

# Town of Andover, NH Hazard Mitigation Plan Update 2019



*Elbow Pond Road Oct 2017*



*Kearsarge Mt. Road Oct 2017*

**Town Adoption Date: July 22, 2019**  
**FEMA Approval Date: August 27, 2019**

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### **Editions:**

2005

2013

July 22, 2019

## Chapter 1 INTRODUCTION

### Authority

This Hazard Mitigation Plan was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA), Section 322, Mitigation Planning. Accordingly, this Hazard Mitigation Plan will be referred to as the “Plan”.

### Funding Source

This Plan was funded by the NH Homeland Security and Emergency Management (HSEM) through a Pre-Disaster Mitigation (PDM) grant, with matching funds by the Town of Andover.

### Purpose

This Hazard Mitigation Plan is a planning tool to be used by the Town of Andover, as well as other local, state and federal governments, in their effort to reduce the effects from natural and man-made hazards.

### Introduction

On October 30, 2000 the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The ultimate purpose of DMA 2000 is to:

- Establish a national disaster hazard mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and
- Provide a source of pre-disaster hazard mitigation funding that will assist State and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section, 322 – Mitigation Planning. This places new emphasis on local mitigation planning. **It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition of receiving Hazard Mitigation Assistance (HMA) grants.** Local governments must review and if necessary, update the mitigation plan every five years to continue program eligibility. However, it is recommended that this Plan be reviewed/updated annually or after a hazard event to be consistent with Chapter 7.

### Why Develop a Mitigation Plan?

The full cost of the damage resulting from natural hazards – personal suffering, loss of lives, disruption of the economy, loss of tax base – is difficult to measure. Our State is subject to many types of natural hazards: floods, hurricanes, severe winter weather, earthquakes, tornadoes, downbursts, and wildfires, all of which can have significant economic and social impacts. Some, such as hurricanes, are seasonal and strike in predictable locations. Others, such as floods, can occur anytime of the year and almost anywhere in the State.

## Scope of the Plan

The scope of this Plan includes the identification of natural hazards affecting the town, as identified by the Hazard Mitigation Planning Committee. The hazards reviewed under the scope of this plan include the relevant hazards that are outlined in the State of New Hampshire's Multi-Hazard Mitigation Plan Update 2018. Some hazards identified in the State Plan were deemed not applicable to the Town of Barnstead (Avalanche, Extreme Cold, Infectious Disease, Landslide and Solar Storms)

**Dam Failure  
Drought  
Extreme Heat  
Earthquake**

**Flooding  
Human Caused  
Hurricane  
Lightning**

**Severe Wind  
Winter Weather  
Wild/Forest Fire**

## Methodology

During the 2019 Update, the Hazard Mitigation Planning Committee with the assistance of Hubbard Consulting LLC held a total of 4 meetings on April 19, 2018, May 17, 2018, May 21, 2018 and April 25, 2019. Public notices were posted at the Town Hall, Library and 2 Post Offices inviting members of all town departments and boards, surrounding communities, businesses, academia, State agencies and non-profit agencies. In addition, email notifications were sent to adjacent communities, the Lakes Region Planning Commission, the Chamber of Commerce and the NH HSEM. There were no members of the general public that attended the committee meetings. The Emergency Management Directors from surrounding towns were notified of the Plan Update and asked to comment on the Plan (see Appendix B). The committee analyzed and revised the following sections of the Plan and provided input to update them: Chapters 1, 2, 3, 4, 5, 6 and 7. After acceptance by the committee, the Plan was submitted to the NH HSEM for formal Approval. The Board of Selectmen formally adopted the plan on July 22, 2019. FEMA approved the plan on August 27, 2019.

The committee developed this Plan as a result of the above meetings and the following planning process.

### Step 1: Form a Hazard Mitigation Planning Committee

Prior to the first public information meeting the Emergency Management Director contacted town department heads to serve on the committee. In addition, a press release was published in the town office and post office inviting residents, businesses, neighboring communities, academia and other private non-profit interests to participate in the planning process. Finally, an email invitation was sent to EMDs of surrounding towns, State Agencies, Regional Planning Commission and the local Chamber of Commerce (See Appendix B). The Committee Members consisted of town and school staff.

### Step 2: Set Hazard Mitigation Goals and Objectives

At the first working meeting the committee reviewed and made minor revisions to the town's Hazard Mitigation Goals. The Hazard Mitigation Goals were adapted from the State's Multi-Hazard Mitigation Plan Update 2013. This first step is extremely important in helping the committee understand the purpose of the Plan and the direction it should go. (See the end of this chapter for the "Hazard Mitigation Goals of the Town of Andover, NH".)

### Step 3: Hazard Identification

The Committee members identified natural hazards and human-caused hazards that have or could potentially affect the Town of Andover. The results of this step can be found in Chapters 2 and 3.

### Step 4: Critical Facilities Analysis

The committee members updated the Critical Facilities List for the town. The Critical Facilities List is divided into 3 sections: Facilities needed for Emergency Response; Facilities not necessary for emergency response; and places and populations to protect in the event of a disaster. The results of this step can be found in Chapter 4.

### Step 5: Capability Assessment

The committee members identified what plans and policies are already in place to reduce the effects of hazards. The results of this step can be found in Chapter 5. Many of these plans and technical reports were reviewed and incorporated during the planning process, including the Andover Emergency Operations Plan and the Andover Master Plan.

### Step 6: Develop Objectives

The Committee identified "Problem Statements" for each of the hazards identified earlier in the planning process. All of the hazards have at least one problem statement associated with them (See Problem Statement in Appendix B). These problem statements were then utilized as objectives in developing mitigation projects, as described in the next step.

### Step 7: Develop Specific Mitigation Measures

As a result of the problem statements identified in step 6, the committee brainstormed specific projects or mitigation measures to address each hazard. The Committee Members used the "*Mitigation Project Identification Worksheet*", as shown in Appendix B, to identify mitigation projects that directly address the hazards affecting the community. Finally, the committee prioritized the top priority projects and listed them in the Mitigation Action Plan found at the end of Chapter 6.

### Step 8: Adopt and Implement the Plan

After acceptance by the committee the Plan was submitted to the NH Homeland Security and Emergency Management for formal Approval. The Board of

Selectmen formally adopted the Plan on July 22, 2019. The letter of approval from FEMA can be found in Appendix C.

With respect to any ongoing mitigation projects, the lead and support agencies/people for such activity will be tasked with implementing the Plan's mitigation projects. The committee approved the "Prioritized Mitigation Projects" list, which identifies responsibility, funding/support and a timeframe for each of the prioritized projects. The Emergency Management Director should be tasked with requesting annual reports as to the progress of each project.

#### Step 9: Monitor and Update the Plan

It is important that this plan be monitored and updated annually or after a presidentially declared disaster. Chapter 7 specifically addresses this issue.

## ***Hazard Mitigation Goals Town of Andover, NH***

During the 2019 update, the Committee reviewed the 2013 Andover Hazard Mitigation Plan goals and made no revisions. The Committee added a new Goal (#2) in response to an increase in severe weather events over the recent years.

1. To improve upon the protection of the general population, the citizens of the Town of Andover and guests, from natural and man-made hazards.
2. To reduce the impact of increased severe weather incidents (flooding, snow and ice storms).
3. To reduce the potential impact of natural and man-made disasters on the Town of Andover's:
  - Emergency Response Capability
  - Critical Facilities
  - Infrastructure
  - Private property
  - Economy
  - Natural environment
  - Historic treasures
4. To improve the Town of Andover's:
  - a. Emergency preparedness and communication network.
  - b. Disaster response and recovery capability.
5. To identify, introduce and implement cost effective Hazard Mitigation measures so as to accomplish the Town's Goals and Objectives.
6. To work in cooperation with the State of New Hampshire's Hazard Mitigation Goals, including:
  - a. Development of a Continuity of Operations / Government Plan.
  - b. Consideration of climate change in future planning.

## Hazard Mitigation Planning Committee 2019

The Andover Hazard Mitigation Committee was comprised of the following individuals who met from April 2018 to April 2019.

<b>Name</b>	<b>Title/Affiliation</b>
Charles Keyser	Andover Board of Selectmen
Christine Braley	Andover Deputy Emergency Management Director
Dave Blinn	Andover Selectman
Jane Hubbard	Hubbard Consulting LLC / Andover EMD
Jane Slayton	Andover Elementary Middle School Principal
Joe Mahoney	Andover Police Chief
John Kinney	Andover EMS
John Thompson	Andover Road Agent
Marjorie Roy	Andover Town Administrator
Mike Vercellotti	Andover Village District (Water)
Rene Lefebvre	Andover Fire Chief
Steve Barton	Andover Fire Department
Vicky Mishcon	Andover Selectmen

The committee members listed above participated in monthly committee meetings, provided departmental information, contributed in their field of expertise, reviewed and commented on committee meeting minutes, reviewed drafts of the Plan and worked together to identify and prioritize mitigation projects.

*Many thanks to all the hard work and effort from each and every one of you.  
This plan would not exist without your knowledge and experience.*

*Thank you!*



## Chapter 2 COMMUNITY PROFILE

### Community Description

The Town of Andover is located in Merrimack County in central New Hampshire. The Town is bordered to the north by Danbury and Hill, to the east by Franklin, to the south by Salisbury, and to the west by Wilmot. Andover is 41 miles to Manchester; 93 miles to Boston, MA; 275 miles to New York, NY; and 220 to Montreal, Canada. Average temperature for the area varies from 19 degrees Fahrenheit in January to 80.0 degrees Fahrenheit in July. The average annual precipitation is 41.4 inches. The Town is governed by a three-member Board of Selectmen and holds annual town meetings in March.

According to the NH Employment Security "Population change for Andover totaled 1,405 over 57 years, from 955 in 1960 to 2,360 in 2017. The largest decennial percent change was a 39 percent increase between 1970 and 1980. The 2017 Census estimate for Andover was 2,360 residents, which ranked 126th among New Hampshire's incorporated cities and towns.

### National Flood Insurance Program (NFIP)

Floodplains for this Plan are defined as the 100-year and 500-year flood hazard zones, as depicted on the April 19, 2010 Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Andover has participated in the National Flood Insurance Program (NFIP) administered by FEMA, since April 2, 1986. In order to enable landowners to qualify for federally insured flood insurance, the Town, in its administration of site plan review, subdivision regulations and zoning, regulates development in the floodplain using federal standards. There are currently 14 NFIP policies and the Town has no repetitive loss properties.

The Town's existing ordinance meets the minimum requirements of the NFIP, according to the latest Community Assistance Visit in 2007. The Town will continue to maintain procedures and regulations that are in compliance with the NFIP by conducting Community Assistance Visits (CAVs) and Community Assistance Contacts (CAC) with the Office of Strategic Initiative (OSI) and updating the Floodplain Ordinance as federal requirements are updated. The Town will continue to hold CAVs/CACs with OSI in the future. In addition, the Town provides NFIP brochures in Town facilities frequented by the public.

Type	Policies in Force	Insurance in Force	Number of Closed Paid Losses	\$ of Closed Paid Losses
Single Family	11	-	-	-
All other Residential	0	-	-	-
Non-Residential	3	-	-	-
<b>Total</b>	<b>14</b>	<b>\$2,748,500</b>	<b>3</b>	<b>\$58,292</b>

**Disaster Risk**

Andover is prone to a variety of natural hazards. These include: flooding, dam breach, severe wind, wildfire, drought, earthquake, hurricane, lightning strikes, extreme heat and severe winter weather, in addition to man-made hazards. The following table summarizes the impact and probability of natural and man-made hazards.

Natural Hazards	Human Impact	Property Impact	Business Impact	Severity	Probability* In 25 years	Risk Severity x Probability
	Probability of death or injury 0: n/a 1: Low 2: Moderate 3: High	Physical loss damage 0: n/a 1: Low 2: Moderate 3: High	Interruption of service 0: n/a 1: Low 2: Moderate 3: High	Avg. of Human / Property / Business	Likelihood this will occur 0: Improbable 1: Remote 2: Occasional 3: Probable 4: Frequent	0-4: Low 5-9: Medium 10-12: High
Severe Winter Weather	2	3	1	2	4	8
Severe Wind (Tornado/Downburst)	3	3	1	2.3	3	6.9
Hurricane	3	3	2	2.7	2	5.4
Flood	1	3	1	1.7	3	5.1
Lightning	3	1	1	1.7	3	5.1
Extreme Heat	2	1	1	1.3	3	3.9
Wild/Forest Fire	1	2	1	1.3	2	2.6
Drought	1	2	1	1.3	2	2.6
Earthquake	2	2	1	1.7	1	1.7
Dam Failure	1	1	1	1	1	1
Landslide	n/a	n/a	n/a	n/a	n/a	n/a
Avalanche	n/a	n/a	n/a	n/a	n/a	n/a
Public Health	n/a	n/a	n/a	n/a	n/a	n/a
Solar Storms	n/a	n/a	n/a	n/a	n/a	n/a

\*Probability Terms are defined as:

- Improbable: Not likely to occur in any 25 year period.
- Remote: Less than 1% probability in the next 25 year period.
- Occasional: Between 1% and 50% probability in the next 25 year period.
- Probable: Between 50% and 99% probability in the next 25 year period.
- Frequent: Near 100% probability in the next year.

