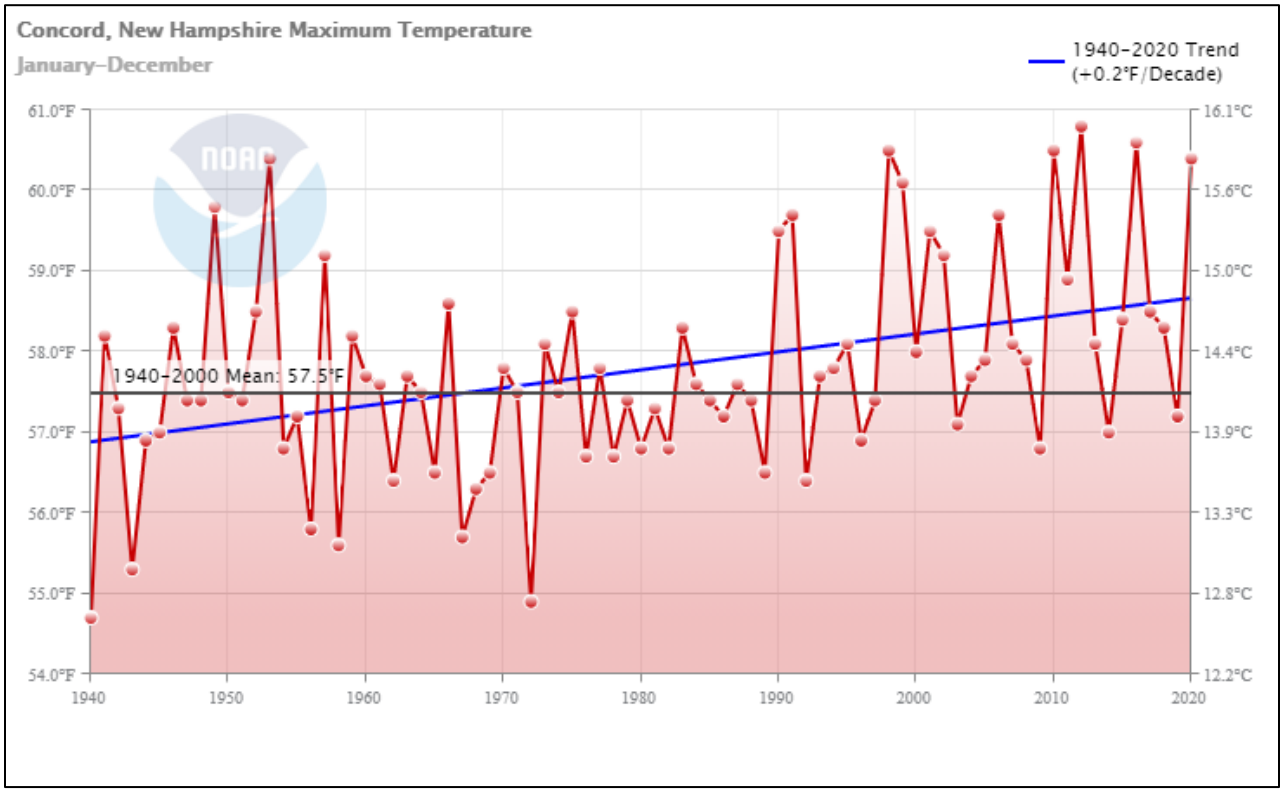
Source: National Oceanic and Atmospheric Administration, last accessed online 03-31-21

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

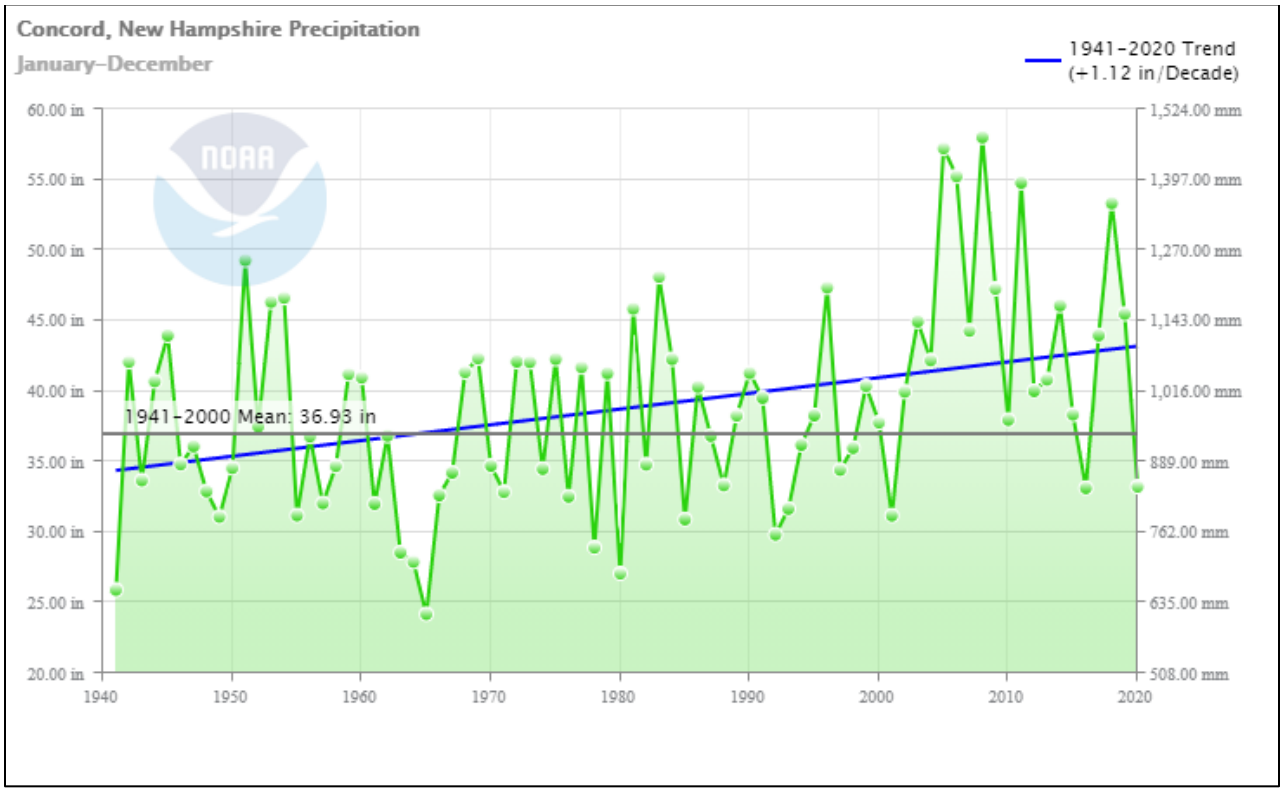


Source: National Oceanic and Atmospheric Administration, last accessed 03-31-21

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. Loudon will have experienced similar conditions.

Figure 24
Average Annual Precipitation for Concord, 1941-2020

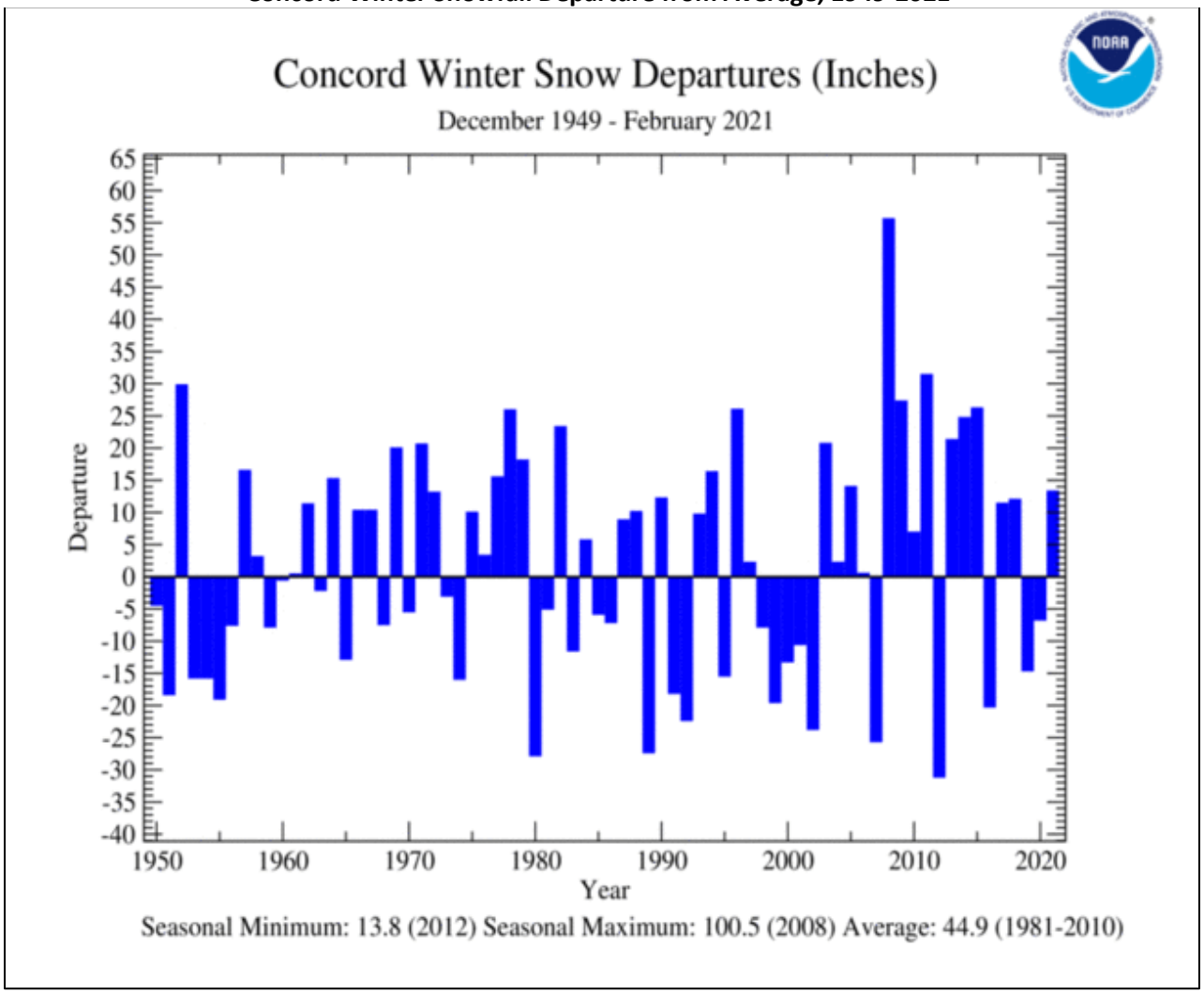


Source: National Oceanic and Atmospheric Administration, last accessed 03-31-21

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**.

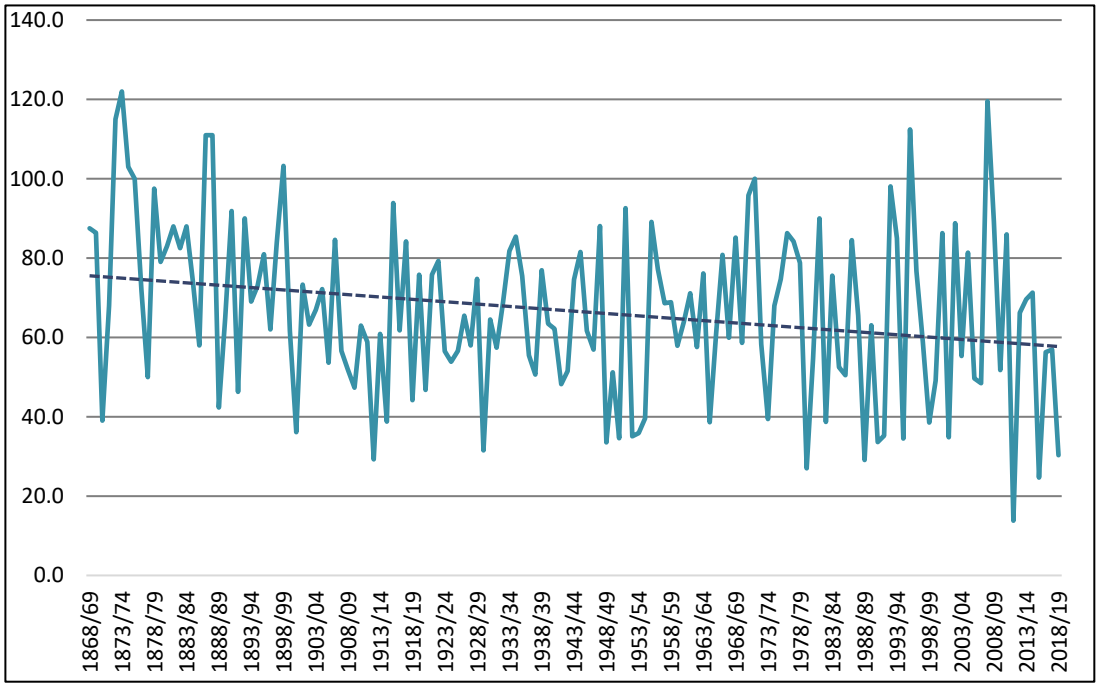
Figure 25
Concord Winter Snowfall Departure from Average, 1949-2021



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. Loudon 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 Loudon. 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 Loudon are within southern New Hampshire. The past and future Southern NH climate overview is illustrated in **Figure 27**.

As a result of anticipated extreme weather continuing and climate changes in Central NH and Loudon, 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***.

Figure 27

Southern NH Climate Assessment Projections

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, Emerald Ash Borer, Red Pine Scale, future likely Lantern Moth infestation of maple trees.
- ☞ 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 impacted by flooding and cannot perform their function.
- ☞ Blocking of water can lead to flooding of the area and roadways, potential 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 Loudon. 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**.

Loudon'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 Loudon'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 population and housing increases over the last **5** years from **2 COMMUNITY PROFILE**, but aging citizens and individuals with limited access and functional needs require more services and assistance. Traffic continues to increase within Town because of NH 106 and NH 129 commuter routes through Loudon as well as the popularity of the NH Motor Speedway events. The need for volunteers increases annually as fewer younger people are joining Town Boards and Committees and finding new people volunteer to serve is difficult. Existing volunteers typically continue their services for many years. Membership in the Capital Area Fire Mutual Aid Compact (CAFMAC) Dispatch has enabled for faster emergency response for Fire Department and Ambulance 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 and response opportunities. 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 Public Works Department labor and vehicles from across the State during times of need. With Loudon's NH Motor Speedway on NH 106 hosting NASCAR events, more local, regional, state, NGO and federal partners are available to assist.

THE TOWN'S STATEMENTS OF VULNERABILITY CHANGE

2022

Natural Disasters Vulnerability The Town's overall vulnerability to natural disasters **is believed to have INCREASED over the last 5 years**. Factors considered include its steady population and housing growth and aging population, the changing climate and severe weather impacts, tree fall during wind or winter events, and continuing disasters and hazard events, and the same number of Town emergency and response personnel have remained the same as in 2017. On the positive side, there have been fewer storms, resulting in less road flooding, less debris and faster damage repair, regular infrastructure improvements and upgrade, more development, and good preparation and mitigation to date, keeping up with improvements.

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 Soucook River, and the Town's brooks, and waterways, often wash out or erode portions of gravel roads, ditches, and drainage systems. Yet floods have not recently reached the **100-**year storm event level. The rain that is unable to run off in the cold months or during the torrential downpours washes out some of the **50** miles of Town maintained roads. Increased traffic accidents result from the weather and road conditions.

More rain is falling more quickly in downpours, and although the roads are mostly good now, washout issues remain the same. Tree debris remains the same because of Eversource and Unitil trimming activity. The Town upgraded culverts underneath roads yet has been experiencing drought conditions as opposed to flooding over the last five years. The potential for a breach at the Town-owned Village Dam increases due to deferred maintenance.

As a mostly forested community, a significant future concern to Loudon is the large die-off of trees (including ash, hemlock, pine trees) which hold the water supply, serve as carbon storage, maintain a healthy local hydrologic cycle (tree transpiration), guard against erosion on the hills to the roads, and host recreational trails. The trees are dying from invasive species (Woolly Adelgid, Emerald Ash Borer, Red Pine Scale, etc). In the future, the Lantern Moth is anticipated to infest New Hampshire and may reach Loudon.

The Clough Pond Association has a lake host program to deter milfoil from Clough Pond boat launch, which also serves as the Town beach. Rocky Pond has milfoil but is harvested annually for removal. Clough Pond regularly has had cyanobacteria blooms which close the facilities. In Crooked Pond, cyanobacteria was found in 2018.

When the normal 4- season climate varies, Loudon has significant recreational economy to be negatively impacted with the NH Motor Speedway. Issues with the Clough Pond Town Beach could increase (algae blooms, aquatic invasive species) could occur with more traffic or development of the area. The Loudon Country Club also brings in recreational monies. The unpredictable weather **since the last Plan has** brought more rain and washouts, more significant or damaging weather events to aging infrastructure (road, bridges, water, sewer, dam, gas, and Town services). Infrastructure upkeep is expensive to maintain. The Town **will not quite be able** to adequately continue optimal services and infrastructure upgrades with future population and housing growth without increased funding, additional staffing, and new equipment.

Town Demographics and Housing Changes

The Town is at greater risk from not only the natural hazards, but also from the changing population characteristics in Loudon. The more affordable housing in Loudon are the manufactured housing parks that attract people with fewer discretionary resources because of their lower pricing and nearby services. 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. In-migration of young college-educated professionals (Millennial Generation) are moving back to Loudon to live with their parents because of pandemic-related issues, encouraged by proximity to Concord and Manchester (30-minutes), and because of high housing costs. There are few jobs in Loudon 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. Additional housing developments containing smaller, multifamily units have been built to fulfill certain housing needs, such as for those over 55 in age. These units are in high demand, are listed at market rate, and both the elderly/retired and young families compete for this housing.

Since the last **Plan**, there are multiple neighborhoods with newly built out homes: the Madison Way, The Villages at Loudon, Memory Lane, Clearview, Creekwater, Chichester Road, Lower Ridge Road, and Flagg Road neighborhoods cannot easily increase further. Bert Lane and Dragonfly Lane were built out prior to 2017. Clough Pond is also fully built out, although many are trying to redevelop the surrounding properties. The area surrounding Clough Pond was initially constructed on unsuitable land and most of the seasonal camps have been transformed to year-round homes.

The townspeople are aging and the need for services increases, although trends have been noted that people who have lived in Loudon for decades may be moving out for assisted or independent living services, there is little availability to downsize to the single-level, ranch style homes that the aging population is looking for in Loudon. Senior programs and classes are available at The Villages and the Community Building (Charlie's Barn). The Town offers emergency Fire, Ambulance, and Police services seven days per week and with on-call, 24 hours per day availability. Loudon continues to have a strong volunteer ethic for Town Committees and Boards and organizations.

Economic Changes

Years when the economy is good, new business development will occur. In the Town are dozens of active commercial and industrial businesses mostly along NH 106 and along with an unknown number of home-based businesses. Home businesses are encouraged

in the community. A diverse tax base enhances funding for long-term mitigation planning projects. Class VI gravel roads and conservation land trails are used for bicycling and walking. Several excavation businesses are situated along the Soucook River to obtain sand and gravel.

New businesses include Dollar General, a gas station, changing restaurant owners, Core & Main (industrial), Bright Farms (was Lef Farms), Shaker Brook Industrial Park (two new buildings), Best Septic, Under His Wings Daycare, and Healthy Heart veterinary clinic expansion. New wedding venues at Currier Hill Farms and Mountainview Stables bring in further recreational tourism dollars. In the application process is American Cranes (industrial). Still, some Loudon residents are believed to work from home as a permitted business, but more are thought to be operational without permits.

Loudon residents can commute 15 minutes to work in Concord or can reach Manchester within 35 minutes. Today, the option to telecommute is growing stronger. There are many local employment opportunities available in Loudon, although most workers commute using NH 106 to 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 a growing older population, the Town of Loudon may be challenged to raise taxes for mitigation projects. **The ability of the infrastructure to meet the Town's needs remains difficult**. For instance, limited funding is available to upgrade the Town's Class V roads (**71** miles). The Town owns but is not responsible for the maintenance of nearly **13** miles of Class VI Town roads. Nearly **20** miles of state roads require maintenance in Loudon. Mitigation Actions were developed for many aspects of Town infrastructure, yet over the last **5** years, there was not enough funding or the staffing capability to see many of the infrastructure projects through to completion.

A new Town Office was constructed in 2017 and is modernized to fulfill Department operational needs. The Safety Center houses the Fire Department, Police Department, and Emergency Operations (EOC) Center, but some structural upgrades are necessary. The Public Works Garage requires some facility upgrades or a new facility. 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 maintains an active CIP, but 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 is increasing with no end in sight. The cost of bridges upkeep is high and rehabilitation costs of Town roads, buildings, dams, and the services provided by Departments are too high to be sustainable with any future

housing and business development without adding staff. The Town could seek 75/25 federal funding for high priority bridges, including the HMGP and BRIC programs. Not enough funding through taxation is available to repair the existing infrastructure, and grant funds are competitive and require staff management and completion time, although sometimes the Town can be proactive, such as securing RSMS transportation funding. Most of Loudon's paved road infrastructure, culverts, and bridges age **5** years with every **Plan** without upgrades.

Overall Natural Hazards Vulnerability

With these risks, Loudon services strive to protect the Town from natural, human, and technological hazards. These protections arise from select infrastructure and service improvements to past vulnerable areas which were identified and mitigated where feasible by the Public Works Department, Emergency Management, Police Department, Fire Department, and Town Administration. The Town is assisted by the State of New Hampshire and holds memberships agreements with organizations and neighboring towns for aid. Some of the major issues cannot be fully mitigated, such as the challenges at the NH Motor Speedway and declining forest and water resource health. Balancing the Town's physical and demographic changes with the changing climate and the potential for hazard events, **Loudon's overall natural hazards vulnerability has INCREASED over the last 5 years**.

