

Town of Pelham, New Hampshire

Hazard Mitigation Plan Update 2024



Prepared with Assistance from the Nashua Regional Planning Commission



Funded in part by the NH Department of Safety, Homeland Security and
Emergency Management



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ACKNOWLEDGMENTS

The 2024 Town of Pelham, NH Hazard Mitigation Planning Committee

The Nashua Regional Planning Commission and the Town of Pelham wish to thank the following individuals for serving on the Town's Hazard Mitigation Committee and for their assistance in the development of this Plan:

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EXECUTIVE SUMMARY

Jurisdiction and Scope of the Plan

This plan addresses the Town of Pelham, NH. The Plan addresses the following types of Hazards:

- Drought
- Earthquake
- Extreme Temperatures
- Flooding
- Severe Wind
- Lightning
- Severe Winter Weather
- Tornado
- Wildfire
- Solar Storms and Space Weather
- Infectious Disease

Hazard Mitigation Goals

The first step in developing a mitigation strategy is to establish goals that reflect what the municipality wishes to achieve through the implementation of its Hazard Mitigation Plan. The Pelham Hazard Mitigation Team established the following goals and objectives, based on its desire to protect the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property. These goals provided the basis for identifying and prioritizing mitigation actions.

Goal 1—Prevent the impacts of natural hazards on the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property whenever possible.

- Objective 1.1—Manage development of known hazard areas to avoid the risks associated with natural hazards.
- Objective 1.2—Plan to incorporate hazard mitigation into capital improvements and other future initiatives.
- Objective 1.3—Ensure building codes and other standards include requirements that make new construction more disaster resistant.
- Objective 1.4—Support the maintenance of this hazard mitigation plan.

Goal 2—Protect the Town's existing critical facilities, infrastructure, and private property from the impacts of natural hazards through cost effective mitigation activities.

- Objective 2.1—Modify existing structures to reduce damage from future natural hazard events.
- Objective 2.2—Perform cost effective flood hazard mitigation measures to protect private property.

Goal 3—Educate and inform the Town’s residents to help them become more resilient to natural hazards impacting the community.

- Objective 3.1—Utilize educational methods to change the perception from “disaster losses are acceptable” to “many disaster losses are preventable if mitigation practices are followed.”
- Objective 3.2—provide educational opportunities across all age ranges.
- Objective 3.3—Develop and distribute public awareness materials regarding the relative risk of natural hazards and practical mitigation measures to reduce damages and injuries.

Goal 4—Address the challenges of natural resource degradation and the associated increased risk from hazards.

- Objective 4.1—Ensure development in hazard areas does not destroy natural barriers to damage, such as floodplains and vegetation.
- Objective 4.2—Protect or recreate environmental assets to help safeguard the built environment.

Goal 5—Protect emergency services, critical facilities, and other critical capabilities from hazard damage in order for them to remain operational.

- Objective 5.1—Identify critical facilities, infrastructure, and emergency services and their vulnerabilities to natural hazards.
- Objective 5.2— Develop and implement programs to promote hazard mitigation actions that protect the provision of emergency services in Town.
- Objective 5.3—Identify, maintain, and protect evacuation routes from hazard damage so they are usable when needed.

CHAPTER 1. PLANNING PROCESS

Section 1.1 ~ Overview of Planning Process

The Pelham Hazard Mitigation Plan Update 2024 was prepared by the Nashua Regional Planning Commission (NRPC) for the Town of Pelham, NH. NRPC staff worked closely with the Pelham Hazard Mitigation Team to write this plan.

NRPC staff met with the Pelham Hazard Mitigation Team for a series of 4 meetings in order to prepare the Pelham Hazard Mitigation Plan Update 2024. Agendas from these meetings appear in the Appendix to this Plan. In between meetings, NRPC worked directly with Pelham Hazard Mitigation Team members to obtain additional information needed to write the Plan.

The primary differences between the 2024 Plan and the 2017 are 1) Infectious Disease is now recognized by the State as a hazard, and 2) Solar and Space Weather is now recognized by the State as a hazard.

Section 1.2 ~ Involvement of Neighboring Communities and Local/Regional Agencies

At the first Hazard Mitigation Team meeting, held on October 18, 2022, the group discussed who should be invited to participate on the planning team that was not currently represented. It was determined that the current Team provided adequate representation and no additional members were necessary. The Team also discussed who should be informed about the Plan, such as neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, and others. It was concluded that the following entities should be informed of the Plan update:

- Homeland Security and Emergency Management, Danielle Morse, Field Representative, Concord, NH
- American Red Cross, Nashua, NH and Manchester, NH
- Easter Seals, Manchester, NH
- Eversource, Manchester, NH
- Liberty Utilities, Salem, NH
- Pennichuck East Utility Inc., Nashua, NH
- Manchester-Boston Regional Airport, Manchester, NH
- Nashua Airport Authority, Nashua, NH
- Board of Selectmen, Town of Hudson, NH
- Board of Selectmen, Town of Dracut, MA
- Board of Selectmen, Town of Salem, NH
- Board of Selectmen, Town of Windham, NH
- Board of Selectmen, Town of Tyngsboro, MA
- City Council, City of Methuen, MA
- Pelham School District, Pelham, NH
- Southern NH Health at Pelham, Pelham, NH
- Pelham Health Care Associates, Pelham, NH
- Candy Break Outlet Store, Pelham, NH
- Hannaford Supermarket, Pelham, NH
- PJ Keating & Co., Dracut, MA

- Yarde Metals, Pelham, NH
- Tennessee Gas Pipeline Co., Pelham, NH
- Kinder Morgan, Houston, TX

A number of these entities, especially the American Red Cross and Easter Seals, work with/provide support to underserved communities and the socially vulnerable making notification of this plan update imperative.

A copy of the letter that was sent to these entities appears in the Appendix to this Plan. The American Red Cross sent staff to participate in several meetings with the Pelham Hazard Mitigation Committee. No other entities responded.

Section 1.3 ~ Public Participation

During the first Hazard Mitigation Team meeting, held on October 18th, 2022, the Team brainstormed all the methods currently employed to notify the public of Town meetings and news. These methods include the Town's website (<http://www.pelhamweb.com/>), Pelham Fire Department Facebook page (<https://www.facebook.com/Pelham.NH.Fire.Department/>), Pelham Police Department Facebook page (<https://www.facebook.com/pelhamnhpolice/>), Pelham Fire Department Twitter account (<https://twitter.com/pelhamnhfiredep?lang=en>), and PTV Pelham Community Television (<http://www.pelhamweb.com/cable-ptv>). The Team determined that these methods should also be used to encourage participation from the general public, underserved communities, and vulnerable populations in the Hazard Mitigation Plan update process. In addition, announcements were made at various televised Board of Selectmen meetings regarding the update process. Public response was minimal, but it is noted that one community member inquired regarding notification they had received of more new construction that will impact their neighborhood. There is a proposed four lot subdivision consisting of three single family/duplex lots accessible from 243 Sherburne Rd. The land behind this house has long since been considered wetlands. They voiced their concerns that disruption to the watershed will lead to other issues. They wonder if adding more construction is only going to make the situation worse. Although this is out of the realm of Hazard Mitigation, their concerns were noted and forwarded to the Town's Planner.

NRPC staff also developed a webpage for the Pelham Hazard Mitigation Plan Update 2024 (https://nashuarpc.org/about_nrpc/our_region_communities/pelham_hazard_mitigation_plan_update/index.php), which allows members of the public to participate in the update process even if they cannot attend meetings. The webpage was updated throughout the planning process and includes the 2017 Pelham Hazard Mitigation Plan, 2024 Hazard Mitigation Plan Outline, and Hazard Mitigation Plan Review Checklist. It also provides meeting times, locations, agendas, and homework assignments. The Town of Pelham's website links to this webpage. The Nashua Regional Planning Commission will keep the website active and will add information about ongoing updates over the next 5 years. A screenshot of the website appears in the Appendix to this Plan.

Section 1.4 ~ Existing and Potential Authorities, Policies, Programs, and Resources

At the first Hazard Mitigation Team meeting, held on October 18th, 2022, the Team discussed Pelham's existing authorities, policies, programs, and resources related to hazard mitigation and its ability to expand and improve on these. The purpose of this discussion was to determine the ability of the Town

to implement its hazard mitigation strategies and to identify potential opportunities to enhance specific policies, programs, or projects. The evaluation of Pelham’s existing authorities, policies, programs, and resources includes planning and regulatory capabilities, emergency management capabilities, floodplain management capabilities, administrative and technical capabilities, and fiscal capabilities. Each of these areas provides an opportunity to integrate hazard mitigation principles and practices into the local decision-making process.

Specifically, the 2024 Hazard Mitigation Team is comprised of select individuals that represent various Town functions and capabilities that will be needed to expand on and improve existing policies and programs, as well as be the responsible parties to implement mitigation strategies.

- Fire Chief/Emergency Management Director – The EMD will facilitate any update to emergency operations and plans/programs. Many hazard mitigation actions involve providing education and services to residents, which falls under the jurisdiction of emergency management. Where the Emergency Management Director in Pelham is also the Fire Chief, this team member can also directly implement improvements and mitigation actions to the Fire Department.
- Deputy Fire Chief – The Deputy Fire Chief assists the Fire Chief in the development of new programs and policies to support mitigation strategies and priorities.
- Police Chief – The Police Chief interacts with the public on a regular basis and will directly support expansion and improvement programs involving public education, protection, and communication as well as the Police Department in general.
- Town Administrator – The Town Administrator is a central contact for all departments and will assist in implementing department-wide changes and mitigation actions.
- Planning Director/Zoning Administrator – The Planning Director/Zoning Administrator will work with the Planning and Zoning Boards to implement new regulatory changes that support hazard mitigation and goals.
- Road Agent – The Road Agent provides insight on existing conditions and deficiencies in municipal infrastructure as well as facilitates Highway Department functions such as maintenance of flood control infrastructure. Many mitigation actions include infrastructure maintenance and improvement as well as implementation of new programs.
- Assessing Assistant – Assessing is important to hazard mitigation by providing flooding data and Town valuation information to support development of mitigation practices.

Planning and Regulatory Capabilities

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate Pelham’s commitment to guiding and managing growth in a responsible manner. The following is a summary of the relevant local plans, ordinances, and programs already in place in the Town of Pelham. Each one should be considered as an available mechanism for incorporating the recommendations of the Pelham Hazard Mitigation Plan Update 2024.

- [Aquifer Conservation District](#)—outlines permitted and prohibited uses in the District, which are designed to protect groundwater resources in Pelham from contamination.

- [Wetlands Conservation District](#)—the purpose of this ordinance is to protect the public health, safety, and general welfare by controlling and guiding the use of land areas which have been found to be subjected to high water tables for extended periods of time.
- [Floodplain Development Ordinance](#)—certain areas of Pelham 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 Pelham 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 as detailed in this ordinance.
- [Pelham Master Plan](#) – Update in progress.
- [Zoning Ordinance](#) – The ordinance was last updated in March of 2023.
- [Subdivision Regulations](#)
- [Site Plan Regulations](#) – Altered to incorporate Stormwater Management MS4 requirements.
- [International Building Code](#) and [International Residential Code](#) – Pelham has adopted the 2018 International Building Code and International Residential Code
- [National Flood Insurance Program](#) – The most recent Flood Insurance Study (FIS) Report for Pelham, dated September 25, 2009 (volumes 1-5), can be found at the [FEMA Flood Map Service Center](#).
- Nashua Regional Water Resiliency Action Plan— Climate change in southern New Hampshire will impact the environment, ecosystem services, economy, public health, and quality of life. According to a 2014 study by the Sustainability Institute at the University of NH, southern NH is expected to become warmer and wetter over the next century with more extreme precipitation events. This weather pattern puts significant stress on the region’s already aging water infrastructure. Furthermore, climate change is likely to cause a number of public health impacts on NH’s most vulnerable residents. Despite efforts taking place to slow the rate of climate change, some level of change is inevitable. Therefore, municipalities must make sound decisions to help their communities adapt to a new climate normal. The goal of the Nashua Region Water Resiliency Action Plan is to help municipalities become more resilient to the impacts that climate change has on their water infrastructure and vulnerable populations.

Emergency Management Capabilities

Hazard mitigation is a key component of emergency management, along with preparedness, response, and recovery. Opportunities to reduce potential losses through mitigation practices are typically implemented before a hazard event occurs, such as enforcement of policies to regulate development that is vulnerable to hazards due to its location or design. Existing emergency management capabilities for the Town of Pelham include:

Emergency Management Plans

- [Pelham Hazard Mitigation Plan 2017](#)—this document provides a guide for the community to reduce the impact of natural hazards on its residents and the built environment.
- Pelham Emergency Operations Plan—This Plan outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster.

- Statewide Mobilization Plan

Emergency Management Departments, Facilities, Personnel, and Volunteers

- [Pelham Fire Department](#), [Pelham Police Department](#)—these departments provide policies, programs, and resources related to hazard mitigation and emergency preparedness.
- Border Area Fire Mutual Aid Association—provides fire assistance to surrounding municipalities. Participated in Statewide Fire Mobilization Implementation Plan.
- Hillsborough County Police Mutual Aid—provides police assistance to surrounding municipalities, including MA communities on the NH border. There is a statewide system being produced currently.
- Public Works Mutual Aid Compact- Statewide written agreement
- Pelham Community Emergency Response Team (CERT) and Medical Reserve Corp (MRC)—educate people without medical backgrounds about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills. CERT and MRC members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT and MRC members are also encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community.
- Emergency Operations Center—located in Fire Department, provides radio, computer, and phone support in conjunction with the State EOC for allocation of resources, equipment, and personnel during an emergency situation.

Emergency Management Communications

- Dispatch—Pelham has its own dispatch, with backup capabilities in the EOC.
- [Citizen Observer](#)—emergency alert system
- [Pelham CERT & MRC Facebook](#)
- [Pelham Police Twitter](#)
- [Pelham Police Facebook](#)
- [Pelham Fire Twitter](#)
- [Pelham Fire Facebook](#)
- [Pelham Community Television](#)—emergency management announcements
- [Pelham Municipal Website](#)—emergency management announcements and education

Floodplain Management Capabilities

The Town of Pelham participates in the National Flood Insurance Program (NFIP). This provides full insurance coverage based on risk as shown on detailed Flood Insurance Rate Maps (FIRMs). Pelham joined the NFIP on March 14, 1980. As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Pelham has adopted the “Floodplain Development Ordinance,” found in Article VIII of the [Town of Pelham, NH Zoning Ordinance](#). The Floodplain Ordinance is enacted to prevent the development of buildings and uses in areas that are unsatisfactory and hazardous due to the threat of flooding, protect natural flows and drainage, and comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-

488, as amended). Additional information on the Floodplain Ordinance and Pelham's participation in the NFIP will be located in Section 3.5 of this Plan.

Administrative and Technical Capabilities

Pelham's ability to develop and implement mitigation projects, policies, and programs is closely related to the staff time and resources it allocates to that purpose. Administrative capability can be improved by coordinating across departments and integrating mitigation planning into existing Town procedures. The following departments, boards, and personnel are critical to Pelham's hazard mitigation administrative and technical capabilities:

- Planning Board
- Planning Staff
 - Planning Director/Zoning Administrator
 - Planning Assistant
 - Planning Office Manager
 - Planning Administrative Assistant
 - Code Compliance Official
- Inspectors
 - Building/Plumbing Inspector
 - Electrical Inspector
 - Health Agent
 - Highway Agent
 - Fire Inspector
- Fire Department
- Police Department
- Town Administrator
- Board of Selectmen
- Zoning Board
- Budget Committee
- Capital Improvements Committee

Fiscal Capabilities

In addition to administrative and technical capabilities, the ability of the Town of Pelham to implement mitigation actions is closely associated with the amount of money available for these projects.

Mitigation actions identified in this Plan, including those that will appear in Table 12—Implementation and Administration, may utilize the following funding sources.

- [Congestion Mitigation and Air Quality \(CMAQ\) Program](#)—this program is administered by the Federal Highway Administration and was implemented to support surface transportation projects and related efforts that contribute to air quality improvements and provide congestion relief.
- [FEMA Hazard Mitigation Grant Program](#)—the Hazard Mitigation Grant Program provides grants to implement long-term hazard mitigation measures after a major disaster declaration. The

purpose of the Program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

- [FEMA Pre-Disaster Mitigation Program](#)—the Pre-Disaster Mitigation Program provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster.
- Community Development Block Grant Program—the Community Development Block Grant (CDBG) program, administered through the US Department of Housing and Urban Development, provides communities with resources to address a wide range of unique community development needs, including Disaster Recovery Assistance. HUD provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.
- [Pelham Capital Improvements Plan 2023-2029](#)— the Pelham Capital Improvements Plan (CIP) links local infrastructure investments with long-term planning. As authorized by RSA 674:5-8 the CIP is the responsibility of the Planning Board or a formally appointed capital improvements program committee, to prepare and amend a recommended program of municipal capital improvements projected over a period of at least six years. The following funding methods may be used:
 - 1-Year Appropriation—most commonly used financing option and refers to those projects that are to be funded by property tax revenues within a single fiscal year. Funds for projects that are financed using this method are most often included in the Town’s operating budget but can appear as warrant articles to be voted on individually. The Pelham CIP committee recommends this approach for irregular capital needs that do not exceed \$100,000.
 - Capital Reserve—a capital reserve account is a non-lapsing savings account, separate from the General Fund. Voters can deposit funds into with approval of a warrant article, with the intent of withdrawing the funds to use for the specific purpose or purchase for which the account was established. This method requires appropriations over more than one year, with the actual project being accomplished only when the total appropriations meet the project cost. The Pelham CIP committee recommends this approach for expenditures over \$100,000 and less than \$1,000,000 and for projects or capital assets having a known fixed life such as vehicle replacement, building maintenance, and road repair.
 - Lease Purchase—lease purchasing an item allows a municipality to spread the cost over a period of years, generally no more than 7. A municipal lease typically allows for Town ownership at the end of the lease term and usually enjoys lower tax-exempt interest rates. Unlike a bond or loan, a municipal lease has a “non-appropriation clause” that allows the town to cancel the lease if the annual payment is not appropriated. The town then loses the equipment that was financed. In the past, Pelham has used this funding mechanism to purchase fire trucks and highway department vehicles. Although it is a valid financing method, the CIP committee recommends funding vehicle replacement through capital reserves, so the Town pays itself the interest on the capital balance rather than a financing company.
 - Bonding—bonding allows the municipality to negotiate the purchase of goods or services at a set price and then pay for that item or service over a period of time. Bonds, unlike capital reserve accounts, allow the town to utilize the item being purchased or constructed while

payments are being made. The most important part of a bond transaction is the promise of the town to repay the debt with interest. There are two major types of bond: general obligation and special revenue. General Obligation Bonds typically have lower interest rates than other types of long-term debt. Revenue Bonds rely on a set revenue source or sources as security for the bond. The Pelham CIP committee recommends this method for capital expenditures of \$1,000,000 or more.

- Impact fees—these fees are collected from new development to pay for new facility capacity. Money collected is placed in a fund until it is either expended within six years or returned to the party from whom it was collected.

Summary and Analysis of Pelham's Existing Authorities, Policies, Programs, and Resources

Measures of Effectiveness are defined as follows:

- Excellent—the existing program works as intended and is exceeding its goals
- Good—the existing program works as intended and meets its goals
- Average—the existing program works as intended but could be improved to meet higher standards
- Poor—the existing program does not work as intended, often falls short of its goals, and/or may present unintended consequences

Capability	Description	Area of Town Covered	Responsible Entities	Effectiveness	Changes or Improvements Needed
Planning and Regulatory	Aquifer Conservation District, Wetlands Conservation District, Floodplain Development Ordinance, Pelham Master Plan, Zoning Ordinance, Subdivision Regulations, Site Plan Regulations, IBC, IRC, NFIP, Nashua Regional Water Resiliency Action Plan	Entire jurisdiction	Planning Board, Zoning Board, Planning Department	Good	Ordinances should be reviewed on a regular basis to ensure they are consistent with goals outlined in the Master Plan and Hazard Mitigation Plan. Consider conducting a Town specific vulnerability assessment to improve local resiliency to climate change impacts.
Emergency Management	Plans; Departments, Facilities, Personnel, and Volunteers;	Entire jurisdiction	Pelham Fire Dept., Pelham Police Dept., CERT, MRC	Excellent	Utilize a variety of communications methods to ensure all residents are

	Communications				educated about emergency preparedness and hazard mitigation measures they can take.
Floodplain Management	Floodplain Ordinance, NFIP	Designated Flood Hazard Areas in Pelham	Pelham Planning Board	Good	Ensure 2017 Pelham Master Plan update includes floodplain management considerations. Incorporate updated floodplains for Merrimack Watershed into municipal planning activities when they become available.
Administrative and Technical	Planning Board, Planning Director, Planning/Zoning Administrator, Planning Office Manager, Code Compliance Official, Building Inspector, Electrical Inspector, Plumbing Inspector, Health Agent, Highway Agent, Fire Inspector, Fire Dept., Police Dept., Town Administrator, Board of Selectmen, Zoning Board, Budget Committee, Capital Improvements Committee	Entire jurisdiction	Entities listed in Description	Excellent	Promote communication across all departments and committees to ensure Hazard Mitigation Plan goals and actions are implemented.
Fiscal	Grant funding,	Entire	Board of	Good	Hazard mitigation

	Capital Improvements Program (CIP)	jurisdiction	Selectmen, Capital Improvements Committee, Planning Board		actions should be considered for inclusion in the CIP and departmental budgets. Pelham's Hazard Mitigation Plan should be updated at least every 5 years to maintain eligibility for FEMA grants.
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Section 1.5 ~ Review and Incorporation of Existing Documents

A number of existing documents were reviewed and incorporated into the Pelham Hazard Mitigation Plan Update 2024. The Pelham Zoning Ordinance was used to provide information on where and how the Town builds. This was particularly helpful when mapping critical facilities corridors (Section 3.3). The Pelham Capital Improvements Plan was used to help document the Town's fiscal capabilities (Section 1.4). The Pelham Master Plan provided insight on future development patterns (Section 2.1) and helped to inform the analysis and prioritization of mitigation actions (Section 4.3). The Pelham Emergency Operation Plan was also used to inform the analysis and prioritization of mitigation actions. The State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 provided insight when developing the description of natural hazards (Section 3.1), description of previous hazards (Section 3.2), probability of future hazards (Section 3.3), vulnerability by hazard (Section 3.5), and goals to reduce vulnerabilities (Section 4.1). The City of Nashua's Comprehensive Emergency Management Plan was referenced to write the hazard descriptions used to determine Pelham's vulnerability by hazard (Section 3.5). Finally, the Nashua Regional Planning Commission's "Nashua Regional Water Resiliency Action Plan" provided insight when developing the description of natural hazards (Section 3.1), probability of future hazards (Section 3.3), vulnerability by hazard (Section 3.4), and goals to reduce vulnerabilities (Section 4.1). It was used to inform the analysis and prioritization of mitigation actions (Section 4.3).

Section 1.6 ~ Updating the Plan

Plan Evaluation

In coordination with the Nashua Regional Planning Commission, the Pelham Emergency Management Director will call meetings of all responsible town parties to review plan progress annually on the anniversary of plan adoption and as needed, based on occurrence of hazard events, and report outcomes to the Select Board. The public will be notified of these meetings in advance through a posting of the agenda at Town Hall. Responsible parties identified for specific mitigation actions will be asked to submit their reports in advance of the meeting. Meetings will entail the following actions:

- Review previous hazard events to discuss and evaluate major issues, effectiveness of current mitigation, and possible mitigation for future events.
- Assess how the mitigation strategies of the plan can be integrated with other Town plans and operational procedures, including the Zoning Bylaw and Emergency Management Plan.

- Review and evaluate progress toward implementation of the current mitigation plan based on reports from responsible parties.
- Amend current plan to improve mitigation practices.
- Meetings will involve evaluation and assessment of the plan, regarding its effectiveness at achieving the plan's goals, stated purpose, and priorities. The following questions will serve as the criteria that is used to evaluate and update the plan:

Plan Mission and Goal

- Is the Plan's stated goal and mission still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the goal and mission?

Hazard Identification and Risk Assessment

- Have there been any new occurrences of hazard events since the plan was last reviewed? If so, these hazards should be incorporated into the Hazard Identification and Risk Assessment.
- Have any new occurrences of hazards varied from previous occurrences in terms of their extent or impact? If so, the stated impact, extent, probability of future occurrence, or overall assessment of risk and vulnerability should be edited to reflect these changes.
- Is there any new data available from local, state, or Federal sources about the impact of previous hazard events, or any new data for the probability of future occurrences? If so, this information should be incorporated into the plan?

Existing Mitigation Strategies

- Are the current strategies effectively mitigating the effect of any recent hazard events?
- Has there been any damage to property since the plan was last reviewed?
- How could the existing mitigation strategies be improved to reduce the impact from recent occurrences of hazards?

Proposed Mitigation Strategies

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any completed mitigation strategies reduced the Town's vulnerability and impact from hazards that have occurred since the strategy was completed? If not and if they have been tested, what changes need to make them more effective?
- Should the criteria for prioritizing the proposed strategies be altered in any way?
- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources, or recent hazard events?