Human Caused Hazards	Human Impact	Property Impact	Business Impact	Severity	Probability* In 25 years	Risk Severity x Probability
	Probability of death or injury 0: n/a 1: Low 2: Moderate 3: High	Physical loss damage 0: n/a 1: Low 2: Moderate 3: High	Interruption of service 0: n/a 1: Low 2: Moderate 3: High	Avg. of Human / Property / Business	Likelihood this will occur 0: Improbable 1: Remote 2: Occasional 3: Probable 4: Frequent	0-4: Low 5-9: Medium 10-12: High
Utility Interruption	1	2	2	1.6	4	6.4
Transport Incident (plane, train, etc.)	2	1	1	1.3	4	5.2
Haz Mat (Transport)	2	2	1	1.6	3	4.8
Haz Mat (Fixed)	2	2	1	1.6	2	3.2
Mass Casualty (Trauma/Medical)	3	1	1	1.6	2	3.2
Bomb Detonation	3	3	1	2.3	1	2.3
Terrorist Attack (WMD)	3	2	1	2	1	2
Biological Terrorism	3	2	1	2	1	2
Armed Attack (assault, sniper)	3	1	1	1.6	1	1.6
Urban Fire	1	3	1	1.6	1	1.6
Civil Disorder	1	1	1	1	1	1
Radiological Release	1	1	1	1	1	1

\*Probability Terms are defined as:

- Improbable: Not likely to occur in any 25 year period.
- Remote: Less than 1% probability in the next 25 year period.
- Occasional: Between 1% and 50% probability in the next 25 year period.
- Probable: Between 50% and 99% probability in the next 25 year period.
- Frequent: Near 100% probability in the next year.

The following Hazards as Identified in the State of NH Multi Hazard Mitigation Plan 2018 were not included in this Plan.

- Avalanche: The topography of the town is not conducive to avalanche.
- Extreme Cold: The town considers extreme cold temperatures under severe winter weather and the community has not seen extreme cold with significant impact.
- Infectious Disease: The town is already a part of a Public Health Network which prepares, responds to and mitigates infectious disease.
- Landslide: The topography of the town is not conducive to landslide.
- Solar Storms: The town does not feel it can actually mitigate this hazard.

## CALCULATING POTENTIAL LOSS

It is difficult to determine the amount of damage that could be caused by natural or human-caused hazards because the damage will depend on the hazard's extent and severity, making each hazard event somewhat unique. Therefore, to calculate potential economic loss, we have assumed that structures impacted by hazards could result in damage of either 1% or 5% of the assessed value.

Based on this assumption, the potential loss from any of the identified hazards would range from 1,954,698 (1%) or 9,773,488 (5%) based on the 2018 town valuations which lists the Town wide assessed values to be \$195,469,754 (See table below). Human loss of life was not included in the potential loss estimates, but could be expected to occur, depending on the severity and type of the hazard.

<b>TOWN WIDE ASSESSED VALUES</b>			
<b>Type</b>	<b>2018 Value</b>	<b>1% Damage</b>	<b>5% Damage</b>
Residential	129,927,254	1,299,273	6,496,363
Manufactured Housing	4,239,900	42,399	211,995
Commercial	18,109,300	181,093	905,465
Tax Exempt	30,851,000	308,510	1,542,550
Utilities	12,342,300	123,423	617,115
<b>Total</b>	<b>\$195,469,754</b>	<b>\$1,954,698</b>	<b>\$9,773,488</b>

*Source: NH DRA 2018 MS-1*

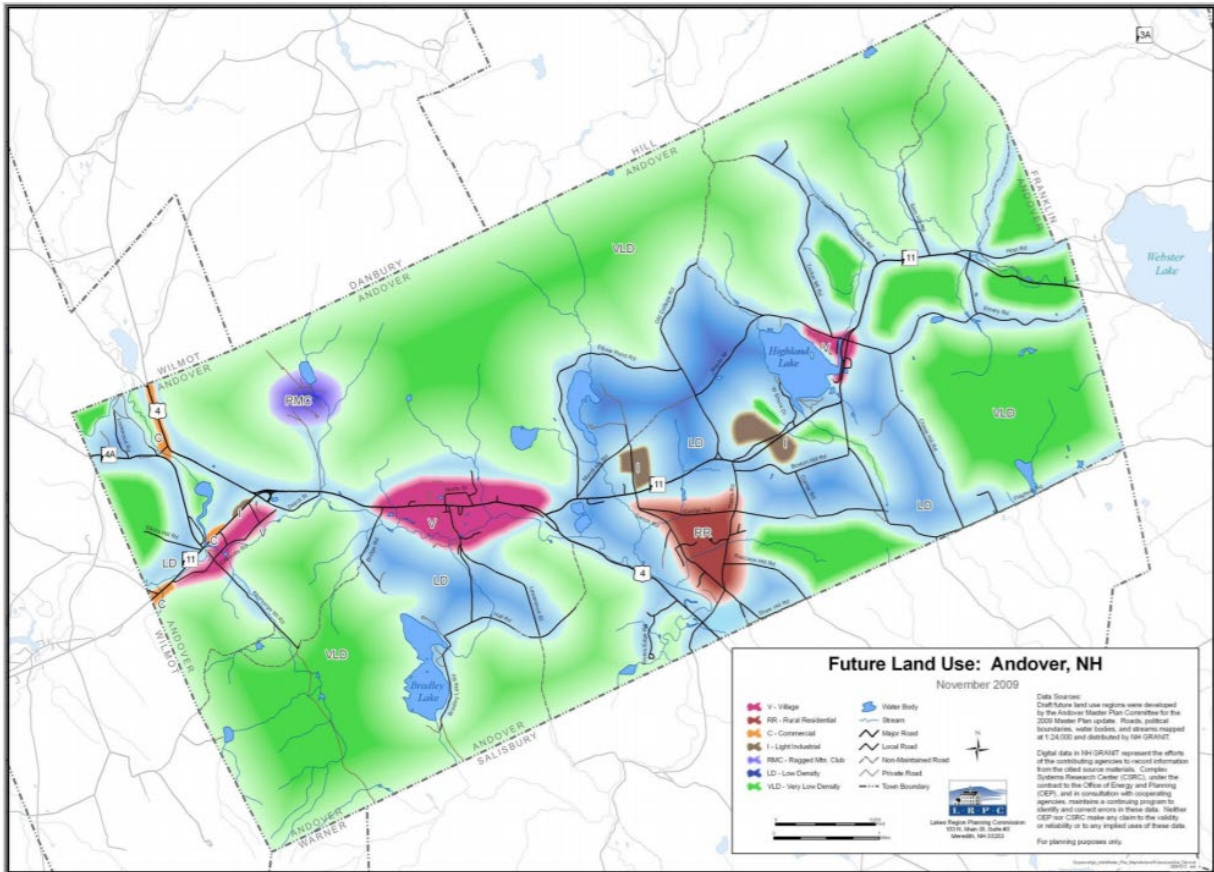
## Development Trends

Existing land use, according to the 2013 Master Plan has "...a strong influence on future development patterns. It is important to understand how land and other resources are currently used before recommendations can be developed regarding future land uses. Several factors have influenced Andover's current land use patterns, including natural resource constraints, the transportation network, agricultural and forestry practices, and the development of commerce and industry. Another significant factor is the influence of the Andover Zoning Ordinance, which has been in place without significant change since the adoption of zoning in 1974.

"Examination of the existing land use maps reveals several characteristics of land use patterns in Andover. The characteristics were identified by the committee, as listed below:

- Development has taken place primarily along existing roads.
- Farms are distributed throughout Andover, although the majority of farms are in the eastern part of town.
- Residences are distributed throughout town.
- Light industrial uses are clustered in specific areas: near Monticello Drive; near the intersection of Plains Road and Route 4; near the westerly junction of routes 4 and 11.
- A large number of wetlands are adjacent to developed areas.
- There is virtually no development on the west side of Bradley Lake, the town's public water supply.
- In general, there is little to no development at higher elevations.
- The Plains area (one-acre zoning) has a higher residential density compared to other areas of the town.
- Little multiple unit residential use is evident, but it is distributed throughout town.
- Commercial use is limited except along route 11 in the far west of Andover."

The 2013 Master Plan update process which engaged the public in determining an appropriate future land use plan for the town of Andover, specific recommendations were developed that are considered keys to the success of the Plan. Several of the recommendations are considered requisites for the recommended zoning changes that are suggested in the Future Land Use Map and others represent supporting recommendations that can be developed over time. Specifically, the Master Plan recommended a review of the Natural Resource Inventory to develop mitigation and protection strategies to minimize adverse impacts.



Andover has experienced moderate growth, as shown in the number of residential building permits issued since 2014.

Residential Building Permits Issued	
Time Period	# of Permits
2014	62
2015	59
2016	49
2017	44
2018	56

**Population**

Current projections from the New Hampshire Office of Strategic Initiative show the population growth rate will increase at a low rate in Andover over the next twenty years, where the year-round population in 2040 is projected to be 2,693.

The Hazard Mitigation Planning Committee utilized the current Plans to review and incorporate development changes. However, due to no substantial changes in development, there were no changes in priorities made to the Plan. Consequently, the Town’s overall vulnerability to the identified hazards has remained the same.

Andover Population Growth	
Year	Population
2017	2,360
2010	2,371
2000	2,114
1990	1,880
1980	1,587
1970	1,138
SOURCE: <a href="http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Andover.htm">http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Andover.htm</a>	

Andover Population Projections	
Year	Population
2020	2,418
2025	2,494
2030	2,582
2035	2,649
2040	2,693

## Chapter 3 HAZARD IDENTIFICATION

### WINTER WEATHER

**Probability:** Frequent

**Definition:**

**Heavy Snow Storms:** A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period. **Ice Storms:** An ice storm involves rain that freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects.

**Blizzard:** A blizzard is a violent snowstorm with winds blowing at a minimum speed of 35 miles (56 kilometers) per hour and visibility of less than one-quarter mile (400 meters) for three hours. **Nor'Easter:** 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 impacted the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force winds.

**Location:**

There is a town-wide vulnerability to severe winter weather. Nor'easters (wind), Ice Storms, Heavy Snow Accumulations and Severe Cold can occur at any place within the town and generally affect the entire town when it happens. The higher elevations are more likely to experience snow or ice before the lower terrain.

**Impact:**

Heavy snow accumulations (generally considered one that deposits six or more inches of snow in a 12-hour period) especially those associated with nor'easters can have a significant affect on the Town, including extended power outages, road closures, collapsed roofs and increased snow removal costs. During ice storms, ice forms on cold surfaces, such as trees and power lines, and may continue to form until the ice is quite deep, as much as several inches thick. Ice damage results in power outages, road closures and forest damage. Ice on the roads can be the most difficult for a rapid emergency response. Private roads are difficult for emergency response vehicles due to restricted access during winter.

**Extent:**

NOAA's National Climatic Data Center produced the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5, similar to

CATEGORY	RSI VALUE	DESCRIPTION
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18.0+	Extreme

the Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. In addition, the



National Weather Service developed and utilizes the Sperry-Piltz Ice Accumulation Index (SPIA) to forecast the impact of an ice storm. The index below ranges from an ice storm rated as "0" which has little impact, to an index rating of 5 that has catastrophic damage to exposed utility systems.

**Previous Occurrence:**

**January of 1923:** 4 storms within a week left over 30 inches of snow.

**February 8-10, 1969:** Event Accumulations up to 27" in southeastern New Hampshire and up to 42" in northeastern New Hampshire. Regions with snow accumulations exceeding 50 cm: parts of the New York Town and Boston metropolitan areas, western Connecticut, western and eastern Massachusetts, southern Vermont, northern Rhode Island, eastern New Hampshire, and southern Maine.

**February 22-28, 1969:** Events Accumulations to 98" in Western Central New Hampshire, 34" in coastal areas and 2 to 3' across New Hampshire generally. The storm produced excessive amounts of snow across New England with accumulations of greater than 75 cm across large sections of eastern Massachusetts, New Hampshire, and Maine.

**January 20, 1978:** 20 inch snowstorm leaving 20' high snowdrifts

**February 5-7, 1978:** Events accumulations to 28" in northeast New Hampshire, 25" in west central New Hampshire and 33" along coastal New Hampshire. Hurricane-force winds and record-breaking snowfall made this storm one of the more intense to occur this century across parts of the northeastern United States.

**Ice Storm Disaster:** The Ice Storm of 1998 had a very minimal effect on the Town of Andover compared to the rest of the State. Ice accumulation usually occurs in the higher elevations while most of Andover is in a valley.

**December 2008:** A major winter storm brought a mixture of snow, sleet, and freezing rain to New Hampshire from the morning of December 11th to the morning of December 12th. The greatest impact in the state was in southern and central New Hampshire where a significant ice storm occurred. Following the ice storm, recovery and restoration efforts were negatively impacted by additional winter weather events that passed through the state. Across southern and central New Hampshire, the thermal structure of the atmosphere was conducive to produce freezing rain and sleet. A mixture of snow, sleet, freezing rain and rain began Thursday morning across the state. The freezing rain and sleet continued overnight and into Friday morning before ending. While precipitation amounts across the southern and central part of the state ranged from 1 to 3 inches, ice accretion to trees and wires in these areas generally ranged from about a half inch to about an inch. The weight of the ice caused branches to snap, and trees to either snap or uproot, and brought down power lines and poles across the region. About 400 thousand utility customers lost power during the event, with some customers without power for two weeks. Property damage across northern, central and southeastern New Hampshire was estimated at over \$5 million.