2022

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, regular Information Technology (IT) improvements to combat human hazards, 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 which include aging infrastructure and the need for electricity and internet.

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 response (Emergency Management, Fire, Police, Ambulance) 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 NH Motor Speedway still remains a high hazard potential and for each NASCAR race, and multiple local, regional, state, and federal departments participate to plan for spectator and participant safety. There is a greater potential for human hazards, although they have not yet escalated.

The Fire Department call volume and Police Department call volume have increased since **2017**. More human hazards have been experienced in the Town, but none that are especially alarming. At the Loudon Elementary School, the increased use of social media is believed to increase the volatile situations and bullying handled by emergency response personnel responding to an increase in mental health crisis calls by younger residents. Homelessness has increased, based on the calls to remove larger encampments from private property. The Police Department no longer has records of firearms in the community since the handgun permit was eliminated by the State.

Stress levels in the community have increased as noticed by Departments and the School District. The COVID-19 pandemic has 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

More people work from home since **2017** and the broadband internet infrastructure is inadequate for the needs. Internet is unreliable in Loudon. People tend to move to Loudon because property taxes are reasonable. Business development is convenient in Town, which continues to attract more industrial and commercial business.

Traffic crash locations continue to occur at Clough Hill and NH 106. The NHMS continues to impact the Town through immense traffic volume, inconvenience to residents, and increased need for emergency services.

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, in the cloud 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.

Cyber incidents have increased dramatically. 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 Loudon, which is not anticipated to be able to keep pace with advanced, changing technological risk. 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 Loudon's population, emergency services, and Schools more vulnerable to the effects of cyberattacks.

Overall Human and Technological Hazards Vulnerability

The Town itself remains well **protected** from human hazards by partnerships among Town Departments, Loudon School District, mutual aid agreements, and emergency response and membership with the Capital Area Mutual Aid Fire Compact (CAMACF). Yet there is great potential for a human or technological hazard event with NH Motor Speedway and other businesses in Town. With the future factors considered, **the Town's vulnerability to these hazards has INCREASED** and is anticipated to continue increasing to **2028** and perhaps indefinitely.

FUTURE DEVELOPMENT IN LOUDON

The Town has 5 established Economic Revitalization Zones (ERZ) along NH 106 to encourage commercial and industrial business. Some of these ERZs have natural gas available, and some have been built out. For new homes, subdivisions and large lots with the potential to subdivide are located everywhere.

Many of the Town's roads and homes are in remote locations, while others are located in Loudon Village and residential communities. Many homes were newly constructed since the **2017 Plan**. Loudon is accessible via the primary NH 106 and NH 129 corridors and local roads such as Old Shaker Road, School Street, Lovejoy Road, Chichester 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 roads, lots built on backlands, near **wetlands** or **steep slopes**, or in-fill development around Loudon Village and NH 106. **Floods**, **landslides**, **erosion**, and **fires** could occur in these potential residential areas. **Severe winter weather**, **storms** and **wind events** on these hilly locations will bring trees down on roadways, interrupt **power and communication** services and will **flood** ditches and **wash out** roads.

Dozens of large businesses are located in Loudon and many new business subdivisions are anticipated in the ERZ areas. Infill development between existing built areas could guide residential and light commercial development as mixed-use in the community. About two dozen conservation easements protect some of Loudon's land from development. **Large-scale commercial/industrial** and **mid- to large scale residential developments** are expected to occur in Loudon in the future.

The risk of **Soucook River flooding** is always present. Most of Loudon's development is on a higher elevation than the **Soucook River** or is buffered by open lands until Loudon Village and the Village Dam. 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 preferrable 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 growing need for technology infrastructure – broadband or fiber optic internet, natural gas connection- will increase in the future. 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**.

THIS PAGE INTENTIONALLY LEFT BLANK

5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

The Hazard Mitigation Committee developed and/or updated as needed each of the assets tables within this Chapter. Sites were added or removed, and contact information was revised. Modifications were made to the ***Primary Hazard Vulnerability*** column to reflect changes over the last five years. Revisions were made to the future development section, which now includes a clear table. The Plan's maps were also updated from the **Loudon Hazard Mitigation Plan 2017**.

The identification of Critical and Community Facilities within Loudon 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 Loudon 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 Assessed Valuation 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 as well as human hazards such as vandalism/ sabotage.

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

Potential dollar losses for each of the facilities' ***Structure Replacement Value $*** (not land) have been obtained through the Apr 2021 assessing software and the 2020 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 Loudon from flooding and other natural hazards are provided using the methods described in the chapter. The Town's participation in the National Flood Insurance Program (NFIP) offers a way for individuals to obtain insurance coverage for flooding. The Town's history with NFIP claims and repetitive losses are examined.

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

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

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 Loudon Town Department facilities, the Town Offices, Fire Department & Police Department (Safety Complex), Public Works, Transfer Station and Rescue Ambulance provide the services necessary for coordinating everyday activities and for emergency response. Other critical partners such as the Schools District provide essential services. Many staffed and unstaffed support facilities are located in Loudon, such as Maxfield Public ibrary. Maintained roads, dams, and bridges are required for safe operation during both normal times and hazard events. Utilities or utility features such as cisterns, culverts, dry hydrants, telecommunications towers, phone and internet switching stations, gas lines, water & sewer lines, and electric transmission lines are included because of the essential communication and utility services provided, and their significant impact on Loudon residents when they fail. Other **Critical Facilities** would include educational facilities, medical facilities, and emergency shelters.

Many critical facilities are located in Loudon. 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: Clough Hill Road Fire Station, Community Building (Charlie's Barn), Fire Department, Highway Department, John O'Cate Van Garage, NHDOT Shed 316, Oak Hill Fire/Communications Tower, Police Department, Town Salt Shed, Transfer Station/Recycling/Compactor Buildings, New Town Office, Highway Department Storage Shed. **Assessed structure (only) valuation for these essential facilities total $2.7m.**

Utilities include: Cascade Campground Community Water System, Eversource Electric Substation (Bee Hole Road and Oak Hill Road), Fairpoint Telephone Switching Station (North Village Road, Pittsfield Road, and Flagg Road), Freedom Co-op Manufactured Housing Park Community Water System, Liberty Natural Gas Aboveground Valve (Old Shaker Road, Shaker Roads, Route 106), Liberty Utilities Natural Gas Regulator Station, Liberty Utilities Natural Gas System, NH Motor Speedway Community Water System (Seasonal), Presidential Pines Manufactured Housing Park Community Water System, Scotch Pines Manufactured Housing Park Community Water System, TDS Telephone Switching Station (Bee Hole Road and Route 106), Telephone Switching Station, The Villages Community Water System, Town Buildings Community Water System . TELECOMMUNICATIONS TOWERS: AT&T Cell Tower (Pleasant Street), NHMS Cell Towers, Sprint-Nextel Cell Tower (Route 103 Tree), Crown Castle Cell Tower Map. FIRE SUPPRESSION: 30 Chichester Road Cistern (30,000 gal), 44 Old Shaker Road Dry Hydrant, 7316 Pleasant View Gardens Dry Hydrant, 92 Loudon Ridge Road Dry Hydrant, Beck Road Dry Hydrant, Bee Hole #1 Road Dry Hydrant,

Bee Hole #2 Road Dry Hydrant, Bert Lane Cistern (30,000 gal), Creekwater Lane Cistern (20,000 gal), Greenview Drive #1 Dry Hydrant, Greenview Drive #2 Dry Hydrant, International Drive Dry Hydrant, Loudon Ridge Road Dry Hydrant, Memory Lane Cistern (30,000 gal), NHMS Dry Hydrant, Oak Hill Drive Dry Hydrant, Piper Hill Road Dry Hydrant, Pittsfield Road Cistern (30,000 gal), Redwood Road Dry Hydrant, Route 129 Dry Hydrant, Sanborn Road Dry Hydrant, School Street Cistern (30,000 gal), South Village Road Dry Hydrant, Wellington Lane Cistern (30,000 gal). **Assessed structure (only) valuation for these utility structures total $25.9m.**

Dams include: **2** High Hazard (**H**) Dams: 143.010 Sanborn Pond Grist Mill Dam (Sanborn Mills Inc), 143.011 Sanborn Sawmill Dam (Sanborn Mills Inc) **0** Significant Hazard (**S**) Dam; **3** Low Hazard (**L**) Dam- 143.018 O'Brien Recreation Dam (OBrien), 143.022 Holt Meadow Pond Dam (Highview Meadows LLC), 143.031 Country Club 12th Hole Pond (The Ledges Golf Links Inc); and Exempt Dams (from classification): 143.005 Soucook River I Dam (Town), 143.006 Giddis Brook Dam (Kimpton), 143.007 Clough Pond Dam (NH F&G), 143.012 Fish Screen Below Crooked Pond (NH F&G), 143.014 Cascade Campground Dam Fire Pond (Ives), 143.015 Soucook River II Dam (Arel), 143.016 Farm Pond (Johnston), 143.017 Recreation Pond (Stevens), 143.019 Pineridge Detention Pond Dam (Borowski), 143.020 Champagne Recreation Pond Dam (Champagne), 143.023 Sedimentation Basin A (HPH Gravel), 143.024 Sedimentation Basin B (HPH Gravel), 143.026 Loudon Country Club Pond Dam (Loudon CC), 143.027 Speedway Northeast Pond Dam (NHMS), 143.028 Mitigation Pond 2 Dam (NHMS), 143.029 Speedway Middle Pond Dam (NHMS), 143.030 Pleasant View Gardens Detention Pond Dam (NEFF LLC). **Estimated structure (only) repair values for these dams total $11.5m**.

Bridges include: **14** TOWN BRIDGES: 044/048 Staniels Road over Soucook River, 054/065 Wales Bridge Road over Soucook River, 061/044 Chichester Road over Bee Hole Brook, 069/084 South Village Road over Soucook River, 080/059 Cross Brook Road over Bee Hole Brook, 096/100 Currier Road over Soucook River, 104/133 Old Shaker Road over Shaker Brook, 135/127 Clough Hill Road over Soucook River, 147/125 Mackenzie Road over Academy Brook, 164/124 Lower Ridge Road over Academy Brook, 172/052 Sanborn Road over Sanborn Brook, 177/123 Bumfagon Road over Academy Brook, 187/112 Kenney Road over Academy Brook, 199/113 Loudon Ridge Road over Academy Brook. **5** STATE BRIDGES: 056/063 NH 106 over Soucook River, 074/086 NH 106 over Soucook River, 074/087 NH 106 over Recreational Trail, 100/114 NH 106 Shaker Brook, 161/050 Pittsfield Road over Sanborn Brook. **2** LOUDON/CANTERBURY BRIDGES: Canterbury 227/122 NH 106 over Gues Meadow Brook, Canterbury 236/156 NH 106 over Soucook River. **Estimated structure (only) rehabilitation values for these bridges total $27m**.

Shelters, Schools, and Medical Facilities include: SCHOOLS: Loudon Elementary School (Town Shelter). MEDICAL FACILITIES: NHMS Infield Hospital *drivers only, during races*, Health Heart Veterinary Clinic. **Assessed structure (only) valuation for these schools, medical facilities and shelters (Town Office only) total $4.6m.**

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**. 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 Highway Department Garage is not large enough, causing trucks to be parked too close together and the building requires too much maintenance. The best location for a new highway garage is the Transfer Station property – sand and salt are stored there, it is more central, and close to NH 106.
- Police and Fire Department building has problems with vectors – rodents and birds. Animal pests can affect public health and result in communication systems failure when they chew through or tamper with wires.
- John O'Cate Van Garage has foundation and structural problems. Ongoing discussions are being held on how to resolve the issues.
- INFO: The Town Office is installing a backup generator and researching a water treatment system (arsenic).
- INFO: Solar panels have been installed on the Town Office with a $0 balance from Eversource. The Array was purchased from the Town fund.
- INFO: A new equipment shed at the Transfer Station was erected to store spare trucks.

Utilities Table

- Oak Hill Tower Road washes out regularly. The road has a ledge on the sides and the Highway Department can only fill the potholes. The State NHDRED owns the road and must improve maintenance.
- Longer and larger gas lines run along NH Route 160 (Josiah Bartlett to Shaker Roads). There is potential for bigger leaks, explosions, larger vapor clouds, traffic disruptions, and more. An older Liberty Gas line runs through the Village which could be hazardous, despite appearing to be in good condition.
- The Oak Hill Road substation is not large enough for its current needs. Eversource provider must upgrade or replace the facility to supply enough electricity.

- The Fire Department is dependent on dry hydrants but is affected by a general lack of water for fire suppression during drought conditions. Difficulties also arise during winter and mud seasons. Maintenance requires dredging for most dry hydrants.
- The privately owned cistern on Memory Lane has leaks, losing 5,000 gallons of water every 4 months. The Fire Department will top off the cistern, but it must be fixed before the road is taken over the town as a Class V Road.
- INFO: The Loudon Fire Department has access to the Oak Hill Tower for the times when no staff is present in the tower. There is a camera to remotely watch the tower and entrance.

Dams Table

- The latest Dam Emergency Action Plans (EAP) of High and Significant Hazard Classification Dams from NHDES need to be obtained.
- The north side of the Village Road Dam needs repairing, or a breach and flooding could occur.
- Sanborn Farm and Mill Dams has the potential to cause major flooding.

Bridges Table

- Currier Road Bridge has the potential to flood. The road's elevation could be increased, and guardrails added to create a dam with the road. Along the waterway there is sandy soil with pine trees lining the shore. Many trees accumulate below the bridge.
- Wales Bridge Road Bridge was previously state owned, now the long and tall bridge with little traffic is owned by the town and redlisted. It is recommended to close the bridge when it becomes impassible. The NHDOT suggested reducing weight limits but in the future the road may become a dead end.
- Lower Ridge Bridge at McKenzie Road decking is set to be replaced due to salt corroding the deck. This is a potential issue for all bridges in Town.
- There are 14 bridges to maintain and rehabilitate in Town.
- Lower Ridge Road bridge has a concrete rail system that needs to be replaced. The Structure is built on a 22 degree angle and is stable. However, three bridges take priority.
- INFO: Currier Road, Cross Brook Road, and Chichester Road bridges have flooded in the past. Since then, they have been enlarged and upgraded, but still have the potential to flood again.
- INFO: After the 2006 flood, the Chichester Road Bridge was replaced. This serves as the best example of what should be done in the rest of Town. The new bridge consists of

prefab concrete with 4' of fill over the top, no bottom, and galvanized guardrails. The hard structure was placed with a crane.

Shelters, Schools and Medical Facilities Table

- The Loudon Elementary school is the designated town shelter. It is equipped with a generator, but showers would need to be brought in. Assembly permits would be required.

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

CULVERT UPGRADES

A table of culverts in need of upgrade could appear in multiple sections, such as the **Critical and Community Facility Vulnerability Assessment** (**APPENDIX A**) or with the **Aging Infrastructure** technological hazard. Instead, as critical facilities, they are included here once within this section and also appear within the **Mitigation Action Plan 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 Loudon 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 Loudon'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. The estimated cost for these projects reaches well over **$85,000** 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 **2022-2028** 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
#58-2022	**Old Shaker Road**	1	Shaker Road intersection	15" alum crushed, upgraded with 24" plastic	24"	Oct-22	**$10,000**
#59-2022	**Blake Road**	1	Intermittent Stream	24" rusted steel, upgraded to 36" plastic	36"	Oct-22	**$10,000**
#60-2022	**Old Shaker Road**	1	Hunting Swamp Crossing between Flagg Rd and Lovejoy Rd	Remove 36" steel, replace with 48" round reinforced concrete, not a box culvert. Limited to sizing by turtles.	48"	2023-2024	**$30,000**
N/A	**Old Shaker Road**	3	Runoff	Aging Pipes	15"	2023	$15,000
N/A	**Beck Road**	1	Runoff from Fire Pond	Aging Pipes	15"	2023	$5,000
N/A	**Clough Hill Road**	3	Runoff	Aging Pipes	15" - 18"	2023	$15,000
	Totals	**10**					**$85,000+**

Source: Loudon 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**. Two of these projects had been completed during Plan development.

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 Loudon has about **108.2** total miles of roadway including **71.3** miles of Town maintained Class V (both paved and unpaved roads), **17.5** 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. Loudon residents reside in neighborhoods, in remote areas, manufactured housing parks, 55+ and older communities, 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

Loudon Roads Legislative Classification	Total Length in Miles	Percentage of Road Network
Class I (State Primary Highway)	9.0	8.4%
Class II (State Secondary Highway)	10.4	9.6%
Class III (State Recreational)	0.0	0.0%
Class IV (Urban Maintained)	0.0	0.0%
Class V (Town Maintained)	71.3	66.0%
Class VI (town Unmaintained)	17.4	16.1%
Private	0.0	0.0%
Totals	**108.2**	**100.0%**

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

The Town of Loudon is responsible for **71.3** 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 Loudon hosts more than average roadway miles.

ONE-EGRESS ROADS AND CUL-DE-SACS

The Town of Loudon has more than **16** miles of roadway, including Town maintained Class V roads, that are dead-end roads or cul-de-sacs with only one way in and one way out. An estimated 1,666 people live in more than **690** housing units along roads which have no secondary means of access. 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. The 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 Hazard Concerns	Condition (Good, Fair or Poor)	Approx. Length in Feet	Approx. # of Homes on Rd	Neighborhood Name (If Applicable)
Azalea Court	Private	Tree Fall, Winter, Erosion	Good		100	The Villages 100+
Bear Hill Road	**Class V**	Tree Fall, Winter, Erosion	Fair	7,233.6	26	
Beck Road	**Class V**	Tree Fall, Winter, Erosion	Good	3,696.0		
Beech Street	Private	Tree Fall, Winter, Erosion	Good		100	Freedom Hill 100+
Berry Road	**Class V**	Tree Fall, Winter, Erosion	Fair	5,280.0	30	Clough Pond Assoc.
Bert Lane	**Class V**	Tree Fall, Winter, Erosion	Good	1,320.0	9	
Blake Road	**Class V**	Tree Fall, Winter, Erosion	Fair	4,224.0	2	
Chestnut Circle	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Clarke Avenue	**Class V**	Tree Fall, Winter, Erosion	Good	686.4	4	
Clearview Drive	**Class V**	Tree Fall, Winter, Erosion	Good	1,636.8	13	
Clinton Street	Private	Tree Fall, Winter, Erosion	Good		54	Presidential Pines
Cooper Street	**Class V**	Tree Fall, Winter, Erosion	Fair	528.0	1	
Cooper Street Extension	**Class V**	Tree Fall, Winter, Erosion	Fair	528.0	5	
Country Hill	**Class V**	Tree Fall, Winter, Erosion	Good	1,584.0	13	
Crab Apple Way	Private	Tree Fall, Winter, Erosion	Fair		4	
Creekwater Lane	**Class V**	Tree Fall, Winter, Erosion	Good	1,584.0	13	
Cross Brook Road	**Class V**	Tree Fall, Winter, Erosion	Good	3,960.0	20	More than 20
Daffodil Drive	Private	Tree Fall, Winter, Erosion	Good			The Villages included
Dogwood Terrace	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Dragonfly Drive	**Class V**	Tree Fall, Winter, Erosion	Good	1,900.8	8	
Drake Circle	Private	Tree Fall, Winter, Erosion	Fair		5	
Dump Road	**Class V**	Tree Fall, Winter, Erosion	Good	528.0	0	
East Cooper Street	**Class V**	Tree Fall, Winter, Erosion	Fair	1,320.0	5	
Elm Place	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Fieldview Lane	**Class V**	Winter, Tree	Good	528.0	2	
Flagg Road	**Class V**	Tree Fall, Winter, Erosion	Fair	10,296.0	5	
Ford Terrace	**Class V**	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Foster Road	**Class V**	Tree Fall, Winter, Erosion	Good	1,056.0	3	
Grant Terrace	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Greenview Drive	Private	Tree Fall, Winter, Erosion	Good		23	
Hackett Hill Road	**Class V**	Tree Fall, Winter, Erosion	Good	528.0	3	
Hardy Road	Private	Tree Fall, Winter, Erosion	Good		12	
Hemlock Hill Drive	**Class V**	Tree Fall, Winter, Erosion	Good	3,696.0	18	
Hilltop Drive	Private	Tree Fall, Winter, Erosion	Fair		3	

One-Egress (One Access/ Exit) Road Name	Road Class (Class V, Class VI or Private)	Specific Hazard Concerns	Condition (Good, Fair or Poor)	Approx. Length in Feet	Approx. # of Homes on Rd	Neighborhood Name (If Applicable)
Hoover Circle	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Ilona Lane	**Class V**	Tree Fall, Winter, Erosion	Good	1,584.0	8	
Indian Point Road	Private	Tree Fall, Winter, Erosion	Fair		2	
International Drive	Private	Tree Fall, Winter, Erosion	Good		0	
Iris Lane	Private	Tree Fall, Winter, Erosion	Good			The Villages included
Jefferson Terrace	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Kenney Road	**Class V** & Class VI	Tree Fall, Winter, Erosion	Fair		24	
Lazy Pines Drive	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Lilac Drive	Private	Tree Fall, Winter, Erosion	Good			The Villages included
Lincoln Terrace	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Magnolia Drive	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Maple Terrace	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Memory Lane	Private	Tree Fall, Winter, Erosion	Good		12	
Merrill Lane	Private	Tree Fall, Winter, Erosion	Fair		1	
Minery Road	**Class V**	Tree Fall, Winter, Erosion	Fair		5	
Morning Glory Drive	Private	Tree Fall, Winter, Erosion	Good			The Villages included
North Pierce Lane	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Oak Hill Drive	**Class V**	Tree Fall, Winter, Erosion	Good	2,112.0	13	
Pierce Lane	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Pine Ridge Road	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Piper Hill Road	**Class V**	Tree Fall, Winter, Erosion	Good	4,329.6	13	
Plateau Ridge Road	**Class V**	Tree Fall, Winter, Erosion	Good	2,112.0	7	
Pleasant Street Extension	Class V, Class VI	Tree Fall, Winter, Erosion	Fair	2,270.4	11	
Presby Lane	Class V	Tree Fall, Winter, Erosion	Good	1,425.6	2	
Rainbow Drive	**Private**	Tree Fall, Winter, Erosion	Fair		13	
Range Road	Class VI	Tree Fall, Winter, Erosion	Fair		3	
Redwood Road	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Ring Road	**Class V**	Tree Fall, Winter, Erosion	Fair	3,696.0	3	
River Road	Private	Tree Fall, Winter, Erosion	Fair		1	
Riverview Lane	**Class V**	Tree Fall, Winter, Erosion	Good	2,112.0	8	
Sanborn Road	**Class V**	Tree Fall, Winter, Erosion	Good	4,224.0	5	
Shaker Brook Industrial Park	Private	Tree Fall, Winter, Erosion	Good		0	
Shaw Road	Class VI	Tree Fall, Winter, Erosion	Fair		3	