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? How could it be improved?
- Are there any Town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them or integrated with other Town planning tools

and operational procedures, including the zoning bylaw, the Comprehensive Emergency Management Plan, and the Capital Improvement Plan?

Following these discussions, it is anticipated that the planning team may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan.

Plan Update

The Emergency Management Director will be responsible for a complete update of the Plan every five years and incorporating the results of Pelham's plan monitoring and evaluation procedures. The next anticipated update of the plan is scheduled to begin in calendar-year 2028, with the goal of adoption in 2029. A first meeting, initiated by the EMD, is anticipated in June 2028. The plan update may begin earlier following a significant natural hazard event within the town and region, such as a federally declared disaster.

The public meetings of the hazard mitigation team shall be publicized through legal notices in local newspapers, posted fliers, and on the town and regional planning commission websites. Written and email comments shall be directed to the EMD. The updated plan will incorporate input from the public, other municipalities and government agencies. The Board of Selectmen is responsible for approving the plan submission to FEMA and for adoption of the plan.

CHAPTER 2. CHANGES FROM PREVIOUS PLAN

Section 2.1 ~ Changes in Development

Since the 2017 plan, there has been substantial residential development mostly consisting of single-family homes. There is also a 16-unit apartment complex constructed on Windham Road, and a 62-unit apartment complex currently in the approval process. These developments are not in hazard prone areas, however, they do increase areas of large population centers making them more vulnerable to the impacts of hazards. In response, Pelham has established a building moratorium on Sherburne Road due to lack of water, to decrease overall vulnerability to hazards (especially wildfire).

Pelham has also planned three significant bridge projects since the 2012 Hazard Mitigation Plan. The Willow Street Bridge was in the Ten-Year Plan with State-Aid Bridge funding for construction in 2020. It was replaced to alleviate flooding issues and correct deficiencies associated with the existing bridge to provide safe, year-round vehicular and pedestrian passage on Willow Street over Beaver Brook. This bridge project is now completed. The Old Bridge Street (Abbot Bridge) is currently in the Ten-Year Plan with State-Aid Bridge funding for construction in 2022. This bridge crosses Beaver Brook and is scheduled for rehabilitation work. The project is still underway. Finally, the Main Street Bridge project will involve both bridge and culvert replacements. This will allow the Town to address flooding issues along Beaver Brook caused by the Willow Street Bridge prior to construction of the Main Street Bridge. The Main Street Bridge project is currently in the Ten-Year Plan and is still underway. All bridge projects are expected to decrease the overall flooding vulnerability of Pelham's transportation critical facilities.

Section 2.2 ~ Progress on Local Mitigation Efforts

In order to assess progress on local mitigation efforts, the Hazard Mitigation Team reviewed the actions originally presented in the Pelham Hazard Mitigation Plan 2017 and determined if they had been completed, deleted, or deferred. Progress on each action and its current priority level were also evaluated to determine if it should continue to be included in the mitigation actions identified in this Plan update.

Table 1—Status of Previous Actions

2017 Mitigation Action	Status	Explanation
Review and update Floodplain Ordinance, Zoning Regulations, and Master Plan. Proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	Completed/ Ongoing	This is a mitigation action (Structural, Property Protection). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of drought, earthquake,	Completed/ Ongoing	This is a mitigation action (All Hazards, Public Education). This action will be completed on an ongoing basis throughout the life of this Plan. As such,

2017 Mitigation Action	Status	Explanation
extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks. Utilize Citizen Observer and community access TV.		this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Develop plans to ensure measures are in place to protect structures from lightning, including guard shack at Veterans Memorial Park. Improve emergency access and create secondary emergency access north of Veterans Memorial Park.	Completed/ Deleted	This action was completed over the course of the 2017 plan and will not be tracked in future hazard mitigation plans.
Continue to evaluate the flooding situation in relation to Beaver Brook and how to offset future flooding impacts.	Completed/ Deleted	This action was completed over the course of the 2017 plan and will not be tracked in future hazard mitigation plans.
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event.	Completed/ Deleted	This action was completed over the course of the 2017 plan and will not be tracked in future hazard mitigation plans.
Distribute and/or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Completed/ Ongoing	This is a mitigation action (Flooding, Property Protection). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Require surveyors to inspect foundations when creating As-built maps to determine if lowest floor is at or above Base Flood Elevation (BFE).	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2017 Hazard Mitigation Plan and will be moved to the Hazard Mitigation Plan Update 2024.
Require use of elevation certificates for new structures in the floodplain.	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2017 Hazard Mitigation Plan and will be moved to the Hazard Mitigation Plan Update 2024.
Enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells	Completed/ Ongoing	This is a mitigation action (Prevention, Public Education). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in

2017 Mitigation Action	Status	Explanation
within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.		the Hazard Mitigation Plan Update 2024.
Work with Pennichuck or a private developer to create a plan to develop a water supply and distribution system to address areas of town experiencing dry wells, including the Sherburne Road neighborhoods.	Completed/ Deleted	This action was completed over the course of the 2017 plan and will not be tracked in future hazard mitigation plans.
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities. Actively communicate with residents regarding snow loads through mechanisms such as Pelham website, signs, and Citizen Observer.	Completed/ Ongoing	This is a mitigation action (Structural, Property Protection). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling stations at the Senior Center and Library.	Completed/ Ongoing	This is a mitigation action. This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Continue to work with Liberty Utilities and Pelham Highway Dept. to harden electrical infrastructure, including trimming trees near power lines.	Completed/ Ongoing	This is a mitigation action (Structural, Property Protection). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.

2017 Mitigation Action	Status	Explanation
Tightly control burn permits and revoke when not properly and safely being utilized. Post fire danger categories. Work with Eversource to remove underbrush and standing deadwood in residential areas and under power lines to reduce the likelihood of wildfires spreading.	Completed/ Ongoing	This is a mitigation action (Prevention, Public Education). This action will be completed on an ongoing basis throughout the life of this Plan. As such, this action will continue to be tracked in the Hazard Mitigation Plan Update 2024.
Map all drainage capture structures and outflows. Incorporate GIS data for drainage infrastructure into hazard mitigation planning and municipal planning activities.	Deleted	This is a preparedness action. As such, it will not be tracked in future hazard mitigation plans.

Section 2.3 ~ Changes in Priorities

The following mitigation actions rose in priority level from the 2017 Plan to the 2024 Plan:

- Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks. Utilize Citizen Observer and community access TV.
- Distribute and/or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.
- Enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.

The following mitigation actions stayed the same priority from the 2017 Plan to the 2024 Plan:

- Review and update Floodplain Ordinance, Zoning Regulations, and Master Plan. Proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.
- Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling stations at the Senior Center and Library.

- Continue to work with Liberty Utilities and Pelham Highway Dept. to harden electrical infrastructure, including trimming trees near power lines.

The following mitigation actions dropped priority from the 2017 Plan to the 2024 Plan:

- Require surveyors to inspect foundations when creating As-built maps to determine if lowest floor is at or above Base Flood Elevation (BFE).
- Require use of elevation certificates for new structures in the floodplain.
- Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities. Actively communicate with residents regarding snow loads through mechanisms such as Pelham website, signs, and Citizen Observer.
- Tightly control burn permits and revoke when not properly and safely being utilized. Post fire danger categories. Work with Eversource to remove underbrush and standing deadwood in residential areas and under power lines to reduce the likelihood of wildfires spreading.

Table 2—Changes in Mitigation Priorities

2017 Mitigation Action	Current Status	Priority Level in 2017 Plan	Priority Level in 2024 Plan
Review and update Floodplain Ordinance, Zoning Regulations, and Master Plan. Proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	Completed/ Ongoing	STAPLEE Score = 6 Rank = 11 out of 15	STAPLEE Score = 6 Rank = 11 out of 14
Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks. Utilize Citizen Observer and community access	Completed/ Deleted	STAPLEE Score = 15 Rank = 4 out of 15	STAPLEE Score = 15 Rank = 3 out of 14

2017 Mitigation Action	Current Status	Priority Level in 2017 Plan	Priority Level in 2024 Plan
TV.			
Develop plans to ensure measures are in place to protect structures from lightning, including guard shack at Veterans Memorial Park. Improve emergency access and create secondary emergency access north of Veterans Memorial Park.	Completed/ Deleted	STAPLEE Score = 2 Rank = 15 out of 15	This action has been deleted and is no longer considered a priority. A similar action was not identified in the 2024 Plan update.
Continue to evaluate the flooding situation in relation to Beaver Brook and how to offset future flooding impacts.	Completed/ Deleted	STAPLEE Score = 7 Rank = 10 out of 15	This action has been deleted and is no longer considered a priority. A similar action was not identified in the 2024 Plan update.
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event.	Completed/ Deleted	STAPLEE Score = 16 Rank = 3 out of 15	This action has been deleted and is no longer considered a priority. A similar action was not identified in the 2024 Plan update.
Distribute and/or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Completed/ Ongoing	STAPLEE Score = 14 Rank = 5 out of 15	STAPLEE Score = 14 Rank = 4 out of 14
Require surveyors to inspect foundations when creating As-built maps to determine if lowest floor is at or above Base Flood Elevation (BFE).	Deferred	STAPLEE Score = 5 Rank = 12 out of 15	STAPLEE Score = 4 Rank = 13 out of 14
Require use of elevation certificates for new structures in the floodplain.	Deferred	STAPLEE Score = 4 Rank = 13 out of 15	STAPLEE Score = 3 Rank = 14 out of 14

2017 Mitigation Action	Current Status	Priority Level in 2017 Plan	Priority Level in 2024 Plan
Enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.	Completed/ Ongoing	STAPLEE Score = 13 Rank = 6 out of 15	STAPLEE Score = 13 Rank = 5 out of 14
Work with Pennichuck or a private developer to create a plan to develop a water supply and distribution system to address areas of town experiencing dry wells, including the Sherburne Road neighborhoods.	Completed/ Deleted	STAPLEE Score = 9 Rank = 7 out of 15	This action has been deleted and is no longer considered a priority. A similar action was not identified in the 2024 Plan update.

2017 Mitigation Action	Current Status	Priority Level in 2017 Plan	Priority Level in 2024 Plan
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities. Actively communicate with residents regarding snow loads through mechanisms such as Pelham website, signs, and Citizen Observer.	Completed/ Ongoing	STAPLEE Score = 7 Rank = 9 out of 15	STAPLEE Score = 15 Rank = 10 out of 14
Protect vulnerable populations from the impacts of extreme temperatures by establishing cooling stations at the Senior Center and Library.	Completed/ Ongoing	STAPLEE Score = 15 Rank = 2 out of 15	STAPLEE Score = 17 Rank = 2 out of 14
Continue to work with Liberty Utilities and Pelham Highway Dept. to harden electrical infrastructure, including trimming trees near power lines.	Completed/ Ongoing	STAPLEE Score = 18 Rank = 1 out of 15	STAPLEE Score = 18 Rank = 1 out of 14
Tightly control burn permits and revoke when not properly and safely being utilized. Post fire danger categories. Work with Eversource to remove underbrush and standing deadwood in residential areas and under power lines to reduce the likelihood of wildfires spreading.	Completed/ Ongoing	STAPLEE Score = 8 Rank = 8 out of 15	STAPLEE Score = 8 Rank = 9 out of 14
Map all drainage capture structures and outflows. Incorporate GIS data for drainage infrastructure into	Deleted	STAPLEE Score = 3 Rank = 14 out of 15	This action has been deleted and is no longer considered a priority. A similar action was not identified in the 2024

2017 Mitigation Action	Current Status	Priority Level in 2017 Plan	Priority Level in 2024 Plan
hazard mitigation planning and municipal planning activities.			Plan update.

CHAPTER 3. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Section 3.1 ~ Description of Natural Hazards

The Town of Pelham is susceptible to a variety of natural hazards, which are outlined in Table 3. For each hazard type, the hazard location within the Town, extent, and impact are also noted. Extent refers to how bad the hazard can be; it is not the same as location. Examples of extent include potential wind speed, depth of flooding, and existing scientific scales (ex. Fujita Tornado Damage Scale). Impact refers to damages or consequences resulting from the hazard.

Hazards Not Included in this Plan

The State of New Hampshire identifies avalanches, landslides, and solar storms and space weather as hazards in the State Multi-Hazard Mitigation Plan Update of 2018.

Landslides and avalanches have not been included in the Pelham Hazard Mitigation Plan Update 2024. “A landslide is the downward or outward movement of earth materials on a slope that is reacting to a combination of the force of gravity and a predisposed weakness in the material that allows the sliding process to initiate” (State of NH Multi-Hazard Mitigation Plan Update 2018, pg 115). “An avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside. The flow can be composed of snow, ice, water, soil, rocks, and trees. An avalanche can be comparable to a landslide; only with snow instead of earth.” (State of NH Multi-Hazard Mitigation Plan Update 2018, pg 48). Pelham has relatively stable terrain and there have been no historic landslide or snow avalanche events in town. As such, the Hazard Mitigation Team did not feel it was necessary to include these hazards in this Plan.

The State of New Hampshire also identifies Solar Storms & Space Weather as hazards. As described by the State of NH Multi-Hazard Mitigation plan (State of NH Multi-Hazard Mitigation Plan Update 2018, page 137), “The term space weather is relatively new and describes the dynamic conditions in the Earth’s outer space environment, similar to how the terms “climate” and “weather” refer to the conditions in the Earth’s lower atmosphere. Space weather includes any and all conditions and events on the sun, in the solar wind, in near-Earth space, and in our upper atmosphere that can affect space-borne and ground-based technological systems. Solar activity (solar storms) refers to solar flares, coronal mass ejections, high-speed solar wind, and energetic solar particles. Any of these events may occur for a few minutes to several hours, have the ability to affect Earth for days to weeks. All solar activity is driven by the solar magnetic field. A solar flare is an intense burst of radiation resulting from the release of sunspot magnetic energy, which can occur for minutes to hours. Solar prominence is a large, bright feature that extends outward from the sun’s surfaces. A coronal mass ejection (CME) occurs when the outer solar atmosphere’s magnetic field is closed, resulting in a confined atmosphere that suddenly explodes, releasing bubbles of gas and magnetic fields. The surface of the sun is hot electrified gas boiling up from the interior of the sun out into space- this is referred to as high-speed solar wind. Solar wind travels at 800,000 to 5 million miles per hour and carries mass the size of Utah’s Great Salt Lake into space every second; however, solar wind is 1000 million times weaker than the winds that we experience on Earth.” There have been no documented occurrences of Solar Storms &

Space weather impacting the Town, and the Pelham Hazard Mitigation team did not have enough knowledge to determine if solar storms and space weather deserved to be recognized in this plan update as a hazard. The Town will re-evaluate the need to include additional hazards to this Plan during subsequent updates of the Plan.

Table 3—Natural Hazards in Jurisdiction

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
Climate Change	Entire jurisdiction.	See Hazard Extent descriptions for Drought, Extreme Temperatures, Flooding	See Impact descriptions for Drought, Extreme Temperatures, Flooding
Drought	Entire jurisdiction.	<u>NH DES Drought Management Plan</u> • Level 1—Alert • Level 2—Warning • Level 3—Emergency • Level 4—Disaster <u>US Drought Monitor</u> • D0—Abnormally Dry • D1—Moderate Drought • D2—Severe Drought • D3—Extreme Drought • D4—Exceptional Drought • S—Short term, typically less than 6 months • L—Long term, typically more than 6 months	<u>D0</u> • short term dryness slowing planting, growth of crops • some lingering water deficits • crops not fully recovered <u>D1</u> • some damage to crops • streams, reservoirs, or wells low, some water shortages developing or imminent • voluntary water-use restrictions requested <u>D2</u> • crop losses likely • water shortages common • water restrictions imposed <u>D3</u> • major crop losses • widespread water shortages or restrictions <u>D4</u> • Exceptional & widespread crop loss • Shortages of water in reservoirs, streams, & wells creating water emergencies <u>S</u>

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			- impacts on agriculture - impacts on hydrology & ecology
Earthquake	Entire jurisdiction.	<u>Richter Scale</u> <3.4—detected only by seismometers >8—total damage, surface waves seen, objects thrown in air For full definitions of Richter Scale, see Section 3.5 Vulnerability by Hazard	Structural damage or collapse of buildings. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system. Loss of water for fire protection. Increased risk of fire (gas break). Risk to life, medical surge.
Extreme Temperatures	Entire jurisdiction.	Extreme heat—period of 3 consecutive days when air temperature reaches 90°F or higher on each day. Extreme cold— period of 3 consecutive days of minimum temperatures at or below 0°F.	Overburdened power systems may experience failures due to extreme heat. Shortages of heating fuel in extreme cold due to high demand. Medical surge. Loss of municipal water supply for drinking water and fire protection due to freezing temperatures.
Flooding	Floodplains cover approximately 18.7% of Pelham—16.7% of Pelham is located in 1% annual floodplain	FEMA flood probabilities: 1% possibility per year 0.2% possibility per year State of NH Dam Hazard Potential Classification system (for flooding resulting from dam/levee failure):	Water damage to structures and their contents. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines,

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
	and 2.0% of Pelham is located in the 0.2% annual floodplain. Areas prone to flooding include: • Coburn St. • McLain St. • Victoria Circle • Leonard Drive • Old Bridge St. • Mercury Lane • Glenside Drive • Simpson Mill See Section 3.5 for additional information on flood-prone areas.	• Class S—significant hazard • Class H—high hazard • Class L—low hazard • Class NM—non-menace For full definitions of Dam Hazard Classes, see Section 3.5 Vulnerability by Hazard	municipal communications, 911 communications, radio system. Environmental hazards resulting from damage. Isolation of neighborhoods resulting from flooding.
Lightning	Entire jurisdiction. Areas with large populations present outdoors and large open spaces are particularly vulnerable.	Lightning Activity Level: • Level 1 • Level 2 • Level 3 • Level 4 • Level 5 • Level 6 For full definitions of Lightning Activity Level, see Section 3.5 Vulnerability by Hazard	Smoke and fire damage to structures and property. Disruption to power lines, municipal communications, and 911 communications. Damage to critical electronic equipment. Injury or death to people involved in outdoor activity.
Severe Wind	Entire jurisdiction.	Saffir-Simpson Hurricane Wind Scale: • Category 1—sustained winds 74-95 mph • Category 2—sustained winds 96-110 mph	Wind damage to structures and trees. Water damage to structures and their contents.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		- Category 3—sustained winds 111-129 mph - Category 4—sustained winds 130-156 mph - Category 5—sustained winds 157 mph or higher	Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system. Environmental hazards resulting from damage. Isolation of neighborhoods resulting from flooding. Water pressure, quality, and capacity issues impacting fire protection. Loss of natural resources.
Severe Winter Weather	Entire jurisdiction.	Depth of snow in a given time frame (ex. 2 or more inches per hour over a 12-hour period). Blizzard—violent snowstorm with minimum winds of 35 mph and visibility less than ¼ mile for 3 hours. Ground snow load factor. Ice Storm—Sperry-Piltz Ice Accumulation Index: 0—little impact 5—catastrophic damage to exposed utility systems For full definitions of Sperry-Plitz Ice Accumulation Index, see Section 3.5 Vulnerability by Hazard	Disruption to road network. Damage to trees municipal communications, and 911 communications. Structural damage to roofs/collapse. Increase in CO, other hazards.
Tornado/Down burst	Entire jurisdiction.	Enhanced Fujita Tornado Damage Scale: - EF0—winds 65-85 mph - EF1—winds 86-110 mph	Wind damage to structures and trees. Damage or loss of

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		- EF2—winds 111-135 mph - EF3—winds 136-165 mph - EF4—winds 166-200 mph - EF5—winds >200 mph	infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system. Environmental hazards resulting from damage. Medical surge. Loss of natural resources.
Wildfire	Areas particularly prone to wildfire include forested areas near residential development.	NWCG Fire Size Classification: - A—greater than 0 but less than or equal to 0.25 acres - B—0.26 to 9.9 acres - C—10.0 to 99.9 acres - D—100-299 acres - E—300 to 999 acres - F—1,000 to 4,999 acres - G—5,000 to 9,999 acres - H—10,000 to 49,999 acres - I—50,000 to 99,999 acres - J—100,000 to 499,999 acres - K—500,000 to 999,999 acres - L—1,000,000+ acres	Smoke and fire damage to structures in wild land/urban interface. Damage to habitat. Impacts to air quality. Impact to roadways. Loss of natural resources.
Infectious Diseases	Entire Jurisdiction. Vulnerable populations are especially at risk.	Center for Disease Control Disease Occurrence: - Endemic – 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 - Cluster – 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,	Burden on healthcare facilities, medical surge. Risk to life.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		usually sudden, in the number of cases of a disease above what is normally expected • Outbreak – The same as epidemic, but over a much smaller geographical area • Pandemic – Epidemic that has spread over several countries or continents, usually affecting many people	

Section 3.2 ~ Probability of Future Hazard Events

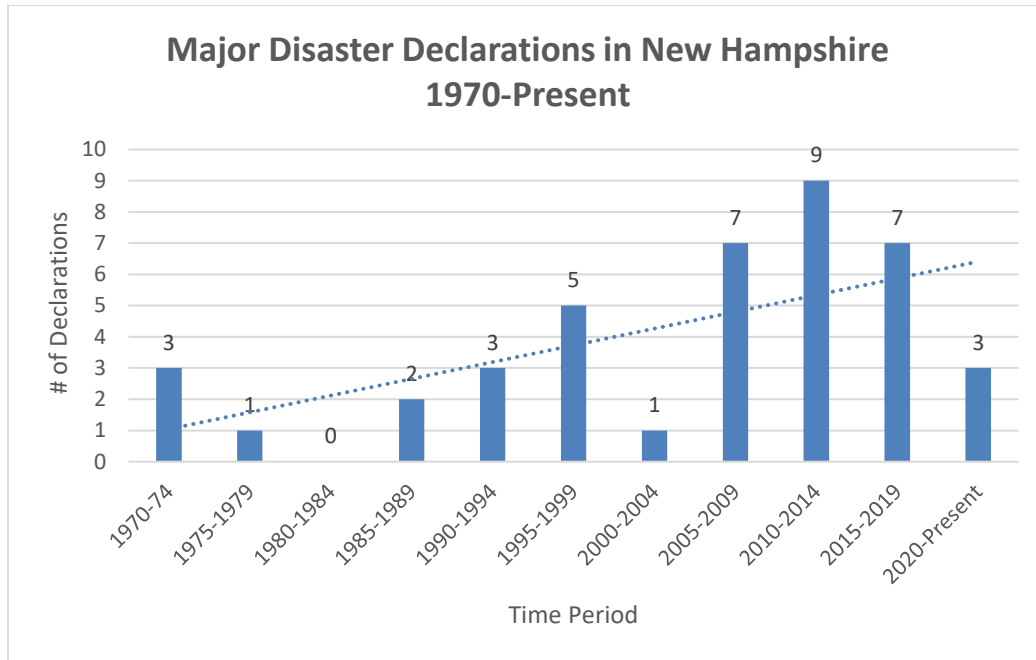
After documenting the occurrence of previous hazard events in the Town of Pelham and the surrounding region, the Hazard Mitigation Team used this information to calculate the annual probability of these events occurring in the future. The first step was to determine how many times a particular hazard had occurred in a given number of years. The number of occurrences was then divided by the number of years to determine annual probability. For example, if history shows that a particular hazard typically occurs 1 time every 4 years, the annual probability is 25%. Annual probability was calculated twice for each hazard. First, annual probability was calculated since the first recorded historic occurrence of the event. Second, annual probability was calculated based on occurrences since 2010 to reflect potential recent changes in hazard event occurrence rates. The probability of future hazard events for each hazard type in the Town of Pelham is outlined in Table 4.

Hazard Probability and Climate Change

Climate change is not identified as a natural hazard in this plan; however, it does have an impact on weather patterns that influence hazards identified in this plan. FEMA acknowledges in the State Mitigation Plan Review Guide, that “the challenges posed by climate change, such as more intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels, could significantly alter the types and magnitudes of hazards impacting states in the future¹.”

The Table below shows an overall increase in the frequency of Major Disaster Declarations in the state of New Hampshire, potentially an impact of climate change. Communities in New Hampshire are becoming more aware of the impacts of climate change on the local hazards already experienced, especially increased flooding events. Pelham is anticipating an increase in natural hazard (Drought, Extreme Temperatures, Flooding, Lightning, Severe Wind, Severe Winter Weather, Tornado/Downburst, and Wildfire) probability and severity in the future.

¹ State Mitigation Plan Review Guide, FEMA, Released March 2015, Effective March 2018, Section 3.2, page 13.



Source: New Hampshire Department of Safety, Declared Disaster Information as of 3/13/2024.
(<https://www.nh.gov/safety/divisions/hsem/disaster/documents/NHDisasterInfo.pdf>)

Municipal Impacts of Climate Change

Increased probability and severity of natural hazards can create a much larger impact on the critical facilities within a municipality, especially utility and transportation systems. Severe winter weather and severe wind events can result in long-term utility outages and create transportation impediments. The general population would also experience additional impacts with the increase of natural hazard probability and severity. More damage to critical facilities and municipal systems can result in extended periods of time without water, heating/cooling, and lack of access to basic services, which can be devastating to vulnerable populations.