**Snow Emergencies:** Merrimack County was declared in the FEMA Snow Emergency Declarations in March 2001 and February 2003. The biggest burden being the cost of snow

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 - 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 - 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.



Scenes like this one were common all over Andover and throughout a broad swath of New England during the ice storm on the weekend of December 13. This photo shows the broken yellow birch that took out the power on Kearsarge Mountain Road. Staff photo: Charlie Darling



removal. One large blizzard event, like the 1978 blizzard in Massachusetts could paralyze the Town of Andover. In addition, the risk today is more the loss of electricity and the loss of heat with severe cold. Just recently in 2003 pipes burst due to the extreme cold.

**October 30, 2011:** The storm brought a heavy, wet snow to southern and central New Hampshire. Snow began to fall across southern New Hampshire late Saturday afternoon, became heavy during the night, and ended before 7 am Sunday morning. The snow was mixed with rain along the immediate coast. The combination of the heavy wet snow and leaves still on the trees caused numerous trees and branches to snap and fall, causing widespread power outages. About 315,000 customers lost power during the storm, mostly across the southeastern part of the state. Some customers were without electrical service for almost a week. Snowfall amounts were quite variable across the state with southern areas and the higher terrain receiving the most snow, and in some cases, record snowfall. In Belknap County, trained weather spotters reported 17.9 inches in Belmont and 17.5 inches in Tilton. The Town of Andover experienced heavy snowfall, debris and isolated power outages for several days.

**February 8-9, 2013 (FEMA Disaster Declaration DR-4105):** An historic winter storm deposited tremendous amounts of snow over all of southern New England from February 8 to Saturday, February 9. What made this an amazing storm was the widespread coverage of heavy snowfall. Most locations received 2 to 2.5 feet of snow! Isolated thunderstorms were common across the entire region during the height of the storm. The band of heaviest snowfall, with 3 to 5 inches per hour for several hours, extended from southwest NH to central and western CT.

**February 25, 2018:** Heavy rains caused flooding and ice jams along Route 4 and the Blackwater River, potentially impacting Bridge Road. Because of the threat of ice jam flooding and losing the bridge the Fire Department moved people out on boat and power was cut on the Bridge Road.

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## SEVERE WIND / TORNADO

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**Probability:** Probable

**Definition:**

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. These events are spawned by thunderstorms and occasionally by hurricanes. They may also occur singularly or in multiples. A downburst is a severe, localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories: Microburst which covers an area less than 2.5 miles in diameter; and Macroburst which covers an area at least 2.5 miles in diameter.

**Location:**

Severe wind events (downburst, tornadoes or high winds associated with thunderstorms) can occur anywhere in Andover. Generally, the higher elevations are more susceptible as well as more vulnerable due to the fact that they are home to emergency response/mutual aid towers. Due to the sporadic nature of tornados and severe wind events, they could occur anywhere in the Town of Andover.

**Impact:**

Depending on the size and location of these events, the destruction to property may be devastating. Several of the more significant and recent events within southern New Hampshire have caused several millions of dollars in damage and at least 5 fatalities. An F-2 Tornado, according to the Fujita scale, maintains wind speeds from 13-157 mph. A tornado occurring in Andover would cause considerable damage. Roofs could be torn off frame houses; mobile homes demolished; large trees snapped or uprooted; and light object missiles would be generated as a result of an F-2 Tornado.

**Extent:**

According to the Enhanced Fujita scale, which rates tornado intensity, an EF-2 tornado maintains wind speeds from 111-135 mph and can cause considerable damage.

EF 0	65-85 mph
EF 1	86-110 mph
EF 2	111-135 mph
EF 3	136-165 mph
EF 4	166-200 mph
EF 5	Over 200 mph

**Previous Occurrence:**

**July 6, 1999:** Severe thunderstorm winds caused damage statewide as downed trees blocked roads and caused power outages. The winds also damaged several buildings. In Sanbornton, a 60 foot pine tree fell on a car killing the driver. An F2 tornado touched down in Pittsfield, moved through Barnstead, and then into Strafford before lifting off the ground, snapping and uprooting hundreds of trees, and damaging several homes. In Lebanon, a 50 x 70 ft section of the City Hall's copper roof was peeled back by the wind. In Hanover, a portion of a roof at Dartmouth College was blown off by the wind. In Claremont, the wind ripped the roof off a bandstand. The wind left 80,000 customers without electrical service statewide. Numerous trees were reported down in towns throughout the state and numerous roads throughout the state were closed.

**December 26, 2000:** A strong low pressure system over Newfoundland produced gusty, northwest winds over the Lakes Region. The gusty winds downed trees and limbs causing widely scattered power outages. A downed tree damaged a mobile home in Bridgewater. Another downed tree disrupted traffic on Route 3 in Laconia. Peak wind gusts were measured at 48 mph in Concord and 41 mph in Laconia.

**October 15, 2003:** A strong low pressure system moving northeast along the Saint Lawrence River Valley caused damaging winds over northern, central, and southeastern New Hampshire. The high winds downed trees and limbs causing property damage and scattered power outages. Downed trees damaged buildings and vehicles and blocked roads. Power outages affected 21,000 customers. Peak wind gusts were measured at 50 mph in Laconia and 47 mph in Rochester.

**November 13, 2003:** A strong low pressure system moving northeast from northern Maine to the Canadian Maritimes brought high winds to northern, central, and southeast New Hampshire. The high winds downed trees onto power lines causing widespread power outages. At the peak of the event early Friday morning, power outages affected 25,200 customers in more than 100 communities.

**June 9, 2004:** Severe thunderstorm winds resulted in trees down in Andover.

**February 16, 2006:** A very strong cold front raced across New Hampshire and western Maine on Friday, the 17th of February. Wind gusts of 60 mph or more were common with and following the frontal passage. Widespread damage occurred throughout the state with the majority of the destruction due to falling trees. Several roofs were also damaged or blown off. Total damage amounted to \$348,000. In addition, 70,000 homes and businesses were left without power.

**July 17, 2012** A cold front slowly sagging south through northern New England was the focus for showers and thunderstorms. An associated shortwave provided significant directional and speed shear for the development of some super cells as the front slowly pushed south during the evening hours of July 17th. Wind damage was the main result of these storms as several bowing line segments moved through northern and central New Hampshire. A small waterspout touched down on Newfound Lake near Bridgewater. A severe thunderstorm downed a tree on a house at Green Crow lumber in Andover.

**June 24, 2013:** A hot and humid airmass was in place over the forecast area on the afternoon of June 24th. Convection developed early in the afternoon over eastern New York and western New England and shifted east into the favorable environment across New Hampshire and western Maine through the evening hours. Very weak shear and high

precipitable water resulted in pulse type convection with large hail and wet microbursts the main threats. Thirty people were injured by lightning at a Boy Scout Camp near Gilmanton. A thunderstorm downed small limbs and produced 0.75 inch hail near Andover. **November 24, 2013:** Strong winds developed behind an arctic cold front during the afternoon of the 24th. Winds gusted to between 40 and 50 mph across much of New Hampshire. Snapped trees and branches caused power outages throughout the region. Power companies reported that about 30,000 customers lost electrical service. In Laconia, one tree company worker was struck and killed by a tree as he was working to remove another tree from a roadway. In Concord where winds gusted to 58 mph, a large fiber communications cable fell across I-93 blocking the interstate highway for three hours. Several areas in Andover lost power for up to 24 hours.

**July 23, 2016:** A strong shortwave and associated cold front were pushing southeast through the region on the afternoon of the 23rd. Good heating ahead of the front propelled CAPEs into the 1500 to 3000 range and combined with increasing uni-directional shear to produce numerous severe cells and more organized line segments. Numerous reports of wind damage were received during the afternoon and evening hours across southern and central New Hampshire. A severe thunderstorm downed power lines at the intersection of Plains Road and Currier Road in Andover.

**July 10, 2018:** A microburst hit central portions of town including Elbow Pond Road, Morrill Hill and Main Street. Widespread trees and wires down along these roads. Utility poles broke and tore the electric box off of at Town Office. Most electric was restored during the day, except Elbow Pond Road was out for about a week.

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## HURRICANE

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**Probability:** Occasional

**Definition:**

A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and the storm may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

**Location:**

When hurricane events occur in Andover they affect the entire town. Certainly, the heavy rainfall associated with hurricanes will impact the 100-year floodplain, but the high winds can have an impact on the whole town.

**Impact:**

New Hampshire's exposure to direct and indirect impacts from hurricanes is real, but modest, as compared to other states in the region. That being said, the probability of hurricanes occurring in Andover is possible. The largest impact is on the floodplain areas due to heavy rains. High winds cause trees to fall thereby causing power outages, structural damage to buildings, road closures and debris management issues.

**Extent:**

Wind speeds within hurricanes may reach 250 miles per hour in a Category 5 hurricane, as measured on the Saffir-Simpson Hurricane Scale. Tropical depressions are considered to be of hurricane force when winds reach 74 miles per hour. Damage resulting from winds of this force can be substantial, especially considering the duration of the event, which may last for many hours.

Category	Wind Speed (mph)	Damage at Landfall
1	74-95	Minimal
2	96-110	Moderate
3	111-130	Extensive
4	131-155	Extreme
5	> 155	Catastrophic

**Previous Occurrence:**

**The Great New England Hurricane of September 21, 1938** in Southern New England resulted in 13 Deaths, 1,363 families received assistance, Disruption of electric and telephone services for weeks. 2 Billion feet of marketable lumber blown down. Total Direct Losses - \$12,337,643

**Hurricane Carol in August 31, 1954** in Southern New England resulted in extensive amount of trees blown down and property damage. Large crop loss. Localized flooding.

**Hurricane Donna in September 12, 1960** in Southern and Central NH caused heavy flooding in Massachusetts and Southern New Hampshire.

Tropical Storm Daisy in October 7, 1962, in Southern and Central NH caused extreme ocean swells and coastal flooding.

**Tropical Storm Doria in August 28, 1971** in Southern and Central NH resulted in heavy rain and damaging winds.

**Tropical Storm Floyd in September 16-18, 1999** affected the entire state. This was originally a Hurricane that heavily impacted North Carolina and dumped heavy rains on New England resulting in a Presidential Declaration of Disaster in NH; FEMA DR-1305-NH in Belknap, Grafton and Cheshire Counties

**August 28, 2011:** Hurricane Irene made landfall across western Long Island, NY and was downgraded to a Tropical Storm as it moved into and through New England. The center of Irene was located just to the southwest of New Hampshire at 5 pm Sunday evening August 28 and then travelled up the Connecticut River Valley to the northern border of New Hampshire by 11 pm. The storm brought a prolonged period of strong and gusty winds and heavy rain to the state. The high winds snapped or uprooted numerous trees throughout the state causing more than 160,000 customers to lose electrical and/or communication services. The heavy rains caused rivers and streams throughout the state to flood causing damage to bridges, roads, and property. Andover officials held an Incident Briefing on August 26, 2011 with all department heads for an incident briefing. The storm moved west of town and did not have a major impact on the Town and the EOC never opened.

**October 29, 2012 (FEMA Declared Disaster #4095 on 11/28/12):** Winds across much of the State generally gusted from 40 to 70 mph Monday and Monday night as a result of the remnants of Hurricane Sandy. These strong and persistent winds combined with the powerful gusts to down numerous trees throughout the State and caused widespread power outages, especially across southern New Hampshire. Some peak wind gusts included 70 mph in Goshen, 62 mph in Londonderry, 60 mph in Portsmouth and Meredith, and between 50 and 60 mph in Concord, Derry, Newington, Fremont, and Rochester. Mount Washington had a gust of 136 mph and the Isles of Shoals gusted to 76 mph. In addition, on Tuesday, thunderstorm wind downed trees and produced damage in Northfield, Franklin, Andover, Plymouth, Meredith, and Canaan. The most significant hydrological impact from the storm was due to the band of heavy rain that fell between Monday afternoon and Tuesday morning. Across the State, this band produced 1 to 3

inches of rain in about a 6- to 12-hour period. This amount of heavy rain in the short duration caused some road washouts throughout the State. Severe convection developed across southern New Hampshire Tuesday evening, the 30th, and knocked over trees and/or caused damage in Meredith, Plymouth, Canaan, Andover, Franklin, and Northfield. A severe thunderstorm associated with the remnants of Hurricane Sandy downed trees on Raccoon Hill Road in Andover.

Since Hurricane Sandy in 2012, the Town has not experienced any significant impact from hurricanes or tropical storms.

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## FLOODING

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**Probability:** Probable

**Definition:**

Flooding is the temporary overflow of water onto land that is not normally covered by water. Flooding results from the overflow of major rivers and tributaries and/or inadequate local drainage. Flooding events considered in this Plan include 100-year and 500-year floodplain events, rapid snow pack melt and ice jams.

**Location:**

Flooding occurs in the 100-year floodplain as designated on the FEMA Flood Insurance Rate Map. These 100-year floodplain areas primarily include Blackwater River, Highland Lake, Elbow Pond, Bradley Lake and other minor tributaries. The potential is moderate and the impact is low to moderate.

**Impact:**

The extent of damage caused by any flood depends on the depth and duration of flooding, the topography of the area flooded, velocity of flow, rate of rise, and the amount and form of development in the floodplain. Most of the past flooding events result in erosion and damage to culverts and roads throughout town.

