

Town of Tilton, New Hampshire Hazard Mitigation Plan Update, 2024

Prepared by the:

Tilton Hazard Mitigation Update Committee



Tilton Police Department

2024

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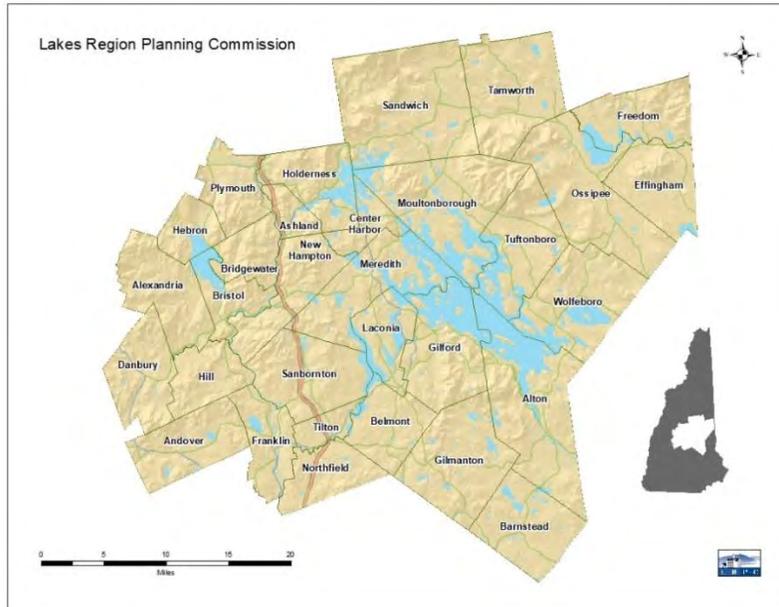
Town of Tilton, New Hampshire Hazard Mitigation Plan Update

2024

With Assistance from:
Lakes Region Planning Commission
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www.lakesrpc.org



Funding for this plan was provided by the NH Department of Safety, Homeland Security and Emergency Management, and with matching funds provided by the Lakes Region Planning Commission.



Lakes Region Planning Commission

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FEMA

April 3, 2024

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

Director Buxton:

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) Region 1 Mitigation Division has approved the *Tilton Hazard Mitigation Plan Update 2024* effective **April 3, 2024** through **April 2, 2029** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended; the National Flood Insurance Act of 1968, as amended; the National Dam Safety Program Act, as amended; and Title 44 Code of Federal Regulations (CFR) Part 201.

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

The plan must be updated and resubmitted to the FEMA Region 1 Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

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

Sincerely,

MELISSA A SURETTE
Digitally signed by MELISSA A SURETTE
Date: 2024.04.05 15:10:13 -04'00'

Melissa A. Surette, D.LP, MSEM, CEM
Floodplain Management and Insurance Branch Chief
DHS, FEMA Region 1 Mitigation Division

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

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EXECUTIVE SUMMARY

The *Tilton Hazard Mitigation Plan Update* (the Plan) serves to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Tilton Hazard Mitigation Planning Update Committee (the Committee) with assistance from the Lakes Region Planning Commission, and contains statements of policy adopted by the Board of Selectmen in Chapter VI.

The Committee agreed that the hazards identified in the 2015 Plan continue today; two additional natural hazards were added to the list: Extreme Temperatures and Infectious Diseases. The Committee determined those natural and human-related hazards which pose at least a moderate risk, based on a ranking system detailed in Chapter III, and shown below:

	Natural	
Earthquake	Severe Winter Weather	Wildfires
Inland Flooding	High Wind Events (Tornado/Downburst)	Tropical & Post-Tropical Cyclones
Infectious Diseases	Lightning	Extreme Temps
	Human-Caused	
Conflagration	Hazardous Materials	Cyber Event
Terrorism/Violence	Aging Infrastructure	Transport Accident

There have been a few changes to the list of Critical Facilities, most notably the construction and opening of the new Police Station/EOC, as recommended in the HMP. The Committee identified numerous existing programs related to hazard mitigation including the following:

Existing Plans, Regulations and Practices Supporting Hazard Mitigation	
Hazard Mitigation Plan 2015	Subdivision Regulations
Code Enforcement	Site Plan Review Regulations
Zoning Ordinance	Master Plan
Flood Plain Ordinance	School Emergency Operation Plan
Emergency Power Generation	Emergency Response Training and Drills
Mutual Aid Agreements	

Seven of the 35 Actions from the 2015 Plan have either been completed or are no longer pertinent. Five more were considered “on-going” Actions. In its effort to further reduce the vulnerability of the town to future hazards, the committee developed a list of 33 general and hazard-specific mitigation actions. These actions were prioritized based on local criteria. Discussions were held regarding how implementation might occur over the next five years. The results of these discussions are summarized in the table: Implementation Schedule for Mitigation Actions in Section V.

CHAPTER I: PLANNING PROCESS

A. BACKGROUND

To be eligible to receive disaster related Federal Emergency Management Agency (FEMA) grant funding to be used for hazard mitigation projects and actions that will ultimately reduce and mitigate future losses from natural or human hazard events, FEMA has required that all communities within the state of New Hampshire establish local hazard mitigation plans. In response to this requirement, the NH Department of Safety's Division of Homeland Security and Emergency Management (HSEM) and the nine regional planning commissions in the state entered into agreements to aid communities with plan development and update. The plan development process generally followed the steps outlined in FEMA's *Local Mitigation Planning Handbook (2013)*.

B. AUTHORITY

The town of Tilton Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning of the Robert T Stafford Disaster Relief and Emergency Assistance Act and Section 104 of the Disaster Mitigation Act (DMA) of 2000. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts.

C. FUNDING SOURCE

The New Hampshire Department of Safety's Homeland Security and Emergency Management (NH HSEM) funded the Plan with matching funds from the Lakes Region Planning Commission.

D. PURPOSE

The Tilton Hazard Mitigation Plan is a planning tool to be used by the town of Tilton, as well as other local, state, and federal government entities, in their efforts to reduce the negative effects from natural and human-related hazards. The Plan contains statements of policy as outlined in the Implementation Schedule for Mitigation Actions and in Chapter V: Plan Adoption and Monitoring. All other sections of this plan are support and documentation for informational purposes only and are not included as a statement of policy.

Developing a hazard mitigation plan allows for the following:

- Increased education and awareness around threats, hazards, and vulnerabilities.
- Building partnerships for risk reduction which include government, organizations, businesses, and the public.
- Identifying long-term, broadly supported strategies for risk reduction.
- Developing local mitigation efforts that support local mitigation efforts.
- Identifying strategies and activities that focus resources on the greatest risks and vulnerabilities; and,
- Communicating priorities to potential sources of funding.

A FEMA-approved hazard mitigation plan is a requirement for receiving certain types of non-emergency disaster assistance including funding for mitigation projects including:

- Public Assistance (Categories C-G)

- Fire Management Assistance Grants (FMAG)
- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- High Hazard Potential Dam (HHPD)
- Building Resilient Infrastructure & Communities (BRIC).

E. SCOPE OF PLAN

The scope of this Plan includes the identification of natural and human-related hazards affecting the town of Tilton, as identified by the Committee. Chapter III discusses the identification and review of these hazards. The plan also describes the process through which actions intended to mitigate these hazards were developed and prioritized. Chapters IV and V include recommended mitigation actions and language to guide in the implementation of those actions.

F. METHODOLOGY

The Lakes Region Planning Commission (LRPC) corresponded with the Tilton Emergency Management Director (EMD) to initiate the hazard mitigation update process in the town of Tilton. The EMD established the Tilton Hazard Mitigation Planning Update Committee for the purpose of updating a long-range plan for hazard mitigation. The Committee consisted of representatives from the departments of Police, Fire, and Public Works, the Town Administrator, and members of the Board of Selectmen. Several meetings were open to the public.

Using FEMA's *Local Mitigation Plan Review Guide (2011)*, *Mitigation Planning Workshop materials (2012)*, and the *Local Mitigation Planning Handbook (2013)* as guidance, the Committee reviewed and updated various elements of the town's 2015 Hazard Mitigation Plan. The planner and the committee reviewed and referenced a variety of plans, studies, reports, and technical information during the development of this Plan Update; a list of these resources can be found in Appendix H. Data on property/structure valuation was obtained through town documents.

The Committee held meetings from June 2021 through October 2021 and then reviewed a draft of the updated plan in December 2022. The following timeline shows the dates and corresponding Committee actions. The committee reviewed each section of the plan and LRPC staff provided updated information on hazards in New Hampshire. Each section of the existing plan was revised, and in some cases reformatted to develop a more comprehensive document. Meeting agendas were posted in Town Hall and are included in Appendix D.

Committee Meetings

June 9, 2021: *Introductory Committee Meeting:*

Zoom

Overview of update process and objectives

Hazards

Critical resources

June 30, 2021: *Committee Meeting:*

Tilton Emergency Operations Center (EOC)

Hazards

Risk Analysis

- August 25, 2021:** Problem Identification
Committee Meeting:
Zoom
 Risk Analysis Review
 Problem Identification
 Potential Mitigation Actions
 - Costs associated with Potential Mitigation Actions
- October 13, 2021:** *Committee Meeting:*
Tilton EOC
 Mitigation Actions
 - At least one Action for each identified hazard
 - List existing Actions
 - New Actions
 Costs associated with Potential Mitigation Actions
 - Estimated costs
 - Potential sources of funding
 Prioritization of Mitigation Actions
 - STAPLEE
- December 15, 2022:** *Public Meeting: Tilton Board of Selectmen*
Tilton Town Hall
 Review of draft update

Public Involvement

The Tilton EMD invited a variety of Hazard Mitigation Planning stakeholders to join the Hazard Mitigation Planning Committee. The Committee was well represented by municipal officials, including the Town Administrator on behalf of the Board of Selectmen. Specific opportunities for public input occurred at each meeting. Local businesses, neighboring communities, those working with underserved and socially vulnerable communities, and members of the public were encouraged to attend all meetings through press releases and postings (Appendix C & D). Notices were sent to the *Laconia Daily Sun*, *The Laker*, the *Hometown Voice*, *The Weirs Times*, and the *Concord Monitor* along with EMDs from adjacent communities (Franklin, Sanbornton, Northfield, and Belmont) inviting them to take part in the update process.

No comments were received from neighboring communities. As a representative of the Senior Center community several insights/concerns pertaining to that socially vulnerable community were raised by J. Alden throughout the planning process. No members of the public beyond those on the committee attended meetings (in person or virtual). However, public comments received during the plan development process (notably the survey – p.81-82 and Board of Selectmen meeting – p.79, 91) were considered by the committee and where applicable, incorporated into the update. This resulted in refinement of a couple of Recommended Actions (Actions g and O).

G. ACKNOWLEDGMENTS

Special thanks to those that assisted in the development of this Plan:

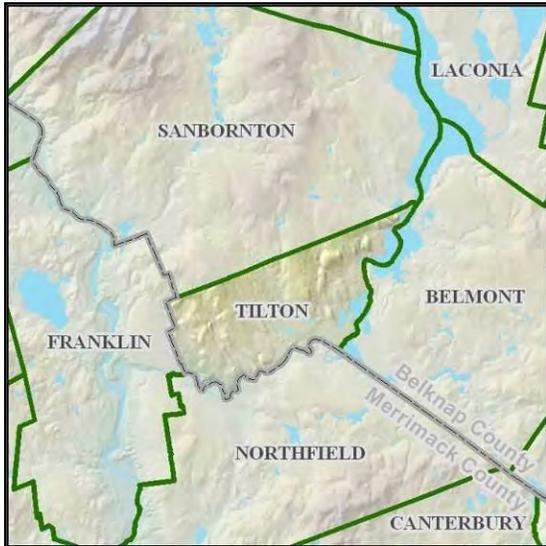
Jeanie Forrester	Tilton Town Admin.
Chief Abe Gilman	Tilton PD (Lt. prior to August 2021)
Chief Cory Piser	Tilton Police Chief (summer 2021)

Kevin Duval	Tilton DPW
Jane Alden	Tilton PB
Jane Alden	Tilton Senior Center, Winnisquam Regional School District (Budget Com.)
Bill Lawrance	Tilton Budget Comm. & business owner
Tim Jubert	Tilton Fire Dept. (Deputy Chief)
Kevin LaChapelle	Tilton Interim EMD
Lee Ann Moynihan	Tilton Land Use Coordinator

Tilton Board of Selectmen
Citizens who submitted surveys.

Julia Chase	<i>Belknap County Field Representative</i> for NH Homeland Security and Emergency Management
Kayla Henderson	<i>Planner</i> for NH Homeland Security and Emergency Management
David Jeffers	<i>Regional Planner</i> , Lakes Region Planning Commission

CHAPTER II: COMMUNITY PROFILE



A. GEOGRAPHY

The town of Tilton is located on the southwestern edge of Belknap County. It is bordered by Franklin to the west, Belmont and Northfield to the south and east, and Sanbornton to the north. The population density of Tilton is 348 persons per square mile of land area.¹

Tilton has elevations reaching approximately 900 feet along the northern border and slopes gently moving southward toward the Winnepesaukee River. Some areas exist with slopes of 15-25% and 25% or greater, most along Winding Hill in East Tilton and in Winnisquam, just north of Lake Winnisquam.

The town of Tilton contains 11.4 square miles (95.8%) of land area and 0.5 square miles (4.2%) of inland water area.¹ The Winnepesaukee River, Silver Lake, and Lake Winnisquam represent the majority of the inland water and form the southern border with the towns of Northfield and Belmont. Lake Winnisquam feeds Silver Lake at the dam in Lochmere, which in turn feeds the Winnepesaukee River. This river flows eastward into Franklin where it joins the Pemigewasset River to form the Merrimack River, which flows to the Atlantic Ocean.

B. WEATHER CONDITIONS

Like many New England towns, Tilton's temperatures and precipitation vary greatly. January temperatures range from an average high of 30 degrees Fahrenheit to an average low of 6 degrees Fahrenheit. July temperatures range from an average high of 82 degrees Fahrenheit to an average low of 57 degrees Fahrenheit. Annual precipitation totals average about 42 inches, where the distribution is slightly lower in the winter months when compared to summer months.² Tilton averages about 70 inches of snow per year.³

C. PUBLIC SERVICES

A five-member Board of Selectmen governs the town of Tilton. The Police Department consists of a Chief, twelve full-time, officers, including a detective and school resource officer. During this update process, the town had an Interim Emergency Management Director. The Tilton-Northfield Fire Department has a chief and 18 full-time and 10 part-time firefighters and/or EMTs; the Deputy Chief is also the Forest Fire Warden. The Public Works Director directs a staff of five who maintain 16.3 miles of town roads. Concord Hospital – Franklin is located three miles to the west

¹ *New Hampshire Community Profiles*, NH Employment and Security Office, <http://www.nhes.state.nh.us/elmi/htmlprofiles/Tilton.html>, visited June 2022

² <http://www.weather.com>,

³ <http://www.city-data.com/city/Tilton-New-Hampshire.html>,

of downtown Tilton and Concord Hospital Laconia is 10 miles east of Tilton. Additional hospitals are also located in Plymouth, Dover, Concord, and Lebanon.

D. DEVELOPMENT TRENDS

The population of Tilton grew moderately between 1990 and 2010. The 2020 Census indicates a jump in population of 11% over since the 2010 Census. The median age of residents is 48.6 years. The most recent projections from NH Office of Planning and Development (OPD) project moderate growth through the next few decades followed by essentially no growth after 2040.

Tilton, NH Year-Round Population, 1990-2020

Year	1990	2000	2010	2020
Population	3,240	3,477	3,567	3,962
% Changed		7%	3%	11%

Tilton, NH Projected Year-Round Population, 2020-2050⁴

Year	2020	2030	2040	2050
Population	3,962	4,128	4,376	4,360
% Change	---	4%	6%	-0.5%

In 2020, the Census found that Tilton had 1,928 housing units, with 1,654 (86%) of them occupied. This occupancy rate is the highest in Belknap County (71%) and among the highest in the Lakes Region (68%). This represents an increase of 4.5% over the past decade in overall housing units. This overall increase resulted from both an increase in occupied units that is in line with the population growth figures and a substantial decrease in the vacant (or seasonal) units. The trend towards a greater percentage of occupied units was noted in most Lakes Region communities. The COVID-19 pandemic and resulting increase in people working remotely has likely further increased this trend.

Housing Units

Year	2010	2020	Change	% Change
Total	1845	1928	83	4.5%
Occupied	1462	1654	192	13.1%
Vacant	383	274	-109	-28.5%
% Occupied	79.2%	85.8%		

According to the American Community Survey (ACS, 2019) more than 1,000 of the housing units were single-family Units, 239 were Multi-Family Housing (2-4 units), and 213 with five or more units in a structure. Another 276 units were Mobile Homes.

Interstate 93 runs north/south through the center of Tilton, with Exit 20 providing access to the freeway. US Route 3/NH Route 11 runs generally east-west along the southern portion of town between Belmont/Laconia and Franklin. NH Route 140 runs generally southeast to Belmont. NH

⁴ New Hampshire Office of Planning and Development, March 2022 <https://www.nh.gov/osi/data-center/population-projections.htm>

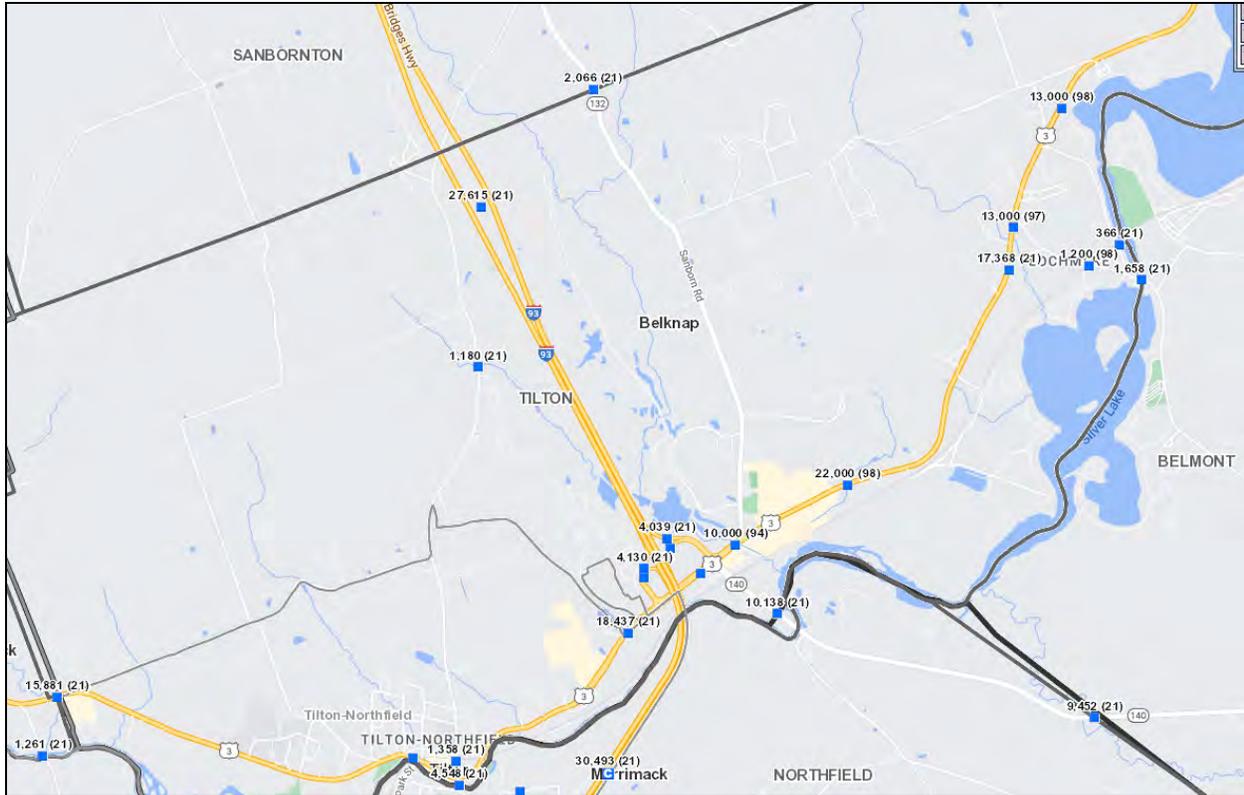
Route 132 runs north to Sanbornton. All these major routes intersect at the interstate, which provides access to Plymouth to the north and Concord to the south.

A standard measure of traffic volume is Average Annual Daily Traffic counts, measured in vehicles per day. As this is a projected average over the entire year, there are certainly many summer days when the volume of traffic on any one of these roads far exceeds these figures. While there is some variability over the years, Tilton experiences some of the largest traffic volumes in the Lakes Region.

These records from the NH Department of Transportation indicate a wide range of traffic volumes⁵ along the roadways in Tilton. Notable high-volume areas are along I-93, US 3/NH 11 (Laconia Rd.)/Main Street, which are among the highest in the Lakes Region.