Table 4—Probability of Future Hazard Events

Hazard Type	Probability of Future Event	Source
Climate Change— Drought	The frequency of short-term drought (1-3 months) in New Hampshire is predicted to increase 2-3 times in the long term (2070-2099) under the higher emissions scenario. The state will experience a more significant increase in medium-term drought (3-6 months) during this period. Short- and medium-term droughts are primarily caused by evapotranspiration as a result of hotter summers. The frequency of long-term drought (6 plus months) does not change significantly in the future under the low or high emissions scenario compared to past long-term drought events in New Hampshire (Wake et al., “Climate Change in Southern New Hampshire,” pg. 30-31).	“Climate Change in Southern New Hampshire,” Sustainability Institute, University of New Hampshire, 2014
Climate Change— Increased Precipitation	Annual average precipitation is predicted to increase 17-20% in southern New Hampshire by the end of the century under both the low and high emissions scenarios. Larger increases in precipitation are expected in the winter and spring, while summer and fall will only experience slight increases (Wake et al., “Climate Change in Southern New Hampshire,” pg. 29). Southern New Hampshire can also expect more extreme precipitation events, defined as those where more than 1 inch of rain falls within 24 hours, or more than 2-4 inches falls in 48 hours. Under both low and high emissions scenarios, the frequency of extreme precipitation events is predicted to more than double by the end of the century (Wake et al., “Climate Change in Southern New Hampshire,” pg. 29).	“Climate Change in Southern New Hampshire,” Sustainability Institute, University of New Hampshire, 2014
Climate Change— Warmer Temperatures	Temperatures in southern New Hampshire will continue to rise under a lower or higher future emissions scenario. In the short-	“Climate Change in Southern New Hampshire,” Sustainability Institute, University of New Hampshire, 2014

Hazard Type	Probability of Future Event	Source
	term (2010-2039), average annual temperatures are predicted to increase by approximately 2°F. Under a higher emissions scenario, long-term (2070-2099) average annual temperatures are predicted to increase by 8 to 9°F. If a lower emissions scenario is achieved, long-term average annual temperatures are predicted to increase by 4°F (Wake et al., "Climate Change in Southern New Hampshire," pg. 23). The region is also predicted to experience more extreme heat events. From 1970-1999, southern New Hampshire had an average of seven days above 90°F each year. In the long-term under a higher emissions scenario, southern New Hampshire is predicted to have over 54 days per year above 90°F. Under a lower emissions scenario, the region is predicted to have 23 days per year above 90°F in the long-term (Wake et al., "Climate Change in Southern New Hampshire," pg. 25).	
Drought	18 years of drought from 1960 through 2023. 18 events in 63 years = .29 events per year Annual Probability = 29% 7 years of drought from 2010 through 2023. 2 events in 13 years = .15 Annual Probability = 15%	NH DES Current Drought Conditions http://des.nh.gov/organization/divisions/water/dam/drought/drought-conditions.htm US Drought Monitor http://droughtmonitor.unl.edu/Home.aspx
Earthquake	History shows no known earthquakes centered in Pelham. However, this hazard is still possible. 6 magnitude 5.0 or greater earthquakes felt in NH from 1929 through 2023.	US Geological Survey http://earthquake.usgs.gov/earthquakes/search/

Hazard Type	Probability of Future Event	Source
	6 events in 94 years = .06 events per year Annual Probability = 6% 2 magnitude 5.0 or greater earthquakes felt in NH from 2010 through 2023. 2 events in 13 years = .15 events per year Annual Probability = 15%	
Extreme Temperatures	28 extreme heat events from 2010 through 2023. 28 events in 13 years = 2.15 event per year Annual Probability = 100% 17 extreme cold events from 2010 through 2016. 17 events in 13 years = 1.31 event per year Annual Probability = 100%	NOAA National Climatic Data Center https://www.ncdc.noaa.gov/cdo-web/search
Flooding	14 flooding events in Hillsborough County from 1927 through 2023. 14 events in 96 years = .15 events per year Annual Probability = 15% 1 flooding events in Hillsborough County from 2010 through 2023. 1 event in 13 years = .08 events per year Annual Probability = 8%	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year
Severe Wind	11 hurricanes/tropical storms from 1938 through 2023. 8 events in 85 years = .13 events per	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year

Hazard Type	Probability of Future Event	Source
	year Annual Probability = 13% 5 hurricanes/tropical storms from 2010 through 2023. 5 events in 13 years = .38 events per year Annual Probability = 38%	ar National Hurricane Center http://www.nhc.noaa.gov/data/tcr/index.php?season=2014&basin=atl
Lightning	2 lightning strike events from 2003 through 2023. 2 events in 20 years = 0.1 events per year Annual Probability = 10% 1 lightning strike event from 2010 through 2023. 1 event in 13 years = .08 events per year Annual Probability = 8%	Local knowledge and public input
Severe Winter Weather	21 severe winter weather events from 1888 through 2023. 21 events in 135 years = .16 events per year Annual Probability = 16% 4 severe winter weather events from 2010 through 2023. 4 events in 13 years = .31 events per year Annual Probability = 31%	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year
Tornado/Downburst	16 tornados and 1 downburst in Hillsborough Co. from 1961 through 2023. 17 events in 62 years = .27 events per year Annual Probability = 27%	Tornado History Project (Joshua Lietz, Storm Prediction Center, National Climatic Data Center) and public input http://www.tornadohistoryproject.com

Hazard Type	Probability of Future Event	Source
	0 tornados and 0 downbursts in Hillsborough Co. from 2010 through 2023. 0 events in 13 years = 0 events per year Annual Probability = 0-25%	
Wildfire	5 wildfire events from 2005 through 2023. 5 events in 18 years = .28 Annual Probability = 28% 3 wildfire events from 2010 through 2023. 3 events in 13 years = .23 events per year Annual Probability = 23%	Local knowledge and public input
Infectious Disease	Like the rest of the state, the Town of Pelham experiences seasonal outbreaks that occur annually such as Influenza. There is a 100% annual probability that Pelham will continue to experience some extent of infectious disease.	Local knowledge NH DHHS Infectious Disease Control https://www.dhhs.nh.gov/programs-services/disease-prevention/infectious-disease-control

Section 3.3 ~ Critical Facilities and their Vulnerability

The next step in determining Pelham’s overall vulnerability was to inventory the Town’s community assets and determine what assets would be affected by each type of hazard event. The Hazard Mitigation Team began by reviewing the Pelham Zoning Ordinance to provide information on where and how the Town builds and to identify the corridors where critical facilities would likely be located. The Team then identified the broad categories of important assets within Pelham, including critical facilities essential to health and welfare; vulnerable populations, such as children and the elderly; economic assets and major employers; areas of high-density residential and commercial development; and historic, cultural, and natural resources. The Team then further divided the Town’s critical facilities into the following categories:

1. General Occupancy

- a. Commercial
- b. Education

- c. Government
- d. Recreation
- e. Religious
- f. Residential
- 2. Essential Facilities**
 - a. Fire Station
 - b. Police Station
 - c. Department of Public Works
 - d. Schools
 - e. Emergency Operations Centers
 - f. Medical Care Facilities
- 3. Transportation Systems**
 - a. Highway Systems—Roads
 - b. Highway Systems—Bridges
 - c. Airport Systems
- 4. Utility Systems**
 - a. Communications
 - b. Natural Gas
 - c. Electric
 - d. Water
- 5. High Potential Hazard Facilities**
 - a. Dams/Levees
- 6. Hazardous Materials Facilities**
 - a. EPA Toxics Release Inventory facilities (<http://www2.epa.gov/toxics-release-inventory-tri-program>)

The critical facilities within each category appear in Tables 5.1-5.6 below. Each table includes the critical facility's name, content vulnerability, and locational vulnerability to hazards. Note that Climate Change is not included as a hazard in this analysis because its effects on critical facilities are included under the hazards of Drought, Extreme Temperatures, and Flooding.

Table 5.1—General Occupancy Critical Facilities

Facility Type and Name	Content Vulnerability										
		Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Commercial—Pelham Industrial Park, Industrial Park Dr and Dick Tracy Dr	Potentially large population present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Pulpit Rock Industrial Area, Pulpit Rock	Potentially large population present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Chunky’s Cinema, 150 Bridge St	Potentially large population present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Hannaford Supermarket, 150 Bridge St	Potentially large population present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—A1 Prime Gas Service Station, 150 Bridge St	Potentially hazardous materials present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—BP Gas Station, 25 Bridge St	Potentially hazardous materials present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Gage Hill Farm, propane filling, 1015 Bridge St	Potentially hazardous materials present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Pelham Hardware, propane filling, 150 Bridge St	Potentially hazardous materials present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Commercial—Pelham Country Store Gas Station, 10 Bridge St	Potentially hazardous materials present, contents valuable to local economy	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Crossroads School, 43 Atwood Rd	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Education—Trails to Learning, 44 Nashua Road, Childcare/ Daycare (6 weeks to 12 years)	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Dynamic Foundations for Children, 90 Bridge St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Kimba’s Kids, 43 Bridge St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Pelham School Age Child Care, 61 Marsh Rd	Potentially large population present, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Clegg Day Care 60 Burns Road Pelham	Potentially large population present, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—King’s Kids, 955 Bridge St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Education—Perfect Place for Children, 125 Main St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Government—Pelham Cable TV, PTV Studio located inside Pelham Town Hall	Contents valuable to public communications	✓	✓	✓		✓	✓	✓	✓	✓	✓
Government—Pelham Public Library, 24 Village Green	Official records and documents, potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Government—US Post Office, 150 Bridge St	Contents valuable to communications	✓	✓	✓		✓	✓	✓	✓	✓	✓
Recreation—Hobbs Senior Center, 8 Nashua Rd	Potentially large population present, elderly population present, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Recreation—Muldoon Park/Town Forest, Muldoon Park Way	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Camp Runnels Girl Scouts, 702 Bridge St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Recreation—Raymond Park Soccer Fields, Mammoth Rd	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Pine Valley Golf Club, 247 Main St	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Veterans Memorial Park, Camp during Summer months	Potentially large population present, located in 1% annual floodplain	✓		✓	✓		✓			✓	✓
Recreation—Town Common, Nashua/Marsh/Main intersection	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Raymond Park, 35 Keyes Hill Rd	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Kirby-Ivers Town Forest, Windham Rd at Hayden	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Merriam-Cutter Conservation Area, Sherburne Rd	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Costa Conservation Area, Frontier Drive	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Gumpas Pond Conservation Area, Hinds Lane	Potentially large population present	✓		✓			✓			✓	✓
Recreation— Little Island Pond Conservation Area, Natures Way	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Wolves Park Trail, Currier Road	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Peabody Town Forest, Briarwood Rd	Potentially large population present	✓		✓			✓			✓	✓
Recreation—Newcomb Field, NH 111A	Potentially large population present, located in 0.2% floodplain	✓		✓	✓		✓			✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Religious—New England Pentecostal Church, 955 Bridge St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Religious—Crossroads Baptist Church, 43 Atwood Rd	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Religious—St. Patrick's Parish, 16 Main St	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Religious—First Congregational Church, 2 Nashua Rd	Potentially large population present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Highland Ave Apartments, 9 Highland Ave	Large population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Prolyn Townhouse Apartments, 45 Bridge St	Large population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Nashua Rd Apartments, 18 Nashua Rd	Large population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Beaver Brook Apartments, Beaver Brook Way	Large population present, elderly population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Pelham Terrace, Terrace Circle	Large population present, elderly population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓
Residential—Kirlin Place, 1 Kirlin Place	Large population present, elderly population present, contents have personal value to owners	✓	✓	✓		✓	✓	✓	✓	✓	✓

Table 5.2—Essential Facilities

Facility Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Central Fire Station and Emergency Operations Center—36 Village Green	Contents and staff valuable to emergency management, generator present	✓	✓	✓		✓	✓	✓	✓	✓	✓
Police Station and Backup Emergency Operations Center—14 Village Green	Contents and staff valuable to emergency management, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Town Hall—6 Village Green	Contents valuable to municipal operations, generator (critical services only)	✓	✓	✓		✓	✓	✓	✓	✓	✓
Highway Department—31 Newcomb Field Parkway	Contents valuable to transportation network and public infrastructure, located in 0.2% annual floodplain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Transfer Station/Recycling Facility and Municipal Fuel Facilities—74 Newcomb Field Parkway	Contents valuable to municipal operations and emergency management, generator (fuel pumps)	✓	✓	✓		✓	✓	✓	✓	✓	✓
Pelham Elementary School—61 Marsh Rd	Potentially large population present, shelter, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Pelham Memorial School—59 Marsh Rd	Potentially large population present, shelter, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Pelham High School—85 Marsh Rd	Potentially large population present, shelter, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓
Pelham Healthcare Associates—49 Atwood Rd	Contents valuable to public health, potentially large staff and population present, located in 1% annual floodplain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Immediate Care of SNH—33 Windham Rd	Contents valuable to public health, potentially large staff and population present, generator	✓	✓	✓		✓	✓	✓	✓	✓	✓

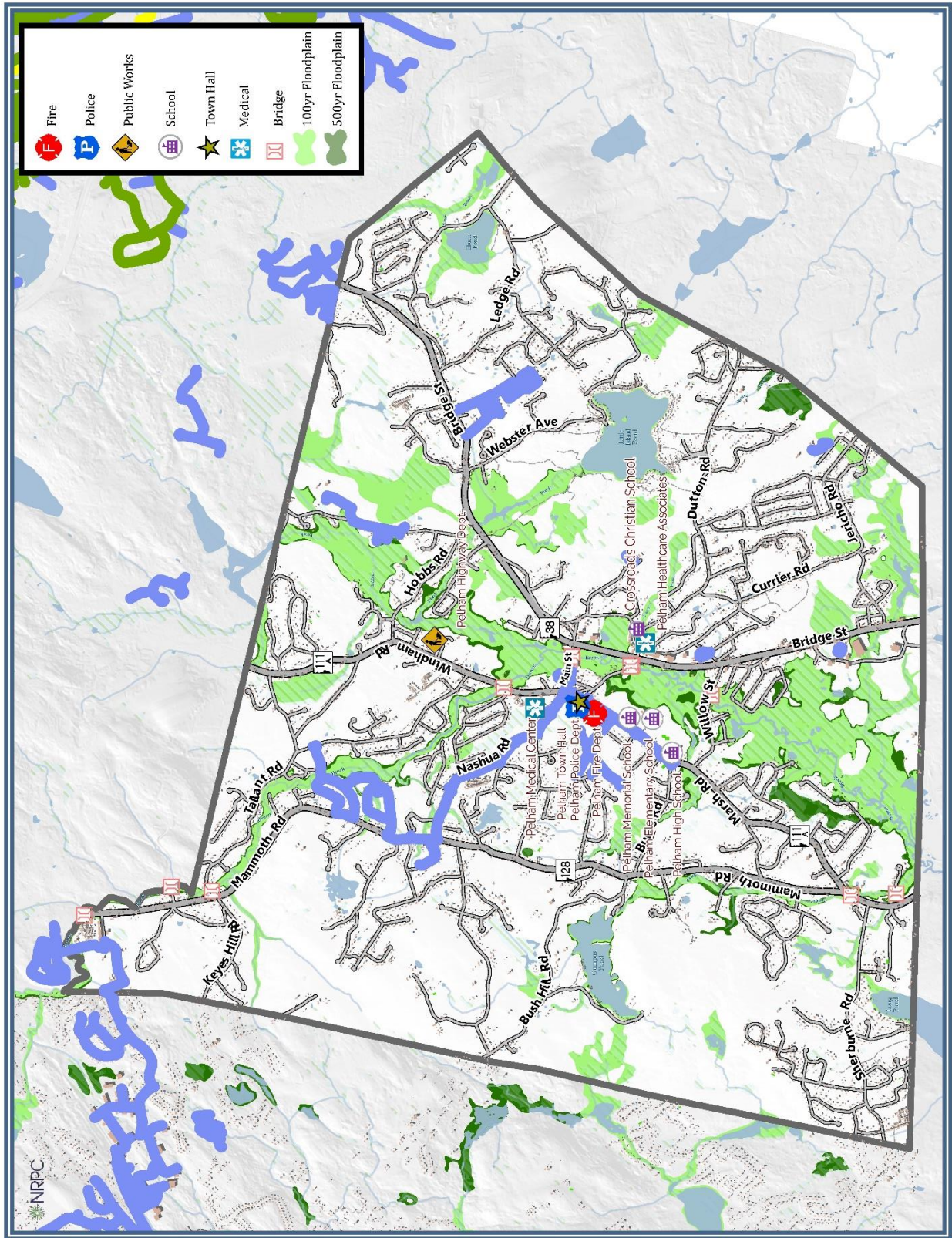


Table 5.3—Transportation Critical Facilities

Transportation infrastructure is particularly vulnerable to flooding hazards. Flooding events frequently cause culvert failures and undermine bridges and roads. Pelham has a total of 139.64 road miles, of which 28.14 miles or 20% are located in the floodplain.

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Highway System—Old Bridge Street at Abbott Bridge	Structure valuable to motor vehicle travel and safety, frequent flooding, portions located in 1% annual floodplain		✓		✓	✓		✓	✓		
Highway System—NH 111A/Windham Rd	Structure valuable to motor vehicle travel and safety, evacuation route, portions in 1% and 0.2% annual floodplain		✓		✓	✓		✓	✓		
Highway System—NH 128/Mammoth Rd	Structure valuable to motor vehicle travel and safety, evacuation route, portions in 1% and 0.2% annual floodplain		✓		✓	✓		✓	✓		
Highway System—NH 38/Bridge St	Structure valuable to motor vehicle travel and safety, evacuation route, portions in 1% and 0.2% annual floodplain		✓		✓	✓		✓	✓		
Highway System—NH 128 bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, evacuation route, structure located in 1% annual floodplain		✓		✓			✓	✓		
Highway System—Bowley Drive, bridge over Gumpas Pond Brook	Structure valuable to motor vehicle travel and safety, evacuation route, structure located in 1% annual floodplain, one access to neighborhood		✓		✓			✓	✓		
Highway System—NH 111A bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, evacuation route, structure located in 1% annual floodplain		✓		✓			✓	✓		

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Highway System—Main St bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, structure located in 1% annual floodplain		✓		✓			✓	✓		
Highway System—Castle Hill Rd bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, structure located in 1% annual floodplain		✓		✓			✓	✓		
Highway System—Tallant Rd bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, structure located in 0.2% annual floodplain		✓		✓			✓	✓		
Highway System—Willow St bridge over Beaver Brook	Structure valuable to motor vehicle travel and safety, structure located in 1% annual floodplain		✓		✓			✓	✓		
Highway System—Old Bridge St bridge over Beaver Brook (scheduled to be replace 2023-2024)	Structure valuable to motor vehicle travel and safety, structure located in 0.2% annual floodplain		✓		✓			✓	✓		
Steck Farm Airport—Jeremy Hill Rd	Structure valuable to aviation		✓				✓	✓	✓	✓	

Table 5.4—Utility Systems

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Cellular Tower—27 Old Lawrence Rd	Structure valuable to communications		✓			✓	✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
AT & T Tower—18 Atwood Rd	Structure valuable to communications		✓			✓	✓		✓	✓	
Cellular Tower—20 Ledge Rd	Structure valuable to communications		✓			✓	✓		✓	✓	
Cellular Tower—9 Rocky Hill Rd	Structure valuable to communications, Police & Fire Department Communications		✓			✓	✓		✓	✓	
Cellular Tower—Tower Hill Rd (1 Bush Hill Rd)	Structure valuable to communications, Police & Fire Department Communications		✓			✓	✓		✓	✓	
Cellular Tower—60 Pulpit Rock Rd	Structure valuable to communications		✓			✓	✓		✓	✓	
Cellular Tower—53 Gibson Rd	Structure valuable to communications		✓			✓	✓		✓	✓	
Cellular Tower- Blueberry Circle, ATC Corporation	Police & Fire Department Communications		✓			✓	✓		✓	✓	
Consolidated Telephone Switching Station—29 Old Bridge St	Structure valuable to communications		✓			✓	✓	✓	✓	✓	
Kinder Morgan Gas Pipeline—south to northeast	Structure valuable to natural gas supply		✓								
Kinder Morgan Gas Compression Station—Tennessee Dr	Structure valuable to natural gas supply		✓								
High voltage power lines—east/west across municipality	Structure valuable to electric grid		✓			✓	✓	✓	✓	✓	
Liberty Utilities Electric Substation—196 Main St	Structure valuable to electric grid, rebuilt in 2019		✓			✓	✓	✓	✓	✓	
National Grid Electric Substation—27 Old Lawrence Rd	Structure valuable to electric grid		✓			✓	✓	✓	✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Williamsburg Pump House—19 Mont Vernon Dr	Water supply pump house, Pennichuck	✓									
Liberty Utilities Pipeline—Natural Gas Take Station, 127 Bridge Street	Structure valuable to electric grid		✓			✓	✓		✓	✓	
Gage Hill Pump House—Vassar Dr	Water supply pump house, small system	✓									
Well—Camp Runnels, 82 Girl Scout Road	Water supply, located in 1% annual floodplain	✓			✓						
Well—Charlie’s Pizza and Subs, 125 Bridge St	Water supply, located in 0.2% annual floodplain	✓			✓						
Well—Marine Fab & Repair Inc., 31 Pulpit Rock Rd	Water supply	✓									
Well—Crossroads Baptist Church and School, 43 Atwood Rd	Water supply	✓									
Well—Dynamic Foundations for Children, 90 Bridge St	Water supply	✓									
Well—Dunkin Donuts, 123 Bridge St	Water supply, located in 0.2% annual floodplain	✓			✓						
Well—Kirlin Place, Kirlin Place	Water supply, located near power lines	✓									
Well—McDonald’s Restaurant, 113 Bridge St	Water supply	✓									
Well—Nashua Rd Apartments, 18 Nashua Rd	Water supply	✓									
Well—Wakefield Vette, 33 Bridge St	Water supply, located in 1% annual floodplain	✓			✓						
Well—Grand 38 Restaurant and Lunch, 26 Bridge St	Water supply	✓									

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Well—Pelham Elderly Terrace, Windham Rd	Water supply	✓									
Well—Pelham Industrial Park, Mammoth Rd	Water supply	✓									
Well—Pelham Kindergarten and Daycare, 96 Bridge St	Water supply	✓									
Well—Pelham Parks & Recreation Dept., Mammoth Rd	Water supply	✓									
Well—Pelham Plaza, 116 Bridge St	Water supply	✓									
Well—Pelham Plaza Corp, 150 Bridge St	Water supply	✓									
Well—PEU Williamsburg, 19 Mt Vernon Dr	Municipal water supply	✓									
Well—Pine Valley Golf Links, 246 Gage Rd	Water supply	✓									
Well—Ray's State Line Market	Water supply	✓									
Well—Prolyns Townhouse Apartments, 45 Bridge St	Water supply	✓									
Well—Highland Ave Apartments, 9 Highland Ave	Water supply	✓									
Well—St Patrick's School, 10 Main St	Water supply	✓									
Well—St Patrick's Church, 12 Main St	Water supply	✓									
Well—Perfect Place for Children, Main St	Water supply	✓									

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Well—Community Water Supply, Lady Slipper	Water supply	✓									
Well—Community Well, Skyview Estates, Aspen Dr	Water supply	✓									

Table 5.5—High Potential Hazard Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Name—Gumpas Pond Dam Dam # D189002 Hazard Class—L Water body—Gumpas Pond Brook Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Little Island Pond Dam Dam # D189006 Hazard Class—NM Water body—Island Pond Brook Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Ivers Pond Dam Dam # D189010 Hazard Class—NM Water body—unnamed stream Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name – Gumpas Pond Dam Dam # D189002 Hazard Class – H Water body – Gumpas Pond Brook Owner – privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Name – Little Island Pond Dam Dam # D189006 Hazard Class – NM Water body – Island Pond Brook Owner – privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name – Ivers Pond Dam Dam # D189010 Hazard Class – NM Water body – Unnamed Stream Owner – privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Pelham Industrial Park Dam Dam # D189014 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓		
Name—Cheney Fire Pond Dam Dam # D189016 Hazard Class—NM Water body—unnamed stream Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓		
Name—Pelham Landfill Pond 1 Dam Dam # D189017 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Pelham Landfill Pond 2 Dam Dam # D189018 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Pelham Landfill Pond 3 Dam Dam # D189019 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control, located in 0.2% annual floodplain		✓		✓	✓		✓	✓		
Name—Spring Street Dam Dam # D189021 Hazard Class—NM Water body—unnamed stream Owner—Town of Pelham	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Name—Burns Road Dam Dam # D189022 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓		
Name—Collins Way Detention Basin Dam # D189023 Hazard Class—L Water body—runoff Owner—Town of Pelham	Structure valuable to flood control		✓			✓		✓	✓		

Table 5.6—Hazardous Materials Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado/Downburst	Wildfire	Infectious Disease
Wakefield Thermal Solutions Inc.—33 Bridge St, Pelham, NH	Chemicals reported to Toxics Release Inventory (TRI) = copper; located in 1% annual floodplain	✓	✓		✓	✓	✓	✓	✓	✓	

Climate Change

Climate change in southern New Hampshire will impact the environment, ecosystem services, economy, public health, and quality of life. According to a 2014 study by the Sustainability Institute at the University of NH, southern NH is expected to become warmer and wetter over the next century with more extreme precipitation events. This weather pattern puts significant stress on the region's already aging water infrastructure. Furthermore, climate change is likely to cause a number of public health impacts on NH's most vulnerable residents, including heat stress; flood related deaths and injuries; respiratory and cardiovascular illness, including asthma; allergies; vector, food, and water-borne disease; chronic disease; and mental health and stress-related disorders. Despite efforts taking place to slow the rate of climate change, some level of change is inevitable. Therefore, municipalities must make sound decisions to help their communities adapt to a new climate normal.