**Extent:**

FEMA defines flood hazards by the 100-year and 500-year flood events. A 100-year flood event is defined as flood event having a 1% chance of being equaled or exceeded in any given year. The 500-year flood event is defined as flood event having a .2% chance of being equaled or exceeded in any given year. The Town of Andover Flood Insurance Rate Maps (FIRM) identify both an A and AE zones. A zones are subject to the 100-year flood, however because there have been no detailed hydraulic studies, there is no Base Flood Elevation (BFE) determined for these zones. The AE zones are subject to the 100-year flood and have BFEs delineated on the FIRM.

**Previous Occurrence:**

**March 11-21, 1936:** Double flood; first due to rains and snowmelt; second, due to large rainfall.

**Sept. 21, 1938:** Hurricane. Stream stages similar to those of March 1936 and exceeded 1936 stages in the Upper Contoocook River.

**August 10, 1986:** FEMA DR-771-NH: Severe summer storms with heavy rains, tornadoes; flash flood and severe winds.



**April 16, 1987:** Severe Storms & Flooding. FEMA DR-789-NH

**August 7-11, 1990:** FEMA DR-876-NH: A series of storm events from August 7-11, 1990 with moderate to heavy rains produced widespread flooding in New Hampshire.

**August 19, 1991:** FEMA DR-917-NH: Hurricane Bob struck New Hampshire causing extensive damage in Rockingham and Stafford counties, but the effects were felt statewide.

**March 22, 2001:** The coastal storm that brought heavy snow to northern and central New Hampshire dropped 2 to 5 inches of rain in the southern part of the state. Small rivers and streams overflowed their banks. Melting snow also contributed to the runoff problem. Storm drains were overburdened causing some sewer systems to back up. Many washouts were also reported as the water flowed down the shoulders of the roads due to the high snow banks.

**April 3, 2005:** A low pressure system moving slowly northeast from through the Mid-Atlantic States spread rain into New Hampshire during the afternoon of April 2. Heavy rain continued through the 3rd as the storm continued to move slowly northeast. Rainfall amounts ranged from 1 to 3 inches across the area with Pinkham Notch receiving 3.61 inches. The rain, in combination with snowmelt, produced numerous road washouts throughout the area and resulted in about 945 thousand dollars in damage.

**October 9-15, 2005 (Columbus Day Flood):** The interaction between a cold frontal boundary and the remnants of Tropical Storm Tammy resulted in tremendous amount of rainfall throughout most of central and southern New Hampshire. Rainfall ranged from just under 2 inches in far northern New Hampshire to 9 inches at Gilford in Belknap County.

**May 13-15, 2006 (Mother's Day Flood):** Low pressure developed south of New England and remained nearly stationary from the 12th to the 15th resulting in over 12 inches of rain in some locations in a 72 hour period. Homes and businesses were damaged extensively. Many roads were washed out and impassable. Some bridges were damaged or destroyed. Several evacuations and rescues took place

during the flood event. Two dams on the Salmon Falls River were being monitored as it was feared they may fail.

**April 17, 2007:** Flooding and damages were countywide. An area of low pressure intensified rapidly as it moved slowly from the southeastern United States on the morning of Sunday, April 15th to near New York City by the morning of Monday, April 16th. Andover EOC was opened April 16 – April 18th and staffed. Damage was town-wide. Over a dozen roads were closed or barely passable. In addition

**September 3, 2011:** Tropical Storm Irene brought over 4 inches of rain to areas throughout New Hampshire. The eye of the storm traveled further west than predicted, up the Connecticut River valley, resulting in lower rainfall amounts than originally predicted for the Andover area.



Columbus Day Weekend brought days of rain and flooding. This was the view looking upstream at the Blackwater River from Cilleyville Road. Flooding closed Route 4 at Fenvale three times during the month. Photo by Charlie Darling

**June 30, 2013:** A stalled frontal boundary was the focus for thunderstorms producing very heavy rainfall on the afternoon of June 30th. 1 to 3 inches of rain fell in less than 3 hours causing rapid rises on streams in Sullivan, Merrimack, and Belknap Counties. Numerous road washouts were reported in all three counties. A thunderstorm produced 1.5 to 3 inches of rain near New London sending several area streams over their banks. There was washout damage to Shaw Hill Road in Andover.



**October 30, 2017 (FEMA Declare Disaster #4355):** An area of low pressure over the southeastern United States on the morning of Sunday, October 29th, intensified rapidly Sunday night and Monday, October 30, as it moved northward and moisture and energy from the remnants of Tropical Storm Philippe merged with the storm. The combined system brought high winds to much of New Hampshire Sunday night into Monday morning, with the highest winds in southern and central sections of the State. In addition, heavy rain accompanied the high winds over New Hampshire leading to both flash flooding and main-stem river flooding. The highest rainfall amounts were observed in the White Mountains. While the high winds and heavy rain ended during the morning of the 30th, flooding persisted into the late afternoon of November 1st. Rainfall amounts generally ranged from 2 to 5 inches across New Hampshire. Most of this rain fell within a 10-hour period from late Sunday evening through early Monday morning. By Wednesday evening, November 1st, all flooding had subsided. Power restoration efforts in the hardest hit areas across New Hampshire persisted for much of the week. In spite of the light amount of damage in Andover, the Fire Department had a busy night answering wires down calls, trees across the road and at least one flooded basement. Power was out for up to 24 hours in Town. Maple Street in East Andover was closed for many hours due to a large tree that had fallen across the road taking down power lines with it. The stress on the lines caused a power pole to snap and fall over across the road. The Town received FEMA Disaster funds for \$4,660 for Road and Bridge emergency repair. In addition, the Town was awarded \$183,193 in FEMA funds for the repair of the Elbow Pond Culvert.



## LIGHTNING

**Probability:** Frequent

**Definition:**

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 50,000 F, considerably hotter than the surface of the Sun.

**Location:**

The entire town is at moderate risk to lightning hazard. The higher elevation areas have an increased probability, however lightning strikes can occur anywhere in the Town.

**Impact:**

Residents and visitors to the New Hampshire area are more vulnerable to being struck by lightning because of the activities with which they are involved, particularly on those warm summer days when lightning is most likely to occur. Often, many people are outside enjoying the variety of recreational activities that attract people to New England during the summer when the vulnerability to lightning strike is highest. More likely to be affected are structures and utilities, often resulting in structure fires and power outages.

**Extent:**

The National Oceanographic Atmospheric Administration (NOAA) defines the extent of lightning activity with a LAL scale as shown in the table below.

LAL 1	No Thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent. 1 to 5 cloud ground strikes in a 5-minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a 5-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

**Previous Occurrence:**

Andover experiences annual lightning events but none that have caused damage to structures.

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## EXTREME HEAT

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**Probability:** Probable

**Definition:**

A Heat Wave is a "Prolonged period of excessive heat, often combined with excessive humidity." Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

**Location:**

Extreme heat events are difficult to define geographically. Due to their widespread nature, a period of extreme heat would affect the entire town.

**Impact:**

A heat wave is defined as 3 or more consecutive days of 90 degrees or higher. Extreme heat conditions may impact the health of residents and visitors. Facilities without generators and air-conditioners that house the elderly and disabled are very susceptible to human health issues. Utilities are also vulnerable as the demand for air-condition rises. Prolonged high temperature has also been associated with civil unrest.



**Extent:**

According to OSHA, the risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather. This table provides guidelines for the risk related to extreme heat.

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91° to 103°F	Moderate	Implement precautions and heighten awareness
103° to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

**Previous Occurrence:**

The summer of 1999 was one of the hottest summers on record. As of 7/27/99, there had been 13 days with temperatures recorded above 90 degrees, 5 days above 95 degrees and 2 above 97 degrees. There was a large increase in emergency response calls, however there were no deaths associated with this event. The Town of Andover experiences extreme heat temperatures several days during the summer but with little impact to the population. The Town has not experienced a significant heat wave since the last Plan update.

**WILDFIRE**

**Probability:** Probable

**Definition:**

Any free burning uncontrollable wild land fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment.

**Location:**

The Ice Storms of 1998 and 2008 left a significant amount of woody debris in the forests of the region and may fuel future Wildfires similar to the debris caused by the Hurricane of 1938. Fires in New Hampshire are predominantly human-caused, and roughly half of the total fire activity is in the most populous three southern counties. The proximity of many populated areas to the forested lands exposes these areas and their populations to the potential impact of wildfire. Wildfires are most likely to occur along areas traveled by humans, such as roads, rail trails and recreational areas.

**Impact:**

Fires in New Hampshire are predominantly human-caused, and roughly half of the total fire activity is in the most populous three southern counties. The proximity of many populated areas to the forested lands exposes these areas and their populations to the potential impact of wildfire. The estimated impact to structures could be derived from the information included in the critical facilities in Chapter 4.

Value	Description
A	Up to .25 acres
B	0.26 to 9.9 Acres
C	10.0 to 99.9 Acres
D	100 to 299 Acres
E	300 to 999 Acres
F	1000 to 4999 Acres
G	5000 to 9999 Acres
H	10000 to 49999 Acres
I	50000 to 99999 Acres
J	100000 to 499999 Acres
K	500000 to 999999 Acres
L	1000000 + Acres

**Extent:**

The extent of damage to structures and the general populations will vary depending on climate, warning, and the time of year. Even the time of day could affect the extent, as there is an increase of recreational hikers and tourists

during the daytime. The National Wildfire Coordinating Group (NWCG) classifies a wildfire into one of several ranges of fire, based upon the number of acres burned. The following list provides NWCG's scale for wildfire values:

**Previous Occurrence:**

**1902**, 50 acres burned on Plains Road as a result of spark from a train.

**1957** on Easter Sunday, 100 acres burned on Plains Road.

**April 2012:** Andover fire fighters responded to a multiple-alarm wildfire in the neighboring Town of Hill, which ultimately burned 83 acres in Hill.

**May 2015:** This month saw a very high level of fire activity. The dry weather made fire conditions in the woods very unsafe. The Fire Department responded to five multiple-alarm fires, which is unusual for most years. This level of activity places a tremendous burden on our volunteer team. The small Forestry pay does not make up for lost wages.

## DROUGHT

**Probability:** Probable

**Definition:**

Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people.

**Location:**

Droughts are difficult to define geographically. Due to their widespread nature a drought would affect the entire Town. However, a drought can affect fire suppression in those areas that do not have access to water for fire suppression.

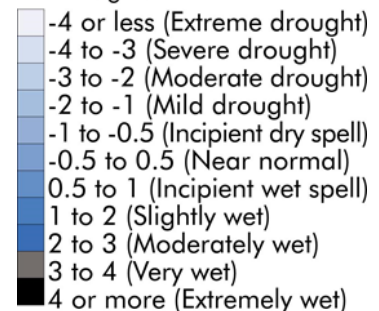
**Impact:**

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are not as damaging to the Town as floods or winter weather. However, a severe drought can affect public water supply, increase the probability of fires, and impede fire suppression. Those areas with minimal fire protection are at a higher risk because of a prolonged drought.

**Extent:**

The Palmer Drought Severity Index (PDSI) was devised in 1965 and was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for un-irrigated cropland. It primarily reflects long-term drought and has been used extensively to initiate drought relief. It is more complex than the SPI and the Drought Monitor.

PDSI Legend



**Previous Occurrence:**

According to the State of New Hampshire Multi-Hazard Mitigation Plan, the southern portion of NH experienced droughts in 1957, 1963, 1965, 1966, 1970, 2001, and 2010. The statewide drought of 2001/02 had a minimal impact on water sources for fire protection in Andover. Most recently, according to [www.drought.gov](http://www.drought.gov), almost 45% of the

State of New Hampshire was in a severe drought at the beginning of 2017. Andover has not experienced a significant drought since the last Plan update.

## EARTHQUAKE

**Probability:** Remote

**Definition:**

An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and Mercalli scale.

**Location:**

According to the State of New Hampshire Multi-Hazard Mitigation Plan, New Hampshire is considered to lie in an area of "Moderate" seismic activity with respect to other areas of the United States and is bordered to the North and Southwest by areas of "Major" activity. Generally, the entire Town is at risk to earthquakes.

**Impact:**

Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, and avalanches. It is assumed that all the buildings in the Town have not been designed to withstand seismic activity. More specifically, the older historic buildings that are constructed of non-reinforced masonry are especially vulnerable to any moderate sized earthquake. In addition, utilities (water, sewer, etc.) are susceptible to earthquake damage. Andover has experienced the effect of small to moderate earthquakes that had minor to no effect on the town's infrastructure.

**Extent:**

Earthquakes with a magnitude of 2.0 to 4.9 on the Richter scale are considered minor to light, and those 5.0 to 6.9 are considered moderate to strong. However, if a large (6+ on the Richter Scale) occurred in or around the town, it is assumed that structural damage would be moderate to severe.

Richter Scale	Magnitude Earthquake Effects
2.5 or less	Usually not felt but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.
6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

**Previous Occurrence:**

The Town of Andover has not experienced any significant earthquakes. The following table summarizes earthquakes of 2.5 magnitude or greater that have occurred in New Hampshire and New England:

<u>Location</u>	<u>Date</u>	<u>Magnitude</u>
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Ontario-Quebec Border	June 23, 2010	5.0
Boscawen, NH	September 26, 2010	3.1
Virginia	August 23, 2011	5.8
Southern Maine	October 16, 2012	4.0
Contoocook, NH	March 21, 2016	2.9
East Kingston, NH	February 15, 2018	2.7

## DAM FAILURE

**Probability:** Remote

**Definition:**

According to the NH Department of Environmental Services (DES), a dam is any artificial barrier which impounds or diverts water which: has a height of 6 feet or more; or is located at the outlet of a great pond, regardless of height or storage; or is an artificial barrier which impounds liquid Industrial or liquid commercial wastes, or septage or sewage, regardless of height or storage.