Loc ID	County	Community	On	From	To	At	Dir	Latest
22451021	BELKNAP	TILTON	E Main St				2-WAY	18437
62451074	BELKNAP	TILTON	Interstate 93 N				2-WAY	27615
81451070	BELKNAP	TILTON	I-93 NB Exit 20 Off ramp (US 3)				RAMP	5576
81451085	BELKNAP	TILTON	I-93 SB Exit 20 Off ramp (US 3)				RAMP	4130
81451086	BELKNAP	TILTON	I-93 SB Exit 20 On ramp (US 3)				RAMP	5527
81451087	BELKNAP	TILTON	I-93 NB Exit 20 On ramp (US 3)				RAMP	4039
82451069	BELKNAP	TILTON	Silver Lake Rd				2-WAY	1658
82451073	BELKNAP	TILTON	Laconia Rd				2-WAY	17368
82451076	BELKNAP	TILTON	Main St				2-WAY	15598
82451077	BELKNAP	TILTON	School St				2-WAY	1180
82451081	BELKNAP	TILTON	River Rd				2-WAY	366
82451082	BELKNAP	TILTON	School St				2-WAY	1358
82451083	BELKNAP	TILTON	Bridge St				2-WAY	4548
82451084	BELKNAP	TILTON	Tilton Rd				2-WAY	10138
82451090	BELKNAP	TILTON	Laconia Rd				2-WAY	29134

⁵ The complete set of current and historic Tilton Traffic Count volumes can be found at <https://nhdot.public.ms2soft.com/tcds/tsearch.asp?loc=Nhdot&mod=TCDS> using the NH DOT TDMS data mapping tool.



Another possible challenge in dealing with hazardous events is evacuation protocol. Seasonal residents may need additional guidance to find the proper evacuation routes. Although Tilton's median age is average for the region, elderly and child age populations exist and may need special consideration in hazard event.

Future Development

Commercial development has occurred in the form of large retail centers and restaurants near the Exit 20, I-93 interchange, and could continue in the future. These commercial areas tend to have a high density of people, which accentuates the need for hazard mitigation planning. The Master Plan (2013) references some opportunities for further commercial development (and re-development) of lots in that area along with some opportunities for tourism/vacation development along the lake, accessed from Rt. 3/11. The plan also noted that not having municipal sewer services west of the high school were limiting development options.

New development has not increased the vulnerability of people or structures in Tilton. Most new development in town has been located away from particularly hazardous areas, such as floodplains.

CHAPTER III: RISK ASSESSMENT

A. INVENTORY ASSETS

The list of critical infrastructures for the town of Tilton was updated. The critical infrastructure list has five facility classifications, 1) Essential Services; 2) Important Structures; 3) Important Infrastructure, 4) Populations to Protect, and 5) School/Other. The first category contains facilities essential in a hazard event, including the Emergency Operation Center and Shelters. The second contains mainly bridges. The third category is a list of facilities that have been identified by the Committee as facilities to protect to minimize additional risk from hazards. The fourth category contains special populations that may require additional attention in the event of a disaster. In some cases, a facility may fall into multiple classifications because, as in many small communities, it serves multiple functions.

Tilton: Critical Facilities & Values

Tilton Critical Facilities 2021							
TYPE	NAME	ADDRESS	CLASSIFICATION	Generator?	Shelter Capacity	Structural Value - 2021 (\$)	Notes
Educational / Regional Shelter	Winnisquam Regional High School & Middle 76 Winter St.	435 W. Main St., Tilton,NH	Essential Service	Yes	250-300	\$8,088,900	
Public Safety	Tilton-Northfield Fire District Fire Station	12 Center St., Tilton, NH	Essential Service	Yes	no shelter	\$205,200	
Public Safety	Tilton Police Department	45 Sanborn Road	Essential Service	Yes	no shelter	\$1,624,900	New facility - Emergency Operations Center
Utility	Public Service of New Hampshire	64 Business Park Dr. Tilton	Essential Service			\$1,879,600	6 structures on NH Electric CoOp
Public Service	Tilton Highway Department	570 W. Main St. Tilton	Essential Service	Portable	no shelter	\$470,500	
Public Service	Tilton Town Hall	257 Main St. Tilton	Essential Service	No		\$691,800	Town Hall is not a shelter. Town records are stored here. The structure is susceptible to fire & flood.
Structure	Cannon Bridge	Bridge St.	Important Structure	No	no shelter		Recently rehabilitated
Structure	Lodmere Bridge (Silver Lake Road)		Important Structure	No	no shelter		
Structure	Mosquito Bridge	Rt 3/Lower Bay Road	Important Structure	No	no shelter		
Structure	Park St Bridge	Rt 3/Park St.	Important Structure	No	no shelter		Recently rehabilitated
Structure/Secondary Shelter	Tilton Grange Hall (Senior Center)	11 Grange Rd. Tilton	Essential Service/ Important Structure		60	\$223,700	No generator - applying through EMPG Cooling & Warming Center Town-owned Has commercial kitchen
Public Service	NH Veteran's Home	139 Winter St. Tilton	Population to Protect	Yes	574	\$10,443,100	Nursing Home Have own EOC.
Educational	Tilton School	30 School St.	School	Yes	gym 340	\$3,415,100	
Utility	Tilton Northfield Aqueduct Co.	14 Academy St	Essential Service	Yes	no shelter	\$3,989,800	
Business - Utility	Liberty Utilities		Important Infrastructure				Regional gas distribution pipeline. Line has recently been extended. Susceptible to very low temperatures
Transportation	State of New Hampshire Bureau of Railroads		Important Infrastructure	No	no shelter		
Utility	Clement Dam	24 Mill St.	Important Infrastructure		no shelter	\$3,376,400	Has Emergency Action Plan.
Cell towers	Tilton PD		Important Infrastructure				
	Episcopal Church		Important Infrastructure				
	Tilton School		Important Infrastructure				
	Galef Hill		Important Infrastructure				
Sewer pump stations			Important Infrastructure				Do these have back-up generators?
Utility	Lodmere Village Water District	POB 267, Lodmere	Essential Service	Yes	no shelter		
Structures	Bridges over I-93		Important Infrastructure	No	no shelter		
Totals						\$34,409,000	

B. IDENTIFYING HAZARDS

The town of Tilton is prone to a variety of natural and human-caused hazards. The following hazards were identified as posing a risk to Tilton in the 2015 Hazard Mitigation Plan.

	Natural	
Severe Wind (Tornado/Downburst, Hurricane)	Lightning	Flooding and Ice Jams
Earthquake	Severe Winter Weather	Wildfire
	Human-caused	
Conflagration	Hazardous Materials in Transport	Terrorism

While updating the Plan, the committee considered the hazards identified in the *2018 State of New Hampshire Multi-Hazard Mitigation Plan*, developed by the New Hampshire Department of Safety's Division of Homeland Security and Emergency Management, for identification and definition of hazards that might affect the town. The 2018 State Plan updated the hazard nomenclature, grouping some hazard types together, adding several hazards, and deleting some. For example, tornado, downburst, and thunderstorm were grouped as High Wind Event, and Radon was deleted.

After discussion, the committee decided upon this list of high and medium risk hazards pertaining to the town of Tilton. Due to topography and geography, coastal flooding, avalanche, and landslide are not pertinent. While hail is occasionally produced during a summer storm, it is infrequent, and the impact is seen by the committee as minimal compared to the impacts of high wind and heavy rain. It was not considered as a separate hazard. While drought does occur periodically, the impact on Tilton was seen as minimal. Dam failure is addressed under inland flooding. Solar storms and space weather were acknowledged as potentially impacting communications equipment, it was seen as a hazard which would impact the entire state and that simply remaining abreast of notices from NH HSEM regarding this hazard would be the wisest course of action.

Tilton Hazards	Risk
Infectious Diseases	28.00
High Wind Events (Torn./Downb.)	24.00
Earthquake	18.00
Inland Flooding	16.00
Severe Winter Weather	13.33
Extreme Temps	8.00
Lightning	8.00
Wildfires	8.00
Tropical & Post-Tropical Cyclones	5.00
Solar Storms & Space Weather	2.67
Dam Failure	2.33
Drought	2.00
Landslides	2.00
Avalanche	0.67

Additionally, the Committee reviewed technological hazards and human-caused hazards because several of these are important to the town. Conflagration, transportation accident, mass casualty incident, terrorism/violence, hazardous materials, aging infrastructure, along with a cyber event were considered high or medium risk hazards in Tilton. As the focus of this plan per FEMA guidelines in on natural hazards, the information and risk ratings of these non-natural hazards are addressed in Appendix K.

C. PROFILING HAZARD EVENTS

Each of the hazards that the Committee identified as likely affecting Tilton is profiled below. This section of the plan **defines** each of the hazards the Committee felt might impact Tilton. It also describes the **extent** of the hazard, the recent **history** of these events, the likely **location** of each hazard, as well as the **probability** of an occurrence in Tilton. These are listed in order of overall risk, as determined by the Committee. This Plan focuses on those events that pose at least a moderate risk to the town of Tilton as determined by the Committee.

The **extent** is a description of “how bad the hazard could get”, considering three factors – magnitude, onset, and duration.

- *Magnitude* is size of the hazard, such as depth of floodwaters or wind speed.
- *Onset* is how quickly the hazard approaches. Depending on geography as well as the nature of the rainstorm, floodwaters might rise over a period of days, or it might take just a few hours to build up a concentrated flow.
- *Duration* is a matter of how long the hazard is present. A downburst or tornado exists for minutes or hours, while a hurricane or tropical depression is usually around for days.

Within the Risk Assessment completed for this plan, extent was measure on a scale ranging from Weak through Moderate, Severe, and Extreme based on magnitude and strength.

If a hazard event has occurred in the past that is listed under **history**, with a focus on those occurring since the last plan. If some parts of the community are more likely to be impacted by a particular hazard, either based on past events or local knowledge of geography, that is described under **location**.

Probability is a description of how likely it is that an event will occur in Tilton within the next 10 years. The committee rated potential hazards on a four-point scale descriptive scale including unlikely, occasional, likely, to highly likely. These were based mainly on past occurrences in the town, region, and state.

The **impact** of a hazard is the potential degree of damage that could occur in Tilton. To rate the impact of a hazard, committee members considered the damages and consequences that might result from an event, in three separate areas Human, Property, and Business & Services. This incorporates the likelihood of injury or death, the assessed value of each critical facility and the vulnerability of these facilities. It also anticipated disruption of services to residents and visitors. Four levels of impact were used, as defined below:

- Low: Limited structural damage, the town’s ability to respond is not compromised, residents can handle the hazard event without help from outside sources
- Moderate: Some structural damage, the town’s ability to respond is compromised, regional or county assistance is needed to survive and/or recover

- High: Substantial structural damage, the town’s ability to respond is greatly compromised, state or federal assistance is necessary to survive and/or recover
- Catastrophic: Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interrupted for days or weeks

Tilton Natural Hazards	Probability	Extent	Human Impact	Property Impact	Business Impact	Average Impact	Risk
Infectious Diseases	4	3	3	1	3	2.33	28.00
High Wind Events (Torn./Downb.)	4	3	2	2	2	2.00	24.00
Earthquake	3	2	3	3	3	3.00	18.00
Inland Flooding	4	2	1	3	2	2.00	16.00
Severe Winter Weather	4	2	1	2	2	1.67	13.33
Extreme Temps	2	2	3	2	1	2.00	8.00
Lightning	4	2	1	1	1	1.00	8.00
Wildfires	3	2	1	2	1	1.33	8.00
Tropical & Post-Tropical Cyclones	3	1	1	2	2	1.67	5.00
Solar Storms & Space Weather	2	1	1	1	2	1.33	2.67
Dam Failure	1	1	3	3	1	2.33	2.33
Drought	2	1	1	1	1	1.00	2.00
Landslides	1	2	1	1	1	1.00	2.00
Avalanche	1	1	0.5	0.5	1	0.67	0.67

High Risk - Top 1/3 score

Medium Risk - Top 2/3 score

Probability of Future Events
<ul style="list-style-type: none"> • Unlikely: <10% probability of occurrence in the next year or a recurrence interval of more than every ten years • Occasional: 10 - 25% probability of occurrence in the next year or a recurrence interval of three to ten years • Likely: 25 - 80% probability of occurrence in the next year or a recurrence interval of two to three years • Highly Likely: 80-100% probability of occurrence in the next year or a recurrence interval of nearly every year
Extent - How bad could it get?
<ul style="list-style-type: none"> • Weak: limited magnitude, slow onset, short duration, little damage. • Moderate: moderate magnitude, moderate onset speed, moderate duration, some damage/loss of service for days. • Severe: Severe magnitude, fast speed of onset, long duration, devastating damage and loss of service for weeks • Extreme: Extreme magnitude, immediate onset, extended duration, catastrophic damage, uninhabitable conditions.
Impact - Human, Property, Business
<p>Low: There is little likelihood that injury or death will result from this hazard. The damage to land and property will likely be limited. Essential services and other services that residents and visitors depend upon will not be interrupted.</p> <p>Moderate: There is some likelihood that injury or death will result from this hazard. There will likely be some damage to land and property. There will likely be some interruption of essential services and other services that residents and visitors depend upon for hours of days.</p> <p>High: It is quite likely that injury or death will result from this hazard. There will be damage to multiple properties. Essential services and other services that residents and visitors depend upon be likely be interrupted for days.</p> <p>Catastrophic: Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interrupted for days or weeks.</p>

Impact

The 2021 assessed value of the critical facilities identified in Section A total \$34,409,000. This does not; however, include the contents of the building and does not necessarily reflect the cost of full replacement. Also not reflected in this assessment is the value of built infrastructure such as streets, sidewalks, bridges, curbs, drainage, and utility transmission lines. These values can also be used to determine potential loss estimates in the event that a natural or manmade hazard damage a part of or an entire facility. Some of the facilities listed here are privately owned but represent structures or service that the Committee considered to be essential in terms of mitigating vulnerability to hazards.

Of course, critical facilities are not the only resources at risk during a hazard event. There are numerous structures in town, both residential and commercial. The total valuation of the structures in Tilton is more than \$500 million dollars. If even a small percentage of those structures are destroyed or damaged during a hazard event, it could be quite costly to repair or replace. More than 50% of the structural valuation in Tilton comes from non-residential structures, different from many Lakes Region communities, some of which are composed of more 80% residential structures.

Tilton Structural Valuation - 2021	Value	1%	2%	5%
Residential	\$ 202,534,300	\$ 2,025,343	\$ 4,050,686	\$ 10,126,715
Manufactured Housing	\$ 18,173,000	\$ 181,730	\$ 363,460	\$ 908,650
Commercial/Industrial	\$ 198,010,500	\$ 1,980,105	\$ 3,960,210	\$ 9,900,525
Utilities	\$ 37,562,600	\$ 375,626	\$ 751,252	\$ 1,878,130
Tax-Exempt & Non-Taxable Buildings	\$ 53,616,500	\$ 536,165	\$ 1,072,330	\$ 2,680,825
Total	\$ 509,896,900	\$ 5,098,969	\$ 10,197,938	\$ 25,494,845

Source: MS-1 in Annual Report

Probability and Impact of Climate Change

The climate in New Hampshire has been changing. The most noticeable changes in the Lakes Region are warmer temperatures and more intense rainfall events. For each of the natural hazards, the effects that these changes have on the probability of each hazard occurring and its potential to impact the community will be noted.

Impact on Vulnerable Populations

According to the New Hampshire State Hazard Mitigation Plan (2023), Tilton's vulnerable populations include single parent households (34%), individuals at least age 65 years (24%), individuals with disabilities (20%), and uninsured individuals under 65 years of age (10%). Some people fall into multiple 'vulnerable groups', for example a 75-year-old person with limited vision. For each natural hazard, the potential impacts on these vulnerable communities will be noted.

NATURAL HAZARDS

The information above was utilized as a guide for further discussion of hazards by the Committee with an emphasis on those most likely to impact Tilton. The following section describes the hazard, its extent, history, likely location, probability of occurrence, and its likely impact in Tilton. The extent is a description of "how bad the hazard could get".

Below is a list of disasters or incidents listed on the HSEM Resource Center page for which public assistance was made available.

Declaration ID	Dates	Hazard Type	Area
DR 4624	July 29 – Aug. 2, 2021	Flooding	Cheshire & Sullivan Co.
DR 4622	July 17-19, 2021	Flooding	Cheshire Co.
EM 3445 & DR 4516	Jan. 20, 2020 & Ongoing	Infectious Disease: COVID-19	Statewide
DR 4457	July 11-12, 2019	Flooding	Statewide
DR 4371	March 13, 2018	Severe Winter Storm	Statewide
DR 4370	March 2-5, 2018	Flooding	Statewide
DR 4355	Oct. 30, 2017	Flooding	Belknap & 4 other counties
4329	July 1, 2017	Severe Thunderstorms	Grafton Co.

INFECTIOUS DISEASE

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

While some diseases are so rare in each population that a single case warrants an epidemiologic investigation (e.g., rabies, plague, polio), there are other diseases that occur more common so that only deviations from the norm (i.e., seeing more cases than expected) warrants investigation.

Extent: Severe

Experience with the Covid-19 pandemic dramatically changed how members of the Committee viewed the risk of infectious diseases as compared to the 2015 Plan. The magnitude and severity of infectious diseases is described by its speed of onset (how quickly people become sick or cases are reported) and how widespread the infection is. Some infectious diseases are inherently more dangerous and deadly than others, but the best way to describe the extent of infectious diseases relates to the disease occurrence:⁶

- Endemic – Constant presence and/or usual prevalence of a disease or infection agent in a population within a geographic area
- Hyperendemic – The persistent, high levels of disease occurrence
- Cluster – Aggregation of cases grouped in place and time that are suspected to be greater than the number expected even though the expected number may not be known
- Epidemic – An increase, usually sudden, in the number of cases of a disease above what is normally expected
- Outbreak – The same as epidemic, but over a much smaller geographical area
- Pandemic – Epidemic that has spread over several countries or continents, usually affecting many people

The NH Department of Health and Human Services (DHHS) developed an epidemic response plan in February 2007, so that communities can be prepared and respond to outbreaks.⁷ The school district has an up-to-date Emergency Operations Plan with policies for addressing epidemics.

History: Since March of 2020, the Covid-19 pandemic has had a significant impact on all facets of life, including on emergency medical responders and the operations of municipal services and local schools. While there certainly have been minor outbreaks of flu in town, other outbreaks of infectious disease haven't compared to the coronavirus pandemic. In 2016, NH DHHS was notified and responded to a total of 102 outbreaks: 73 gastrointestinal illnesses (5 of which were foodborne), 23 respiratory illnesses, and 6 other types of illness. The Covid-19 pandemic began to impact the United States and New Hampshire in 2020.

Date	Description	Impacts	Location	Additional Info
2020-22	COVID-19 or Coronavirus Pandemic EM 3445 & DR 4516	Hospitals, schools, municipalities, & businesses have taken extra precautions, cancelled many events, and adjusted policies	Worldwide	Respiratory disease >342,000 cases in NH, with >2,646 deaths (Aug. 2022) 1,329 cases locally ⁸
Annually	Foodborne outbreaks	Ill individuals associated with outbreaks	Statewide	5-10 outbreaks per year

⁶ <https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section11.html>

⁷ <http://www.dhhs.nh.gov/dphs/cdcs/avian/documents/pandemic-plan.pdf>,

⁸ <https://www.covid19.nh.gov/dashboard/map>

Date	Description	Impacts	Location	Additional Info
Annually. Seasonal	Influenza and other respiratory virus outbreaks	Ill individuals associated with outbreaks	Statewide	25-50 outbreaks per year primarily to vulnerable populations – at least 63 deaths in 2018
Annually	Norovirus and other gastrointestinal virus outbreaks	Ill individuals associated with outbreaks	Statewide	60-80 outbreaks a year primarily to vulnerable populations

Location: An epidemic is an outbreak of a disease, generally isolated to one area. The disease spreads easily person-to-person and can cause serious illness, with long-lasting side effects and deaths. An outbreak could impact anyone in town. Transmission of germs and diseases between people is accelerated in a close living and socializing environment. Schools, and congregate care centers for the elderly are good places for transmission to occur.

Probability of Occurrence: Highly Likely

Epidemics do occur in Tilton and other Lakes Region communities from time to time.

Impact: High

The concerns associated with an infectious disease include local capacity to respond to not only the residents of Tilton but also any visitors. The cost of infectious diseases in Tilton is difficult to calculate as any cost would primarily result from health care response, not physical structures. As we have learned from the COVID-19 pandemic, there are additional human and economic costs due to the slow down/shut down of many businesses and services in town and the region.

Probability and Impact of Climate Change on Infectious Disease events: Changes in New Hampshire's climate could potentially lead to an increase in precipitation. Increased precipitation may lead to more flooding. This could lead to increased impacts from mold in affected areas including homes and businesses. This could also result in greater instances of stagnant water, leading to more vector-borne diseases. In Tilton this would be of particular concern during the summer and holiday seasons when there are many extra visitors to the area.

