Town of Merrimack, New Hampshire

Hazard Mitigation Plan Update 2021

Date Approved Pending Adoption: June 11, 2021

Date Adopted: July 15, 2021

Date Final Approval: July 19, 2021

Prepared with Assistance from the Nashua Regional Planning Commission

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

Table of Contents

PLANNING PROCESS

Section 1.1 ~ Overview of Planning Process

The Merrimack Hazard Mitigation Plan Update 2015 was prepared by the Nashua Regional Planning Commission (NRPC) for the Town of Merrimack, NH. NRPC staff worked closely with the Merrimack Hazard Mitigation Team to write this plan. The Merrimack Hazard Mitigation Team included:

- Casey Wolfe, Assistant Planner, Community Development Department, Town of Merrimack, NH
- Kyle Fox, Director, Department of Public Works, Town of Merrimack, NH
- Dawn Tuomala, Public Works Department, Town of Merrimack, NH
- Dave Fredrickson, Operations Manager, Merrimack Village District
- Matthew Duke, Fire Chief, Fire Department, Town of Merrimack, NH
- Brian Levesque, Chief of Police, Police Department, Town of Merrimack, NH
- Matthew Tarleton, Deputy Chief, Police Department, Town of Merrimack, NH

NRPC staff met with the Merrimack Hazard Mitigation Team for a series of 4 meetings to prepare the Merrimack Hazard Mitigation Plan Update 2021. Agendas from these meetings appear in the Appendix to this Plan. In between meetings, NRPC worked directly with Merrimack Hazard Mitigation Team members to obtain additional information needed to write the Plan.

The primary differences between the 2021 Plan and the 2015 Plan are 1) Fluvial Erosion is no longer recognized as a hazard in the 2021 Plan, 2) Infectious Disease is now recognized by the State as a hazard, and 3) 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 December 9, 2020, the group discussed who should be invited to participate on the planning team that was not currently represented. It was determined that the Superintendent of Merrimack Schools should be notified and included in the Hazard Mitigation Team. 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:

- American Red Cross, Northern New England Regional Headquarters, Concord, NH
- Anheuser-Busch Inc, John Richtarik, Facility Manager, Merrimack, NH
- BAE Systems, Merrimack, NH
- City of Nashua, NH, Lori Wilshire, President, Board of Aldermen
- Dartmouth-Hitchcock, Doris Dowell, Office Manager, Merrimack, NH
- Fidelity Investments, Charles MacEachern, Senior Branch Leader, Merrimack, NH
- Homeland Security and Emergency Management, Liz Gilboy, Field Representative, Concord, NH
- Jones Chemical, Kevin Ballantine, Branch Manager, Merrimack, NH
- Manchester-Boston Regional Airport, Manchester, NH
- Nashua Airport Authority, Chris Lynch, Nashua, NH
- Thomas More College, Valerie Burgess, NH Executive Assistant to the President, Merrimack, NH
- Town of Amherst, NH, Peter Lyon, Chairman, Board of Selectmen
- Town of Bedford, NH, David Gilbert, Chairman, Town Council
- Town of Litchfield, NH, Steven Webber, Chairman, Board of Selectmen
- Pennichuck Water Works, Nashua, NH

A copy of the letter that was sent to these entities appears in the Appendix to this Plan. BAE Systems responded but had no contributions to the plan.

Section 1.3 ~ Public Participation

During the first Hazard Mitigation Team meeting, held on December 9, 2020, 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.merrimacknh.gov/), Merrimack Police Department Twitter account (https://twitter.com/MerrimackPD), Merrimack Police Department Facebook account (https://www.facebook.com/pages/Merrimack-Police-Department/104950052912992), Merrimack Fire Rescue Facebook account (https://www.facebook.com/merrimackfireresCue), Merrimack Community Development Department Twitter account (https://twitter.com/ComDevMerrimack), and local cable

access television (http://merrimacktv.com/). The Team determined that these methods should also be used to encourage public participation in the Hazard Mitigation Plan update process. There was no public response to provide input to the Merrimack Hazard Mitigation Plan Update 2021 process.

NRPC staff also developed a webpage for the Merrimack Hazard Mitigation Plan Update 2021 (https://www.nashuarpc.org/energy-environmental-planning/hazard-mitigation-planning/), 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 2015 Merrimack Hazard Mitigation Plan, 2021 Hazard Mitigation Plan Outline, and Hazard Mitigation Plan Review Checklist. It also provides meeting times, locations, agendas, and homework assignments. The Town of Merrimack'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 screen shot 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 December 9, 2020, the Team discussed Merrimack'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 Merrimack'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.

Planning and Regulatory Capabilities

Planning and regulatory capability is based on the implementation of plans, ordinances, and programs that demonstrate Merrimack'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 Merrimack. Each one should be considered as an available mechanism for incorporating the recommendations of the Merrimack Hazard Mitigation Plan Update 2015.

- Flood Hazard Conservation District—includes all Special Flood Hazard Areas designated by FEMA in its "Flood Insurance Study for the County of Hillsborough, NH" with an effective date of September 25, 2009, together with the associated Flood Insurance Rate Maps dated September 25, 2009.
- Wetlands Conservation District—this district limits construction in wetlands soils, wetlands, and buffer areas.
- Stormwater Management Standards—designed to protect water quality in the Town. Prior to any disturbance, the responsible party is required to submit a SWMP to the Community Development Department for any tracts of land that results in a total disturbance of 20,000 of more square feet of land.

- 2013-2020 Capital Improvement Program—6-year plan that outlines proposed capital expenditures from municipal departments, school board, library, and water district. Planning Board defines capital expenditures as the purchase, construction, or improvement of land, buildings, infrastructure, or equipment having an associated cost of $100,000 or more and an estimated useful life of at least 7 years.
- Zoning Ordinance and Building Code—revised January 14, 2021
- Subdivision Regulations – Adopted September 3, 2019
- Site Plan Regulations – Adopted September 3, 2019
- 2013 Master Plan Update—adopted January 7, 2014
- National Flood Insurance Program

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 Merrimack include:

Emergency Management Plans

- Merrimack Hazard Mitigation Plan 2015—this document provides a guide for the community to reduce the impact of natural hazards on its residents and the built environment. It addresses natural hazards in the Town, previous occurrences of these hazards, the probability of future hazard events, and the vulnerability of Merrimack's critical facilities to these hazards. The Hazard Mitigation Plan also identifies and prioritizes mitigation actions to reduce Merrimack's vulnerability to natural hazards.
- Merrimack Emergency Response Plan—this document outlines responsibilities and the means by which resources are deployed during and following an emergency or disaster, updated in 2013.

Emergency Management Departments, Facilities, Personnel, and Volunteers

- Merrimack Fire and Rescue Department—responds to all types of incidents including fires, automobile accidents, medical emergencies, hazardous materials response, and technical rescues. In addition, the Department promotes emergency preparedness, fire prevention, building code enforcement, emergency management, health division and other life safety programs.
- Merrimack Police Department
- CERT Team—organized through Police Department, primarily involved with vaccinations and public health issues
- Cooperation with City of Nashua Emergency Management—Merrimack and Nashua emergency management teams meet quarterly regarding emergency management and public health issues, all Nashua alerts (ex. storms, Red Cross, public health) are also sent to Merrimack.
- Souhegan Valley Mutual Aid, Border Area

- Police Mutual Aid—Hillsborough County, Londonderry, State Police, National Guard
- NH Public Works Mutual Aid

Emergency Management Communications

- Nixle—connects public safety agencies to Merrimack residents via text, web, and email
- 411 for School subscribers
- Merrimack Police Department Twitter and Facebook accounts—emergency management announcements
- Merrimack Fire Rescue Facebook
- Local access TV—emergency management announcements
- Merrimack Town website—emergency management announcements and education
- Regional communications system, total interoperability of radio, officers have portable radios, interoperability with Mutual Aid, BAE interoperable system in command vehicle.
- Merrimack Village District Water Works Facebook
- Merrimack Department of Public Works Facebook
- Merrimack Community Development Twitter

Floodplain Management Capabilities

The Town of Merrimack 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). Merrimack joined the NFIP on July 16, 1979. As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Merrimack has adopted the "Flood Hazard Conservation District," found in Section 2.02.8 of the Merrimack Zoning Ordinance and Building Code. The Flood Hazard Conservation District includes all Special Flood Hazard Areas designated by FEMA in its "flood Insurance Study for the County of Hillsborough, NH," with an effective date of September 25, 2009, together with the associated Flood Insurance Rate Maps dated September 25, 2009.

Additional information on the Flood Hazard Conservation District and Merrimack's participation in the NFIP can be found in Section 3.7 of this Plan.

Administrative and Technical Capabilities

Merrimack'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 Merrimack's hazard mitigation administrative and technical capabilities:

- Planning Board
- Planning Staff
- Building Inspector
- Building Official
- Health Officials
- Fire Department—FEMA ICS 300-700 trained

- Police Department—FEMA ICS 300-700 trained
- Department of Public Works
- Town Manager
- Town Council
- Zoning Board
- Conservation Commission
- Merrimack Village District Water Works
- School Budget Committee

Fiscal Capabilities

In addition to administrative and technical capabilities, the ability of the Town of Merrimack to implement mitigation actions is closely associated with the amount of money available for these projects. Mitigation actions identified in this Plan, including those in Table 12—Implementation and Administration, may utilize the following funding sources:

- State and Federal Grants, including, but not limited to:
  - 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.
  - NH Department of Transportation Bridge Aid Program
  - Capital Improvements Plan
  - The Merrimack Planning Board was directed as a result of the 1984 Town Meeting to prepare and maintain a six-year capital improvements program (CIP) to aid the Budget Committee in its consideration of annual budgets. It is updated yearly.
  - RSA 674:7 requires municipal departments, the school board, the library, and the water district to submit statements of proposed capital expenditures to the Planning Board.

For CIP purposed, the Planning Board defines capital expenditure as the purchase, construction, or improvement of land, buildings, infrastructure, or equipment having an associated cost of $100,000 or more and an estimated useful life of at least seven years.

Summary and Analysis of Merrimack'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	Flood Hazard Conservation District, Wetlands Conservation District, Stormwater Management Standards, 2019-2026 Capital Improvement Program, Zoning Ordinance and Building Code, Subdivision and Site Plan Regulations, 2013 Master Plan, NFIP	Entire jurisdiction	Planning Board, Zoning Board, Community Development 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.
Emergency Management	Plans; Departments, Facilities, Personnel, and Volunteers; Communications	Entire jurisdiction	Merrimack Fire and Rescue, Merrimack Police, CERT Team, City of Nashua Emergency Management, Souhegan Valley Mutual Aid Border Area, Police Mutual Aid, NH Public Works Mutual Aid	Good	Utilize a variety of communications methods to ensure all residents are educated about emergency preparedness and hazard mitigation measures they can take.

Floodplain Management	Flood Hazard Conservation District, NFIP	Designated Flood Hazard Areas in Merrimack	Merrimack Planning Board	Excellent	No changes or improvements needed.
Administrative and Technical	Planning Dept., Planning Staff, Building Inspector, Building Official, Health Officials, Fire Dept., Police Dept., Public Works, Town Administrator, Town Council, Zoning Board, Conservation Commission, Merrimack Village District Water Works, School Budget Committee	Entire jurisdiction	Entities listed in Description	Good	Promote communication across all departments to ensure Hazard Mitigation Plan goals and actions are implemented.
Fiscal	Grant funding, Capital Improvements Program (CIP)	Entire jurisdiction	Town Council, Planning Board, Budget Committee	Good	Hazard mitigation actions should be considered for inclusion in the CIP and departmental budgets. Merrimack's Hazard Mitigation Plan should be updated at least every 5 years in order to maintain eligibility for FEMA grants.

Section 1.5 ~ Review and Incorporation of Existing Documents

A number of existing documents were reviewed and incorporated into the Merrimack Hazard Mitigation Plan Update 2015. The Merrimack Zoning Ordinance was used to provide information on where and how the Town builds. This was particularly helpful when mapping critical facilities corridors (Section 3.4). The Merrimack Capital Improvements Plan was used to help document the Town's fiscal capabilities (Section 1.4). The Merrimack 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 Merrimack Emergency Response Plan was also used to inform the analysis and prioritization of mitigation actions. The State of New Hampshire Multi-Hazard Mitigation Plan Update 2013 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). Finally, the City of Nashua's Comprehensive Emergency

Management Plan was referenced to write the hazard descriptions used to determine Merrimack's vulnerability by hazard (Section 3.5).

Section 1.6 ~ Updating the Plan

The Town of Merrimack is required to update its Hazard Mitigation Plan at least every five years. In order to monitor, evaluate, and update the Mitigation Strategies identified in Table 12—Implementation and Administration, the Merrimack Hazard Mitigation Team will meet annually. The Merrimack Police Chief is responsible for initiating this review and will consult with members of the Merrimack Hazard Mitigation Team and the community. During this meeting, the Team will identify mitigation actions that can be conducted in the current year as well as mitigation actions that will require budget requests for the following year. These mitigation actions will be monitored throughout the year by the Team.

Changes should be made to the Plan to accommodate projects that have failed or are not considered feasible after an evaluation and review for their consistency with the benefit cost analysis, STAPLEE analysis, timeframe, community's priorities, and funding resources. Mitigation strategies that were not ranked as priorities during the 2015 update should be reviewed as well during the monitoring, evaluation, and update of this Plan to determine feasibility of future implementation. New mitigation actions or plans proposed upon adoption of this Plan should follow the benefit cost and STAPLEE analysis methods utilized in this Plan to ensure consistency with the adopted Plan and to help the Hazard Mitigation Team evaluate overall potential for success.

In addition to this annual meeting, the Hazard Mitigation Team will meet before, during, and after any hazard occurrence as part of the Town's debriefing exercise. The Hazard Mitigation Plan will be updated following this meeting to reflect changes in priorities and mitigation strategies that have resulted from the hazard event. It is especially important to incorporate updates within one year after a Presidential Disaster Declaration.

The Town of Merrimack will utilize its website, local cable channel, and existing social media outlets, including Facebook and Twitter to notify members of the public about the annual Hazard Mitigation Plan Update meeting and to involve them in the update process. Any public input that is received will be incorporated into the Plan update. In addition, following its annual meeting, the Hazard Mitigation Team will report the results of its update process to the Merrimack Town Council. The Town Council meetings are open to the public and are also broadcast on Merrimack public access cable.

CHAPTER 2. CHANGES FROM PREVIOUS PLAN

Section 2.1 ~ Changes in Development

Since the 2015 Plan, there has been significant residential development in Merrimack. Merrimack has seen the addition of 540 rental units, 115 condo units, 47 elderly housing units, and a 66-unit single family development. A large shopping plaza and an extended stay hotel were also constructed. The additional population significantly raises the Town's vulnerability to hazards regarding human life.

Section 2.2 ~ Progress on Local Mitigation Efforts

The mitigation actions and implementation framework identified in the Merrimack Hazard Mitigation Plan Update 2021 have been revised to reflect progress in local mitigation efforts. Progress has been made on a number of local mitigation efforts identified in the 2015 Plan, including:

- Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.
- Work with FEMA to voluntarily remove structures from flood-prone areas to minimize
- Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.
- Protect critical emergency management facilities and equipment from lightning
- Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.
- Protect vulnerable populations from the impacts of extreme temperatures and severe winter storms by establishing heating and cooling centers at designated facilities and providing transportation to and from these centers.
- Conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe thunderstorms, and severe winter weather.
- Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.
- Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.