**Location:**

Highland Lake Dam and Bradley Lake Dam are classified as Significant Hazard dams. The Town and the Andover Village District maintain Emergency Action Plans for these two dams. The map below identifies the location of these dams.

**Impact:**

A dam failure or breach could occur due to extreme rainfall amounts and/or a human caused incident. A failure or breach would result in rapid loss of water that is normally held by the dam resulting in an inundation downstream.

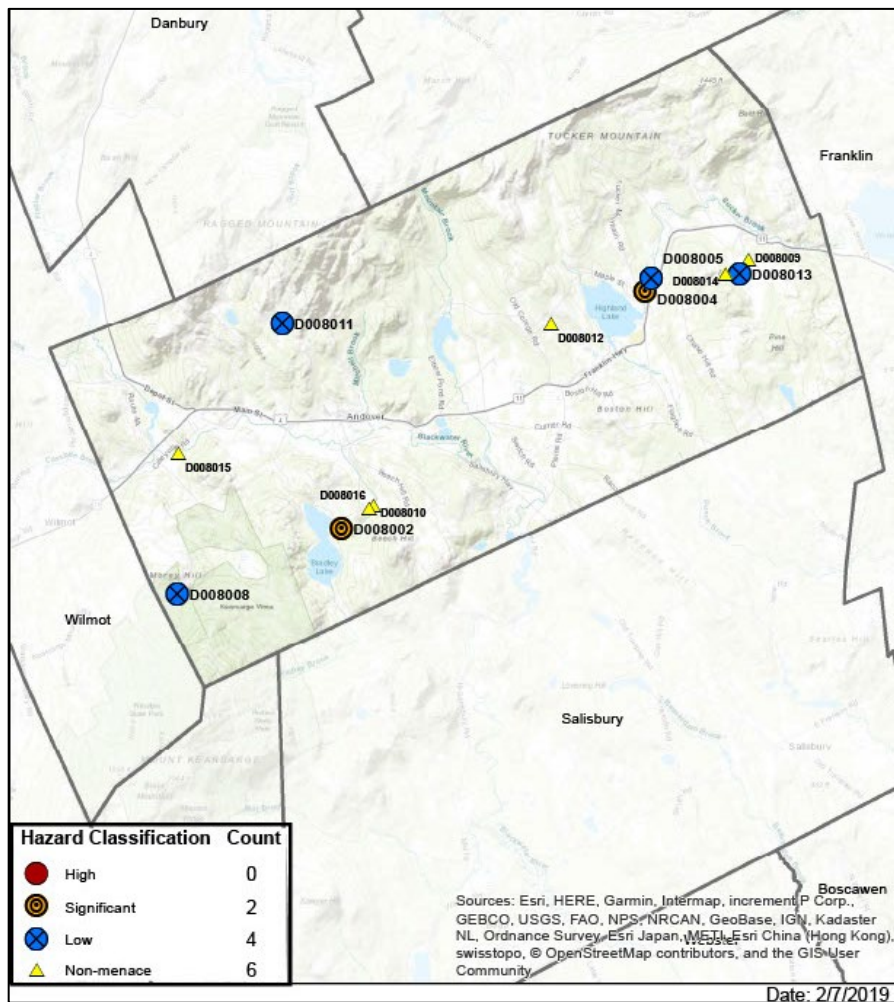
**Extent:**

NH Department of Environmental Services categorizes Dams into one of four classifications, which are differentiated by the degree of potential damages that a failure of the dam is expected to cause. The classifications are designated as non-menace, low hazard, significant hazard and high hazard. A **Significant Hazard** means a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: no probable loss of lives; major economic loss to structures or property; structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services; or major environmental or public health losses. A **Low Hazard structure** means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: 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 impassable or otherwise interrupt public safety services; The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course; Reversible environmental losses to environmentally-sensitive sites. A **Non-Menace** structure means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is: Less than six feet in height if it has a storage capacity greater than 50 acre-feet; or Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

**Previous Occurrence:**

There is no history of significant dam failures in Andover.



## **Chapter 4 CRITICAL FACILITIES**

### **Introduction**

The Critical Facilities List for the Town of Andover has been identified by the Andover Hazard Mitigation Planning Committee. A critical facility is defined as a building, structure or location which is: vital to the emergency response; maintains an existing level of protection from hazards within the community and would create a secondary disaster if a hazard were to impact it. The Critical Facilities List for the Town of Andover has been identified using the following categories:

#### **CATEGORY 1 (Facilities needed for Emergency Response)**

- Fire
- Emergency Medical Services (EMS)
- Police
- Hospital
- Shelter
- Town Hall
- Emergency Operations Center (EOC)
- Public Works
- Water Supply/Treatment
- Sewer Treatment
- Emergency Fuel

#### **CATEGORY 2 (Facilities NOT necessary during an emergency event)**

- Public Utilities
- Transportation
- Evacuation Routes

#### **CATEGORY 3 (Populations & Places to Protect)**

- Schools
- Daycares
- High Concentration Populations
- Elderly Facilities
- Healthcare Facilities
- Recreation areas
- Historic Resources



Andover, NH Inventory of Critical Facilities and Assets							
Facility	Name/Location	Owner	Back-Up Power	Category 1	Category 2	Category 3	Assessed Value (2018)
Town Hall	Andover Town Hall, 31 School Street	Municipal	Portable	✓			\$470,400
EOC Primary Secondary	Andover Town Hall, 31 School Street	Municipal	Portable	✓			\$470,400
	Andover Fire Station, 197 Main Street	Municipal	Yes	✓			180,600
Police Station	Andover Police Station, 32 School Street	Municipal	Yes	✓			\$66,700
Fire Station/ EMS	Andover Fire Station, 197 Main Street	Municipal	Yes	✓			\$180,600
	East Andover Fire Station, 23 Channel Road	Municipal	Yes	✓			\$123,600
	Andover EMS	Municipal	n/a	✓			n/a
Hospital / Medical Facility	Proctor Health Center, North Street	Private	n/a	✓			n/a
Shelter	Andover Elementary Middle School, 20 School Street	Municipal	No	✓			\$6,678,000
	Proctor Academy, Main Street	Private	Generator @ various buildings	✓			Varies
Public Works	Road Agent provides equipment, services and direction to Town Public Works.	Municipal	n/a	✓			n/a
Water Supply/ Treatment	Andover Village District, within district from Mitchell Brook to Bridge Road North Street down Lawrence Street & Peg Shop Road, park street block house lane – surface water from Bradley Lake Road	Govt. Precinct	Yes	✓			Varies
Emergency Fuel Supply w/ Back-up power	DOT Shed on Switch Road (diesel only)	State	Yes	✓			\$285,300
	Diesel and gas at the State DOT shed on Rt. 127	City	Yes	✓			n/a
Sewer Treatment	Private systems only	n/a	n/a	n/a			n/a

Andover, NH Inventory of Critical Facilities and Assets							
Facility	Name/Location	Owner	Back-Up Power	Category 1	Category 2	Category 3	Assessed Value (2018)
Public Utilities	NH Electric Coop	Private	No		✓		\$197,900
	PSNH (about 3 dozen residents)	Private	No		✓		Not avail
	Verizon cell tower	Private	No		✓		Not avail.
	TDS Telephone and internet (2 switching stations on School Street and Chase Hill Road)	Private	No		✓		Not avail.
Transportation Services	First Student Bus Company	Private	n/a		✓		n/a
	Proctor Academy	Private	n/a		✓		n/a
Evacuation Routes	Route 4 East & West	n/a	n/a		✓		n/a
	Route 11 East & West	n/a	n/a		✓		n/a
Schools	Andover Elementary Middle School, 20 School Street	Municipal	No			✓	\$2,052,000
	Proctor Academy	Private	Yes			✓	\$7,226,092
High Population Areas	Proctor Academy, Main Street	Private	Yes			✓	\$7,226,092
	Andover Village District	Mixed	n/a			✓	Varies
	East Andover Village District	Mixed	n/a			✓	Varies
Elderly	Pine View Haven, 85 Franklin Hwy	Private	No			✓	\$211,100
	Mildred Longfellows, Franklin Hwy	Private	No			✓	\$128,600
	Singh, Branden O'Malley-Elderly Shelter	Private				✓	\$159,400



Andover, NH Inventory of Critical Facilities and Assets							
Facility	Name/Location	Owner	Back-Up Power	Category 1	Category 2	Category 3	Assessed Value (2018)
Recreational Areas	Blackwater Ski Area, Lawrence Street	Private	n/a			✓	Part of Proctor
	Proctor Academy Athletic Fields and Ice Rink	Private	n/a			✓	Part of Proctor
	Chaffee Park – Town Beach	Municipal	n/a			✓	\$482,900
	Blackwater Park	Municipal	n/a			✓	\$169,500
	Corson Park	Municipal	n/a			✓	Part of AEMS
	Bradley lake	Mixed	n/a			✓	Varies
	Highland Lake	Mixed	n/a			✓	Varies
Historic	Durgin, Gershom, House, 391 Franklin Highway	Private	No			✓	\$161,100
	East Andover Village Center Historic District, Jct. Rt. 11 and Chase Hill Rd.	Mixed	No			✓	Varies
	Potter Place Train Station Area	Historical Society	No			✓	\$147,900
	Covered Bridges (Bridge Street & Cilleyville)	Municipal	No			✓	\$150,000 ea
	Hersey Farm, Franklin Highway	Private	No			✓	\$84,300
	Taunton Hill (Old College Road) – various houses	Mixed	No			✓	Varies

## Chapter 5 CAPABILITY ASSESSMENT

The following is a list of current policies and regulations adopted by the Town of Andover that protect people and property from natural and man-made hazards. The table includes a description of the policy/regulation, the responsible agent, the policy's effectiveness and recommended strategies to improve mitigation efforts.

### Summary of Policies and Programs Reviewed

Emergency Operation Plan	Wetlands Protection Ordinance
Building Code	Aquifer Protection Ordinance
Floodplain Ordinance	Hazardous Materials Plan/Team
Elevation Certificates	Public Education Programs
Emergency Warning System	School Emergency Response Plan
Subdivision Regulations	Master Plan
Road Design Standards	Capital Improvement Program
Bridge Maintenance Program	Facilities with Back-up Power
Storm Drain/ Culvert Maintenance	Dam Emergency Action Plans
Wellhead Protection Ordinance	

### Integration of Mitigation Priorities into Planning and Regulatory Tools

The Town should conduct periodic review of these regulations and this Hazard Mitigation Plan. Reviewing these plans on a regular basis will ensure the integration of mitigation strategies. This review will continue to be a priority of the Andover Emergency Management Director and will likely include yearly requests in the annual budget process. Moreover, as suggested in the onset of this document, this *Plan* is a planning tool to be used by the Town of Andover, as well as other local, state, and federal governments, in the effort to reduce future losses from natural and/or man-made hazardous events before they occur. Under the Prioritized Mitigation Projects *Action Plan* (found in Chapter 6), all parties listed under the Responsibility/Oversight category shall also review this listing annually and consider the listed (and updated) mitigation projects within their annual budget requests.

<b>Andover, NH Existing Protection Matrix</b>				
<b>Existing Protection</b>	<b>Description</b>	<b>Responsible Agent</b>	<b>Effectiveness (Fair/Avg/Exc)</b>	<b>Recommended Changes</b>
Emergency Operations Plan	The EOP identifies the response procedures and capabilities of the Town.	Emergency Management Director (EMD)	Average	Update in 2019
Zoning Enforcement / Building Code	State Residential IBC & Town Building Code	Zoning Enforcement Officer & Selectmen	Average	None
Floodplain Ordinance	The town is currently participating the NFIP and has adopted the required floodplain ordinance.	Zoning Enforcement Officer & Planning Board	Average	Continue to update NFIP Ordinance to meet state and federal requirements.
Elevation Certificates Maintained	E.C. Permits required for development in the 100-year floodplain only	Zoning Enforcement Officer & Planning Board	Average	Continue to maintain Elevation Certificates for development in the Floodplain.
Emergency Warning System	E911 ENS, Public access channel, Cable, website, door-to-door	EMD	Average	None (PAs on emergency vehicles and EAS is sufficient).
Subdivision Regulations	The purpose of Andover's subdivision regulations is to provide for the orderly present and future development of the town by promoting the public health, safety, convenience and welfare of the town's residents.	Planning Board & Selectmen	Average	Update regulations as necessary.

<b>Andover, NH Existing Protection Matrix</b>				
<b>Existing Protection</b>	<b>Description</b>	<b>Responsible Agent</b>	<b>Effectiveness (Fair/Avg/Exc)</b>	<b>Recommended Changes</b>
Road Design Standards	Andover's Subdivision Regulations include road design standards that control the amount and retention of storm water runoff.	Planning Board	Average	Update regulations as necessary.
Bridge Maintenance Program	There are currently 7 bridges on the state Red List. Inspection and clean-up occur annually. The state inspects all bridges every other year and maintains their bridges.	Road Agent & Selectmen	Average	Continue to inspect and upgrade bridges.
Storm Drain / Culvert Maintenance	Town-wide	Road Agent	Average	Inventory culverts on GPS with condition, type & age of culvert
Wellhead Protection	None	n/a	n/a	Research wellhead protection regulations around Bradley Lake.
Wetlands Protection	No Town Ordinance	DES	Average	Activity in wetlands requires state approval.
Aquifer Protection Ordinance	No town ordinance.	n/a	n/a	Research aquifer protection regulations for under Plains Road area.
Hazardous Materials Response Team	Central NH Haz Mat Response Team	Fire Department	Average	Continue to participate in the regional haz mat team.