Impact on Vulnerable Communities: Potential impacts associated with infectious disease on Tilton's vulnerable populations include:

- Limited resources for seeking medical assistance
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for accessing attention
- More likely to have compromised immune systems

HIGH WIND EVENT (THUNDERSTORM/TORNADO/DOWNBURST)

Tilton is likely to experience either of two types of high wind events that usually result from other severe storms and can occur at any time of the year: tornados and straight-line winds. A **tornado** is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. It is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.⁹ **Straight-line winds** describes any thunderstorm wind that is not associated with rotation and is usually used to differentiate from tornadic winds. There are several sub-types of straight-line winds, including **downdraft**, which is a small-scale column of air that rapidly sinks towards the ground; and **downburst**, which is the result of a downdraft, referred to as a **macroburst** when the area affected is greater than 2.5 miles and **microburst** when less than 2.5 miles.¹⁰



Image source: NH HSEM

Extent: Severe

Tornadoes are violent rotating storms that extend to the ground with winds that can reach 300 miles per hour. They are produced from thunderstorms and can uproot trees and buildings. According to the National Oceanic and Atmospheric Administration (NOAA) a downburst is a strong downdraft, rotational in nature, which causes damaging winds on or near the ground. Winds can exceed 130 mph.¹¹

Tilton is at risk of several types of natural events associated with high winds, including microbursts, macrobursts, and tornadoes. According to the National Oceanic and Atmospheric Administration (NOAA), a downburst is a strong downdraft, rotational in which causes damaging winds on or near the ground. Winds can exceed 130 mph. Downbursts fall into two categories based on their size:

- microbursts, which cover an area less than 2.5 miles in diameter, and
- macrobursts, which cover an area at least 2.5 miles in diameter.

Tornadoes are violent rotating storms that extend to the ground with winds that can reach 300 miles per hour. They are produced from thunderstorms and can uproot trees and buildings.

The Enhanced Fujita Scale is used to categorize tornados based on a combination of wind speed and the type of damage that is observed.

Operational Enhanced Fujita (EF) Scale

Enhanced Fujita Scale						
EF Number	0	1	2	3	4	5
3-Second Gust (mph)	65-85	86-110	111-135	136-165	166-200	Over 200
Damage Indicator		Small barns, Farm Outbuildings	One-or two-family residences	Single-Wide Mobile Home	Double-Wide Mobile Homes	Apt, Condo, Townhouse (3 Stories or less)

⁹ <http://www.nssl.noaa.gov/education/svrwx101/tornadoes/>

¹⁰ <http://www.nssl.noaa.gov/education/svrwx101/wind/types>

¹¹ *Weather Glossary*. National Oceanic and Atmospheric Administration, <http://www.weather.gov/glossary/index.php?letter=d>, visited August 6, 2019.

History of High Wind Events

Hazard	Date	Location	Magnitude	Description
High Wind	6/7/2016	BELKNAP – LACONIA AIRPORT	50 kts.	Thunderstorm Wind
High Wind	6/7/2016	BELKNAP – WEIRS BEACH	50 kts.	Thunderstorm Wind
High Wind	7/1/2016	BELKNAP – MEREDITH	50 kts.	Thunderstorm Wind
High Wind	7/23/2016	BELKNAP – LACONIA, SANBORNTON	50 kts.	Thunderstorm Wind
Hazard	Date	Location	Magnitude	Description
High Wind	10/30/2017	Belknap	61 kts.	50-60 mph winds/ 2 to 5 inches of rain
High Wind	8/3/2018	BELKNAP – Tilton, Belmont, Gilmanton	50-70 kts.	Thunderstorm Wind – Downed trees and wires
High Wind	8/7/2019	BELKNAP – LACONIA AIRPORT, MEREDITH	50-60 kts.	Thunderstorm Wind
High Wind	6/6/2020	Sanbornton, Tilton, Laconia	50 kts.	Thunderstorm Wind, Downed trees led to home damages (\$105K)
Tornado	8/22/2020	Alton	EF 0	Waterspout, no damage
High Wind	5/26/2021	Gilford/Laconia/Alton	52 kts	Thunderstorm Wind
High Wind	6/30/2021	Gilmanton, Barnstead	61 kts	\$20K damages to homes. Water rescue from flipped boat.
High Wind	7/20/2021	Gilford, Meredith	55 kts.	Thunderstorm Wind

The most recent damaging tornado to touch down in New Hampshire was on July 24, 2008, classifying around 100 homes “uninhabitable” and killing one person. The tornado traveled from Epsom to Effingham, missing Tilton by 30 to 40 miles. It transitioned from EF1 to EF2 multiple times and caused significant damage to 83 homes in Alton and Barnstead which, like Belmont, are located in the Lakes Region of central New Hampshire.

Since 2015, there have been a dozen recorded high wind events in the Belknap region. High wind events affected Tilton on October 29, 2017, August 3, 2018, October 17, 2019, and November 1, 2019, all of which downed trees and utility wires. The 2017 storm was the most serious of the four, resulting in \$39,376 in FEMA Public Assistance Reimbursement (FEMA-4355-DR-NH, also noted under Flooding).

Location: While thunderstorms can be localized, they often hit the whole town. On average, six tornadoes touch down somewhere in New England each year. There is no way of knowing where or when the next damaging tornado will strike as they are among the most unpredictable weather phenomena. Downbursts are 10 times more likely to occur than tornadoes. All areas of town are susceptible to damage from high winds, although the Committee noted that they frequently occur near the lakefront areas.

Probability of Occurrence: Highly Likely

Impact: Moderate

Tornados and downbursts could strike anywhere in town with little if any warning. While individual events may be small and rare, their impacts could be devastating. All structures, especially older ones, which are not necessarily built to the current building code standards, could be at risk.



Downed tree damages home and vehicles in Tilton, 2018. WMUR

In Tilton, damage can occur to most structures due to downed trees in any high wind event, including the commonly occurring thunderstorms. These winds can bring down limbs and trees, causing damage to structures as well as pulling down power and telephone lines and blocking roads. This is particularly the case along private roadways that may only get limited cutback of vegetation. Trees and wires down across evacuation routes could slow evacuation efforts and draw limited emergency response personnel away from other safety efforts.

All structures in Tilton are susceptible to damage by high wind events, whether through thunderstorms, downburst, or tornado. Structures and infrastructure that are at risk include Jensen's Trailer Park, the New Franklin Apts. (elderly housing), and various hazardous materials locations. Assuming 1% to 5% town-wide damage to buildings, high winds could result in \$5.1 million to \$25.5 million in damages. The potential impact to the town due to high winds is moderate.

Impact of Climate Change on High Wind Events: Changes in New Hampshire's climate could potentially lead to an increase in any of high wind events. This will lead to additional damage being created from these storms, including more extreme and widespread power outages, and downing of trees and wires. This could result in greater damage to property and infrastructure. This could have a large impact on the business (tourism and sales) community. The increased damage and loss will also likely lead to larger, more complex, and longer lasting restoration efforts for each storm that occurs.

Impact on Vulnerable Communities: Potential impacts associated with high wind events on Tilton's vulnerable populations include:

- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance, dependence upon others to travel
- May have limited access to early warning alerts
- Limited resources for seeking medical assistance

EARTHQUAKE >4.0

An earthquake is a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating.

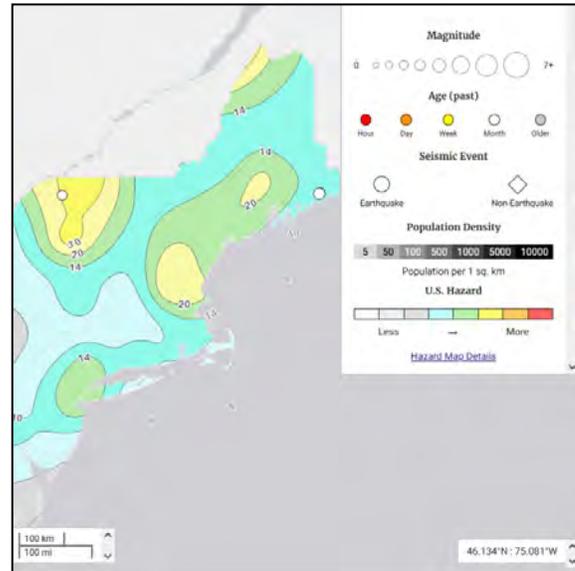
Extent: Moderate

Earthquakes are commonly measured using *magnitude*, or the amount of seismic energy released at the epicenter of the earthquake. The Richter magnitude scale is a mathematical device used to compare the size of earthquakes, shown in the table below.

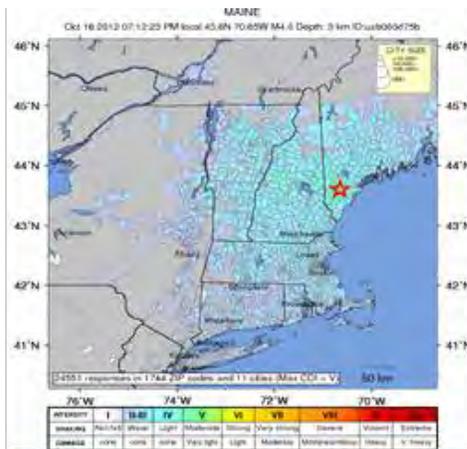
Richter Magnitude Scale

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.

Note: The 2023 NH State HMP now qualifies this hazard as *Earthquakes > 4.0* as opposed to simply *Earthquakes*. New Hampshire is in an area of moderate seismic activity with respect to other regions of the country. This means the state could experience large (6.5-7.0 magnitude) earthquakes, but they are not likely to occur as frequently as in a high hazard area like the Pacific coast. There is the potential for nearby earthquakes to register 5.5 on the Richter Scale, causing slight damage to buildings and structures. Due to the unique geology of New Hampshire, earthquake propagation waves travel up to 40 times further than they do in the western United States, possibly enlarging the area of damage.¹² The strongest earthquakes to strike New Hampshire occurred December 20 and 24, 1940 in the town of Ossipee.



Both earthquakes had a magnitude of 5.5 and were felt over an area of 400,000 square miles.



Areas where the October 16, 2012 earthquake

History: On average, every other year the Lakes Region experiences an earthquake, though these earthquakes are mild and go mostly undetected by people. Sanbornton and Tamworth are identified as a major epicenters in the region.¹³ A search of the USGS National Earthquake Information Center database shows that since 1977 there have been 15 earthquakes with a magnitude of at least 3.0 within a 100 km (62 mi.) radius of Tilton; the largest was magnitude 4.5. Two such earthquakes have occurred since 2006; a 3.4 event in 2010 centered in Penacook, NH and a 4.0 quake in southern Maine shook the region on October 16, 2012. The image at left indicates the communities where people reported feeling this event.¹⁴ The image at right shows the expected number of damaging earthquake shaking in 10,000 years.

¹² <http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html> visited February 8, 2011.

¹³ <http://des.nh.gov/organization/commissioner/pip/factsheets/geo/documents/geo-3.pdf>, pg. 3, visited January 25, 2011.

¹⁴ USGS, Earthquake Archive Search. <https://earthquake.usgs.gov/earthquakes/map/>

Location: An earthquake could affect all areas of Tilton, but especially the downtown area with its taller, older, masonry structures.

Probability of Occurrence: Likely

Impact: High

According to the US Geologic Survey, the overall earthquake risk to the state is high due to the built environment which means that many structures in the state are old or not built to withstand an earthquake.

A relatively large earthquake would likely impact the roads including the bridges, limiting the ability of emergency services to be rendered. The committee identified the bridges over I-93, the various evacuation routes, and fire hydrants as infrastructure which might be compromised. Hazardous materials facilities, including the Liberty Utilities, were identified as areas of concern. The New Franklin Apartments is a multistory masonry building housing a population to protect (elderly). Several buildings downtown are older, multi-story, and built of masonry. Damages could range from cracked foundations, chimneys, and supports to full collapse. Structures that are taller, older, or built of masonry are most at risk. Additionally, earthquake shaking could damage the dams controlling water as it flows through Tilton.

The fire department would have some response problems if the bridges were impacted, although in most cases there are alternate options, requiring redeployment of apparatus and people or mutual aid assistance.

All structures in Tilton are susceptible to damage by an earthquake, especially those in the downtown area. Assuming 1% town-wide damage to buildings, an earthquake could result in \$5.1 million in damages any given year.

Impact of Climate Change on Earthquake events: The impact on Tilton and probability associated with an earthquake would not be affected by climate change.

Impact on Vulnerable Communities: Potential impacts associated with earthquakes on Tilton's vulnerable populations include:

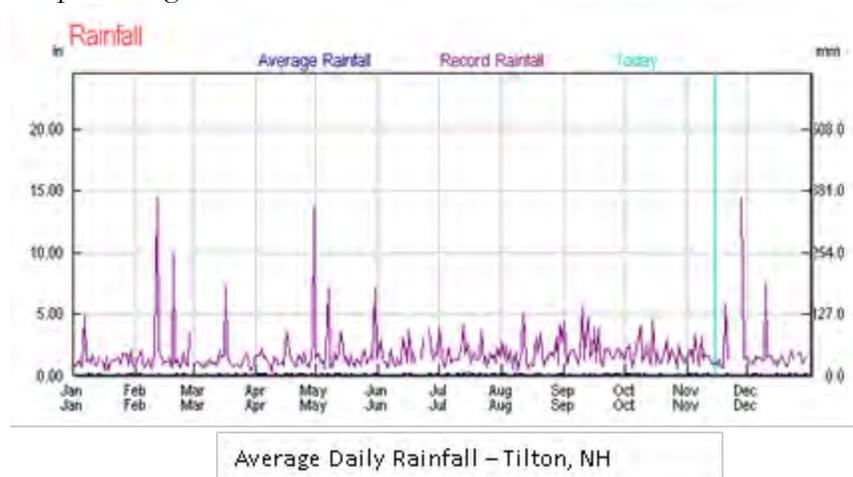
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance, dependence upon others to travel
- Limited resources for seeking medical assistance

INLAND FLOODING

Flooding is defined as a temporary overflow of water onto lands that are not normally covered by water. It results from the overflow of rivers and tributaries or inadequate drainage.

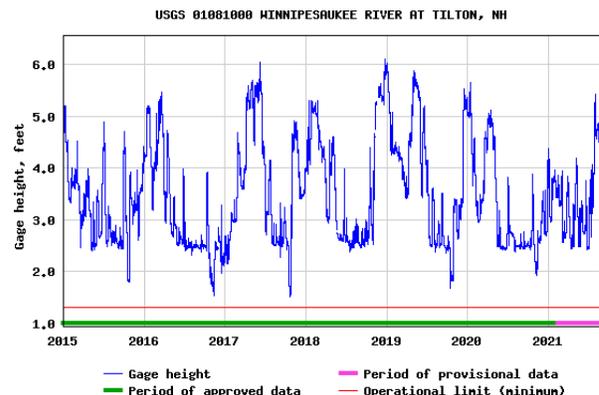
Flooding is commonly associated with structures and properties located within the 1% annual (or 100-year) floodplain. Areas in this floodplain have been identified as having a 1% chance of flooding any given year. This means that flooding in this area is projected to have an average recurrence interval of 100-years; however, that does not mean that a flood in this area will only occur once every 100 years.

Historically, the state's two largest floods occurred in 1936 and 1938. The 1936 flood was associated with snow melt and heavy precipitation. The 1938 flooding was caused by the Great New England Hurricane of 1938. Those floods prompted the construction of a series of flood control dams throughout New England, built in the 1950s and '60s. They continue to be operated by the US Army Corps of Engineers.¹⁵



There are numerous rivers and streams within the region and significant changes in elevation, leading to some fast-moving water. The region also has a great deal of shoreline, making it exposed to rising water levels as well. Although historically, there have not been many instances of shoreline flooding, the potential always exists for a flood event to occur.

Recent rain events have proven this is becoming an increasing concern as additional development is contributing to flood hazards. As areas are covered with impervious surfaces, less water is allowed to infiltrate, evaporate, or be transpired by vegetative growth and more of it runs off directly into surface drainages and water bodies. This increases the likelihood of flash floods and substantial overland flow. Of greatest concern are the waterfront properties on the lakes, ponds, and associated tributaries.



Culvert improvements and roadwork have been conducted throughout the region due to localized flooding events. Of particular concern in the region are areas of steep slopes and soils with limited capacity to accept rapid volumes of rainwater. Roads and culverts near these conditions are most at risk of localized flooding.

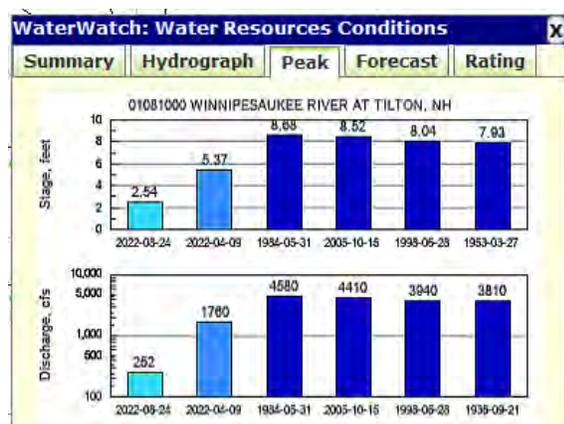
Ice forming in riverbeds and against structures often presents significant hazardous conditions for communities. Meltwater or stormwater may encounter these ice formations and apply lateral and/or vertical force upon structures. Moving ice may scour abutments and riverbanks. Ice may also create temporary dams. There is the potential that this could happen at the Franklin Falls dam, impacting low-lying areas along the Winnepesaukee River.

¹⁵ <http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html> date visited: January 18, 2011

Extent: Moderate

Flooding is defined as a temporary overflow of water onto lands that are not normally covered by water. It results from the overflow of rivers and tributaries or inadequate drainage. Flooding is usually associated with structures and properties located within the 1% annual (or 100-year) floodplain. Areas in this floodplain have been identified as having a one percent chance of flooding any given year.

The stream gauge along the Winnepesaukee River can give an indication of both current and historic water levels in the river¹⁶. This US Geological Survey (USGS) graph of the Winnepesaukee River at the stream gauge in Tilton indicates that the height of the river varies a great deal throughout the year from less than two feet to over seven feet.



The USGS provides volume data indicating the amount of water flowing through the river in cubic feet per second (cfs). A graph of historic flows is shown.

Dams in New Hampshire are classified by the New Hampshire Department of Environmental Services Dams Bureau. The four dam hazard classifications (High, Significant, Low, and Non-Menace) are based on the potential losses associated with a dam failure (see Appendix F for a detailed description). High (H) and Significant (S) Hazard dams have the highest

potential for damage; this could include damage to state or municipal roadways as well as structures.

There are no High Hazard Dams in Tilton or directly impacting the town. The active dams in Tilton include one Significant Hazard and one Low Hazard, the remainder are Non-Menace (NM) Hazard dams. Additionally, Lochmere dam in Belmont (upstream) and Franklin Falls Hydro Dam 2 (downstream) control water levels along the Winnepesaukee River and the two associated lakes (Silver and Winnisquam).

Dams in and around Tilton

HAZCL	NAME	TOWN	HEIGHT (ft.)	IMPOUND (acres)	OWNER
L	LOCHMERE DAM	BELMONT	14.00	4264.000	State
L	FRANKLIN FALLS HYDRO DAM 2	FRANKLIN	20.00	1.500	Private
S	CLEMENT DAM	TILTON	26.00	3.000	Private
L	FLEISHHACKER LOWER DAM	TILTON	13.70	3.900	Private

Thunderstorms can pop up quickly, dropping sudden bursts of rainfall upon the landscape. Often the rain soaks into the soil but if it happens very quickly, the water will run off into streams. Where drainage is inadequate, this sort of flooding can be amplified because the water has nowhere to go and backs up or overflows. Rainfall from tropical depressions or hurricanes can overwhelm the drainage systems due to the duration of the event, saturating the soil over a period of several days. The graph at right of www.WeatherUnderground.com records stretching back to 1948 show that while the rainfall

¹⁶ Winnepesaukee River in Tilton, http://waterdata.usgs.gov/nh/nwis/uv?site_no=01081000.

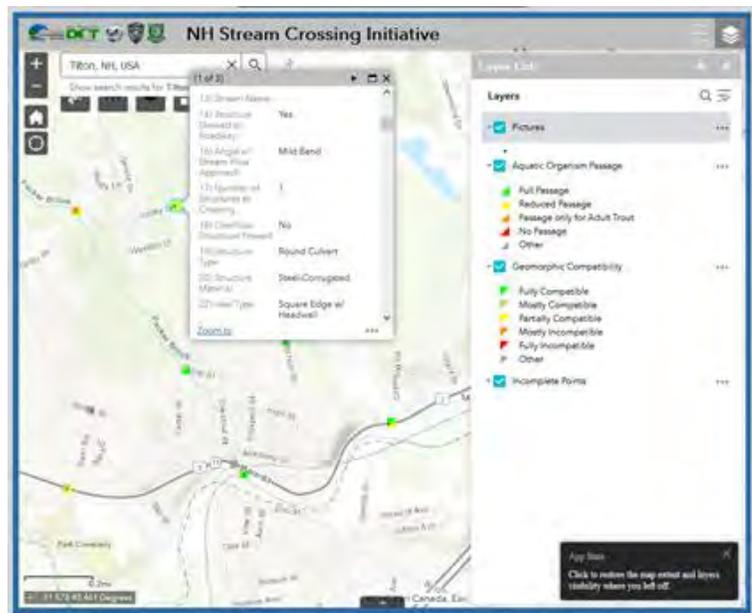
in Tilton averages less than half an inch per day, daily totals of five inches or more have been documented on nearly twenty separate dates and more than ten inches of rain on three separate dates.