In order to assess progress on local mitigation efforts, the Hazard Mitigation Team reviewed the actions originally presented in the Merrimack Hazard Mitigation Plan 2015 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

2015 Mitigation Action	Status	Explanation
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2015 Hazard Mitigation Plan and will be moved to the Hazard Mitigation Plan Update 2021.
Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2015 Hazard Mitigation Plan and will be moved to the Hazard Mitigation Plan Update 2021.
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Deferred	This is a mitigation action (Flooding, Property Protection). This action was not completed over the span of the 2015 Hazard Mitigation Plan and will be moved to the Hazard Mitigation Plan Update 2021.
Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.	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 2021.
Map and assess vulnerability to erosion. Conduct stream assessments and prepare fluvial erosion hazard zone maps.	Deleted	Fluvial Erosion is no longer tracked in Hazard Mitigation Planning. This action will not be tracked in future hazard mitigation plans.
Work with FEMA to voluntarily remove structures from flood-prone areas to minimize	Completed/ Ongoing	This is a mitigation action (Prevention, 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 2021.
Implement culvert and bridge capacity improvements at hazard	Deleted	Fluvial Erosion is no longer tracked in Hazard Mitigation Planning. This action

2015 Mitigation Action	Status	Explanation
prone locations identified in DPW Plan and Fluvial Erosion Study.		will not be tracked in future hazard mitigation plans.
Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.	Completed/ Ongoing	This is a mitigation action (Prevention, Flooding). 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 2021.
Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.	Completed/ Ongoing	This is a mitigation action (Prevention, 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 2021.
Protect vulnerable populations from the impacts of extreme temperatures and severe winter storms by establishing heating and cooling centers at designated facilities and providing transportation to and from these centers.	Completed/ Deleted	This action was completed over the course of the 2015 plan and will not be tracked in future hazard mitigation plans.
Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	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 2021.
Conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe thunderstorms, and severe winter weather.	Completed/ Ongoing	This is a mitigation action (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 2021.
Remove fuel from urban/wild land interface.	Deleted	This is a mitigation action (Prevention, Property Protection). This action has been deleted because there is no interest among residents for it. As such,

2015 Mitigation Action	Status	Explanation
		it will not continue to be tracked in the Hazard Mitigation Plan Update 2021.
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.	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 2021.
Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	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 2021.

Section 2.3 ~ Changes in Priorities

Table 2 depicts the change in STAPLEE scores of the 2015 mitigation actions and what their status is in the 2021 Plan update.

The following mitigation action rose in priority level from the 2015 Plan to the 2021 Plan:

- Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.
- Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.
- Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.
- Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe thunderstorms, and severe winter weather.
- Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.

The following mitigation actions dropped in priority level from the 2015 Plan to the 2021 Plan:

- Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.

- Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.
- Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.
- Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.

The following mitigation actions stayed the same in priority level from the 2015 Plan to the 2021 Plan:

- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.
- Work with FEMA to voluntarily remove structures from flood-prone areas to minimize
- Protect critical emergency management facilities and equipment from lightning

The following mitigation actions were completed and/or deleted and will no longer be included in the 2021 Plan:

- Map and assess vulnerability to erosion. Conduct stream assessments and prepare fluvial erosion hazard zone maps.
- Implement culvert and bridge capacity improvements at hazard prone locations identified in DPW Plan and Fluvial Erosion Study.
- Protect vulnerable populations from the impacts of extreme temperatures and severe winter storms by establishing heating and cooling centers at designated facilities and providing transportation to and from these centers.
- Remove fuel from urban/wild land interface.

Table 2—Changes in Mitigation Priorities

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	Deferred	STAPLEE Score = 5 Rank = 8 out of 15	STAPLEE Score = 7 Rank = 8 out of 16
Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.	Deferred	STAPLEE Score = 6 Rank = 7 out of 15	STAPLEE Score = 9 Rank = 6 out of 16
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Deferred	STAPLEE Score = 1 Rank = 11 out of 15	STAPLEE Score = 4 Rank = 9 out of 16
Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed	Completed/Ongoing	STAPLEE Score = 8 Rank = 5 out of 15	STAPLEE Score = 7 Rank = 8 out of 16

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
based on street address and date.			
Work with FEMA to voluntarily remove structures from flood-prone areas to minimize	Completed/Ongoing	STAPLEE Score = 3 Rank = 10 out of 15	STAPLEE Score = 3 Rank = 10 out of 16
Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.	Completed/Ongoing	STAPLEE Score = 9 Rank = 4 out of 15	STAPLEE Score = 9 Rank = 6 out of 16
Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.	Completed/Ongoing	STAPLEE Score = 8 Rank = 5 out of 15	STAPLEE Score = 10 Rank = 5 out of 15
Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	Completed/Ongoing	STAPLEE Score = 8 Rank = 5 out of 15	STAPLEE Score = 16 Rank = 1 out of 16
Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe	Completed/Ongoing	STAPLEE Score = 9 Rank = 4 out of 15	STAPLEE Score = 13 Rank = 3 out of 16

2015 Mitigation Action	Current Status	Priority Level in 2015 Plan	Priority Level in 2021 Plan
thunderstorms, and severe winter weather.			
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.	Completed/Ongoing	STAPLEE Score = 12 Rank = 1 out of 15	STAPLEE Score = 12 Rank = 4 out of 16
Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	Completed/Ongoing	STAPLEE Score = 10 Rank = 3 out of 15	STAPLEE Score = 16 Rank = 1 out of 16

CHAPTER 3. HAZARD IDENTIFICATION AND RISK ASSESSMENT

Section 3.1 ~ Description of Natural Hazards

The Town of Merrimack 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. Enhanced 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 Merrimack Hazard Mitigation Plan Update 2021. "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). Merrimack 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 (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 Merrimack 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.

Lastly, infectious disease is also included in the 2018 NH State Hazard Mitigation Plan. The CDC defines infectious diseases as illnesses caused by germs (such as bacteria, viruses, and fungi) that can enter the body, multiply, and can cause an infection. Some infectious diseases are contagious (or communicable), that is, spread from one person to another. Other infectious diseases can be spread by germs carried in air, water, food, or soil. They can also be spread by vectors (like biting insects) or by animals. In 2020, all communities around the globe were impacted by the COVID-19 pandemic and continue to be affected today. To date, 2024 Merrimack residents have tested positive for COVID-19, and there are ongoing mass vaccination efforts being conducted by medical providers in Merrimack. Multiple disaster declarations were issued for Hillsborough County (see below).

> Presidential declared disaster for Hillsborough County of: New Hampshire
> COVID-19 PANDEMIC (DR-4516-NH)
> Incident Period: January 20, 2020 and continuing
> Major Disaster Declaration declared on April 3, 2020

As this pandemic event is still unfolding, the Merrimack Hazard Mitigation Team does not have enough information to fully document and analyze the risk to infectious disease in this Plan. The Town will re-evaluate and include infectious disease in subsequent updates of this 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	<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>

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		than 6 months	• 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> • impacts on agriculture <u>L</u> • 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 water sources for drinking water and fire protection due to freezing temperatures.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
Flooding	Floodplains cover approximately 11.4% of Merrimack—7.7% of Merrimack is located in 1% annual floodplain and 3.7% of Merrimack is located in the 0.2% annual floodplain. Floodplains are primarily located around the Merrimack River, Souhegan River, and Baboosic Brook. The Island Drive area of Merrimack is particularly prone to flooding. See Section 3.5 for additional information on flood-prone areas.	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): • 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	Water damage to structures and their contents. 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.
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 • Category 3—sustained winds 111-129 mph	Wind damage to structures and trees. Water damage to structures and their contents. Damage or loss of

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		• Category 4—sustained winds 130-156 mph • Category 5—sustained winds 157 mph or higher	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/ Downburst	Entire jurisdiction.	Enhanced Fujita Tornado Damage Scale: • EF0—winds 65-85 mph • EF1—winds 86-110 mph • EF2—winds 111-135 mph • EF3—winds 136-165 mph • EF4—winds 166-200 mph • EF5—winds >200 mph	Wind damage to structures and trees. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio system. Environmental hazards resulting from damage. Medical surge.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			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.

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

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• Shortages of water in reservoirs, streams, & wells creating water emergencies S • impacts on agriculture L • impacts on hydrology & ecology
Earthquake	Entire jurisdiction.	Richter Scale • <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 water sources for drinking water and fire protection due to freezing temperatures.
Flooding	Floodplains cover approximately 4.23% of Merrimack—3.48% of Merrimack is located in 0.75% annual floodplain and 0.01% of	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): • Class S—significant hazard • Class H—high hazard	Water damage to structures and their contents. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal communications, 911 communications, radio

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
	Merrimack is located in the 0.2% annual floodplain. Floodplains primarily located around Souhegan River, Blood Brook, Stony Brook, Mill Brook, and dam impoundments. See Section 3.5 for additional information on flood-prone areas.	• Class L—low hazard • Class NM—non-menace For full definitions of Dam Hazard Classes, see Section 3.5 Vulnerability by Hazard	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 • Category 3—sustained winds 111-129 mph • Category 4—sustained winds 130-156 mph • Category 5—sustained winds 157 mph or higher	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, 911 communications, radio system. Environmental hazards resulting from damage. Isolation of neighborhoods resulting from flooding. Water pressure, quality, and capacity issues impacting fire

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
			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/ Downburst	Entire jurisdiction.	Enhanced Fujita Tornado Damage Scale: • EF0—winds 65-85 mph • EF1—winds 86-110 mph • EF2—winds 111-135 mph • EF3—winds 136-165 mph • EF4—winds 166-200 mph • EF5—winds >200 mph	Wind damage to structures and trees. Damage or loss of 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	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.

Hazard Type	Hazard Location within Jurisdiction	Hazard Extent	Impact
		• J—100,000 to 499,999 acres • K—500,000 to 999,999 acres • L—1,000,000+ acres	

Section 3.2 ~ Description of Previous Hazards

The first step in determining the probability of future hazard events in the Town of Merrimack is to examine the location, extent, and impact of previous hazards. If a hazard event has not occurred within Merrimack but has occurred in the region it is also noted.

Table 4—Previous Occurrences of Hazards in Jurisdiction

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Climate Change	It is beyond the scope of this Plan to determine if a specific hazard event was the result of Climate Change.			
Drought	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.
Drought	1999	Entire jurisdiction	Level 2—Warning. Drought warning issued on June 29, 1999.	Damage to crops. Low water levels in dug wells.
Drought	March 2002	Entire jurisdiction	Level 3—Emergency. First time Level 3 Drought Impact Level had been declared.	Damage to crops. Low water levels in dug wells.
Drought	May 2015	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	June 2015	Entire jurisdiction	USDA D1 (Moderate Drought)	Damage to crops.
Drought	August-September 2015	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	October 2015-February 2016	Entire jurisdiction	USDA D1 (Moderate Drought)	Damage to crops.
Drought	March 2016-June 2016	Entire jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops. Low water levels in wells.
Drought	July 2016-September 2016	Entire jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells.
Drought	October 2016-December 2016	Entire jurisdiction	USDA D3 (Extreme Drought)	Low water levels in wells.
Drought	January 2017-March 2017	Entire jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Drought	April 2017	Entire jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
Drought	June-July 2018	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	September-October 2019	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	May 26-June 22 2020	Entire Jurisdiction	USDA D0 (Abnormally Dry)	Damage to crops.
Drought	June 23 - August, 2020	Entire Jurisdiction	USDA D1 (Moderate Drought)	Low water levels in wells.
Drought	September 2020	Entire Jurisdiction	USDA D2 (Severe Drought)	Low water levels in wells, wells went dry.
Earthquake		There have been no earthquakes centered in Merrimack to date. Earthquakes noted below were centered in NH.	Earthquakes noted below had a magnitude of 2.5 or greater.	
Earthquake	March 18, 1926	Manchester, NH	No historic data on extent	Intensity V effects observed in Amherst, Lyndeborough, Manchester, Mason, and Wilton. No damage in Merrimack.
Earthquake	December 20, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Merrimack
Earthquake	December 24, 1940	Lake Ossipee, NH	Magnitude 5.5 on Richter Scale	No damage in Merrimack
Earthquake	December 4, 1963	Laconia, NH (43.6 latitude, -71.5 longitude)	Magnitude 3.7 on Richter Scale	No damage in Merrimack
Earthquake	June 28, 1981	Sanbornton, NH (43.56 latitude, -71.56 longitude)	Magnitude 3.0 on Richter Scale	No damage in Merrimack
Earthquake	January 19, 1982	Sanbornton, NH (43.5 latitude, -71.6 longitude)	Magnitude 4.7 on Richter Scale	No damage in Merrimack
Earthquake	October 25, 1986	Northfield, NH (43.399 latitude, -71.59 longitude)	Magnitude 3.9 on Richter Scale	No damage in Merrimack
Earthquake	October 20, 1988	Milan, NH (44.539 latitude, -71.158 longitude)	Magnitude 3.9 on Richter Scale	No damage in Merrimack
Earthquake	November 22, 1988	Milan, NH	Magnitude 3.2 on Richter Scale	No damage in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
		(44.557 latitude, -71.183 longitude)		
Earthquake	April 6, 1989	Berlin, NH (44.511 latitude, -71.144 longitude)	Magnitude 3.5 on Richter Scale	No damage in Merrimack
Earthquake	October 6, 1992	Canterbury, NH (43.324 latitude, -71.578 longitude)	Magnitude 3.4 on Richter Scale	No damage in Merrimack
Earthquake	June 16, 1995	Lyman, NH (44.286 latitude, -71.915 longitude)	Magnitude 3.8 on Richter Scale	No damage in Merrimack
Earthquake	August 21, 1996	Bartlett, NH (44.184 latitude, -71.352 longitude)	Magnitude 3.8 on Richter Scale	No damage in Merrimack
Earthquake	January 27, 2000	Raymond, NH (43.00 latitude, -71.18 longitude)	Magnitude 3.0 on Richter Scale	No damage in Merrimack
Earthquake	September 26, 2010	Boscawen, NH (43.2915 latitude, -71.6568 longitude)	Magnitude 3.4 on Richter Scale	No damage in Merrimack
Earthquake	October 11, 2013	Contoocook, NH (43.255 latitude, -71.747 longitude)	Magnitude 2.6 on Richter Scale	No damage in Merrimack
Earthquake	March 21, 2016	Contoocook, NH (43.264 latitude, -71.767 longitude)	Magnitude 2.8 on Richter Scale	No damage in Merrimack
Earthquake	February 15, 2018	East Kingston, NH (42.921° latitude -71.011° longitude)	Magnitude 2.7 on Richter Scale	No damage in Merrimack
Earthquake		Earthquakes noted below were centered outside of NH but were felt by NH municipalities.		No damage in Merrimack
Earthquake	November 18, 1929	Grand Banks, Newfoundland	Magnitude 7.2 on Richter Scale	No damage in Merrimack
Earthquake	November 1, 1935	Timiskaming, Canada	Magnitude 6.25 on Richter Scale	No damage in Merrimack
Earthquake	June 15, 1973	Near Canadian/NH border	Magnitude 4.8 on Richter Scale	No damage in Merrimack
Earthquake	June 23, 2010	Buckingham, Quebec, Canada	Magnitude 5.0 on Richter Scale	No damage in Merrimack
Earthquake	August 23, 2011	Washington, DC	Magnitude 5.8 on Richter Scale	No damage in Merrimack
Earthquake	October 16, 2012	Hollis Center, ME	Magnitude 4.0 on Richter Scale	No damage in Merrimack
Extreme Temperature (Cold)	January 16-20, 2000	Entire jurisdiction	5 consecutive days of minimum	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			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	
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
Extreme Temperature (Cold)	January 9-12, 2004	Entire jurisdiction	4 consecutive days of minimum temperatures at or below 0°F:	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• 1/9/04: -7°F • 1/10/04: -8°F • 1/11/04: -8°F • 1/12/04: -7°F	
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
Extreme Temperature (Cold)	January 25-27, 2009	Entire jurisdiction	3 consecutive days of minimum	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			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 Merrimack
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 Merrimack
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 Merrimack
Extreme Temperature (Cold)	February 11-13, 2014	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 2/11/14: -7°F • 2/12/14: -7°F • 2/13/14: -7°F	No known impact in Merrimack
Extreme Temperature (Cold)	February 1-4, 2015	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 2/1/15: 0°F • 2/2/15: 0°F • 2/3/15: -3°F • 2/4/15: -2	No known impact in Merrimack
Extreme Temperature (Cold)	February 14-19, 2015	Entire Jurisdiction	6 consecutive days of minimum temperatures at or below 0°F: • 2/14/15: -7°F	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• 2/15/15: -4°F • 2/16/15: -5°F • 2/17/15: -2°F • 2/18/15: -3°F • 2/19/15: -4°F	
Extreme Temperature (Cold)	February 14-16, 2016	Entire Jurisdiction	3 consecutive days of minimum temperatures at or below 0°F: • 2/14/16: -11°F • 2/15/16: -9°F • 2/16/16: -9°F	No known impact in Merrimack
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 Merrimack
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 Merrimack
Extreme Temperature (Cold)	January 31-February 3, 2019	Entire Jurisdiction	4 consecutive days of minimum temperatures at or below 0°F: • 1/31/19: -3°F • 2/1/19: -3°F • 2/2/19: -5°F • 2/3/19: -4°F	No known impact in Merrimack
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 Merrimack
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	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• 6/17/01—91°F	
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Extreme Temperature (Heat)	July 5-7, 2003	Entire jurisdiction	3 consecutive days of temperatures above 90°F: • 7/5/03—91°F • 7/6/03—90°F • 7/7/03—91°F	No known impact in Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• 9/2/10—95°F • 9/3/10—96°F	
Extreme Temperature (Heat)	July 21-24, 2011	Entire jurisdiction	4 consecutive days of temperatures above 90°F: • 7/21/11—92°F • 7/22/11—96°F • 7/23/11—101°F • 7/24/11—96°F	No known impact in Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
Extreme Temperature (Heat)	July 29-31, 2015	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 7/29/15—93°F	No known impact in Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
			• 7/30/15—94°F • 7/31/15—90°F	
Extreme Temperature (Heat)	August 16-20, 2015	Entire Jurisdiction	5 consecutive days of temperatures above 90°F: • 8/16/15—90°F • 8/17/15—90°F • 8/18/15—91°F • 8/19/15 – 93°F • 8/20/15 – 90°F	No known impact in Merrimack
Extreme Temperature (Heat)	September 2-4, 2015	Entire Jurisdiction	3 consecutive days of temperatures above 90°F: • 9/2/15—91°F • 9/3/15—92°F • 9/4/15—92°F	No known impact in Merrimack
Extreme Temperature (Heat)	September 7-11, 2015	Entire Jurisdiction	5 consecutive days of temperatures above 90°F: • 9/7/15—90°F • 9/8/15—94°F • 9/9/15—94°F • 9/10/15 – 94°F • 9/11/15 – 93°F	No known impact in Merrimack
Extreme Temperature (Heat)	July 22-29, 2016	Entire Jurisdiction	8 consecutive days of temperatures above 90°F: • 7/22/16—95°F • 7/23/16—93°F • 7/24/16—93°F • 7/25/16—92°F • 7/26/16—96°F • 7/27/16—96°F • 7/28/16—93°F • 7/29/16—93°F	No known impact in Merrimack
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 Merrimack
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 Merrimack