Temperatures in southern New Hampshire will continue to rise under a lower or higher future emissions scenario. In the short-term (2010-2039), average annual temperatures are predicted to increase by approximately 2°F. Under a higher emissions scenario, long-term (2070-2099) average annual temperatures are predicted to increase by 8 to 9°F. If a lower emissions scenario is achieved, long-term average annual temperatures are predicted to increase by 4°F (Wake et al., “Climate Change in Southern New Hampshire,” pg. 23). The region is also predicted to experience more extreme heat events. From 1970-1999, southern New Hampshire had an average of seven days above 90°F each year. In the long-term under a higher emissions scenario, southern New Hampshire is predicted to have over 54 days per year above 90°F. Under a lower emissions scenario, the region is predicted to have 23 days per year above 90°F in the long-term (Wake et al., “Climate Change in Southern New Hampshire,” pg. 25).

Annual average precipitation is predicted to increase 17-20% in southern New Hampshire by the end of the century under both the low and high emissions scenarios. Larger increases in precipitation are expected in the winter and spring, while summer and fall will only experience slight increases (Wake et al., “Climate Change in Southern New Hampshire,” pg. 29). Southern New Hampshire can also expect more extreme precipitation events, defined as those where more than 1 inch of rain falls within 24 hours, or more than 2-4 inches falls in 48 hours. Under both low and high emissions scenarios, the frequency of extreme precipitation events is predicted to more than double by the end of the century (Wake et al., “Climate Change in Southern New Hampshire,” pg. 29).

The frequency of short-term drought (1-3 months) in New Hampshire is predicted to increase 2-3 times in the long term (2070-2099) under the higher emissions scenario. The state will experience a more significant increase in medium-term drought (3-6 months) during this period. Short- and medium-term droughts are primarily caused by evapotranspiration as a result of hotter summers. The frequency of long-term drought (6 plus months) does not change significantly in the future under the low or high emissions scenario compared to past long-term drought events in New Hampshire (Wake et al., “Climate Change in Southern New Hampshire,” pg. 30-31).

Climate Change Hazard Loss Estimate

Because the impacts of climate are wide ranging and have little historic data to draw from, it is beyond the scope of this Plan to estimate the dollar value of losses to the municipality resulting from climate change.

Some insights on the municipality’s vulnerability to climate change may be gained by examining the results of the Nashua Region Water Vulnerability Assessment, conducted by the Nashua Regional Planning Commission in 2016. Based on the results of the vulnerability assessment, the Nashua Region is most vulnerable to threats related to warmer temperatures and threats that affect water supply.

Threats related to warmer temperatures are highly likely to occur, are broad ranging, have critical severity, and moderately effective mitigation options. In addition, while the region has experience with flooding (and drought to a smaller extent), the region has no experience with warming temperatures to provide historical guidance.

Threats that affect water supply are likely to occur, have moderate to critical severity, will likely affect between 10 and 50% of the region’s population, and have moderately effective mitigation options. There are numerous threats in this category, and they have broad implications from public health and safety to agriculture and the economy.

It may also be helpful to review the Drought, Extreme Temperatures, and Flooding sections in this Plan for more insight on the municipality’s vulnerability to climate change.

Drought

Hydrological drought is evidenced by extended periods of negative departures from normal rainfall. New Hampshire has been under several drought warnings, including a drought emergency, since 1999. The most severe drought conditions occurred between 1960 and 1969; the event had a greater than 25-year recurrence interval. The southern New Hampshire region experienced a 100-year drought event from 1964 to 1965.

Southern New Hampshire also experienced a 50-year drought event beginning in the summer of 2016. In February of 2017, Pelham was in a Long-term (L), Severe Drought (D2) conditions. As of May 30, 2023, Pelham is no longer experiencing drought conditions.

Although drought is not likely to damage structures, low water levels can have a negative impact on existing and future home sites, especially those that depend on groundwater for water needs. Additionally, the dry conditions of a drought may lead to an increase wildfire risk. Drought can cause the most significant impact to agricultural land and assets.

The Pelham Selectmen adopted an ordinance prohibiting any residential lawn watering, per RSA 41:11-d. It became effective on October 7, 2016, and remains in effect as of the writing of this Plan. The ordinance was adopted in response to the historic drought, which left some Pelham residents experiencing water supply shortages.

Previous Occurrences of Drought

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
1960-1969	Entire jurisdiction	Long term drought—9 years of less than normal precipitation	Farms had minimal grass for grazing animals and poor crops. Wells went dry for 2 consecutive years in mid-1960s.
1999	Entire jurisdiction	Level 2—Warning. Drought warning issued on June 29, 1999.	Damage to crops. Low water levels in dug wells.
March 2002	Entire jurisdiction	Level 3—Emergency. First time Level 3 Drought Impact Level had been	Damage to crops. Low water levels in dug wells.

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
		declared.	
2016	Entire jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells. Pennichuck East Utility issued mandatory outdoor water use bans. Town of Pelham issued voluntary water restrictions.
January-March 2017	Entire jurisdiction	USDA D2 (Severe Drought)	Damage to crops. Low water levels in dug wells.
April 2017	Entire jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
June-July 2018	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
September-October 2019	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
May 26-June 22 2020	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
June 23 - August, 2020	Entire jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
September - October 2020	Entire Jurisdiction	USDA D2 (Severe Drought)	Damage to crops. Low water levels in dug wells.
March 30 – April 12 2021	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Low water levels in wells.
July 2022 – September 26, 2022	Entire Jurisdiction	USDA D1 (Moderate Drought). 90% of the county experienced D2 conditions throughout September. Some southern areas of the state experienced D3 (extreme drought) conditions from mid to late August.	Specialty crops are impacted in both yield and fruit size. Warnings are issued on water use and outdoor burns, and possible poor air quality
October 2022	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Low water levels in wells.

Drought Hazard Loss Estimate

Because the impacts of drought are long lasting and wide ranging, it is beyond the scope of this Plan to estimate the dollar value of losses to Pelham resulting from drought. Instead, the Hazard Mitigation Team estimated the percentage of land in Pelham vulnerable to drought and the percentage of the population vulnerable to drought as a quantitative measure of this hazard's impact.

Total Acres of Agricultural Land in Pelham	Agriculture as % of Total Land Area in Pelham	% of Land in Pelham Vulnerable to Drought
460	2.67%	2.67%

% of population with Public Drinking Water in Pelham	% of population with Private Well Water in Pelham	Water Utility	Primary Water Source	Secondary Water Source
11.3%	88.7%	Pennichuck East	Williamsburg System—2 gravel pack wells in Pelham	None

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Drought Hazard Area	Percentage of this type of Critical Facilities in Drought Hazard Area
General Occupancy	46	46	100%
Essential Facilities	10	10	100%
Transportation	13	0	0%
Utility System	44	29	66%
High Potential Hazard	14	0	0%
Hazardous Materials	1	1	100%

Earthquake

The Richter magnitude scale was developed by Charles F. Richter in 1935 as a way to compare the size of earthquakes. The magnitude of an earthquake is calculated from the logarithm of the amplitude of waves recorded by seismographs.

- Magnitude <2.0—micro-earthquakes. Recorded by seismographs, but not felt or rarely felt by people. Several million occur annually worldwide on average.
- Magnitude 2.0-2.9—felt slightly by some people. No damage to buildings. Over 1 million occur annually worldwide on average.
- Magnitude 3.0-3.9—often felt by people but very rarely cause damage. Shaking of indoor objects can be noticeable. Over 100,000 occur annually worldwide on average.
- Magnitude 4.0-4.9—noticeable shaking of indoor objects and rattling noises. Felt by most people in affected area. Generally causes minimal to no damage. Moderate to significant damage is very unlikely. 10,000-15,000 occur annually worldwide on average.

- Magnitude 5.0-5.9—felt by everyone. Can cause damage of varying severity to poorly constructed buildings, and slight to no damage to all other buildings. Few, if any, casualties. 1,000-1,500 occur annually worldwide on average.
- Magnitude 6.0-6.9—felt up to hundreds of miles from epicenter. Strong to violent shaking in epicenter. Damage to many buildings in populated areas. Poorly designed structures have moderate to severe damage. Earthquake-resistant structures have slight to moderate damage. Damage can be caused far from epicenter. Death toll up to 25,000. 100-150 occur annually worldwide on average.
- Magnitude 7.0-7.9—felt in very large area. Damage to most buildings, including partial or complete collapse. Death tolls up to 250,000. 10-20 occur annually worldwide on average.
- Magnitude 8.0-8.9—felt in extremely large region. Major damage to buildings over large areas. Structures likely destroyed. Moderate to heavy damage to sturdy or earthquake-resistant buildings. Death tolls up to 1 million. 1 occurs annually worldwide on average.
- Magnitude 9.0+ —damage and shaking extends to distant locations. Near or total destruction. Severe damage and collapse to all buildings. Permanent changes in ground topography. 1 occurs every 10-50 years worldwide on average.

Since 1940, there have been 14 earthquakes centered in NH with a magnitude of 3.0 or greater and only two earthquakes with a magnitude of 5.0 or greater. There have been no recorded earthquakes to-date centered in Pelham, however, one could occur.

Previous Occurrences of Earthquakes

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
	There have been no earthquakes centered in Pelham to date. Earthquakes noted below were centered in NH.	Earthquakes noted below had a magnitude of 2.5 or greater.	
December 20, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Pelham
December 24, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Pelham
December 4, 1963	Laconia, NH (43.6 latitude, -71.5 longitude)	Magnitude 3.7 on Richter Scale	No damage in Pelham
June 28, 1981	Sanbornton, NH (43.56 latitude, -71.56 longitude)	Magnitude 3.0 on Richter Scale	No damage in Pelham
January 19, 1982	Sanbornton, NH (43.5 latitude, -71.6 longitude)	Magnitude 4.7 on Richter Scale	No damage in Pelham
October 25, 1986	Northfield, NH (43.399 latitude, -71.59 longitude)	Magnitude 3.9 on Richter Scale	No damage in Pelham

October 20, 1988	Milan, NH (44.539 latitude, - 71.158 longitude)	Magnitude 3.9 on Richter Scale	No damage in Pelham
November 22, 1988	Milan, NH (44.557 latitude, - 71.183 longitude)	Magnitude 3.2 on Richter Scale	No damage in Pelham
April 6, 1989	Berlin, NH (44.511 latitude, - 71.144 longitude)	Magnitude 3.5 on Richter Scale	No damage in Pelham
October 6, 1992	Canterbury, NH (43.324 latitude, - 71.578 longitude)	Magnitude 3.4 on Richter Scale	No damage in Pelham
June 16, 1995	Lyman, NH (44.286 latitude, - 71.915 longitude)	Magnitude 3.8 on Richter Scale	No damage in Pelham
August 21, 1996	Bartlett, NH (44.184 latitude, - 71.352 longitude)	Magnitude 3.8 on Richter Scale	No damage in Pelham
January 27, 2000	Raymond, NH (43.00 latitude, - 71.18 longitude)	Magnitude 3.0 on Richter Scale	No damage in Pelham
September 26, 2010	Boscawen, NH (43.2915 latitude, - 71.6568 longitude)	Magnitude 3.4 on Richter Scale	No damage in Pelham
October 11, 2013	Contoocook, NH (43.255 latitude, - 71.747 longitude)	Magnitude 2.6 on Richter Scale	No damage in Pelham
March 21, 2016	Contoocook, NH (43.264 latitude, - 71.767 longitude)	Magnitude 2.8 on Richter Scale	No damage in Pelham
February 11, 2017	Bedford, NH (42.946°N latitude, 71.541°W longitude)	Magnitude 2.2 on Richter Scale	No damage in Pelham
February 15, 2018	East Kingston, NH (42.921°N latitude, 71.011°W longitude)	Magnitude 2.7 on Richter Scale	No damage in Pelham
February 4, 2022	Gorham, NH (44.386°N latitude, 71.175°W longitude)	Magnitude 2.9 on Richter Scale	No damage in Pelham
April 25, 2023	Center Sandwich, NH (43.780°N 71.480°W)	Magnitude 2.9 on Richter Scale	No damage in Pelham
	Earthquakes noted below were centered outside of NH but were felt by NH municipalities.		
November 18, 1929	Grand Banks, Newfoundland	Magnitude 7.2 on Richter Scale	No damage in Pelham
November 1, 1935	Timiskaming, Canada	Magnitude 6.25 on Richter Scale	No damage in Pelham
June 15, 1973	Near Canadian/NH	Magnitude 4.8 on	No damage in

	border	Richter Scale	Pelham
June 23, 2010	Buckingham, Quebec, Canada	Magnitude 5.0 on Richter Scale	No damage in Pelham
August 23, 2011	Washington, DC	Magnitude 5.8 on Richter Scale	No damage in Pelham
October 16, 2012	Hollis Center, ME	Magnitude 4.0 on Richter Scale	No damage in Pelham
May 17, 2013	Shawville, Canada	Magnitude 5.1 on Richter Scale	No damage in Pelham
November 11, 2017	Little Creek, DE	Magnitude 4.1 on Richter Scale	No damage in Pelham
January 15, 2019	Ocean City, MD	Magnitude 4.6 on Richter Scale	No damage in Pelham
November 8, 2020	Bliss Corner, MA	Magnitude 3.6 on Richter Scale	No damage in Pelham

Earthquake Hazard Loss Estimate

Step 1. Determine potential earthquake strength in Pelham

- US Seismic Hazard, 2% in 50 years PGA is 0.2(g) in Pelham
- Source: [USGS NH Seismic Map 2014](#)

Step 2. Determine percent building damage ratio to single family residence from PGA (g) 0.2 earthquake

- Wood Frame Construction with Low general seismic design level = 2.8% building damage
- Source: [FEMA Identifying Hazards and Estimating Losses](#), pg 4-17

Step 3. Determine percent of structures in Pelham that would be damaged by PGA (g) 0.2 earthquake

- 1-5% of structures estimated to be damaged by earthquake
- Source: *Pelham Hazard Mitigation Team (no historical data on earthquake damage in Pelham)*

Step 4. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham = \$ 1,764,927,630
- Source: *Pelham Assessing Department*

Step 5. Determine total loss from PGA (g) 0.2 Earthquake

- Total Loss from Earthquake = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Earthquake = \$91,764,927,630 * .01 * .028 = \$494,180
- Total Loss from Earthquake = \$1,764,927,630 * .05 * .028 = \$2,470,899
- **\$494,180 to \$2,470,899**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Earthquake Hazard Area	Percentage of this type of Critical Facilities in Earthquake Hazard Area
General Occupancy	46	32	66%

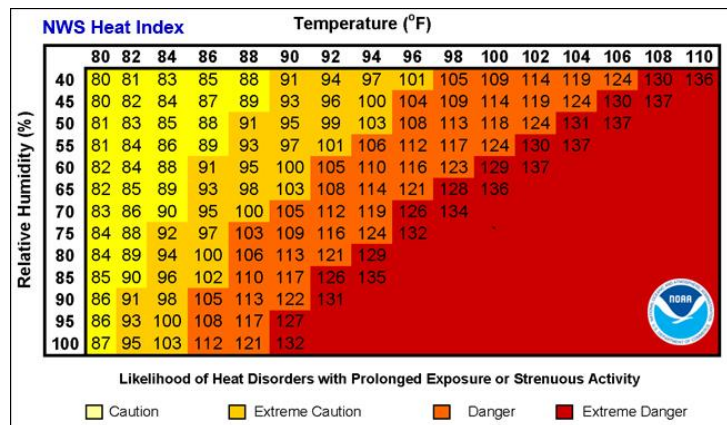
Essential Facilities	10	10	100%
Transportation	13	13	100%
Utility System	44	15	34%
High Potential Hazard	14	14	100%
Hazardous Materials	1	1	100%

Extreme Temperatures

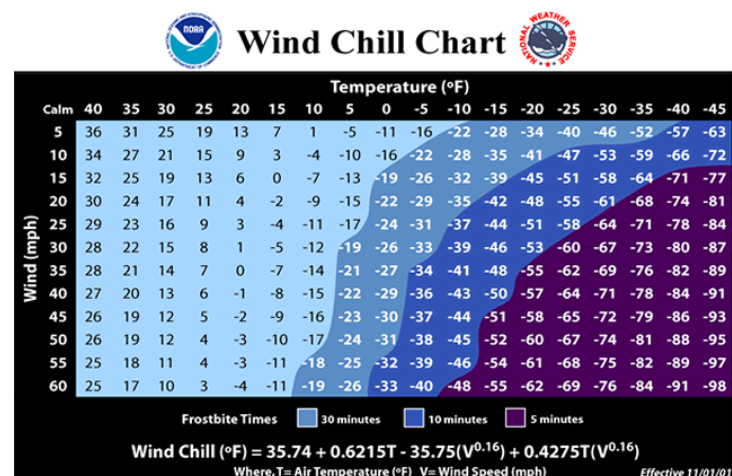
Extreme temperatures can be broken into both extreme heat and extreme cold. Though the hazards are different, the effects would be similar to vulnerable populations in Pelham.

A heat wave can be defined as a prolonged period of excessive heat, often combined with excessive humidity. Heat kills by pushing the human body beyond its limits. The risk of heat-related illness increases as temperature and humidity levels rise. Extreme heat events can be defined as periods with temperatures of 90 degrees Fahrenheit or higher.

Extreme heat should not be confused with a drought (extended periods of negative departures from normal rainfall). Overburdened power networks may experience failures due to the impacts of extreme heat. The National Weather Service (above) illustrates the probability of heat disorders with prolonged exposure or strenuous activity.



Extreme cold is defined as an extended period where temperatures are at or below 0 degrees Fahrenheit. With the rising costs of heating fuel and electric heat, many low-income or homeless citizens are not able to adequately heat their homes, exposing themselves to cold related emergencies or death. Extremely cold winters can lead to shortages in heating fuels due to high demand. The National Weather Service Windchill Chart (right) depicts the dangers of freezing temperatures and winds.



Previous Occurrences of Extreme Temperatures

Hazard	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Cold)	January 16-20, 2000	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 1/16/00: -3°F • 1/17/00: -2°F • 1/18/00: -5°F • 1/19/00: -6°F • 1/20/00: -4°F	No known impact in Pelham
Extreme Temperature (Cold)	January 28-30, 2000	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/28/00: -6°F • 1/29/00: -2°F • 1/30/00: -4°F	No known impact in Pelham
Extreme Temperature (Cold)	January 18-20, 2003	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/18/00: -9°F • 1/19/00: -11°F • 1/20/00: -11°F	No known impact in Pelham
Extreme Temperature (Cold)	January 28-31, 2003	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/28/03: -9°F • 1/29/03: -5°F • 1/30/03: -0°F • 1/31/03: -0°F	No known impact in Pelham
Extreme Temperature (Cold)	February 13-17, 2003	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 2/13/03: -3°F • 2/14/03: -11°F • 2/15/03: -10°F • 2/16/03: -7°F • 2/17/03: -2°F	No known impact in Pelham
Extreme Temperature (Cold)	February 26-28, 2003	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 2/26/03: -4°F • 2/27/03: -6°F • 2/28/03: -1°F	No known impact in Pelham
Extreme	January 9-12, 2004	Entire jurisdiction	4 consecutive days	No known impact in

Temperature (Cold)			of minimum temperatures at or below 0°F: • 1/9/04: -7°F • 1/10/04: -8°F • 1/11/04: -8°F • 1/12/04: -7°F	Pelham
Extreme Temperature (Cold)	January 14-17, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/14/04: -10°F • 1/15/04: -10°F • 1/16/04: -12°F • 1/17/04: -9°F	Wind chills of -30°F, 6 fatalities in NH
Extreme Temperature (Cold)	January 24-27, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/24/04: -4°F • 1/25/04: -6°F • 1/26/04: -6°F • 1/27/04: -0°F	No known impact in Pelham
Extreme Temperature (Cold)	January 18-25, 2005	Entire jurisdiction	8 consecutive days of minimum temperatures at or below 0°F: • 1/18/05: 0°F • 1/19/05: -8°F • 1/20/05: -3°F • 1/21/05: -5°F • 1/22/05: -12°F • 1/23/05: -9°F • 1/24/05: 0°F • 1/25/05: -1°F	No known impact in Pelham
Extreme Temperature (Cold)	January 28-30, 2005	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 2/28/05: -1°F • 2/29/05: -7°F • 2/30/05: -5°F	No known impact in Pelham
Extreme Temperature (Cold)	January 16-18, 2009	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/16/09: -16°F • 1/17/09: -16°F • 1/18/09: -9°F	No known impact in Pelham
Extreme Temperature (Cold)	January 25-27, 2009	Entire jurisdiction	3 consecutive days of minimum	No known impact in Pelham

			temperatures at or below 0°F: • 1/25/09: -7°F • 1/26/09: -7°F • 1/27/09: -5°F	
Extreme Temperature (Cold)	January 15-18, 2011	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/15/11: -6°F • 1/16/11: -5°F • 1/17/11: 0°F • 1/18/11: -2°F	No known impact in Pelham
Extreme Temperature (Cold)	January 23-27, 2011	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 1/23/05: -5°F • 1/24/05: -10°F • 1/25/05: -9°F • 1/26/05: -3°F • 1/27/05: -2°F	No known impact in Pelham
Extreme Temperature (Cold)	January 15-17, 2012	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/15/12: -2°F • 1/16/12: -2°F • 1/17/12: 0°F	No known impact in Pelham
Extreme Temperature (Cold)	January 3-5, 2014	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/3/14: 0°F • 1/4/14: -16°F • 1/5/14: -14°F	No known impact in Pelham
Extreme Temperature (Cold)	January 23-25, 2014	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/23/14: -1°F • 1/24/14: -6°F • 1/25/14: 0°F	No known impact in Pelham
Extreme Temperature (Cold)	February 7-9, 2014	Entire jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 2/7/14: -7°F • 2/8/14: -7°F • 2/9/14: -2°F	No known impact in Pelham
Extreme	February 11-13,	Entire jurisdiction	3 consecutive days	No known impact in

Temperature (Cold)	2014		of minimum temperatures at or below 0°F: • 2/11/14: -10°F • 2/12/14: -10°F • 2/13/14: -9°F	Pelham
Extreme Temperature (Cold)	March 4-8, 2014	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 3/4/14: -5°F • 3/5/14: -4°F • 3/6/14: -4°F • 3/7/14: -6°F • 3/8/14: -4°F	No known impact in Pelham
Extreme Temperature (Cold)	January 8-12, 2015	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 1/8/15: -7°F • 1/9/15: -7°F • 1/10/15: -2°F • 1/11/15: -3°F • 1/12/15: 0°F	No known impact in Pelham
Extreme Temperature (Cold)	February 1-4, 2015	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 2/1/15: -8°F • 2/2/15: -8°F • 2/3/15: -5°F • 2/4/15: -8°F	No known impact in Pelham
Extreme Temperature (Cold)	February 14-19, 2015	Entire jurisdiction	6 consecutive days of minimum temperatures at or below 0°F: • 2/14/15: -13°F • 2/15/15: -7°F • 2/16/15: -6°F • 2/17/15: -4°F • 2/18/15: -5°F • 1/19/15: -5°F	No known impact in Pelham
Extreme Temperature (Cold)	February 28-March 4, 2015	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 2/28/15: -11°F • 3/1/15: -11°F • 3/2/15: 0°F • 3/3/15: -1°F • 3/4/15: 0°F	No known impact in Pelham

Extreme Temperature (Cold)	February 12-16, 2016	Entire jurisdiction	5 consecutive days of minimum temperatures at or below 0°F: • 2/12/16: -7°F • 2/13/16: -7°F • 2/14/16: -13°F • 2/15/16: -13°F • 2/16/16: -12°F	No known impact in Pelham
Extreme Temperature (Cold)	December 28-31, 2017	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 12/28/17: -7°F • 12/29/17: -9°F • 12/30/17: -6°F • 12/31/17: -11°F	No known impact in Pelham
Extreme Temperature (Cold)	January 1-3, 2018	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/1/18: -5°F • 1/2/18: -14°F • 1/3/18: -13°F	No known impact in Pelham
Extreme Temperature (Cold)	January 31-February 3, 2019	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/31/19: -2°F • 2/1/19: -5°F • 2/2/19: -5°F • 2/3/19: -1°F	No known impact in Pelham
Extreme Temperature (Cold)	January 15-17, 2022	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 1/15/22: -2°F • 1/16/22: -6°F • 1/17/22: 0°F	No known impact in Pelham
Extreme Temperature (Heat)	May 3-5, 2001	Entire jurisdiction*	3 consecutive days of temperatures above 90°F: • 5/3/01—93°F • 5/4/01—92°F • 5/5/01—92°F	No known impact in Pelham
Extreme Temperature (Heat)	June 15-17, 2001	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 6/15/01—92°F • 6/16/01—95°F • 6/17/01—91°F	No known impact in Pelham