One-Egress (One Access/ Exit) Road Name	Road Class (Class V, Class VI or Private)	Specific Hazard Concerns	Condition (Good, Fair or Poor)	Approx. Length in Feet	Approx. # of Homes on Rd	Neighborhood Name (If Applicable)
Soucook Lane	**Class V**	Tree Fall, Winter, Erosion	Good	792.0	1	
South Clinton Street	Private	Tree Fall, Winter, Erosion	Good			Presidential Pines included
Spring Street	Private	Tree Fall, Winter, Erosion				Scotch Pines
Stonegate Terrace	**Class V**	Tree Fall, Winter, Erosion	Good	792.0	4	
Sunset Drive	Private	Tree Fall, Winter, Erosion	Fair		4	
Targhee Drive	**Class V**	Tree Fall, Winter, Erosion	Good		5	
Taylor Haynes Road	Class VI	Tree Fall, Winter, Erosion	Fair		1	
Terry Drive	**Class V**	Tree Fall, Winter, Erosion		528.0	4	
Thistle Hill Road	**Class V**	Tree Fall, Winter, Erosion	Good	1,848.0	6	
Tote Road	Private	Tree Fall, Winter, Erosion	Fair		3	
Tower Road	Class VI	Tree Fall, Winter, Erosion	Fair		0	
Veterans Drive	**Class V**	Tree Fall, Winter, Erosion	Good		0	
Violet Way	Private	Tree Fall, Winter, Erosion	Good			The Villages included
Voted Road	**Class V**	Tree Fall, Winter, Erosion	Good		1	
Wellington Lane	**Class V**	Tree Fall, Winter, Erosion	Good	2,904.0	13	
Whitehouse Road	**Class V**	Tree Fall, Winter, Erosion	Good	1,584.0	3	
Wiggins Road	Class VI	Tree Fall, Winter, Erosion	Fair		3	
Willow Terrace	Private	Tree Fall, Winter, Erosion	Good			Freedom Hill included
Wyman Road	**Class V**	Tree Fall, Winter, Erosion	Fair	528.0	1	
			Total Feet One-Egress Roads:	**84,955.2+**	**664+**	**Vulnerable Homes**
			Total Miles One-Egress Roads:	**16.1+**		

Source: Loudon Highway Department Road Agent, Sep 2022

Using the **2020** Census calculation of **2.5** people per housing unit, there are about **1,660** residents living along more than **16** miles one-egress (one access/exit) roads. Emergency access and evacuation should be considered if these roads become blocked due to a severe wind or winter event or crash incident.

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: Community Bridges, Inc. – Home for Disabled (~4 beds), NeuroRestorative – Assisted Home (~3 beds). CHILD CARE FACILITIES; Under His Wings Daycare. MANUFACTURED HOUSING NEIGHBORHOODS: Freedom Hill Co-op – Manufactured Housing Park (~148 homes), Freedom Hill Co-op – 8 Community Buildings, Presidential Pine Enterprises Manufactured Housing Park (~57 homes), Scotch Pines – Manufactured Housing Park (~57 homes), Bert Lane/Loudon Woods Estates. APARTMENTS AND INDEPENDENT LIVING: The Villages of Loudon (~100 units), Volunteers of America – Independent Living Elderly Apartments (~32 units). **Assessed structure (only) valuation for these vulnerable population facilities total $55.0m**.

Economic Assets include those LARGE BUSINESSES **and services** that employ a large number of people or contribute to the local economy: Brookside Mall, Capitol Fire Protection, Central NH Trailer, Concord-Loudon Self Storage LLC, Dunkin Donuts, Filmore Industries, Harry O Electric, Loudon Building Supply, Loudon Village Country Store, NH Motor Speedway, Northern Design Precast, Penny Press, Plan-Tech Inc, Quality Inn, Speedway Self Storage, Tasker Landscaping LLC. AGRICULTURAL: DS Cole Growers, Grandpa's Farm, Meadowledge Farm, Miles Smith Farm and Inn, NEH Greenhouses LLC, Pleasant View Gardens, Red Manse Farm Organic Produce, Sanborn Mills Farm. See also **Hazardous Materials** facilities. **Assessed structure (only) valuation for these economic asset facilities total $17.7m**.

Hazardous Materials Facilities include: Beanstalk Convenience and Gas, Big Apple Store Loudon Shell, Eastern Oil and Propane, Environmental Soil Management Inc, E-Z Stop Gas Station, Huckleberry Propane and Heating, Z-1 Express Gas Station. AUTO REPAIR SHOPS: Big Ed Repair, Bollinger Park (10 units), E&W Auto, Heath Undercoating, J&D Repairs LLC, Jay's Auto Sales and Service, John George Garage, Kezar Auto, Lane's Garage, Loudon Garage, Stash's Garage. See also **Economic Asset** facilities. **Assessed structure (only) valuation for these hazardous material facilities total $6.6m**.

Cemeteries and Churches include: CHURCHES: Advent Christian Family Bible Church, Church of the Nazarene, Faith Community Bible Church, Landmark Baptist Church, Loudon Congregational Church, Loudon Free Will Baptist Church. CEMETERIES: Abbott Cemetery (State of NH), Blaisdell Family Cemetery

60/54, Blake Cemetery 36/14, Cate Cemetery 51/40, Cate Family Cemetery 60/17, Fletcher Cemetery, French Cemetery 36/3, Hill Cemetery 50/8, Hill Family Cemetery 50/4, Hilliard Cemetery 24/12, Ladd Cemetery 26/10, Loudon Center Cemetery (Active, Loudon Ctr Cem Assn), Loudon Mills Cemetery (Town), Loudon Ridge Cemetery (Loudon Ridge Cem Assn), Lougee Cemetery 50/59, Lovering Cemetery 49/106, Maxfield Cemetery (Town), Merrill Cemetery 27/1, Moore Cemetery (Active, Union Cemetery Assn), Moore-Sleeper Cemetery 45/5, Mount Hope Cemetery (Active, Union Cemetery Assn), Pearl Cemetery 59/14, Sleeper Family Cemetery 51/16, Smith-Sargent Cemetery 59/7, Whittemore Family Cemetery 58/5, Winslow Cemetery 4/11. **Assessed structure (only) valuation for church facilities and headstone replacement estimates for cemeteries total $3.2m**.

Historic Sites and Buildings include: Charlie's Barn/Historical Society/Community Building, North East Motor Sports Museum at NHMS, Oak Hill Fire Tower, Old Town Office – Historical Society, Sanborn Farm/Mill Buildings, Town Hall and Church – National Register, Town Pound, William Maxfield Monument. See also **Recreational and Gathering Sites**. **Assessed structure (only) valuation for these historic facilities total $1.85m**.

Recreational and Gathering Sites of both land and buildings include: Elementary School Fields, American Legion Post 88, Cascade Park, Landry Field (Town), Loudon Village Recreational Fields (DART), Maxfield Public Library, Recreational Skate Park, Town Beach. PRIVATE RECREATION: Loudon Country Club. EASEMENTS: Bachelder Parcel, Bachelder Town Forest, Bachelder Farm, Bearhill Commons Lot, Bergeron WMA, Bronnenberg Easement, Bumfaggon Brook, Cabot C.&P., Cabot/Holt Pond, Easement G, Flagg Lot, Grady Tract, Greene, Hoit Road Marsh WMA, Maxfield Lot, Merrill, J.M Merrill, R., Mitigation Tract, Oak Hill Fire Tower, Osborne WMA, Prescott, Sanborn Family Trust, Sleeper, Smith Tract, Soucook River State Forest, Soucook River WMA, Yeaton. 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 $1.2m**.

Future Development includes both residential and commercial development potential in Loudon. FUTURE DEVELOPMENTS. LEGACY PARCELS (large lots with development potential): Lovejoy Road Map 57 Lot 1 [180 acres], Lovejoy & Flagg Roads Map 57 Lot 11 [63 acres], 154 Blake Road Map 36 Lot 14 [114 acres], 1229 NH Route 129 Map 26 Lot 2 [112 acres], 117 Loudon Ridge Road Map 26 Lot 15 [190 acres], 7471 Currier Road Map 41 Lot 1 [133 acres], 7384 Currier Road Map 32 Lot 5 [126 acres], 7577 Currier Road Map 42 Lot 7 [144 acres], 251 East Ricker Road Map 3 Lot 3 [95 acres], East Ricker Road Map 3 Lot 3.1 [1144 acres], Chichester Road Map 4 Lot 8 [108 acres], 314 Route 106 South Map 11 Lot 12 [111 acres], Wales Bridge Road Map 20 Lot 1 [30 acres], 18 River Road Map 20 Lot 2 [30 acres], 14 Presby Lane Map 26 Lot 17 [114 acres], 35 Presby Lane Map 26 Lot 8 [155 acres], 483 Clough Hill Road Map 33 Lot 40 [141 acres], 161 Route 129 Map 21 Lot 56 [83.5 acres].LOTS IN LOUDON FOR SALE **08-22**: lots for sale during this snapshot include: Youngs Hill Road [106 acres], Upper City Road [49.3 acres]. NH 106 South [13 acres], NH 129 [40.9 acres], NH 106 [21.5 acres], NH 106 [3.4 acres commercial/industrial park lot.

Assessed valuation for the Potential/Approved PB Developments (LAND) Legacy Parcels (LAND) and Lots for Sale properties (LAND) only totals $4.1m.

PROBLEM STATEMENTS AND EVALUATION

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

Vulnerable Populations Table

- Freedom Hill, Presidential Pines, The Villages, and Volunteers of America have only 1 egress and limited access in the event of an emergency, causing evacuation issues.
- The availability of potable water for vulnerable communities could be a problem during hazard events. Wells require electricity so when the power fails there is no water. All Town owned wells also have water storage issues. In the Soucook Aquifer area there is low recharge in certain spots. The Town will truck bottled water to neighborhood facilities. The National Guard also has provided non-potable water for household uses. This is not a frequent problem, for most people keep a supply of water at home but is especially taxing on older residents. A grant through the National Volunteer Fire Council – Anhauser Busch donates pallets of canned water nationwide, which would be enough to last through the summer season.
- More emergencies would have an impact on the Fire Department, Rescue, and Police Department services. The local resources are limited due to funding. The cost of fuel is a significant problem due to increased run volumes each year. Recently there have been more than 100 Fire Department and EMS calls per month without an increase in staffing, budget, or equipment. The again population needs more services and assistance especially. Mental health and social services are also needed but are not available in Loudon.
- The town has difficulties accommodating the language and culture of new immigrants and refugees to the area because Concord and Manchester tends to absorb most of the new populations. Emergency 911 does have a translation service or interpreter and translating software can be used.
- Vulnerable population neighborhoods will be impacted by natural disasters and weather events, and as a result require more services. Whenever the electricity fails, multiple calls

for oxygen and medical supplies are taken. Public education of the importance of having a 3 day supply occurs regularly.

- INFO: The Villages generators run on propane and the tanks carry extra supply. The tanks have almost run out, but Eastern Propane or Huckleberry are local and can respond quickly.

Economic Assets Table

- Economic business is interrupted by weather events and cannot service residents' needs. Most critical are Huckleberry, Eastern Propane, Loudon Mart (formerly Beanstalk) for fuel, and Dollar General, Brookside Pizza for convenience.
- DS Cole Greenhouse and Leaf Farms are larger producers of crops, if their access to natural gas is hindered, they will lose their crops. Fuel access is maintained underground. Some agricultural facilities place additional wells and pump houses as a preventive measure.
- Much of Loudon's economy is agro-tourism based. Crops at agricultural operations may be lost during droughts causing a significant economic loss to the Town.
- INFO: Eversource is removing more trees as a preventative measure against power outages caused by tree damage to lines.

Hazardous Materials Table

- There are limited hazard materials detection equipment for the Loudon Fire Department, which may hinder the Town's ability to combat hazardous material emergencies. Loudon is a member of Central NH Haz Mat.
- There is limited spill containment equipment available to the Town. The number of technical experts is low and therefore dangerous. Loudon is contributing a member to the Central NH Hazmat team, but staffing technical experts is difficult to establish and retain. There are plans in place to address local spills, but not enough funding is available to meet the Town's standards.
- Local businesses are often not proficient at completing Tier 1 reporting.

Cemeteries & Churches Table

- Vandalism or civil disturbances could occur in cemeteries. Treefall could also damage cemeteries and churches, but the town has an active cutting program. Smaller family cemeteries are at greater risk of damage.

- There is potential for churches to be targeted with active violence threats. Churches should become more involved with active shooter training in Town. Additional community groups such as Young at Heart and Volunteers of America should also participate.

Historic Sites & Buildings Table

- The town facilities and the village buildings need a better dry hydrant design to accommodate large buildings. There are a lack of fire protection, suppression, and water resources.
- There are no water sources at the Old Town Hall, Fire Station, or Transfer Station which could be problematic in the event of a fire at Clough Hill Road.
- INFO: The Oak Hill Fire Tower was recently upgraded by the state, it has a generator and new electric

Recreation & Gathering Sites Table

- Bodily injuries occur at Town recreational facilities and lightning strikes regularly. There is potential for injury of all degrees at all these sites in town.
- Loudon recreational and gathering sites have the potential to be target areas for vandalism or civil disturbances. Additional security cameras for the Police Department could be useful deterrent.
- Loudon Town trails are non-invasive on the environment so there are narrow bridges and wetland crossings which can inhibit the ability of emergency responders. ATV/UTV use for a rescue is significantly limited. The Fire Department is making signs for the Trail committee (No Smoking and Wayfinding Locators) to help prevent fire or lost recreationalists.
- INFO: Town trails have maps, latitude and longitude markings, blazes, and way finding signs.

Future Development Table

- Compliance review of business with planning, zoning, and code enforcement must be ensured.
- There are limited Town services available for future development without improvement and expansion of infrastructure including water and sewer, road maintenance, transfer station capacity
- Potential development in Loudon would require a cistern and could even require one of increased size.

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 Loudon 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 Loudon 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. Loudon 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 **May 2022** is **2,756**. Using Loudon's **MS-1 2022** valuation data, **the total assessed value of all residential and non-residential structures ONLY in Loudon (\$487,541,150) is the basis for loss estimation calculations.** ***Land and utilities are not included here.***

Potential Building Dollar Losses by SFHA Flooding

Parcels within the floodplain that may also have structures in the floodplain from 2017 were updated using Loudon's online digital tax maps developed by AxisGIS in **October 2022** that contained assessing data. The DFIRMS were the initial source of these locations from previous **Plans**. ***Building Type*** was characterized into one of four categories, single-family homes, multi-family homes, manufactured homes, and non-residential buildings. Building number and value were excerpted from the assessing database. **Table 31** summarizes this data, identifying **406** primary buildings by address thought to be located in the SFHA. ***Land value, building contents value and infrastructure were not considered in these calculations.*** Loudon parcels and assessing data can be found at www.axisgis.com/LoudonNH.

Table 31

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	371	$73,539,000	$198,218
Multi-family Homes	10	$4,958,400	$495,840
Manufactured Homes	0	$0	$0
Non-Residential Buildings	25	$11,676,200	$467,048
Totals	**406**	**$90,173,600**	-----

Sources: AxisGIS Town Assessing, Oct 2022, www.axisgis.com/LoudonNH

In **Table 31**, digital analysis and human interpretation identified **371** single family residential homes, **10** multi-family homes, **0** manufactured homes, and **25** 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 **2,234**, about **17%** of Loudon's residences seem to be located in a floodplain area. The average replacement value is **\$198k** for a single-family home or **\$496k** for a multi-family home, or **\$467k** 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 **\$90.2m**.

There are alternative ways to calculate potential SFHA losses. In the following tables, the average building replacement value was calculated by adding the assessed values of all structures in the special flood

hazard areas and dividing by the number of structures. The Federal Emergency Management Agency (FEMA) has developed a process to calculate potential loss for structures during flooding. The potential loss was calculated by multiplying the average replacement value by the percent of damage expected from the hazard event, and then by multiplying that figure by the number of structures.

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

Table 32 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 32

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	**$73,539,000**	$36,034,110	$20,590,920	$14,707,800
Multi-Family Homes	**$4,958,400**	$2,429,616	$1,388,352	$991,680
Manufactured Homes	**$0**	$0	$0	$0
Non-Residential Buildings	**$11,676,200**	$5,721,338	$3,269,336	$2,335,240

*Sources: See **Table 31**; FEMA*

If all **371** single family homes were damaged by a ***Two-Foot Flood (20% Damage)***, the dollar damage to the *buildings* could be **$14.7m** while an ***Eight-Foot Flood (49% Damage)*** could cause **$36.0m** in *building* damage. If all **10** multi-family homes identified in the SFHA were damaged by a ***Two-Foot Flood (20% Damage)***, the damage could be **$992k** for *buildings* only, while an ***Eight-Foot Flood*** could cause **$2.4m** in *building* damage. If all **25** nonresidential buildings in the SFHA were damaged by a ***Two-Foot Flood***, the dollar damage to the *buildings* only could be **$2.3m**, while an ***Eight-Foot Flood*** could cause **$5.7m** in *building* damage. Dollar damage estimations vary according to the standard percentages of damage levels associated with flooding levels set by FEMA.

Table 33 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 33

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	**$198,218**	$97,127	$55,501	$39,644
Multi-Family Homes	**$495,840**	$242,962	$138,835	$99,168
Manufactured Homes	**$0**	$0	$0	$0
Non-Residential Buildings	**$467,048**	$228,854	$130,773	$93,410

Sources: See Table 31; FEMA

One (**1**) single family home averages **$39k** in damages by a ***Two-Foot Flood*** while an ***Eight-Foot Flood*** could cause **$97k** in *building* damages only. One (**1**) multi-family home compares at **$99k** for a ***Two-Foot Flood*** in *building* damages only and at **$243k** for an ***Eight-Foot Flood***. One (**1**) non-residential building in the SFHA is averages **$93k** in *building* damages for a ***Two-Foot Flood***, while experiencing about **$229k** 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 Loudon is $487,541,150 (no land) on 2,756 parcels.** Disaster damages are often illustrated in the following section utilizing a percentage range of town-wide building damage. At **2,234** housing units in Loudon counted in the preliminary **2020** US Census, any type of disaster impacting **10%** of Loudon housing units would yield **223** damaged homes.

The inventory of Town sites or buildings in **APPENDIX A Critical and Community Facilities Vulnerability Assessment** indicates which hazards each site is most susceptible to and provides its

assessed valuation. This dollar value can be used as a damage estimate from the natural hazard events listed below. Yet the potential losses discussed in this section involve all buildings across the community to provide a more distinct portrait of potential losses using the assessed valuation of all town buildings. Damages from natural hazards to anything other than buildings, such as infrastructure, land, humans or building contents, are not examined here. Specific individual studies would be needed to assess more detailed scenarios. Following are potential building-only dollar damages from select natural hazards.

Drought

Drought is often declared on state-wide or region-wide basis, and sometimes by individual 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 Loudon. People who rely on private well water have found their dug wells running dry in **2015-2016** and again in **2018** and **2020** and have needed to dig bedrock wells. Agricultural operations run the risk of high damage from **drought** which also brings economic consequences. In Loudon, 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 old Town Hall, Churches, 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. NH 106 and NH 129 travels over several bridges including the **Soucook River** and serve as local highways for a great number of people.

Loss of infrastructure or other community buildings or highways could result in fewer services available to residents or reduce the ability to evacuate. Buildings which are located on or near the sides of river and stream banks or that are located on a hill over **15%** could be subject to **landslide** triggered by rains or **erosion**. The Central NH Region area of Boscawen, Loudon, 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 **$2.4m** to **$4.9m** 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. Loudon has many vulnerable populations, including day care facilities, senior 55+ development (The Villages), multi-family neighborhoods, manufactured housing parks, remote neighborhoods on cul-de-sacs, and more. Loudon Elementary School has young children during three seasons. 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 Loudon Ridge Road 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 **$4.9m (for more localized downburst, high winds and hail, or tornadoes)** to **$24.4m (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 Loudon 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 Village 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 (Clough Hill) and tall or exposed businesses like the NH Motor Speedway which is a considerable lightning risk. Town Facilities like the Highway Garage, Town Offices, Fire & Police Safety Center, Maxfield Public Library, and Transfer Station are necessary for governmental function and provision of basic services. The Oak Hill Fire tower is exposed to the lightning and is used to spot forest wildfires quickly when the tower is staffed.

The Town's utilities, including powerlines, high tension powerlines, telecommunications tower, switching stations, telephone lines and broadband cable internet service, gas lines, public water 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 **$2.4m** in building-only damage costs alone, not including contents, infrastructure, land, or additional damage through fire spreading.

Public Health

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

River Hazards

Ice jams on the **Soucook River** or one of the brooks would 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 rivers, 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 Loudon 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**.