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
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 Merrimack
Flooding – Dam Failure	There have been no flooding events caused by dam failure in Merrimack to date.			

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Flooding	1927	Hillsborough County	No data on extent available	Damage to road network.
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 Merrimack are unknown.
Flooding	1940	Souhegan River, near Central Fire Station	No historic data on extent	Damage to road network.
Flooding	June 1942	Merrimack River	No historic data on extent	Damage to road network.
Flooding	June 1944	Merrimack River	No historic data on extent	Damage to road network.
Flooding	April 1960	Merrimack River	No historic data on extent	Flooding resulting from rapid snow melt and heavy rain. Damage to road network.
Flooding	March 10, 1964	Souhegan River	Maximum gage height of 6.06 feet	No data on impact.
Flooding	March 19, 1968	Souhegan River	Discharge of 3,800 cfs	No data on impact.
Flooding	July 11, 1973	Hillsborough County	No data on extent available	FEMA Disaster Declaration #399. Specific impacts to Merrimack are unknown.
Flooding, ice jam	March 1977	Souhegan River	No historic data on extent	5 homes flooded in Merrimack.
Flooding, ice jam	March 1977	Baboosic Brook	No historic data on extent	Impact to transportation infrastructure.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				$80,000 to replace bridge. Town tried unsuccessfully to remove ice with backhoe.
Flooding	July 29-August 10, 1986	Hillsborough County	No data on extent available	FEMA Disaster Declaration #771. Many roads impassable in Hillsborough County. Specific impacts to Merrimack 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 Merrimack are unknown.
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 in Hillsborough County. Specific impacts to Merrimack 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 Merrimack are unknown.
Flooding	July 2, 1998	Hillsborough County	No data on extent available	$3,400,000 in damage in NH, 6

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				counties impacted including Hillsborough. FEMA Disaster Declaration #1231. Primary impact to structures and infrastructure in Hillsborough County. Specific impacts to Merrimack are unknown.
Flooding	May 2001	Pennichuck Brook	No data on extent available	NH 101A collapsed on the eastbound side. Traffic impacted for months
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 Merrimack 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. Specific impacts to Merrimack are unknown.
Flooding	April 15, 2007	Hillsborough County	100-500-year recurrence interval	$27,000,000 in damages in NH; 2,005 homeowners and renters applied for assistance in NH. FEMA Disaster Declaration #1695. Primary impact to structures and infrastructure in

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				Hillsborough County.
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 Merrimack 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. Flooding near Johnson Corner due to undersized culvert. FEMA Disaster Declaration #1913 Primary impact to roads and bridges in Hillsborough County. Specific impacts to Merrimack are unknown.
Flooding	May 26, 2011	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4006. No impact to Merrimack.
Flooding	May 29, 2012	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4065. No impact to Merrimack.
Flooding	June 26, 2013	Hazard was not experienced in jurisdiction.	N/A	Disaster Declaration #4139. No impact to Merrimack.
Flooding	July 1, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4329. No impacts to Merrimack.
Flooding	October 29 – November 1, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4355. No impacts to Merrimack.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Flooding	March 2-8, 2018	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4370. No impacts to Merrimack.
Flooding	July 11-12, 2019	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4357. No impacts to Merrimack.
Severe Wind	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. Specific impact to Merrimack is unknown.
Severe Wind	August 31, 1954 (Carol)	Hillsborough County	Saffir-Simpson Scale Category 3.	Extensive tree and crop damage.
Severe Wind	September 12, 1960 (Donna)	Hillsborough County	Saffir-Simpson Scale Category 3	Water damage to structures due to flooding.
Severe Wind	September 27, 1985 (Gloria)	Hillsborough County	Saffir-Simpson Scale Category 2	Damage to trees and power lines from high winds.
Severe Wind	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.
Severe Wind	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.
Severe Wind	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.
Severe Wind	October 26, 2012 (Sandy)	Hillsborough County	Tropical Storm (winds 39-73 mph).	FEMA Disaster Declaration #4095. Minimal damage.
Severe Wind	October 29-30, 2017	Hillsborough County	Tropical Storm (winds 39-73 mph).	A powerful storm fed by tropical moisture knocked

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				out power to more than 270,000 homes and business across the state. Falling trees severely damaged many homes and electrical infrastructure in Merrimack. Merrimack experienced widespread and prolonged power outages, as well as 2.8 inches of rain.
Severe Wind	There has been no significant damage from tropical-post tropical cyclones (severe wind) in Merrimack since 2017.			
Lightning	There has been no significant damage from lightning in Merrimack to date.			
Severe Winter Weather	March 11-14, 1888	Entire jurisdiction	30-50 inches of snow	No historic data on impact
Severe Winter Weather	1922	Entire jurisdiction	No historic data on extent	Extreme snow drifts paralyzed road network.
Severe Winter Weather	February 14-15, 1940	Entire jurisdiction	Over 30 inches of snow	Snow and high winds paralyzed road network.
Severe Winter Weather	February 14-17, 1958	Entire jurisdiction	20-33 inches of snow	Primary impact to road network.
Severe Winter Weather	March 18-21, 1958	Entire jurisdiction	22-24 inches of snow	Primary impact to road network.
Severe Winter Weather	March 2-5, 1960	Entire jurisdiction	Up to 25 inches of snow	Primary impact to road network.
Severe Winter Weather	January 18-20, 1961	Entire jurisdiction	Up to 25 inches of snow	Blizzard conditions paralyze road network.
Severe Winter Weather	February 22-28, 1969	Entire jurisdiction	24-98 inches of snow in Central NH	Primary impact to road network. Slow moving storm.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Severe Winter Weather	December 25-28, 1969	Entire jurisdiction	12-18 inches of snow	Primary impact to road network.
Severe Winter Weather	January 19-21, 1978	Entire jurisdiction	Up to 16 inches of snow	Primary impact to road network.
Severe Winter Weather	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.
Severe Winter Weather	April 5-7, 1982	Entire jurisdiction	18-22 inches of snow	Primary impact to road network.
Severe Winter Weather	March, 1983	Entire jurisdiction	Over 18 inches of snow, 30-40 mph winds	Snow paralyzed road network and forced closure of businesses.
Severe Winter Weather	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.
Severe Winter Weather	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.
Severe Winter Weather	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. Damage to power and phone lines and trees.

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
Severe Winter Weather	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.
Severe Winter Weather	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.
Severe Winter Weather	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
Severe Winter Weather	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	March 14-15, 2017	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4316. No impacts to Merrimack.
Severe Winter Weather	March 13-14, 2018	Hazard was not experienced in jurisdiction	N/A	Disaster Declaration #4371. No impacts to Merrimack.
Tornado		No Tornados have originated in Merrimack to-date.		http://www.tornadohistoryproject.com/t

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
		Tornados noted below originated in Hillsborough Co, NH.		ornado/New_Hampshire
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, originated near Goffstown, NH	Fujita Scale F1	0 fatalities, 0 injuries
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 Merrimack, 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,	Fujita Scale F1	0 fatalities, 0 injuries

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
		originated near Swanzey, NH		
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.	Macroburst	2 fatalities, 2 lost roofs, damage to trees and utility infrastructure
Tornado	July 24, 2008	Rockingham, Merrimack, Belknap, Strafford and Carrol Co.	Fujita Scale F2	1 fatality, 2 injuries, significant structural damage
Wildfire	May 4, 1942	Fire began in Merrimack then jumped Merrimack River into Litchfield near McQuesten Farms. Fire eventually spread to Nashua and Amherst.	NWCG Fire Size Classification F: 2,000 acres in Merrimack, Litchfield, Nashua, and Amherst	Numerous area fire departments battled the blaze. Many firefighters were injured.
Wildfire	May 8, 1950	2 separate fires roughly 1 mile apart near Wildcat Falls	NWCG Fire Size Classification C: approximately 40 acres	Destruction of commercial property (Art's Garage), large barn, and silo. Death to livestock
Wildfire	September 1, 2007	Power lines along Route 3 near Pointer Fish and Game Club, Merrimack to Bedford	NWCG Fire Size Classification C: approximately 20 acres	8-day event, no damage to houses
Wildfire	March 22, 2012	Median on the Everett Turnpike, just north of Wire Road overpass	NWCG Fire Size Classification A	Fire started by cigarette butt, no impact to structures or roadway.
Wildfire	May 4, 2013	Ichabod Drive	NWCG Fire Size Classification B: 1 acre	No damage to structures. Firefighters from Merrimack, Nashua, and Amherst fought fire.
Wildfire	May 6, 2015	Fidelity Investments Property	NWCG Fire Size Classification C	A large brush fire was found in a

Hazard Type	Date	Hazard Location within Jurisdiction	Hazard Extent	Impact
				heavily wooded area of walking trails, the fire began to rapidly spread due to the windy dry conditions. At the fire's peak over 14-acres were burning. No damage to structures. Mutual aid from Amherst, Hollis, Bedford, Nashua, Manchester, Londonderry, Hudson, Goffstown, Milford, and the NH Forest Protection Service. One firefighter was injured.
Wildfire		No Wildfire events have occurred in Merrimack since 2015.		

Section 3.3 ~ Probability of Future Hazard Events

After documenting the occurrence of previous hazard events in the Town of Merrimack 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 2000 to reflect potential recent changes in hazard event occurrence rates. The probability of future hazard events for each hazard type in the Town of Merrimack is outlined in Table 5.

Table 5—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," Sustainability Institute, University of New Hampshire, 2014

Hazard Type	Probability of Future Event	Source
	"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 in predicted to more than double by the end of the century (Wake et al., "Climate Change in Southern New Hampshire," pg. 29).	
Climate Change—Warmer Temperatures	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	"Climate Change in Southern New Hampshire," Sustainability Institute, University of New Hampshire, 2014

Hazard Type	Probability of Future Event	Source
	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	17 years of drought from 1960 through 2020. 17 events in 60 years = 0.28 events per year **Annual Probability = 28%** 7 years of drought from 2000 through 2020. 4 events in 20 years = 0.35 **Annual Probability = 35%**	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 Merrimack. However, this hazard is still possible.	US Geological Survey http://earthquake.usgs.gov/earthquakes/search/

Hazard Type	Probability of Future Event	Source
	2 magnitude 5.0 or greater earthquakes felt in NH from 1926 through 2020. 2 events in 94 years = 0.02 events per year **Annual Probability = 2%** 0 magnitude 5.0 or greater earthquakes felt in NH from 2000 through 2020. 0 events in 20 years = 0 events per year **Annual Probability = 0-25%**	
Extreme Temperatures	34 extreme heat events from 2000 through 2020. 34 events in 20 years = 1.7 events per year **Annual Probability = 100%** 23 extreme cold events from 2000 through 2020. 23 events in 20 years = 1.2 events per year **Annual Probability = 100%**	NOAA National Climatic Data Center https://www.ncdc.noaa.gov/cdo-web/search
Flooding/Dam Failure	29 flooding events in Merrimack/Hillsborough County from 1927 through 2020. 29 events in 93 years = 0.32 events per year	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year

Hazard Type	Probability of Future Event	Source
	Annual Probability = 32% 6 flooding events in Merrimack/Hillsborough County from 2000 through 2020. 6 events in 20 years = 0.30 events per year **Annual Probability = 30%** <u>Dam Failure</u> Because of limited data on previous dam failure events, probability cannot be calculated statistically. History shows no occurrences of dam failure causing damage in Merrimack. However, this hazard is still possible and therefore the probability is low. Low probability is defined as a 0-25% chance of occurrence annually. Dam Failure **Annual Probability – 0-25%**	
Severe Wind	9 hurricanes/tropical storms from 1938 through 2020. 9 events in 82 years = 0.11 events per year **Annual Probability = 11%**	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year National Hurricane Center http://www.nhc.noaa.gov/data/tcr/index.php?season=2014&basin=atl

Hazard Type	Probability of Future Event	Source
	4 hurricanes/tropical storms from 2000 through 2020. 4 events in 20 years = 0.20 events per year **Annual Probability = 20%**	
Lightning	Because of limited data on previous lightning events, probability cannot be calculated statistically. History shows no occurrences of lightning strikes causing damage in Merrimack. However, this hazard is still possible and therefore the probability is low. Low probability is defined as a 0-25% chance of occurrence annually.	Local knowledge and public input
Severe Winter Weather	22 severe winter weather events in Hillsborough County from 1888 through 2020. 22 events in 132 years = 0.17 events per year **Annual Probability = 17%** 7 severe winter weather events in Hillsborough County from 2000 through 2020. 7 events in 20 years = 0.35 events per year	Local knowledge FEMA Presidential Disaster Declaration https://www.fema.gov/disasters/grid/year