Extreme Temperature (Heat)	July 22-26, 2001	Entire jurisdiction	5 consecutive days of temperatures above 90°F: • 7/22/01—90°F • 7/23/01—90°F • 7/24/01—92°F • 7/25/01—95°F • 7/26/01—93°F	No known impact in Pelham
Extreme Temperature (Heat)	August 7-10, 2001	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 8/7/01—94°F • 8/8/01—97°F • 8/9/01—96°F • 8/10/01—100°F	No known impact in Pelham
Extreme Temperature (Heat)	July 2-5, 2002	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/2/02—90°F • 7/3/02—95°F • 7/4/02—98°F • 7/5/02—97°F	No known impact in Pelham
Extreme Temperature (Heat)	July 30-August 2, 2002	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/30/02—90°F • 7/31/02—91°F • 8/1/02—91°F • 8/2/02—93°F	No known impact in Pelham
Extreme Temperature (Heat)	August 13-20, 2002	Entire jurisdiction	8 consecutive days of temperatures above 90°F: • 8/13/02—94°F • 8/14/02—96°F • 8/15/02—98°F • 8/16/02—95°F • 8/17/02—94°F • 8/18/02—92°F • 8/19/02—94°F • 8/20/02—92°F	No known impact in Pelham
Extreme Temperature (Heat)	June 25-28, 2003	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 6/25/03—90°F • 6/26/03—93°F • 6/27/03—92°F • 6/28/03—92°F	No known impact in Pelham
Extreme Temperature (Heat)	July 5-7, 2003	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 7/5/03—91°F	No known impact in Pelham

			• 7/6/03—90°F • 7/7/03—91°F	
Extreme Temperature (Heat)	July 17-19, 2006	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 7/17/06—90°F • 7/18/06—93°F • 7/19/06—94°F	No known impact in Pelham
Extreme Temperature (Heat)	August 2-4, 2006	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 8/2/06—96°F • 8/3/06—97°F • 8/4/06—92°F	No known impact in Pelham
Extreme Temperature (Heat)	August 16-20, 2006	Entire jurisdiction	5 consecutive days of temperatures above 90°F: • 8/16/09—90°F • 8/17/09—90°F • 8/19/09—91°F • 8/19/09—93°F • 8/20/09—90°F	No known impact in Pelham
Extreme Temperature (Heat)	July 4-10, 2010	Entire jurisdiction	7 consecutive days of temperatures above 90°F: • 7/4/10—90°F • 7/5/10—90°F • 7/6/10—97°F • 7/7/10—98°F • 7/8/10—97°F • 7/9/10—92°F • 7/10/10—92°F	No known impact in Pelham
Extreme Temperature (Heat)	July 17-20, 2010	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/17/10—93°F • 7/18/10—93°F • 7/19/10—93°F • 7/20/10—90°F	No known impact in Pelham
Extreme Temperature (Heat)	August 30-Sept. 3, 2010	Entire jurisdiction	5 consecutive days of temperatures above 90°F: • 8/30/10—92°F • 8/31/10—91°F • 9/1/10—94°F • 9/2/10—95°F • 9/3/10—96°F	No known impact in Pelham
Extreme Temperature (Heat)	July 21-24, 2011	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/21/11—92°F	No known impact in Pelham

			• 7/22/11—96°F • 7/23/11—101°F • 7/24/11—96°F	
Extreme Temperature (Heat)	June 21-23, 2012	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 6/21/12—96°F • 6/22/12—94°F • 6/23/12—93°F	No known impact in Pelham
Extreme Temperature (Heat)	July 13-16, 2012	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/13/12—92°F • 7/14/12—92°F • 7/15/12—93°F • 7/16/12—91°F	No known impact in Pelham
Extreme Temperature (Heat)	August 3-6, 2012	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 8/3/12—91°F • 8/4/12—94°F • 8/5/12—95°F • 8/6/12—93°F	No known impact in Pelham
Extreme Temperature (Heat)	June 1-3, 2013	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 6/1/13—93°F • 6/2/13—92°F • 6/3/13—91°F	No known impact in Pelham
Extreme Temperature (Heat)	July 16-21, 2013	Entire jurisdiction	6 consecutive days of temperatures above 90°F: • 7/16/13—90°F • 7/17/13—91°F • 7/18/13—93°F • 7/19/13—93°F • 7/20/13—96°F • 7/21/13—91°F	No known impact in Pelham
Extreme Temperature (Heat)	July 29-31, 2015	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 7/29/15—90°F • 7/30/15—93°F • 7/31/15—90°F	No known impact in Pelham
Extreme Temperature (Heat)	July 29-31, 2015	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 7/29/15—90°F • 7/30/15—93°F • 7/31/15—90°F	No known impact in Pelham

Extreme Temperature (Heat)	September 8-10, 2015	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 9/8/15—93°F • 9/9/15—93°F • 9/10/15—94°F	No known impact in Pelham
Extreme Temperature (Heat)	July 23-29, 2016	Entire jurisdiction	7 consecutive days of temperatures above 90°F: • 7/23/16—96°F • 7/24/16—95°F • 7/25/16—90°F • 7/26/16—95°F • 7/27/16—93°F • 7/28/16—94°F • 7/29/16—93°F	No known impact in Pelham
Extreme Temperature (Heat)	June 12-14, 2017	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 6/12/17—94°F • 6/13/17—98°F • 6/14/17—96°F	No known impact in Pelham
Extreme Temperature (Heat)	July 20-22, 2017	Entire Jurisdiction	3 consecutive days of temperatures above 90°F : • 7/20/17—93°F • 7/21/17—94°F • 7/22/17—92°F	No known impact in Pelham
Extreme Temperature (Heat)	August 1-4, 2017	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 8/1/17—90°F • 8/2/17—92°F • 8/3/17—91°F • 8/4/17—90°F	No known impact in Pelham
Extreme Temperature (Heat)	September 25-28, 2017	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 9/25/17—93°F • 9/26/17—91°F • 9/27/17—90°F • 9/28/17—91°F	No known impact in Pelham
Extreme Temperature (Heat)	July 1-7, 2018	Entire Jurisdiction	7 consecutive days of temperatures above 90°F: • 7/1/18—91°F • 7/2/18—95°F • 7/3/18—92°F • 7/4/18—95°F • 7/5/18—92°F • 7/6/18—92°F • 7/7/18—92°F	No known impact in Pelham

Extreme Temperature (Heat)	August 29-31, 2018	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 8/29/18—92°F • 8/30/18—93°F • 8/31/18—93°F	No known impact in Pelham
Extreme Temperature (Heat)	July 20-22, 2019	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 7/20/19—91°F • 7/21/19—95°F • 7/22/19—93°F	No known impact in Pelham
Extreme Temperature (Heat)	August 10-13, 2020	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 8/10/20—91°F • 8/11/20—95°F • 8/12/20—93°F • 8/13/20—93°F	No known impact in Pelham
Extreme Temperature (Heat)	June 5-9, 2021	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 6/5/21—92°F • 6/6/21—93°F • 6/7/21—94°F • 6/9/21—95°F	No known impact in Pelham
Extreme Temperature (Heat)	June 27-30, 2021	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 6/27/21—91°F • 6/28/21—96°F • 6/29/21—97°F • 6/30/21—96°F	No known impact in Pelham
Extreme Temperature (Heat)	August 11-14, 2021	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 7/11/21—92°F • 7/12/21—94°F • 7/13/21—93°F	No known impact in Pelham
Extreme Temperature (Heat)	August 24-27, 2021	Entire Jurisdiction	4 consecutive days of temperatures above 90°F: • 7/24/21—92°F • 7/25/21—92°F • 7/26/21—95°F • 7/27/21—91°F	No known impact in Pelham
Extreme Temperature (Heat)	July 19-24, 2022	Entire Jurisdiction	6 consecutive days of temperatures above 90°F: • 7/19/22—92°F • 7/20/22—96°F • 7/21/22—95°F	No known impact in Pelham

			• 7/22/22—92°F • 7/23/22—95°F • 7/24/22—97°F	
Extreme Temperature (Heat)	August 3-10, 2022	Entire Jurisdiction	8 consecutive days of temperatures above 90°F: • 8/3/22—90°F • 8/4/22—92°F • 8/5/22—99°F • 8/6/22—92°F • 8/7/22—96°F • 8/8/22—97°F • 8/9/22—98°F • 8/10/22—93°F	No known impact in Pelham
Extreme Temperature (Heat)	August 20-22, 2022	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 8/20/22—91°F • 8/21/22—96°F • 8/22/22—91°F	No known impact in Pelham

**NOAA does not have a full history of temperature data for the Town of Pelham, NH. Extreme Temperature data is based on readings from NOAA weather station in Nashua, NH.*

Extreme Temperatures Hazard Loss Estimate

Because the impacts of extreme temperatures can result in the loss of life, it is beyond the scope of this Plan to estimate the dollar value of losses to Pelham resulting from extreme temperatures. Though the entire Pelham population may experience a thermal emergency, populations without adequate climate control are most at risk. Extreme temperatures are not likely to cause damage to structures, although pipes can burst in extreme cold conditions.

Flooding

Localized Flooding

Localized flooding can result from even minor storms. Runoff overloads the drainage ways and flows into the streets and low-lying areas. Homes and businesses can be inundated, especially basements and the lower part of first floors. Localized flooding poses most of the same problems caused by larger floods, but because it typically has an impact on fewer people and affects small areas, it tends to bring less State or Federal involvement such as funding, technical help, or disaster assistance. As a result, the community and the affected residents or business owners are left to cope with the problems on their own. Finally, flooding of this type tends to recur; small impacts accumulated over time can become major problems.

Riverine Flooding

Riverine flooding involves the overflowing of normal flood channels, rivers or streams, generally as a result of prolonged rainfall or rapid thawing of snow cover. The lateral spread of floodwater is largely a function of the terrain, becoming greater in wide, flat areas, and affecting narrower areas in steep

terrain. In the latter cases, riparian hillsides in combination with steep declines in riverbed elevation often force waters downstream rapidly, sometimes resulting in flash floods.

Floodplains cover approximately 18.7% of Pelham; 16.7% of Pelham is located in 1% annual floodplain and 2.0% of Pelham is located in the 0.2% annual floodplain. There are over 35 miles of perennial streams in Pelham and four major brooks that flow through Town, including Beaver Brook, Golden Brook, Little Island Pond Brook, and Gumpas Pond Brook.

Dam Failure

The NH Department of Environmental Services indicates several failure modes for dams. Most typical include hydraulic failure or the uncontrolled overflowing of water, seepage, or leaking at the dam's foundation or gate; structural failure or rupture; general deterioration; and gate inoperability. These modes vary between dams depending on their construction type.

The State of New Hampshire uses a hazard potential classification to define the extent of a dam breach or failure. All class S (Significant) and H (High hazard) dams have the potential to cause damage if they breach or fail.

Class H—high hazard: 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 probably loss of human life as a result of: water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure that is occupied under normal conditions; water levels rising above 1st floor elevation of a habitable residential structure or a commercial or industrial structure that is occupied under normal conditions when the rise due to dam failure is greater than 1 foot; structural damage to an interstate highway, which could render the roadway impassible or otherwise interrupt public safety services; release of a quantity and concentration of material that qualify as “hazardous waste” under RSA 147-A:2 VII; any other circumstance that would more likely than not cause one or more deaths.

Class S—significant hazard: dam has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: no probable loss of lives; major economic loss to structures or property; structural damage to a Class I or Class II road that would render the road impassable or otherwise interrupt public safety services; major environmental or public health losses.

Class L—low hazard: dam has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: no possible loss of life; low economic loss to structures or property; structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassible or otherwise interrupt public safety service; the release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than 2 acre-feet and is located more than 250 feet from a water body or water course; reversible environmental losses to environmentally-sensitive sites.

Class NM—non-menace: dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is less than 6 feet in height if it has a storage capacity greater than 50 acre-feet; or less than 25 feet in height if it has a storage capacity of 15-50 acre-feet.

Pelham has 11 Class NM dams (Non-Menace), 2 Class L dams (Low hazard potential), 0 Class S dams (Significant hazard potential), and 1 Class H dams (High hazard potential). There have been no known dam breaches to-date in Pelham.

Previous Occurrences of Flooding

Hazard	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Flooding – Dam Failure	There have been no flooding events caused by dam failure in Pelham to date.			
Flooding	1927	Hillsborough County	No data on extent available	No data available on impact in Pelham.
Flooding	March 11-21, 1936	Hillsborough County	25-50 year recurrence interval	\$133,000,000 in property damage and 77,000 homeless throughout New England. Primary impact to structures, infrastructure, and road network. Flooding caused by heavy snowfall totals, heavy rains, and warm weather. Impact listed here are general to Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	July 11, 1973	Hillsborough County	No data on extent available	FEMA Disaster Declaration #399. Specific impacts to Pelham are unknown.
Flooding	July 29-August 10, 1986	Hillsborough County	No data on extent available	FEMA Disaster Declaration #771. Many roads impassable in Hillsborough Co. Specific impacts to Pelham are

				unknown.
Flooding	March 30-April 11, 1987	Hillsborough County	25-50+ year recurrence interval	\$4,888,889 in damage in NH. FEMA Disaster Declaration #789. Primary impact to agricultural fields in Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	February 24, 1990	Beaver Brook in north Pelham (42° 48' 23" latitude, 71° 21' 11" longitude)	No data on extent available	Flooding caused by ice jam in Beaver Brook. No damage reported in Pelham.
Flooding	August 7-11, 1990	Hillsborough County	No data on extent available	\$2,297,777 in damage in NH. FEMA Disaster Declaration #876. Primary impact to infrastructure. Series of storms with moderate to heavy rain causing widespread flooding. Impact listed here are general to Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	October 20-23, 1996	Hillsborough County	No data on extent available	\$2,341,273 in damage in NH. FEMA Disaster Declaration #1144. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	July 2, 1998	Hillsborough County	No data on extent available	\$3,400,000 in damage in NH, 6 counties impacted including Hillsborough. FEMA Disaster Declaration #1231. Primary impact to structures and

				infrastructure in Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	October 26, 2005	Hillsborough County	50-100 year recurrence interval	5 counties impacted in NH, including Hillsborough. FEMA Disaster Declaration #1610. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	May 12-23, 2006	Hillsborough County	As much as 14 inches of rainfall in region. 100-500 year recurrence interval.	7 counties impacted in NH, including Hillsborough. FEMA Disaster Declaration #1643. Numerous road closures in Hillsborough Co. Specific impacts to Pelham are unknown.
Flooding	April 15, 2007	Hillsborough County	100-500 year recurrence interval	\$27,000,000 in damages in NH; 2,005 home owners and renters applied for assistance in NH. FEMA Disaster Declaration #1695. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Pelham are unknown.
Flooding	September 6-7, 2008	Hillsborough County	50-100 year recurrence interval	\$6.90 per capita in damages in Hillsborough County. FEMA Disaster Declaration #1799. Primary impact to structures and infrastructure in Hillsborough County. Specific

				impacts to Pelham are unknown.
Flooding	March 14, 2010	Hillsborough County	50-100 year recurrence interval	\$1,880,685 in FEMA public assistance in NH; \$1.80 per capita in Hillsborough County. FEMA Disaster Declaration #1913 Primary impact to roads and bridges in Hillsborough County. Flooding near Johnson Corner in Pelham due to undersized culvert.
There has been no major flooding events in Hillsborough County since 2010.				

Flood Hazard Loss Estimate

Step 1. Determine percent building damage to a 1 or 2 story building with basement

- 1-foot flood depth = 15% building damage
- 2-foot flood depth = 20% building damage
- 3-foot flood depth = 23% building damage
- 4-foot flood depth = 28% building damage
- *Source: FEMA Identifying Hazards and Estimating Losses, pg 4-13*

Step 2. Determine number of structures in Pelham located in the floodplain

- 281 structures located in 1% floodplain
- 111 structures located in 0.2% floodplain
- *Source: Nashua Regional Planning Commission GIS*

Step 3. Determine total value of structures in Pelham located in 1% floodplain

- Average assessed value of all structures in Pelham = \$350,671
- Total number of structures in Pelham located in 1% floodplain = 281
- Total assessed value of all structures in Pelham in 1% floodplain = \$350,671 * 281
- Total assessed value of all structures in Pelham in 1% floodplain = \$98,538,551
- *Source: Pelham Hazard Mitigation Team calculations based on Pelham Assessing data & NRPC GIS data*

Step 4. Determine total loss from flooding in 1% floodplain

- Total Loss from Flooding = Total Assessed Value of all Buildings in 1% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = \$98,538,551 * .15 = **\$14,780,783**
- Total Loss from 2-foot flood depth = \$98,538,551 * .20 = **\$19,707,710**
- Total Loss from 3-foot flood depth = \$98,538,551 * .23 = **\$22,663,867**
- Total Loss from 4-foot flood depth = \$98,538,551 * .28 = **\$27,590,794**

Step 5. Determine total value of structures in Pelham located in 0.2% floodplain

- Average assessed value of all structures in Pelham = \$350,671
- Total number of structures in Pelham located in 0.2% floodplain = 111
- Total assessed value of all structures in Pelham in 0.2% floodplain = \$350,671 * 111
- Total assessed value of all structures in Pelham in 0.2% floodplain = \$38,924,481
- *Source: Pelham Hazard Mitigation Team calculations based on Pelham Assessing data & NRPC GIS data*

Step 6. Determine total loss from flooding in 0.2% floodplain

- Total Loss from Flooding = Total Assessed Value of all Buildings in 0.2% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = \$38,924.481 * .15 = **\$5,838,672**
- Total Loss from 2-foot flood depth = \$38,924.481 * .20 = **\$7,784,896**
- Total Loss from 3-foot flood depth = \$38,924.481 * .23 = **\$8,952,631**
- Total Loss from 4-foot flood depth = \$38,924.481 * .28 = **\$10,898,855**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in 1% Annual Floodplain	Percentage of this type of Critical Facilities in 1% Annual Floodplain	Number of this type of Critical Facilities in 0.2% Annual Floodplain	Percentage of this type of Critical Facilities in 0.2% Annual Floodplain
General Occupancy	46	1	2%	1	2%
Essential Facilities	10	1	10%	1	10%
Transportation	13	10	77%	5	38%
Utility System	44	2	5%	2	5%
High Potential Hazard	14	10	71%	1	7%
Hazardous Materials	1	1	100%	0	0%

Severe Wind/Tropical Storm

A hurricane is the term used for tropical cyclones that occur in the Northern Hemisphere east of the International Dateline to the Greenwich Meridian. Tropical cyclones originate over tropical or subtropical waters and are characterized by organized deep convection and a closed surface wind circulation about a well-defined center. The Atlantic hurricane season lasts from June 1 through November 30 and peaks in late August and September. The Saffir-Simpson Hurricane Wind Scale categorizes hurricanes from 1 to 5 based on sustained wind speed. The National Weather Service National Hurricane Center provides the following estimates of potential property damage based on hurricane wind speed (<http://www.nhc.noaa.gov/aboutsshws.php>).

Category 1—sustained winds 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.

Category 2—sustained winds 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.

Category 3—sustained winds 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.

Category 4—sustained winds 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.

Category 5—sustained winds 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 possible months. Most of the area will be uninhabitable for weeks or months.

FEMA declared disasters in Hillsborough County during Hurricane Bob (1991) and Hurricane Floyd (1999). Though these were the only formally declared incidents, Pelham has experienced strong remnants of numerous tropical cyclones including Hurricane Carol (1954), Donna (1960), Gloria (1985), Irene (2011), and Sandy (2012).

Previous Occurrences of Severe Wind/Tropical Storm

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Great Hurricane of 1938	Hillsborough County	No data on extent available	\$12,337,643 total damages (not adjusted for inflation), 13 deaths and 494 injuries in NH. Damage to road network and structures caused by flooding.
August 31, 1954 (Carol)	Hillsborough County	Saffir-Simpson Scale Category 3.	Extensive tree and crop damage.
September 12, 1960 (Donna)	Hillsborough County	Saffir-Simpson Scale Category 3	Water damage to structures due to flooding.
September 27, 1985 (Gloria)	Hillsborough County	Saffir-Simpson Scale Category 2	Damage to trees and power lines from high winds.
August 19, 1991 (Bob)	Hillsborough County	Saffir-Simpson Scale Category 1	FEMA Disaster Declaration #917. Damage to structures, trees, and power lines from high winds.
September 16-18, 1999 (Floyd)	Hillsborough County	Tropical Storm (winds 39-73 mph)	FEMA Disaster Declaration #1305. Primary impact to trees, infrastructure, and road network.
August 28, 2011 (Irene)	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4026. Damage to trees and power lines from high winds. Flash floods.
October 26, 2012 (Sandy)	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4095. Minimal damage.
October 29- November 1, 2017	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4355. A powerful storm fed by tropical moisture knocked out power to more than 270,000 homes and business across the state. Parts of the region experienced 2.8 inches of rainfall

			and widespread power outages. Falling trees severely damaged many homes and electrical infrastructure. Local roads were closed due to downed trees and flash flooding.
August 3-6, 2020 (Isaias)	Hillsborough County	Tropical Storm (winds 39-73 mph).	Tropical storm with extreme wind gusts, flash flooding, high rainfall, tree damage, and power outages.
August 19-27, 2021 (Henri)	Hillsborough County	Tropical Storm (winds 39-73 mph).	Strong tropical storm with flash flooding, high winds, power outages, tree damage, heavy rain between 2 and 4 inches.
There has been no significant damage from tropical-post tropical cyclones (severe wind) in Pelham since 2021.			

Severe Wind/Tropical Storm Hazard Loss Estimate

There are no standard loss estimation models or tables for wind damage (*Understanding Your Risks*, FEMA, pg 4-30). As such, the Hazard Mitigation Team used data from previous hurricane events to determine damage estimates. Historically, the strongest hurricane seen in NH was a Category 3, so loss estimates were calculated based on a hurricane of that strength. Hurricanes have primarily damaged road networks and infrastructure in NH. It is beyond the scope of this project to estimate the costs of repairing or replacing transportation and utility infrastructure damaged by a hurricane. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from a hurricane.

Step 1. Determine percent building damage ratio to single family residence from Category 3 hurricane

- Wood Frame Construction, Low general hurricane design level = 20% building damage
- *Source: Pelham Hazard Mitigation Team*

Step 2. Determine percent of structures in Pelham that would be damaged by Category 3 hurricane

- 5% of structures estimated to be damaged by Category 3 hurricane

- *Source: Pelham Hazard Mitigation Team (no historical data on hurricane damage in Pelham)*

Step 3. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham = \$1,764,927,630
- *Source: Pelham Assessing Department*

Step 4. Determine total loss from Category 3 hurricane

- Total Loss from Hurricane = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Hurricane = \$1,764,927,630 * .05 * .2 = **\$17,649,276**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Severe Wind Hazard Area	Percentage of this type of Critical Facilities in Severe Wind Hazard Area
General Occupancy	46	32	70%
Essential Facilities	10	10	100%
Transportation	13	4	31%
Utility System	44	13	30%
High Potential Hazard	14	14	100%
Hazardous Materials	1	1	100%

Lightning

By definition, all thunderstorms contain lightning. Lightning is a giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the Sun. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction causes a shock wave that we hear as thunder.

Lightning is a major hazard to citizens involved in outdoor activities. A lightning strike at a densely attended special event has the potential to create a major mass casualty incident. Lightning also can create wildfires and structure fires and may cause power and/or communications outages.

The Lightning Activity Level (LAL) grid can be used to measure the extent of a lightning event.

LAL	Cloud & Storm Development	Lightning Strikes/15 min
1	No thunderstorms	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are	9-15

	few, but two or three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	9-15

Previous Occurrences of Lightning

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
August 13, 2003 (2:03PM)	Long Beach, Veterans' Memorial Park, Pelham, NH	No data on extent	9-day campers and adults treated for lightning strike. 2 lightning bolts strike near building used for shelter. Mutual aid from Hudson and Windham utilized.
August 5 th , 2022 (3 PM)	Marsh Road, Pelham, NH	No data on extent	5-minute storm duration, lightning strike causing small fire on wall of a single home, no injuries.

Lightning Hazard Loss Estimate

Losses from lightning would be on a small, localized scale. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from lightning.

Step 1. Determine percent building damage ratio to single family residence from lightning

- Wood Frame Construction = 5% building damage
- *Source: Pelham Hazard Mitigation Team*

Step 2. Determine percent of structures in Pelham that would be damaged by lightning

- 0.25% of structures estimated to be damaged by lightning
- *Source: Pelham Hazard Mitigation Team (no historical data on lightning damage in Pelham)*

Step 3. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham = \$1,764,927,630
- *Source: Pelham Assessing Department*

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Step 4. Determine total loss from lightning

- Total Loss from Lightning = Total Assessed Value of all Structures *Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Severe Thunderstorm = \$1,764,927,630 * .0025 * .05 = **\$220,616**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Lightning Hazard Area	Percentage of this type of Critical Facilities in Lightning Hazard Area
General Occupancy	46	46	100%
Essential Facilities	10	10	100%
Transportation	13	1	8%
Utility System	44	13	30%
High Potential Hazard	14	0	0%
Hazardous Materials	1	1	100%

Severe Winter Weather

A heavy snowstorm is generally considered to be one that deposits two or more inches of snow per hour in a twelve-hour period. Heavy snow can immobilize a region, stranding commuters, closing businesses, and disrupting emergency services. Accumulating snow can collapse buildings and knock down trees and power lines. Snow removal from roadways, utility damage, and disruption to businesses can have a significant economic impact on municipalities and residents.