The Villages is situated along a meander of the Soucook River which at any time could release during another 100-year or 500-year storm event. Another way to view potential **river hazard** damages is if around half (**185**) of the **371** 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 **$7.4m** 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 Loudon 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 Loudon, wooded and forested sections vulnerable to tree fall, include the entire Town. 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 **$4.9m** to **$24.4m** 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 local communication systems, electric grids, and technology. The Town, School, Oak Hill Fire Tower, and Capital Area, state and county repeater 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 **$4.9m** 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 Loudon agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding. For more information on the National Flood Insurance Program, visit https://www.floodsmart.gov/why/why-buy-flood-insurance.

The initial identification of Loudon's Flood Hazard Boundary Maps was produced on **May 3, 1974,** and later the first Flood Insurance Rate Maps (FIRM) were developed on **April 2, 1979** and included the Special Flood Hazard Areas (SFHAs). The Town entered the regular phase of NFIP membership on **this date**. Loudon's first Flood Insurance Study (FIS) was produced in **October 1978**. No amended FIS or FIRMs were developed for the Town until over four decades later, consistent with other Central NH Region communities.

In the present day, Loudon's effective FIRMs are digital (DFIRMs) dated **April 19, 2010** as is the Merrimack County Flood Insurance Study (FIS) which includes Loudon (community **#330117**); 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 34** summarizes the historical background of the Town's NFIP effective dates.

Table 34

NFIP History of Loudon – Effective Dates

Version	Flood Insurance Study (FIS)	Flood Insurance Rate Maps
Original	**August 1, 2004**	**August 1, 2004**
Current	**April 19, 2010**	**April 19, 2010**

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

LOUDON NFIP STATISTICS

In Table 35 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 Loudon'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 35

History of NFIP Policy and Paid Loss Statistics

					Type of Current NFIP Policies in Force			
Report Date	**Policies in Force**	**Insurance in Force**	**Number of Paid Losses Since 1979**	**Total Losses Paid Since 1979**	**Single Family**	**2-4 Family**	**Other Residential**	**Non-Residential**
Dec 2004	2	$70,000	0	$0				
Aug 2011	9	$2,247,000	0	$0				
Apr 2016	6	$1,445,000	0	$0				
Apr 2023	6	$1,123,000	0	$0	6	0	0	0

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

From Table 35, in **Dec 2004** prior the severe flooding event period of **2005-2008**, **2** properties in Loudon were covered by NFIP flood insurance and **0** claims had been paid since **1979** (actually **2004**, which is when Loudon joined the NFIP). By the **2009 Plan** after the flooding period, the number of policies increased to **9** but still **0** losses paid. By **Apr 2016**, policies had decreased again to **6** while the paid losses remained null. By **April 2023**, Loudon property owners had **6** flood insurance policies in place.

Normally, the number of policies would fluctuate, influenced by the number of current severe flooding events, recent changes in flood insurance regulation, the higher cost of insurance, uncertainty about exact floodplain location, mortgage requirements, the changing real estate market, and assumptions that flood insurance is unnecessary if one's property is outside of the floodplain. Since there has been no recent severe flooding, fluctuation did occur in Loudon with people not renewing their policies, from 6 to 0 policies between **2016** and **2022**.

Table 35 also illustrates that while the property owners anywhere in the entire Town of Loudon are eligible to purchase flood insurance for their property, **6** properties out of the **2,756** total parcels in the entire community are insured against flooding. As described previously, a total of **406** parcels with homes and non-residential buildings seem to be at least partially situated in the Special Flood Hazard Areas (SFHA).

*Assuming the **6** NFIP policy properties are within the SFHA, then **1%** of buildings in the floodplain are insured against flooding.*

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

Flood hazards between **2005-2008** are described in more detail in the previous **2017 Plan** along with graphics and maps. The **Soucook River's *Fluvial Geomorphology Assessment Maps*** and ***Fluvial Erosion Hazard Belt Maps*** are attached to this **2023 Plan** to remind the community of the potential risky areas during widespread inundation flooding.

REPETITIVE LOSS PROPERTIES

A specific target group of properties is identified and serviced separately from other NFIP policies when repetitive losses occur on the same properties. The group includes every NFIP-insured property that, since **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**, Loudon had a total of **0** repetitive loss properties according to records kept by the Federal Emergency Management Agency and supplied by the NH Office of Planning and Development (NH OPD). 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 Loudon as of **April 2023,** consistent with the **0** losses had been recorded in **Table 35**. **Table 36** displays the general repetitive loss data:

Table 36

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 Loudon

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

Since the NH Office of Planning and Development (NH OPD) identified Loudon as a repetitive loss community, which is based upon **Table 36** data, Loudon 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 without any repetitive losses, they are classified as Tier 2 where a telephone call may be made to the Town every 5-10 years or otherwise as needed when so classified.

The Town of Loudon is a fairly recent participant to the NFIP, having joined in **August 2004**. Since then, its Floodplain Ordinance and Floodplain Development District has undergone review and revision as noted in

the prior section. In **June 2005**, the Town had a review by staff of the NH Office of Planning and Development (NHOPD) staff, known as a Community Assistance Visit (CAV) that permitted an extensive review and education on NFIP policies, procedures and the Floodplain Ordinance.

Any minor problems with the floodplain management regulations or process was rectified. When the next severe flood occurs, a CAV should be made by NH OPD to request a review of zoning compliance procedures and the contents of the Floodplain Development Ordinance, Subdivision Regulations and Site Plan Review Regulations.

Floodplain Development District Ordinance

The Town of Loudon has a Floodplain Ordinance that currently contains the required FEMA regulations to remain eligible for the NFIP. The Town of Loudon approved their first Floodplain Ordinance at Town Meeting in **March 2004** prior to becoming a NFIP member in **August 2004**. The Zoning Ordinance does not indicate all revision dates and the origin date within the Floodplain Development District.

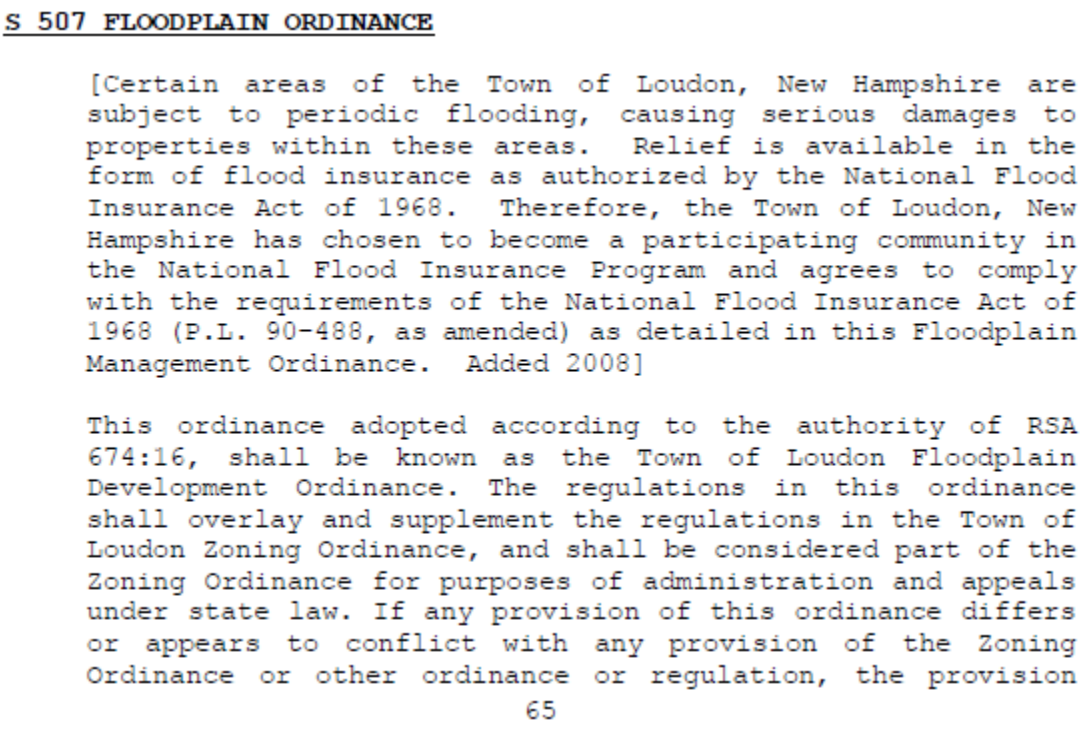
In **March 2008**, Loudon updated the Floodplain Development District Ordinance to comply with a round of changes to the NFIP program.

Revisions are noted in **January 2010** to adopt the new 2010 Flood Insurance Study and DFIRMS. This is when the Board of Selectmen adopted the new **April 19, 2010** Flood Insurance Rate Maps (FIRMS) and Merrimack County Flood Insurance Study (FIS). There are no further revisions other than recodifications through **March 2022**.

The **2022** Loudon 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 28**.

Figure 28

Latest National Floodplain Development Zoning Ordinance



S 507 FLOODPLAIN ORDINANCE

[Certain areas of the Town of Loudon, New Hampshire are subject to periodic flooding, causing serious damages to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968. Therefore, the Town of Loudon, New Hampshire has chosen to become a participating community in the National Flood Insurance Program and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended) as detailed in this Floodplain Management Ordinance. Added 2008]

This ordinance adopted according to the authority of RSA 674:16, shall be known as the Town of Loudon Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Loudon Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeals under state law. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or other ordinance or regulation, the provision

65

Source: Section of Loudon Zoning Ordinance March 2022

NFIP Familiarity in Loudon

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 Ton 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. Loudon 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; **6** properties out of the **2,756** parcels in Loudon are protected by flood insurance and currently take advantage of the NFIP insurance opportunity. Informational links for the public on flood topics could be located on the Town's website at https://www.loudonnh.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 **Loudon 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 ACTION EVALUATION** and **8 MITIGATION ACTION PLAN**.

CAPABILITY ASSESSMENT TABLES

Planning & 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
- Technical Skills, Training, Drills
- Assets, Security, Resources (Specialized Equipment)

Financial Resources
- Financial Programs or Funding Resource for Hazard Mitigation Projects

Education and Outreach
- Public Outreach Program, Educational Activity, Notifications

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 Loudon 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 the Town Departments, Boards 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
CE	Code Enforcement
EM	**Emergency Management**
FD	**Fire & Rescue Department**
HO	Health Officer
HD	**Highway Department**
LU	Land Use Department
PB	**Planning Board**
PD	**Police Department**
PRI	Private or Non-Town
SD	School District
TA	Town Administration
NHMS	**NH Motor Speedway**

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.

Primary Mitigation Department

PLANNING AND REGULATORY CAPABILITIES

The planning and regulatory capabilities displayed in Table 37 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 37

Planning and Regulatory Capabilities

Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
LOUDON PLANS AND PLANNING DOCUMENTS							
July 2001	**CC Open Space Trail System Plan**	Plan identifies areas in Town that are highly desirable to protect from development	Entire Town	**Moderate**	Conservation Commission	Have an active Trails Subcommittee in Town, created over 3 trails with maps, kiosks, parking lots and brochures. Maps are online for people to download. Committee documents their work.	Update the Plan with new trails and conservation lands. Provide public education on the document, trails. Place QR codes at the kiosks for quick map download.
Fall 2021	**CC Natural Resources Inventory 2021**	National Resource Inventory includes Natural Resource Co-occurrence, Wildlife Habitat Co-occurrence, Conservation Lands, Upland Habitat and Water Resources. Used most current maps from NH Fish & Game. Identified areas of highest value for protection and obtained easements in those areas	Entire Town	**Moderate**	Conservation Commission	Developed the NRI maps and document in 2021. Included co-occurrence maps and recommendations.	Educate the public about the value of the NRI. Utilize the NRI to make good conservation decisions in Town and update as needed.
July 2017	**EM**	Latest FEMA approved Haz Mit Plan will expire	Entire Town	**High**	Emergency Management	Some Actions were completed.	Currently updating Haz Mit Plan as of

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Updating for Aug 2022	**Hazard Mitigation Plan 2017**	(Jul 2022), currently updating as of Aug 2022					8/22, will evaluate and revise Plan over the 5-year interim.
May 2008 Aug 2019 update	**EM/HO Mass Casualty Plan**	Some parts may have been updated in 2006. Up to 9 alarm mass casualty plan, including ambulances. Includes list of all hospitals, resources. Dispatch has all the information. Plan needs to be updated	Entire Town	**Moderate**	Health Officer with Emergency Management	Updated ambulance run cards in Aug 2019. Ambulances and hospitals remain the same.	Revaluate the Mass Casualty Plan.
2013	**EM Collection of Higher Risk Dam Plans**	Plans of the higher risk dams are on file at the Town, obtained Feb 2003 and Sep 2006. Collecting Low, Significant, and High Hazard dam Plans. Sanborn Mills Plan last received.	Sanborn Pond Dam Outlet, other dams	**Moderate**	Emergency Management	Dams reclassified in state, may have been reclassified in Loudon.	Obtain most recent dam hazard Emergency Action Plans of Low, Significant, and High hazard dams from DES.
Oct 2017	**EM Loudon Emergency Operations Plan (EOP)**	EOP first updated October 16, 2006. New ESF format in 2017.	Entire Town	**High**	Emergency Management	Updated EOP, include ESF format. Used for COVID, reviewed with Dept heads in Mar 2020. Some items implemented.	Update there Resource List.
June 2012 Updated 1/9/2013, 6/29/14, 6/30/15 10/1/15	**FD Public Health Emergency Management Plan Components**	Emergency Response Plan (includes West Nile, EEE, Smallpox, more) for public health coordinates all Town departments and officials. Plan is tested annually with participating communities through the Capital Area Public Health Network (CAPHN)	Entire Town, CAPHN Communities	**High**	Fire Department	Used Plan to guide COVID response in Town. Maintained good communication between CAPHN and Town. Attended monthly meetings with CAPHN.	Incorporate the lessons learned/ best practices from the super-max vaccination clinics and local mass vax clinics for COVID-19.

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Current as of Sep 2022	**HD Culvert Replacement Plan #32-2017**	The Highway Dept staff keeps track of which culverts need to be upgraded first and how the figure fits within the annual budget.	Roadway Stream Crossings	**High**	Highway Department	Culverts are upgraded annually by the Highway Dept	Culverts will be replaced on an as needed basis, according to condition and volume of flow
Jul 2022	**NHMS Weather and Lightning Emergency Response Plan Appendix**	Last Plan related to weather in completed in 2009. The stadiums has been renovated and updated to hold fewer seats (103k to 44k seats). The NH HSEM used National Weather Service info to help develop plan with NHMS.	NH Motor Speedway on Route 106	**High**	NH Motor Speedway (private)	Developed plan after several meetings and collaborations. Plan was used for shelter in place during race in July 2022.	Develop a study by an outside contractor for evacuation of spectators and cast members.
December 2015 Updated annually (2022)	**NHMS Emergency Action Plan (Private)** **#29-2011**	Plan contains contact information, roles of responsible agencies and procedures on how to handle different emergency scenarios. The federal government does not contribute much funding or time to help with security.	NH Motor Speedway on Route 106	**High**	NH Motor Speedway (private) with HSEM assistance and Fire and Police Department input	New Weather Appendix. Updated Command and Control section, flow charts, Comms plan. State & local public safety resources updated.	Coordinate with outside agencies and NHMS to hold a drill on the Plan after a rewrite of an updated Evacuation Plan.
December 2015	**NHMS Flood Emergency Response Plan Appendix (Private)**	Identifies key personnel to contact and the action plan to follow. A recovery plan in included and photos of prior floods are depicted as well as how the issues were fixed. Most problems mitigated. Possibly one of the Shaker Dams in Canterbury could flood.	NH Motor Speedway on Route 106	**High**	NH Motor Speedway (private)	Most issues had been mitigated, no known updates to Plan.	Update contact information. Obtain the Dam EAPs for the Shaker dams.
May 2022	**NHMS Hazardous Waste Contingency Plan for Emergencies Appendix (Private)**	Plan to be used in case of fire, explosion or release of hazardous waste that could endanger people or the environment. Contains an evacuation plan and emergency response procedures.	NH Motor Speedway on Route 106	**High**	NH Motor Speedway (private)	Reviewed and updated annually as part of the NASCAR agreement.	Relationship with NHMS and obtain the annual version of the Haz Mat Plan and review.

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
Updated in 2021,	**PB Capital Improvements Program**	Includes Police, Highway, Fire, and other Depts' capital expenditures over a 6-year period. Can contain haz mit Actions funded in CIP, infrastructure improvements	Entire Town	**Moderate**	CIP Committee (Planning Board)	Working on update for 2022. Funded several projects in the CIP. Dept heads very involved.	Get involvement from Board of Selectmen.
December 2001 Nov 2018	**PB Master Plan**	Document for improving Town infrastructure, protecting environmental, guideline for Depts, basis for ordinances and regulations	Entire Town	**Moderate**	Planning Board	Updated in Nov 2018.	Solicit public input and participation to develop a relevant Master Plan. Encourage PB to review a couple chapters per year to keep the MP current.
February 2004	**PB Loudon Village Plan**	Economic and recreation Plan for the Village was not adopted.	Village	**Low**	Planning Board	Plan has not been used by the Town, was not adopted by Selectmen. Wider shoulder on South Village Road was paved.	The Plan is not considered relevant to the community at this time. No updates are planned for the future.
July 17, 2003	**PB Route 106 Corridor Study**	Greenway and trees, landscaping at intersections along Route 106. Planning Board has not required this.	Route 106 corridor	**Low**	Planning Board	Planning Board references the study. Plan has not been updated since 2003.	Update the Plan and consider recommendations for landscaping and access regulations.
June 2009	**PD Town Evacuation Plan 2009**	Plan covers all scenarios and situations in Town. The evacuation drill may have been reviewed & revised, but covers everything needed at this time. A separate plan from EOP. Police Chief used to be EMD.	Entire Town and Route 106 corridor	**Low**	Police Department	HMC members are unable to locate the Plan. SA to check to see if CNHRPC has 2009 Evac Plan.	When located, evaluate and update the Plan and incorporate into Town LEOPs as an Annex.
January 2009 (updating	**SD Elementary School All**	The All Hazard Plan (dated January 2009) covers procedures for	Elementary School	**High**	School Administration	Reviewed and updated annually.	Increase the number of cameras for

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
as of 02-16) Annual review and update July 2022	**Hazards Plan (School)**	evacuation, bomb threats, fire drill, lock down, reverse evacuation/outdoor gunfire/intruder, sheltering in place, and drop, cover, hold			With Fire & Police Dept, and Emergency Management assistance	Worked with the HSEM on assessment of policies, procedures and facilities. Complete drills annually. Installed a generator for the LES to serve as a Town shelter.	observation in the common areas and playground. Add double-locked foyer in Elementary School.
LOUDON BUILDING CODES, PERMITTING, INSPECTIONS							
April 19, 2010, updated by Aug 2022 but not yet received	**BOS Digital Flood Insurance Rate Maps**	Adopted by Town, used for Soucook River, streams, brooks and wetlands. The USGS and/or FEMA RiskMap have developed a new set of maps. Some Loudon changes identified.	Floodplains	**Moderate**	Board of Selectmen	FEMA RiskMap will soon provide revised maps to Loudon. Used the maps with property owners and collected Letters of Map Revision and Letters of Map Amendment.	Use floodplain maps, collect LOMRs, collect certificates of elevation from property owners.
2018	**CE State Building Code (International Building Code 2018)**	Contains a suite of residential, commercial, plumbing, electrical, mechanical, energy, and existing buildings. State may be getting ready to adopt 2015 version in which case Loudon will follow. In legislative session 2016, the measure failed to pass. Some of the new codes have a 6-month grace period, others do not.	Entire Town	**High**	Code Enforcement	Followed the current code, used the new 2018 state code when adopted.	Use the 2020 code when the State of NH Fire Marshal's Office adopts the code.
2018	**CE State Energy Code**	Provides energy efficiency requirements	Entire Town	**High**	Code Enforcement	Followed the current code, used the new	Use the 2020 code when the State of NH Fire

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
		such as insulation and approved by PUC				2018 state code when adopted.	Marshal's Office adopts the code.
2018	**FD State Fire Inspection and Life Safety Code**	NFPA codes are followed but considering making changes to fit the Town. New 2015 code expected for adoption by state	Entire Town	**High**	Fire Departmen t	Followed the current code, used the new 2018 state code when adopted.	Use the 2020 code when the State of NH Fire Marshal's Office adopts the code.
LOUDON LAND USE ORDINANCES, REGULATIONS							
March 2021	**HD Road Design and Construction Standards (Land Development Regulations)**	Specifies method of construction and materials. Contains NH DOT roadway and drainage standards.	Entire Town-Roadways	**High**	Highway, Selectmen, Planning Board	Planning Board applied regulations during application process, Highway followed regulations for Town roads	Utilize and annually monitor, evaluate and review the road design standards for revisions
March 2022, Annual updates	**PB Zoning Ordinance**	Document addresses steep slopes, floodplain, wetlands, buildable area, and other matters that could affect the Town's residents and properties. Accessory Dwelling, Fire Cistern amendments	Entire Town	**Moderat e**	Planning Board	Solar Farm, Light pollution, Affordable housing	Revise Zoning Ordinance for 2023
April 19, 2010	**PB Floodplain Development Ordinance (Zoning Ordinance)** **#33-2017**	Adopted and amended in accordance with the National Flood Insurance Rate Program. The Floodplain Ordinance protects life and property by regulating distance of structures to flood hazard areas, regulating elevation, clarifying definitions, regulating new structures and encroachments, stating duties of the Code Enforcement Officer, etc.	Entire Town-Floodplains	**High**	Planning Board with Code Enforceme nt	Followed the ordinance when working with Planning Board applications and Building permits. Attended 2 meetings annually to maintain knowledge.	Review the floodplain ordinance and incorporate any federal changes, such as local RiskMap revisions.
June 2022	**PB**	Document contains both the Subdivision	Entire Town	**High**	Planning Board	Added Technical	Consider the Housing

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
	Land Development Regulation Requirements	Regulations and Site Plan Review Regulations for development to follow, including environmental regs.				Review Committee, Minor changes to driveway, cisterns, landscaping & architecture.	(Subcommittee with many Boards) work to incorporate into regulations.
March 2010	**PB Septic System Setbacks (Zoning Ordinance)**	No closer than 75 feet from a well or a water body, unless meet other conditions.	Entire Town	**High**	Planning Board	Followed regulations while reviewing applications.	Evaluate setback according to latest Master Plan and NRI recommendations.
March 2010	**PB Wetlands Overlay District Ordinance (Zoning)**	Wetlands are not considered part of the minimum size of a lot in all districts	Entire Town-Wetlands	**High**	Planning Board	Followed regulations while reviewing applications.	Evaluate wetlands according to latest Master Plan and NRI recommendations.
March 2006	**PB Conservation Subdivisions Ordinance (Zoning Ordinance)**	Provides standards for residential development of land in conjunction with the permanent protection of a portion of the property as undeveloped open space.	Entire Town	**High**	Planning Board	Followed regulations while reviewing applications.	Evaluate ordinance according to latest Master Plan and NRI recommendations.
June 2022	**PB Stormwater Construction and Maintenance Standards (Land Development Regulations)**	Stormwater drainage system construction in accordance with drainage laws of NH, NH Standard specifications for Road and Bridge Construction and American Association of State Highway and Transportation Officials.	Entire Town	**High**	Planning Board	LDR revised in 2022. Followed standards during review of applications.	Evaluate standards according to latest Master Plan and/or NRI recommendations.
December 2015	**PB Shoreland Water Quality Protection Act State Regulations**	State law: Board must address when looking at applications involving shorelands	Shorelands, Soucook River	**High**	Planning Board	Followed regulations while reviewing applications.	Evaluate ordinance according to latest Master Plan and NRI recommendations.