Hazard Type	Probability of Future Event	Source
	Annual Probability = 35%	
Tornado/Downburst	16 tornados and 1 downburst in Hillsborough Co. from 1961 through 2020. 17 events in 59 years = 0.29 events per year **Annual Probability = 29%** 0 tornados and 0 downbursts in Hillsborough Co. from 2000 through 2020. 0 events in 20 years = 0 events per year **Annual Probability = 0-25%**	Tornado History Project (Joshua Lietz, Storm Prediction Center, National Climatic Data Center) and public input http://www.tornadohistoryproject.com
Wildfire	6 Wildfires in Merrimack from 1942 through 2020 6 events in 78 years = 0.08 events per year **Annual Probability = 8%** 4 wildfires in Merrimack from 2000 through 2020 4 events in 20 years = 0.20 events per year **Annual Probability = 20%**	Local knowledge and public input

Section 3.4 ~ Critical Facilities and their Vulnerability

The next step in determining Merrimack'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 Merrimack 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 Merrimack, 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. Residential
    b. Commercial
    c. Industrial
    d. Agriculture
    e. Religion
    f. Government
    g. Education
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. Railway Systems
    d. Bus Facilities
    e. Airport Systems
4. **Utility Systems**
    a. Potable Water
    b. Drinking Water
    c. Oil/Propane Facilities
    d. Natural Gas Facilities
    e. Electric Power
    f. Communications
5. **High Potential Hazard Facilities**
    a. Dams/Levees
    b. Nuclear Power Plants
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 the Tables 6.1-6.6 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 6.1—General Occupancy Critical Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Commercial—Home Depot – 721 Milford Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial—PC Connection – 730 Milford Rd	Potentially large population present, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Commercial—Merrimack Outlets – 80 Premium Outlets Blvd	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial—Holiday Inn Express – 4 Amherst Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial—Quality Inn – 242 DW Hwy	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial—Residence Inn – 246 DW Hwy	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial – WoodSpring Suites – 2 Executive Park Dr	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial—Atrium Medical – 40 Continental Blvd	Potentially large population present. Located in 1% annual floodplain.		✓		✓	✓	✓	✓	✓	✓
Commercial—Cinemagic – 11 Executive Park Dr	Potentially large population present		✓			✓	✓	✓	✓	✓
Commercial – Gilbert Crossing – 3 Gilbert Dr	Potentially large population present		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Merrimack Townhomes – 4 Angelo Dr	Potentially large population present. Located in 0.2% annual floodplain.		✓		✓	✓	✓	✓	✓	✓
Residences at Executive Park – 1 Vanderbilt Dr	Potentially large population present		✓			✓	✓	✓	✓	✓
Education—Thomas Moore College – 6 Manchester St	Potentially large population present		✓			✓	✓	✓	✓	✓
Government—NH DOT Turnpike Maintenance Facility	Backup fuel for Merrimack		✓			✓	✓	✓	✓	✓
Government—Adult Community Center – 4 Church St	Potentially large population present, shelter for up to 50		✓			✓	✓	✓	✓	✓
Government—Merrimack Public Library – 470 DW Hwy	Potentially large population present, official records and documents		✓			✓	✓	✓	✓	✓
Government—Merrimack Town Hall complex – 6 Baboosic Lake Rd	Potentially large population present, official records and documents		✓			✓	✓	✓	✓	✓
Government—Merrimack District Court – 4 Baboosic Lake Road	Potentially large population present, official records and documents		✓			✓	✓	✓	✓	✓
Industrial—Anheuser-Busch Brewery and athletic fields – 221 DW Hwy	Potentially large population present (public events)		✓			✓	✓	✓	✓	✓
Recreation—Abbie Griffin Park – 6 Baboosic Lake Rd	Potentially large population present	✓					✓			
Recreation—Watson Park – 447 DW Hwy	Potentially large population present	✓					✓			
Recreation—Twin Bridges/Kids Cove – 487 DW Hwy	Potentially large population present	✓					✓			

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Recreation—Wasserman Park – 116 Naticook Rd	Potentially large population present	✓					✓			
Recreation—Kollsman Field – 220 DW Hwy	Potentially large population present	✓					✓			
Recreation—Merrimack Veteran's Memorial Park – 5 Veterans Park Dr	Potentially large population present	✓					✓			
Recreation—Turkey Hill ball fields	Potentially large population present, located in 0.2% annual floodplain	✓			✓		✓			
Recreation—Camp Sargent – 141 Camp Sargent Rd	Potentially large population present	✓	✓			✓	✓	✓	✓	✓
Recreation—YMCA – 6 Henry Clay Dr	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—Grace Baptist Church – 67 Bedford Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—First Congregational Church of Merrimack – 7 Baboosic Lake Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—Our Lady of Mercy Church – 16 Baboosic Lake Road	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—Merrimack Valley Baptist Church – 517 Boston Post Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—St. James United Methodist Church – 646 DW Hwy	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—Faith Episcopal Church – 590 DW Hwy	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—St. John Newman Church – 708 Milford Rd	Potentially large population present, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Religious—Riverside Christian Church – 27 Depot St	Potentially large population present, located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Religious—Merrimack Baptist Temple – 517 Boston Post Rd	Potentially large population present		✓			✓	✓	✓	✓	✓
Religious—Kingdom Hall Jehovah's Witnesses – 59 Wire Rd	Potentially large population present, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Residential—Rose Haven – 8 Jennifer Dr	Elderly housing, large population present, contents have personal value to owners		✓			✓	✓	✓	✓	✓
Residential—Wentworth Place – 1 Coventry Ct	Elderly housing, large population present, contents have personal value to owners		✓			✓	✓	✓	✓	✓
Residential—Parker Village – 6 Stearns Ln	Elderly housing, large population present, contents have personal value to owners		✓			✓	✓	✓	✓	✓
Residential – Overlook Estates - 9 Abenaki Cir	Elderly housing, large population present, contents have personal value to owners.		✓			✓	✓	✓	✓	✓

Table 6.2—Essential Facilities

Facility Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Police Station Headquarters – 31 Baboosic Lake Rd	Contents and staff valuable to emergency management. Serves as communications/dispatch center, backup Emergency Operations Center.		✓			✓	✓	✓	✓	✓
Central Fire Station No. 1 (Headquarters) – 432 Daniel Webster Hwy	Contents and staff valuable to emergency management. Serves as Emergency Operations Center, backup communication/dispatch center. Located in 0.2% annual floodplain.		✓		✓	✓	✓	✓	✓	✓
Reed's Ferry Fire Station No. 3 – 643 Daniel Webster Hwy	Contents and staff valuable to emergency management.		✓			✓	✓	✓	✓	✓
South Merrimack Station No. 2 – 196 Naticook Road	Contents and staff valuable to emergency management.		✓			✓	✓	✓	✓	✓
Public Works Highway Facility - 6 Baboosic Lake Rd	Contents valuable to transportation network and public infrastructure.		✓			✓	✓	✓	✓	✓
Government—Solid Waste Transfer Facility – 1 Fearon Rd	Potentially large population present, used during cleanup efforts after hazard event		✓			✓	✓	✓	✓	✓
Jones Chemical - 40 Railroad Ave	Critical to water purification throughout east coast and Canada, located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Merrimack High School – 38 McElwain St	Potentially large population present.		✓			✓	✓	✓	✓	✓
Merrimack Middle School – 31 Madeline Bennett Ln	Potentially large population present. Shelter for up to 1,000.		✓			✓	✓	✓	✓	✓
Mastricola Upper Elementary School – 26 Baboosic Lake Rd	Potentially large population present.		✓			✓	✓	✓	✓	✓
Mastricola Elementary School – 7 School St	Potentially large population present.		✓			✓	✓	✓	✓	✓

Facility Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Reeds Ferry Elementary School – 15 Lyons Rd	Potentially large population present.		✓			✓	✓	✓	✓	✓
Thornton's Ferry Elementary School – 134 Camp Sargent Rd	Potentially large population present.		✓			✓	✓	✓	✓	✓
Dartmouth Hitchcock Medical Center – 294 Daniel Webster Hwy	Contents valuable to public health, large staff and population present		✓			✓	✓	✓	✓	✓
Home and Health Hospice Care – 7 Executive Park Dr	Contents valuable to public health, large staff and population present		✓			✓	✓	✓	✓	✓
Southern NH Health System, Merrimack Medical Center – 696 Daniel Webster Hwy	Contents valuable to public health, large staff and population present		✓			✓	✓	✓	✓	✓
St. Joseph Medical Center – 4 Dobson Way	Contents valuable to public health, large staff and population present		✓			✓	✓	✓	✓	✓
Convenient MD – 2 Dobson Way	Contents valuable to public health, large staff and population present		✓			✓	✓	✓	✓	✓

Table 6.3—Transportation Critical Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Highway System—Daniel Webster Highway	Structure valuable to motor vehicle travel and safety, evacuation route; portion of DW Highway over Baboosic Brook immediately north of Wire Road is located in Very High Fluvial Erosion Hazard Zone.		✓			✓		✓	✓	
Highway System—Wire Road from DW Highway to Bedford Road	Structure valuable to motor vehicle travel and safety, evacuation route; portions of Wire Road between DW Highway and Everett Turnpike border Very High Fluvial Erosion Hazard Zone along Baboosic Brook.		✓			✓		✓	✓	
Highway System—Baboosic Lake Road east and west from DW Highway to Amherst town line	Structure valuable to motor vehicle travel and safety, evacuation route		✓			✓		✓	✓	
Highway System—FE Everett Turnpike north and south from Bedford town line to Nashua city line	Structure valuable to motor vehicle travel and safety, evacuation route; portion of FE Everett Turnpike over Baboosic Brook is located in Very High Fluvial Erosion Hazard Zone.		✓			✓		✓	✓	
Highway System—Amherst Road east and west Merrimack from Continental Blvd to Amherst town line	Structure valuable to motor vehicle travel and safety, evacuation route		✓			✓		✓	✓	
Highway System—Continental Blvd east and west from DW Highway to Route 101A	Structure valuable to motor vehicle travel and safety, evacuation route		✓			✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Highway System—bridge over Baboosic Brook at Stowell Road	Structure valuable to motor vehicle travel and safety, located in 1% annual floodplain and 0.2% annual floodplain		✓		✓	✓		✓	✓	
Highway System—bridge over Baboosic Brook at Wire Road	Structure valuable to motor vehicle travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Highway System—bridge over Souhegan tributary at Amherst Road	Structure valuable to motor vehicle travel and safety		✓			✓		✓	✓	
Highway System—bridge over Baboosic Brook at Bedford Road	Structure valuable to motor vehicle travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Highway System—bridge over Baboosic Brook at Route 3	Structure valuable to motor vehicle travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Highway System—bridge over Baboosic Brook at Bean Road	Structure valuable to motor vehicle travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Highway System—Access Road near Loop Road Culvert over Baboosic Brook	Structure valuable to motor vehicle travel and safety, received Mostly Compatible rating, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	
Highway System—Bean Road Culvert over Baboosic Brook	Structure valuable to motor vehicle travel and safety, received Partially Compatible rating, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	
Highway System—Bedford Road Bridge over Baboosic Brook	Structure valuable to motor vehicle travel and safety, received Mostly Incompatible rating, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Railroad System—railroad bridge at Depot Street	Structure valuable to rail travel and safety, located in 0.2% annual floodplain		✓		✓	✓		✓	✓	
Railroad System—railroad bridge at Griffin Street	Structure valuable to rail travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Railroad System—railroad bridge over Souhegan River at Railroad Ave	Structure valuable to rail travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Railroad System—railroad bridge over Pennichuck Brook at Amherst Road	Structure valuable to rail travel and safety		✓			✓		✓	✓	
Railroad System—railroad bridge over Horseshoe Pond outlet	Structure valuable to rail travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Railroad System—railroad bridge over Pennichuck Brook	Structure valuable to rail travel and safety, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Railroad System—railroad crossing at Mast Road	Critical to access wastewater treatment		✓			✓		✓	✓	
Airport Systems—FAA Center	Structure valuable to air traffic control		✓			✓	✓	✓	✓	✓

Table 6.4—Utility Systems

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Communication—Consolidated Communications	643 Daniel Webster Hwy		✓			✓	✓	✓	✓	✓
Communications—repeater at Hutchinson Road	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications—voter at MPO	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – receiver at South Fire Station – 432 Daniel Webster Hwy	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – receiver at Reeds Ferry Fire Station – 643 Daniel Webster Hwy	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – receiver at Parker Rd Water Tower – 17 Parker Rd	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Communications – receiver at Merrimack Premium Outlets – 80 Premium Outlets Blvd	Structure valuable to communications		✓			✓	✓	✓	✓	✓
Electric—Eversource sub-station at Bedford town line	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Electric—Eversource sub-station at Star Drive	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Electric—Eversource sub-station at Front Street	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Electric—Eversource sub-station at Railroad Ave	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Electric—Eversource lines at McGraw and DW Highway	Structure valuable to utility network		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Electric—Eversource lines at 411 DW Highway (Consolidated Switching Network)	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Electric—Eversource lines at 239 DW Highway	Structure valuable to utility network		✓			✓	✓	✓	✓	✓
Water—Merrimack Village District office – 2 Greens Pond Road	Water District office		✓			✓	✓	✓	✓	✓
Water—Hutchinson Road water tower	1,000,000 gallons; structure valuable to water supply		✓			✓	✓	✓	✓	✓
Water—Turkey Hill water tower	5,000,000 gallons; structure valuable to water supply		✓			✓	✓	✓	✓	✓
Water—Parker Drive water tower	600,000 gallons; structure valuable to water supply		✓			✓	✓		✓	
Water—Merrimack Village District Well #2	Structure valuable to water supply, located in 0.2% annual floodplain	✓			✓		✓		✓	
Water—Merrimack Village District Well #3	Structure valuable to water supply,	✓					✓		✓	
Water—Merrimack Village District Well #4	Structure valuable to water supply, located in 0.2% annual floodplain	✓			✓		✓		✓	
Water—Merrimack Village District Well #5	Structure valuable to water supply, located in 0.2% annual floodplain	✓			✓		✓		✓	
Water—Merrimack Village District Well #7	Structure valuable to water supply, located in 1% annual floodplain	✓			✓		✓		✓	
Water—Merrimack Village District Well #8	Structure valuable to water supply, located in 1% annual floodplain	✓			✓		✓		✓	
Wastewater—Pennichuck Wastewater pumping station at Mast Rd	Structure valuable to sewage pumping, located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Wastewater—Thornton's Ferry sewage pumping station at Greely Rd	Structure valuable to sewage pumping, located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Wastewater—Souhegan sewage pumping station at Railroad Ave	Structure valuable to sewage pumping, located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Wastewater—sewage pump station at Pearson Road	Structure valuable to sewage pumping		✓			✓	✓	✓	✓	✓
Wastewater—sewage pump station at Burt Street	Structure valuable to sewage pumping		✓			✓	✓	✓	✓	✓
Wastewater—Pennichuck Square sewage pump station	Structure valuable to sewage pumping, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	✓
Wastewater—exposed sewer pipe over Baboosic Brook	Structure valuable to sewage treatment, located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	
Wastewater—exposed sewer pipe over Horseshoe Pond outlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	
Wastewater—Railroad Ave siphon station, inlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	
Wastewater—Railroad Ave siphon station, outlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	
Wastewater—80 Acres siphon station, inlet	Structure valuable to sewage treatment, structure located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	
Wastewater—80 Acres siphon station, outlet	Structure valuable to sewage treatment, structure located in 0.2% annual floodplain		✓		✓	✓	✓	✓	✓	
Wastewater—Mallard Point siphon station, inlet	Structure valuable to sewage treatment, structure located in 1% annual floodplain		✓		✓	✓	✓	✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Wastewater—Mallard Point siphon station, outlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	
Wastewater—Conifer Street siphon station, inlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	
Wastewater—Conifer Street siphon station, outlet	Structure valuable to sewage treatment		✓			✓	✓	✓	✓	