A blizzard is a violent snowstorm with winds blowing at a minimum speed of 35 miles per hour and visibility of less than one-quarter mile for three hours. A Nor'easter is a large weather system traveling from south to north, passing along the coast. As the storm's intensity increases, the resulting counterclockwise winds impact the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force, knocking down trees, utility poles, and power lines.

Ice storms occur when a mass of warm, moist air collides with a mass of cold, arctic air. The less dense warm air rises and the moisture precipitates out in the form of rain. When this rain falls through the colder, more-dense air and comes in contact with cold surfaces, ice forms and can become several inches thick. Heavy accumulations of ice can knock down trees, power lines, and communications for extended periods of time. Ice Storm extent can be defined by the Sperry-Piltz Ice Accumulation Index:

- 0—minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages
- 1—some isolated or localized utility interruptions are possible, typically lasting for a few hours. Roads and bridges may become slick and hazardous.
- 2—scattered utility interruptions expected, typically lasting 12-24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
- 3—numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days.

- 4—prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days.
- 5—catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

In recent years, FEMA issued disaster declarations in Hillsborough County for severe winter weather in 1998, 2008, 2010, 2011, 2013, and 2015. Among these storms was a rare Nor'easter in late October of 2011 that caused major destruction in Hillsborough and Rockingham Counties. Heavy wet snow fell on trees that had much of their foliage remaining. Many trees could not withstand the extra weight of the snow and collapsed under the stress. Damage was very focused in the southern part of New Hampshire and caused nearly three times the amount of debris that the 2008 ice storm produced.

Previous Occurrences of Severe Winter Weather

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
March 11-14, 1888	Entire jurisdiction	30-50 inches of snow	No historic data on impact
1922	Entire jurisdiction	No historic data on extent	Extreme snow drifts paralyzed road network.
February 14-15, 1940	Entire jurisdiction	Over 30 inches of snow	Snow and high winds paralyzed road network.
February 14-17, 1958	Entire jurisdiction	20-33 inches of snow	Primary impact to road network.
March 18-21, 1958	Entire jurisdiction	22-24 inches of snow	Primary impact to road network.
March 2-5, 1960	Entire jurisdiction	Up to 25 inches of snow	Primary impact to road network.
January 18-20, 1961	Entire jurisdiction	Up to 25 inches of snow	Blizzard conditions paralyze road network.
February 22-28, 1969	Entire jurisdiction	24-98 inches of snow in Central NH	Primary impact to road network. Slow moving storm.
December 25-28, 1969	Entire jurisdiction	12-18 inches of snow	Primary impact to road network.
January 19-21, 1978	Entire jurisdiction	Up to 16 inches of snow	Primary impact to road network.
February 5-7, 1978 (Blizzard of '78)	Entire jurisdiction	25-33 inches of snow	Snow paralyzed road network, trapped commuters in cars, and forced closure of businesses.
April 5-7, 1982	Entire jurisdiction	18-22 inches of snow	Primary impact to road network.
March, 1983	Entire jurisdiction	Over 18 inches of snow, 30-40 mph	Snow paralyzed road network and forced

		winds	closure of businesses.
December 1996	Entire jurisdiction	14 inches of snow	Damage to power lines forces closure of businesses. Heavy wet snow caused many trees to come down. Widespread power outages.
January 7, 1998	Entire jurisdiction	Ice storm, no data on extent available	\$12,446,202 in total damages, 1 death and 6 injuries in NH. \$17,000,000 in damages to PSNH equipment. FEMA Disaster Declaration #1199. 20 major road closures; 67,586 without power; 2,310 without phone service; 1 communication tower failure.
January 24, 1998	Entire jurisdiction	No data on extent available	Extensive damage to power lines.
December 11, 2008	Entire jurisdiction	Ice storm, no data on extent available	\$10,383,602 in FEMA public assistance in NH; \$6.35 per capita in Hillsborough County. FEMA Disaster Declaration #1812 Damage to power and phone lines and trees.
February 23, 2010	Entire jurisdiction	Snow followed by rainfall between 2-6 inches. Winds over 70 mph.	\$6,268,179 in FEMA public assistance in NH; \$3.68 per capita in Hillsborough County. FEMA Disaster Declaration #1892 Damage to power and phone lines, trees, and road network. Over 330,000 customers without power state-wide.

October 29-30, 2011	Entire jurisdiction	15-20 inches of snow.	\$3,052,769 in FEMA public assistance in NH; \$5.11 per capita in Hillsborough County. FEMA Disaster Declaration #4049 Damage to power and phone lines, trees, and road network.
February 8-10, 2013	Entire jurisdiction	Snowfall totals of 12-18 inches across region, up to 30 inches in parts of NH. Winds 10-20 mph with gusts up to 40 mph. Visibility less than ¼ mile.	FEMA Disaster Declaration #4105
January 26-28, 2015	Entire jurisdiction.	Snowfall totals of 18-24 inches across region. Winds 35 mph. Visibility 0.	\$3,293,059 in FEMA public assistance in NH; \$3.88 per capita in Hillsborough County. FEMA Disaster Declaration DR-4209.

Severe Winter Weather Hazard Loss Estimate

Severe Winter Weather events have primarily damaged road networks and infrastructure in NH. It is beyond the scope of this project to estimate the costs of repairing or replacing transportation and utility infrastructure damaged by severe winter weather. The Hazard Mitigation Team used the following calculations to estimate loss to single family residential structures from severe winter weather.

Step 1. Determine percent building damage ratio to single family residence from severe winter weather

- Wood Frame Construction, no additional provisions for roof snow loads = 5% building damage
- *Source: Pelham Hazard Mitigation Team*

Step 2. Determine percent of structures in Pelham that would be damaged by severe winter weather

- 1% of structures estimated to be damaged by severe winter weather
- *Source: Pelham Hazard Mitigation Team*

Step 3. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham \$1,764,927,630
- *Source: Pelham Assessing Department*

Step 4. Determine total loss from Severe Winter Weather

- Total Loss from Severe Winter Weather = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Severe Winter Weather = \$1,764,927,630 * .01 * .05 = **\$882,464**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Severe Winter Weather Hazard Area	Percentage of this type of Critical Facilities in Severe Winter Weather Hazard Area
General Occupancy	46	32	70%
Essential Facilities	10	10	100%
Transportation	13	13	100%
Utility System	44	4	9%
High Potential Hazard	14	14	100%
Hazardous Materials	1	1	100%

Tornado/Downburst

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are created when cold air overrides warm air, causing the warm air to rise rapidly.

A downburst is a severe localized wind blasting down from a thunderstorm. These 'straight line' winds are distinguishable from tornadic activity by their pattern of destruction and debris. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories. Microbursts cover an area less than 2.5 miles in diameter and macrobursts cover an area at least 2.5 miles in diameter.

Hillsborough County has a higher risk of tornado activity compared to the rest of the State. Between 1961 and 1998 there were 15 known tornadoes in Hillsborough County. The most recent downburst activity occurred on July 6, 1999 in the form of a macroburst in Merrimack, Grafton and Hillsborough Counties. There were two fatalities as well as roof damage, widespread power outages, and downed trees, utility poles and wires.

Previous Occurrences of Tornado/Downburst

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Tornado	July 2, 1961	Northern Hillsborough Co, originated near Weare, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	July 21, 1961	Central Hillsborough Co, originated near New Boston, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	May 9, 1963	Northeastern, Hillsborough Co,	Fujita Scale F1	0 fatalities, 0 injuries

		originated near Goffstown, NH		
Tornado	May 20, 1963	Western Hillsborough Co, originated near Peterborough, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	June 9, 1963	Northeastern Hillsborough Co, originated near Manchester, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	August 28, 1965	Eastern Hillsborough Co, originated near Litchfield, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 19, 1966	Southern Hillsborough Co, originated near Amherst, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 17, 1968	Central Hillsborough Co, originated near Wilton, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	August 20, 1968	Northeastern Hillsborough Co, originated near Manchester, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 19, 1972	Southeastern Hillsborough Co, originated near Hudson, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 5, 1984	Western Hillsborough Co, originated near Harrisville, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 5, 1984	Southeastern Hillsborough Co, originated near Pelham, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	June 16, 1986	Western Hillsborough Co, originated near Swanzey, NH	Fujita Scale F1	0 fatalities, 0 injuries
Tornado	July 3, 1997	Central Hillsborough Co, originated near Greenfield, NH	Fujita Scale F2	0 fatalities, 0 injuries
Tornado	May 31, 1998	Western Hillsborough Co, originated near Antrim, NH	Fujita Scale F2	0 fatalities, 0 injuries
Downburst	July 6, 1999	Merrimack, Grafton, and Hillsborough Co.	Macrobust	2 fatalities, 2 lost roofs, damage to trees and utility infrastructure
Tornado	July 24 th , 2008	Southern	Fujita Scale F2	1 fatality, damage to

		Hillsborough County (Candia & Deerfield, NH more effected than others)		over 100 structures, some destroyed, causing over \$2 million in damage and injuring 2 people directly.
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Tornado Hazard Loss Estimate

There are no standard loss estimation models or tables for tornados (*Understanding Your Risks*, FEMA, pg 4-27). As such, the Hazard Mitigation Team used data from previous tornado events to determine damage estimates. Historically, the strongest tornado seen in Hillsborough County was a F2, so loss estimates were calculated based on a tornado of that strength.

Step 1. Determine percent building damage ratio to single family residence from F2 tornado

- Wood Frame Construction, Low general tornado design level = 50% building damage
- *Source: Pelham Hazard Mitigation Team*

Step 2. Determine percent of structures in Pelham that would be damaged by F2 tornado

- 1% of structures estimated to be damaged by F2 tornado
- *Source: Pelham Hazard Mitigation Team (no historical data on tornado damage in Pelham)*

Step 3. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham \$1,764,927,630
- *Source: Pelham Assessing Department*

Step 4. Determine total loss from F2 Tornado

- Total Loss from Tornado = Total Assessed Value of all Structures *Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Tornado = \$1,764,927,630 * .01 * .5 = **\$8,824,623**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Tornado Hazard Area	Percentage of this type of Critical Facilities in Tornado Hazard Area
General Occupancy	46	32	70%
Essential Facilities	10	10	100%
Transportation	13	13	100%
Utility System	44	13	30%
High Potential Hazard	14	14	100%
Hazardous Materials	1	1	100%

Wildfire

Wildfires are fires ignited in grassy or wooded areas. They may be ignited intentionally by humans, naturally through lightning, or accidentally due to spark ignition from sources such as power lines or fireworks. The interface between forested lands and developed lands poses an ongoing threat to property from wildfires. Potential wildfire areas outside of the recommended response time radius from the fire station may pose a higher risk to structures and residents than those located closer to the fire station.

Previous Occurrences of Wildfire

Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
2005	Dogwood Circle	NWCG Fire Class C—30 acres of brush burned	No significant damage to people or property
April 2, 2006	7 Shelly Drive, Pelham, NH	NWCG Fire Size Classification C	50-acre brush fire in powerlines
June 2012	Cemetery Road	NWCG Fire Class A—¼ acre of brush burned	No significant damage
2020	Rolling Acres Mobile Home Park	NWCG Fire Class A—¼ acre of brush burned	No significant damage
April 24 th , 2021	Pelham & Hudson, NH	NWCG Fire Class C—32 acres of brush burned	No significant damage to people or property

Wildfire Hazard Loss Estimate

Step 1. Determine percent building damage ratio to single family residence from wildfire

- Wood Frame Construction, combustible siding and decking = 20% building damage
- *Source: Pelham Hazard Mitigation Team*

Step 2. Determine percent of structures in Pelham that would be damaged by wildfire

- 0.5% of structures estimated to be damaged by wildfire
- *Source: Pelham Hazard Mitigation Team*

Step 3. Determine total assessed value of structures in Pelham

- Total Assessed Value of all Structures in Pelham = \$1,764,927,630
- *Source: Pelham Assessing Department*

Step 4. Determine total loss from wildfire

- Total Loss from Wildfire = Total Assessed Value of all Structures * Percentage of Structures Estimated to be Damaged * Percent Building Damage Ratio
- Total Loss from Wildfire = \$1,764,927,630 * .005 * .2 = **\$1,764,928**

Critical Facility Type	Total Number of this type of Critical Facilities in Pelham	Number of this type of Critical Facilities in Wildfire Hazard Area	Percentage of this type of Critical Facilities in Wildfire Hazard Area
General Occupancy	46	46	100%
Essential Facilities	10	10	100%
Transportation	13	1	8%
Utility System	44	12	27%
High Potential Hazard	14	0	0%
Hazardous Materials	1	1	100%

Infectious Diseases

Infectious diseases are illnesses caused by organisms—such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but under certain conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person, some are transmitted by bites from insects or animals, and others are acquired by ingesting contaminated food or water or being exposed to organisms in the environment. Signs and symptoms vary depending on the organism causing the infection, but often include fever and fatigue. Mild infections get better on their own without treatment, while some life-threatening infections may require hospitalization.

The magnitude and severity of infectious diseases is 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 infectious diseases relates to the disease occurrence (<https://www.cdc.gov/opphss/csels/dsepd/ss1978/lesson1/section11.html>)

- Endemic – 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
- Cluster – 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
- Outbreak – The same as epidemic, but over a much smaller geographical area
- Pandemic – Epidemic that has spread over several countries or continents, usually affecting many people

Public health incidents and infectious diseases may occur suddenly or with a slow onset. Incidents that occur suddenly may have extraordinary and/or overwhelming medical resource needs. Incidents may occur with a slow onset and/or with advance warning will allow for a more coordinated response. During sudden onset incidents, many victims may reach healthcare facilities on their own without the use of Emergency Medical Services (EMS), which means that victims may arrive to find unprepared or inadequate facilities.

Incidents may be insidious or obvious, and both have unique impacts. Insidious incidents (such as diseases that have a longer incubation/onset period where infection can be spread without knowing) can result in a much higher infection rate, eventually overwhelming existing medical resources and resulting in higher morbidity and mortality. Incidents that are more obvious are more recognizable and can result in a more accurate healthcare response, but this may also result in much higher social complications such as fear, anxiety, unnecessary social distancing. For example, the average person may be more afraid of Ebola than influenza; however, the latter is much more likely to occur in the US. Having proper surveillance systems to recognize public health and infectious disease incidents is critical to be able to limit impacts.

The duration of the incident can also cause unique impacts. In a short duration incident, there may be a medical surge at the beginning which tapers off as the incident goes on and may not result in significant disruption to everyday life. However, longer duration incidents may have significant impacts not only for the public health response, but also for business/industry and the economy (State of NH Multi-Hazard Mitigation Plan Update 2018 pg. 110-113).

Previous Occurrences of Infectious Disease

As does the rest of the state, Pelham experiences outbreaks annually. These include foodborne outbreaks, Influenza and other respiratory outbreaks, and Norovirus and other gastrointestinal virus outbreaks.

In 2020, the world experienced a major pandemic from the Coronavirus (Covid-19). New Hampshire Covid-19 Emergency Declaration EM-3445-NH spanned from January 20, 2020 through May 11, 2020. As of May 2023, Pelham had 4,561 Covid-19 cases total (NH DHHS).

The New Hampshire Department of Health and Human Services conducts infectious disease surveillance, and provides [statistics and reports on their website](#).

Infectious Disease Hazard Loss Estimate

Because the impacts of infectious disease are wide ranging, it is beyond the scope of this Plan to estimate the dollar value of losses to the municipality resulting from infectious diseases. Vulnerable populations are most at risk for this type of hazard.

Section 3.4 ~ Overall Summary of Vulnerability

This section summarizes the Town of Pelham's vulnerability by hazard and by facility type. The Town of Pelham acknowledges that they are equally at risk to and should address all hazards discussed throughout this chapter and listed below.

Table 6—Overall Summary of Vulnerability by Hazard

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
Climate Change	- General Occupancy - Essential Facilities - Transportation - Utility Systems - High Potential Hazard - Hazardous Materials - Agricultural Land	See Impacts related to Drought, Extreme Temperatures, and Flooding below.	See Critical Facilities calculations for Drought, Extreme Temperature, and Flooding below.	See damage estimates for Drought, Extreme Temperature, and Flooding below.	Calculating \$ value of losses is beyond the scope of this Plan (see Section 3.5 Climate Change for explanation)
Drought	Agricultural land. Not likely to have a significant impact on structures themselves but can have significant impact on people's ability to utilize them.	Loss of crops. Inadequate quantity of drinking water—11.3% of Pelham population on public drinking water, 88.7% of Pelham population on private well water. Loss of water for fire protection. Increased risk of fire.	General Occupancy = 100% Essential Facilities = 100% Transportation = 0% Utility Systems = 66% High Potential Hazard = 0% Hazardous Materials = 100%	460 acres of agricultural land (2.7% of total land area)	Calculating \$ value of losses is beyond the scope of this Plan (see Section 3.5 Drought for explanation)
Earthquake	- General Occupancy - Essential Facilities - Transportation - Utility Systems - High Potential Hazard - Hazardous Materials	Structural damage or collapse of buildings. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system. Loss of water for fire protection.	General Occupancy = 66% Essential Facilities = 100% Transportation = 100% Utility Systems = 34% High Potential	1-5%	\$494,180 - \$2,470,899

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
		Risk to life, medical surge.	Hazard = 100% Hazardous Materials = 100%		
Extreme Temperatures	Not likely to have a significant impact on structures.	Overburdened power networks. Heating fuel shortages. Risk to life from prolonged exposure.	General Occupancy = 100% Essential Facilities = 100% Transportation = 0% Utility Systems = 0% High Potential Hazard = 0% Hazardous Materials = 0%	0%	\$0
Flooding	- General Occupancy - Transportation - High Potential Hazard - Hazardous Materials	Water damage to structures and their contents. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system. Environmental hazards resulting from damage. Isolation of neighborhoods resulting from flooding.	General Occupancy = 2% in 1% annual floodplain; 2% in 0.2% annual floodplain Essential Facilities = 10% in 1% annual floodplain; 10% in 0.2% annual floodplain Transportation = 77% in 1% annual floodplain; 38% in 0.2% annual floodplain	281 structures in 1% floodplain; 111 structures in 0.2% floodplain	Loss in 1% floodplain: 1-foot flood = \$14,470,783 2-foot flood = \$19,707,710 3-foot flood = \$22,663,867 4-foot flood = \$27,590,794 Loss in 0.2% floodplain: 1 foot flood = \$5,838,672

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
			Utility Systems = 5% in 1% annual floodplain; 5% in 0.2% annual floodplain High Potential Hazard = 71% in 1% annual floodplain; 7% in 0.2% annual floodplain Hazardous Materials = 100% in 1% annual floodplain; 0% in 0.2% annual floodplain		2-foot flood = \$7,784,896 3-foot flood = \$8,952,631 4-foot flood = \$10,898,855
Severe Wind	- General Occupancy - Essential Facilities - Transportation - Utility Systems - High Potential Hazard - Hazardous Materials	Wind damage to structures and trees. Water damage to structures and their contents. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, radio system. Environmental hazards resulting from damage. Isolation of neighborhoods resulting from flooding.	General Occupancy = 70% Essential Facilities = 100% Transportation = 31% Utility Systems = 30% High Potential Hazard = 100% Hazardous Materials = 100%	5%	\$17,649,276

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
Lightning	- General Occupancy - Essential Facilities - Utility System - High Potential Hazard - Hazardous Materials	Smoke and fire damage to structures. Disruption to power lines and municipal communications. Damage to critical electronic equipment. Injury or death to people involved in outdoor activity.	General Occupancy = 100% Essential Facilities = 100% Transportation = 8% Utility Systems = 30% High Potential Hazard = 0% Hazardous Materials = 100%	0.5%	\$220,616
Severe Winter Weather	- General Occupancy - Essential Facilities - Transportation - Utility - High Potential Hazard - Hazardous Materials	Disruption to road network. Damage to trees and power lines, communications. Structural damage to roofs/collapse. Increase in CO, other hazards.	General Occupancy = 70% Essential Facilities = 100% Transportation = 100% Utility Systems = 9% High Potential Hazard = 100% Hazardous Materials = 100%	1%	\$882,464
Tornado/Downburst	- General Occupancy - Essential Facilities - Transportation - Utility System - High Potential Hazard	Wind damage to structures and trees. Damage or loss of infrastructure, including roads, bridges, railroads,	General Occupancy = 70% Essential Facilities = 100%	1%	\$8,824,623

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
	Hazardous Materials	power and phone lines, municipal communications, radio system. Environmental hazards resulting from damage. Medical surge.	Transportation = 100% Utility Systems = 30% High Potential Hazard = 100% Hazardous Materials = 100%		
Wildfire	- General Occupancy - Essential Facilities - Utility System - High Potential Hazard - Hazardous Materials	Smoke and fire damage to structures in wild land/urban interface. Damage to habitat. Impacts to air quality. Loss of natural resources.	General Occupancy = 100% Essential Facilities = 100% Transportation = 8% Utility Systems = 27% High Potential Hazard = 0% Hazardous Materials = 100%	0.5%	\$1,764,928
Infectious Disease	- General Occupancy - Essential Facilities	Risk to life, medical surge/overburdened healthcare systems.	General Occupancy = 100% Essential Facilities = 100% Transportation = 0% Utility Systems = 0% High Potential Hazard = 0%	0%	Calculating \$ value of losses is beyond the scope of this Plan (see Section 3.5 Infectious Diseases for explanation)

Hazard	Types of Critical Facilities Impacted by Hazard	Impact of Hazard	% of Critical Facilities in Hazard Area	% of Structures Estimated to be Damaged	\$ Value of Loss
			Hazardous Materials = 0%		

Table 7—Overall Summary of Vulnerability by Facility Type

Note that Climate Change is not included as a hazard in this analysis because its effects on critical facilities are included under the hazards of Drought, Extreme Temperatures, and Flooding.

Facility Type	Total # of facilities	# susceptible to Drought	# susceptible to Earthquake	# susceptible to Extreme Temperatures	# susceptible to Flooding	# susceptible to Severe Wind	# susceptible to Lightning	# susceptible to Severe Winter Weather	# susceptible to Tornado/Downburst	# susceptible to Wildfire	# susceptible to Infectious Disease
General Occupancy	46	46	32	46	1 in 1% annual, 1 in 0.2% annual	32	46	32	32	46	46
Essential Facilities	10	10	10	10	1 in 1% annual; 1 in 0.2% annual	10	10	10	10	10	10
Transportation	13	0	13	0	10 in 1% annual; 5 in 0.2% annual	4	1	13	13	1	0
Utility	44	29	15	0	2 in 1% annual; 2 in 0.2% annual	13	13	4	13	12	0

Facility Type	Total # of facilities	# susceptible to Drought	# susceptible to Earthquake	# susceptible to Extreme Temperatures	# susceptible to Flooding	# susceptible to Severe Wind	# susceptible to Lightning	# susceptible to Severe Winter Weather	# susceptible to Tornado/Downburst	# susceptible to Wildfire	# susceptible to Infectious Disease
High Hazard	14	0	14	0	10 in 1% annual; 1 in 0.2% annual	14	0	14	14	0	0
Hazardous Materials	1	1	1	0	1 in 1% annual; 0 in 0.2% annual	1	1	1	1	1	0

Section 3.5 ~ National Flood Insurance Program

The Town of Pelham participates in the National Flood Insurance Program (NFIP). This provides full insurance coverage based on risk as shown on detailed Flood Insurance Rate Maps (FIRMs). Pelham joined the NFIP on March 14, 1980. The Town's initial Flood Hazard Boundary Map was identified on February 22, 1974 and its initial Flood Insurance Rate Map was identified on March 14, 1980. The current effective map date is September 25, 2009.

Pelham has 44 NFIP policies in force and \$10,931,700 of insurance in force. There have been 23 paid losses totaling \$485,796. Pelham has 3 repetitive loss properties with total repetitive loss payments of \$165,338. All repetitive loss structures in Pelham have been 2-4 family residential.

The Floodplain Administrator/Building Inspector of the Town of Pelham is responsible for making determinations of substantial improvement and substantial damage (defined in 44 CFR 59.1). These determinations are made for all development in a special flood hazard area that proposes to improve an existing structure including alterations, movement, enlargement, replacement, repair, additions, rehabilitations, renovations, repairs of damage from any origin (such as, but not limited to flood, fire, wind, or snow) and any other improvement of or work on such structure including within its existing footprint.

The Building Inspector/Floodplain Administrator, in coordination with any other applicable community official(s), shall be responsible for the following:

1. Determine if a substantial damage (SD) determination needs to be made and communicate SD and permit requirements to property owners.
2. Verify the cost of repairs to the structure.
3. Verify the market value of the structure.
4. Make the SD determination and issue it to the property owner.
5. Permit development/ensure compliance with community ordinance.
6. Inspect development and maintain as-built compliance documentation post construction.