Source: Loudon Hazard Mitigation Committee

ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capabilities in **Table 38** 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 38

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
LOUDON ADMINISTRATIVE PROGRAMS, POLICIES, MUTUAL AID AGREEMENTS, PARTNERSHIPS, OPERATIONS, PROCEDURES							
July 1992	**BOS State 911 Street Address System**	House numbering and street naming guidelines followed by Highway and Fire Department. Chapter 109-H Enhanced 911 System.	Entire Town	**High**	Board of Selectmen	Followed the regulations and applied new addresses to new development.	Adopt the newest changes as the State of NH Office of Emergency Communications adopts a new version.
May 2022 last purchase	**CC Conservation Commission Acquisition of Easements**	Program evaluates and purchases key open space parcels and/or easements when opportunities arise. Almost 3,000 acres in conservation. December 2015 land donation, 2011 easement purchase.	Entire Town	**High**	Conservation Commission	May 222 land conservation easement and land donation – donation 50 acres, easement was LCHIP/NRCS/Town 278. Pearle Farm property. CRF has been raised to $30,000 per year.	Funding the Conservation Commission Fund: LUTC 50% money funds Conservation Fund, for purchase of easements. Conservation capital reserve fund deposit annual $50,000
Apr 2022	**EM Multi-Department Disaster Drills**	Mutual Aid Compact requires hosting one drill a year, as well as attendance at 6-7 other events hosted by other nearby towns. Various drills for Town emergency personnel.	Entire Town, Schools, Surrounding Towns	**High**	Emergency Management	Held mutual aid drills on annual basis (although not required). Covid changed procedures. Quarterly drills are starting on each side of Merrimack River (Apr	Participate in regional mutual aid Capital Area Fire Compact drills. Increase MCI response capabilities (have

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). Actively participate with Manchester-Boston Regional Airport Mass Casualty Incident planning.	knowledge, not fully equipped now)
Annual (different), as of Jun 2022	**FD Fire Department Training Standards**	All personnel are trained to minimum standards as EMT or FF1&2 (once at Fire Academy, training monthly). One time certification, need to complete EMT continuing education every 2 years.	Entire Town	**High**	Fire Department	Increased average level of training of staff, more cross training, EMT, level 2 Firefighter than previously.	Train on a monthly basis. Maintain certifications. Strive for Paramedic coverage in every ambulance.
June 2022 (updated for every race) Part of the EAP updated annually – one EAP for all Depts.	**FD NHMS Incident Command Plan, Traffic Control Plan Binder** **#29-2011**	Comprehensive guidelines and procedures for racetrack. Contains phone numbers, contacts, resources, etc. Includes mass casualty plan from various town and state Departments and NHMS.	NH Motor Speedway	**High**	Fire Department	Updated the plan for each race. Had better planning coordination & collaboration with NH HSEM and other partners. Held meeting with National Weather Service regarding lightning impacts and potential evacuation issues.	Work with NHMS to review and expand the Incident Command Plan as needed. Make the Plan and all the associated plans and maps cloud-based. Have a new Life & Public Safety and Evacuation analysis for NHMS due to reduction of seating capacity (from 106,000 to 48,000 people).
Annual January	**FD Fire & Rescue Capital Area**	Member of Capital Area Compact (24 towns) and Lakes Region Compact (35 towns).	Entire Town, Compact Area	**High**	Fire Department	Added a new radio console at CAMAFC and related	Consider increasing membership on Central NH

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
	Mutual Aid Compact Member	Communications are effective	Communities			technology, voted to spend $500,000 on new CAD system (at Concord Fire Alarm). Changed to Simulcast communication	Haz Mat team and capabilities. Add a C2 position on the Compact (have only 1 staff on CAMAFC)
Updated sections regularly (last May 2022)	**FD Fire Department Standard Operating Guidelines (SOGs)**	Standard Operating Guidelines recently updated, emergency response, operations, support, incident command, personnel, and more.	Fire Station	**Moderate**	Fire Department	Updated the attendance and membership policy, uniform High Heat policy for staff, fire fighter rehabilitation SOG. New lieutenant began implementing process for SOG accessibility for new members and a review process.	Find time and staff to write and update SOGs. Catalog SOGs digitally on Google cloud for accessibility and update ease.
July 2022	**FD On-Call Fire & Rescue Coverage**	January 1997 - Volunteer Fire Department members arrive for incidents. Have 35 firefighters presently. Coverage is 24/7. Transition to per diem (day) volunteer shifts instead of on-call to comply with new State procedures. Daytime coverage remains a struggle – most work outside of Loudon.	Entire Town	**Moderate**	Fire Department	July 1 FY changes- Sundays will be a per diem day (used to be standby). Wage adjustments stand by to $54.24 to $75/night for the standby/on call on MTWTh nights only. Must arrive within 5 minutes of receiving pager call – difficult to fill shifts. Other shifts covered by FT	Transition to 24/7 paid shifts (FT or per diem) rather than depend on on-call – if accomplish this, Effectiveness would be High. Add 1-2 career staff positions for daytime volume coverage.

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
						staff or per diem staff.	
October 2018	**HD Road Construction Program**	Have an annual construction schedule of up to 1.5 miles of road rebuilding with funding from the Highway Block Grant, Town's budget and warrant articles.	Town Roads	**High**	Highway Department	Funded program, reconstructed roads	Place road construction items into the CIP and utilize the annual revision schedule
October 2018	**HD Snowplowing Guidelines**	Road Agent monitors roads with road treatment and plowing commencing as needed.	Roadways, Entire Town	**High**	Highway Department		Enforce the town ordinance of plowing driveway snow across Town roads.
Annually. Current as of Jul 2022	**HD Hazardous Tree/Limb Removal Program** **#02-2011**	Highway Department crew removes hazardous or dead trees in the roadways or rights of way, or they contact the electric company.	Town Roadways & Rights of Way, Entire Town	**High**	Highway Department	Cut back dead and dying trees from right of way, contacted Unitil or Eversource when trees and powerlines were don on roads.	Program is part of HD services. Expand budget to take care of some trees proactively with the die-off of ash & hemlock species.
October 2018	**HD NH Highway Mutual Aid Agreement Member**	NH's network of Highway officials. Mutual aid of staff and equipment available for emergency assistance across the State	Entire Town, State	**High**	Highway Department	Participated in the mutual aid agreement	Maintain membership in NH Highway MUA
Since 2017, Pittsfield, Can & Gilmanton updated	**PD Police Department Mutual Aid Compact**	Mutual aid contract with abutting communities, (Pittsfield, Gilmanton – Jan 2016, May 2016, Chichester – May 2016, Canterbury, Concord – May 2016, etc) including other communities as needed during special events. When a new Chief comes in, MACs will be updated. Individual with each community. Not exactly the same, slightly different language.	Entire Town, Mutual Aid Communities	**Moderate**	Police Department	Updated & resign Mutual Aid documents with Pittsfield, Gilmanton and Canterbury, when Chief changed.	Policy will be renewed with each new Chief. Include enhanced mutual assistance language in the new mutual aid documents.

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
Full update Summer 2018	**PD Police Department Standard Operating Procedures (SOPs)**	Used on a case by case basis, discretion exercised by responding officers and supervisor. Include domestic violence, assaults, hostage, bank, traffic control, many others. Adopted new in 2011, social media policies, internet sites incorporated	Entire Town	High	Police Department	Summer 2018, incorporated new policies that are certified - Commission on Accreditation for Law Enforcement Agencies to ensure consistency, shared policies across nation. Implemented new such as social media policies, internal investigation policy, close to 100 individual policies.	
October 2021	**PD Police Department Safety Committee Meetings with Loudon Elementary School (School)**	PD invited to participate in LES meetings, go periodically. Went over lock down & evacuation procedures. Two drills per year are conducted. Mitigation plans are in effect for various types of incidents	Loudon Elementary School	High	Police Department with Elementary School	Drill with LES for active shooter in October 2021. Partnered with FD, LES staff, MVSD Facilities Director. Moved from LES to Church Street Church where parents would pick up children.	Work closely with HSEM & school site assessment recommendations during drills and response. Set up a PD individual drill firearms training at LES in Oct 2022 weekend in empty school.
June 2022	**PD/FD Police and Fire NHMS Security Meetings and Drills**	Meetings from April to October. Have "table-top" drills at NHMS for local and state officials. A new traffic plan (of multiple towns) is devised for each race.	NHMS, Route 106	High	Police Department, Fire Department	PD evacuation drill in June 2022 with NHMS, NHSEM, FD, PD, Fire Marshal.	Monitor, evaluate and review NHMS traffic plan for revisions. Goal to hold drills and exercises annually.

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
May 2022	**PD Police Department Detail Policy (for NHMS)**	Policy includes a list of roads in Town that require Police detail for construction or utility work or public events, interfering with regular traffic flow. Different contractors receive different wages. (PD does not invoice NHMS for cruisers, but invoices the outside contractor).	Entire Town	High	Police Department	May 2022 – wages increase. Outside agencies can invoice the NHMS directly instead of through LPD.	Utilize, monitor, evaluate and review detail policy for revisions. Seek additional funding for detail work.
LOUDON TECHNICAL SKILLS, TRAINING, AND DRILLS							
45 Staff & Volunteers certified by Aug 2022	**EM Town Red Cross CPR Certification**	Town staff and volunteers earned CPR certifications each year. All Fire Dept members are required and most Police Dept members.	Entire Town	High	Emergency Management	Have done little on CPR during COVID. Started working on internal American Heart Assn CPR, then community based program in fall 2022.	Train additional personnel (Highway Dept) to the updated guidelines and maintain certifications.
43 Staff & Volunteers as of Aug 2022	**FD Firefighter Training (and EMS)**	All firefighters and EMTs are certified as Fire Fighter level 1 (30), level 2 (14), and level 3 (0), 17 EMTs, 8 Advanced EMTs, 5 Paramedics. #1 FT Chief, #1 FT Deputy & 1 FT secretary. And 4 FT FF with EMS skills.	Entire Town	High	Fire Department	Trained new volunteers and maintained existing certifications. Must have either FF or EMS certification by end of the year to maintain position. Contributed funds toward training.	Need more active personnel to answer calls, daytime/summer is difficult coverage. Need to add additional career staff during the day 7 days (7:00A – 7:00P).
44 Staff & Volunteers	**FD Hazardous Materials Skills Training**	All are at Operational Level and Awareness Level. A L1 FF is at Haz Mat and Operational/Awareness level. Training is free, but 2-week training needs time off.	Entire Town	High	Fire Department	No longer have Technician Level personnel	Pay people for their time to attend Hazardous Materials incident response

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
							training (2 weeks)/
2011 Still use as of Aug 2022, annual agreement	**FD IAmResponding Communications Tool**	Communications web-based information tool to help first responders respond to emergency calls.	Fire Department	**High**	Fire Department	Renewed annually in July for $660. Used it daily to coordinate calls, messaging. Used by entire Capital Area Compact towns.	Purchase annual license agreement, works very well.
4 employees have Class A CDL license	**HD Highway Department Employees have Class A CDL License**	Experienced employees with Class A can drive all vehicles.	Roadways	**High**	Highway Department	HD Staff maintained certifications for CDL	Maintain certification and have more staff apply for CDLs.
6 trained	**HD Highway Department Skills Training**	All employees take NHMA training courses when time allows.	Entire Town	**Moderate**	Highway Department	Maintained staff skill sets	Train staff with T2 or Primex
6 staff	**HD Highway Department Informal Duty Winter Procedures**	Six employees on call 24/7 and are in radio contact most of the time.	Entire Town	**High**	Highway Department	Performed winter duty procedures	Evaluate winter duty procedures and change as needed
2 trained annually, as of Aug 2022	**PD Police Academy Certified Field Officer Training**	Have a manual to consistently train new officers. Recruits sign off. Hazard Training component	Entire Town	**High**	Police Department	Updated the FTO policy manual in 2019, used from accredited agency.	Train more officers to certified FTO.
2 Staff on for FD & PD as of Aug 2022	**PD/FD 24/7 Paid Safety Personnel Coverage**	Coverage for safety personnel has been obtained 24 hours per day, seven days per week. Should be a FT position, always 2. Challenge to find people to drive the apparatus, few people have this license.	Entire Town	**High**	Police Dept, Fire Dept	Personnel received a pay raise as incentive. Ensured 2 persons provided safety services all day, 24/7 (4 staff).	FD 24/7 coverage would be ideal situation, need an extra person during the day (3 staff 7 days/week). Fund the $4,500 class to obtain CDL for 1 per year.

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
1 Admin. Asst., 7 members & 3 alternates	**PB Planning Board Member Training**	Members attend NHMA, CNHRPC, and NH OEP annual training sessions	Entire Town	Moderate	Planning Board	PB members participated in training opportunities annually	Get all PB Members involved with training sessions.
Annual, June 2022	**SD Loudon Elementary School Drills (School)**	LES holds fire drills, lockdown, shelter in place, and active shooter drills. Have internal drills. Police and Fire Department are sometimes invited to participate. Have added a missing persons drill.	Loudon Elementary School	High	School Administration, assistance from FD & PD	Performed more drills than required, including unannounced, all haz drills, active shooter drills, more with Fire & Police.	Add a biological agent or biohazards and hazard materials procedures to the drill listing. (School)
Current as of Aug 2022	**TA Cartographic Associates**	Provides layout of all parcels in town. Digital tax parcel maps can overlay onto critical facility sites and hazard event areas	Entire Town	High	Town Administration	Tax maps provided on AxisGIS. Annual set of new maps is provided	Update tax maps, upload new maps, print paper sets annually
LOUDON ASSETS, SECURITY, AND RESOURCES (SPECIALIZED EQUIPMENT)							
Current as of Aug 2022	**BOS Town Office Safety**	Town Office employees are situated behind locked doors.	Town Office	High	Board of Selectmen	Hold annual safety meeting. New Town Office building in 2017	Review other safety features or procedures.
10 base 21mobiles 64 portables	**EM Radio Compatibility Between Police and Fire Departments**	Police and Fire Departments have P25 capable equipment and therefore have the ability to communicate at all times via radio	Police Department, Fire Department	High	Emergency Management	Purchase of new radios	Work to obtain funding to update current 18 year old inventory of portable radios.
7/2020	**EM Emergency Operations Center (EOC)**	Emergency Command Center in Fire Station #2 does have the facilities needed to become a proper EOC should an emergency arise	Fire Station	High	Emergency Management	$89k worth of equipment & technology upgrades through EMPG Funding.	Increase size of radio / dispatch room
6/ 2019	**FD Fire Department Hazardous Materials Truck**	Truck & Supplies no longer stored in Loudon. All CNHHT assets moved to Concord Fire	Entire Town, Compact Area Communities	Low	Fire Department	Due to no team members belonging to LFD all assets moved to CFD	Work to obtain funding to cover payroll costs in order to send LFD

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
							members to Technician Level training
7/2022	**FD Radios**	Used for emergency notification for Fire, Rescue, EMS and Haz Mat Materials. Have enough for everyone in the Dept.	Fire Department	Low	Fire Department	Purchased 14 new portable radios between budgeted funds & ARPA funds. Purchased 7 new mobile radios with budgeted funds.	Work to replace portable and mobile radios as funding opportunities develop.
~20 Barricades	**HD Reflective Wooden Barricades**	Barriers readily stabilize a dangerous condition (shoulder washout) and/or direct traffic to alternate route without tying up Town personnel (directing traffic, etc.)	Highway Department, Roadways	**High**	Highway Department	HD staff constructed all barricades since 2011, also made about 10 for FD	Evaluate whether to construct more barricades in the future.
1 Base 2 Portable 14 Mobile Radios	**HD Radios**	All highway vehicles are equipped with 2-way radios.	Highway Dept	**High**	Highway Dept	Radios have been replaced or purchased with new vehicles.	A radio repeater system is being installed as soon as possible with funding from ARPA. This system will allow highway, police and fire to communicate during town emergencies.
10/2021	**FD Portable Generators**	Currently have 4 portable generators. Used for scene lighting/various operations. We also have 2 PTO powered generators on apparatus.	Fire Department, available for Entire Town	**High**	Fire Department	Purchased 1 new PTO powered generator on Engine 1	Secure additional funding for current generator maintenance & upgrades as additional funds are secured.
10/2020	**FD / Town Generators**	Enables running of heat & electricity during power failure at Fire Station 1, 2 & Highway	Safety Complex, Fire Station 2, Highway	**High**	Fire Department, Highway	Maintained and used generators when needed	Fund the bi-annual service and maintenance

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
		Department. TO has a generator on order and should be installed fall of 2022..	Department, & Town Office		Department		agreements on all standby generators.
10/2021	**FD Additional Flood Lighting**	Currently have 30 flood lights for Departments. Used for scene lighting. New Engine has a generator powered Light Tower.	Fire Department	**High**	Fire Department	New Engine was purchased with cord reels and remote control light tower.	Include scene lighting upgrades including PTO powered generators and light towers on future apparatus specifications when purchased.
8/2022	**PD / Public Access Automatic Defibrillators (AEDs)**	2 Portable AEDs used by the Police Department to have in their cruisers, have officers trained on their use. We have 13 Public Access AED units in the community	Police Department / Fire Department	**High**	Fire Department / Police Department	Trained for AED/CPR, & Purchase additional AEDs	Purchase an AED for each Police Cruiser and 6 additional Public Access devices.
9/2021	**PD Inter-Operable Digital Radios**	12 Digital radios have ability to communicate with all Police, Fire and EMS services in the state who also have digital equipment	Police Department	**High**	Police Department	Obtained used portables from Northfield PD	Purchase 2 new portable radios each year to maintain serviceable units.
Current as of Aug 2022	**SD School District Loudon Elementary School Town Shelter**	Generator can be used at LES as needed when power failure occurs. Town Shelter can open (kitchen, showers, generator, cots, etc)	Loudon Elementary School and School District	**Moderate**	School District with Emergency Management	Town Shelter concept not yet tested but remains available	Undertake Town Shelter drills, obtain volunteers for shelter staffing

Source: Loudon Hazard Mitigation Committee

FINANCIAL CAPABILITIES

The financial resources in Table 39 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) **2022-2027** 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 39

Financial Capabilities

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
LOUDON FINANCIAL PROGRAM OR FUNDING RESOURCE FOR HAZARD MITIGATION PROJECTS							
March 2022	**CC Conservation Land Use Change Tax Fund and Cons Comm Capital Reserve Fund**	Land use change taxes of 50% are placed into this fund to help the Conservation Commission purchase key easements or properties for water quality, wetlands protection, etc.	Key Conservation Areas in Town	**Moderate**	Conservation Commission	Purchased conservation easement 2022.	Increase LUCT (to 50% or higher) into Conservation Fund to obtain more funding for conservation parcels
March 2022	**EM Emergency Management Operating Budget**	Budget is essentially a place holder but is not sufficient to fund planning and mitigation efforts	Entire Town	**Low**	Emergency Management	Updated every March at Town Meeting	Develop a budget which will fund mitigation initiatives as outlined in this plan.
March 2022	**FD Fire Department Operating Budget**	Budget is a maintenance budget and is not funded to address mitigation or increase in call volume or mitigation planning or incident mitigation.	Entire Town	**Low**	Fire Department	Update every March at Town Meeting	Develop a budget which will fund mitigation initiatives as outlined in this plan
July 2022	**PB Town Capital Improvements Program (CIP) Project Funding**	Sets aside funds for large equipment/projects.	Entire Town	**Moderate**	CIP Committee	The CIP is reviewed and updated annually	Encourage all Town Depts & Board of Selectmen to use CIP for capital expenses. CIP is annually updated and could include expensive or