Table 6.5—High Potential Hazard Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Stump Pond Dam Dam #D156003 Hazard Class—L Water body—Farley Brook Owner—Town of Merrimack	Structure valuable to flood control, located in 0.2% annual floodplain		✓		✓	✓		✓	✓	
Meadow Wood Pond Dam Dam #D156045 Hazard Class—L Water body—Souhegan River tributary Owner—Town of Merrimack	Structure valuable to flood control		✓			✓		✓	✓	
DW Highway Fish Pond Dam Dam #D156002 Hazard Class—NM Water body—Dumpling Brook Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Watson Dam Dam #D156010 Hazard Class—NM Water body—Watson Brook Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Naticook Lake Dam Dam #D156011 Hazard Class—L Water body—Naticook Brook Owner—Town of Merrimack	Structure valuable to flood control, located in 1% annual floodplain		✓		✓	✓		✓	✓	
Farm Pond Dam Dam #D156013 Hazard Class—NM Water body—unnamed stream 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	Wildfire
Watson Brook Pond Dam Dam #D156014 Hazard Class—NM Water body—Watson Brook Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Recreation Pond Dam Dam #D156015 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Carriage Place Pond Dam Dam #D156020 Hazard Class—NM Water body—unnamed stream Owner—unknown	Structure valuable to flood control		✓			✓		✓	✓	
Fire Pond Dam Dam #D156021 Hazard Class—NM Water body—unnamed stream Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Standard Hardware Dam Dam #D156026 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
C & I Investment Pond Dam Dam #D156028 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Peaslee Place I Dam Dam #D156026 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Abington Heights Dam Dam #D156036 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Fidelity Det Basin 3 Dam Dam #D156040 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Fidelity Det Basin 6 Dam Dam #D156041 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Doyle Woods Det Pond Dam Dam #D156042 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Home Depot Det Pond Dam Dam #D156044 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Wasserman Det Pond Dam Dam #D156046 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Merrimack Outlet Det 3 Dam Dam #D156047 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Merrimack Outlet Det 4 Dam Dam #D156048 Hazard Class—NM Water body—runoff Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	
Land of Goshen LLC Dam Dam #D156049 Hazard Class—NM Water body—unnamed Owner—privately held	Structure valuable to flood control		✓			✓		✓	✓	

**The field assessment protocol used to determine fluvial erosion hazard zones was only able to determine potential structural vulnerability in culverts and cannot be applied to dams.*

Table 6.6—Hazardous Materials Facilities

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Saint Gobain Performance Plastics – 701 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals onsite include #2 Fuel oil, Sulfuric Acid (batteries), Dupont Kevlar and Nylon Weave Fabric, PTFE dispersion in water, and Transformer oil.		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Kollsman/Elbit Systems – 220 Daniel Webster Hwy.	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include liquid Nitrogen.		✓			✓	✓	✓	✓	✓
BAE Systems – 130 & 144 Daniel Webster Hwy	Chemicals on site include #2 Fuel oil, liquid Nitrogen, propane, Sulfuric Acid, Transformer oil, Sodium Chloride, Silica sand, Diesel Fuel, and Lead.		✓			✓	✓	✓	✓	✓
LAW Logistics – 59 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Polythersulone, Lead, Sulfuric Acid (batteries), Polysulfone, PVC Solvin, Sabric Resin, Zircon sand, Vanadium pentoxide, Paraffin Wax, Tabular Alumina, Sicotrans Red, Phthalocyanine Green Asaflow, Mulcoa 60 & 47, Lecene LC, Cellulose Diacetate, Carbon Black, Alumina Trihydrate, and Alathon M6030.		✓			✓	✓	✓	✓	✓
Eversource Reeds Ferry Substation (Merrimack 3) – 14 Twin Bridge Rd	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Transformer oil.		✓			✓	✓	✓	✓	✓

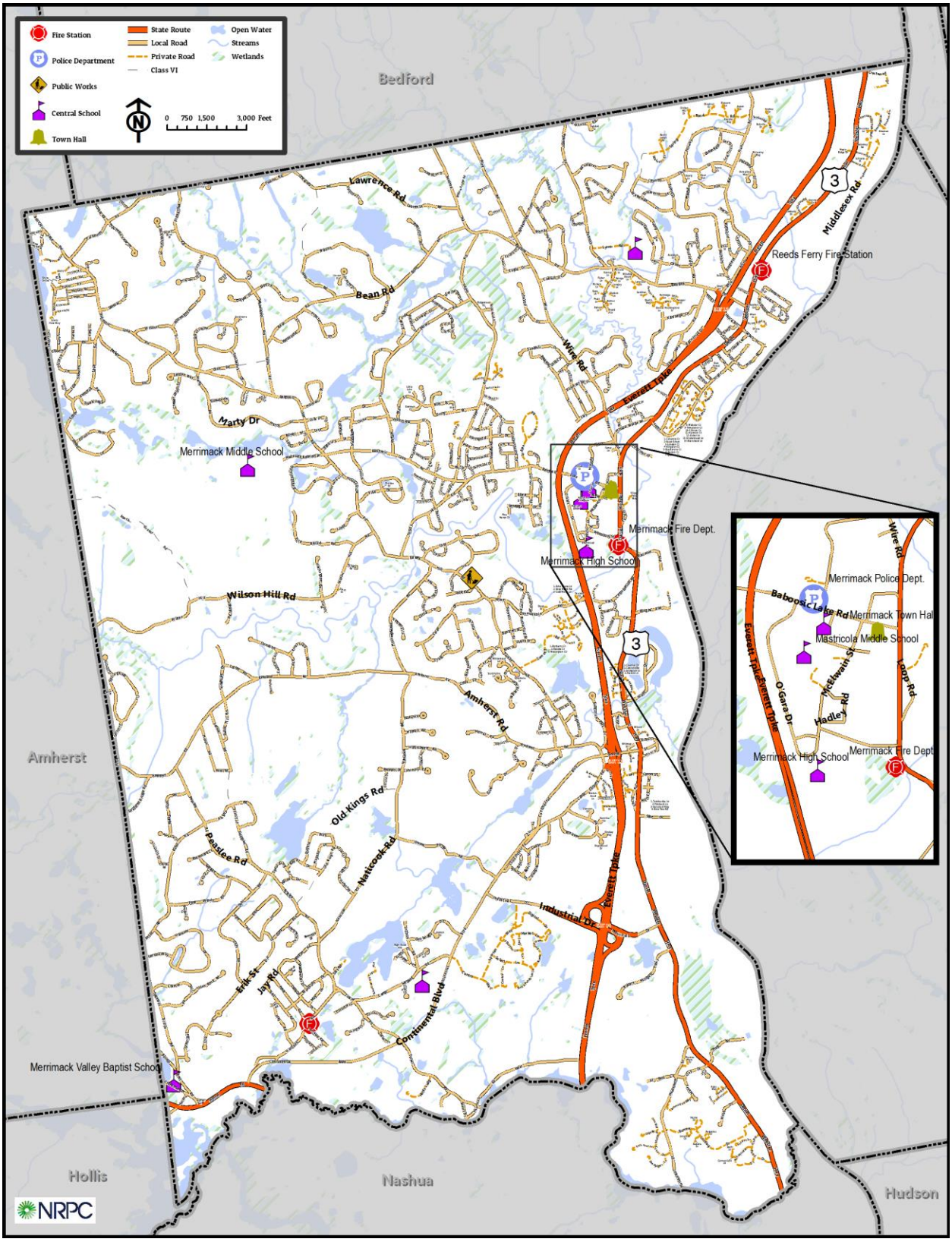
Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Eversource Merrimack Distribution Substation (Merrimack 2) – 153 Depot St	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Transformer oil.		✓			✓	✓	✓	✓	✓
Eversource Busch Substation (Merrimack 1) – 221 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Transformer oil.		✓			✓	✓	✓	✓	✓
Eversource Thornton Distribution Substation – 239 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Transformer Oil.		✓			✓	✓	✓	✓	✓
Eversource North Merrimack Transmission Substation – 750 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Lead and Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓
Eversource Eagle Transmission Substation – 23 Star Drive	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Lead and Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Eversource GT Solar – 243 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Petroleum Electrical Insulating oil.		✓			✓	✓	✓	✓	✓
Home Depot – 721 Milford Road	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓
JCI Jones Chemicals Inc— 40 Railroad Ave	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Anhydrous Ammonia, Sodium Bisulfate solution, Sulfur Dioxide, and Sodium Hypochlorite. Located in 0.2% annual floodplain.		✓		✓	✓	✓	✓	✓	✓
US Cellular Congress Park MTSO – 19 Columbia Circle	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Diesel Fuel, Lead, and Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Colt Refining Inc—12A Star Drive	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Calcium Hydroxide, Copper, Lead, Potassium Cyanide, Tin, Silver, and Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓
FAA Boston TRACON – 25 Robert Milligan Pkwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Diesel Fuel and Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓
Eastern Propane Depot Street Bulk – Depot St	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Propane.		✓			✓	✓	✓	✓	✓
Eastern Propane Merrimack Commons Bulk 1 – 515 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Propane.		✓			✓	✓	✓	✓	✓
Consolidated Merrimack – 417 DW Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓

Facility Type and Name	Content Vulnerability	Drought	Earthquake	Extreme Temperatures	Flooding	Severe Wind	Lightning	Severe Winter Weather	Tornado	Wildfire
Student Transportation of America (STA) Terminal – 574 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Sulfuric Acid (batteries).		✓			✓	✓	✓	✓	✓
Rochette's Oil Terminal – 658 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Fuel oil.		✓			✓	✓	✓	✓	✓
Fidelity Investments – 1 Spartan & 2 Contra Way	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Daiflon, Diesel Fuel, Halon 1301, HCFC-123, Sulfuric Acid (batteries), Mineral Oil Dielectric fluid, #2 Fuel oil, Propane, and Road Salt.		✓			✓	✓	✓	✓	✓
Huntsmen Chemical – 57 Daniel Webster Hwy	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include liquid nitrogen.		✓			✓	✓	✓	✓	✓
Verizon Wireless – 26 Columbia Circle	Chemical and hazardous materials release could have impacts on public health and environmental quality. Chemicals on site include Sulfuric Acid (batteries)		✓			✓	✓	✓	✓	✓

Merrimack Critical Facilities Map



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 in 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 May 2015 and lasting through April 2017. During that time, Merrimack experienced drought levels from USDA D0 (Abnormally Dry) to USDA D3 (Extreme Drought).

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.

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 Merrimack resulting from drought. Instead, the Hazard Mitigation Team estimated the percentage of land in Merrimack vulnerable to drought and the percentage of the population vulnerable to drought as a quantitative measure of this hazard's impact.

Total Acres of Land in Merrimack	Total Acres of Agricultural Land in Merrimack	% of Land in Merrimack Vulnerable to Drought
21,376	0	0%

% of population with Public Drinking Water in	% of population with Private Well Water in	Water Utility	Primary Water Source	Secondary Water Source
90.4%	9.6%	Pennichuck	Public drinking Water	Private Wells

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Drought Hazard Area	Percentage of this type of Critical Facilities in Drought Hazard Area
General Occupancy	42	8	19%
Essential Facilities	18	0	0%
Transportation	23	0	0%
Utility System	40	6	15%
High Potential Hazard	22	0	0%
Hazardous Materials	24	0	0%

Earthquake

An earthquake is a sudden and violent shaking of the ground, sometimes causing great destruction, as a result of movements within the earth's crust or volcanic action. 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, 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 tolls 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 Merrimack, however, one could occur.

Earthquake Hazard Loss Estimate

Step 1. Determine potential earthquake strength in Merrimack

- US Seismic Hazard, 2% in 50 years PGA is 0.2 to 0.3(g) in Merrimack
- *Source: USGS NH Seismic Map 2014*

Step 2. Determine percent building damage ratio to single family residence from PGA (g) 0.25 earthquake

- Wood Frame Construction with Low general seismic design level = 4.6% building damage
- *Source: FEMA Identifying Hazards and Estimating Losses, pg. 4-17*

Step 3. Determine percent of structures in Merrimack that would be damaged by PGA (g) 0.25 earthquake

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

Step 4. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

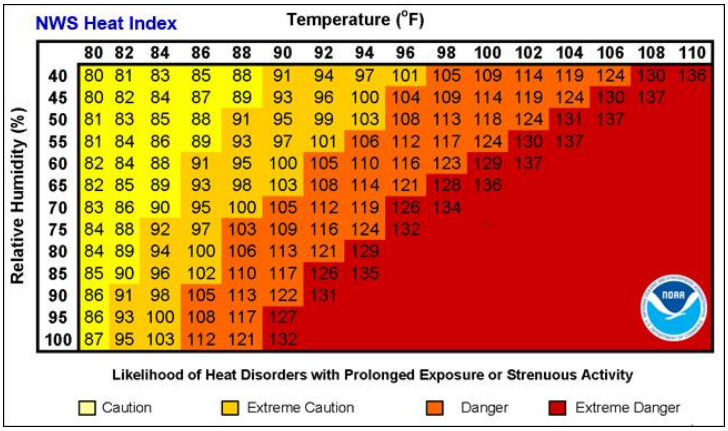
Step 5. Determine total loss from PGA (g) 0.25 Earthquake

- 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 = $4,530,000,000.00 * 0.01 * 0.046 = $2,083,800.00
- Total Loss from Earthquake = $4,530,000,000.00 * 0.05 * 0.046 = $10,419,000.00
- **$2,083,800.00 to $10,419,000.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Earthquake Hazard Area	Percentage of this type of Critical Facilities in Earthquake Hazard Area
General Occupancy	42	35	83%
Essential Facilities	18	18	100%
Transportation	23	23	100%
Utility System	40	34	85%
High Potential Hazard	22	22	100%
Hazardous Materials	24	24	100%

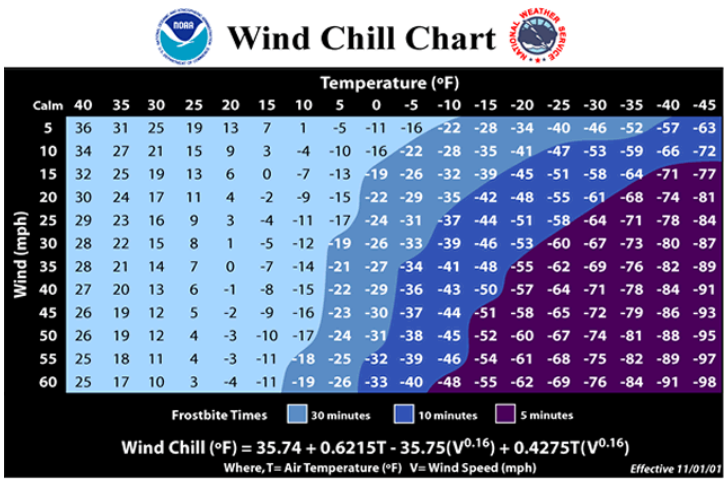
Extreme Temperatures

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 Merrimack.



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 ehat 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.



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 Merrimack resulting from extreme temperatures. Though the entire Merrimack 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

Special flood areas are defined as the 100-year or 1% annual floodplain. These are areas with a 1% annual chance of flood or the probability of one flood every 100 years. Special flood areas also include the 500-year or 0.2% annual floodplain. In these areas there is a 0.2% annual chance of flood, or the probability of one flood every 500 years. Special flood areas are the most likely places to experience flooding in a municipality.

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 4.23% of Merrimack; 3.48% of Merrimack is located in 1% annual floodplain and 0.75% of Merrimack is located in the 0.2% annual floodplain. Floodplains in Merrimack are primarily located around the Merrimack River, Souhegan River, Baboosic Brook, Naticook Brook, Baboosic Lake, Greens Pond, and Pennichuck Brook and associated ponds/wetlands along the southern municipal border.