<b>Andover, NH Existing Protection Matrix</b>				
<b>Existing Protection</b>	<b>Description</b>	<b>Responsible Agent</b>	<b>Effectiveness (Fair/Avg/Exc)</b>	<b>Recommended Changes</b>
Public Education Programs	The Fire Department & EMS conducts fire prevention programs. The Police Department conducts periodic programs.	EMD/Fire Chief/Police Chief	Average	Research & apply for grant money for public education.
School Emergency Response Plan	The School maintains an emergency response plan and conducts at least 10 drills a year.	School Principal/EMD	Average	Update as required by the State, or as necessary.
Master Plan	The Master Plan serves as the guiding document for future development in Andover.	Planning Board	Average	Update in 2023
Capital Improvement Program	Long-term budget program.	Planning Board	Average	Include Haz Mit Projects where applicable.
Facilities with Emergency Back-up Power	The fire stations and town hall have backup generators.	EMD	Average	Purchase and install generator for the shelter at the Elementary-Middle School.
Dam Emergency Action Plans (EAPs)	Highland Lake Dam and Bradley Lake Dam are owned by the Town and the Village District. Both Dams have Emergency Actions Plans on file at the Town Office.	EMD	Average	Include as part of the Town's Emergency Operations Plan.

## Chapter 6 MITIGATION PROJECTS

### Hazard Identification

The Committee utilized the *Hazard Identification Worksheet*, as shown in Appendix B, to identify potential hazards, the historical occurrence, locations, assets at risk and the probability of each hazard. The results of this process can be found in Chapters 2 and 3.

### Problem Statements

From the Hazard Identification process the Committee developed a list of Problem Statements for each Hazard (see Appendix B). Based on the hazards and risks within the town, the Committee summarized the ‘problems’ associated for every hazard identified. These problem statements allowed the Committee to identify mitigation alternatives during the project identification step described below.

### Goals Identified

During the 2019 update, the Committee reviewed the 2013 Andover Hazard Mitigation Plan goals and made no revisions. The Goals were not modified for any substantial content, as there has not been any substantial change in development.

### Project Identification

Using the *Mitigation Project Identification Worksheet* (see Appendix B) as a guide, the Committee members identified mitigation projects for each problem Statement. Specific objectives included: Prevention, Property Protection, Public Education, Natural Resource Protection, Emergency Services and Structural Projects.

This process resulted in the *Mitigation Project Identification Matrix*. For illustrative purposes the table below is an excerpt from the *Matrix* included in Appendix B. In this *Matrix*, the committee was able to determine a basic benefit/cost by using the STAPLEE method. For each project identified, the committee considered the STAPLEE Criteria (Social, Technical, Administrative, Political, Legal, Economic and Environmental) to guide their decision in prioritizing the projects. One component of STAPLEE is the Economic criteria which aided the committee in determining whether the benefits outweigh the costs.

Hazard	Problem Statement	Mitigation Project <i>(Objectives: Prevention /Property Protection/ Public Educ./ Nat.Resource /Emerg. Serv / Structural)</i>	Social	Technical	Administrative	Political	Legal	Economic	Environments
Lightning	Critical facilities are at risk to lightning strikes.	Install/Upgrade lightning protections systems (grounding, lightning rods, surge protectors, etc.) on Critical Facilities.	+	+	+	+	+	-	+

### Completed Projects since 2013

The Town of Andover completed the latest version of this plan in 2013. Since that time, the town has completed the projects listed below. These completed projects are not included in the 2019 edition of the Hazard Mitigation plan. In addition, the Committee added new projects to the Mitigation Action Plan, all of which are included in the Action Plan.

<b>Completed Projects since 2013</b>
Install security lighting and measures at the East Andover Fire Department and Town Hall.
Replace and upgrade multiple culverts on top-half of Tucker Mountain Road.
<b>Deleted Projects since 2013</b>
“Investigate fire suppression requirements to be implemented in the Building Code and Subdivision Regulations and continue to update to meet state regulations.” Was deleted because the NH Legislature has deemed it illegal to require fire suppression equipment for residential structures.
A portion of one project (‘work with American Red Cross to conduct a shelter survey’) was removed as the Town does not expect ARC to run a local shelter in Town and the Town is part of a Regional Shelter plan with the Capital Area Public Health Network.
<b>Continuing Projects since 2013</b>
<i>(Note: these projects were identified by the committee as either on-going or annual projects that they wanted to maintain or were just simply not completed since the last plan.)</i>
Provide annual ICS/NIMS training and qualification requirements for emergency services personnel.
Purchase a portable/mobile radio with town frequency for Road Agent.
Develop a Memorandum of Agreement between the School and the Town for use of facility as a shelter.
Purchase and install generator at the Andover Elementary School in order to operate the facility as a designated shelter.
Purchase shelter supplies (i.e. blankets, first aid)
Purchase safety equipment, cones, road signs/barriers for Road Agent.
Eliminate tree hazards over public roads as needed.
Inventory culverts, including the age and condition, using GPS and associated hardware & software. Road Service Management System. (RSMS)
Purchase and install security measures at the water filtration plant (i.e. building security alarm, detection system).
Update EOP in 2011 to include shelter care for pets during and emergency.
Develop Water Resource Protection Plan (WRPP) that identifies potential pollution sources and remedies for Bradley Lake Drinking Water Supply (i.e. land acquisition, regulations, point source identification, etc.)
Replace and upgrade multiple culverts on Shaw Hill Road (from Keyser property to Raccoon Hill intersection)
Continue to ensure town regulations meet the National Flood Insurance Program (NFIP) standards, hold Community Assistance Visits with Office of Strategic Initiatives and educate the public on the NFIP regulations.

**2019 Prioritized Mitigation Projects:**

In 2019, each committee member reviewed the updated list of Mitigation Projects. After careful evaluation, the committee ranked the projects by voting for half of the projects. The project that received the most votes was ranked as the highest priority and the project receiving the least amount of votes received the lowest priority. (See Prioritized Mitigation Projects in Appendix B.) The committee was able to determine a basic benefit/cost by using the STAPLEE method. For each project identified, the committee considered the STAPLEE Criteria (Social, Technical, Administrative, Political, Legal, Economic and Environmental) to guide their decision in prioritizing the projects. The prioritized projects are identified in the Mitigation Action Plan.

There have been no significant changes to mitigation priorities for the Town of Andover. The Town has not experienced any changes in resources, new hazard impacts, or development patterns that merit changes to mitigation priorities. The Hazard Mitigation Committee identified new projects as described below and prioritized them as discussed above.

**Incorporating Mitigation Into Local Planning**

In order for the requirements of this plan to be effective, it is essential that the Town of Andover incorporate the strategies and actions into its planning process. Educating employees working within the Town Agencies along with members of the various Boards on the provisions of the plan is critical for ensuring that disaster preparedness and risk mitigation become part of their planning process when holding discussions, making decisions, and developing plans and Standard Operating Procedures (SOPs). As noted above, information outreach is a high priority action item that will impact more than just Town employees and Board members. Since interested citizens attend various Town meetings where decisions are made, having a community base that understands the importance of disaster mitigation planning will also assist in ensuring that future plans and actions integrate the requirements found in this plan.

The Board of Selectmen will instruct the Town Agency Heads to review their SOPs and ensure that where appropriate, the requirements of this plan are integrated into those procedures. They will also coordinate with both the Zoning Board and the Planning Board to ensure that risk mitigation planning continues to be a part of their recommendation/decision process in order to fulfill the goals and objectives outlined in this plan.

Since the last update of this Plan in 2013, the Town incorporated Hazard Mitigation Planning into the following documents:

- Andover Emergency Operations Plan (EOP) – The EOP is designed to allow the Town to respond more effectively to disasters as well as mitigate the risk to people and property. The EOP was updated in 2015 and was reviewed to ensure that where appropriate, specific mitigation actions outlined in the HMP were also addressed in the EOP.



**Mitigation Action Plan**

The projects identified in 2013 included preparedness projects as well as mitigation projects. During the 2019 update, the committee separated mitigation projects from preparedness projects (a.k.a Non-Mitigation). Both mitigation and non-mitigation projects are compiled in the Mitigation Action Plan found on Page 6-4 which identifies Responsibility, Funding, Time frame, Hazards Addressed and the Priority for each mitigation project.

Mitigation Action Plan - Andover, NH						
Mitigation Action	Responsibility/ Oversight	Funding/ Support	Timeframe*	Hazards Addressed	Estimated Cost	Priority
1. Install a generator at the Andover Police Department (or connect to Fire Department Generator)	Police Department	Town Budget / Grants	Medium	Hurricane, Severe Wind, Winter Weather	\$7,800	High (7)
2. Purchase and install generator at the Andover Elementary School in order to operate the facility as a designated shelter.	School Board	School Budget / Town Budget / Grants	Medium	Severe Winter Weather	\$50-\$100,000	High (6)
3. Eliminate tree hazards over public roads as needed.	Road Agent	Town Budget	Ongoing	Hurricane, Severe Wind, Winter Weather	\$10,000 – 25,000	High (5)
4. Include the Highland Lake and Bradley Lake Dam Emergency Action Plans (EAP) to the EOP and test the EAPs every 2 years.	Emergency Management Director	Staff Time Only	Short	Dam Failure	\$0	High (5)
5. Identify and map the water system infrastructure.	Andover Village District	Town Budget	Medium	Earthquake, Human Caused	Unknown	Medium (4)
6. Install a repeater on the Verizon Tower to enhance police and fire radio communications.	Fire & Police Departments	Fire and Police Budgets	Medium	Hurricane, Severe Wind, Winter Weather	\$0	Medium (4)
7. Inventory culverts, including the age and condition, using GPS and associated hardware & software. Road Service Management System. (RSMS)	Road Agent	Town Budget	Medium	Flooding	\$2,000	Medium (4)
8. Purchase Uninterrupted Power Supply (UPS) for all town owned computer systems.	Board of Selectmen / Town Administrator	Town Budget	Ongoing	Lightning	\$200	Medium (3)
9. Replace generator at the water treatment plant with a large sized generator.	Andover Village District	AVD Budget	Medium	Severe Winter Weather	\$20,000	Medium (3)
10. Install erosion control (i.e. riprap) at the face of Bradley Lake dam.	Andover Village District / Road Agent	AVD Budget	Medium	Dam Failure	\$7,000	Medium (2)

Mitigation Action Plan - Andover, NH						
Mitigation Action	Responsibility/ Oversight	Funding/ Support	Timeframe*	Hazards Addressed	Estimated Cost	Priority
11. Replace and upgrade multiple culverts on Shaw Hill Road (from Keyser property to Raccoon Hill intersection)	Road Agent	Town Budget	Short	Flooding	\$40,000	Medium (2)
12. Continue to ensure town regulations meet the National Flood Insurance Program (NFIP) standards, hold Community Assistance Visits with Office of Strategic Initiatives and educate the public on the NFIP regulations.	Planning Board / Building Inspector / EMD	Staff Time	Ongoing	Flooding	\$0	Medium (2)
13. Continue to increase funds in the Wildfire Reserve Fund.	Fire Chief	Town Budget	Ongoing	Wildfire	\$5,000 / year	Medium (2)
14. Educate the general public and vulnerable populations on the steps to mitigate extreme heat, including establishing and promoting accessible cooling centers in the community.	Emergency Management Director	Staff Time	Short	Extreme Heat	\$0	Low (1)
15. Add signage for the 12" pipe on the east side of Bradley Lake Dam, located in the woods and vulnerable to vehicle load.	AVD	AVD Budget	Medium	Dam Failure	\$200	Low (1)
16. Develop Water Resource Protection Plan (WRPP) that identifies potential pollution sources and remedies for Bradley Lake Drinking Water Supply (i.e. land acquisition, regulations, point source identification, etc.)	AVD	Staff Time / Office of Strategic Initiatives	Medium	Drought	\$0	Low (0)
17. Educate the public on the hazards of and the steps to reduce the impact of lightning strikes to humans and structures.	Emergency Management Director	Staff Time	Short	Lightning	\$0	Low (0)

Mitigation Action Plan - Andover, NH						
Mitigation Action	Responsibility/ Oversight	Funding/ Support	Timeframe*	Hazards Addressed	Estimated Cost	Priority
<b>NON-MITIGATION PROJECTS</b>						
1. Develop a Memorandum of Agreement between the School and the Town for use of facility as a shelter.	School Board / Board of Selectmen	Staff Time	Short	All Hazards	\$0	Medium (4)
2. Purchase and install security measures at the water filtration plant (i.e. building security alarm, detection system).	Andover Village District	AVD Budget / Grants	Short	Human Caused Hazards	\$50/month	Medium (4)
3. Develop emergency response plan for the Town Office Building.	Board of Selectmen / Town Administrator	Staff Time / EMD	Short	Human Caused Hazards	\$0	Medium (4)
4. Purchase shelter supplies (i.e. blankets, first aid)	EMD / Board of Selectmen	Town Budget	Long	All Hazards	\$1,000	Medium (3)
5. Purchase a portable/mobile radio with town frequency for Road Agent.	Police / Fire Departments	Town Budget	Short	All Hazards	\$3,000	Medium (3)
6. Purchase safety equipment, cones, road signs/barriers for Road Agent.	Road Agent	Town Budget	Ongoing	All Hazards	\$3,000	Medium (3)
7. Provide annual ICS/NIMS training and qualification requirements for emergency services personnel.	EMD / Police Chief / Fire Chief	State of NH	Ongoing	All Hazards	\$0	Medium (2)
8. Update EOP to include shelter care for pets during and emergency.	EMD	Staff Time	Short	All Hazards	\$0	Medium (2)

\*Timeframe: Short Term=1 year or less, or ongoing Medium Term=2-3 years Long Term=4-5 years

\* Ongoing: Projects that are reviewed and implemented on a daily, monthly or annual basis.