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
							long-term hazard mitigation projects
8 / 2022	**TA FEMA Public Assistance Grants (Disaster Recovery Costs)**	Public Assistance Categories A&B are available for disaster recovery costs, then C-G for permanent work available if Town has an approved Haz Mit Plan (unexpired)	Entire Town	**High**	Town Administration	Applied for and received disaster assistance funding in 2020, 2021, & 2022	Maintain an open dialogue with NH HSEM to utilize the FEMA PA program to help with disaster costs
LOUDON FUTURE FINANCIAL RESOURCES TO EXPLORE FOR HAZ MIT PROJECTS							
Not yet used for mitigation projects	**BOS Warrant Articles**	Warrant Articles could be used in the future to fund large Hazard Mitigation projects	N/A	**N/A**	Board of Selectmen	Not yet used for mitigation projects	Use warrant articles as a way to finance future hazard mitigation improvements
August 2022 CRF funding being used for 1 bridge replacement	**HD Highway CRF for Bridge Replacement**	Bridge replacements are done on an as needed basis with funding from CRF and taxes.	Bridges	**High**	Highway Department	Lower Ridge Road bridge/Mckenzie Road replacement August 2022	Increase fund to CRF
Not yet used for mitigation projects	**HD 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, towns can set aside money for the several years it takes for the state to undertake the local bridge project.	Currently have zero bridges in program	**N/A**	Highway Department	Not yet used for mitigation projects	Consider this program for potential redlist bridges or other bridge repairs

Source: Loudon Hazard Mitigation Committee

EDUCATION AND OUTREACH CAPABILITIES

In Table 40, 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 40

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 Effective-ness	Respons-ibility	Changes Since Last Haz Mit Plan (2017)	Future Improvements to Capability
LOUDON PUBLIC OUTREACH PROGRAM, EDUCATIONAL ACTIVITY, NOTIFICATIONS							
10/ 2021	**FD Fire Prevention Program in School**	Fire prevention discussion held at school. Visits Elementary School during Fire Prevention Week as well as FD Open House during Fire Prevention week and Firefighter Fridays at LES when firefighters eat lunch with the students	School	High	Fire Department	Visited the school & participated in Firefighter Fridays.	Maintain and grow Fire Prevention & Safety programs at LES and around our community
2022	**FD Fire Department Facebook Page**	Fire Department Facebook Page used to provide information to the public about the Fire Department	Entire Town, General Public	High	Fire Department	Updated regularly with public announcements/incidents/trainings	Provide regular public information & FD ongoing activities and safety messaging.
October 2021	**FD Fire Department Annual Open House**	Open House each fall, introduce fire safety to the community	Entire Town, General Public	High	Fire Department	Changes in presentations	Keep program and messaging fresh each year to maintain interest
4/2022	**FD / PD Departments Blood Drive**	FD /PD holds a blood drive once or twice per year	Entire Town, General Public	High	Fire Department / Police Department	Hold program 1-2 times per year	Maintain & provide blood drive opportunities.
April 2022	**TS Transfer Station Household Hazardous Waste Disposal**	Household hazardous material disposal program permits disposal of dangerous materials at the Transfer Station: propane tanks, dried	Transfer Station	High	Transfer Station	Held events Bi-annually in spring, advertised at Transfer Station and Town Hall	Provide bi-annual household hazardous waste disposal day service

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
	#42-2017	paint cans, waste oil, waste antifreeze, batteries, tires. Program saves these materials from being dumped in the woods and waterbodies. Cost pays a waste disposal company (Clean Harbors) for 1 day of HHW collection.					
Current as of Aug 2022	**PD Police Department Website**	Police Department Website used to provide information to the public about the Police Department	Entire Town, General Public	**Moderate**	Police Department	Update the website with new material	Utilize page daily and provide regular public information.
Daily	**PD Police Department Visitation to Elementary School "Walk & Talks" Program**	Daily walkabouts to Elementary School to familiarize kids with the Police and have a presence	Public Schools	**High**	Police Department	New program. Police visit the school daily and talk to students.	Maintain daily school visitation and socialization
Current as of Aug 2022	**TA Town Website**	Used by multiple Town Depts, available to residents and visitors, hosts Zoning amendment changes	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.
Will be up August 2022	**TA Town Facebook Page**	Will be used by multiple town depts, available to residents	Entire Town	**High**	Town Administration	Will be updated regularly with announcements & notices	Increase usage to keep residents informed.

Source: Loudon Hazard Mitigation Committee

THIS PAGE INTENTIONALLY LEFT BLANK

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 41** 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 Loudon's activities. Deleted Actions are listed in **Table 42.**

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 43** 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 ***Town Hazard Mitigation Plan***.
Preparedness	**Short Term**	Action assists or supports planning, protective activities, public education, training and exercise. ↪ Best suited for ***Town Emergency Operations Plan***.
Response, Recovery, Other Related	**Short Term**	Action supports preventative, response, recovery-related, repeated or deferred maintenance activities. ↪ Best suited for ***Town Emergency Operations Plan***.

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 Loudon.

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 earliest **2005 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.

Loudon'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	
2005 Plan	#NA	#NA
2011 Plan	#1- 2011 to	#30- 2011
2017 Plan	#31- 2017 to	#44-2017
2023 Plan	#45- 2022 to	#69- 2022

A total of **13** mitigation Actions have been **Completed** from the previous **Hazard Mitigation Plans** as shown in **Table 41**. This includes **4** Actions most recently **Completed** between the **2017 Plan** and **2023 Plan** . Note the **P** designation which indicates Actions were partially completed (may become Ongoing in a future **Plan**). Several Actions (**4**) were moved to the **6 CAPABILITY ASSESSMENT** tables.

Table 41

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 – Add completed Actions				
		See Chapter 8 – Add completed Actions				
COMPLETED BY 2023 Plan						
36	**#29-2011**	**Continue Updating NHMS Traffic Control Plan to Reduce the Risk of Natural and Other Hazards to Crowds**	**Sep 2022 Moved to Cap Asst**	Emergency Management	$0	Lightning, Wind/Tropical, Flood, Crash, Human/Terrorism, Evacuation

Priority Score (2017)	Action Number	Action	Completed By Date	Who is Responsible	Approx $ Cost	Natural Hazards Addressed
36	#33-2017	Update the Floodplain Zoning Ordinance to Comply with NFIP Requirements to Reduce Flooding Risk	Sep 2022 Moved to Cap Asst	Planning Board	$0	Flood, Winter (Melt/Ice), River. Fluvial Erosion and Channel Movement, Debris, Dam
36	#02-2011	Continue Ensuring Hazardous Trees Are Cut Back from Power Lines to Reduce the Impact of Severe Wind Events	Sep 2022 Moved to Cap Asst	Highway Department	$5,000 annually	Wind/Tropical, Debris, Wildfire, Earthquake, Utility Outages (electricity, Communications)
36	#42-2017	Continue the Annual Transfer Station Household Hazardous Waste Disposal Day Service to Reduce the Risk of Water Quality Contamination and Fires	Sep 2022 Moved to Cap Asst	Highway Department	$10,000 bi-annually	Health (Water Quality), Wildfire, Hazardous Materials
36	#32-2017	Develop Plan for Road and Drainage Reconstruction Projects to Reduce the Risk of Flooding and Washout	Aug 2022-Completed 4 roads for reconstruction in 2022. Bridge reconstruction in 2022. Lower Ridge Road at McKenzie Road intersection in Aug 2022.	Highway Department	Unknown $	Flood, Wind/Tropical Rainstorms, Winter, Ice, Erosion
33 (P)	#01-2011	Improve Town Buildings for Code Compliance to Reduce the Impact of Severe Wind, Storm Events, Winter Weather or Earthquakes	Sep 2022	Board of Selectmen	$100,000	Wind/Tropical & Rain Storms, Winter, Extreme Temps (Hot-Cold), Earthquake, Health and Safety
36	#11-2011	Upgrade the Pleasant Street Culvert to Reduce the Risk of Flooding and Washouts	Spring 2017	Highway Department	Unknown $	Flood, Wind/Tropical Rainstorms, Winter, Ice, Erosion
36 (P)	#38-2017	Inventory Town Culverts by GPS According to Condition and Volume of Stormwater to Reduce the Risk of Flooding and Washouts	Sep 2022	Highway Department	$4,000	Flood, Erosion, Wind/Tropical, Tree Debris, Dam

Priority Score (2017)	Action Number	Action	Completed By Date	Who is Responsible	Approx $ Cost	Natural Hazards Addressed
33 (P)	#41-2017	**Purchase Key Parcels or Conservation Easements to Enhance Flood Storage Capacity and to Protect Water Quality**	**Sep 2022**	Conservation Commission	$25,000 annually	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement
COMPLETED BY 2017 Plan						
24	#09-2011	**Restore South Village Road Dam**	**Summer 2012 (south side)**	Board of Selectmen	$250,000	Flood, Dam Failure, Erosion
24	#10-2011	**Replace the Old Shaker Road 36" Culvert**	**Summer 2013**	Highway Department	$20,000	Flood, Debris Impacted Infrastructure, Erosion
24	#11-2011	**Replace the Pleasant Street Culvert**	**2014 (completed by state)**	Highway Department	$3,000	Flood, Debris Impacted Infrastructure, Erosion
36	#27-2011	**Seek Grant Writer**	**Spring 2015**	Board of Selectmen	$0	Fire, Wind and Extreme Temperature Hazards, Human and Tech Hazards

Source: Loudon Hazard Mitigation Committee

P = *Project Partially Completed – Appears in **2022 Mitigation Action Plan***

The pink highlighted rows indicate the **24** total **Deleted** Actions in Table 42 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***.

Table 42

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 – Add deleted Actions				
		See Chapter 8 – Add deleted Actions				
DELETED FROM 2023 Plan						
36	**#31-2017**	**Consider New Road Elevation and/or More than 1 Egress for New Developments to Reduce the Risk of Injury from Natural Hazards**	**Sep 2022**	Planning Board	$0	Was not realistic (Was not supported by the Planning Board)
35	**#35-2017**	**Upgrade the Condition of Tower Road to Ensure Emergency Access to Oak Hill Fire Tower and Reduce Erosion**	**Sep 2022**	Board of Selectmen, helped by Emergency Management	$0	Was not feasible (Not a Town project - State)
DELETED FROM 2017 Plan						
26	**#03-2011**	**Inspect Fuel Storage Tanks**	**March 2016**	Fire Department	$0	Is a preparedness, response or recovery item
24	**#04-2011**	**Clear Trees and Debris from Waterways**	**March 2016**	Highway Department	$0	Was not realistic
24	**#05-2011**	**Update the Zoning Ordinance to Comply with NFIP Requirements**	**March 2016**	Planning Board	$0	Was incorporated into another action
24	**#06-2011**	**Encourage Security of Towers**	**March 2016**	Police Department	$0	Duplicates existing efforts, and was not realistic
24	**#07-2011**	**Ensure Fire Safety at Campgrounds**	**March 2016**	Fire Department	$0	Is a preparedness, response or recovery item
24	**#08-2011**	**Replace the Currier Road Culvert**	**March 2016**	Highway Department	$5,000	Was not feasible to complete or could it have been not realistically undertaken

Priority Score (2017)	Action Number	Action	Deleted Date	Who is Responsible	Approx $ Cost	Why Deleted? The Action…
12	#12-2011	Install a Cistern in the Village	March 2016	Fire Department	$30,000	Was not realistic
36	#13-2011	Encourage Generator Procurement for Loudon Elementary School	March 2016	School District	$75,000	Was modified and incorporated into a different Action
36	#14-2011	Install Additional Phone Lines in Fire Station	March 2016	Fire Department	$1,440	Is a preparedness, response or recovery item
24	#15-2011	Acquire All-Terrain Vehicles	March 2016	Fire Chief, Police Chief	$20,000	Is a preparedness, response or recovery item
12	#16-2011	Develop New Standard Operating Guidelines for Fire and Rescue	March 2016	Fire Department	$0	Is a preparedness, response or recovery item
36	#18-2011	Sign Up for NIXLE Warning System	March 2016	Police Department	$0	Is a preparedness, response or recovery item
24	#19-2011	Encourage Tree Windbreaks on Loudon Ridge	March 2016	Highway Department	$0	Was not realistic
24	#20-2011	Undertake Tabletop Exercises for Pleasant View Gardens and Huckleberry Heating	March 2016	Fire Department	$500	Is a preparedness, response or recovery item
24	#21-2011	Update Emergency Response Handling Procedures	March 2016	Emergency Management Director	$5,000	Was modified and incorporated into other actions
24	#22-2011	Undertake More Hazardous Materials Training	March 2016	Fire Department	$0	Duplicate existing efforts
24	#23-2011	Undertake Pandemic Training and Planning	March 2016	Fire Department	$0	Is a preparedness, response or recovery item
24	#24-2011	Undertake More Tactical Training Exercises to Improve Reaction Time to Active Shooter Incidents	March 2016	Police Department	$7,000	Is a preparedness, response or recovery item
12	#25-2011	Participate in NFIP Training	March 2016	Code Enforcement Office, Tax Assessor	$0	Is a preparedness, response or recovery item
36	#26-2011	Establish Committee to Study, Design, and Incorporate EOC with New Municipal Facility	March 2016	Board of Selectmen	$0	Was not realistic
36	#28-2011	Continue Meetings of the Joint Loss Committee	March 2016	Board of Selectmen	$0	Is not relevant to Plan although important to the Town
28	#30-2011	Train for Emergency NHMS Evacuation	March 2016	Police Department	$0	Is a preparedness, response or recovery item

Source: Loudon Hazard Mitigation Committee

The tan highlighted rows in Table 43 indicate the numerous **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 43

Deferred Mitigation Actions

Priority Score (2017)	Action Number	Action	Deferred Date	Who is Responsible	Approx $ Cost	Why Deferred? Because…	Hazards Addressed
33	#01-2011	**Improve Town Buildings for Code Compliance to Reduce the Impact of Severe Wind, Storm Events, Winter Weather or Earthquakes**	Sep 2022	Code Enforcement with Depts	$100,000	More time is needed to complete (Action was updated)	Severe Wind, Hurricanes and Tropical Storms, Severe Rainstorms, Thunderstorms, Winter Weather, Extreme Heat, Earthquake, Public Health and Safety
33	#38-2017	**Inventory Town Culverts by GPS According to Condition and Volume of Stormwater to Reduce the Risk of Flooding and Washouts**	Sep 2022	Highway Department	$4,000	Other activities took priority.	Flood, Erosion, Wind/Tropical, Tree Debris, Dam
34	#34-2017	**Purchase Land and Construct a New Highway Department Garage to Reduce the Impact of Hazard Events by Improving Response Time**	Sep 2022	Highway Department	$1.25M	Action was partially completed by the State, but Street needs more work by Town in other areas	Flood, Rapid Snow Pack Melt, Ice Jam, Wind & Rain Storms, Debris Impacted Infrastructure, Dam Failure
36	#36-2017	**Place a Static Soucook River Gage on the Village Road Dam to Reduce the Impact of Flooding**	Sep 2022	Emergency Management	$1,000	'Other activities took priority. (Ride bys easily indicate the river height)	River, Dam, Flood, Ice, Erosion and Channel Movement, Wind/Tropical, Tree Debris
33	#37-2017	**Instigate Public Support and Funding for the Installation of a Water System in Loudon Village to Reduce the Risk of Fire**	Sep 2022	Board of Selectmen	$1,000	No funding, and other activities took priority	Wildfire, Winter, Water Quality, Drought

Priority Score (2017)	Action Number	Action	Deferred Date	Who is Responsible	Approx $ Cost	Why Deferred? Because…	Hazards Addressed
35	#39-2017	**Upgrade the North Side of the Village Road Dam (and Dredge Bi-Annually to Maintain a Dry Hydrant)**	Sep 2022	Board of Selectmen	$1,000,000	No funding	Flood, Fire, Wildfire, Ice, Tree Debris, Dam, Crash, Utility Outage (Gas)
33	#40-2017	**Purchase and Place Soucook River or Large Brook Shoreland Under Permanent Conservation that Protects the Parcels from Development Effects (Erosion, Channel Movement, Sedimentation Movement)**	Sep 2022	Conservation Commission	$1,000 annually	No funding or land available.	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement
36	#41-2017	**Purchase Key Parcels or Conservation Easements to Enhance Flood Storage Capacity and to Protect Water Quality**	Sep 2022	Conservation Commission	$25,000 annually	No funding or land available.	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement
35	#43-2017	**Assess the Large Wood Jams in the Soucook River Annually to Reduce the Risk of Flooding and Channel Movement (FGA)**	Sep 2022	Conservation Commission	$500	No staffing or funding available.	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement
36	#17-2011	**Print and Distribute Plastic Disaster Information Placards to Residents to Reduce the Risk of Personal Injury During Natural Disasters**	Sep 2022	Emergency Management with help of Board of Selectmen	$7,500	No funding and other activities took priority	Flood, Wind/Tropical, Winter, Extreme Temps (Heat-Cold), Earthquake, Wildfire, Haz Mat
34	#44-2017	**Develop and Provide Educational Materials to Soucook River Property Owners and a Newsletter to the Public to Reduce Bank Erosion and**	Sep 2022	Conservation Commission	$250	Other activities took priority	Flood, Winter (Ice Jam), Tree Debris, Dam, Fluvial Erosion and Channel Movement

Priority Score (2017)	Action Number	Action	Deferred Date	Who is Responsible	Approx $ Cost	Why Deferred? Because…	Hazards Addressed
		Flooding Damage (FGA)					

Source: Loudon Hazard Mitigation Committee

P = *Project Partially Completed – Appears in **2022 Mitigation Action Plan***

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 Loudon 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 Loudon.

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

ACTION MATRIX

A listing of **11 Deferred** mitigation Actions from **2017** and **30 New** mitigation Actions from **2022** important to the Town of Loudon 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, **#45- 2022** through **#69- 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.

Loudon'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 44** ***Planning and Regulatory***; **Table 45** ***Structure and Infrastructure***; **Table 46** ***Natural Systems Protection;*** and **Table 47** ***Education and Outreach*** should be able to guide future hazard mitigation efforts in the Town through an annual implementation process.

Eleven (**11**) **Deferred** Actions from **2017** and **30** **New** Actions from **2022** combine to develop the **41** Actions of the **2022** **Mitigation Action Plan**. The **Deferred** Actions' cells are highlighted in tan.

Table 44

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
#45-2022	**Coordinate with Liberty Utilities to Mitigate the Impact of a Potential Natural Gas Event Along NH 106**	Short Term 1-2 Years	71	Fire Department, with Liberty Utilities	$5,000	Longer and larger gas line runs along Route 106 (Josiah Bartlett to Shaker Rd). Potential for bigger leaks, explosion, larger vapor cloud, traffic disruption. An older Liberty Gas line runs through the Village, although it appears to be in good condition. Obtain the emergency response plan and obtaining additional portable monitoring equipment to detect gas leaks.	Utilities Outage (Gas line Leak)	NH 106	Cost is for monitoring equipment, labor is in-kind.	Fire Department Haz Mat Budget
#46-2022	**Collaborate with Loudon Boards, Local Businesses, and Eversource to Ensure Adequate Electricity Remains Sustainable Especially During Weather Natural Hazard Events**	Short Term 1-2 Years	73	Planning Board, Economic Development Committee, with Eversource	$0	Oak Hill Rd substation is not large enough for current needs, requires more capacity. Eversource provider must upgrade or replace facility to supply enough electricity. Ongoing discussions about upgrading supply for new developments (like greenhouse). Eversource intends to upgrade powerline to greenhouse in 2022, but includes removal of the substation. Electric failure issues have been noticed within the entire town during normal hours. Worked on substation in Sept 2022, trying to determine the best way to deliver more power to north end of Town. (Planning Board approvals for large businesses increase the	Utilities Outage (Electric), Extreme Temps (Heat-Cold), Solar Storms	Northern Loudon, New Developments	Cost is for in-kind staff and volunteer time.	N/A

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
						electric draw without obtaining additional Eversource resources.				
#47-2022	**Adopt Subdivision and Site Plan Review Regulations that Require Cisterns for Phased Subdivisions to Ensure Adequate Water Capacity to Reduce the Impact of Wildfire and Fire**	Medium Term 3-4 Years	72	Planning Board with Fire Department	$1,000	Increase town focus on cistern placement and maintenance during the plan approval process and ensure adequate water capacity along Class VI roads. Currently, 4+ residential subdivision lots require cisterns, FD goal is to ensure 1-3 lot subdivisions have a cistern also, which include conditions of approval that do not permit developer to come back for further subdivision without a cistern. Private Memory Lane cistern has leaks, loses 5,000 gallons of water every 4 months. Cistern is privately owned by developer. FD will top off cistern to be kept full. Need to fix the cistern before private road is taken over by the Town as a Class V road. PB has site plan review and subdivision reg changes. If development is continued on Class VI roads, consideration for water supply needs to be provided. Regulation adoption.	Wildfire, Fire	New Developments, Phased Developments	Cost is for legal review and/or public noticing and/or printing costs.	Planning Board budget
#48-2022	**Contact NHDOT to Post Appropriate Weight Limit on Wales Bridge Road to Reduce the Risk of Crashes**	Short Term 1-2 Years	73	Highway Department	$300	Wales Bridge Rd bridge used to be state owned, a long & tall bridge with little traffic now considered Town redlisted. Inspected by NHDOT annually. Recommendation is to close down bridge when it becomes	Aging Infrastructure, Crash	Wales Bridge Road	Cost is for potential signage.	Highway Sign Budget