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 it if 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.

Merrimack has 21 Class NM dams (Non-Menace), 3 Class L dams (Low hazard potential), 0 Class S dams (Significant hazard potential), and 0 Class H dams (High hazard potential). See Table 6.5 for all Dams and Dam locations in Merrimack.

All of Merrimack's Dams have either a non-menacing or low hazard classification, which means that they have a relatively low hazard potential because of their size and location. Failure or misoperation of any number of these dams would not result in an economic loss to structures and property and no probable loss of lives. No structures or areas specifically would be impacted in Merrimack from failure of any of the dam locations.

Three of Merrimack's Dams have a high hazard classification, which could potentially result in loss of life in the case of structural failure or misoperation. However, to date there is no history of dam failure in Merrimack making it a rare occurrence and minimal risk.

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 Merrimack located in the floodplain

- 289 structures located in 1% floodplain
- 540 structures located in 0.2% floodplain
- *Source: Nashua Regional Planning Commission http://data-nashuarpc.opendata.arcgis.com/datasets/98afc8bbe9a14c5494c87cc92480b4b1_0*

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

- Average assessed value of all structures in Merrimack = $617,629.00
- Total number of structures in Merrimack located in 1% floodplain = 289
- Total assessed value of all structures in Merrimack in 1% floodplain = $617,629.00 * 289 = $178,494,781.00
- Total assessed value of all structures in Merrimack in 1% floodplain = $178,494,781.00
- *Source: Merrimack Hazard Mitigation Team calculations based on Merrimack Assessing data & NRPC GIS data*

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

- Total Loss from Flooding = Total Assessed Value of all structures in 1% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = $178,494,781.00 * 0.15 = **$26,774,217.15**
- Total Loss from 2-foot flood depth = $178,494,781.00 * 0.20 = **$35,698,956.20**
- Total Loss from 3-foot flood depth = $178,494,781.00 * 0.23 = **$41,053,799.63**
- Total Loss from 4-foot flood depth = $178,494,781.00 * 0.28 = **$49,978,538.68**

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

- Average assessed value of all structures in Merrimack = $617,629.00
- Total number of structures in Merrimack located in 0.2% floodplain = 540
- Total assessed value of all structures in Merrimack in 0.2% floodplain = $617,629.00 * 540
- Total assessed value of all structures in Merrimack in 0.2% floodplain = $333,519,660.00
- *Source: Merrimack Hazard Mitigation Team calculations based on Merrimack 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 structures in 0.2% Floodplain * Percent Building Damage Ratio
- Total Loss from 1-foot flood depth = $333,519,660.00 * 0.15 = **$50,027,949.00**
- Total Loss from 2-foot flood depth = $333,519,660.00 * 0.20 = **$66,703,932.00**
- Total Loss from 3-foot flood depth = $333,519,660.00 * 0.23 = **$76,709,521.80**
- Total Loss from 4-foot flood depth = $333,519,660.00 * 0.28 = **$93,385,504.80**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	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	42	4	10%	3	7%
Essential Facilities	18	0	0%	2	11%
Transportation	23	12	52%	1	4%
Utility System	40	6	15%	7	18%
High Potential Hazard	22	2	9%	1	4%
Hazardous Materials	24	0	0%	0	0%

Severe Wind Hazard Loss Estimate

For the purpose of this plan, the severe wind hazard is referring to winds generated from hurricanes and tropical storms. 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. Hurricane season in the Atlantic runs from June 1st to November 30th.

According to the New Hampshire State Hazard Mitigation Plan (2018) tropical cyclones with maximum sustained winds of less than 39 mph are called tropical disturbances. Once the tropical cyclone reaches winds of at least 39 mph, they are typically called a tropical storm and assigned a formal name. If the winds reach 74 mph or greater, they are upgraded and called a hurricane. A major hurricane is considered a tropical cyclone with maximum sustained winds of greater than 111 mph.

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: Merrimack Hazard Mitigation Team*

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

- 5% of structures estimated to be damaged by Category 3 hurricane
- *Source: Merrimack Hazard Mitigation Team (no historical data on hurricane damage in Merrimack)*

Step 3. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

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 = $4,530,000,000.00 * 0.05 * 0.2 = **$45,300,000.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Severe Wind Area	Percentage of this type of Critical Facilities in Hurricane Hazard Area
General Occupancy	42	35	83%
Essential Facilities	18	18	100%
Transportation	23	23	100%
Utility System	40	34	85%
High Potential Hazard	22	22	100%
Hazardous Materials	24	24	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 few, but two or three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
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. Rian is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	9-15

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: Merrimack Hazard Mitigation Team*

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

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

Step 3. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

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 = $4,530,000,000.00 * 0.0025 * 0.05 = **$566,250.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Lightning Hazard Area	Percentage of this type of Critical Facilities in Lightning Hazard Area
General Occupancy	42	42	100%
Essential Facilities	18	18	100%
Transportation	23	4	17%
Utility System	40	40	100%
High Potential Hazard	22	0	0%
Hazardous Materials	24	24	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 encounters 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 lasing on a few hours. Roads and bridges may become slick and hazardous.
- 2—scattered utility interruptions expected, typically lasing 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 lasing 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 lasing 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, 2015, 2017 and 2018. 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.

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: Merrimack Hazard Mitigation Team*

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

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

Step 3. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

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 = $4,530,000,000.00 * 0.01 * 0.05 = **$2,265,000.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	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	42	35	83%
Essential Facilities	18	18	100%
Transportation	23	23	100%
Utility System	40	40	100%
High Potential Hazard	22	22	100%
Hazardous Materials	24	24	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.

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: Merrimack Hazard Mitigation Team*

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

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

Step 3. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

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 = $4,530,000,000.00 * 0.01 * 0.5 = **$22,650,000.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Tornado Hazard Area	Percentage of this type of Critical Facilities in Tornado Hazard Area
General Occupancy	42	35	83%
Essential Facilities	18	18	100%
Transportation	23	23	100%
Utility System	40	40	100%
High Potential Hazard	22	22	100%
Hazardous Materials	24	24	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.

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: Merrimack Hazard Mitigation Team*

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

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

Step 3. Determine total assessed value of structures in Merrimack

- Total Assessed Value of all Structures in Merrimack = $4,530,000,000.00
- *Source: Merrimack Assessing Department (2020)*

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 = $4,530,000,000.00 * 0.005 * 0.2 = **$4,530,000.00**

Critical Facility Type	Total Number of this type of Critical Facilities in Merrimack	Number of this type of Critical Facilities in Wildfire Hazard Area	Percentage of this type of Critical Facilities in Wildfire Hazard Area
General Occupancy	42	35	83%
Essential Facilities	18	18	100%
Transportation	23	1	4%
Utility System	40	33	83%
High Potential Hazard	22	0	0%
Hazardous Materials	24	24	100%

Section 3.6 ~ Overall Summary of Vulnerability

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

Table 7.1—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 Temperatures, 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—90.4% of Merrimack population on public drinking water, 9.6% of Merrimack population on private well water. Loss of water for fire protection. Increased risk of fire.	General Occupancy = 19% Essential Facilities = 0% Transportation = 0% Utility Systems = 15% High Potential Hazard = 0% Hazardous Materials = 0%	0 acres of agricultural land (0% 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	Structural damage or collapse of buildings. Damage or loss of infrastructure,	General Occupancy = 83% Essential Facilities = 100%	1-5%	**$2,083,800 to $10,419,000**

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
	• High Potential Hazard • Hazardous Materials	including roads, bridges, railroads, power and phone lines, municipal communications, radio system. Loss of water for fire protection. Risk to life, medical surge.	Transportation = 100% Utility Systems = 85% High Potential 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 = 0% Essential Facilities = 0% Transportation = 0% Utility Systems = 0% High Potential Hazard = 0% Hazardous Materials = 0%	0%	$0
Flooding	• General Occupancy • Essential Facilities • Transportation • Utilities • High Potential Hazard	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.	General Occupancy = 17% in floodplain Essential Facilities = 11% in floodplain Transportation = 56% susceptible to flooding Utility Systems = 33%	289 structures in 1% annual floodplain 540 structures in 0.2% annual floodplain	Loss in 1% floodplain: 1-foot flood = **$26,774,218** 2-foot flood = **$35,698,957** 3-foot flood = **$41,053,800** 4-foot flood = **$49,978,539**

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
		Isolation of neighborhoods resulting from flooding.	susceptible to flooding High Potential Hazard = 13% in floodplain Hazardous Materials = 0% in 1 floodplain		Loss in 0.2% floodplain: 1-foot flood = **$50,027,949** 2-foot flood = **$66,703,932** 3-foot flood = **$76,709,522** 4-foot flood = **$93,385,505**
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 = 83% Essential Facilities = 100% Transportation = 100% Utility Systems = 85% High Potential Hazard = 100% Hazardous Materials = 100%	5%	**$45,300,000**
Lightning	• General Occupancy	Smoke and fire damage to structures.	General Occupancy = 100%	0.5%	**$566,250**

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
	• Essential Facilities • Transportation • Utility System • High Potential Hazard • Hazardous Materials	Disruption to power lines and municipal communications. Damage to critical electronic equipment. Injury or death to people involved in outdoor activity.	Essential Facilities = 100% Transportation = 17% Utility Systems = 100% High Potential Hazard = 0% Hazardous Materials = 100%		
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 = 83% Essential Facilities = 100% Transportation = 100% Utility Systems = 100% High Potential Hazard = 100% Hazardous Materials = 100%	1%	**$2,265,000**
Tornado/Downburst	• General Occupancy • Essential Facilities • Transportation • Utility System • High Potential Hazard • Hazardous Materials	Wind damage to structures and trees. Damage or loss of infrastructure, including roads, bridges, railroads, power and phone lines, municipal	General Occupancy = 83% Essential Facilities = 100% Transportation = 100%	1%	**$ 22,650,000**

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
		communications, radio system. Environmental hazards resulting from damage. Medical surge.	Utility Systems = 100% 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 = 83% Essential Facilities = 100% Transportation = 4% Utility Systems = 83% High Potential Hazard = 0% Hazardous Materials = 100%	0.5%	**$ 4,530,000**

Table 7.2—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
General Occupancy	42	8	35	0	7	35	42	35	35	35
Essential Facilities	18	0	18	0	2	18	18	18	18	18
Transportation	23	0	23	0	13	23	4	23	23	1
Utility	40	0	24	0	13	34	40	40	40	33
High Hazard	22	0	22	0	3	22	0	22	22	0
Hazardous Materials	24	0	24	0	0	24	24	24	24	24

Section 3.7 ~ National Flood Insurance Program

The Town of Merrimack 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). Merrimack joined the NFIP on July 16, 1979. The Town's initial Flood Hazard Boundary Map was identified on April 12, 1974 and its initial Flood Insurance Rate Map was identified on July 16, 1979. The current effective map date is September 25, 2009.

Merrimack has 95 NFIP policies in force and $22,316,200 of insurance in force. There have been 51 paid losses totaling $1,205,852. Merrimack has 8 repetitive loss properties with repetitive loss payments totaling $818,835. All repetitive loss structures in Merrimack have been single family residential.

As a participant in the NFIP, communities must agree to adopt a floodplain management ordinance and enforce the regulations found in the ordinance. Merrimack has adopted the "Flood Hazard Conservation District," found in Section 2.02.8 of the Merrimack Zoning Ordinance and Building Code. The Flood Hazard Conservation District is determined to be the flood hazard areas designated by the Federal Insurance Administration, through on-site mapping of elevations in the flood hazard areas of the Town of Merrimack, dated September 25, 2009. The Flood Hazard Conservation District is shown in the Flood Insurance Study and on the Flood Insurance Rate Maps of Hillsborough County, NH. In all cases where the Flood Hazard Conservation District is super-imposed over another zoning district in the Town, the district whose regulations are the more restrictive shall apply.

The purpose of the Flood Hazard Conservation District is:

- To prevent unwise use of lands susceptible to flooding within Special Flood Hazard Areas; to promote sound orderly development of the Town's resources; and to reduce future flood damage, financial loss, suffering, and loss of life.
- To prevent the development of residential, commercial, and industrial buildings and other land uses in Special Flood Hazard Areas, which would impede the natural water flow or result in an increase in flood levels during flood periods.
- To prevent the destruction and inappropriate use of flood-prone land.
- To prevent unnecessary or excessive expenses on the part of the Town to provide and maintain essential services and utilities which arise because of inharmonious use of lands within Special Flood Hazard Area.
- To prevent culverting, damming, dredging or obstructing such as to impede or obstruct natural water flow during its maximum flood level.
- To prevent the building of public facilities such as schools, hospitals, fire, police departments, or other similarly related agencies except those necessary for the public health, safety, and welfare, whereupon such uses shall otherwise remain in full conformance with applicable Federal requirements.

To demonstrate the Merrimack'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**
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	• Emergency Services Protection	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.	• Prevention • Natural Resources Protection	• Flooding • Erosion • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).	• Prevention	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM.	• Public Information	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard

			• Hazardous Materials
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	• Public Information	• 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 Merrimack 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.

- Objective2.1—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 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
National Flood Insurance Program Mitigation Actions			
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	• Emergency Services Protection	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.	• Prevention • Natural Resources Protection	• Flooding • Erosion • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).	• Prevention	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials

Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM.	• Public Information	• Flooding • Hurricane	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	• Public Information	• Flooding	• General Occupancy
2015 Mitigation Actions			
Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.	• Prevention • Public Education • Natural Resources Protection	• Drought	• General Occupancy • Utility System
Work with FEMA to voluntarily remove structures from flood-prone areas to minimize	• Prevention	• Flooding	• General Occupancy • Essential Facilities • Utility Systems • Hazardous Materials
Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.	• Structural	• Flooding • Fluvial Erosion • Hurricane	• Transportation Systems
Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.	• Property Protection	• Severe Thunderstorm	• General Occupancy • Essential Facilities • Utility Systems • Hazardous Materials
Enforce the International Building Code (IBC) and	• Prevention	• Earthquake • Flooding	• General Occupancy

International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	• Property Protection	• Hurricanes • Severe Winter Weather	• Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe thunderstorms, and severe winter weather.	• Public Education	• Severe Thunderstorm • Severe Winter Weather • Tornado • Wildfire	• General Occupancy • Essential Facilities • Transportation Systems • Utility Systems • High Potential Hazard • Hazardous Materials
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.	• Property Protection	• Severe Winter Weather	• Essential Facilities
Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	• Prevention	• Hurricane • Tornado • Severe Winter Weather	• Transportation Systems • Utility Systems
Additional Mitigation Actions			
Monitor water supply and drought conditions. Utilize NH Division of Forest and Lands reports and consult the New Hampshire Drought Management Team (DMT) and the State Drought Management	• Natural Resources Protection	• Drought	• General Occupancy • Essential Facilities

Plan to monitor drought indicators.			
Create a database to track those individuals at high risk of death during hazard events, such as the elderly, sick, and homeless. Coordinate with the Emergency Management Director to conduct in-person outreach to these individuals to ensure they are adequately protected from the impacts of hazard events, including severe winter weather and extreme temperatures.	• Prevention • Public Information	• Extreme Temperatures • Severe Winter Weather	• Human lives
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 Nixle, community access TV, Merrimack website, and social media.	• Public Information • Prevention • Natural Resource Protection	• Drought • Earthquake • Extreme Temperatures • Flooding • Lightning • Severe Wind • Severe Winter Weather • Tornado • Wildfire	• General Occupancy • Human lives
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.	• Natural Resource Protection • Property Protection	• Wildfire	• General Occupancy