History of Flooding Events

			EXTENT	IMPACT		
Hazard	Date	Location	Magnitude/ Description	Damage	Notes	Source
Flash Flood	6/19/2017	<u>BELKNAP – LACONIA & GILFORD</u>	2 to 3 inches in three hours	\$45 K		NOAA
Severe Storm & Flooding	10/29 – 11/1/2017	<u>Belknap, Carroll, Coos, Grafton, & Sullivan Co.</u>	Uprooted trees and heavy rains downed power lines leading to roughly 290K power outages		Presidentially Declared Disaster DR-4355	NH HSEM
Flash Flood	7/29/2021	<u>Barnstead, Gilford, Gilmanton, Alton</u>	Major road washouts	\$75K		

While there have been flooding events in Belknap County, there have not been any individual events in Tilton in the last ten years (and since the last plan) according to both the NOAA Storm Events Database and the Tilton HMP Committee. There are, however, areas that flood or erode regularly, mainly associated with vulnerable culverts (see Location and Impact).

Location: The Tilton Flood Insurance Rate Maps (FIRM) show the flood boundaries in the event of a 100-year flood, defined as having a one percent chance of flooding each year. These maps date from 1979. The map identifies floodplains along the shores of Lake Winnisquam and Silver Lake, the Winnepesaukee River, and eight brooks on the south side of town that drain into the Winnepesaukee River. All the tributaries cross under US Route 3/NH Route 11. Most have the potential to impact residential or commercial properties.



The [NH Stream Crossing Initiative and Mapping Tool](#), coordinated by UNH T2 can be useful resources for tracking the location and status of bridges and culverts.

Probability of Occurrence: Highly Likely

Brief thunderstorms occur frequently throughout the summer while a tropical depression might occur once a year with several days of rain.

Impact: Moderate

The critical facilities most likely to be impacted by a flood event are the Clement Dam, Lochmere Village Water District, evacuation routes, the Liberty Utilities facility, and half a dozen road segments

(Academy St, Colby St., Lancaster Hill Rd., Route 3/Brook Rd, South Bay, and a section of US 3/NH 11 along the Winnepesaukee River that is eroding).

The town of Tilton actively participates in the National Flood Insurance Program (NFIP) through the administration of its floodplain ordinance by the Selectmen and Code Enforcement Officer. This includes correspondence with the NH Floodplain Manager regarding specific issues and periodically updating the town's floodplain ordinance. By actively participating in the NFIP property owners are able to purchase flood insurance through the FEMA program.

The town has been in the program since May 1, 1979. The current Flood Insurance Rate Maps (FIRM) were developed by FEMA and dated August 19, 1979; they have not been updated since then. While there is currently no Flood Insurance Study (FIS) and no digital FIRMs for Belknap County, digital FIRMs for the Winnepesaukee River watershed are in development.

The town's Floodplain Ordinance was last amended in 1994. The Code Enforcement Officer is responsible for maintaining floodproofing and elevation certificates. Information regarding floodplains, floodproofing, and flood insurance are provided with all building permit applications. The NH Floodplain Coordinator considers the town officials to be knowledgeable regarding floodplains and the town compliant with floodplain administration

There are currently 20 flood insurance policies in force through the NFIP (insurance value \$7,347,400). Eleven of the NFIP-insured structures are in "A" (High Risk) Zones, while nine are in the B, C, or X (Moderate Risk) Zones. Note: This is four fewer than in the last plan reducing the total by nearly \$500,000. All these policies were for structures in the AE Zone.

Since 1975 there have been eleven losses paid out for a total of \$138,283; two-thirds of the paid claims (and two-thirds of the payments) have been on structures outside the A-Zone. One structure has incurred more than one loss, representing a total of \$25,130, or 20% of the total payments. There have not been any repetitive losses since 2006.

Implementation

Tilton's Floodplain Administrator (Code Enforcement Officer) is responsible for making determinations of substantial improvement and substantial damage*. These determinations are made for all development in a special flood hazard area that proposes to improve an existing structure including alterations, movement, enlargement, replacement, repair, additions, rehabilitations, renovations, repairs of damage from any origin (such as, but not limited to flood, fire, wind, or snow) and any other improvement of or work on such structure including within its existing footprint.

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

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

Definitions:

13.1.28 SUBSTANTIAL DAMAGE: means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the damage occurred.

13.1.29 SUBSTANTIAL IMPROVEMENT: means any combination of repairs, reconstruction, alteration, or improvements to a structure in which the cumulative cost equals or exceeds (50) percent of the market value of the structure. The market value of the structure should equal (1) the appraised value prior to the start of the initial repair or improvement, or (2) in the case of damage, the value of the structure prior to the damage occurring. For the purposes of this definition, “substantial improvements” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. This term includes structures which have incurred substantial damage, regardless of actual repair work performed. The term does not, however, include any project for improvement of a structure required to comply with existing health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions or any alteration of a “historic structure”, provided that the alteration will not preclude the structure’s continued designation as a “historic structure”.

Over the past several decades, the Planning Board, Land Use staff, and Code Enforcement Officer have sought and received assistance from the NH Floodplain Manager, in the form of General Technical Assistance from the NH Floodplain Manager, Community Assistance Calls, and Visits (most recently on November 28, 2018).

While there certainly there is the potential for flooding in the downtown and other areas along the Winnepesaukee River, there is also the likelihood that flooding will occur at one or more of the eight brooks in town draining into the river, all of which must pass through drainage structures under US Route 3/NH Route 11. While it is not a municipal road, committee members and survey comments noted that there has been significant erosion near Rt. 3/11 as it runs along the Winnepesaukee River.

Assuming a total of 1%- 2% chance of damage to structures might be as high as \$5.1 million - \$10.2 million annually.

Impact of Climate Change on Flooding: Flooding is influenced by how much water enters the watershed upstream. With warmer temperatures, more water evaporates and then falls as precipitation. Increased precipitation is likely to increase stream flow. Increased stream flow can increase soil erosion, impair water quality, and disrupt ecosystems. Increased temperatures could also impact the amount of snowpack and timing of snow melt & ice out.

The primary waterbody(ies) in Tilton, the Winnepesaukee River and associated Silver Lake will likely be impacted by a warmer and wetter climate. While flooding of these water bodies could impact both residences (Silver Lake) and businesses (Winnepesaukee River), both are dam controlled. The erosion along the Winnepesaukee River, mainly US Route 3/NH Route 11 along with the flooding along the brooks noted above will likely be exacerbated. Attention will need to be given to the control of the dams, along with the associated water levels & erosion. Appropriate design and maintenance of the drainage structures for the brooks will also be important.

Impact on Vulnerable Communities: Potential impacts associated with flooding on Tilton’s vulnerable populations include:

- May have limited access to early warning alerts
- May live in areas prone to flooding
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

SEVERE WINTER WEATHER (SNOWSTORM, ICE STORM)

Tilton experiences four types of severe winter weather: heavy snow, blizzards, nor’easters, and ice storms.

Extent: Moderate

A heavy snowstorm can be defined as one which deposits four or more inches of snow in a twelve-hour period.¹⁷ Snowstorms are a common occurrence throughout the Lakes Region. Blizzards, which may dump 12” – 36” or more of snow in a one- to three-day period are less frequent, but can have a serious impact on structures, utilities, and services. The region typically receives greater than 66” of snow annually.¹⁸

Average and Record Snowfalls for New Hampshire’s Lakes Region¹⁹



Records indicate that Tilton’s average snowfall on any day from November through April is less than one inch. These records also show that most days from late December through February snowfalls of 10 inches or more have been seen and that during the month of February daily snowfalls of more than 15” have occurred several times since 1948.²⁰

An ice storm coats trees, power lines, streets, vehicles, and roofs with a very slick and heavy coating of ice. In the winter of 1998, a major ice storm crippled much of New Hampshire, coating everything with as much as three inches of ice. The U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory estimates a 40 – 90-year return period for an event with a uniform ice thickness of between 0.75 and 1.25 inches. In 2008, just ten years later, however, New Hampshire was struck again by another severe ice storm.

¹⁷ <http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html>,

¹⁸ Northeast States Emergency Consortium, <http://www.nesec.org/>,

¹⁹ Weather Underground, Season Weather Averages

<http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KL.CI&SafeCityName=Tilton&StateCode=NH&Units=none&IATA=L.CI>.

²⁰ Weather Underground, Seasonal Weather Averages,

<http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KL.CI&SafeCityName=KL.CI&StateCode=NH&Units=none>,

CATEGORY	NESIS VALUE	DESCRIPTION
1	1–2.499	Notable
2	2.5–3.99	Significant
3	4–5.99	Major
4	6–9.99	Crippling
5	10.0+	Extreme

A couple of scales have been adopted recently by NOAA for comparing snowstorms that incorporate the number of inches of snow that accumulate, the area of the storm, and the number of people that could be impacted by the storm. The Northeast Snowfall Impact Scale (NESIS)²¹ applies specifically to the northeastern United States. It groups high-impact snowstorms into five categories.

The Sperry-Piltz Ice Accumulation (SPIA) Index is being used to forecast and classify ice storms based on a combination of the average thickness of ice coating (referencing expected temperature and precipitation levels) and wind speed; ratings range from 0 to 5.²² The SPIA Index was first used in the United States in 2009 and is now beginning to be utilized by the National Weather Service.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>*Revised October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 - 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 - 0.50	< 15	
2	0.10 - 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 - 0.50	15 - 25	
3	0.50 - 0.75	< 15	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Free line damage is excessive. Outages lasting 1 - 5 days.
	0.10 - 0.25	> 25	
	0.50 - 0.75	25 - 35	
4	0.75 - 1.00	< 15	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 - 10 days.
	0.25 - 0.50	> 25	
	0.50 - 0.75	25 - 35	
	0.75 - 1.00	15 - 25	
5	1.00 - 1.50	< 15	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.50 - 0.75	>= 35	
	0.75 - 1.00	>= 25	
	1.00 - 1.50	>= 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

New Hampshire generally experiences at least one or two nor'easters each year with varying degrees of severity. A nor'easter is defined as a large anticyclone weather system that resides near the New England region. These storms have the potential to inflict more damage than many hurricanes because high winds can last from twelve hours to three days, while the duration of hurricanes ranges from six to twelve hours. A nor'easter also has the potential to sustain hurricane force winds, produce torrential rain, and create blizzard conditions in winter months.

In the winter months, the state may experience the additional coincidence of blizzard conditions with many of these events. A blizzard is characterized by sustained winds or frequent gusts to 35 miles per hour or greater and considerable amounts of falling or blowing snow that last for a duration of three hours or longer. The combination of winds and snow reduce visibility to less than a quarter mile.²³

History of Severe Winter Weather Events

Hazard	Date	Location	EXTENT	IMPACT
			Magnitude	Description
Heavy Snow	1/26/2015	County Wide	6 to 14 inches	
Heavy Snow	2/2/2015	County Wide	8 to 14 inches	
Heavy Snow	2/7/2015	County Wide	6 to 15 inches	
Heavy Snow	2/14/2015	County Wide	6 to 12 inches	
Heavy Snow	2/5/2016	County Wide	4 to 10 inches	
Heavy Snow	12/11/2016	County Wide	4 to 8 inches	
Heavy Snow	12/17/2016	County Wide	4 to 7 inches	
Heavy Snow	12/29/2016	County Wide	6 to 16 inches	

²¹ <https://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis>

²² SPIA Northeast webpage, <http://www.spia-index.com/neIce.php>, June 3, 2014.

²³ "Winter storm terms," http://www.fema.gov/hazard/winter/wi_terms.shtm,

Hazard	Date	Location	EXTENT	IMPACT
			Magnitude	Description
Heavy Snow	2/9/2017	County Wide	6 to 15 inches	
Heavy Snow	2/12/2017	County Wide	6 to 16 inches	
Heavy Snow	2/15/2017	County Wide	4 to 12 inches	
Heavy Snow	3/14/2017	County Wide	12 to 20 inches	Laconia – 3 hrs blizzard conditions. (DR-4316)
Heavy Snow	3/31/2017	County Wide	6 to 12 inches	
Heavy Snow	4/1/2017	County Wide	6 to 12 inches	
Heavy Snow	12/22/2017	County Wide	3 to 10 inches	
Heavy Snow	1/4/2018	County Wide	10 to 15 inches	
Heavy Snow	2/7/2018	County Wide	6 to 10 inches	
Heavy Snow	2/17/2018	County Wide	2 to 9 inches	
Heavy Snow	3/7/2018	County Wide	10 to 18 inches	
Heavy Snow	3/13/2018	County Wide	12 to 24 inches	
Heavy Snow	11/20/2018	County Wide	6 to 10 inches	
Heavy Snow	1/19/2019	County Wide	6 to 10 inches	
Heavy Snow	1/29/2019	County Wide	5 to 7 inches	
Heavy Snow	12/1/2019	Statewide	5 to 12 inches	
Winter Storm	12/29/2019	Statewide	6 to 10 inches	
Heavy Snow	1/16/20	County Wide	5 to 7 inches	Heavy wet snow
Winter Storm	3/23/2020	Statewide	5 to 7 inches	
Winter Weather	5/9/2020	County Wide	1 to 3 inches	Wet snow
Winter Storm	12/5/2020	Statewide		
Winter Storm	12/17/2020	Statewide	18-24 in.	
Winter Storm	2/1/2021	Statewide	5-8 in	
Winter Storm	12/18/2021	Statewide	7 in.	Snow, sleet, and freezing rain
Winter Storm	1/29/2022	Lakes Region	2-9 in	
Winter Storm	2/4/2022	Belknap Co.	2-7 in	
Winter Storm	2/25/2022	Statewide	7-9 in	

Location: Severe winter weather occurs frequently and can affect the entire town. Severe winter weather occurs frequently in the northeast and the possibility exists for residents to have to withstand several days without power. No one area of the town and region is at greater risk than another, but there are segments of the population that are more at risk. These include the elderly, people who need regular medical care, and young children. These weather events can vary greatly based on slight differences in temperature, humidity, and elevation. Some events will produce a combination of winter weather types.

The committee noted that the Cannon, Lochmere, Mosquito, and Park Street bridges would all be especially impacted by an ice storm.

Probability of Occurrence: Highly Likely

Impact: Moderate

Almost all facilities in town can be impacted by heavy snow or ice. Flat-roofed buildings are all susceptible to damage from snow and ice loads. Downed limbs and wires and unplowed or untreated roads can severely limit emergency access to many residences. The potential for very cold temperatures and loss of power can quickly compound the issue.

Heavy snows can cause damage to property, disrupt services, and make for unsafe travel, even for emergency responders. Due to poor road conditions, residents may be stranded for several days. Extra pressure is placed on road crews and emergency services under these conditions.

Major roads, Essential Services, and flat-roofed buildings are all likely to be impacted by winter storms. While the town is accustomed to seasonal heavy snowfall, any particularly severe event with significant accumulations, especially combined with severe cold can be a burden. These events often lead to ice accumulation, and power loss, significantly increasing the vulnerability of populations and facilities.

Many of the roads in Tilton are state roads, including most of the town's evacuation routes; maintenance of them falls to NH DOT. The town has a significant amount of roadways to maintain. Town facilities are not particularly at risk to Severe Winter Weather. The potential for impact to the town is moderate.

The major threats to a community due to ice storms include structural damage due to heavy loads on roofs, interruptions of services such as electricity, fuel, water, and communications, as well as hazardous road conditions. Downed limbs and wires and unplowed or untreated roads can severely limit emergency access to many residences.

Snow load in severe winter storms is of concern as well. This is particularly true for flat roofed structures. Several small storms can produce the same snow load as a single larger storm and the combined weight of the snow load can damage rooftops. Ice adds additional weight as well. It is not uncommon in New Hampshire to experience mixes of winter precipitation as temperatures fluctuate above and below the freezing mark. While not widespread, instances of collapsed roofs are not uncommon.

All structures in Tilton are susceptible to damage by winter weather events, whether through ice storms, blizzards, or the heavy, wet snow often associated with a nor'easter. Assuming 1% to 5% town-wide damage to buildings, winter weather could result in \$5.1 million to \$25.5 million in damages annually.

Impact of Climate Change on Winter Weather Events: Changes in New Hampshire's climate could potentially lead to an increase in any of the four types of winter precipitation. This possible increase could result in an increase of unsafe structures due to increased weight of snow, ice, and rain accumulating on rooftops. It could also lead to roof collapses, compromising personal safety. An increase of winter precipitation also creates unsafe travel conditions around the region. These events also use a considerable amount of resources to deal with the clean-up.

In Tilton the impacts may include changes to expected snow & ice loads on roofs, different timing and nature of ice jams in the river, and different patterns for clearing winter weather debris.

Impact on Vulnerable Communities: Potential impacts associated with severe winter weather on Tilton's vulnerable populations include:

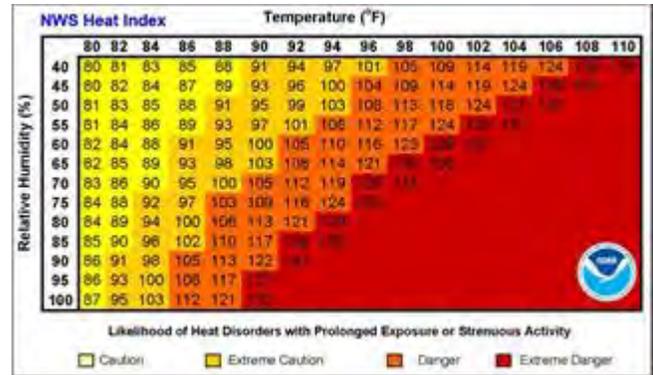
- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel

- Limited resources for seeking medical assistance

EXTREME TEMPERATURES

Extreme temperatures are a period of prolonged and/or excessive hot or cold that presents a danger to human health and life.

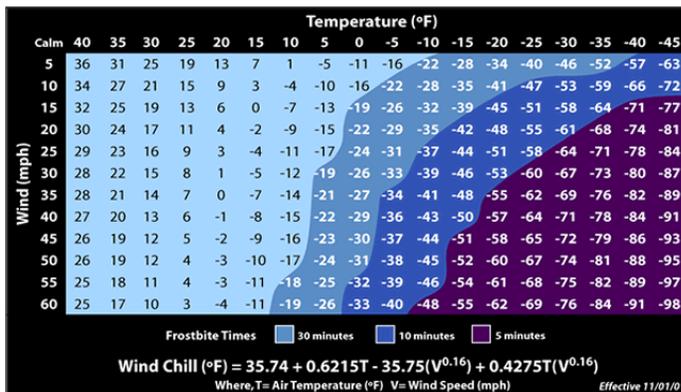
Extreme Heat events occur due to above normal temperatures, which often coincide with high relative humidity, that increase the likelihood of heat disorders with prolonged exposure or strenuous activity. Heat related disorders include heat cramps, heat exhaustion, and heat stroke. High heat and humidity can also adversely affect air quality, leading to respiratory problems. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.



Extreme Cold events are caused by the southern transport of arctic airmasses into the Northeast. This effect is exacerbated when there are winds present that effectively lower the temperature that is perceived by the human body, known as the wind chill. The risk comes from when the body is losing heat faster than it can produce it. Wind acts to carry heat away from the body, therefore amplifying the perceived temperature by the human body and reducing the body’s core temperature. Cold disorders can include frostbite and hypothermia.

Frostbite occurs when uncovered skin/extremities are exposed to extreme cold and the body tissue is either injured or killed. Hypothermia is when the body is unable to heat itself at the rate it is being cooled and the body’s core temperature begins to drop below normal values. A normal core body temperature is 98.6°F; mild hypothermia occurs when core body temperature drops between 90-95°F and severe hypothermia occurs at core body temperatures of below 90°F. If left untreated, hypothermia can result in unconsciousness and eventually death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

Wind Chill Chart



Extent: Moderate

- Heat Advisory—Two or more consecutive hours of Heat Index values of 95-99 °F for two or more days OR any duration of Heat Index values of 100-104 °F. A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions.