As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Pelham has adopted the “Floodplain Development Ordinance,” found in Article VIII of the [Town of Pelham, NH Zoning Ordinance](#). The Floodplain Ordinance is enacted to prevent the development of buildings and uses in areas that are unsatisfactory and hazardous due to the threat of flooding, protect natural flows and drainage, and comply with the requirements of the National Flood Insurance Act of 1968 (P.L. 90-488, as amended). The ordinance includes the following sections: Purpose, Definitions, Administration, and Variances and Appeals,

To demonstrate Pelham’s continued compliance with NFIP requirements, the Hazard Mitigation Team identified the follow mitigation actions as part of its comprehensive mitigation strategy. These actions also appear in Section 4.2, Table 9—Mitigation Actions.

Table 8—National Flood Insurance Program Mitigation Actions

National Flood Insurance Program Mitigation Actions			
Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Distribute and/or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Public Information	Flooding	General Occupancy
Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	Public Information	Flooding	- General Occupancy - Essential Facilities
Require surveyors to inspect foundations when creating As-built maps to determine if lowest floor is at or above Base Flood Elevation (BFE).	- Prevention - Property protection - Structural	Flooding	General Occupancy
Require use of elevation certificates for new structures in the floodplain.	- Prevention - Property protection - Structural	Flooding	General Occupancy

CHAPTER 4. MITIGATION STRATEGY

Section 4.1 ~ Goals and Objectives to Reduce Vulnerabilities to Hazards

The first step in developing a mitigation strategy is to establish goals that reflect what the municipality wishes to achieve through the implementation of its Hazard Mitigation Plan. The Pelham Hazard Mitigation Team established the following goals and objectives, based on its desire to protect the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property. These goals provided the basis for identifying and prioritizing mitigation actions.

Goal 1—Prevent the impacts of natural hazards on the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property whenever possible.

- Objective 1.1—Manage development in known hazard areas to avoid the risks associated with natural hazards.
- Objective 1.2—Plan to incorporate hazard mitigation into capital improvements and other future initiatives.
- Objective 1.3—Ensure building codes and other standards include requirements that make new construction more disaster resistant.
- Objective 1.4—Support the maintenance of this hazard mitigation plan.

Goal 2—Protect the Town's existing critical facilities, infrastructure, and private property from the impacts of natural hazards through cost effective mitigation activities.

- Objective 2.1—Modify existing structures to reduce damage from future natural hazard events.
- Objective 2.2—Perform cost effective flood hazard mitigation measures to protect private property.

Goal 3—Educate and inform the Town's residents to help them become more resilient to natural hazards impacting the community.

- Objective 3.1—Utilize educational methods to change the perception from "disaster losses are acceptable" to "many disaster losses are preventable if mitigation practices are followed."
- Objective 3.2—provide educational opportunities across all age ranges.
- Objective 3.3—Develop and distribute public awareness materials regarding the relative risk of natural hazards and practical mitigation measures to reduce damages and injuries.

Goal 4—become more resilient to the impacts that climate change has on the Town's population, critical facilities, infrastructure, emergency services, natural resources, and private property.

- Objective 4.1—Utilize existing documents, including the Nashua Regional Water Resiliency Action Plan (NRPC, 2016) and "Climate Change in Southern New Hampshire" (Sustainability Institute, University of New Hampshire, 2014) to better understand predicted changes in the region's climate.
- Objective 4.2—Conduct a town-specific vulnerability assessment to better understand the municipality's strengths and weaknesses with respect to climate change readiness.

- Objective 4.3—Prioritize which climate change impacts to address and when. Prioritization could be based on vulnerability assessment results, current needs, upcoming plans, feasibility, or budget considerations.
- Objective 4.4—Develop an adaptation strategy, including potential mitigation measures, timelines, responsible parties, and available funding sources.
- Objective 4.5—Implement the adaptation strategy and incorporate finding into hazard mitigation plan updates.
- Objective 4.6—Track progress and monitor results to determine where improvements can be made. Adjust the implementation strategy as necessary.

Goal 5—Address the challenges of natural resource degradation and the associated increased risk from hazards.

- Objective 5.1—Ensure development in hazard areas does not destroy natural barriers to damage, such as floodplains and vegetation.
- Objective 5.2—Protect or recreate environmental assets to help safeguard the built environment.

Goal 6—Protect emergency services, critical facilities, and other critical capabilities from hazard damage in order for them to remain operational.

- Objective 6.1—Identify critical facilities, infrastructure, and emergency services and their vulnerabilities to natural hazards.
- Objective 6.2— Develop and implement programs to promote hazard mitigation actions that protect the provision of emergency services in Town.
- Objective 6.3—Identify, maintain, and protect evacuation routes from hazard damage so they are usable when needed.

Section 4.2 ~ Mitigation Actions

After establishing goals and objectives to reduce vulnerabilities to each hazard type, the Hazard Mitigation Team identified mitigation actions to achieve these goals. The resulting mitigation actions appear in Table 9 below.

Table 9—Mitigation Actions

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Mitigation Actions Originally Identified in Pelham Hazard Mitigation Plan 2017			
The Planning Board will review and update the Floodplain Ordinance, Zoning Regulations, and the Master Plan to support hardened infrastructure and development as time and budget allows for the duration of this plan. The	• Prevention • Property Protection	• Earthquake • Flooding • Severe Wind • Severe Winter Weather • Tornado	• General Occupancy • Essential Facilities • Hazardous Materials

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Building Inspector will proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.			
The Board of Selectmen will enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.	• Prevention • Natural Resources Protection • Public Information	• Drought	• General Occupancy • Essential Facilities
The Highway Department will start implementing structural inspections of roofs, and train maintenance personnel for roof snow-removal operations at critical facilities during the winter months. Public Works will also actively communicate with residents through the Town website, signs, and social media educating the public on snow loads to prevent property damage and	• Property Protection	• Severe Winter Weather	• General Occupancy • Essential Facilities

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
promote public safety from severe winter weather events.			
The Emergency Management Director will protect vulnerable populations from the impacts of extreme temperatures by establishing guidelines and best management practices for the creation of cooling and heating stations at the Senior Center and Library.	- Prevention - Public Information	Extreme Temperatures	Human lives
The Highway Department will establish a regular system to monitor and maintain brush cutting, and proactively work with Liberty Utilities to harden electrical infrastructure and decrease overall vulnerability to damage during severe wind and winter weather events. This will include additional attention to tree trimming and removal in the vicinity of power lines and structures.	Prevention	- Severe Winter Weather - Severe Wind	- Transportation Systems - Utility Systems
The Fire Department will increase enforcement and oversight of burn permits, revoking them when not properly and safely being utilized. The Fire Department will also begin working with Liberty Utilities to remove underbrush and standing deadwood in residential areas and under power lines to reduce the vulnerability to wildfires.	- Natural Resource Protection - Property Protection	Wildfire	General Occupancy
National Flood Insurance Program Mitigation Actions			
The Building Inspector will distribute and make NFIP insurance and building codes explanatory pamphlets or booklets more accessible on the Town website to better assist residents assess the vulnerability of their homes/structures/businesses.	Public Information	Flooding	General Occupancy

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
Require Planning/Zoning Board members as well as Building Department staff to regularly participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	Public Information	Flooding	- General Occupancy - Essential Facilities
Create the regulatory requirement and enforcement standards to require surveyors to inspect foundations when creating as-built maps to ensure that the lowest floor is at or above Base Flood Elevation (BFE).	- Prevention - Property protection - Structural	Flooding	General Occupancy
Create the regulatory requirement and enforcement measures for the use of elevation certificates for new structures in the floodplain.	- Prevention - Property protection - Structural	Flooding	General Occupancy
Additional Mitigation Actions			
The Emergency Management Director will update and distribute Community Hazards Guides, as well as set up a schedule for regularly conducting various forms of outreach and education programs to increase awareness and assess vulnerability to drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks.	- Public Information - Prevention - Natural Resource Protection	- Drought - Earthquake - Extreme Temperatures - Flooding - Lightning - Severe Wind - Severe Winter Weather - Tornado - Wildfire	- General Occupancy - Human lives
Establish a regular inspection and maintenance schedule for all departments to protect critical emergency management facilities and equipment from lightning damage. This will include maintenance and replacement of all surge protection and battery	Property Protection	Severe Thunderstorm	- General Occupancy - Essential Facilities - Utility Systems - Hazardous Materials

Mitigation Action	Mitigation Type	Hazard Addressed	Critical Facilities Addressed
backup on critical electronic equipment.			
The Fire Department will work to reduce wildfire vulnerability in Pelham by establishing a regular schedule for inspection and maintenance of inspecting the functionality of Pelhams water resources including fire hydrants, dry hydrants, cisterns, etc. This will also include implementing required maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.	- Prevention - Property Protection	Wildfire	- General Occupancy - Essential Facilities
The Emergency Management Director will work to establish and implement municipal infectious disease standard operating guidelines, as well as update the PPE point of distribution plan to reduce the hazard of spreading infectious diseases.	- Prevention - Public Information	Infectious Diseases	- General Occupancy - Human Lives

Section 4.3 ~ Prioritizing Mitigation Actions

After identifying mitigation actions to address each hazard, the Team then began a two-step process to prioritize them. The first step was to conduct a benefit cost review. Benefit cost reviews provide a comprehensive overview of the monetary and non-monetary costs and benefits associated with each action. During this process, the Hazard Mitigation Team asked a variety of questions such as, “How beneficial is this action to the entire Town?” “How many people will benefit from this action?” “How large of an area is impacted by this project?” “How costly is this project?”

Table 10—Benefit Cost Review

Mitigation Action	Likely Benefits	Likely Costs
The Planning Board will review and update the Floodplain Ordinance, Zoning Regulations, and the Master Plan to support hardened infrastructure and development as time and budget allows for the duration of this plan. The Building Inspector will proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of	- This action would be effective at avoiding and reducing future losses. - This action is beneficial to all applicable buildings across the entire Town.	- This action may not benefit older structures not subject to newer building codes. \$10,000 to update ordinances, regulations, and Master Plan; complete in conjunction with similar

Mitigation Action	Likely Benefits	Likely Costs
earthquake, flooding, severe wind, severe winter weather, and tornado.		mitigation actions (source: grant funding and/or Pelham Planning Department budget)
The Board of Selectmen will enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.	• This action has environmental benefits if residents comply with reduced water consumption measures. • The state may have educational materials that the Town could utilize.	• This action may have limited impact if there is not an accompanying enforcement mechanism. • \$0 additional costs, percentage of Selectmen's budget for implementation; percentage of Police Department budget for enforcement (source: 2023 Pelham Operating Budget)
The Highway Department will start implementing structural inspections of roofs, and train maintenance personnel for roof snow-removal operations at critical facilities during the winter months. Public Works will also actively communicate with residents through the Town website, signs, and social media educating the public on snow loads to prevent property damage and promote public safety from severe winter weather events.	• Protects critical municipal buildings and avoids future losses. • Reduces liability to Town.	• Adds additional burden to Fire Dept. during time when they may need to be responding to increased level of emergency calls. • This action may have limited impact because it can be difficult to get people to pay attention to outreach campaigns. • \$2,500 per building (source: 2023 Pelham Operating Budget)
The Emergency Management Director will protect vulnerable populations from the impacts of extreme temperatures by establishing guidelines and best management practices for the creation of cooling and heating stations at the Senior Center and Library.	• This action would benefit the entire Town and particularly the most at risk and needy populations. • This action has broad social benefits for the community.	• \$0 additional costs, percentage of Emergency Management budget (source: 2023 Pelham Operating Budget – Emergency Management)
The Highway Department will establish a regular system to monitor and maintain brush cutting, and proactively work with Liberty Utilities to harden electrical infrastructure and decrease overall vulnerability to damage during severe wind	• Trimming trees near power lines would reduce the risk of outages. • Fewer trees directly along road would also	• Removal of trees along designated scenic roads requires Planning Board approval • Tree removal may be incompatible with local

Mitigation Action	Likely Benefits	Likely Costs
and winter weather events. This will include additional attention to tree trimming and removal in the vicinity of power lines and structures.	reduce root systems in roadways, allow more sunlight for better snowmelt, and improve overall improve road conditions.	aesthetics \$0 for tree work conducted by Liberty; \$1,200 per large tree for removal by Town (source: 2023 Pelham Operating Budget)
The Fire Department will increase enforcement and oversight of burn permits, revoking them when not properly and safely being utilized. The Fire Department will also begin working with Liberty Utilities to remove underbrush and standing deadwood in residential areas and under power lines to reduce the vulnerability to wildfires.	- This action would result in reduced fire-fighting costs. - This action would be most beneficial to portions of Town near wooded areas. - Sound forestry practices can help reduce the risk of wildfire. - This action would also be beneficial to mitigate man-made fire related hazards.	- Large scale wildfires are relatively rare in Pelham and therefore the costs of implementing this action may outweigh the benefits of reduced property damage. - Opinions vary about wildfire management, so this action could cause social and political tension. - Enforcement of burn permits can be costly. \$0 for underbrush and standing deadwood removed by Liberty Utilities; percentage of Fire Department budget for burn permit enforcement (source: 2023 Pelham Operating Budget – Fire Department)
The Building Inspector will distribute and make NFIP insurance and building codes explanatory pamphlets or booklets more accessible on the Town website to better assist residents assess the vulnerability of their homes/structures/businesses.	- Educate residents, builders, and other professionals about NFIP. - Reduce property loss costs associated with flooding.	- Minimal, part of normal Planning Department operations to provide education to residents. \$2,400 (60 hours annually); part of existing budget (source: 2023 Pelham Operating Budget – Planning Department)
Require Planning/Zoning Board members as well as Building Department staff to regularly participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	- Educate residents, builders, and other professionals about NFIP. - Reduce property loss costs associated with flooding	\$0 in additional costs; Percentage of existing Planning Department budget (source: 2023 Pelham Operating Budget – Planning Department)
Create the regulatory requirement and enforcement standards to require surveyors	This action would be most beneficial to	Some individuals may view these building

Mitigation Action	Likely Benefits	Likely Costs
to inspect foundations when creating as-built maps to ensure that the lowest floor is at or above Base Flood Elevation (BFE).	residents in flood-prone areas of Town. This action has the potential to reduce flood related structural damage and economic losses.	standards as an economic hardship. - Additional responsibility for surveyors. \$0 from municipal budget (costs borne by surveyors)
Create the regulatory requirement and enforcement measures for the use of elevation certificates for new structures in the floodplain.	- This action would be most beneficial to residents in flood-prone areas of Town. - This action has the potential to reduce flood related structural damage and economic losses.	- Some individuals may view these building standards as an economic hardship. - Additional responsibility for building inspector. - Percentage of Planning Department budget (<i>source: 2023 Pelham Operating Budget – Planning Department</i>)
The Emergency Management Director will update and distribute Community Hazards Guides, as well as set up a schedule for regularly conducting various forms of outreach and education programs to increase awareness and assess vulnerability to drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks.	- The Town currently has the capacity to implement this action. - This action is beneficial to all residents in Town.	- This action may have limited impact because it can be difficult to get people to pay attention to outreach campaigns. \$0 additional costs, percentage of Emergency Management budget (<i>source: 2023 Pelham Operating Budget – Emergency Management</i>)
Establish a regular inspection and maintenance schedule for all departments to protect critical emergency management facilities and equipment from lightning damage. This will include maintenance and replacement of all surge protection and battery backup on critical electronic equipment.	Reduced inconvenience and loss associated with a shutdown of critical facilities due to lightning damage.	\$1,000-\$5,000 per critical facility for lightning protection devices (<i>source: 2023 Pelham Operating Budget – Town Buildings</i>)
The Fire Department will work to reduce wildfire vulnerability in Pelham by establishing a regular schedule for inspection and maintenance of inspecting the functionality of Pelham's water resources including fire hydrants, dry hydrants, cisterns, etc. This will also include implementing required maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.	- This action would result in reduced fire-fighting costs. - This action would be most beneficial to portions of Town near wooded areas.	\$0 additional costs; Percentage of existing Fire Department budget (<i>source: 2023 Pelham Operating Budget – Fire Department</i>)

Mitigation Action	Likely Benefits	Likely Costs
Department heads will work to establish and implement municipal infectious disease standard operating guidelines, as well as update the PPE point of distribution plan to reduce the hazard of spreading infectious diseases.	- This action would benefit the entire Town and particularly the most at risk and needy populations. - This action has broad social benefits for the community.	\$0 additional costs, percentage of Emergency Management budget (<i>source: 2023 Pelham Operating Budget – Emergency Management</i>)

After completing a Benefit Cost review for each action, the Hazard Mitigation Team then prioritized the actions by conducting a STAPLEE Analysis, which stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental factors. For each mitigation action, the Team asked the following questions:

- Social— Will the action unfairly affect any one segment of the population? Will it disrupt established neighborhoods? Is it compatible with present and future community values? Will it adversely affect cultural resources?
- Technical—How effective is the action in avoiding or reducing future losses? Will it create more problems than it solves? What are some secondary impacts? Does it solve a problem or only a symptom?
- Administrative— Does the community have the capability to implement the action? Can the community provide the necessary maintenance? Can it be accomplished in a timely manner?
- Political— Is there public support both to implement and maintain the action? Is the political leadership willing to support it? Does it present a financial burden to stakeholders?
- Legal— Does the community have the authority to implement the action? Is enabling legislation necessary? What are the legal side effects? Will the community be liable for the actions, support of actions, or lack of actions?
- Economic— What are the costs of this action? How will the costs be borne? Are state/federal grant programs applicable? Does the action fit into existing capital improvements or economic development budgets?
- Environmental— How will this action affect the environment? Does it comply with local, state, and federal environmental regulations? Is it consistent with community environmental goals? Are endangered or threatened species likely to be affected?

The cost and benefit of each mitigation action were then evaluated and assigned a quantitative score based on the STAPLEE criteria.

Benefit Score Range: 0 = Not Beneficial, 1 = Somewhat Beneficial, 2 = Beneficial, 3 = Very Beneficial

Cost Score Range: 0 = Not Costly, -1 = Somewhat Costly, -2 = Costly, -3 = Very Costly

Next, the scores for each action were added to determine priority. Finally, the Hazard Mitigation Team reviewed the scores and resulting prioritization to make sure it was consistent with the Town's goals and Master Plan. The STAPLEE analysis and prioritized mitigation actions appear in Table 11 below.

Table 11—STAPLEE Analysis

Mitigation Action: The Highway Department will establish a regular system to monitor and maintain brush cutting, and proactively work with Liberty Utilities to harden electrical infrastructure and decrease overall vulnerability to damage during severe wind and winter weather events. This will include additional attention to tree trimming and removal in the vicinity of power lines and structures.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population or disrupt established neighborhoods. It is compatible with community values that understand trees need to be trimmed for road maintenance and public safety.	0	3
Technical	This action would be effective in avoiding or reducing future losses. It is highly likely that a severe winter weather or severe wind event will occur that will impact power lines. It would not create more problems than it solves, and it solves the problem rather than only a symptom. Loss of power has significant consequences for residents, businesses, and emergency operations. Fewer trees directly along the road would also improve drainage, reduce road systems in the roadway, and allow more sunlight to melt the snow, all resulting in better road conditions.	0	3
Administrative (including responsible party)	Pelham has the capacity to implement this action. The Pelham Highway Dept. and Liberty Utilities would be the responsible parties.	0	3
Political	In general there is political support for this action.	0	3
Legal	The Town does not have the authority to trim trees along scenic roads without first receiving approval from the Planning Board. The Planning Board has the legal authority to declare dead trees along a scenic road a public hazard and therefore allow them to be removed. Some costs associated with this action would be borne by Liberty Utilities. The remaining costs would be borne by the Town. The removal of large trees would cost an estimated \$1,200 per tree and would be performed by a hired contractor. The removal of small trees would be performed by the Pelham Highway Dept. The benefits of a more resilient electrical infrastructure far outweigh the costs of this action.	-1	3
Economic (including direct cost)	This action would positively impact the environment by improving road drainage and decreasing the need to use ice melting agents.	-1	3
Environmental		-0	2
Subtotal		-2	20
Total			18
Priority			1

Mitigation Action: The Emergency Management Director will protect vulnerable populations from the impacts of extreme temperatures by establishing guidelines and best management practices for the creation of cooling and heating stations at the Senior Center and Library.			
Criteria	Evaluation	Cost	Benefit
Social	This action primarily benefits Pelham's most vulnerable residents. It is compatible with present and future community values.	0	2
Technical	This action does not solve the problem of extreme temperatures, but it does solve the symptom of exposure. Extreme temperatures are very likely to occur in Pelham, so mitigation measures are important.	0	3
Administrative (including responsible party)	Pelham has the capability to implement this action. The Pelham Emergency Management Director is responsible for it and it falls under ongoing emergency management operations. This action can be implemented in a very timely manner.	0	3
Political	There is public support to implement and maintain this action.	0	3
Legal	Pelham has the legal authority to implement this action.	0	3
Economic (including direct cost)	This action falls under Pelham's existing Emergency Management budget and does not impose additional costs on the Town.	0	3
Environmental	There are no environmental impacts associated with this action.	0	0
Subtotal		0	17
Total			17
Priority			2

Mitigation Action: The Emergency Management Director will update and distribute Community Hazards Guides, as well as set up a schedule for regularly conducting various forms of outreach and education programs to increase awareness and assess vulnerability to drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks.			
Criteria	Evaluation	Cost	Benefit
Social	This action does not unfairly affect any one segment of the population. It is available to all Pelham residents, provided that a variety of distribution methods are utilized.	0	2
Technical	There is a high likelihood that at least one of the hazards addressed through this action will occur. This action would help to decrease risk and avoid future loss, but only if residents take personal action as a result of this educational campaign.	-2	3
Administrative (including responsible party)	Pelham has the capability to implement this action and it could be accomplished in a very timely manner. This action would be the responsibility of the Pelham Emergency Management Director.	0	3
Political	There is public support to implement and maintain this action.	0	2
Legal	Pelham has the legal authority to implement this action.	0	3
Economic (including direct cost)	There is \$0 in additional costs to implement this action. It is part of the existing Emergency Management budget.	0	3
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		-2	17
Total			15
Priority			3

Mitigation Action: The Building Inspector will distribute and make NFIP insurance and building codes explanatory pamphlets or booklets more accessible on the Town website to better assist residents assess the vulnerability of their homes/structures/businesses.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	2
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to flooding than the underlying problem itself. It would not create additional problems or cause secondary impacts.	0	3
Administrative (including responsible party)	Pelham has the capability to implement this action. The Pelham Building Inspector would be responsible for it. It can be accomplished in a timely manner.	0	3
Political	There is public support to implement and maintain this action. The political leadership is also willing to support it.	0	2
Legal	Pelham has the legal authority to implement this action. The Town's role is only to provide and distribute the materials, not to make actual insurance determinations.	0	2
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs. It takes roughly 60 hours of staff time per year to implement (approximately \$2,400) and would come out of the Planning Dept. budget.	-1	2
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts only if the recommendations in the literature are implemented.	0	1
Subtotal		-1	15
Total			14
Priority			4

Mitigation Action: The Board of Selectmen will enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.