## **Chapter 7 ADOPTION, IMPLEMENTATION, MONITORING**

### **Adoption**

The Andover Selectmen by majority vote officially adopted the *Andover Hazard Mitigation Plan 2019 Update* on July 22, 2019. This plan identified Mitigation Actions to be implemented as outlined in Chapter 6.

### **Implementation**

There were 17 mitigation projects and 7 non-mitigation projects that were prioritized by the Committee. For each project the Committee identified who, when and how they would be implemented. Please refer to the “Action Plan” in Chapter 6 for a description of the timeframe and persons or departments responsible for implementation of the Prioritized Projects.

It will be the future responsibility of the Emergency Management Director to ensure implementation of these Prioritized Projects.

### **Monitoring & Updates**

The *Andover Hazard Mitigation Plan 2019 Update* must be reviewed, evaluated and updated at least once every five years. The Emergency Management Director is responsible for initiating this review and needs to consult with members of the Andover Emergency Management Committee, in order to track progress and update the Prioritized List in Chapter 6. The EMD will ensure the following:

- The Hazard Analysis will be evaluated for accuracy.
- Projects completed will be evaluated to determine if they met their objective.
- Projects not completed since the last updated will be reviewed to determine feasibility of future implementation.
- New projects will be identified and included in future updates as needed.
- The public, members of the Committee and State and non-profit agencies, will continue to be invited and involved during this process.
- In keeping with the process of adopting the 2019 Andover Hazard Mitigation Plan, a public hearing to receive public comment will be held. This will require the posting of two public notices, and where appropriate by posting a notice on the town’s Web Site.
- Updates to the *Plan* may be adopted subsequent to a public meeting or hearing by the Andover Board of Selectmen.
- Once every five years, the EMD will submit an updated plan to HSEM for approval.

<b>Annual Hazard Mitigation Plan Update, Monitor &amp; Evaluate Schedule and Public Involvement</b>			
<b>Meeting Schedule</b>	<b>Task</b>	<b>Town of Andover Responsibilities</b>	<b>Public Involvement (neighboring communities)</b>
Annually or as needed	Assess current status of funding for mitigation projects. Discuss any new projects/plans that should be obtained for your community.	Dept. heads and Board of Selectmen to locate and apply for sources of funding and implement the proposed strategies and plans.	Residents, businesses, and neighboring / watershed communities.
Annually or as needed	Meet to discuss the Hazard Mitigation Plan content and any updates needed for the plan	Department Heads or other agencies.	Residents, businesses, and neighboring / watershed communities.
Annually or as needed	Discussion and evaluation of Training Programs and public outreach efforts. New public outreach methods discussed.	Department Heads or other agencies.	Residents, businesses, and neighboring / watershed communities.

# CERTIFICATION OF ADOPTION

**TOWN OF ANDOVER, NH  
31 School Street, Andover, NH 03216  
July 22, 2019**

## **A RESOLUTION ADOPTING THE TOWN OF ANDOVER, NH HAZARD MITIGATION PLAN UPDATE 2019**

WHEREAS, the Town of Andover, NH has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (i.e. *flooding, lightning, high wind, winter weather, earthquakes, dam failure, etc*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Andover, NH, has developed and received conditional approval from the NH Homeland Security and Emergency Management for its Hazard Mitigation Plan Update 2019 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between April 2018 and April 2019 regarding the development and review of the Hazard Mitigation Plan Update 2019; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for the Town of Andover, NH; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Andover, NH, 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 Andover, NH eligible for funding to alleviate the impacts of future hazards; now therefore be it RESOLVED by the Board of Selectmen: The Plan is hereby adopted as an official plan of the Town of Andover, NH

1. The respective official identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
2. Future revisions and Plan maintenance required by 44 CFR 201.6, FEMA and NH HSEM are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution.
3. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by April 1<sup>st</sup> of each year.

Adopted, this 22nd day of July, 2019.

CLB  
Board of Selectmen, Chair

[Signature]  
Board of Selectmen

William Royce  
Board of Selectmen

State of New Hampshire  
County of Merrimack  
Margie M. Roy, J.P.



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## ACRONYMNS

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**BMP – Best Management Practices**  
**CDBG - Community Development Block Grant**  
**CRS – Community Rating System**  
**DES – Department of Environmental Services**  
**DHS – Department of Homeland Security**  
**DMA – Disaster Mitigation Act**  
**DOT – Department of Transportation**  
**EAP – Emergency Action Plan**  
**EMD – Emergency Management Director**  
**EMPG – Emergency Management Performance Grant**  
**EMS – Emergency Medical Services**  
**EOC – Emergency Operations Center**  
**EOP – Emergency Operations Plan**  
**FEMA – Federal Emergency Management Agency**  
**FIRM – Flood Insurance Related Maps**  
**FMA – Flood Mitigation Assistance Program**  
**GIS – Geographic Information System**  
**HAZMAT – Hazardous Material**  
**HMGP – Hazard Mitigation Grant Program**  
**HSEM – Homeland Security and Emergency Management**  
**ICC – International Code Council**  
**NFIP – National Flood Insurance Program**  
**NH HSEM – NH Homeland Security and Emergency Management**  
**PDM – Pre-Disaster Mitigation**  
**OEP – Office of Energy Planning**  
**RC&D – Resource Conservation and Development**  
**USGS – United State Geological Survey**

## APPENDICES

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Appendix A  
Appendix B  
Appendix C

Hazard Mitigation Resources  
Documentation of Planning Process  
Approval Letter from FEMA

## **APPENDIX A**

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### **Hazard Mitigation Resources**

Type	Resource	Link
<b>Hazard Assessment</b>	FEMA Disaster Declarations	<a href="https://www.fema.gov/disasters">https://www.fema.gov/disasters</a>
	National Oceanic and Atmospheric Administration Storm Events Database	<a href="https://www.ncdc.noaa.gov/stormevents/">https://www.ncdc.noaa.gov/stormevents/</a>
	United States Geological Survey (USGS) Earthquake Archives	<a href="http://earthquake.usgs.gov/earthquakes/search">http://earthquake.usgs.gov/earthquakes/search</a>
	National Geophysical Data Center / World Data Service (NGDC/WDS): Significant Earthquake Database	<a href="https://www.ngdc.noaa.gov/nndc/struts/form?t=101650&amp;s=1&amp;d=1">https://www.ngdc.noaa.gov/nndc/struts/form?t=101650&amp;s=1&amp;d=1</a>
<b>NESEC</b>	The Northeast States Emergency Consortium (NESEC) to provides free assistance to help local, state, regional and other organizations	<a href="http://nsec.org/mapyourrisk/">http://nsec.org/mapyourrisk/</a>
<b>Funding Possibilities</b>	Hazard Mitigation Grant Program (HMGP)	<a href="http://www.fema.gov/hazard-mitigation-grant-program">http://www.fema.gov/hazard-mitigation-grant-program</a>
	Flood Mitigation Assistance Grant Program (FMA)	<a href="https://www.fema.gov/flood-mitigation-assistance-grant-program">https://www.fema.gov/flood-mitigation-assistance-grant-program</a>
	Pre-Disaster Mitigation Grant Program (PDM)	<a href="http://www.fema.gov/pre-disaster-mitigation-grant-program">http://www.fema.gov/pre-disaster-mitigation-grant-program</a>
	HMA grant programs – eligible activities by grant program	<a href="https://www.fema.gov/hazard-mitigation-assistance-mitigation-activity-chart">https://www.fema.gov/hazard-mitigation-assistance-mitigation-activity-chart</a>
	Flood Mitigation Assistance (FMA) Grant Program	<a href="https://www.fema.gov/flood-mitigation-assistance-grant-program">https://www.fema.gov/flood-mitigation-assistance-grant-program</a>
	U.S. Economic Development Administration: Road and water infrastructure upgrades and potential projects.	<a href="http://www.eda.gov/funding-opportunities/">http://www.eda.gov/funding-opportunities/</a>
	FEMA; USGS National Earthquake Hazards Reduction: Technical program assistance under grants to states and local jurisdictions	<a href="http://www.fema.gov/national-earthquake-hazards-reduction-program">http://www.fema.gov/national-earthquake-hazards-reduction-program</a>
<b>Technical Assistance</b>	State Hazard Mitigation Officers	<a href="http://www.fema.gov/state-hazard-mitigation-officers">http://www.fema.gov/state-hazard-mitigation-officers</a>
	USDA, Natural Resources Conservation Service (NRCS) Conservation Technical Assistance	<a href="http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/cta">http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/cta</a>
<b>Publications</b>	FEMA Region I Webliography	<a href="http://www.fema.gov/about-region-i/about-region-i/hazard-mitigation-planning-webliography">http://www.fema.gov/about-region-i/about-region-i/hazard-mitigation-planning-webliography</a>
	Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards	<a href="http://www.fema.gov/media-library/assets/documents/30627?id=6938">http://www.fema.gov/media-library/assets/documents/30627?id=6938</a>
	FEMA B-797, Hazard Mitigation Field Book – Roadways	<a href="http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=4271">http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=4271</a>
	Flood Hazard Mitigation Handbook for Public Facilities	<a href="http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=3724">http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=3724</a>
	FEMA 386-6, Mitigation Planning How To #6: Integrating Historic Property & Cultural Resource into Hazard Mitigation Planning	<a href="http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=1892">http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=1892</a>
	FEMA P-787 Catalog of FEMA Building Science Branch: Publications and Training Courses (2015)	<a href="http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=3184">http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&amp;id=3184</a>
	Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials (2013)	<a href="http://www.fema.gov/media-library/assets/documents/31372">http://www.fema.gov/media-library/assets/documents/31372</a>
	Local Mitigation Planning Handbook (2013)	<a href="https://www.fema.gov/media-library/assets/documents/31598">https://www.fema.gov/media-library/assets/documents/31598</a>

## **APPENDIX B**

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### **Documentation of Planning Process**

**Including:**

**Agendas**

**Attendance Sheets**

**Public Notices / Email Notices**

**Problem Statements**

**Mitigation Project Identification Matrix**

**Prioritized Mitigation Projects**

## Andover, NH Hazard Mitigation Plan

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### April 19, 2018 Committee/Public Meeting AGENDA

1. Introductions
2. Review/Update Goals
3. Review/Update Hazard History
4. Review/Update Risk Matrix
5. MISC:
  - a. Any significant changes in development since fall of 2010, especially in hazard prone areas?
  - b. Participation/activities in NFIP since 2010?
  - c. Was the HMP incorporated into other planning mechanisms? If not, why?
6. Review for next meeting:

Update Critical Facilities (Chap. 4)  
Update Capability Assessment (Chap.5)  
Distribute Sample Mitigation Projects

#### ATTENDEES

Name	Title/Affiliation
Dave Blinn	Andover Board of Selectmen
Jane Hubbard	Andover EMD / Hubbard Consulting LLC
Jane Slayton	Andover Elementary/Middle School Principal
Joe Mahoney	Andover Police Chief
John Kinney	Andover EMS
Rene Lefebvre	Andover Fire Chief
Steve Barton	Andover Fire Department
Vicky Mishcon	Andover Board of Selectmen

# Andover, NH Hazard Mitigation Plan

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May 17, 2018

## Committee/Public Meeting AGENDA

1. Update Mitigation Projects (completed/delete/keep)
2. Update Critical Facilities Chapter
3. Update Existing Mitigation Strategies Chapter
4. Distribute Sample Mitigation Projects
5. Review for next meeting:

Identify NEW Mitigation Projects

### ATTENDEES

Name	Title/Affiliation
Dave Blinn	Andover Board of Selectmen
Jane Hubbard	Andover EMD / Hubbard Consulting LLC
Joe Mahoney	Andover Police Chief
John Kinney	Andover EMS
John Thompson	Andover Highway Department
Marj Roy	Andover Town Administrator
Rene Lefebvre	Andover Fire Chief
Vicky Mishcon	Andover Board of Selectmen



# Andover, NH Hazard Mitigation Plan

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May 21, 2018

## Committee/Public Meeting AGENDA

1. Identify NEW Mitigation Projects  
*Using the 'ProblemStatementsToProjects' form  
STAPLEE Worksheet*
  
2. Review for next meeting:
  - Prioritize Projects
  - Complete the Mitigation Action Plan
  - Review Draft Plan

### ATTENDEES

Name	Title/Affiliation
Christine Braley	Andover Deputy EMD
Jane Hubbard	Andover EMD / Hubbard Consulting LLC
Jane Slayton	Andover Elementary/Middle School Principal
Joe Mahoney	Andover Police Chief
John Kinney	Andover EMS
Mike Vercellotti	Andover Village Water District
Rene Lefebvre	Andover Fire Chief
Steve Barton	Andover Fire Department
Vicky Mishcon	Andover Board of Selectmen

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# Andover, NH Hazard Mitigation Plan

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April 4, 2019

## Committee/Public Meeting AGENDA

1. Prioritize Mitigation Projects
2. Complete the Mitigation Action Plan
3. Review Draft of Hazard Mitigation Plan

### ATTENDEES

<b>Name</b>	<b>Title/Affiliation</b>
Charles Keyser	Andover Board of Selectmen
Jane Hubbard	Andover EMD / Hubbard Consulting LLC
Jane Slayton	Andover Elementary/Middle School Principal
Joe Mahoney	Andover Police Chief

**PUBLIC NOTICE TO THE  
RESIDENTS OF ANDOVER, NH**

**PUBLIC NOTICE  
April 17 2018 6:30 – 8:30pm  
Location: Andover Fire Department  
Andover, NH**

The Town of Andover, with the local Hazard Mitigation Planning Committee, is working to update Andover's *Hazard Mitigation Plan*. The *Plan* identifies potential natural and man-made hazards throughout the town and various projects and/or strategies to mitigate their effects. The President signed into law, the Disaster Mitigation Act of 2000 (DMA). The Act requires all local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) project grants.