- Excessive Heat Warning—Two or more hours with Heat Index values of 105 °F or greater. An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions.
- Excessive Heat Watches—Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
- Excessive Heat Outlooks—Issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.
- Wind Chill Watch: NWS issues a wind chill watch when dangerously cold wind chill values are *possible*. As with a warning, adjust your plans to avoid being outside during the coldest parts of the day. Make sure your car has at least a half a tank of gas and update your winter survival kit.
- Wind Chill Advisory: NWS issues a wind chill advisory when seasonably cold wind chill values but not extremely cold values are expected or occurring. Be sure you and your loved ones dress appropriately and cover exposed skin when venturing outdoors. A Wind Chill Advisory is issued for New Hampshire is wind chill values are expected to be -20°F to -29°F and winds are greater than 5 mph.
- Wind Chill Warning: NWS issues a wind chill warning when dangerously cold wind chill values are expected or occurring. A Wind Chill Advisory is issued for New Hampshire is wind chill values are expected to be -30°F and winds are greater than 5 mph.²⁴

History:

Event Date	Event Description	Impacts	Location	Additional Information
July 1911	Heat Wave	Record high temperatures set in Concord, New Hampshire	Statewide	Extreme heat was recorded from July 3 rd through July 5 th , with high temperatures ranging from 101-102°F in Concord on these days. ¹¹⁶ These three days account for three of the top 10 hottest days on record for Concord, New Hampshire.
March 2012	Heat Wave	Record high temperatures set in Concord, New Hampshire	Statewide	High temperature records in Concord, New Hampshire were broken for 5 consecutive days, with the hottest day being 84°F.
September 2017	Heat Wave	High temperature records set across New Hampshire	Statewide	Mount Washington set record a daily high temperatures for four consecutive days. Manchester, Concord, and other areas across the State and New England also saw daily temperature records broken. ¹¹⁷
December 2017	Cold Wave	Record low temperatures set across New Hampshire	Statewide	Record low temperatures were set across the State as a result of a cold wave. Portsmouth saw a low of -1°F and Mount Washington saw a low of -33°F (with a wind chill of -51°). Wind Chill Advisories were posted in central and southern New Hampshire, and Wind Chill Warnings were posted for northern New Hampshire.
February 2018	One Day Winter Heat Wave	High temperature records set across New Hampshire	Statewide	Exceptionally strong high pressure ridge in place across the Eastern Seaboard. Record high temperatures were broken across the State. ¹¹⁸

Tilton has experienced regular extreme hot and cold temperatures annually since the last plan update but nothing out of the normal range.

Location:

Extreme temperatures can occur anywhere throughout the town of Tilton. Extreme heat might be concentrated in areas with a lot of pavement such as downtown.

Probability of Occurrence: Occasional

Impact: Moderate

²⁴ Adapted from *State of NH Multi-Hazard Mitigation Plan Update 2018* https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf.

Heat related disorders include heat cramps, heat exhaustion, and heat stroke. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy. Frostbite occurs when uncovered skin and extremities are exposed to extreme cold and body tissue is either injured or killed. Hypothermia occurs when the body is unable to heat itself at the rate it is being cooled and the body's core temperature begins to drop below normal values. A normal core body temperature is 98.6°F. Mild hypothermia occurs when core body temperature drops between 90 and 95° F, and severe hypothermia occurs at core body temperatures of below 90° F. If left untreated, hypothermia can result in unconsciousness and eventually death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy. Committee members expressed particular concern for vulnerable populations, including the elderly.

While most of the impact from extreme temperatures is to people and animals, there can also be structural impacts, especially from freezing and expansion of water in pipes and the resulting damages. Assuming 1% to 2% town-wide damage to buildings, winter weather could result in \$5.1 million to \$10.2 million in damages in any given year.

Impact of Climate Change on Extreme Temperature events: An increase in extreme temperatures will create ecosystem stress based on more intense heat waves and more extreme cold weather waves. The extreme temperatures will create additional health impacts due to high heat/extreme cold exposure, and poor outdoor air quality during extreme heat events. Heat waves can exacerbate droughts and wildfire, which can lead to negative impacts on the agriculture sector.

Impact on Vulnerable Communities: Potential impacts associated with extreme temperature events on Tilton's vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

LIGHTNING

Lightning is a giant spark of electricity that occurs within the atmosphere, or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the Sun. During a lightning discharge, the sudden heating of the air causes it to expand rapidly, resulting in thunder.²⁵

Extent: Moderate

The National Weather Service does utilize a six-point scale for characterizing lightning activity called the Lightning Activity Level (LAL) based on frequency of ground strikes along with rainfall and ground conditions.²⁶

LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five-minute period.

²⁵ <http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-3.pdf> accessed September 16, 2013.

²⁶ NWS Definitions webpage, <http://graphical.weather.gov/definitions/defineLAL.html>. Accessed June 3, 2014.

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.

All thunderstorms have the potential to create lightning, which can cause death, injury, and property damage and have great potential to cause damage to electronic equipment as well as structure and wildfires. Although the numbers have trended downward in recent decades, during the last half of the twentieth century more people were killed in the United States each year by lightning than by any other weather event. It can also wreak havoc with electrical and communications systems.

History of Lightning Events

Hazard	Date	Location	Magnitude/Description	Damage	Source
Lightning	5/15/2020	<u>Meredith</u>	0 injury/fatality \$20K property	House struck by lightning	NOAA

There have not been any known impacts from lightning in Tilton since the last plan update.

Location: Lightning can strike anywhere in town. Exactly where and when lightning will strike is unknown. Tall buildings, tall or exposed trees, and exposed boats are particularly susceptible to lightning strikes. Homes near the water and boats on the lake are vulnerable to summer storms and accompanying lightning strikes.

Probability of Occurrence: Highly Likely

In the Lakes Region, fewer than two lightning strikes occur per square kilometer annually.²⁷ While this value is not particularly high compared with other parts of the country, the frequency of storms with lightning is a significant local concern, especially during the summer months.

Impact: Low

Although the numbers have trended downward in recent decades, during the last half of the twentieth century more people were killed in the United States each year by lightning than by any other weather event. It can also wreak havoc with electrical and communications systems.

Power outages, whether associated with natural or man-made hazards have the potential to cause great disruption to residents and the functioning of the town. There is back-up power for most municipal facilities.

All structures in Tilton are susceptible to damage by lightning and resulting fires. The town's computer and communication systems could also be impacted by lightning. Assuming 1% town-wide damage to buildings annually, then each year lightning could result in \$5.1 million in damages.

Probability and Impact of Climate Change on Lightning events: Climate change is beginning to shift seasons resulting in longer, warmer summer months, and an earlier spring onset, which may

²⁷ *Northeast States Emergency Consortium*, <http://www.nesec.org/>

create more intense heat waves. Lightning is mostly observed during the warmer summer months, and the longer the season becomes, the opportunity for damaging lightning increases. The impact of any individual lightning strike would remain the same, but they may become more frequent with a warmer, wetter climate.

Impact on Vulnerable Communities: Potential impacts associated with lightning on Tilton's vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

WILDFIRE

A wildfire is defined as a fire in wooded, potentially remote areas that may endanger lives. A wildfire is any non-structural fire, other than prescribed fire, that occurs in wildland areas consisting of vegetation or natural fuels. Wildfires can be referred to as brush fires, wildland fires, or grass fires depending on the location and what is burning.²⁸

Extent: Moderate

A wildfire is defined as a fire in wooded, potentially remote areas that may endanger lives. New Hampshire has about 500 wild land fires each year and most of these fires burn less than half an acre. Much of the Lakes Region is forested and susceptible to fire.

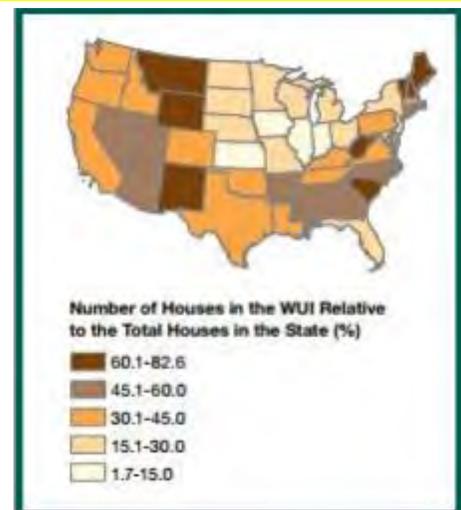
The National Wildfire Coordinating Group (NWCG) has defined seven classes of wildfire based on size:

- Class A - one-fourth acre or less;
- Class B - more than one-fourth acre, but less than 10 acres;
- Class C - 10 acres or more, but less than 100 acres;
- Class D - 100 acres or more, but less than 300 acres;
- Class E - 300 acres or more, but less than 1,000 acres;
- Class F - 1,000 acres or more, but less than 5,000 acres;
- Class G - 5,000 acres or more.

History: There have not been any wildfires in Tilton recently.

Extent: Moderate

New Hampshire has about 500 wild land fires each year; most of these fires burn less than half an acre. Much of the Lakes Region (and Tilton) is forested and susceptible to fire.



²⁸ https://www.nwcg.gov/glossary/a-z#letter_w

History:

From 2014-2018 there have been 724 wildfires statewide amounting to 2,007 acres burned. 2016 saw 351 of those wildfires alone.

According to both the NOAA Storm Events Database and the Tilton HMP Committee, in the last ten years (since the last plan), there has been no wildfire activity impacting Tilton.

Location: Tilton has a few areas that are wooded; a fire could occur in the northern and western section of town.

Probability of Occurrence: Likely

Impact: Low

No facilities were noted as being particularly impacted by wildfire. Areas that might be impacted are a few sparsely developed areas in the western and northern sections of town. All properties in town have the potential to be impacted by wildland fire. Assuming 1%-2% town-wide damage to buildings, a wildfire could result in \$5.1 million to \$10.2 million in damages in any given year.

Probability and Impact of Climate Change on Wildfire events: Increased precipitation from severe thunderstorms, wind events, ice storms may damage trees and forests. This can lead to insect or disease outbreaks that may result in a significant amount of woody debris in the forests which may increase the risk of wildfires. Increased temperatures associated with climate change increases the likelihood of drought, enhancing the chance of wildfire. While small fires will continue to be likely, the impact of wildfire in Tilton will remain low.

Impact on Vulnerable Communities: Potential impacts associated with wildfire on Tilton's vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Likely to be more prone to the effects of air pollutants (smoke) associated with wildfire
- Limited resources for seeking medical assistance

TROPICAL & POST-TROPICAL CYCLONES

Tropical and Post-Tropical cyclones are large storms with winds rotating in a counterclockwise manner. Tropical depressions and hurricanes form over the Atlantic Ocean and often come ashore in the southeastern United States, frequently moving up the Eastern Seaboard. Occasionally such storms come ashore along the northeast coast. Sustained high winds and heavy rains for 12 – 36 hours are characteristic of tropical depressions and hurricanes. There are many stages throughout the life cycle of a tropical cyclone.

- Potential Tropical Cyclone: Describes a disturbance that is not yet a tropical cyclone, however, poses the threat of becoming one
- Tropical Disturbance: A cluster of showers and thunderstorms that flares up over the tropics. Usually 100-300 miles in diameter and generally move westward.
- Tropical Storm: Sustained wind levels are between 34 knots and 64 knots (39 to 74 MPH)

- Hurricane: Once a tropical cyclone sustains wind levels between 64 and 96 knots (74 to 111 MPH)
- Major Hurricane: A tropical cyclone with maximum sustained winds of 96 knots (111 MPH) and higher. Major hurricanes are classified as category 3 or higher.
- Post-tropical Cyclone: A former tropical cyclone, this term is used to describe a cyclone that no longer possess the sufficient tropical characteristics to be considered a tropical cyclone. These post-tropical cyclones often undergo an extratropical transition and form frontal boundaries. Post-tropical cyclones can continue carrying heavy rains and high winds and cause storm surge.

Extent: Weak

Hurricanes are severe tropical storms that have winds at least 74 miles per hour. In the Lakes Region they could produce heavy rain and strong winds that could cause flooding or damage buildings, trees, power lines, and cars.²⁹ Hurricanes are measured by the Saffir-Simpson Hurricane Scale: a 1-5 rating based on a hurricane's intensity using wind speed as the determining factor (see table below). The scale is used to give an estimate of the potential property damage and flooding expected from a hurricane landfall.

Saffir-Simpson Hurricane Scale

Category	Characteristics
1	Winds 74-95 mph (64-82 kts or 119-153 km/hr). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.
2	Winds 96-110 mph (83-95 kts or 154-177 km/hr). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.
3	Winds 111-129 mph (96-113 kts or 178-209 km/hr). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.
4	Winds 130-156 mph (114-135 kts or 210-249 km/hr). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).
5	Winds greater than 156 mph (135 kts or 249 km/hr). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Source: <http://www.nhc.noaa.gov/aboutsshs.shtml>

²⁹ http://www.fema.gov/hazard/hurricane/hu_about.shtml, visited January 25, 2011.

On September 21, 1938, a Category 3 hurricane claimed 13 lives in New Hampshire and many more throughout New England. Official records at the Weather Bureau in Concord show sustained winds of 56 miles per hour, but around the state, gusts around 100 miles per hour were reported, mostly due to topographical acceleration. The Merrimack River rose nearly 11 feet above its flood stage, *The Hanover Gazette* reported that in New Hampshire, 60,000 people were homeless, and many areas were without power. Damages were estimated at \$22 million.³⁰ Hurricane Bob, a category 2 storm, in 1991, was declared a major federal disaster in New Hampshire and is recorded as a severe storm in the state's history. New Hampshire has not experienced a severe hurricane directly since 1938.

History: In the past five years no hurricanes have hit the region. By the time that a hurricane reaches central New Hampshire, it is rare that it retains the characteristics of a hurricane. Wind speeds usually dissipate but they can still bring a great deal of rainfall to the region. That was the case with the remnants of Hurricanes Irene and Sandy, which hit the area in 2011 and 2012 as tropical depressions. The town has not experienced a tropical or post-tropical cyclone since 2014.

Location: A cyclone could affect all areas of Tilton. Stream crossings, floodplains, and steep slopes are most likely to be impacted.

Probability of Occurrence: Occasional

Impact: Moderate

Hurricanes in the Lakes Region could produce heavy rain and strong winds that could lead to flooding and damage to property and infrastructure. Tropical and post-tropical cyclones can cause the same damage that high wind events cause, with the added hazard of possible flooding.

All structures in Tilton are susceptible to damage by cyclonic events, whether through tropical depression or hurricane. Assuming 2% to 5% town-wide damage to buildings, high winds could result in \$5.1 million to \$10.2 million in damages in Tilton in any given year.

Probability and Impact of Climate Change on Cyclonic events: An increase in temperature could potentially lead to stronger, and more frequent storms. Storms that produce a higher level of precipitation will lead to an increase in flooding and potential flooding damage.

Impact on Vulnerable Communities: Potential impacts associated with cyclonic events on Tilton's vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May live in areas prone to flooding
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

³⁰ <http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html>, visited January 25, 2011.

SOLAR STORM

The term space weather is relatively new and describes conditions in the Earth’s outer space environment. Space weather includes conditions and events on the sun, in the solar wind, in near-Earth space, and in Earth’s upper atmosphere that can affect space-borne and ground-based technological systems.³¹ Although space weather has occurred since the beginning of time, little was understood about the causes and impacts of these instances on the planet. It has only been in the last 200 or so years where multiple science fields have come together to study space weather.³² Not all space weather is damaging or effects humans or technology. Perhaps one of the most well-known effects of space weather on the Earth’s atmosphere is the Aurora Borealis (aka Northern Lights – northern hemisphere) and the Aurora Australis (southern hemisphere). Aurora displays are a result of solar wind where some of the charged particles become trapped in the Earth’s atmosphere.

Scale	Description	Effect	Physical measure	Average Frequency (1 cycle = 11 years)
R 5	Extreme	<p>HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector.</p> <p>Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.</p>	X20 (2×10^3)	Less than 1 per cycle
R 4	Severe	<p>HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time.</p> <p>Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.</p>	X10 (10^3)	8 per cycle (8 days per cycle)
R 3	Strong	<p>HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth.</p> <p>Navigation: Low-frequency navigation signals degraded for about an hour.</p>	X1 (10^2)	175 per cycle (140 days per cycle)
R 2	Moderate	<p>HF Radio: Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes.</p> <p>Navigation: Degradation of low-frequency navigation signals for tens of minutes.</p>	M5 (5×10^2)	350 per cycle (300 days per cycle)
R 1	Minor	<p>HF Radio: Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact.</p> <p>Navigation: Low-frequency navigation signals degraded for brief intervals.</p>	M1 (10^2)	2000 per cycle (950 days per cycle)

Extent: Weak

The 2018 State of New Hampshire Multi-Hazard Mitigation Plan Update describes three different types of events: Geomagnetic Storms, Solar Radiation Storms, and Radio Blackout. Each of these is then rated on a five-level scale (minor, moderate, strong, severe, extreme), with descriptions of increasing impacts on power, spacecraft, biological, satellite, high frequency radio, and navigation systems. A solar storm may exacerbate radio communications problems. The Radio Blackout Scale³³ offers a measure of the extent of solar storms on radio communications.

History: There have not been any known occurrences in Tilton of solar storms or space weather, and no significant events have been reported statewide. Nearby events include Quebec, Canada, which experienced a 9-hour blackout in March 1989 when solar winds caused a fluctuation in the Earth’s magnetic field and caused Hydro-Quebec’s transmission to go down.³⁴

Location: All of Tilton and the entire State of New Hampshire are at risk of solar storms and space weather. While the Earth is somewhat protected from solar storms and space weather by its upper atmosphere, the potential for a loss of communications, power, and GPS exists.

Probability of Occurrence: Occasional

Impact: Moderate

³¹ https://www.nasa.gov/mission_pages/sunearth/spaceweather/index.html#q12

³² https://www.nasa.gov/mission_pages/sunearth/spaceweather/index.html#q12

³³ https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf, p. 141

³⁴ Adapted from the State of New Hampshire Multi-Hazard Mitigation Plan Update (2018),

https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf.

Solar storms and space weather impact the Earth daily, although the effects are not often felt. It is difficult to estimate the impact of this hazard on Tilton as knowledge of this hazard is evolving, but committee members recognized that while human and property impacts are low, compromised communications could impact communications and response during other types of hazards, including reaching out for mutual aid.

Probability and Impact of Climate Change on Solar Storm events: The probability and impacts associated with a solar storm would not likely be affected by climate change.

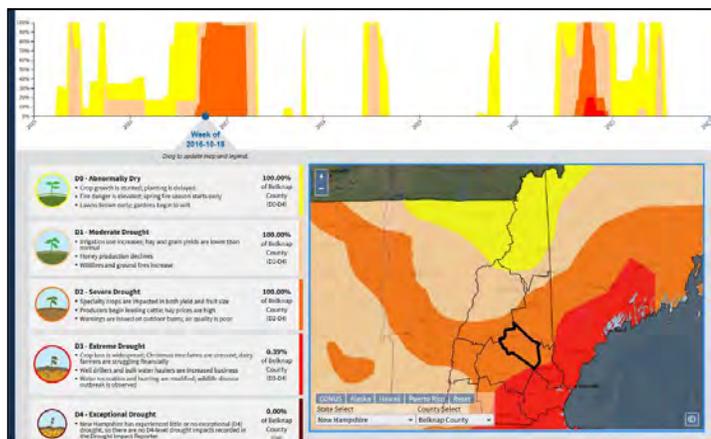
Impact on Vulnerable Communities: Potential impacts associated with solar storms and space weather on these Tilton's vulnerable populations all are related to compromised electronic communication and response associated with some other emergency.

DROUGHT

Drought occurs when less than the normal amount of water is available for extended periods of time. It is often but not always, accompanies elevated temperatures. Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced rain/snowfall, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

Drought is the absence of water in a region that occurs slowly due to below-average precipitation over an extended period, resulting in low stream flows, low surface water, and low groundwater levels.³⁵ According to NOAA, the climatological community has defined four types of droughts to address their cause(s), timeframe, and effects³⁶:

- **Meteorological Drought:** Occurs when dry weather patterns dominate an area, resulting in a lack of precipitation.
- **Hydrological Drought:** Occurs when low water supply becomes evident, especially in streams, reservoirs, and groundwater levels—usually after many months of meteorological drought.
- **Agricultural Drought:** Occurs when crops become affected by drought conditions.
- **Socioeconomic Drought:** Effects of supply and demand of commodities affected by drought conditions.



Extent: Weak

³⁵ <https://www.des.nh.gov/organization/divisions/water/dam/drought/index.htm>

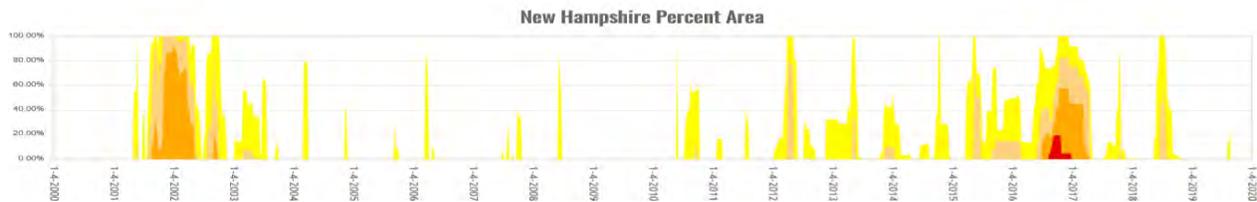
³⁶ <https://www.ncdc.noaa.gov/monitoring-references/dyk/drought-definition>

A drought can last for months, or even years. Since 1990 New Hampshire has had a state Drought Emergency Plan, which identifies four levels of action indicating the severity of the drought:

- Alert
- Warning
- Severe
- Emergency

Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced precipitation, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies. The US Drought Monitor³⁷ uses a five-level drought intensity scale ranging from Abnormally Dry to Exceptional Drought.

History: There have been five extended droughts in New Hampshire in the past century: 1929 – 1936, 1939 – 1944, 1947 – 1950, 1960 – 1969, and 2001 – 2002. While much of the country experienced drought conditions in 2012, New Hampshire received adequate precipitation.³⁸ Moderate drought conditions existed in New Hampshire during parts of 2015, 2016 and into April of 2017. In 2020 Belknap County experienced a moderate drought.