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
						impassible. State DOT suggested reducing weight limits when they inspect bridge annually, currently unrestricted weight permitted. In the future, may become a dead end road.				
#49-2022	**Adopt Subdivision and Site Plan Review Regulations that Require Road Elevation and/or More than 1 Egress for New Developments to Reduce Safety Risks from Wildfire, Winter, and Severe Wind Events**	Long Term 4-5 Years	59	Planning Board	$1,000	Many of the manufactured home parks, senior housing, and neighborhoods have only 1 egress/limited access in the event of an emergency. Mass evacuation would be very difficult for some populations as would Town emergency services reaching residents. Review the subdivision and site plan to upgrade the road standards.	Wind, Winter, Wildfire, Tropical	New Development, Entire Town	Cost is for legal review and/or public noticing and/or printing costs.	Planning Board budget
#50-2022	**Encourage Tree Plantings Around Buildings to Shade Parking Lots and Along Public Rights-of-Way to Reduce the Effects of Drought and Extreme Heat**	Long Term 4-5 Years	52	Planning Board	$1,000	This provision would be a revision to the Planning Board's Subdivision Regulations and Site Plan Review Regulations. Develop an approved list of acceptable noninvasive trees and shrubs. Submit a landscape and maintenance plan with the project as developed by a landscape architect for approval. Ensuring shade trees are **planted and maintained** will eventually provide shade, runoff collection, and heat reduction in the vicinity of paved areas. PB does look at impervious surface ratio in Zoning and Site Plan Regulations.	Extreme Temps (Heat), Drought	New Developments	Cost is for legal review and/or public noticing and/or printing costs.	Planning Board budget
#51-2022	**Develop and Promote Public Health Policies**	Short Term 1-2 Years	68	Health Officer	$500	Town posted all Executive Orders and CAPHN orders on the town	Health	Town Buildings,	Cost is for copying costs.	Health Budget

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	and Procedures to Reduce Cyanobacteria and Infectious Diseases like Coronavirus					website. All Town teams worked together - cleaning, sanitizing, masks, sneeze screens- successfully. Post together all previously developed protocols and policies. The policies will overlap with CAPHN and the project is to place all previously used documentation into one Public Health Policy for the Town.		Clough Pond, Businesses		
#52-2022	**Develop a Plan for the Rotation and Upgrade of Communications Equipment for Town Services to Reduce the Impact of Weather and Natural Hazard Events**	Long Term 4-5 Years	68	Emergency Management	$400,000	Radio equipment of all 3 depts is aged. A plan of the existing inventory of communications equipment and future needs should be developed. Purchase of newer equipment is better shielded from solar storms. Base, mobile, portable, and antennas, repeaters should be included in the assessment and upgrade. EM/PD/FD- 10 base stations, 21 mobiles (vehicle), 64 portables. HD- 1 base station, 14 mobiles (vehicle), 2 portables. The FD recently purchased 14 new portable radios and 7 new mobile radios.	Solar Storms, Health & Safety, Wind, Winter, Flood, Wildfire	Entire Town	Cost is for the purchase of new radios, antennas, and repeaters for the Town.	Seek potential AFG (tried 3 times) or other FEMA grants, Match covered by Warrant Article or Fire Equip CRF
#53-2022	**Adopt Subdivision and Site Plan Regulations that Require a Groundwater Study for New Development to Reduce the Impact of Drought**	Short Term 1-2 Years	72	Planning Board	$1,000	Water supply in Town is low in many areas. A high transmissivity sand and gravel aquifer is located under the Soucook River, but supplies are low especially during extended drought conditions. New development brings the need for additional water that further tax the stressed aquifer.	Drought, Aquifer Health, Extreme Temps (Heat-Cold),	New Development	Cost is for legal review and/or public noticing and/or printing costs.	Planning Board budget

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
						The goal is to ensure enough water is available for the new developments as well as for existing residents and businesses. A groundwater study should be required for new and modified developments.				
	TOWN TO ADD NEW ACTION HERE									
	TOWN TO ADD NEW ACTION HERE									

Source: Loudon Hazard Mitigation Committee

Table 45

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
#01-2011	**Improve Town Buildings for Code Compliance to Reduce the Impact of Severe Wind, Storm Events, Winter Weather or Earthquakes**	**Long Term 4-5 Years**	**70**	Code Enforcement with Depts	$100,000	The Community Building does not have sprinklers and the old, stone former Town Office building is not fully handicapped accessible (CRF $ established for 2027 construction). New Town Office constructed in 2017. In 2021, solar panels installed on Town Office building. Generator will be installed in fall 2022. Solar panels to be installed on Fire Dept 2022. Other Town buildings were built prior to current codes for natural hazards. Working on a few projects to be ADA compliant (Library auto-open doors) this year - using ARPA funding. Town won't be building new buildings except for Highway garage in the future. Not enough funding for all potential projects.	Wind/Tropical & Rainstorms, Winter, Extreme Temps (Hot-Cold), Earthquake, Health and Safety	Town Buildings	Cost is for a facility study and upgrades to Town Office, Police, Fire for ADA compliance.	Capital Reserve Fund
#34-2017	**Construct a New Highway Department Garage on the Transfer Station Property to Reduce the Impact of Hazard Events by Improving Response Time**	**Long Term 4-5 Years**	**68**	Highway Department	$1,250,000	Highway Department is not large enough; trucks are bumper to bumper; too small, too old, too much maintenance. Need a new, larger garage built to current codes. Existing lot is not big enough for a larger building. Department response to hazards such as trees down on roads, washouts, winter weather, etc. and is slower and could become impeded with existing building.	Flood, Tree Debris, Dam, Wildfire, Wind/Tropical, Winter, Earthquake, Power/Utility Failure	New lot in Town along an adequate roadway	Cost is for labor and building construction (In CIP at $20,000 year to construct new Highway Garage – about $60,000 in July 2022. Cost to build ~$1,250,000)	New Capital Reserve Fund, Warrant Article

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
						No purchase of land. Will be placed at Transfer Station. New garage constructed within 5-6 years. New CRF Highway Garage was established, $20,000/year. Recommended to $150,000/year. Existing facility does not accommodate current vehicles. Highway Department Garage is not large enough; trucks are bumper to bumper; too small, too old, too much maintenance. Need a new, larger garage. Trucks are now larger than before. For a new Highway Garage, best location is the Transfer Station property - sand & salt are stored there, more central and close to NH 106.				
#36-2017	**Place a Static Soucook River Gage on the Village Road Dam to Reduce the Impact of Flooding by Early Notification**	**Short Term 1-2 Years**	**75**	Emergency Management	$1,000	Currier Road, Cross Brook Road, and Chichester Road bridges have flooded in the past. They have been enlarged and upgraded but may flood again in the future. Monitoring a static river gage on the Village Dam will provide advance warning to residents and the Town emergency management, reducing risk to people in the Village. (Ride bys easily indicate the river height)	River, Dam, Flood, Ice, Erosion and Channel Movement, Wind/Tropical, Tree Debris	Soucook River on Village Road Dam	Cost is for the purchase and installation of a static river height gage	Emergency Management Operating Budget
#37-2017	**Instigate Public Support and Funding for the Installation of a Water System in Loudon Village to**	**Long Term 4-5 Years**	**68**	Board of Selectmen with Fire Dept assistance	$1,000	Town has a significant lack of water for fire suppression. Loudon Village is congested, has a large population, and would be well-suited for a potential water	Wildfire, Winter, Water Quality, Drought	Loudon Village	Cost is for refreshments, then in-kind staff and volunteer time.	Town Contingency Fund

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
	Reduce the Risk of Wildfire and Fire					system, including hydrants. The FD is dependent on dry hydrants and winter weather, drought and mud season are challenging to fighting fires in Town.				
#38-2017	**Inventory Town Culverts by GPS According to Condition and Volume of Stormwater to Reduce the Risk of Flood and Washouts**	**Long Term 4-5 Years**	**65**	Highway Department	$4,000	Most of the culverts in Town identified by GPS (likely by UNH students), but inventory is not yet complete and the Town has not received the data. The inventory project must be completed before a thorough sorting of the most problematic culverts for upgrade can be developed. These problem culverts need to be upgraded to protect residents from the effects of flooding and debris impacted infrastructure. Actively replacing steel culverts, a mile or 1.5 miles per year.	Flood, Erosion, Wind/Tropical, Tree Debris, Dam	Town Roadways	Cost is for a student or volunteer to inventory culverts.	Increase HD Maintenance Budget to $10,000 annually
#54-2022	**Upgrade the Safety Building's Metal Roof for Weather-Sealing and Wildlife Deterrence**	**Short Term 1-2 Years**	**73**	Police Dept	$92,000	The Safety Building's walls, ceilings, foundation were assessed by an energy efficient consultant. The existing roof has areas that create ice dams and enable water to subsequent dip into the building, ceiling, and through walls. Building mold and sagging walls/sealing are safety hazards. Additionally, the Police and Fire Dept building has problems with rodents and birds. Critters can affect public health and result in communication systems failure when they chew through wires. A new roof is	Winter, Wind/Tropical Rain Storms, Health (Mold)	Safety Building	Cost is for labor, roofing materials, and disposal.	CRF for Safety Building, or ARPA funding

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
						required so emergency services remain unhindered.				
#55-2022	**Install a Dry Hydrant at the Staniels Road Bridge over the Soucook River to Reduce the Impact of Wildfire, Fire, Lightning, and Drought**	**Short Term 1-2 Years**	**75**	Fire Dept	$8,000	FD is dependent on dry hydrants, with a general lack of water for fire suppression during drought conditions, difficulties during winter and mud season. Worse during droughts. Distinct lack of water for fire suppression in southern end of Loudon. Need to find funding for new dry hydrant work at Staniels Road in the industrial area. Technical issues at the bridge will require NHDES permitting.	Wildfire, Fire, Drought, Lightning	Staniels Road Bridge	Cost is for permitting, construction labor, materials, and equipment rentals.	Fire Dept Dry Hydrant/Cistern Maintenance Budget
#56-2022	**Encourage the Manufactured Housing Cooperatives to Upgrade their Respective Public Water System's Well Infrastructure to Reduce the Risk of Water Contaminants**	**Short Term 1-2 Years**	**75**	Board of Health	$0	Most licensed public water systems in Town have arsenic levels exceeding the state levels. Owners having trouble mitigating. Education materials provided to owners and abutters as notice of violation.	Aging Infrastructure, Health (Water Quality)	Manufactured Home Cooperatives	Cost is for in-kind staff and volunteer time.	N/A
#57-2022	**Rehabilitate the Currier Road Bridge Over the Soucook River to Reduce the Impact of Flood, Erosion, Winter, and Tree Debris**	**Medium Term 3-4 Years**	**74**	Highway Department	$500,000	Currier Road (1987), Cross Brook Road (best), and Chichester Road bridges (best) have flooded in the past. They were rehabilitated after the 2006-2008 floods but the Soucook River may flood again in the future. Currier Road Bridge situation is not critical, but it is a lo Town does not clear debris. Nearest landowner has removed some wood, waits for high water to float debris. wer approach (4' to water). Sandy soil	River, Flood, Winter, Tree Debris, Dam, Aging Infrastructure	Currier Road Bridge, Soucook River	Cost is for raising the elevation of the road and rehab the bridge. Will contract out. Engineering study, permitting may be necessary.	Bridge CRF

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
						base with pines on the shore, lots of trees accumulate below the bridge. Options include raise the road elevation, placement of guardrails, turn the road into a "dam". Town does not clear debris. Nearest landowner has removed some wood, waits for high water to float debris.				
#58-2022	**Rehabilitate the Lower Ridge Bridge at McKenzie Road to Reduce the Impact of Flood, Erosion, Winter, and Tree Debris**	**Short Term 1-2 Years**	**75**	Highway Department	$371,000	Lower Ridge bridge at McKenzie Road to replace the slab of decking, salt corroded. Contractor has provided estimate. Timeline in 2022 for replacement (completed Aug 2022). Structural issues only, abutments used as retaining. Winter weather problems with salt on all bridges in Town.	Flood, Erosion, Winter, Tree Debris, Aging Infrastructure	Lower Ridge Bridge at McKenzie Road	Cost is for engineering, permitting, contract labor, materials and equipment rentals.	Bridge CRF
#59-2022	**Obtain Funding and Construct a Village Water System, Including a Pump house, Diesel Pump, 6" Pipes, and Hydrant System to Reduce the Impact of Fire, Wildfire, Drought**	**Long Term 4-5 Years**	**66**	Fire Dept	$3,000,000	Next step after #37-2017. The Town facilities and the village buildings need a better dry hydrant design to accommodate large buildings. Lack of fire protection/ suppression, water resources. No easily accessible water nearby. Fire Dept would use the Village Dam dry hydrant as nearest water source (if available).	Wildfire, Fire, Health (Water Quality & Quantity), Drought	Village	Cost is for engineering, permitting, contract labor, materials and equipment rentals.	General Grant Funding, NHDES, Others
#60-2022	**Install a Cistern at the Old Town Hall and Transfer Station to Reduce the Impact of Wildfire, Fire, Lightning, and Drought**	**Long Term 4-5 Years**	**70**	Fire Dept	$75,000	No water source at Old Town Hall, Transfer Station in the event of fire at Clough Hill Road. Fire Station at Clough Hill Rd installed a cistern last fall 2021. In 2007, lightning struck the historic Old	Wildfire, Fire, Lightning	Old Town Hall and Transfer Station	Cost is for two cisterns, one at the Transfer Station and one at the Old Town Hall. Contracted	Warrant Article

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Town Hall which sustained heavy damage.			labor, equipment rentals, and materials.	
#61-2022	**Install Lightning Alert Systems at the Recreational Drive and Staniels Road Recreation Fields to Reduce the Risk of Injury from Lightning**	**Short Term 1-2 Years**	**75**	Fire Dept and Loudon Youth Assn	$10,000	Bodily injuries occur at Town recreational facilities. Lightning strikes regularly and a coach was injured by lightning in 2022. Lightning alert systems are pole mounted, set at recreation fields, and detect lightning from several miles away. Sirens and flashing lights warn nearby residents and those on the field.	Lightning	Recreational Drive, Staniels Road	Cost is for two "Istrike" mounted box (building or pole), either hardwire or solar on Recreational Drive, Staniels Road.	Warrant Article or Loudon Youth Association Budget Line
#62-2022	**Upgrade Culvert at Old Shaker Road at Shaker Road Intersection for Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout**	**Short Term 1-2 Years**	**75**	Highway Department	$10,000	The existing culvert 15" alum crushed. Highway to upgrade with 24" plastic pipe.	Flood, Wind/Tropical Rainstorms, Winter, Ice, Erosion	Old Shaker Road at Shaker Road intersection	Cost is for materials, labor is in-kind staff.	ARPA funding
#63-2022	**Upgrade Culvert at Blake Road at Intermittent Stream for Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout**	**Short Term 1-2 Years**	**75**	Highway Department	$10,000	The existing culvert is 24" rusted steel. Highway to upgrade to 36" plastic.	Flood, Wind/Tropical Rainstorms, Winter, Ice, Erosion	Blake Road	Cost is for materials, labor is in-kind staff.	ARPA funding
#64-2022	**Upgrade Drainage Culvert at Old Shaker Road at Hunting Swamp Crossing between Flagg Rd and Lovejoy Rd for**	**Short Term 1-2 Years**	**72**	Highway Department	$30,000	Remove 36" steel culvert and replace with 48" round reinforced concrete, not a box culvert. Limited to sizing by turtles.	Flood, Wind/Tropical Rainstorms, Winter, Ice, Erosion	Old Shaker Road at Hunting Swamp Crossing	Cost is for permitting, construction labor, materials, and	ARPA funding

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
	Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout								equipment rentals	
	TOWN TO ADD NEW ACTION HERE									
	TOWN TO ADD NEW ACTION HERE									

Source: Loudon Hazard Mitigation Committee

Table 46

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
#39-2017	**Upgrade the North Side of the Village Road Dam and Dredge Bi-Annually to Maintain the Southside Dry Hydrant**	**Long Term 4-5 Years**	**66**	Board of Selectmen	$1,000,000	Dredge the Village Dam and the dry hydrant replaced to ensure deeper water source for adequate fire suppression in the Village. and develop an engineering study of the north side abutment and railing. (long term). One mile up from South Village Road dam is where trees accumulate. The north side of the Village Road dam needs concrete abutments or another solution now that the south side has been repaired; both sides upgraded will result in greater water capacity to reduce floods from the Soucook River on the Village Bridge. Consider a coffer dam. Consider a pool lower down on the river. South Village Road dry hydrant at the dam freezes annually, works but not well. Previously, dam activities were not approved by Town Meeting. North side of the Village Road dam needs concrete abutments or other solution now that the south side was repaired around 2014-2015, resulting in greater water capacity to reduce floods. By 2022, issue has not yet been resolved. At the least, the rusted metal steel rail needs to be replaced in the future. (existing dry hydrant is on south	Flood, Fire, Wildfire, Ice, Tree Debris, Dam, Crash, Utility Outage (Gas)	North side of Village Road dam	Cost is for the repair of the abutment on the north side, for materials, labor, and engineering.	Warrant article at Town meeting

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
						side). State inspection rating is lowered every 2 years. Major natural gas line running under the bridge - Liberty Utilities cooperation.				
#40-2017	**Purchase and Place Soucook River or Large Brook Shoreland Under Permanent Conservation that Protects the Parcels from Long Term Development Effects Including Erosion, Channel Movement, and Sedimentation**	**Medium Term 3-4 Years then Ongoing**	**65**	Conservation Commission	$1,000 annually	Conservation Commission program acquires donated or purchases easements and lands. The program evaluates and purchases key open space parcels and/or easements when opportunities arise. Almost 3,000 acres in conservation. Expand this by identifying and purchasing key Soucook River or large brook shoreland parcels to protect the watercourse from future development and erosion. Currently, no funding or land available. Few properties become available, those that are gravel operations. Cons comm has purchased 1 parcel, held by 5 Rivers Trust, privately owned 50 acres with 1,200 frontage. Owners log property and could opt to make available to public. Loudon CC does not maintain or review easement.	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement	Parcels abutting Soucook River or large brook shoreland	Cost is for legal review of easement deeds.	Conservation Budget
#41-2017	**Purchase Key Parcels or Conservation Easements to Enhance Flood Storage Capacity and to Protect Water Quality**	**Medium Term 3-4 Years**	**66**	Conservation Commission	$25,000 annually	Use the Conservation Commission program to purchase flood storage parcels in the floodplain and wetlands. Increase existing LUTC money that funds Conservation Fund, apply for more State grants to purchase easements. Use	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement	Key floodplain, forestry, wetland, and conservation land parcels	Cost is to place funding into the Conservation Fund to use for purchase of key easements or parcels.	Warrant Article into Conservation Fund

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
						Conservation capital reserve fund accumulation, increase the annual $20,000 deposit to a higher amount. Properties need to come available. Lovejoy donated Fee ownership land 50 acres to Town, Pine Island Brook runs through land. CIP 2022 asked for $20,000 more ($50,000 total) at town meeting because land costs are rising. LUTC is now 50%. No funding & land at present in 2022.				
#43-2017	**Assess the Large Wood Jams in the Soucook River Annually to Reduce the Risk of Flooding and Channel Movement (FGA)**	**Medium Term 3-4 Years**	**73**	Conservation Commission	$500	Determine whether each wood jam in the Soucook River could have an impact during high flow events. Determine what needs to be done, if anything. Conservation Commission to assess and write a report to the Selectmen each year. No staffing or funding presently.	Flood, Winter, Tree Debris, Dam, Fluvial Erosion and Channel Movement	Soucook River - 1 mile north of dam & south of NH 106	Cost is for canoe rentals for in-kind volunteers to perform the assessment.	Conservation Commission Budget
#65-2022	**Encourage Closer Collaboration for Maintenance of the Oak Hill Fire Tower Road and Placement of Remote Cameras on Oak Hill Fire Tower to Reduce the Impact of Nearby Fire, Wildfire, and Lightning**	**Medium Term 3-4 Years**	**75**	Forest Warden	$0	Oak Hill Tower road washes out regularly. The road has ledge on the sides and LHD can only fill the potholes. State NHDRED owns the road and needs to maintain it better (funding is limited). [Recent timber operators had to maintain the road at the time]. INFO: LFD has access to tower if no one there. Has one camera to remotely watch the tower and entrance.	Wildfire, Fire	Oak Hill	Cost is for in-kind staff and volunteer time. Labor and equipment would be borne by the State (NH DRED).	N/A
#66-2022	**Dredge the Three Existing Dry Hydrants at International Drive**	**Short Term 1-2 Years**	**71**	Fire Department	$30,000	FD is dependent on dry hydrants, with a general lack of water for fire suppression during drought	Drought, Wildfire, Fire, Lightning	Industrial Drive,	Cost is for dredging 3 hydrants (	Fire Dept Cistern/Dry

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	and Loudon Ridge to Reduce the Impact of Fire, Wildfire, Lightning, and Drought					conditions, difficulties during winter and mud season. Worse during droughts. Maintenance requires dredging for all/most dry hydrants. Increase the budget line accordingly to keep pace with need. International Drive has commercial & industrial business, while Loudon Ridge is rural and at higher elevation which inhibits easy water sources. These three dry hydrants are key for fire protection, especially during times of extended drought.		Loudon Ridge	Increase the budget line accordingly to keep pace with need.)	Hydrant Maintenance
#67-2022	**Encourage the Town's Agricultural Businesses to Drill a Second Well on Their Properties to Reduce the Economic Impact of Drought**	**Medium Term 3-4 Years**	**71**	Conservation Commission	$0	Agricultural operations (apple, maple, blueberry, xmas trees) may lose crops during droughts. Much of Loudon's economy is agro-tourism based. Overall economic loss to Town.	Drought	Entire Town	Cost is for in-kind staff and volunteer time. Labor and equipment would be borne by the State (NH DRED).	N/A
	TOWN TO ADD NEW ACTION HERE									T
	TOWN TO ADD NEW ACTION HERE									

Source: Loudon Hazard Mitigation Committee

Table 47
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
#17-2011	**Print and Distribute Plastic Disaster Information Placards to Residents to Reduce the Risk of Personal Injury During Natural Disasters**	Short Term 1-2 Years	73	Emergency Management with help of Board of Selectmen	$7,500	In times of disaster, residents can place the placards in their windows so emergency personnel will immediately know when going door to door whether help is needed. No funding and other activities took priority. FD takes lots of calls from aging population about power loss, other basic info calls, generator fuel refills. A Red HELP/green OK 11x17 plastic placard to place in window. Method of distribution is TBD.	Flood, Wind/Tropical, Winter, Extreme Temps (Heat-Cold), Earthquake, Wildfire, Haz Mat	Entire Town - residences	Cost is for placard printing, 1 for each household and business. 2,234 housing units + 200 businesses = 2,500 placards, @ $3/ per placard	EM Budget, and Possible Grants
#44-2017	**Develop and Provide Educational Materials to Soucook River Property Owners and a Newsletter to the Public to Reduce the Impact of Bank Erosion and Flood**	Short Term 1-2 Years	75	Conservation Commission	$250	Develop a fact sheet about the Soucook River's current state and the "do's and don'ts" of how to properly utilize waterfront property and mail to riverfront landowners. Place in the Loudon Ledger (free town newspaper) as a feature article, and place on the Town website. Goal is to limit detrimental activities along the river by educating the public.	Flood, Winter (Ice Jam), Tree Debris, Dam, Fluvial Erosion and Channel Movement	Soucook River	Cost is for paper and printing (publications) for handouts.	Conservation Commission Operating Budget
#68-2022	**Encourage the Placement of a Static Dam Volume Gage Indicator/Alarm System at the Sanborn Pond to Provide Early Flood Warning**	Short Term 1-2 Years	75	Emergency Management	$0	D143.100 Sanborn Grist Mill Dam (large)- sluiceway was dry, regularly open up. Presently, have logs in water when running the active sawmill. The museum saws what they need onsite. Association of State Dam Safety Officials – EWS early warning systems and data acquisition can assist in monitoring.	Flood	Sanborn Pond	Cost would be borne by the property owner.	