All residents, neighboring communities, businesses, and interested parties are formally invited to participate in the plan update process.

For more information, please contact Jane Hubbard at [jhubb\\_99@yahoo.com](mailto:jhubb_99@yahoo.com)

The above notice was posted at the Town Office, Library, Fire Department and Police Department. In addition, email notices were sent to neighboring towns, chamber of commerce and the regional planning commission, as shown below.

The following was emailed on 4/11/18, 5/18/18 and 3/30/19:

*The Town of Andover, NH is in the process of updating its Hazard Mitigation Plan. This Plan is a tool to be used by the Town, as well as other local, state and federal governments, to reduce the effects of natural and man-made hazards. Our communities and organizations share common hazards which do not respect governmental boundaries. Therefore, we are personally inviting you to participate in the planning process to update the Town's Hazard Mitigation Plan.*

*We encourage you to attend the first Committee meeting on April 17, 2018 at 6:30pm at the Andover Town Office. If you are unable to attend this meeting you may access a copy of the planning documents and/or comment on hazard mitigation issues by emailing Jane Hubbard with Hubbard Consulting LLC at [jhubb\\_99@yahoo.com](mailto:jhubb_99@yahoo.com) or at [603-848-8801](tel:603-848-8801).*

*For further information on mitigation planning, we are attaching a fact sheet. We look forward to hearing your ideas on how to mitigate future hazards for the community. Thank you, on behalf of the Town of Andover,  
Jane Hubbard*

Emailed to the following:

Danbury EMD  
Chief Thomas Austin  
danburyfire36c1@myfairpoint.net

Franklin EMD  
Chief Kevin LaChapelle  
klachapelle@franklinnh.org

Hill EMD  
Chief Deanna Ford  
townofhillfire@comcast.net

Salisbury Town Admin  
Margaret Warren  
seloff@tds.net

Warner EMD  
Ed Mical  
emd@warner.nh.us

Wilmot EMD  
Chief Dave Zuger  
wilmotpd@comcast.net

Lakes Region Planning Commission  
Jeffrey Hayes  
jhayes@lakesrpc.org

SAU #46  
Mark MacLean  
mmaclean@mvsdpride.org

Capital Area Public Health Network  
Mary Reed  
Mary@CapitalAreaPHN.org

Shawna Leigh Morton  
NH HSEM Field Rep  
shawnaleigh.morton@dos.nh.gov

Jennifer Gilbert, NFIP Coord.  
Office of Energy & Planning  
jennifer.gilbert@nh.gov

Hazard	Problem Statements	<b>Projects</b> <i>RED is NOT Mitigation</i> <b>BOLD are existing projects from last edition of plan</b>	Social	Technical	Administrativ	Political	Legal	Economic	Environment
<b>SAMPLE</b>	Hazard 'X' can damage town.	Implement a mitigation project.	+	+	+	+	+	-	+
<b>Dam Failure</b>	Highland Lake Dam and Bradley Lake Dam, if breached, could damage downstream culverts, bridges, roads and two structures.	Include the Highland Lake and Bradley Lake Dam Emergency Action Plans (EAP) to the EOP and test the EAPs every 2 years.	+	+	+	+	+	+	+
		Install erosion control (i.e. riprap) at the face of Bradley Lake dam.	+	+	+	+	+	-	+
		Add signage for the 12" pipe on the east side of Bradley Lake Dam, located in the woods and vulnerable to vehicle load.	+	+	+	+	+	+	+
<b>Drought</b>	Private wells dry-up during periods of drought.	Replace generator at the water treatment plant with a large sized generator.	+	+	+	+	+	+	+
	An extended drought increases the probability of fires and may hinder fire suppression to those areas relying on dry-hydrants in local water-bodies.	<b>Develop Water Resource Protection Plan (WRPP) that identifies potential pollution sources and remedies for Bradley Lake Drinking Water Supply (i.e. land acquisition, regulations, point source identification, etc.)</b>	+	+	+	+	+	+	+
<b>Earthquake</b>	Critical facilities that are made of un-reinforced masonry are susceptible to earthquake damage.	Identify and map the water system infrastructure.	+	+	+	+	+	-	+
<b>Extreme Heat</b>	There are functional needs populations without air-conditioning that may need assistance during prolonged periods of extreme heat.	Educate the general public and vulnerable populations on the steps to mitigate extreme heat, including establishing and promoting accessible cooling centers in the community.	+	+	+	+	+	+	+
<b>Flooding</b>	Heavy rains cause erosion and damage culverts, ditches and roads.	<b>Inventory culverts, including the age and condition, using GPS and associated hardware &amp; software. Road Service Management System. (RSMS)</b>	+	+	+	+	+	+	+
		<b>Replace and upgrade multiple culverts on Shaw Hill Road (from Keyser property to Raccoon Hill intersection)</b>	+	+	+	+	+	+	+
	Flooded and closed roads impede emergency response and essential services.								

Hazard	Problem Statements	<b>Projects</b> <i>RED is NOT Mitigation</i> <b>BOLD are existing projects from last edition of plan</b>	Social	Technical	Administrativ	Political	Legal	Economic	Environment
	Flooding can cause damage to public and private structures.	<b>Continue to ensure town regulations meet the National Flood Insurance Program (NFIP) standards</b>	+	+	+	+	+	+	+
Hurricane	Wind damage results in downed trees, wires and utilities which can impact emergency communications, electricity and information technology.	Install a repeater on the Verizon Tower to enhance police and fire radio communications.	+	+	+	+	+	+	+
	Heavy rains cause erosion and damage culverts and roads.	Install a generator at the Andover Police Department.	+	+	+	+	+	+	+
Lightning	Structural fires and forest fires can result from the frequent lightning strikes.								
	Critical facilities are at risk to lightning strikes.	Purchase Uninterrupted Power Supply (UPS) for all town owned computer systems.	+	+	+	+	+	+	+
	People are at risk to lightning strikes.	Educate the public on the hazards of and the steps to reduce the impact of lightning strikes to humans and structures.	+	+	+	+	+	+	+
Severe Wind (Tornado /Downburst)	Wind damage results in downed utilities which can negatively impact emergency communications.	<b>Eliminate tree hazards over public roads as needed.</b>	+	+	+	+	+	+	+
	Critical facilities and other structures are at risk to severe wind (downburst, tornado, hurricane) damage.								
Wild/Forest Fire	Conservation, timber, residential and forested areas are at risk to forest fire.	<b>Develop Water Resource Protection Plan (WRPP) that identifies potential pollution sources and remedies for Bradley Lake Drinking Water Supply (i.e. land acquisition, regulations, point source identification, etc.)</b>	+	+	+	+	+	+	+
		Continue to increase funds in the Wildfire Reserve Fund.	+	+	+	+	+	+	+
	Structures without fire breaks are at risk to forest fire.								
	Ice storms down trees and wires and disrupt communication services.								

Hazard	Problem Statements	<b>Projects</b> <i>RED is NOT Mitigation</i> <b>BOLD are existing projects from last edition of plan</b>	Social	Technical	Administrativ	Political	Legal	Economic	Environment
<b>Severe Winter Weather</b>	Wind from blizzards and nor'easters results in downed utilities which can impact emergency communication, information technology and result in prolonged power outages.	<b>Purchase a portable/mobile radio with town frequency for Road Agent.</b>	+	+	+	+	+	+	+
		<b>Purchase and install generator at the Andover Elementary School in order to operate the facility as a designated shelter.</b>	+	+	+	+	+	+	+
	All structures are susceptible to collapse due to heavy snow loads.								
	Schools and individual residents (especially the elderly) are at risk due to lack of heat and water during power outages.	<b>Develop a Memorandum of Agreement between the School and the Town for use of facility as a shelter.</b>	+	+	+	+	+	+	+
		<b>Purchase shelter supplies (i.e. blankets, first aid)</b>	+	+	+	+	+	+	+
		<b>Update EOP in 2011 to include shelter care for pets during and emergency.</b>	+	+	+	+	+	+	+
Impedes emergency response and essential services.									
<b>Human Caused Hazards</b>	A mass casualty incident would quickly overwhelm local responders.	<b>Provide annual ICS/NIMS training and qualification requirements for emergency services personnel.</b>	+	+	+	+	+	+	+
		<b>Purchase and install security measures at the water filtration plant (i.e. building security alarm, detection system).</b>	+	+	+	+	+	+	+
		<b>Develop emergency response plan for the Town Office Building.</b>	+	+	+	+	+	+	+
	A hazardous material incident is probable, due to the volume of transportation carrying haz mat materials.	<b>Purchase safety equipment, cones, road signs/barriers for Road Agent.</b>	+	+	+	+	+	+	+



For purposes of prioritizing the **mitigation projects** listed in the table below, each committee member should **vote for half of the projects (total of 9)** by **placing a check mark in the "# of votes" column.** The projects will be prioritized based upon the total number of votes received for each project.

<b>PRIORITIZED MITIGATION PROJECTS</b>	<b># OF VOTES</b>
1. Install a generator at the Andover Police Department.	7
2. Purchase and install generator at the Andover Elementary School in order to operate the facility as a designated shelter.	6
3. Include the Highland Lake and Bradley Lake Dam Emergency Action Plans (EAP) to the EOP and test the EAPs every 2 years.	5
4. Update EOP in 2011 to include shelter care for pets during and emergency.	5
5. Eliminate tree hazards over public roads as needed.	5
<del>6.</del> Identify and map the water system infrastructure.	4
7. Inventory culverts, including the age and condition, using GPS and associated hardware & software. Road Service Management System. (RSMS)	4
8. Install a repeater on the Verizon Tower to enhance police and fire radio communications.	4
9. Purchase Uninterrupted Power Supply (UPS) for all town owned computer systems.	3
10. Replace generator at the water treatment plant with a large sized generator.	3
11. Replace and upgrade multiple culverts on Shaw Hill Road (from Keyser property to Raccoon Hill intersection)	2
12. Continue to ensure town regulations meet the National Flood Insurance Program (NFIP) standards	2
13. Continue to increase funds in the Wildfire Reserve Fund.	2
14. Install erosion control (i.e. riprap) at the face of Bradley Lake dam.	2
15. Add signage for the 12" pipe on the east side of Bradley Lake Dam, located in the woods and vulnerable to vehicle load.	1
16. Educate the general public and vulnerable populations on the steps to mitigate extreme heat, including establishing and promoting accessible cooling centers in the community.	1
17. Educate the public on the hazards of and the steps to reduce the impact of lightning strikes to humans and structures.	0
18. Develop Water Resource Protection Plan (WRPP) that identifies potential pollution sources and remedies for Bradley Lake Drinking Water Supply (i.e. land acquisition, regulations, point source identification, etc.)	0

For purposes of prioritizing the **NON-mitigation projects** listed in the table below, each committee member should **vote for half of the projects (total of 4) by placing a check mark in the "# of votes" column.** The projects will be prioritized based upon the total number of votes received for each project.

<b>PRIORITIZED NON-MITIGATION PROJECTS</b>	<b># OF VOTES</b>
1. Develop a Memorandum of Agreement between the School and the Town for use of facility as a shelter.	6
2. Develop emergency response plan for the Town Office Building.	5
3. Purchase safety equipment, cones, road signs/barriers for Road Agent.	4
4. Purchase and install security measures at the water filtration plant (i.e. building security alarm, detection system).	4
5. Purchase shelter supplies (i.e. blankets, first aid)	3
6. Provide annual ICS/NIMS training and qualification requirements for emergency services personnel.	3
7. Purchase a portable/mobile radio with town frequency for Road Agent.	2

Priority: 0-1 Low

2-4 Medium

5-7 High

7 voters total

## **APPENDIX C**

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### **Approval Letter from FEMA**



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

**FEMA**

SEP 10 2019

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

Dear Ms. Monastiero:


As outlined in the FEMA-State Agreement for FEMA-DR-4316, 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 Andover, NH Hazard Mitigation Plan Update 2019 and approved it effective **August 27, 2019** through **August 26, 2024** 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 Melissa Surette at (617) 956-7559 or [Melissa.Surette@fema.dhs.gov](mailto:Melissa.Surette@fema.dhs.gov).

Sincerely,

  
Captain W. Russ Webster, USCG (Ret.), CEM  
Regional Administrator  
FEMA Region I

WRW:ms