Hazard	Date	Location	Magnitude/Description	Damage	Source
Drought	9/1/2020	<u>Statewide & Belknap Co.</u>			NOAA
Drought	10/1/2020	<u>Statewide & Belknap Co.</u>		Property \$100K, Crops \$500K	NOAA
Drought	11/1/2020	<u>Statewide & Belknap Co.</u>		Property \$20K, Crops \$9K	NOAA

Location: Being a state-wide or regional event, drought would affect most areas of the community. Those with shallow wells would likely be affected first.

Probability of Occurrence: Occasional

Impact: Low

Those with shallow wells would be most affected. Impacts from a drought would be on businesses and services, not structures.

³⁸ US Drought Monitor <http://droughtmonitor.unl.edu/>. Accessed September 4, 2019.

Probability and Impact of Climate Change on Drought events: Heat waves can exacerbate droughts or cause them to occur more frequently. More intense rain events certainly may reduce drought, conversely because of their intensity, it can be a situation of so much rain coming down in a short period of time that much of the water runs off as stormwater and does not have an opportunity to seep in and replenish the aquifer. More frequent or more intense drought could have negative impacts on the agriculture sector.

Impact on Vulnerable Communities: Potential impacts associated with drought on Tilton's vulnerable populations include:

- Living in poorly maintained housing with aging infrastructure
- May be dependent upon others to travel
- Limited resources for seeking medical assistance

LANDSLIDE

A landslide is the downward or outward movement of earth materials on a slope that is reacting to a combination of the force of gravity and a predisposed weakness in the material that allows the sliding process to initiate. The broad classification of landslides includes mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows. Landslides may be formed when a layer of soil on a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Although gravity becomes the primary reason for a landslide once a slope has become weak through a process such as the one just described, other causes can include: ¹

- Erosion by rivers that creates over-steepened slopes through erosion of the slope's base. In the case of rivers, this can occur because of flash flooding
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains
- Earthquake creates stress that makes weak slopes fail—earthquakes of 4.0 magnitude and greater have been known to trigger landslides
- Wildfires (loss of vegetation)
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore, the formation of waste piles, or building of man-made structures may stress weak slopes to the point of failure.

Extent:

While there is no universally accepted standard or scientific scale has been developed for measuring the severity of all landslides, severity can be measured several other ways:

- Steepness/grade of the Slope (measured as a percent)
- Geographical Area
 - o Measured in square feet, square yards, etc.
 - o More accurately measured using LiDAR/GIS systems
- Earthquake, either causing the event or caused by the event
 - o measured using the Moment Magnitude Intensity or Mercalli Scale

There are also multiple types of landslides:

- Falls: A mass detaches from a steep slope or cliff and descends by free-fall, bounding, or rolling
- Topples: A mass tilts or rotates forward as a unit
- Slides: A mass displaces on one or more recognizable surfaces, which may be curved or planar

- **Flows:** A mass moves downslope with a fluid motion. A significant amount of water may or may not be part of the mass

Like flooding, landslides are unique in how they affect different geographic, topographic, and geologic areas. Therefore, consideration of a multitude of measurements is required to determine the severity of the landslide event.

History: Records (NOAA Storm Events database and New Hampshire State Hazard Mitigation Plan) indicate no landslides have occurred in Belknap County. There was no local knowledge of a landslide occurring in Tilton.

Location: Although New Hampshire is mountainous, it consists largely of relatively old geologic formations that have been worn by the forces of nature for eons. Consequently, much of the landscape is relatively stable and the exposure to this hazard type is generally limited to areas in the north and north central portion of the state. Formations of sedimentary deposits along the Connecticut and Merrimack Rivers also create potential landslide conditions.

Due to geography (limited steep slopes) and no known occurrences, it was determined that Tilton does not have areas at risk of landslides.

Probability of Occurrence: Low

Impact: Low

The primary impacts of a landslide are the damage and destruction to property and infrastructure located in the area where the landslide occurred. The land material moved during a landslide can cause damage to roads, buildings, and infrastructure at the base of the slope on which the landslide occurred. Buildings or infrastructures that are atop the slide, or on the side of the slope where the slide occurs, can be severely damaged or destroyed through its consumption by the slide. The hazard of death and injury to individuals atop, on, or at the base of a slide exists if such individuals are present in those locations when the landslide occurs.

Landslides that occur adjacent to a waterbody, such as a river or lake, can introduce excess sediment, increasing the turbidity of the receiving waterbody and impacting water quality if the quantity of sediment is of sufficient quantity. A very large landslide into a river could cause an obstruction that acts like a dam, creating an impoundment of water which leads to sediment and woody material deposition within it. This could also further create an additional risk of a “dam failure” at some future time when the natural dam breaks down, resulting a rapid release of the stored water from upstream.

As there are no significant steep slopes near structures nor adjacent to rivers or lakes, the potential impact to Tilton is minimal.

Probability and Impact of Climate Change on Landslide events: Increased heat due to changes in the climate results in increased severity of precipitation events. This can lead to increased bank erosion along rivers. The erosion occurring along the Winnepesaukee River impacting US 3/NH 11 was addressed under Inland Flooding.

Impact on Vulnerable Communities: Potential impacts associated with landslide on Tilton’s vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

AVALANCHE

An avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside. The flow can be composed of snow, ice, water, soil, rocks, and trees. An avalanche is a large mass of snow and ice, falling, sliding, or flowing under the force of gravity. An avalanche can be comparable to a landslide; only with snow instead of earth.

Natural and human-caused snow avalanches most often result from structural weaknesses of mountainside and unstable snow and ice formations. Factors leading to these conditions include recent heavy snow, temperature, wind direction, snowpack conditions, slope angle, and slope orientation. Heavy snowfall followed by high winds often create areas of unstable snow accumulations that can be set in motion by human activities, such as hiking, ice climbing, skiing, and snowboarding.

There are three categories of avalanches:

- Soft Slab – consists of soft, low-density snow
- Hard Slab – consists of dense, hard-packed snow
- Loose Snow (also called sluffs or point releases) – release from a single point, typically on a very steep slope

Extent: Low

North American Public Avalanche Danger Scale (NAPADS) from the National Avalanche Center (www.avalanche.org) is a system that rates avalanche danger and provides general travel advice based on the likelihood, size, and distribution of expected avalanches. It consists of five levels, from least to highest amount of danger: 1 – Low, 2 – Moderate, 3 – Considerable, 4 – High, 5 – Extreme. Danger ratings are typically provided for three distinct elevation bands. Although the danger ratings are assigned numerical levels, the danger increases exponentially between levels. In other words, the hazard rises more dramatically as it ascends toward higher levels on the scale.

There are no locations in Tilton where avalanches would occur.

History: Records (NOAA Storm Events database and New Hampshire State Hazard Mitigation Plan) indicate no avalanches have occurred in Belknap County. There was no local knowledge of a landslide occurring in Tilton.

Location: The mountainous regions of Carroll, Coos, and Grafton counties are at risk for avalanches, with the highest risk of avalanches occurring in the Presidential Range, particularly on Mount Washington.

There are no locations in Tilton where avalanches would occur.

Probability of Occurrence: Low

Avalanches are a common occurrence in high terrain areas in New Hampshire during the winter and spring months. Early warning systems have resulted in less impact lately, however, as more people get involved in outdoor recreation, the number exposed to avalanche threat could increase.

There are no locations in Tilton where avalanches would occur. The probability of an avalanche is low.

Impact: Low

Avalanches present a significant threat to hikers, skiers, and other people recreating on the mountain. Falling ice and rocks can cause injury or death. Cracks, holes, and crevasses in the snowpack can cause individuals to become trapped or buried in snow, which can result in extreme cold injuries, suffocation, and possibly death. Twenty-five to thirty people die each year nationally from avalanches.

There are no locations in Tilton where avalanches would occur. The impact of an avalanche is low.

Probability and Impact of Climate Change on Avalanche events: Increasing precipitation associated with climate change are likely to lead to heavier, wetter snowfalls and more layers of snow and ice (less stability). Increased temperatures will raise the snow line to higher elevations, reducing the risk of lower altitude avalanches. As there are no avalanche locations in Tilton, climate change will have no effect on the probability and impact of avalanche.

Impact on Vulnerable Communities: Potential impacts associated with avalanche on Tilton's vulnerable populations include:

- May have limited access to early warning alerts
- Living in poorly maintained housing with aging infrastructure
- May have limited mobility for getting assistance/evacuation, dependence upon others to travel
- Limited resources for seeking medical assistance

Due to geography and topography, landslide and avalanche were not considered to be hazards likely to have any effect on Tilton and were thus not considered any further in the plan.

CHAPTER IV: VULNERABILITY

The Committee looked at the intersection of potential hazards and facilities by using the Vulnerability Matrix below. Factors considered included exposure and resiliency. This helped guide the assessment of risk, identification of problems, and development of mitigation actions.

Critical Facilities Hazard - Vulnerability																							Key: 3 = High, 2 = Medium, 1 = Low, 0 = Not Applicable		High - Top 20% score		Medium - Top 40% score	
Tilton																												
Facility	Natural Hazards													Human-Caused & Technological Hazards										TOTAL				
	Inland Flood	Wildfire	Drought	Extreme Temps	Earthquake	Land-slide	Infectious Disease	Avalanche	Lightning	Post-Trop. Cyclones	High Wind Events	Dam Failure	Severe Winter Weather	Solar Storms Space Weather	Aging Infrastructure	Long-Term Utility Outage	Conflagration	Transp. Incident	Haz Mat	Contaminants	Cyber Event	Terror Violence	Mass Casualty Incident		Radio-logical			
Winnisquam Regional Middle School	1	2	1	1	2	0	2	0	2	2	2	0	2	1	1	1	2	1	2	1	2	2	2	1	33			
Winnisquam Regional High School	1	2	1	1	2	0	2	0	2	2	2	0	2	1	1	1	2	1	2	1	2	2	2	1	33			
Tilton Northfield Fire District Fire Station	1	2	1	1	2	0	2	0	2	2	2	0	2	2	3	1	2	1	2	1	1	2	1	1	34			
Tilton Police Department	1	2	1	1	2	0	2	0	2	2	2	0	2	2	0	1	1	1	2	1	2	2	1	1	31			
Power - EverSource (NHECoop - 6)	1	2	1	2	2	0	1	0	2	0	3	1	2	0	1	1	2	0	2	0	1	2	0	0	26			
Tilton Highway Department	2	2	1	2	2	0	2	0	2	2	2	1	2	1	0	0	2	0	2	0	0	2	0	0	27			
Tilton Town Hall	1	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	2	0	0	21			
Cannon Bridge (downtown)	2	1	1	1	2	0	1	0	1	0	2	0	1	0	0	0	1	0	2	0	0	2	0	0	17			
Lochmere Bridge (Silver Lake Road)	1	1	1	1	2	0	1	0	1	0	2	0	1	0	0	0	1	0	2	0	0	2	0	0	16			
Mosquito Bridge	2	1	1	1	2	0	1	0	1	0	2	0	1	0	0	0	1	0	2	0	0	2	0	0	17			
Park St Bridge	2	1	1	1	2	0	1	0	1	0	2	0	1	0	0	0	1	0	2	0	0	2	0	0	17			
Tilton Grange Hall (Senior Center)	1	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	1	0	0	18			
NH Veteran's Home	1	2	1	1	2	0	3	0	2	0	2	0	2	0	0	0	2	0	3	0	0	2	0	0	20			
Tilton School	1	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	2	0	0	19			
Tilton Northfield Aqueduct Co.	1	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	2	0	0	19			
Liberty Utilities	3	3	1	1	3	0	1	0	3	0	2	0	2	0	0	0	3	0	3	0	0	3	0	0	27			
State of NH Bureau of Railroads	1	1	1	1	2	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	0	1	0	0	12			
Clement Dam (Mill St.)	3	1	1	1	2	0	1	0	2	0	1	0	2	0	0	0	1	0	1	0	0	2	0	0	17			
Lochmere Village Water District	3	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	2	0	0	21			
Bridges over I-93	1	1	1	1	3	0	1	0	1	0	1	0	1	0	0	0	1	0	2	0	0	3	0	0	16			
First Student (School Bus Depot)	1	1	1	1	2	0	2	0	1	0	2	0	1	0	0	0	1	0	2	0	0	2	0	0	15			
Evacuation Routes	3	1	1	1	3	0	1	0	1	0	2	0	2	0	0	0	1	0	2	0	0	2	0	0	19			
Elderly Housing-New Franklin Apts	2	3	1	2	3	0	2	0	2	0	3	0	2	0	0	0	3	0	2	0	0	1	0	0	24			
Fire Hydrants	2	1	1	1	3	0	1	0	1	0	1	0	1	0	0	0	1	0	1	0	0	1	0	0	14			
Cell Tower - Tilton PD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Cell tower Episcopal church	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Cell Tower - Tilton School	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Cell Tower Calef Hill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Sewer pump stations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Daycare Facilities	1	2	1	1	2	0	2	0	2	0	2	0	2	0	0	0	2	0	2	0	0	1	0	0	20			
Living	2	3	1	1	3	0	2	0	2	0	3	0	2	0	0	0	3	0	3	0	0	3	0	0	28			
SUM TOTAL	41	45	26	29	58	0	42	0	44	10	51	2	44	7	6	5	44	4	52	4	8	50	6	4				

CHAPTER V: MITIGATION STRATEGIES

A. CURRENT PLANS, POLICIES, AND REGULATIONS

The planning decisions that affect community growth patterns have evolved over the years as Tilton has developed. Many local programs have the effect of mitigating disasters; some of these have been in effect for years, others were implemented since the development of the 2015 Hazard Mitigation Plan. A review of existing mitigation strategies was conducted and included review of pertinent documents including the zoning ordinance, subdivision regulations, emergency management plan, site plan regulations, and discussion with Committee members. The following strategies detail existing plans and regulations related to hazard mitigation. The furthest right column indicates what entity (agency or position) is responsible for implementing, expanding, or improving each protection.

The review of Existing Protections and Policies and the status of the 2015 Actions in Chapter V.B for effectiveness utilized the following categorizations:

Poor *The policy, plan or mutual aid system does **not work as well as it should** and **often** falls short of meeting its goals.*

Fair *The policy, plan or mutual aid system does **not work as well as it should** and **sometimes** falls short of meeting its goals.*

Good *The policy, plan or mutual aid system **works well** and **is achieving its goals**.*

Excellent *The policy, plan or mutual aid system **works very well** and **often exceeds its goals**.*

Untested *The policy, plan or mutual aid system has not yet been utilized or tested.*

Existing Protections and Policies

Existing Protection	Description	Notes	How Effective?	Changes	Responsible Party
Master Plan (2013)	Reference to the Tilton Hazard Mitigation Plan.	Describes the purpose of the HMP, the benefits to the town, and the advantages of keeping the HMP updated.	F	When the master plan is updated, this section should be made current.	PB
Zoning Ordinance	Flood plain Development Ordinance [developed to enforce FEMA flood insurance study]		G		PB
	FIRM [member as of 1975, 24 policies]	Maps are now 35 years old.	Poor	Update in process	FEMA

	Wetlands Conservation District	Prohibits development in environmentally sensitive areas	G	Very Broad. Need better understanding of protection. Difficult to administer.	PB
	Structure Fire & Catastrophic Struct. Damage	Hazards must be demolished or fixed in 1 yr	G/F	Town ordinance says one year to rebuild. - CEO to explore	BoS
	Logging practices must follow NH State Best Management Practices		G		BoS
Subdivision Regulations	[6.4] Grading and Erosion Control	Reduces damage to the site and nearby properties and infrastructure	G		PB
	[6.5 and 7.7] Storm Drain System and Culvert requirements	Reduces the concentration of water that can lead to flooding and erosion.	G		PB
	[6.6 and 7.8] Sanitary Sewer System environmental regulations	Reduces health and water quality problems.	G	A little stricter than the state	PB
	[6.7] Wellhead protection, common water system, and fire protection requirements	Works to ensure that adequate firefighting resources are available.	G/F	Looking at strengthening enforcement capability"	PB
	[7.1 and 7.11] Design Standards for Roadway Improvements	Ensures that new development does not result in substandard infrastructure.	G		PB
	[7.2] Lot Area requirements (HISS and wetland delineation)	Aimed at reducing environmental and structural problems with new development.	G		PB
Site Plan Regulations	Wireless telecommunications safety requirements	Reliable communications	G		PB
	Selectmen review plans to ensure mobile homes meet state tie-down regulations	This is now done by the Building Inspector.	G	Building Inspector	Building Inspector
Wetland Ordinance	No septic tanks within 125 feet	Health	G		PB

	No structure within 20 feet	Environmental and structural	G	100' for vernal pools and wetlands > 1,000 sf	PB PB
Fire Department	Full-time FD Chief		G		BoS
	13 full-time & 29 part-time (firefighters/EMT's)		G	18 FT/10 PT	Fire Chief
	Forest Fire Warden		G		Fire Chief
	100% Haz Mat Awareness Certified	Coordination	G		Fire Chief
	100% ICS Certified	Coordination	G		Fire Chief
	Hydrants mapped [in Critical Facilities map]		G		Fire Chief
	Member of Lakes Region Mutual Aid	Effective support network	G		Fire Chief
	Adopted State Fire Codes		G		Fire Chief
	Wildfire forestry truck and 6-wheel ATV with stretcher sled		G		Fire Chief
	Inflatable rigid hulled boat, handheld GPS, cell phones	Water rescue	G		Fire Chief
	Pre-fire plans	Describes building and emergency contacts.	G		Fire Chief
	Have use of Central New Hampshire HazMat Team	Effective support network	G		Fire Chief
	Technical rescue equipment		G		Fire Chief
	Member of regional Swift Water Rescue Team	Became a FEMA Type III deployable resource for Swiftwater Rescue.	No longer	No longer member of FEMA Type III	Fire Chief
	2 ambulances [Tilton/Northfield Mutual Aid]	Effective support network	G	No Change - ISO 3/3Y	Fire Chief
Police Department	Full-time PD Chief		G	New Chief	BoS
	18 full-time officers & 4 part-time officers		F	12 now - in hiring mode	Police Chief
	Command Staff is NIMS Certified	Coordination	G	Likely - Can arrange it - Need all Town office staff	BoS

	DARE program [Northfield]	Outreach to youth		Now have the LEAD program instead	Police Chief
	Member of Belknap County Special Operations Group	SWAT	G		Police Chief
	Central New Hampshire Special Operations Unit, June 2008	for Search & Rescue and medical	G		Police Chief
	Building evacuation plan	Coordination		Yes	EMD
	Permanent alarm, motion detector		G		Police Chief
	Back-up generator	This is much improved since 2008	G	In process at new facility	EMD
	Repeater on communications tower	Improved - through Belknap Mtn.		In process	EMD
Highway Department	Full-time Road Agent			Director of Public Works, not Road Agent	BoS
	4 full-time staff		G	5 staff, could use 1 more	DPW Dir.
	Town maintenance plan	Coordination	F	Needs to be revisited.	DPW Dir.
	Portable generator		G		EMD
	Evacuation plan	Coordination, communication	G		EMD
	Fire extinguishers, emergency lighting		G		DPW Dir.
	Have a repair schedule for roads	Have a 10-yr. plan for roads, sidewalks, and equipment.	G		DPW Dir.
Winnisquam Regional School System	Evacuation Plan, successfully implemented 2007	Coordination, communication	G	Updated 2018	EMD
	Sprinkler system, Union School [upgraded 2007], MS/HS	tested twice per year	G		EMD
	Emergency bottled water, food, blankets		G		EMD
	Security system, video surveillance, automatic locks [MS/HS]	Upgraded the locks (2014)	G	Updated (\$20K) HSEM School Security	EMD
	Permanent generator in HS	HS serves as Regional	G		EMD

		Shelter.			
Emergency Operations Plan	Updated 2023	Directs and coordinates emergency response. It references the HMP.	E	This was updated in 2023 after a long period without an update. It should be updated every 5 years to remain current.	EMD
Building Codes and Inspector	The Town of Tilton follows the State Building Code 2020 and Electrical and Plumbing 2018. The Town Ordinance requires Building Permits for all new construction as well as renovations & repairs.	Part-time inspector and has support staff	G		Building Inspector
Dry Hydrants	Several exist. [identified on Critical Facilities map]		G		Fire Chief
Transfer Station	Containers to hold trash, recycling, construction waste, e-waste, batteries, tires		G	Updating Debris Management Plan	DPW Dir.
Shelters	Winnisquam Regional Middle & High School		G		EMD
Sewer/ Water Service	Tilton-Northfield Water District	Upgraded pumps to handle volume and pressure	G	Northfield crossing siphon NH DES	T-N Water District
	Winnepesaukee River Basin Program (LR Interceptor)	For municipal sewage	G	11 sewer pumps (4 generators, 1 portable) Tilton Sewer	Tilton Sewer Commission
	Water drawn from prime aquifer		G		T-N Water District
Town Administration	Panic Alarm [periodically tested]		G	Upgraded - Fire Alarm horns	EMD
	Smoke detectors		G		Fire Chief

	Work with Lakes Region Partnership for Public Health (LRPPH) on pandemic/epidemic planning and other health and emergency preparedness issues.		G		EMD
Communications	FD has upgraded communications through Simulcast		G		EMD
	Town has switched systems for Emergency communications to OneCall.	Has a great deal of capacity for targeted messaging and feedback.	G	Lower cost, not as feature-rich	EMD

The foundation for planning and Land Use policy for municipalities in New Hampshire is the local Master Plan. The Planning Board is responsible for the development and update of the town’s Master Plan under RSA 674:1 (recommended every 5 to 10 years).