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
Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	• This action helps municipalities to share resources and decreases the burden on any one community. • This action helps the Town to know what resources are available for use in an emergency. • This action has the potential to reduce flood related economic losses.	• Responding to a mutual aid call in a neighboring community could take away resources from Merrimack. • Mutual aid calls for non-federally declared disasters would not be reimbursed by FEMA. • Percentage of existing Fire Department Emergency Management budget (source: 2020-21 Operating Budget)
Incorporate flood mitigation into local planning. Revise/adopt subdivision regulations and erosion control regulations to improve floodplain management in Merrimack.	• This action would be most beneficial to residents in flood-prone areas of Town. • This action has the potential to reduce flood related economic losses.	• There are potential economic costs associated with limiting where development can go. • Percentage of existing Planning/Zoning Administrator Wages Line Item (source: 2020-21 Operating Budget)
Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).	• This action would be most beneficial to residents in flood-prone areas of Town. • This action has the potential to reduce flood related economic losses.	• Minimal, part of normal town operations (source: 2020-21 Operating Budget, Code Enforcement)
Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge	• Educate residents, builders, and other professionals about NFIP • Reduce property loss costs	• Minimal, part of normal town operations • $0 additional costs, percentage of existing

Mitigation Action	Likely Benefits	Likely Costs
of how to read and interpret the FIRM.		Code Enforcement budget (source: 2020-21 Operating Budget)
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	• Educate residents, builders, and other professionals about NFIP • Reduce property loss costs associated with flooding	• Minimal, part of normal town operations (source: 2020-21 Operating Budget, Code Enforcement Clerical wages)
Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.	• If followed, it would help to reduce the impacts of drought.	• The effectiveness of this action depends on the ability of the Town to enforce it. • This action is costly to enforce • $4,400 Advertising & Public Information; $500 Public Education (source: 2020-21 Merrimack Village District budget)
Work with FEMA to voluntarily remove structures from flood-prone areas to minimize	• This action would avoid future flood losses to the properties that are moved. • Decrease in emergency response costs.	• Loss of tax revenue from the property. • FEMA covers the administrative costs associated with this action. • $0—no direct costs to Town, town only facilitates process
Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.	• Taking this action helps reduce the risk of major repair costs that might occur if no action were taken. • Solves the problem of bridge and roadway flooding and ensures safe, reliable transportation.	• Very costly action to implement • $30,000 design; $170,000 construction (Source: 2018- 2025 CIP, Capital Reserve Fund)
Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.	• Reduced inconvenience and loss associated with a shutdown of critical facilities due to lightning damage	• $200 per department (source: 2020-21 Operating Budget—Office Equipment budget)

Mitigation Action	Likely Benefits	Likely Costs
Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	• 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. • Percentage of existing Building Inspector Budget (source: 2020-21 Operating Budget)
Conduct outreach and education programs to increase awareness of earthquakes, extreme temperatures (including carbon monoxide risks), hurricanes, severe thunderstorms, and severe winter weather.	• 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. • Percentage of Fire Department Education and Training Budget (source: 2020-21 Operating Budget)
Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.	• Protects critical municipal buildings and avoids future losses • Reduces liability to Town	• $2,500 per building (source: 2020-21 Operating Budget, Buildings and Grounds Maintenance)
Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	• Reduced inconvenience and loss associated with a shutdown of critical facilities. • Decreased burden on vulnerable populations.	• Tree removal may be incompatible with local aesthetics • Burying power lines may be cost prohibitive • Buried power lines would only benefit those living in areas with underground utilities. • $1,200 per large tree for removal (source: Merrimack Highway Dept. Tree Service budget) • $5,000 for preliminary cost benefit review of power line burial (source: 2020-21 Operating Budget, Planning/Zoning Administrator Wages line item)
Monitor water supply and drought conditions. Utilize NH Division of Forest and Lands	• If followed, it would help to reduce the impacts of drought.	• $0 additional costs, percentage of existing

Mitigation Action	Likely Benefits	Likely Costs
reports and consult the New Hampshire Drought Management Team (DMT) and the State Drought Management Plan to monitor drought indicators.		Merrimack Village District budget
Create a database to track those individuals at high risk of death during hazard events, such as the elderly, sick, and homeless. Coordinate with the Emergency Management Director to conduct in-person outreach to these individuals to ensure they are adequately protected from the impacts of hazard events, including severe winter weather and extreme temperatures.	• Helps vulnerable populations • Voluntary participation	• May be difficult to get personal contact information • Voluntary participation means not everyone would be covered • $750 annually (source: 2020-21 Operating Budget, Fire Department Emergency Management)
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 Nixle, community access TV, Merrimack website, and social media.	• 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 existing Fire Department Emergency Management budget (source: 2020-21 Operating Budget)
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.	• 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 manmade fire related hazards.	• Opinions vary about wildfire management, so this action could cause social and political tension. • Enforcement of burn permits can be costly. • $0 additional costs, percentage of existing Fire Dept. and Public Works budgets (source: 2020-21 Operating Budget)

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?

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

Table 11—STAPLEE Analysis

Mitigation Action: Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	There are no social impacts associated with this action. Enforcement would apply evenly across all applicable buildings, including new construction, major renovations, and changes of use.	0	3
Technical	This action is effective at avoiding and reducing future losses and it mitigates the impacts of these hazards.	0	3
Administrative (including responsible party)	Merrimack has the capability to implement this action. Responsibility would fall under the Building & Code Enforcement Division.	0	3
Political	There is public support for this action. Concerns may exist among some property owners who would be directly impacted.	-1	2
Legal	Merrimack has adopted these codes and has the legal authority to enforce them.	0	2
Economic (including direct cost)	There would be no additional costs associated with enforcing building codes, as it falls under the existing Code Enforcement budget. This action could have a positive economic impact by reducing the number of emergency response calls.	0	2
Environmental	This action is environmentally beneficial if residents pay attention to and comply with reduced water consumption measures.	0	2
Subtotal		**-1**	**17**
Total		**16**	
Priority		**1**	

Mitigation Action: Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action would not unfairly affect any segment of the population or disrupt established neighborhoods. It is generally compatible with community values that understand trees need to be trimmed for road maintenance and public safety, although all residents do not agree with this.	-1	3
Technical	This action would be effective in avoiding or reducing future losses. It is very likely that a severe winter storm or severe wind event will occur and impact power lines. It would not create more problems than it solves, and it solves the problem rather than only a symptom. Fewer trees directly along the road would also improve drainage, reduce rood systems in the roadway, and allow more sunlight to melt the snow, all resulting in better road conditions.	0	3
Administrative (including responsible party)	Merrimack has the capacity to implement this action. The Merrimack Public Works department and Eversource would be the responsible parties. The Planning Department is responsible for considering the costs/benefits of burying power lines.	0	3
Political	In general, there is political support for this action, although there may be some opposition to tree trimming along designated scenic roads. Developers may not support this action if it significantly increases their costs.	-1	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.	-1	3
Economic (including direct cost)	Some costs associated with this action would be borne by Eversource. 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 benefits of a more resilient electrical infrastructure far outweigh the costs of this action.	-1	3
Environmental	This action would positively impact the environment by improving road drainage and decreasing the need to use ice melting agents.	0	2
Subtotal		**-4**	**20**
Total		**16**	
Priority		**1**	

Mitigation Action: 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.			
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.	0	3
Technical	This action helps to avoid or reduce future losses. Wildfire poses danger during dry periods, which Merrimack has been experiencing in recent years. 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)	Merrimack has the capability to implement this action, although it poses an additional burden on the Fire Dept., particularly for enforcement of burn permits. Eversource is responsible for removing underbrush and standing deadwood under power lines.	-2	3
Political	There is public and political support for this action.	0	2
Legal	Merrimack has the legal authority to implement this action.	0	3
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 Merrimack 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	3
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	3
Subtotal		**-4**	**20**
Total		**16**	
Priority		**1**	

Mitigation Action: Create a database to track those individuals at high risk of death during hazard events, such as the elderly, sick, and homeless. Coordinate with the Emergency Management Director to conduct in-person outreach to these individuals to ensure they are adequately protected from the impacts of hazard events, including severe winter weather and extreme temperatures.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This is a voluntary program, so it would not affect any one segment of the population. Helping vulnerable populations is compatible with community values.	0	3
Technical	This action is only effective at avoiding or reducing future losses if residents voluntarily participate in it.	0	2
Administrative (including responsible party)	The Town has the capability to implement this action if information is voluntarily provided by residents. The Merrimack Fire Chief and Emergency Management are responsible for implementing this action.	0	3
Political	There is political support for this action.	0	2
Legal	The Town has the authority to implement this action and no enabling legislation is necessary. Participation in this program in entirely voluntary.	0	2
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs.	0	3
Environmental	This action would not impact the environment.	0	0
Subtotal		**0**	**15**
Total		**15**	
Priority		**2**	

Mitigation Action: 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 Nixle, community access TV, Merrimack website, and social media.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action does not unfairly affect any one segment of the population. It is available to all Merrimack residents.	0	2
Technical	This action would help to decrease risk and avoid future loss.	0	2
Administrative (including responsible party)	Merrimack has the capability to implement this action. This action would be the responsibility of Emergency Management. It would be implemented through the Fire and Police Departments using a combination of Nixle, community access TV, the Town website, and social media.	0	2
Political	There is public support to implement and maintain this action.	0	3
Legal	Merrimack has the legal authority to implement this action.	0	1
Economic (including direct cost)	There are no additional costs associated with this project since it is part of the existing Emergency Management budget.	0	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	2
Subtotal		**0**	**13**
Total		**13**	
Priority		**3**	

Mitigation Action: Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action will 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	3
Administrative (including responsible party)	Merrimack has the capacity to implement this action. The Fire Department would be the responsible party to implement the action. It can be accomplished in a timely manner, although it may occur during periods of high demand for emergency response calls.	-1	2
Political	There is public support to implement and maintain this action. The political leadership is also willing to support it.	0	2
Legal	The community has the authority to implement the action and no enabling legislation is necessary. The community would be liable for a lack of action that resulted in the collapse of a roof on a municipal building.	0	3
Economic (including direct cost)	The cost for this action would be covered by existing building and grounds maintenance budgets. If no action was taken and the roof collapsed on any of these buildings, the economic losses would be significant.	-1	2
Environmental	This action will not impact the environment.	0	0
Subtotal		**-2**	**14**
Total		**12**	
Priority		**4**	

Mitigation Action: Monitor water supply and drought conditions. Utilize NH Division of Forest and Lands reports and consult the New Hampshire Drought Management Team (DMT) and the State Drought Management Plan to monitor drought indicators.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	There are no known social issues associated with this action.	0	2
Technical	This action would help to avoid or reduce future losses. It has more potential to solve symptoms related to drought rather than the underlying problem itself. It will not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	Merrimack Village District Water Works is the responsible party.	0	2
Political	This action is consistent with normal Merrimack Village District Water Works operations and does not impose additional economic costs.	-2	2
Legal	There are no legal issues associated with this action.	0	2
Economic (including direct cost)	This action is consistent with normal Town Health Department operations and does not impose additional economic costs.	0	2
Environmental	This action is environmentally beneficial if residents pay attention to and comply with reduced water consumption measures.	0	2
Subtotal		**-2**	**14**
Total		**12**	
Priority		**4**	

Mitigation Action: Protect critical emergency management facilities and equipment from lightning damage. Install and maintain 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 Merrimack.	0	1
Administrative (including responsible party)	Merrimack 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	Merrimack has the authority to implement this action.	0	3
Economic (including direct cost)	The cost of $1,000-$5,000 per critical facility for lightning protection devices would come out of the Merrimack 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		**5**	

Mitigation Action: Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action is compatible with present and future community values, including ensuring safe, reliable transportation. This action could be disruptive to residents living near construction. It may also affect property owners if easements are taken.	-1	3
Technical	This action solves the problem of bridge and roadway flooding. Steps are also taken to ensure all bridges upstream are at proper elevation to avoid backups.	0	3
Administrative (including responsible party)	Merrimack has the capability to implement and maintain this action. Evaluations of roadways occur annually to ensure it is accomplished in a timely manner. The Public Works department is the responsible party.	-3	2
Political	There is public and political support to implement and maintain this action.	0	2
Legal	Merrimack has the legal authority to implement this action and no enabling legislation is needed.	0	0
Economic (including direct cost)	This action is very costly to implement. It does fit into the existing Capital Improvements budget.	-3	3
Environmental	This action is beneficial to the environment by reducing flooding and road washout.	0	3
Subtotal		**-7**	**16**
Total		**9**	
Priority		**6**	

Mitigation Action: Incorporate flood mitigation into local planning. Revise subdivision regulations and to improve floodplain management in Merrimack.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action would impact property owners subject to the revised subdivision regulations. It would have a positive social impact on the community by reducing flooding.	-1	1
Technical	This action helps solve the problem of flood related damage. It is effective in reducing future losses.	0	2
Administrative (including responsible party)	Merrimack has the capability to implement this action. Revisions to regulations require a public hearing. The Community Development department is the responsible party for this action.	0	1
Political	There is public support to implement and maintain this action and the Town Council is willing to support it.	0	0
Legal	Merrimack has the legal authority to implement this action.	0	1
Economic (including direct cost)	There are no additional costs to the Town to implement this action because it falls under the existing Community Development budget. There are potential economic costs associated with limiting where development can go.	-1	2
Environmental	This action has positive environmental impacts by encouraging erosion control and reduced floodplain development. It is consistent with community environmental goals.	0	3
Subtotal		**-1**	**10**
Total		**9**	
Priority		**6**	

Mitigation Action: Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	There are no social impacts associated with this action. Enforcement would apply evenly across all applicable buildings, including new construction, major renovations, and changes of use.	0	2
Technical	This action would help to avoid or reduce future losses. It would not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	The Town has the capacity to administer this action. The Building & Code Enforcement Division is the responsible party.	0	2
Political	There are no political issues associated with this action.	0	0
Legal	There are no legal issues associated with this action.	0	0
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs.	0	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts.	0	1
Subtotal		**0**	**8**
Total		**8**	
Priority		**7**	

Mitigation Action: Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM.			
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	1
Technical	This action would help to avoid or reduce future losses. It would not create additional problems or cause secondary impacts.	0	2
Administrative (including responsible party)	The Town has the capacity to administer this action. The Building & Code Enforcement Division is the responsible party.	0	1
Political	There are no political issues associated with this action.	0	1
Legal	There are no legal issues associated with this action.	0	1
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs.	0	1
Environmental	This action has the potential to reduce property damage and subsequent environmental impacts only if the specified parties understand and correctly utilize the FIRM.	0	1
Subtotal		**0**	**8**
Total		**8**	
Priority		**7**	

Mitigation Action: Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	There are no social impacts related to this action. It will not unfairly affect any segment of the population or disrupt established neighborhoods. It is compatible with present and future community values of working cooperatively with neighboring municipalities.	0	2
Technical	This action may reduce future losses by allowing Merrimack to provide flood aid more quickly. It also helps the Town to know what resources are available for use in an emergency.	0	2
Administrative (including responsible party)	Merrimack has the capability to implement this action and it can be accomplished in a timely manner. Police, Fire, and Public Works departments are each responsible for establishing their own agreements.	-1	2
Political	There is public support to implement and maintain this action and the Town Council is willing to support it.	0	2
Legal	Merrimack has the legal authority to implement this action. No enabling legislation is necessary.	0	0
Economic (including direct cost)	The cost of mutual aid calls would be covered by FEMA if the Town was responding to a declared disaster. This action could add costs for non-declared events (ex. overtime to cover Merrimack needs while its staff is elsewhere).	-1	1
Environmental	This action has no negative environmental impacts. It could positively benefit the environment by improving floodplain management.	0	0
Subtotal		**-2**	**9**
Total		**7**	
Priority		**8**	