Criteria	Evaluation	Cost	Benefit
Social	This action does not unfairly affect any one segment of the population because it is applied evenly to all residents and businesses. It is compatible with present and future community values.	0	3
Technical	The effectiveness of this action depends on the ability of the Town to enforce it. If followed, it would help to reduce the impacts of drought.	-2	3
Administrative (including responsible party)	Pelham has the capability to implement this action. The Pelham Board of Selectmen would be responsible for implementation and the Pelham Police Dept. would be responsible for enforcement.	0	3
Political	The Pelham Board of Selectmen supports this action. There is general public support for this action, although some residents may be unsatisfied with it.	-1	2
Legal	The Pelham Board of Selectmen have the legal authority to implement this action under NH RSA 41:11-d.	0	3
Economic (including direct cost)	There are no additional costs associated with this action. A percentage of the Selectmen's budget would be used for implementation and a percentage of the Police Dept. budget would be used for enforcement.	-1	0
Environmental	This action would have a positive impact on the environment by reducing water use in a time of scarcity.	0	3
Subtotal		-4	17
Total			13
Priority			5

Mitigation Action: The Emergency Management Director will work to establish and implement municipal infectious disease standard operating guidelines, as well as update the PPE point of distribution plan to reduce the hazard of spreading infectious diseases.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	2
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to infectious disease than the underlying problem itself. It would not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	Pelham has the capability to implement this action. The Pelham Emergency Management Director would be responsible for it.	0	2
Political	There is public support to implement and maintain this action, especially since the recent Covid-19 pandemic. The political leadership is also willing to support it.	0	3
Legal	Pelham has the legal authority to implement this action.	0	2
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs.	0	2
Environmental	This action will not impact the environment.	0	0
Subtotal		0	13
Total			13
Priority			6

Mitigation Action: Establish a regular inspection and maintenance schedule for all departments to protect critical emergency management facilities and equipment from lightning damage. This will include maintenance and replacement of all surge protection and battery backup on critical electronic equipment.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	3
Technical	This action is effective in avoiding or reducing future losses. It would not create more problems than it solves. It would reduce the inconvenience from a shutdown of critical facilities resulting from power outages. However, incidents related to lightning are very rare in Pelham.	0	1
Administrative (including responsible party)	Pelham has the capacity to implement this action. Each critical facility department head is responsible for implementing the installation of lightning protection devices. There are already grounding devices on the communications building.	0	2
Political	There is political support to implement and maintain this action.	0	2
Legal	Pelham has the authority to implement this action.	0	2
Economic (including direct cost)	The cost of \$1,000-\$5,000 per critical facility for lightning protection devices would come out of the Pelham Town Buildings and Grounds appropriation. Given the infrequent occurrence of lightning strikes and the fact that there has been no damage recorded, the costs of this action seem to outweigh the benefits.	-2	1
Environmental	This action would not impact the environment.	0	0
Subtotal		-2	12
Total			10
Priority			7

Mitigation Action: Require Planning/Zoning Board members as well as Building Department staff to regularly participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.			
Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources.	0	2
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to flooding than the underlying problem itself. It would not create additional problems or cause secondary impacts. Given that flooding is relatively rare in Pelham, this action would likely have minimal impact.	0	1
Administrative (including responsible party)	The Pelham Building Inspector would participate in this training.	0	1
Political	There is political support to implement this action.	0	1
Legal	Pelham has the legal authority to implement this action.	0	2
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs. The cost for the Building Inspector to attend the training would come out of the Code Enforcement budget.	0	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		0	9
Total			9
Priority			8

Mitigation Action: The Fire Department will increase enforcement and oversight of burn permits, revoking them when not properly and safely being utilized. The Fire Department will also begin working with Liberty Utilities to remove underbrush and standing deadwood in residential areas and under power lines to reduce the vulnerability to wildfires.			
Criteria	Evaluation	Cost	Benefit
Social	This action does not unfairly impact any segment of the population and it is compatible with present and future community values. It is most valuable to portions of town near wooded areas.	0	1
Technical	This action helps to avoid or reduce future losses. It has the potential to solve the underlying problem of wildfires by removing the fuel source. It will not create additional problems or cause secondary impacts.	0	3
Administrative (including responsible party)	Pelham has the capability to implement this action, although it poses an additional burden on the Fire Dept. Liberty Utilities is responsible for removing underbrush and standing deadwood under power lines.	-1	2
Political	There is public and political support for this action.	0	2
Legal	Pelham has the legal authority to implement this action.	0	2
Economic (including direct cost)	The benefits of reduced fire-fighting costs and potential decrease in property damage could exceed the costs of implementing this action. At the same time, large scale wildfires are relatively rare in Pelham and therefore the costs of implementing this action may outweigh the benefits. Eversource would be responsible for the direct costs of brush removal under power lines.	-2	1
Environmental	Fire is a natural part of the ecosystem and suppressing it may have negative consequences. On the other hand, large-scale, man-made fires can have a detrimental impact on the environment.	-1	1
Subtotal		-4	12
Total		8	
Priority		9	

Mitigation Action: The Highway Department will start implementing structural inspections of roofs, and train maintenance personnel for roof snow-removal operations at critical facilities during the winter months. Public Works will also actively communicate with residents through the Town website, signs, and social media educating the public on snow loads to prevent property damage and promote public safety from severe winter weather events.

Criteria	Evaluation	Cost	Benefit
Social	This action would not unfairly affect any segment of the population, disrupt established neighborhoods, or adversely affect cultural resources. It is compatible with community values, as it will protect critical municipal buildings.	0	2
Technical	This action is effective at reducing and avoiding future losses to critical municipal facilities. It will not create more problems than it solves.	0	2
Administrative (including responsible party)	Pelham has the capacity to implement this action. The Public Works Dept. would be the responsible party. It can be accomplished in a timely manner, although it may occur during periods of high demand for emergency response calls.	-2	2
Political	There is public support to implement and maintain this action.	0	1
Legal	Pelham has the legal authority to implement this action. The community would be liable for a lack of action that resulted in the collapse of a roof on a municipal building.	-1	2
Economic (including direct cost)	This action would cost roughly \$2,500 per building over the course of a year, depending on how much snow is received. It would be covered under the existing Pelham Fire Dept. budget. If no action was taken and a roof collapsed on a municipal building, the economic losses would be significant.	0	2
Environmental	This action will not impact the environment.	0	0
Subtotal		-4	11
Total		7	
Priority		10	

Mitigation Action: The Planning Board will review and update the Floodplain Ordinance, Zoning Regulations, and the Master Plan to support hardened infrastructure and development as time and budget allows for the duration of this plan. The Building Inspector will proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.			
Criteria	Evaluation	Cost	Benefit
Social	There are not social impacts associated with this action. Enforcement would apply evenly across all applicable buildings, including new construction, major renovations, and changes of use.	-1	2
Technical	This action is effective at avoiding and reducing future losses and it mitigates the impacts of these hazards.	0	2
Administrative (including responsible party)	Pelham has the capability to implement this action. Responsibility would fall under the Pelham Planning Dept., including the Pelham Building Inspector.	-1	2
Political	There is public support for this action. Concerns may exist among some property owners who would be directly impacted.	-2	2
Legal	There are no legal issues related to this action.	0	1
Economic (including direct cost)	It would cost roughly \$10,000 to update ordinances, regulations, and the Master Plan. However, this expenditure would simultaneously accomplish a number of similar mitigation actions.	-2	2
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		-6	12
Total		6	
Priority		11	

Mitigation Action: The Fire Department will work to reduce wildfire vulnerability in Pelham by establishing a regular schedule for inspection and maintenance of inspecting the functionality of Pelham's water resources including fire hydrants, dry hydrants, cisterns, etc. This will also include implementing required maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.			
Criteria	Evaluation	Cost	Benefit
Social	This action does not unfairly impact any segment of the population and it is compatible with present and future community values. It is most valuable to portions of town near wooded areas.	0	1
Technical	This action helps to avoid or reduce future losses. It has the potential to solve the underlying problem of wildfires by removing the fuel source. It will not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	Pelham has the capability to implement this action, although it poses an additional burden on the Fire Department. Liberty Utilities is responsible for removing underbrush and standing deadwood under power lines.	-1	1
Political	There is public and political support for this action	0	1
Legal	Pelham has the legal authority to implement this action	0	1
Economic (including direct cost)	The benefits of reduced fire-fighting costs and potential decrease in property damage could exceed the costs of implementing this action. At the same time, large scale wildfires are relatively rare in Pelham and therefore the costs of implementing this action may outweigh the benefits. It is part of the existing Fire Department budget. Liberty Utilities would be responsible for the direct costs of brush removal under power lines.	-1	1
Environmental	Fire is a natural part of the ecosystem and suppressing it may have negative consequences. On the other hand, large-scale, man-made fires can have a detrimental impact on the environment	0	0
Subtotal		-2	7
Total			5
Priority			12

Mitigation Action: Create the regulatory requirement and enforcement standards to require surveyors to inspect foundations when creating as-built maps to ensure that the lowest floor is at or above Base Flood Elevation (BFE).			
Criteria	Evaluation	Cost	Benefit
Social	This action may be viewed as placing an economic burden on residents building new homes and properties. It would benefit residents in flood-prone areas by reducing flood damage.	-2	1
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to flooding rather than the underlying problem itself. It will not create additional problems or cause secondary impacts.	0	1
Administrative (including responsible party)	The Town has the capacity to administer this action. The Pelham Building Inspector is responsible for oversight of this action and private surveyors would be responsible for implementation.	0	1
Political	There are no political issues associated with this action.	0	1
Legal	The Town has the authority to implement this action and no enabling legislation is necessary.	0	1
Economic (including direct cost)	Some landowners may believe they will face an economic hardship if they are required to take extra measures in order to build in flood-prone areas. Private surveyors would be responsible for the direct costs related to this action. Oversight for this action is consistent with normal town operations and would come out of the Planning Dept. budget.	-1	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		-3	8
Total		4	
Priority		13	

Mitigation Action: Create the regulatory requirement and enforcement measures for the use of elevation certificates for new structures in the floodplain.			
Criteria	Evaluation	Cost	Benefit
Social	This action would directly impact individuals seeking to build in the floodplain.	-2	2
Technical	This action is effective in avoiding or reducing future losses. It has more potential to solve symptoms related to flooding rather than the underlying problem itself. It will not create additional problems or cause secondary impacts. Development in the floodplain is already limited, so this action may not have a significant impact.	-1	2
Administrative (including responsible party)	Pelham has the capacity to administer this action. The Pelham Building Inspector would be the responsible party. It can be accomplished in a timely manner.	0	1
Political	There is political support for this action.	0	1
Legal	Pelham has the authority to implement this action.	0	1
Economic (including direct cost)	Some landowners may believe they will face economic hardship if they are required to take extra measures in order to build in flood-prone areas. This action is consistent with normal town operations and would come out of the Planning Dept. budget.	-2	0
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		-5	8
Total			3
Priority			14

Section 4.4 ~ Implementing and Administering Mitigation Actions

The Town of Pelham has integrated its 2017 Hazard Mitigation Plan into a variety of other planning mechanisms, including the Pelham Emergency Response Plan and Pelham Master Plan. In addition, the Town of Pelham has incorporated and will continue to integrate requirements of the Pelham Hazard Mitigation Plan Update 2024 into other planning mechanisms and actions, such as mutual aid agreements for Public Works and drought mitigation measures.

Updates to Pelham’s Capital Improvement Plan will include any applicable mitigation projects identified in the Hazard Mitigation Plan, such as bridge improvements. The next update to the Town’s Master Plan, will also incorporate elements of the Hazard Mitigation Plan where applicable.

The Pelham Hazard Mitigation Team will be responsible for helping Town boards and departments to integrate the Hazard Mitigation Plan into their own planning mechanisms. The Hazard Mitigation Team developed Table 12, which is an action plan that outlines who is responsible for implementing the prioritized mitigation actions, how they will be funded, and when they will be completed.

Timeframe	
Short Term	1 year or less
Medium Term	2 -3 years
Long Term	4-5 years

Table 12—Implementation and Administration

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
1	Public Works will establish a regular system to monitor and maintain brush cutting, and proactively work with Liberty Utilities to harden electrical infrastructure and decrease overall vulnerability to damage during severe wind and winter weather events. This will include additional attention to tree trimming and removal in the vicinity of power lines and structures.	Pelham Highway Works Department	Cost = \$0 for tree work conducted by Liberty; \$1,200 per large tree for removal by Town Funding Source: Pelham Highway Department budget	Short Term
2	The Emergency Management Director will protect vulnerable populations from the impacts of extreme temperatures by establishing guidelines and best management practices for the creation of cooling and heating stations at the Senior Center and Library.	Pelham Emergency Management Director	Cost = \$0 additional costs Funding Source: Pelham Emergency Management budget	Short Term
3	Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of drought, earthquake, extreme	Pelham Emergency Management Director	Cost = \$0 additional costs, percentage of Emergency Management budget	Short Term

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
	temperatures, flooding, lightning, severe wind, severe winter weather, tornado, wildfire, and carbon monoxide risks. Utilize Citizen Observer and community access TV.		Funding Source: Pelham Emergency Management budget	
4	The Building Inspector will distribute and make NFIP insurance and building codes explanatory pamphlets or booklets more accessible on the Town website to better assist residents assess the vulnerability of their homes/structures/businesses.	Pelham Building Inspector	Cost = \$2,400 (60 hours annually); part of existing budget Funding Source: Pelham Planning Department budget	Short Term
5	The Board of Selectmen will enforce RSA 41:11-d, which allows municipalities to restrict all residential lawn watering for properties on public water systems and those on private domestic wells within their political boundaries if the state or federal government declares a drought condition for that region of the state. The governing body can enforce the lawn watering restrictions by imposing fines in accordance with RSA 625:9. Notice shall be given at least 3 calendar days before the regulations are implemented and shall be published in a paper of general circulation in the municipality and shall be posted in at least 2 public places. Other outreach methods include Pelham town website, social media accounts, local cable, and Citizen Observer.	Pelham Board of Selectmen, Pelham Police Department	Cost = \$0 additional costs, percentage of Selectmen's budget for implementation; percentage of Police Department budget for enforcement Funding Source: Pelham Board of Selectmen budget, Pelham Police Department budget	This action will start when a state or federal drought is declared and will be completed when drought conditions end.
6	The Emergency Management Director will work to establish and implement municipal infectious disease standard operating guidelines, as well as update the PPE point of distribution plan to reduce the hazard of spreading infectious diseases.	Pelham Emergency Management Director	Cost = \$0 additional costs Funding Source: Pelham Emergency Management budget	Medium Term
7	Establish a regular inspection and maintenance schedule for all departments to protect critical emergency management facilities and equipment from lightning damage. This will include maintenance and replacement of all surge protection and battery backup on critical electronic equipment.	Each Department	Cost = \$200 per department Funding Source: Pelham Town Buildings budget	Short Term
8	Require Planning/Zoning Board members as well as Building Department staff to regularly participate in NFIP training	Pelham Building Inspector	Cost = \$0 additional costs, percentage of Planning	Short Term

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
	offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.		Department budget. Funding Source: Pelham Planning Department budget	
9	The Fire Department will increase enforcement and oversight of burn permits, revoking them when not properly and safely being utilized. The Fire Department will also begin working with Liberty Utilities to remove underbrush and standing deadwood in residential areas and under power lines to reduce the vulnerability to wildfires.	Pelham Fire Department (burn permit enforcement), Eversource (underbrush removal)	Cost = \$0 municipal costs for underbrush and standing deadwood removed by Liberty Utilities; percentage of Fire Department budget for burn permit enforcement Funding Source: Pelham Fire Dept. budget (burn permits), Liberty Utilities (brush removal)	Short Term
10	The Highway Department will start implementing structural inspections of roofs, and train maintenance personnel for roof snow-removal operations at critical facilities during the winter months. Public Works will also actively communicate with residents through the Town website, signs, and social media educating the public on snow loads to prevent property damage and promote public safety from severe winter weather events.	Pelham Highway Department	Cost = \$2,500 per building annually depending on snow load Funding Source: Pelham Fire Department budget	Short Term
11	The Planning Board will review and update the Floodplain Ordinance, Zoning Regulations, and the Master Plan to support hardened infrastructure and development as time and budget allows for the duration of this plan. The Building Inspector will proactively enforce the International Building Code (IBC) to protect buildings and infrastructure from the impacts of earthquake, flooding, severe wind, severe winter weather, and tornado.	Pelham Planning Dept., Pelham Building Inspector	Cost = \$10,000 to update ordinances, regulations, and Master Plan; complete in conjunction with similar mitigation actions Funding Source: grant funding and/or Pelham Planning Department budget	Short Term
12	The Fire Department will work to reduce wildfire vulnerability in Pelham by establishing a regular schedule for inspection and maintenance of inspecting the functionality of Pelhams	Liberty Utilities, Pelham Highway Dept., Pelham Fire Dept.	Cost = \$0 municipal costs for underbrush and standing deadwood removed by Liberty Utilities;	Short Term

Priority	Mitigation Action	Responsible Party	Cost & Funding	Timeframe
	water resources including fire hydrants, dry hydrants, cisterns, etc. This will also include implementing required maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.		percentage of Fire Department budget for fire hydrant inspection Funding Source: Pelham Fire Department budget	
13	Create the regulatory requirement and enforcement standards to require surveyors to inspect foundations when creating as-built maps to ensure that the lowest floor is at or above Base Flood Elevation (BFE).	Pelham Planning Dept. (oversight), private surveyors (implementation)	Cost = \$0 costs from municipal budget Funding Source: Private Surveyors	Short Term
14	Create the regulatory requirement and enforcement measures for the use of elevation certificates for new structures in the floodplain.	Pelham Building Inspector	Cost = \$0 additional costs, percentage of existing Planning Department budget. Funding Source: Pelham Planning Department budget	Medium Term

CHAPTER 5. PLAN ADOPTION

Section 5.1 ~ Formal Adoption by Governing Body

CERTIFICATE OF ADOPTION

Town of Pelham, NH BOARD OF SELECMEN

A RESOLUTION ADOPTING THE TOWN OF PELHAM, NH HAZARD MITIGATION PLAN UPDATE 2024

WHEREAS, the Town of Pelham has historically experienced damage from natural hazards and it continues to be vulnerable to the effects of climate change, drought, earthquake, extreme temperatures, flooding, severe wind, lightning, severe winter weather, tornado, and wildfire, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Pelham has developed and received Approval Pending Adoption from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2024 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between October 8, 2022, and April 4, 2023 regarding the development and review of the Hazard Mitigation Plan Update 2024; and

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

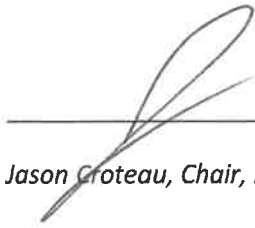
WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Pelham, with the effect of protecting people and property from loss associated with those hazards; and

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

RESOLVED by the Pelham Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Pelham
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council/Board of Selectmen by the Pelham Hazard Mitigation Team.

Adopted this day, the 9th of July, 2024.



Jason Groteau, Chair, Pelham Board of Selectmen

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Pelham the 9th of July, 2024.



Witness

MELISSA J. BINETTE
NOTARY PUBLIC
State of New Hampshire
My Commission Expires
September 7, 2027

Section 5.2 ~ FEMA Approval Letter



FEMA

July 24, 2024

Robert M. Buxton, Director
New Hampshire Homeland Security and Emergency Management
33 Hazen Dr.
Concord, NH 03305

Director Buxton:

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region 1 Mitigation Division has approved the *Town of Pelham, New Hampshire Hazard Mitigation Plan Update 2024* effective **July 24, 2024** through **July 23, 2029** 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; the National Dam Safety Program Act, as amended; and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the Town of Pelham, NH 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 1 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,

CHRISTOPHER J MARKESICH Digitally signed by CHRISTOPHER J MARKESICH
Date: 2024.07.29 09:19:55 -04'00'

Chris Markesich
Floodplain Management and Insurance Acting Branch Chief | Mitigation Division | DHS, FEMA Region 1

cc: Austin Brown, Mitigation & Recovery Section Chief, NH HSEM
Lynne Doyle, State Planner, NH HSEM
Dean Savramis, Mitigation Division Director, DHS, FEMA Region 1
Josiah (Jay) Neiderbach, Hazard Mitigation Community Planner, DHS, FEMA Region 1

Town of Pelham, New Hampshire
Hazard Mitigation Plan Update
2024 Appendix

Hazard Mitigation Team Meeting Agendas & Sign-in Sheets

Notification Letter

Hazard Mitigation Plan Update Website Screen Shot

Hazard Mitigation Team Meeting Agendas & Sign-in Sheets



Pelham Hazard Mitigation Plan Update 2023

Meeting 1

October 18th, 2022 | 9 AM | Selectmen's Conference Room (6 Village Green)

Agenda

1. Review the planning process.
2. Determine who to notify about the Hazard Mitigation Plan update.
3. Determine how to involve members of the public in the planning process.
4. Determine what existing plans, documents, and reports to review and incorporate into the update.
5. Determine changes in development and land use planning since last plan that impact hazard mitigation.
6. Determine Pelham's existing capabilities in the following areas and its ability to expand and improve on these:
 - a. Planning and Regulatory Authority
 - b. Emergency Management
 - c. Floodplain Management
 - d. Administrative and Technical
 - e. Fiscal
7. Discuss homework and set next meeting date.

Pelham Hazard Mitigation Plan Update - 10/18/22 - 9 AM - Selectmen's Conference Room

Name	Title	Agency	Email
Anne T. Perrella	Chief of Police	Pelham PD	aperriello@pelhampolice.com
JOSEPH ROARK	TOWN ADMINISTRATOR	TOWN OF PELHAM.	jroark@pelhamweb.com
James midgley	Fire chief	Pelham Fire	Jmidgley@PelhamFire.com
John Ignatowicz	Deputy Fire Chief	Pelham Fire	jignatowicz@pelhamfire.com
JAMES HOFFMAN	Road Agent	Highway Dept.	JHoffman@pelhamweb.com
Susan Snide	Assessing	Assessing	ssnide@pelhamweb.com



Pelham Hazard Mitigation Plan Update

Meeting 2

November 15th, 2022 | 9 AM | Selectmen's Conference Room (6 Village Green Pelham, NH)

Agenda

1. Table 3—Natural Hazards in Jurisdiction
2. Table 4—Previous Occurrences of Hazards
3. Table 5—Probability of Future Hazard Events
4. Table 6—Critical Facilities and their Vulnerabilities
5. Section 3.5—Vulnerability by Hazard
6. Discuss homework and set next meeting date.
 - a. Meeting 3- January 17th, 2023
 - b. Common Mitigation Actions

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Pelham Hazard Mitigation Plan Update 2023

Meeting 3

February 21, 2023 | 9:00am | Selectmen's Conference Room (6 Village Green)

Agenda

1. Complete Table 1—Status of Previous Actions (Section 2.2)
2. Select at least 2 NFIP mitigation actions (Section 3.7 and 4.2)
3. Select at least 1 mitigation action per hazard (Section 4.2)
4. Homework and next meeting date

Pelham Hazard Mitigation Meeting ~ February 21, 2023

Name	Title	Agency	Email
Jenn Beauregard	Planning Director	Town of Pelham	jbeauregard@pelhamnh.com
Marsha Haines	Planning	Red Cross	marsha.haines2@redcross.org
NORM GENTRY	SNH DPM VP	Red Cross	NORMAN.GENTRY@REDCROSS.ORG
Anne T. Perriello	Chief of Police	Pelham P.D.	aperriello@pelhampolice.com
JOSEPH ROARK	TOWN ADMINISTRATOR	TOWN OF PELHAM	jroark@pelhamnh.com
John Ignatowicz	Deputy Fire Chief	PFD	jignatowicz@pelhamfire.com



Pelham Hazard Mitigation Plan Update 2023

Meeting 4

April 4, 2023 | 9:00am | Selectmen's Conference Room (6 Village Green)

Agenda

1. Complete Table 11—STAPLEE Analysis
2. Determine how elements of Hazard Mitigation Plan will be incorporated into other planning documents and initiatives (*Section 4.4*)
3. Determine method and schedule for keeping plan current after update (*Section 1.6*)
4. Determine how public will continue being involved in plan maintenance (*Section 1.6*)

Pelham Hazard Mitigation Meeting ~ April 4, 2023

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Notification Letter



Pelham

October 18th, 2022

Pelham, NH Hazard Mitigation Plan Update

The Town of Pelham, in conjunction with the Nashua Regional Planning Commission, is in the process of updating its Hazard Mitigation Plan. We strongly encourage all residents, members of the business community, and other interested individuals to participate in the update process.

The Pelham Hazard Mitigation Plan Update will examine changes in development and mitigation priorities that have occurred since the 2017 Plan. It will also address natural hazards in the Town, previous occurrences of these hazards, the probability of future hazard events, and the vulnerability of Pelham's critical facilities to these hazards. The Plan will conclude by identifying and prioritizing mitigation actions to reduce Pelham's vulnerability to natural hazards.

You can stay informed by visiting the Pelham Hazard Mitigation Plan Update website at www.nashuarpc.org/PelhamHazMit. The webpage will be updated throughout the planning process and includes meeting times, locations, agendas, and updated documents. For additional information or to participate in the Plan update, please contact me at paytonh@nashuarpc.org or (603) 417-6570 x6567.

All the best,

NASHUA REGIONAL PLANNING COMMISSION

A handwritten signature in black ink, appearing to read "Payton Hoyt".

Payton Hoyt

Regional Planner

(603) 417-6570 x6567

paytonh@nashuarpc.org

Hazard Mitigation Plan Update Website Screen Shot

PELHAM HAZARD MITIGATION PLAN UPDATE

PAGE MENU

Pelham Hazard Mitigation Plan Update 2017

Hazard Mitigation Plan Guide

RESOURCES

CONTACT

HOME > ABOUT NRPC > OUR REGION & COMMUNITIES > PELHAM > PELHAM HAZARD MITIGATION PLAN UPDATE

The Town of Pelham, in conjunction with the Nashua Regional Planning Commission, is in the process of updating its Hazard Mitigation Plan. We strongly encourage all residents, members of the business community, and other interested individuals to participate in the update process.

The Pelham Hazard Mitigation Plan Update will examine changes in development and mitigation priorities that have occurred since the 2017 Plan. It will also address natural hazards in the Town, previous occurrences of these hazards, the probability of future hazard events, and the vulnerability of Pelham's critical facilities to these hazards. The Plan will conclude by identifying and prioritizing mitigation actions to reduce Pelham's vulnerability to natural hazards. The webpage will be updated throughout the planning process and includes meeting times, locations, agendas, and updated documents.

For additional information or to participate in the Plan update, please contact Cassie Cashin at cassiec@nashuarpc.org or (603) 417-6570 x6567.

Steering Committee Members

Name	Title
Jenn Beauregard	Planning Director
James Hoffman	Road Agent
John Ignatowicz	Deputy Fire Chief
James Midgley (Jim)	Chief of Fire Department/EMD
Anne Perriello	Chief of Police
Joseph Roark (Joe)	Town Administrator
Susan Snide	Assessing Assistant

Hazard Mitigation Plan Update Meetings

All meetings will take place at 9:00 am in the Selectmen's Conference Room, 6 Village Green, Pelham, NH.

Meeting 1, October 18, 2022

[Agenda, Homework](#)

Task 1: planning process, identifying resources

Meeting 2, November 1, 2022

[Agenda](#)

Task 2: natural hazards, previous occurrences of hazards, probability of future hazards, critical facilities, vulnerabilities by hazard

Meeting 3, February 21, 2023

[Agenda](#)

Task 3: status of previous mitigation actions, new mitigation actions

Meeting 4, April 4, 2023

[Agenda](#)

Task 4: prioritize mitigation actions, implementation schedule