The Tilton Zoning Ordinance was developed by the Planning Board and adopted by the residents at the Town Meeting in 1956. These rules help guide local land use. It is administered by the Planning Board. Amendments to the zoning (expansion or improvements) can be made but changes to it must be approved by a majority of the voters at Town Meeting (NH RSA 674:16). Zoning is enforced by the Board of Selectmen through the Code Enforcement Officer.

Funding capability: There are a variety of methods for funding these existing capabilities as well as expansion and improvement of these policies and programs. The town of Tilton utilizes an annual Operating Budget. The Operating Budget funds many of the Mitigation Actions along with many existing capabilities. Other funding may include warrant articles and grants. The Budget Committee and Board of Selectmen make recommendations, and the budget is voted on by town residents annually. For special projects the town may opt to develop a warrant article for residents to vote on. The town may also apply for grants to help pay for implementation of recommended mitigation actions or improvement and expansion of existing capabilities.

B. STATUS OF 2015 ACTIONS

The 2015 HMP contained 35 recommendations. A review of the status of these actions reveals that five have been completed and two others are no longer considered pertinent. The status of the mitigation actions recommended in the 2015 plan is indicated in the Table below as either, Completed, Deleted, or Deferred. Some of the completed or deleted Actions are now listed above as “Current Plans, Policies, and Regulations”. Deferred or Ongoing Actions (or deferred portions of Actions) were carried forward to be considered as new Mitigation Actions.

Status of Actions from the 2015 Hazard Mitigation Plan

*ID letter is simply for identification.		Tilton		Status: Completed (C) , Delete (X) , Defer (D)	
ID*	Hazard	Problem 2013	Mitigation Action	Current Status	Comments
A	All Hazards	Emergency response facilities are not adequate meet the town's needs.	Construct a new police station and ensure that EOC operations are supported with appropriate equipment and workspace	C	New police station
B	All Hazards	Development can adversely impact other properties in the community by increasing opportunities for flooding, erosion, fire, etc.	Include in the plan submission sections of both site plan and subdivision regulations a reference to the Hazard Mitigation Plan, and require the applicant to articulate how the proposal complies with the standards of the plan and achieves a “no adverse impact” status as it relates to emergency situations.	C	PB now requesting 100 yr floodplain
C	All Hazards	Hazard Planning documents should be clear and in general agreement regarding priorities.	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	C	EMD, Check EOP will be in next update. Completed and referenced in 2023.
D	All Hazards	Not all personnel potentially involved in emergency response have a clear understanding of their role.	Train all town employees to be NIMS certified	D	EMD - Need to work on it. FD all NIMS, working with PD & HSEM (with DPW)
E	All Hazards	There are still some road names that have not been approved through the 911 system; this could cause confusion.	Work with Dept of Safety 911 Mapping to fix known problems with GIS road data to limit confusion in emergency planning and response	D	EMD - Especially Main St. working with 911

ID*	Hazard	Problem 2013	Mitigation Action	Current Status	Comments
F	All Hazards	Not having a backup EOC could hamper communication and response during an emergency if the primary EOC were compromised.	Designate Fire Station as backup EOC	X	EMD - a. Secondary EOC? (Adjacent communities or virtual) b. new Fire Station?
G	Blizzard, Ice Storm, Thunder storm, Nor'easter	Loss of power and downed wires can put residents and visitors in danger.	Amend site plan regulations to require underground cables in all new developments	X	Not required. Underground where possible. PB is aware - recommend.
H	Blizzard, Ice Storm, Thunder storm, Nor'easter	Loss of power and downed wires can put residents and visitors in danger.	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice	D	Has not happened. Cost prohibitive.
b	Earthquake, Fire	Tilton's older, multi-story buildings downtown could be impacted in a significant earthquake	Require sprinklers in downtown buildings.	D	FD Difficult due to cost
g	Epidemic	Elderly housing, schools, and areas where many congregate are places where communicable diseases could spread quickly.	Work with LRPPH and target areas to conduct outreach regarding prevention.	Ongoing	Ongoing (Action Completed)
X	Fire	Overhead wires in downtown prevent the use of ladder trucks, leaving most of the upper stories of downtown at risk during a fire.	Bury the wires in downtown.	D	Expense, State road (some new solutions in future)
Y	Fire	Wooded areas around Pest House Rd. and north of Lancaster Hill Rd. have limited access for fire prevention. Up to two dozen residences are at risk.	Encourage residents in these areas to adopt all or part of the FireWise program for protecting their property.	D	No action on Firewise. Access improved but could be better
a	Flood	One residence has experienced repetitive flood damage.	Improve drainage along Packer Brook	C	Big box culvert & 700' of drainage. DPW funding

ID*	Hazard	Problem 2013	Mitigation Action	Current Status	Comments
I	Flood	The most current flood maps are from 1997 and not in digital format. There has been development in Tilton since then and a digital format would improve local mapping and interpretation.	Impress upon the State Floodplain Manager, NH HSEM, and FEMA the need to update the FIRM maps for Belknap County.	D	HSEM is working on it. Still a couple years out.
J	Flood	Flooding occurs along Matthew Dr./Pest House Rd. due to poor drainage and undersized culverts. There are several homes along this road.	Work with Franklin to improve drainage and culverts on Matthew Dr/Pest House Rd to protect residents from flooding	C	Franklin Side
Z	Flood, ice jam	Downtown is at risk for flooding, especially if there is a backup at the dam in Franklin.	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	D	Silver Lake - lack of communication. Anticipate more problems with Franklin WW project. Also Route 3 erosion - increased wear & tear on road. And island
K	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Academy St.	D	Ongoing - Difficulties property access, needs more time
L	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Colby St.	D	State Rd - resurfaced but not drainage work
M	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	D	State Rd - resurfaced but not drainage work
N	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	D	State Rd - resurfaced but not drainage work
O	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	D	State Rd - resurfaced but not drainage work

ID*	Hazard	Problem 2013	Mitigation Action	Current Status	Comments
P	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Work with NH DOT and the Lakes Region Transportation Advisory Committee to upgrade vulnerable culverts and bridges on state roads, especially Route 3/Route 132 N.	D	State Rd - resurfaced but not drainage work
Q	Hazardous Material Accident	Tilton Highway Dept. staff are exposed to hazardous materials due to poor ventilation on the garage.	Install exhaust ventilation system to reduce worker exposure to harmful chemicals in Hwy Dept building	D	Trucks & equipment
U	Hazardous Material Accident	If hazardous materials are in the floodplain, the facilities for storing them should be inspected. There are no standards for inspection.	Develop an inspection standard to ensure proper safety precautions are met for hazardous material location in the floodplain	D	PB does require Maint. Plan. (Partial) No ongoing schedule for managing that. Many businesses do have fed. Reporting requirements to FD - share with PB. Selectboard/Public Meeting concern – consider not limiting this to floodplain sites, other waterbodies might be impacted.
f	Hazardous Materials Accident	Major roadways run near waterbodies and over the aquifer. A spill could quickly impact drinking water and recreational water.	Ensure that adequate initial response equipment is available, and that coordination is maintained with the Lakes Region HazMat Response Team.	Ongoing	Ongoing (Action Completed)
c	Lightning	Some people are not aware of how to reduce the likelihood of being struck by lightning (person or structure).	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	D	FD Will update website
R	Lightning	Town buildings, electronic equipment, and data could be damaged during a lightning strike.	Evaluate and install lightning rods on town owned buildings susceptible to strikes	D	Problem still exists. New PD properly grounded.
S	Lightning, Fire	Town hall does not meet fire codes, putting town employees, equipment, and data, along with visitors are risk.	Renovate town hall to meet fire codes	C	Town Hall now meets minimum Life Safety
V	Lightning, Fire	Insufficient access to water limits the ability of the Fire Department to fight fires in some areas of town.	Explore additional dry hydrant sites	D	Looking to improve and upgrade - continuous

ID*	Hazard	Problem 2013	Mitigation Action	Current Status	Comments
W	Lightning, Fire	Insufficient access to water limits the ability of the Fire Department to respond.	Purchase equipment for new dry hydrants	D	Ongoing - line item in budget
d	Severe Wind	Some people are not aware of how to reduce the likelihood of wind damage.	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	D	Wind may not be the problem. What it knocks over is.
e	Severe Winter Weather	Buildup of snow and ice can lead to roof collapses	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information.	Ongoing	Ongoing issue. Find a more proactive solution. Code does require snow loads to code. FD - Alternate methods of getting message to businesses & residents. (Action Completed)
h	Terrorism	There are numerous potential target areas and groups in Tilton (industrial areas, schools, elderly, the mall).	Ensure that there is a high level of participation in the EveryReady communications system.	Ongoing	Use Tilton Alert, social media Now use a different system. Do need to get people signed up. Do have message board
i	Terrorism	There are numerous potential target areas and groups in Tilton (industrial areas, schools, elderly, the mall)..	Conduct outreach to the business and non-profit community regarding steps that they can take to protect their facilities and people.	Ongoing	Schools have EOPs
T	Terrorism	Local data and communications may be at risk due to inadequate security.	Improve security to the switching hub on Prospect St, which houses fiber-optic cables	D	Yes. Up to date & protected. Software, hardware - Ongoing Note – PD did have cyber attack 2020.

NH RSA 674:2(e) does allow for the inclusion of a natural hazards chapter in a local master plan. The existing Master Plan does have a statement describing the Hazard Mitigation Plan and its purpose as well as a statement regarding the importance of updating the HMP frequently.

The Tilton Local Emergency Operations Plan (LEOP) was updated in 2023.

C. MITIGATION GOALS AND TYPES OF ACTIONS

The committee reaffirmed its support for the goals stated in the town's 2015 HMP and State HMP. The general goals below are similar to the goals in the earlier plan while the hazard-specific goals address specific local concerns.

General Goals:

1. Improve the protection of the residents of Tilton and its visitors from all hazards, raise general awareness, and reduce the liability to the town for hazard events.
2. Reduce the potential impact of hazard events on Tilton's critical support services, facilities, and infrastructure.
3. Improve emergency preparedness.
4. Improve the response and recovery capability of Tilton to hazard events.
5. Reduce the potential impact of hazard events on private and public property, the natural environment, and economic resources.

Hazard Specific

Flooding

6. Minimize the impact that a flood would have on life, property, and infrastructure on the Winnepesaukee River and its floodplain along with various brooks of the town of Tilton.

Fire

7. Reduce the risk of loss of life, and damage to property and infrastructure due to structural or wildfires.
8. Reduce the impact on life, structures, and infrastructure (especially communications infrastructure) resulting from a lightning strike.

Winter Weather

9. Minimize the impact of severe winter weather on people living in or visiting Tilton along with structures and infrastructure.

Severe Wind

10. Reduce the likelihood of damage or loss of life due to high wind events.

Earthquake

11. Minimize the impact that an earthquake may have on the people in the town of Tilton as well as structures and infrastructure.

Epidemic

12. Minimize the impact that an epidemic or other health hazard may have on the people in the town of Tilton

There are several types of actions that communities may take to reduce the likelihood that a hazard might impact the community. These include:

- Local Plans and Regulations
- Structure and Infrastructure Projects

- Natural Systems Protection
- Education and Awareness Programs

D. POTENTIAL ACTIONS

Through a review of the risk assessment and local vulnerabilities, several Problem Statements were identified and refined by the Committee. Multiple brainstorming sessions yielded an updated list of mitigation strategies to address these current problems. As noted earlier, actions or portions of actions which were deferred from the previous plan were brought forward in this table and considered along with new ideas; all were then treated as potential actions and prioritized in a similar manner (Section E). The Table below lists the problems and actions along with the hazard(s) that they address and notes whether the action addresses existing structures/infrastructure or future (new) structures/infrastructure as well as which goal(s) they address and the type of mitigation action each represents. The ID letters are used simply for tracking purposes (and are different from the previous table); they do not indicate any sort of prioritization. Note: the goals and their numbers are listed in the previous section. The estimated cost represents what the Committee thought it would cost in terms of dollars or staff hours to implement each action.

Problems and Actions indicating Hazard, Structure, Goal, and Types of Action

ID*	Hazard	Problem	Mitigation Actions	New/Existing	Goal	Mitigate/Prep.Resp	Type	Estimated Cost
H	Flood	The most current flood maps are from 1997 and not in digital format. There has been development in Tilton since then and a digital format would improve local mapping and interpretation.	Work with the State Floodplain Manager, NH HSEM, and FEMA to update the FIRM maps for Belknap County (Winnepesaukee Basin)	N	1.2.5.6	Mitigate	Local Plans and Regs	20 hours Staff Time/yr
P	Blizzard, Ice Storm, Thunder storm, Nor'easter	Loss of power and downed wires can put residents and visitors in danger.	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice.	E	1.2.4.5.7.9.10	Mitigate	Struct./Infrastr.	\$10K - 15K
b	Fire - Conflagration	Overhead wires downtown prevent the use of ladder trucks, leaving most of the upper stories of downtown at risk during a fire.	Bury the overhead wires in downtown (\$5 M) Phase I - Put out an RFP to bury the overhead wires in downtown.	E	1.2.3.4.5.7	Mitigate	Prep.Resp.	\$10K - 15K

ID*	Hazard	Problem	Mitigation Actions	New/Existing	Goal	Mitigate/Prep.Resp	Type	Estimated Cost
N	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for the state's 10-year Transportation Plan to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Construction could be fully federally funded but take longer.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$10K - 15K
N2	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for discretionary grant opportunities to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Likely faster construction, but requires 20% match.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$10K - 15K
S	Lightning	Some people are not aware of how to reduce the likelihood of being struck by lightning (person or structure).	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	E	1.2.3.5.8	Mitigate	Educ./Awareness	10 staff hrs/yr
Q	Severe Winter Weather	Buildup of snow and ice can lead to roof collapses	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information. Conduct physical inspections of commercial properties	E	1.2.5.9	Mitigate	Educ./Awareness	40 staff hrs/yr
O.1	Flooding/Erosion	Erosion is occurring under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	Coordinate with NH DOT to develop plans to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	E	1.2.5.6	Mitigation	Struct./Infrastr.	\$20,000
O.2	Flooding/Erosion	Erosion is occurring under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	Coordinate with NH DOT to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	E	1.2.5.6	Mitigation	Struct./Infrastr.	\$2 million

ID*	Hazard	Problem	Mitigation Actions	New/Existing	Goal	Mitigate/Prep.Resp	Type	Estimated Cost
X	Drought	NH experienced drought conditions in 2017 & 2020, Belknap Co. was in Moderate Drought (D1). This could lead to increased irrigation and increase the chance of wildfires.	Raise public awareness through drought monitor, including links on municipal webpage (https://www.drought.gov/states/new-hampshire). Post and distribute resources for homeowners regarding water-saving actions that can reduce household water consumption, decreasing the impacts of drought.	E/N	1.2.5.7	Mitigate	Educ./Awareness	20 staff hours/year
j	All Hazards	Hazard Planning documents should be clear and in general agreement regarding priorities.	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	E	1.2.3.4.5	Mitigate	Local Plans and Regs	20 hrs staff time
W	Dam failure, ice jam	Downtown is at risk for flooding, especially if there is a back up at the dam in Franklin.	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	E	1.2.3.5.6	Mitigate	Local Plans and Regs	20 staff hrs/yr
R	Extreme Temps	There are times when either extreme heat or cold make it difficult for some people to keep cool or stay warm.	Distribute information (electronic & hard copies) on improving weatherproofing homes as well as accessing cooling/heating centers.	E	1.5.9	Mitigate	Struct./Infrastr.	40 staff hours/year
A	Infectious Disease	A clear, coordinated effort to mitigate the impacts of infectious diseases locally is important.	Identify who would be lead on becoming more involved & creating a Plan of Action related to infectious disease mitigation.	n/a	1.2.3	Mitigate	Local Plans and Regs	30 hr
B	Infectious Disease	Elderly housing, schools, and areas where many congregate are places where communicable diseases could spread quickly.	Work with LRPPH and target areas to conduct outreach regarding prevention.	E	1.2.3.4.5.12	Mitigate	Educ./Awareness	30 hr/yr
V	Wildfire	Wooded areas around Pest House Rd. and north of Lancaster Hill Rd. have limited access for fire prevention. Up to two dozen residences are at risk.	Conduct outreach to the two dozen residences around Pest House Rd. and north of Lancaster Hill Rd. about protecting their property where there is limited firefighting access including maintaining safe access for fire apparatus and creating defensible space around homes.	E	1.2.5.7	Mitigate	Prep.Resp.	20 staff hrs/yr
I	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Academy St.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$60,000

ID*	Hazard	Problem	Mitigation Actions	New/Existing	Goal	Mitigate/Prep.Resp	Type	Estimated Cost
J	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Colby St.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$60,000
K	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$60,000
L	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$120,000
M	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	E	1.2.5.6	Mitigate	Struct./Infrastr.	\$120,000
D	Severe Wind	Trees and limbs should be taken down in advance	DPW works with homeowners on trimming	E	1.2.5.10	Mitigate	Educ./Awareness	30 hr/ yr
C	Severe Wind	Some people are not aware of how to reduce the likelihood of wind damage.	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	E	1.2.5.10	Mitigate	Educ./Awareness	30 hr/ yr
E	Severe Wind	Emerald ash borer can weaken trees	Work with NH Dept. of Natural & Cultural Resources (DNCR) to address the weakening of trees	E	1.2.5.10	Mitigate	Educ./Awareness	30 hr/ yr
T	Lightning	Town buildings, electronic equipment, and data could be damaged during a lightning strike.	Evaluate lightning rods on town owned buildings susceptible to strikes	E	1.2.5.8	Mitigate	Struct./Infrastr.	10 hrs
T2	Lightning	Town buildings, electronic equipment, and data could be damaged during a lightning strike.	Install lightning rods on town owned buildings susceptible to strikes	E	1.2.5.8	Mitigate	Struct./Infrastr.	<\$10,000
new	Earthquake	Tilton's older, multi-story buildings downtown could be impacted in a significant earthquake	Develop and implement an outreach program using established materials to residents and business owners especially in the older, multistory downtown area regarding the risks posed by earthquakes and steps that building owners can take to mitigate those risks.	E	1.2.5.11	Mitigate	Educ./Awareness	40 staff hrs/yr

ID*	Hazard	Problem	Mitigation Actions	New/Existing	Goal	Mitigate/Prep.Resp	Type	Estimated Cost
new	Tropical & Post Tropical Cyclones	The combination of both heavy rain and strong winds for an extended time could lead to both flooding and downed trees in combination while stretching the town's response capacity.	Compile, distribute and promote outreach materials to residents and business owners regarding the risks posed by cyclones and steps that building owners can take to mitigate those risks including structural and property maintenance actions.	E	1.2.5.6. 10	Mitigate	Educ./Awareness	20 staff hrs/yr
new	All Hazards	The Tilton Master Plan is the foundation of all zoning and land use regulation in town. It does reference the HMP. The master Plan is more than 10 years old and may not accurately reflect current conditions.	Update the town's Master Plan (2013), incorporating current information. This will better enable any necessary land use or zoning changes.	N	1.2.5.6	Mitigate	Local Plans and Regs	approx. \$50K
new	Flooding	The Wetlands Conservation District is too broad and difficult to administer. This can lead to development in inappropriate areas, resulting in properties and structures vulnerable to flood damage.	Review and revise the Wetlands Conservation District (Zoning) to better define its purpose and administration, reducing the likelihood that development will occur in flood prone areas.	N	1.2.5.6	Mitigate	Local Plans and Regs	40 staff hours
new	Fire - Conflagration	Wording in the town ordinance governing demolition and rebuilding after a fire or structural damage is confusing. This could result in property being exposed to additional hazards unnecessarily.	Review and revise the town's land use ordinance regulating removal of damaged structures and reconstruction to better define its purpose and administration, reducing the possibility of hazards further impacting the property.	N	1.2.5.7Ch. V.E	Mitigate	Local Plans and Regs	40 staff hours
new	Fire - Conflagration	The ability to enforce the subdivision regulations surrounding water resources for firefighting purposes (6.7) is insufficient.	Review and revise the town's subdivision regulations to allow for better enforcement, especially of Section 6.7.C - Water for Firefighting Protection. This could reduce the spread of a fire.	N	1.2.5.7	Mitigate	Local Plans and Regs	40 staff hours
new	Flooding/ Erosion	There are at least half a dozen hazard mitigation issues that deal with roads and flooding. When this work is not well coordinated, it is not efficient.	Update the town's Highway Maintenance Plan and coordinate tasks to ensure efficient use of local resources and reducing the impacts of flooding on local infrastructure.	E	1.2.4.5	Mitigate	Local Plans and Regs	100 staff hours

Note: The purpose of the Tilton Hazard Mitigation Plan is to identify the natural hazards that pose a risk to the assets of Tilton and to develop strategies to mitigate those risks. While it was stressed that the focus was on natural hazards and development of mitigation actions, the committee did identify both human-caused and technological hazards that could impact the town. (Note: At the time of plan

development, the New Hampshire State Hazard Mitigation Plan listed human-caused and technological hazards.) Additionally, some preparation and response activities were identified for both natural and non-natural hazards. So, while they are not an integral part of the Tilton HMP, their work is retained in Appendix K for the benefit of the community.