Mitigation Action: Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.			
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	0
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.	-1	3
Administrative (including responsible party)	Merrimack has the capability to implement this action. Merrimack Village District is the responsible party.	0	3
Political	The Town Council supports this action. There is general public support for this action, although some residents are unsatisfied with it.	-1	2
Legal	There are no legal issues associated with this action.	0	0
Economic (including direct cost)	Implementation of this action falls under the Merrimack Village District budget. It can be costly to enforce.	-1	0
Environmental	This action has a positive impact on the environment by promoting water conservation.	0	2
Subtotal		**-3**	**10**
Total		**7**	
Priority		**8**	

Mitigation Action: Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.			
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	0
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	1
Administrative (including responsible party)	Merrimack has the capability to implement this action. The Building & Code Enforcement Division would be responsible for it. It can be accomplished in a timely manner.	0	1
Political	There is public support to implement and maintain this action.	0	1
Legal	Merrimack 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	0
Economic (including direct cost)	This action is consistent with normal town operations and does not impose additional economic costs.	0	0
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		**0**	**4**
Total		**4**	
Priority		**9**	

Mitigation Action: Work with FEMA to voluntarily remove structures from flood-prone areas to minimize			
Criteria	**Evaluation**	**Cost**	**Benefit**
Social	This action impacts people with structures in the floodplain. It does not unfairly affect any one segment of the population because participation is voluntary.	0	1
Technical	This action would avoid future losses due to flooding.	0	3
Administrative (including responsible party)	Merrimack does have the capability to implement this action. The Merrimack Finance Dept. would be responsible for this action in cooperation with FEMA.	-1	0
Political	It is unclear whether there is public and political support for this action.	-1	1
Legal	There are no legal issues associated with this action. FEMA is responsible for purchasing the properties. Merrimack simply facilitates the process.	0	0
Economic (including direct cost)	FEMA covers the administrative costs associated with this action. Merrimack would see a loss of tax revenue from the property; however, emergency response costs would also decrease.	-2	1
Environmental	This action would reduce property damage and subsequent environmental impacts. It may also create additional open space in Town, depending on how the parcel was reused.	0	1
Subtotal		**-4**	**7**
Total		**3**	
Priority		**10**	

Section 4.4 ~ Implementing and Administering Mitigation Actions

The Town of Merrimack has integrated its 2015 Hazard Mitigation Plan into a variety of other planning mechanisms, including the Merrimack Emergency Response Plan, Evacuation Plan for the Mastricola and High School Campus, DPW Plan for Bridge and Culvert Repairs, and the Capital Improvement Plan. In addition, the Town of Merrimack has incorporated and will continue to integrate requirements of the Merrimack Hazard Mitigation Plan Update 2021 into other planning mechanisms. For example, hazard assessments from the Merrimack Hazard Mitigation Plan Update 2021 will be integrated into the Emergency Response Plan. Updates to Merrimack's Capital Improvement Plan will include any applicable mitigation projects identified in the Hazard Mitigation Plan, such as drainage improvements. The next update to the Town's Master Plan will also incorporate elements of the Hazard Mitigation Plan where applicable.

The Merrimack 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, or ongoing*
Medium Term	2-3 years
Long Term	4-5 years

**Ongoing indicates that the action will be completed on an ongoing basis throughout the life of the Plan.*

Table 12—Implementation and Administration

Mitigation Action	Responsible Party	Cost & Funding	Timeframe
1. Enforce the International Building Code (IBC) and International Residential Code (IRC) to protect buildings and infrastructure from the impacts of earthquakes, flooding, hurricanes, and winter storms.	Building & Code Enforcement Division	Cost = $0 Funding Source: Code Enforcement budget	Short Term/ Ongoing
2. Protect power lines by working with utility companies to harden electrical infrastructure, including trimming trees near power lines. Consider the costs and benefits of requiring that overhead power lines be buried in all new developments.	Public Works Department	1,200 per large tree for removal $5,000 for preliminary cost benefit review of power line burial Funding Source: 2020-21 Operating Budget, Planning/Zoning Administrator Wages line item, Public Works Department budget	Short Term/ Ongoing
3. 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.	Fire Department	Cost = $0 Funding Source: Fire Department and Public Works Department budgets	Short Term/ Ongoing
4. Create a database to track those individuals at high risk of death during hazard events, such as the elderly, sick, and homeless. Coordinate with the Emergency Management Director to conduct in-person outreach to these individuals to ensure they are adequately protected from the impacts of hazard events, including severe winter weather and extreme temperatures.	Emergency Management, Fire Department	Cost = $750 annually Funding Source: Fire Department Emergency Management	Short Term
5. Distribute Community Hazards Guides and conduct outreach and education programs to increase awareness of drought, earthquake, extreme temperatures, flooding, lightning, severe wind, severe winter	Emergency Management, Fire Department, Police Department	Cost = $0 Funding Source: Fire Department Emergency Management budget	Short Term/ Ongoing

Mitigation Action	Responsible Party	Cost & Funding	Timeframe
weather, tornado, wildfire, and carbon monoxide risks. Utilize Nixle, community access TV, Merrimack website, and social media.			
6. Implement structural inspections of roofs and deploy trained maintenance personnel for roof snow-removal operations at critical facilities.	Fire Department	Cost = $0 Funding Source: Building and Grounds Maintenance budgets	Medium Term
7. Monitor water supply and drought conditions. Utilize NH Division of Forest and Lands reports and consult the New Hampshire Drought Management Team (DMT) and the State Drought Management Plan to monitor drought indicators.	Merrimack Village District	Cost = $0 Funding Source: Merrimack Village District	Short Term/ Ongoing
8. Protect critical emergency management facilities and equipment from lightning damage. Install and maintain surge protection and battery backup on critical electronic equipment.	Each Department	Cost = $200 per department Funding Source: 2020-21 Operating Budget—Office Equipment budget	Short Term/ Ongoing
9. Elevate new roads and bridges above the base flood elevation and raise existing low-lying bridges and roads.	Public Works Department	Cost = $30,000 design, $170,000 construction Funding Source: 2020-21 Operating Budget—Office Equipment budget	Long Term
10. Incorporate flood mitigation into local planning. Revise subdivision regulations and to improve floodplain management in Merrimack.	Community Development, Planning Board	Cost = Percentage of existing Planning/Zoning Administrator Wages Line Item Funding Source: 2020-21 Operating Budget	Long Term
11. Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE).	Building & Code Enforcement Division	Cost = $0 Funding Source: Code Enforcement budget	Short Term/ Ongoing
12. Enhance local officials, builders, developers, local citizens and other	Building & Code Enforcement Division	Cost = $0	Short Term

Mitigation Action	Responsible Party	Cost & Funding	Timeframe
stakeholders' knowledge of how to read and interpret the FIRM.		Funding Source: Code Enforcement budget	
13. Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event. Form partnerships between local, state, and regional entities to expand resources and improve coordination to support floodplain management.	Public Works Department, Fire Department, Police Department	Cost = $0 Funding Source: FEMA, Fire Department Emergency Management budget	Short Term
14. Require water conservation by enforcing the year round even/odd water ordinance, which limits the days outside watering is allowed based on street address and date.	Merrimack Village District	Cost = $4,400 Advertising & Public Information; $500 Public Education Funding Source: Merrimack Village District	Short Term/ Ongoing
15. Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Building & Code Enforcement Division	Cost = Percentage of Code Enforcement Clerical wages Funding Source: 2020-21 Operating Budget	Short Term
16. Work with FEMA to voluntarily remove structures from flood-prone areas to minimize	Finance Department, FEMA	Cost = $0—no direct costs to Town, Town only facilitates process Funding Source: FEMA	Long Term

CHAPTER 5. PLAN ADOPTION

Section 5.1 ~ Formal Adoption by Governing Body

CERTIFICATE OF ADOPTION

TOWN OF MERRIMACK, NH TOWN COUNCIL

A RESOLUTION ADOPTING THE TOWN OF MERRIMACK, NH HAZARD MITIGATION PLAN UPDATE 2021

WHEREAS, the Town of Merrimack 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 Merrimack has developed and received conditional approval from NH Homeland Security & Emergency Management (HSEM) for its Hazard Mitigation Plan Update 2021 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between December 9, 2020 and March 10, 2021 regarding the development and review of the Hazard Mitigation Plan Update 2021; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Merrimack, 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 Merrimack eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Merrimack Town Council:

1. The Plan is hereby adopted as an official plan of the Town of Merrimack.
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. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Town Council by the Merrimack Hazard Mitigation Team.

Adopted this day, the 15th **of** July, **2021.**

Thomas Koenig, Chairman, Merrimack Town Council

Finlay Rothhaus, Vice Chair, Merrimack Town Council

Nancy Harrington, Merrimack Town Council

Barbara Healy, Merrimack Town Council

Nancy Murphy, Merrimack Town Council

Lon Woods, Merrimack Town Council

Andy Hunter, Merrimack Town Council

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Merrimack the 15 of July, 2021.

Witness

Section 5.2 ~ FEMA Approval Letter

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

FEMA

July 22, 2021

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

Dear Mr. Eaton:

As outlined in the FEMA-State Agreement for FEMA-DR-4457, your office has been delegated the authority to review and approve local mitigation plans under the Program Administration by States Pilot Program. Our Agency has been notified that your office completed its review of the Town of Merrimack, New Hampshire Hazard Mitigation Plan Update 2021 and approved it effective **July 19, 2021** through **July 18, 2026** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

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

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

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Jay Neiderbach at (617) 832-4926 or Josiah.Neiderbach@fema.dhs.gov.

Sincerely,

FOR [illegible] DRA (Acting)

Paul F. Ford
Acting Regional Administrator
DHS, FEMA Region I

PFF:jn

cc: Fallon Reed, Chief of Planning, New Hampshire

Town of Merrimack, New Hampshire

Hazard Mitigation Plan Update 2021

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

Merrimack Hazard Mitigation Plan Update 2020/21
Meeting 1
December 9, 2020 | 10:00am | ZOOM Meeting

Agenda

1. Review the planning process.

2. Determine who to notify about the planning process.

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 since last plan that impact hazard mitigation.

6. Determine Merrimack'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.

Merrimack Hazard Mitigation Meeting ~ December 9, 2020

Name	Title	Agency	Email
Casey Wolf	Asst. Planner	Community Dev.	cwolf@merrimacknh.gov
Kyle Fox	Director	Public Works	kfox@merrimacknh.gov
Dawn Tuomala	Town Engineer	Public Works	dtuomala@merrimacknh.gov
Dave Fredrickson	Operations Manager	MVD	dave.fredrickson@mudwater.org
Matthew Duke	Chief	Fire Dept.	mduke@merrimacknh.gov
Matt Tarleton	Deputy Chief	Police Dept.	mtarleton@merrimacknh.gov
Brian Levesque	Chief	Police Dept.	blevesque@merrimacknh.gov

Merrimack Hazard Mitigation Plan Update 2021
Meeting 2
January 13, 2021 | 10:00am| Zoom Meeting

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.

Merrimack Hazard Mitigation Meeting ~ January 13, 2021

Name	Title	Agency	Email
Dave Fredrickson	Operations Manager	MVD	dave.fredrickson@mvdwater.org
Dawn Tuomala	Town Engineer	Public Works	dtuomala@merrimacknh.gov
Casey Wolf	Asst. Planner	Community Dev.	cwolf@merrimacknh.gov
Kyle Fox	Director	Public Works	kfox@merrimacknh.gov
Matthew Duke	Chief	Fire Dept.	mduke@merrimacknh.gov
Brian Levesque	Chief	Police Dept.	blevesque@merrimacknh.gov

Merrimack Hazard Mitigation Plan Update 2021
Meeting 3
February 10, 2021 | 10:00am| Zoom Meeting

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

Merrimack Hazard Mitigation Meeting ~ February 10, 2021

Name	Title	Agency	Email
Dave Fredrickson	Operations Manager	MVD	dave.fredrickson@mvdwater.org
Casey Wolf	Asst. Planner	Community Dev.	Cwolf@merrimacknh.gov
Matthew Duke	Chief	Fire Dept.	mduke@merrimacknh.gov
Brian Levesque	Chief	Police Dept	blevesque@merrimacknh.gov
Kyle Fox	Director	Public Works	kfox@merrimacknh.gov
Dawn Tuomala	Town Engineer	Public Works	dtuomala@merrimacknh.gov
Matt Tarleton	Deputy Chief	Police	mtarleton@merrimacknh.gov

Merrimack Hazard Mitigation Plan Update 2021
Meeting 4
March 10, 2021 | 10:00am | Zoom Meeting

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)*

Merrimack Hazard Mitigation Meeting ~ March 10, 2021

Name	Title	Agency	Email
Brian Levesque	Chief	Police Dept.	blevesque@merrimacknh.gov
Matthew Duke	Chief	Fire Dept.	mduke@merrimacknh.gov
Dawn Tuomala	Town Engineer	Public Works	dtuomala@merrimacknh.gov
Casey Wolf	Asst. Planner	Community Dev.	cwolf@merrimacknh.gov
Kyle Fox	Director	Public Works	kfox@merrimacknh.gov

Notification Letter

NRPC
NASHUA REGIONAL PLANNING COMMISSION

December 16, 2020

American Red Cross
2 Maitland Street
Concord, NH 03301

Subject: **Town of Merrimack NH, Hazard Mitigation Plan Update**

Dear Sir or Madam,

The Town of Merrimack, NH, in conjunction with the Nashua Regional Planning Commission, is in the process of updating its Hazard Mitigation Plan. All residents, members of the business community, and other interested individuals are welcome to participate in the Plan update process.

The Merrimack Hazard Mitigation Plan Update will assess natural hazards that could impact the municipality and will document natural hazards that have occurred since the previous Plan was written. It will also identify critical facilities and infrastructure that are vulnerable to natural hazards and prioritize mitigation actions to protect these critical facilities and infrastructure. In addition, the Plan aims to enhance communication and coordination among municipal departments and to raise awareness of the potential and proactive measures that can be taken to mitigate against natural disasters.

We invite you to follow the Merrimack Hazard Mitigation Plan Update process at http://www.nashuarpc.org/energy-environmental-planning/hazard-mitigation-planning/. For additional information or to participate in the Plan update, please contact me at cassiem@nashuarpc.org or 603-417-6570 x6578.

Sincerely,

NASHUA REGIONAL PLANNING COMMISSION

Cassie Mullen

Cassie Mullen
Regional Planner II

Hazard Mitigation Plan Update Website Screen Shot

NRPC
Nashua Regional Planning Commission
30 Temple Street, Suite 310
Nashua, NH 03060
Phone: 603.417.6570

Value yesterday. Enhance tomorrow. Plan today.

Hazard Mitigation Planning

Planning for natural disasters can reduce loss of life, injuries, and property damage. Hazard Mitigation Plans identify critical facilities and areas of concern throughout a municipality, analyze potential natural hazards and risks to these facilities, and prioritize mitigation measures to address the hazards. Municipalities must update their Hazard Mitigation Plans every five years in order to maintain eligibility for federal mitigation grants.

Potential natural hazards in the NRPC region include drought, earthquake, extreme temperatures, flooding, severe wind, lightening, severe winter weather, tornado, wildfire, solar storms & space weather, and infectious disease.

NRPC is currently working with Lyndeborough, Merrimack, Mont Vernon, and Wilton to update each town's Hazard Mitigation Plan.

▲ Merrimack

Meetings

Meeting 1
Date & Time: December 9, 2020 at 10:00am
Location: ZOOM Meeting
Agenda

Meeting 2
Date & Time: January 13, 2021 at 10:00am
Location: ZOOM Meeting
Agenda

Meeting 3
Date & Time: February 10, 2021 at 10:00am
Location: ZOOM Meeting
Agenda

Meeting 4
Date & Time: March 10, 2021 at 10:00am
Location: ZOOM Meeting
Agenda

▼ Mont Vernon

▼ Wilton

Nashua Region 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. 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.

A critical component of water sustainability is resilience, which means ensuring that natural and man-