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
#69-2022	**Establish a Mobile Health Clinic to Visit Vulnerable Populations, Assist with Check-ups, and Provide Education to Reduce the Risk of Public Health, Weather, and Natural Disaster Events**	**Medium Term 3-4 Years**	**59**	Fire Department with Board of Health	$250,000 annually	Vulnerable pop neighborhoods will be impacted by natural disasters and weather events, and as a result require more services. Whenever the electricity fails, multiple calls for oxygen and medical supplies are taken. Public education for 3 day supply occurs regularly. Community paramedic health program could help with check-up services and education, identify the vulnerable populations and their needs using a mobile clinic.	Health, Wind/Tropical, Winter, Flood, Earthquake, Extreme Temps (Heat-Cold)	Entire Town	Cost is for program and staffing, but a grant is necessary complete the project. To hire a FT FF Paramedic for the right fit will be difficult, with benefits, vehicle and equipment.	FEMA AFG or other programs (short term) through NH Charitable Trust (Tillotson Trust for example) for Public Health Grant, Others
#70-2022	**Encourage Residents and Businesses to Purchase and Utilize Rain Barrels to Reduce the Impact of Drought**	**Short Term 1-2 Years**	**75**	Emergency Management	$250	Develop a flyer and place information on the Town website, Loudon Ledger about the importance of rain barrels, how they should be used, where they can be purchased, how much they cost, how to store them, etc.	Drought	Entire Town	Cost is for paper and printing (publications) for handouts.	EM Budget
#71-2022	**Establish a Cemetery Commission to Undertake Long-Term Planning at the Town Lots and Monitor Trees and Headstones to Reduce the Impact of Wind/Tropical, Winter and Vandalism**	**Short Term 1-2 Years**	**75**	Board of Selectmen	$50,000	Vandalism or civil disturbance could occur in Town and private cemeteries. Treefall could be an issue, although Town has an active cutting program when problems are identified. Small family cemeteries are particularly at risk but the Town lacks ability to do work there. Cemetery oversight is now a volunteer position, a full Commission is needed to assist. Moore and	Wind/Tropical, Winter, Vandalism	Entire Town	Cost is for surveying the remaining cemetery lots, business plan for cremation options.	Cemeteries Capital Reserve Fund

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
						Hope Cemeteries are the Town cemeteries with space available.				
#72-2022	**Encourage Places of Assembly such as Local Churches and Volunteers of America to Hold Active Shooter Training to Reduce the Risk of Terrorism**	**Short Term 1-2 Years then Ongoing**	**75**	Police Department with Emergency Management	$0	Encourage churches to become more involved with active shooter training. Low to no representation at classes, could be improved. Other groups include Young at Heart, Volunteers of America. Participation has been an issue in previous trainings (HSEM offers the training). Training held in August at VOA active shooter, Sep scam avoidance. Also completed for Young at Heart. More promotion for participation (Town website, Loudon Ledger articles). Police Dept performs PowerPoint presentations.	Human (Terrorism)	Entire Town	Cost is for in-kind staff and volunteer labor.	
#73-2022	**Encourage Business and Agricultural Self-Reporting of Potential Seasonal Hazards to Reduce the Impact of Hazardous Materials Events to Water Quality**	**Short Term 1-2 Years then Ongoing**	**73**	Fire Department with Code Enforcement	$1,000	Local businesses are not always good at completing Tier 1 reporting. Reporting is including but not limited to: large quantities of products on-site fertilizers, and pesticides, liquid or gas tanks so the Fire Department knows how to respond to fires and hazard events. A fire at one of the agricultural operations, especially those with large propane tanks and stored fertilizers and pesticides, is a potential hazard. There is a federal reporting system to OSHA and some farms meet this requirement. No requirement for	Public Health (Water Quality), Fire, Explosion, Haz Mat	Agricultural Sites, Haz Mat Facilities	Cost is for in-kind staff and volunteer labor, office supplies, information to distribute.	N/A

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Town to follow through. For emergency planning and through the Right to Know Act, the Fire Department would like to inspect these properties in the future to understand on-site risks. A reporting and inspection system and the CAD database would need to be started and maintained.				
#74-2022	**Engage in a Public Outreach Campaign to Ensure More Business and Residential Property Owners Anchor Their Mobile and Stationary Gas/Oil Tanks to Reduce the Risk of Explosion During River Flood and Wind/Tropical Events and Develop a System for These Requirements During New Inspections**	**Short Term 1-2 Years then Ongoing**	**74**	Code Enforcement with Emergency Management	$0	During inspection and permitting process, the Town can require anchoring of tanks for properties along the Soucook River. Most propane tanks of all sizes (grill and utility) are not anchored to the ground as they should be. During heavy wind, tropical and flooding events, they become floating bombs. There are free FEMA brochures are available as handout to residents. Problems with flooding of propane facilities, where unanchored residential tanks do float downstream). Town can provide brochures and verbal information, and post information on the Town website.	Flood, River, Fire/ Explosion, Haz Mat, Wind/Tropical	Waterfront Properties (Soucook River), Campgrounds	Cost is to distribute free FEMA brochures on tank anchoring to various businesses and residences in Town and to businesses that sell tanks to make available to buyers.	N/A
	TOWN TO ADD NEW ACTION HERE									
	TOWN TO ADD NEW ACTION HERE									

Source: Loudon 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 Loudon 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 including 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**.

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:

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

- Does the action reduce damage and human losses?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Does the action offer reasonable benefits compared to its cost in implementing?

- Is the action legal?
- 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. Loudon's **Mitigation Action Plan** STAPLEE rating is shown in **Figure 29** and includes a basic benefit-cost ranking as shown in yellow.

Figure 29
Enhanced STAPLEE Ranking of Mitigation Actions

Action Number	Does the Action..... or Is the Action..... 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?)	Implemented Quickly? (See also Action Plan for Timeframe)	Socially Acceptable ? (People like project)	Politically Acceptable ? (Public Officials like 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 $$ 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
#45-2022	Coordinate with Liberty Utilities to Mitigate the Impact of a Potential Natural Gas Event Along NH 106	5	4	5	5	4	4	4	5	5	5	5	5	5	5	5	71
#46-2022	Collaborate with Loudon Boards, Local Businesses, and Eversource to Ensure Adequate Electricity Remains Sustainable Especially During Weather Natural Hazard Events	5	5	5	5	4	5	4	5	5	5	5	5	5	5	5	73
#47-2022	Adopt Subdivision and Site Plan Review Regulations that Require Cisterns for Phased Subdivisions to Ensure Adequate Water Capacity to Reduce the Impact of Wildfire and Fire	5	5	5	5	5	2	5	5	5	5	5	5	5	5	5	72
#48-2022	Contact NHDOT to Post Appropriate Weight Limit on Wales Bridge Road to Reduce the Risk of Crashes	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	73
#49-2022	Adopt Subdivision and Site Plan Review Regulations that Require Road Elevation and/or More than 1 Egress for New Developments to Reduce Safety Risks from Wildfire, Winter, and Severe Wind Events	5	5	5	5	2	1	1	5	5	5	5	4	5	5	1	59
#50- 2022	Encourage Tree Plantings Around Buildings to Shade Parking Lots and Along Public Rights-of-Way to Reduce the Effects of Drought and Extreme Heat	3	3	5	2	2	4	3	5	5	2	5	2	5	5	1	52
#51- 2022	Develop and Promote Public Health Policies and Procedures to Reduce Cyanobacteria and Infectious Diseases like Coronavirus	5	5	5	4	4	3	3	5	5	5	5	4	5	5	5	68
#52- 2022	Develop a Plan for the Rotation and Upgrade of Communications Equipment for Town Services to Reduce the Impact of Weather and Natural Hazard Events	5	5	5	5	3	5	5	3	5	5	5	5	2	5	5	68
#53- 2022	Adopt Subdivision and Site Plan Regulations that Require a Groundwater Study for New Development to Reduce the Impact of Drought	5	5	5	5	4	3	5	5	5	5	5	5	5	5	5	72
#01- 2011	Improve Town Buildings for Code Compliance to Reduce the Impact of Severe Wind, Storm Events, Winter Weather or Earthquakes	5	5	5	5	3	5	5	5	5	4	5	4	4	5	5	70
#34- 2017	Construct a New Highway Department Garage on the Transfer Station Property to Reduce the Impact of Hazard Events by Improving Response Time	5	5	5	4	2	4	5	5	5	5	5	5	5	5	3	68
#36- 2017	Place a Static Soucook River Gage on the Village Road Dam to Reduce the Impact of Flooding by Early Notification	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#37- 2017	Instigate Public Support and Funding for the Installation of a Water System in Loudon Village to Reduce the Risk of Wildfire and Fire	5	5	5	5	1	5	4	5	5	5	5	4	4	5	5	68
#38- 2017	Inventory Town Culverts by GPS According to Condition and Volume of Stormwater to Reduce the Risk of Flood and Washouts	5	4	5	4	3	5	5	3	5	5	5	5	4	2	5	65

Action Number	Does the Action..... or Is the Action..... 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?)	Implemented Quickly? (See also Action Plan for Timeframe)	Socially Acceptable ? (People like project)	Politically Acceptable ? (Public Officials like project)	Administratively 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 $$ 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
#54- 2022	Upgrade the Safety Building's Metal Roof for Weather-Sealing and Wildlife Deterrance	5	5	5	5	5	5	4	5	5	5	5	4	5	5	5	73
#55- 2022	Install a Dry Hydrant at the Staniels Road Bridge over Soucook River to Reduce the Impact of Wildfire, Fire, Lightning, and Drought	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#56- 2022	Encourage the Manufactured Housing Cooperatives to Upgrade their Respective Public Water System's Well Infrastructure to Reduce the Risk of Water Contaminants	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#57- 2022	Rehabilitate the Currier Road Bridge Over the Soucook River to Reduce the Impact of Flood, Erosion, Winter, and Tree Debris	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	74
#58- 2022	Rehabilitate the Lower Ridge Bridge at McKenzie Road to Reduce the Impact of Flood, Erosion, Winter, and Tree Debris	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#59- 2022	Obtain Funding and Construct a Village Water System, Including a Pump house, Diesel Pump, 6" Pipes, and Hydrant System to Reduce the Impact of Fire, Wildfire, Drought	5	5	5	5	2	5	3	5	5	5	5	5	1	5	5	66
#60- 2022	Install a Cistern at the Old Town Hall and Transfer Station to Reduce the Impact of Wildfire, Fire, Lightning, and Drought	5	5	5	5	3	5	5	5	5	5	5	5	2	5	5	70
#61- 2022	Install Lightning Alert Systems at the Recreational Drive and Staniels Road Recreation Fields to Reduce the Risk of Injury from Lightning	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#62- 2022	Upgrade Culvert at Old Shaker Road at Shaker Road Intersection for Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#63- 2022	Upgrade Culvert at Blake Road at Intermittent Stream for Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#64- 2022	Upgrade Drainage Culvert at Old Shaker Road at Hunting Swamp Crossing between Flagg Rd and Lovejoy Rd for Better Stormwater Drainage to Reduce the Risk of Flood, Erosion and Washout	5	5	5	5	4	5	5	5	5	5	5	3	5	5	5	72
#39- 2017	Upgrade the North Side of the Village Road Dam and Dredge Bi-Annually to Maintain the Southside Dry Hydrant	5	5	5	5	2	3	5	5	5	5	5	5	1	5	5	66
#40- 2017	Purchase and Place Soucook River or Large Brook Shoreland Under Permanent Conservation that Protects the Parcels from Long Term Development Effects Includeing Erosion, Channel Movement, and Sedimentation	5	5	5	5	2	4	5	5	5	2	5	5	2	5	5	65
#41- 2017	Purchase Key Parcels or Conservation Easements to Enhance Flood Storage Capacity and to Protect Water Quality	5	5	5	5	3	4	5	5	5	2	5	5	2	5	5	66
#43- 2017	Assess the Large Wood Jams in the Soucook River Annually to Reduce the Risk of Flooding and Channel Movement (FGA)	5	5	5	5	4	5	5	5	4	5	5	5	5	5	5	73
#65- 2022	Encourage Closer Collaboration for Maintenance of the Oak Hill Fire Tower Road and Placement of Remote Cameras on Oak Hill Fire Tower to Reduce the Impact of Nearby Fire, Wildfire, and Lightning	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#66- 2022	Dredge the Three Existing Dry Hydrants at International Drive and Loudon Ridge to Reduce the Impact of Fire, Wildfire, Lightning, and Drought	5	5	5	5	4	5	5	5	5	5	5	5	2	5	5	71
#67- 2022	Encourage the Town's Agricultural Businesses to Drill a Second Well on Their Properties to Reduce the Economic Impact of Drought	5	5	5	5	5	3	3	5	5	5	5	5	5	5	5	71
#17- 2011	Print and Distribute Plastic Disaster Information Placards to Residents to Reduce the Risk of Personal Injury During Natural Disasters	5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	73
#44- 2017	Develop and Provide Educational Materials to Soucook River Property Owners and a Newsletter to the Public to Reduce the Impact of Bank Erosion and Flood	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#68- 2022	Encourage the Placement of a Static Dam Volume Gage Indicator/Alarm System at the Sanborn Pond to Provide Early Flood Warning	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#69- 2022	Establish a Mobile Health Clinic to Visit Vulnerable Populations, Assist with Check-ups, and Provide Education to Reduce the Risk of Public Health, Weather, and Natural Disaster Events	5	5	5	2	2	5	5	5	5	5	5	2	1	5	2	59
#70- 2022	Encourage Residents and Businesses to Purchase and Utilize Rain Barrels to Reduce the Impact of Drought	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#71- 2022	Establish a Cemetery Commission to Undertake Long-Term Planning at the Town Lots and Monitor Trees and Headstones to Reduce the Impact of Wind/Tropical, Winter and Vandalism	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#72- 2022	Encourage Places of Assembly such as Local Churches and Volunteers of America to Hold Active Shooter Training to Reduce the Risk of Terrorism	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#73- 2022	Encourage Business and Agricultural Self-Reporting of Potential Seasonal Hazards to Reduce the Impact of Hazardous Materials Events to Water Quality	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	73
#74- 2022	Engage in a Public Outreach Campaign to Ensure More Business and Residential Property Owners Anchor Their Mobile and Stationary Tanks to Reduce the Risk of Explosion During River Flood and Wind/Tropical Events and Develop a System for These Requirements During New Inspections	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	74

Source: Loudon 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 an 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.

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	Public Health	See Actions related to Public Health, Health (Water Quality), Infectious, Life & Safety and general natural disaster.
HIGH	Lightning	See Actions related to Wildfire, Wind/Tropical (storms), Fire, Tree Debris.
HIGH	High Wind Events	See Actions related to Wind, Tropical, Tree Debris, overall Severe Weather Storms.
HIGH	River Hazards	See Actions related to River, Flood, Dam, Erosion, Landslide and overall Severe Weather Storms.
HIGH	Severe Winter Weather	See Actions related to Winter, overall Severe Weather Storms, Ice, Tree Debris.
HIGH	Drought	See Actions related to Drought, Lightning, Extreme Temperatures, and Fire.
HIGH	Wildfire	See Actions for Wildfire, Tree Debris, Lightning.
HIGH	Tropical and Post- Tropical	See Actions related to Wind, Tropical, Tree Debris, overall Severe Weather Storms.
MEDIUM	Extreme Temperatures	See Actions related to Drought, Climate Change, Winter Weather, Extreme Heat.
MEDIUM	Inland Flooding	See Actions related to Flood, Dam, Erosion, River, and Aging Infrastructure.
MEDIUM	Solar Storms and Space Weather	See Actions related to Extreme Temperatures, Aging Infrastructure, Utility Failure.
MEDIUM	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.

Source: Loudon Hazard Mitigation Committee

THIS PAGE INTENTIONALLY LEFT BLANK

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 Loudon will review, monitor, and update its new **Loudon 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:

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

Stakeholders who will be solicited to attend meetings and to participate equitably in the Plan development process include representatives from Loudon School District, Library, Historical Society, NH

NH Motor Speedway, neighborhoods *such as from homeowners associations or manufactured home parks), 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** *Budgets Determined*	**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** *$ Available*	**Annual funding is received from March Town Meeting.** HMC completes annual update of the **CHAPTER 8 Mitigation Action Plan Tables,** polls Depts/Bds for new Hazard Events descriptions/impacts/locations/date **to add to CHAPTER 4 Local Hazard Event History Table**, requests photos of Hazard Events and updates **APPENDIX Photographic History**. HMC reviews and revises **CHAPTER 4 HIRA Table**. HMC determines Action Plan items to pursue for Year, including $0 cost items.
May	HMC members ensure Depts/Bds are provided with information to work on their Actions for the Year. HMC members meet with Depts/Bds to discuss Action priorities and requests completion of This Year & Next Year Actions. Depts/Bds begin working on Actions. HMC posts a **Haz Mit/Severe Weather Survey** online for widespread public input. HMC helps Depts/Bds with grants for Actions.
JUNE **HMC Meeting**	**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

Meeting or Activity Month	ANNUAL Preliminary HMC Interim Meeting Agenda Items and Activities
Infrastructure Projects Underway	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** *CIP updated, Budgets drafted*	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: Loudon 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, Loudon School District representatives, Stakeholders (such as NH Motor Speedway), 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 Loudon, and will be posted on the Town of Loudon website at https://www.loudonnh.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 **2028 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 2026-2028.

Figure 30 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 30
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 Acton 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 **Loudon 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 Loudon has a comprehensive network of plans, processes, champions, regulations, and budgets to ensure its local objectives, projects and budgets are fulfilled. The **Loudon 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 **Loudon 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 2018** the opportunity exists now for incorporation of the **2023 Plan** . The **Capital Improvements Program 2022/23-2026/27** has been recently updated and its projects influence new funding for Departments, including the Highway Department funding that previously upgraded culverts 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 were updated in **2022** as the Land Development Regulations. 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 Public Works Department and are important mitigation projects in Loudon.

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 Loudon Master Plan was adopted by the Planning Board in **November 2018**. The goal for future updates is annual review and revision of a selection of Chapters. Chapters from the ***2018 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 Historic and Cultural Resources, and the **Hazard Mitigation Plan 2023**.

*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

Loudon's last adopted **Capital Improvements Program (CIP)** is **2022/23-2026/27** as adopted in **2022**. 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 Loudon, 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, Loudon 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 Loudon 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.loudonnh.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 Loudon Town Hall, outside on the Town Bulletin Board, at the Library, at the Safety Center, at the local schools, 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 Loudon 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 Loudon 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 Loudon 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 Loudon. See **9 ANNUAL EVALUATION AND IMPLEMENTATION** and **Figure 30** for details.

THIS PAGE INTENTIONALLY LEFT BLANK

11 MAPS

Four (**4**) detailed Maps were fully updated during the development of the **Loudon 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 Loudon 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 Loudon 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 Loudon.

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

Fluvial Geomorphic Assessment 2015 Maps

As a result of the many past flooding events and existing complications of the very dynamic Soucook River and a potential for future flooding on the Soucook, the NH Geological Survey (NHGS) at the NH Department of Environmental Services (NHDES) coordinated fluvial geomorphology assessments of the River. Conducted by Field Geology Services who collected fluvial geomorphology field data in designated river reaches of the Soucook River in Concord/Pembroke and Loudon in **2014**, a suite of river data features was collected from the confluence of the Merrimack north into Loudon along the Soucook River.

The NHGS wrote the *Soucook River Fluvial Geomorphology Assessment Discussion Guide* in **Spring 2015** to help communities interpret the data that was collected on by river reach. While the full **Soucook River Fluvial Geomorphic Assessments** is located in the **2017 Plan**, just the accompanying maps have been retained for reference in the **Hazard Mitigation Plan Update 2023**.

SOUCOOK RIVER FLUVIAL GEOMORPHIC ASSESSMENT (FGA) MAPS 2015

- **Map 5A - Soucook River Fluvial Geomorphic Features (South)**
- **Map 5B - Soucook River Fluvial Geomorphic Features (Village)**
- **Map 5C - Soucook River Fluvial Geomorphic Features (Currier Road)**
- **Map 5D - Soucook River Fluvial Geomorphic Features (North)**

- **Map 6A - Soucook River Fluvial Erosion Hazard Meander Belts (South)**
- **Map 6B - Soucook River Fluvial Erosion Hazard Meander Belts (Village)**
- **Map 6C - Soucook River Fluvial Erosion Hazard Meander Belts (Currier Road)**
- **Map 6D - Soucook River Fluvial Erosion Hazard Meander Belts (North)**