E. PRIORITIZATION OF ACTIONS

After considering the Pros and Cons of each project, the Committee prioritized the various projects which had been identified. Committee members agreed to use an adaptation of a standard prioritization tool to better reflect the concerns of the community. The tool asks the committee to consider eleven separate aspects for each Action including the Costs (See Appendix H for full details). The Table below shows the Actions group by anticipated cost, then ordered by their overall score. Total scores range from a high of 11 to a low of 2.

Recommended Actions in Ranked Order

ID*	Hazard	Problem	Mitigation Actions	STAPLEE Total
H	Flood	The most current flood maps are from 1997 and not in digital format. There has been development in Tilton since then and a digital format would improve local mapping and interpretation.	Work with the State Floodplain Manager, NH HSEM, and FEMA to update the FIRM maps for Belknap County (Winnepesaukee Basin)	11
P	Blizzard, Ice Storm, Thunder storm, Nor'easter	Loss of power and downed wires can put residents and visitors in danger.	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice.	10
b	Fire - Conflagration	Overhead wires downtown prevent the use of ladder trucks, leaving most of the upper stories of downtown at risk during a fire.	Bury the overhead wires in downtown (\$5 M) Phase I - Put out an RFP to bury the overhead wires in downtown.	10
N	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for the state's 10-year Transportation Plan to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Construction could be fully federally funded but take longer.	10
N2	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for discretionary grant opportunities to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Likely faster construction, but requires 20% match.	10
S	Lightning	Some people are not aware of how to reduce the likelihood of being struck by lightning (person or structure).	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	10
Q	Severe Winter Weather	Buildup of snow and ice can lead to roof collapses	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information. Conduct physical inspections of commercial properties	10

ID*	Hazard	Problem	Mitigation Actions	STAPLEE Total
O.1	Flooding/ Erosion	Erosion is occurring under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	Coordinate with NH DOT to develop plans to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	9
O.2	Flooding/ Erosion	Erosion is occurring under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	Coordinate with NH DOT to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	9
X	Drought	NH experienced drought conditions in 2017 & 2020, Belknap Co. was in Moderate Drought (D1). This could lead to increased irrigation and increase the chance of wildfires.	Raise public awareness through drought monitor, including links on municipal webpage (https://www.drought.gov/states/new-hampshire). Post and distribute resources for homeowners regarding water-saving actions that can reduce household water consumption, decreasing the impacts of drought.	8
j	All Hazards	Hazard Planning documents should be clear and in general agreement regarding priorities.	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	7
W	Dam failure, ice jam	Downtown is at risk for flooding, especially if there is a backup at the dam in Franklin.	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	6
R	Extreme Temps	There are times when either extreme heat or cold make it difficult for some people to keep cool or stay warm.	Distribute information (electronic & hard copies) on improving weatherproofing homes as well as accessing cooling/heating centers.	6
A	Infectious Disease	A clear, coordinated effort to mitigate the impacts of infectious diseases locally is important.	Identify who would be lead on becoming more involved & creating a Plan of Action related to infectious disease mitigation.	6
B	Infectious Disease	Elderly housing, schools, and areas where many congregate are places where communicable diseases could spread quickly.	Work with LRPPH and target areas to conduct outreach regarding prevention.	6
V	Wildfire	Wooded areas around Pest House Rd. and north of Lancaster Hill Rd. have limited access for fire prevention. Up to two dozen residences are at risk.	Conduct outreach to the two dozen residences around Pest House Rd. and north of Lancaster Hill Rd. about protecting their property where there is limited firefighting access including maintaining safe access for fire apparatus and creating defensible space around homes.	6
I	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Academy St.	5
J	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Colby St.	5
K	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	5

ID*	Hazard	Problem	Mitigation Actions	STAPLEE Total
L	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	5
M	Flood, Nor'easter, T'storm	Flooding occurs along several state and local roads due to poor drainage and undersized culverts.	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	5
D	Severe Wind	Trees and limbs should be taken down in advance	DPW works with homeowners on trimming	5
C	Severe Wind	Some people are not aware of how to reduce the likelihood of wind damage.	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	5
E	Severe Wind	Emerald ash borer can weaken trees	Work with NH Dept. of Natural & Cultural Resources (DNCR) to address the weakening of trees	3
T	Lightning	Town buildings, electronic equipment, and data could be damaged during a lightning strike.	Evaluate lightning rods on town owned buildings susceptible to strikes	2
T2	Lightning	Town buildings, electronic equipment, and data could be damaged during a lightning strike.	Install lightning rods on town owned buildings susceptible to strikes	2
new	Earthquake	Tilton's older, multi-story buildings downtown could be impacted in a significant earthquake	Develop and implement an outreach program using established materials to residents and business owners especially in the older, multistory downtown area regarding the risks posed by earthquakes and steps that building owners can take to mitigate those risks.	n/a
new	Tropical & Post Tropical Cyclones	The combination of both heavy rain and strong winds for an extended time could lead to both flooding and downed trees in combination while stretching the town's response capacity.	Compile, distribute and promote outreach materials to residents and business owners regarding the risks posed by cyclones and steps that building owners can take to mitigate those risks including structural and property maintenance actions.	n/a
new	All Hazards	The Tilton Master Plan is the foundation of all zoning and land use regulation in town. It does reference the HMP. The master Plan is more than 10 years old and may not accurately reflect current conditions.	Update the town's Master Plan (2013), incorporating current information. This will better enable any necessary land use or zoning changes.	n/a
new	Flooding	The Wetlands Conservation District is too broad and difficult to administer. This can lead to development in inappropriate areas, resulting in properties and structures vulnerable to flood damage.	Review and revise the Wetlands Conservation District (Zoning) to better define its purpose and administration, reducing the likelihood that development will occur in flood prone areas.	n/a
new	Fire - Conflagration	Wording in the town ordinance governing demolition and rebuilding after a fire or structural damage is confusing. This could result in property being exposed to additional hazards unnecessarily.	Review and revise the town's land use ordinance regulating removal of damaged structures and reconstruction to better define its purpose and administration, reducing the possibility of hazards further impacting the property.	n/a

ID*	Hazard	Problem	Mitigation Actions	STAPLEE Total
new	Fire - Conflagration	The ability to enforce the subdivision regulations surrounding water resources for firefighting purposes (6.7) is insufficient.	Review and revise the town's subdivision regulations to allow for better enforcement, especially of Section 6.7.C - Water for Firefighting Protection. This could reduce the spread of a fire.	n/a
new	Flooding/ Erosion	There are at least half a dozen hazard mitigation issues that deal with roads and flooding. When this work is not well coordinated, it is not efficient.	Update the town's Highway Maintenance Plan and coordinate tasks to ensure efficient use of local resources and reducing the impacts of flooding on local infrastructure.	n/a

F. IMPLEMENTATION OF MITIGATION ACTIONS

There are many factors that influence how a town chooses to spend its energy and resources in implementing recommended actions. Factors include:

- Urgency
- How quickly an action could be implemented
- Likelihood that the action will reduce future emergencies
- Regulations required to implement the action
- Administrative burdens
- Time (both paid and volunteer)
- Funding availability
- Political acceptability of the action.

In the context of these factors, the Committee discussed the mitigation actions and relative level of priority, recognizing that some actions are of greater priority to different town departments. This implementation schedule contains a matrix indicating the estimated cost of implementation, potential funding sources, the parties responsible for bringing about these actions, and implementation time frame. Once the plan is approved the town will begin working on the actions listed below with an estimated completion date as noted in the time frame column. Though several recommended mitigation actions received high scores, the time frame for which the actions are executed depends upon staff time and budgetary limitations.

To keep the plan current, the implementation schedule should be updated and re-evaluated on a regular basis as outlined in the monitoring section of this plan.

Implementation Schedule for Mitigation Actions (Time Frame - Short: 1-2 years, Medium: 3-4 years, or Long: 5 years).

ID*	Hazard	Mitigation Actions	Estimated Cost	Source	Responsible Party	STAPLE Total	Time Frame
H	Flood	Work with the State Floodplain Manager, NH HSEM, and FEMA to update the FIRM maps for Belknap County (Winnepesaukee Basin)	20 hours Staff Time/year	Operating Budget	Land Use	11	Short
P	Blizzard, Ice Storm, Thunder storm, Nor'easter	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice.	\$10K - 15K	Oper. Budget, Warrant Art. NH DOT, PSNH, grant	EMD, BoS	10	Medium
b	Fire - Conflagration	Bury the overhead wires in downtown (\$5 M) Phase I - Put out an RFP to bury the overhead wires in downtown.	\$10K - 15K	Oper. Budget, Warrant Art. NH DOT, PSNH, grant	NH DOT, EMD, BoS	10	Long

ID*	Hazard	Mitigation Actions	Estimated Cost	Source	Responsible Party	STAPLE Total	Time Frame
N	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for the state's 10-year Transportation Plan to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Construction could be fully federally funded but take longer.	\$10K - 15K	Operating Budget, Warrant Art. NH DOT	NH DOT (DPW coord.)	10	Long
N2	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for discretionary grant opportunities to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Likely faster construction, but requires 20% match.	\$10K - 15K	Operating Budget, Warrant Art. NH DOT	NH DOT (DPW coord.)	10	Long
S	Lightning	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	10 staff hrs/yr	Operating Budget	FD	10	Short
Q	Severe Winter Weather	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information. Conduct physical inspections of commercial properties	40 staff hrs/yr	Operating Budget	FD	10	Short
O.1	Flooding/ Erosion	Coordinate with NH DOT to develop plans to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	\$20,000	NH DOT	DPW, BoS	9	Short
O.2	Flooding/ Erosion	Coordinate with NH DOT to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	\$2 million	NH DOT (10 YR Plan)	DPW, BoS	9	Long
X	Drought	Raise public awareness through drought monitor, including links on municipal webpage (https://www.drought.gov/states/new-hampshire). Post and distribute resources for homeowners regarding water-saving actions that can reduce household water consumption, decreasing the impacts of drought.	20 staff hours/ year	Operating Budget	FD	8	Short
j	All Hazards	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	20 hrs staff time	Operating budget	EMD	7	Medium
W	Dam failure, ice jam	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	20 staff hrs/yr	Operating Budget	EMD	6	Medium

ID*	Hazard	Mitigation Actions	Estimated Cost	Source	Responsible Party	STAPLE Total	Time Frame
R	Extreme Temps	Distribute information (electronic & hard copies) on improving weatherproofing homes as well as accessing cooling/heating centers.	40 staff hours/year	Operating Budget	Town Hall	6	Short
A	Infectious Disease	Identify who would be lead on becoming more involved & creating a Plan of Action related to infectious disease mitigation.	30 hr	Operating Budget	EMD	6	Short
B	Infectious Disease	Work with LRPPH and target areas to conduct outreach regarding prevention.	30 hr/yr	Operating Budget	Health Officer/EMD	6	Short
V	Wildfire	Conduct outreach to the two dozen residences around Pest House Rd. and north of Lancaster Hill Rd. about protecting their property where there is limited firefighting access including maintaining safe access for fire apparatus and creating defensible space around homes.	20 staff hrs/yr	Operating Budget/ Outreach grant	FD	6	Medium
I	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Academy St.	\$60,000	Warrant Art. & HMPG grant	DPW	5	Short
J	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Colby St.	\$60,000	NH DOT	NH DOT (DPW coord.)	5	Short
K	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	\$60,000	NH DOT	NH DOT (DPW coord.)	5	Short
L	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	\$120,000	NH DOT	NH DOT (DPW coord.)	5	Medium
M	Flood, Nor'easter, T'storm	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	\$120,000	NH DOT	NH DOT (DPW coord.)	5	Medium
D	Severe Wind	DPW works with homeowners on trimming	30 hr/ yr	Operating Budget	DPW	5	Short
C	Severe Wind	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	30 hr/ yr	Operating Budget	DPW	5	Medium
E	Severe Wind	Work with NH Dept. of Natural & Cultural Resources (DNCR) to address the weakening of trees	30 hr/ yr	Operating Budget	DPW	3	Medium
T	Lightning	Evaluate lightning rods on town owned buildings susceptible to strikes	10 hrs	Operating Budget	FD	2	Medium
T2	Lightning	Install lightning rods on town owned buildings susceptible to strikes	<\$10,000	Operating Budget	FD	2	Long

ID*	Hazard	Mitigation Actions	Estimated Cost	Source	Responsible Party	STAPLE Total	Time Frame
new	Earthquake	Develop and implement an outreach program using established materials to residents and business owners especially in the older, multistory downtown area regarding the risks posed by earthquakes and steps that building owners can take to mitigate those risks.	40 staff hrs/yr	Operating Budget	FD	n/a	Medium
new	Tropical & Post Tropical Cyclones	Compile, distribute and promote outreach materials to residents and business owners regarding the risks posed by cyclones and steps that building owners can take to mitigate those risks including structural and property maintenance actions.	20 staff hrs/yr	Operating Budget	FD	n/a	Medium
new	All Hazards	Update the town's Master Plan (2013), incorporating current information. This will better enable any necessary land use or zoning changes.	approx. \$50K	operating budget	PB	n/a	Medium
new	Flooding	Review and revise the Wetlands Conservation District (Zoning) to better define its purpose and administration, reducing the likelihood that development will occur in flood prone areas.	40 staff hours	operating budget	PB	n/a	Medium
new	Fire - Conflagration	Review and revise the town's land use ordinance regulating removal of damaged structures and reconstruction to better define its purpose and administration, reducing the possibility of hazards further impacting the property.	40 staff hours	operating budget	CEO	n/a	Short
new	Fire - Conflagration	Review and revise the town's subdivision regulations to allow for better enforcement, especially of Section 6.7.C - Water for Firefighting Protection. This could reduce the spread of a fire.	40 staff hours	operating budget	CEO	n/a	Short
new	Flooding/ Erosion	Update the town's Highway Maintenance Plan and coordinate tasks to ensure efficient use of local resources and reducing the impacts of flooding on local infrastructure.	100 staff hours	operating budget	CEO	n/a	Medium

CHAPTER VI: PLAN ADOPTION AND MONITORING

A. IMPLEMENTATION

The Tilton Hazard Mitigation Plan Update Committee, established by the EMD and Board of Selectmen, will meet annually to review the Plan and provide a mechanism for ensuring that an attempt is made to incorporate the actions identified in the plan into ongoing town planning activities. Essential elements of implementation require that all responsible parties for the various recommendations understand what is expected of them, and that they are willing to fulfill their role in implementation. It is therefore important to have the responsible parties clearly identified when the town adopts the final plan. Where appropriate it would be helpful to have any hazard mitigation activities identified in job descriptions.

Many of the actions in this plan rely on the town's operating budget along with grant funds available through FEMA and other sources such as those listed in Appendix B. The Emergency Management Director will coordinate with the department heads, Budget Committee, and Selectmen to ensure that funds and staff time for these projects are available. The EMD and Hazard Mitigation Committee will work with the Selectmen to incorporate the various projects into subsequent budgets. The EMD will also coordinate with the NH HSEM Field Representative to ensure that the town applies for appropriate grant funds.

For those mitigation actions which involve either revisions to the Subdivision Regulations or development of regulations or standards, members of the Hazard Mitigation Committee will work with the Planning Board to develop appropriate language.

When appropriate, an effort will be made to incorporate this plan into the Emergency Operations Plan. Within a year after the town officially adopts this update to the Hazard Mitigation Plan, an attempt will be made to have hazard mitigation strategies integrated into these existing mechanisms and into all other ongoing town planning activities.

B. PLAN MAINTENANCE & PUBLIC INVOLVEMENT

Plan Evaluation

To track progress and evaluate the mitigation strategies identified in Chapter V.F., the Tilton Hazard Mitigation Planning Committee and the Selectboard will review the Tilton Hazard Mitigation Plan every year or after a hazard event. The Town of Tilton Emergency Management Director is responsible for initiating this review and needs to consult with members of the Tilton Committee identified in this Plan. This review will be conducted annually on the anniversary of plan adoption and as needed based on the occurrence of hazard events. The public will be notified of these meetings in advance through a posting of the agenda at Town Hall. Responsible parties identified for specific mitigation actions will be asked to submit their reports in advance of the meeting.

Meetings will entail the following actions:

- Review previous hazard events to discuss and evaluate major issues, effectiveness of current mitigation, and possible mitigation for future events.

- Assess how the mitigation strategies of the plan can be integrated with other Town plans and operational procedures, including the zoning ordinance and local Emergency Operations Plan.
- Review and evaluate progress toward implementation of the current mitigation plan based on reports from responsible parties (See Appendix J)
- Amend current plan to improve mitigation practices.
- Meetings will involve evaluation and assessment of the plan, regarding its effectiveness at achieving the plan's goals, stated purpose, and priorities. The following questions will serve as the criteria that is used to evaluate and update the plan:

Plan Purpose and Goals

- Is the Plan's stated purpose (Section I.D) and Goals (Section V.C) still accurate and up to date, reflecting any changes to local hazard mitigation activities?
- Are there any changes or improvements that can be made to the purpose and goals?

Hazard Identification and Risk Assessment (Section III)

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

Existing Mitigation Strategies (Section V.A.)

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

Proposed Mitigation Strategies (Section V.F.)

- What progress has been accomplished for each of the previously identified proposed mitigation strategies?
- How have any completed mitigation strategies reduced the Town's vulnerability and impact from hazards that have occurred since the strategy was completed? If not and if they have been tested, what changes need to make them more effective?
- Should the criteria for prioritizing the proposed strategies be altered? (Appendix G)

Review of the Plan and Integration with Other Planning Documents

- Is the current process for reviewing the Hazard Mitigation Plan effective? How could it be improved?
- Are there any Town plans in the process of being updated that should have the content of this Hazard Mitigation Plan incorporated into them or integrated with other Town planning tools and operational procedures, including the zoning ordinance, site plan or subdivision regulations, the Local Emergency Operations Plan, or the Capital Improvement Plan?

Implementation

- Should the priority given to individual mitigation strategies be changed, based on any recent changes to financial and staffing resources, or recent hazard events?

- The HMP Committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan.

Plan Update

The Emergency Management Director will be responsible for updating the plan every five years and incorporating the results of the town's plan monitoring and evaluation procedures. The next anticipated update of the plan is scheduled to begin in April 2028. The plan update may begin earlier following a significant natural hazard event within the town and region, such as a federally declared disaster.

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

The update will likely follow a similar planning process and outline to the current planning process, making deviations when needed to ensure an effective and efficient plan and planning process.

Administrative staff may be utilized to assist, especially with the public involvement process.

For each public committee meeting, and the annual update process, techniques that will be utilized for public involvement include:

- ❖ Provide invitations to Budget Committee members.
- ❖ Provide invitations to municipal department heads and underrepresented or vulnerable communities.
- ❖ Post notices of meetings at the Town Hall, Fire Station, Library, and on the town website.
- ❖ Submit press releases for publication in the *Winnisquam Echo*, *Laconia Daily Sun*, and other appropriate newspapers or media outlets.

Entities to invite to future Hazard Mitigation plan updates include the Emergency Management Directors of the neighboring communities of Franklin, Northfield, Sanbornton, and Belmont.

C. SIGNED CERTIFICATE OF ADOPTION

BOARD OF SELECTMEN
A RESOLUTION ADOPTING THE
TILTON HAZARD MITIGATION PLAN UPDATE 2024

WHEREAS, the Town of Tilton has historically experienced damage from natural hazards, and it continues to be vulnerable to the effects of those natural hazards as profiled in this plan, potentially resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Tilton has developed and received approval pending adoption from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2022 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between June 9, 2021 and December 15, 2022 regarding the development and review of the Tilton Hazard Mitigation Plan Update 2024; and

WHEREAS, the Plan specifically addresses hazard mitigation actions and Plan maintenance procedures for the Town of Tilton, and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that could impact the Town of Tilton, 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 Tilton eligible for funding to mitigate the impacts of future hazards; now therefore be it RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Tilton;
2. The respective officials identified in the mitigation actions of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the plan's mitigation action items shall be presented to the Selectboard by the Emergency Management Director.

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the town seal of the Town of Tilton this

Date: 3/28/2024

Seal:

TILTON SELECTBOARD

Patricia Consentin (Signature)

PATRICIA CONSENTIN (Printed)

Jonathan A. Scanton (Signature)

JONATHAN G SCANTON (Printed)

Joseph Jesseman (Signature)

Joseph JESSEMAN (Printed)

Scott Puggles (Signature)

SCOTT PUGGLES (Printed)

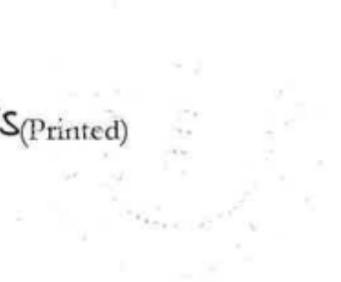
Katherine D. Dawson (Signature)

Katherine D Dawson (Printed)

ATTEST:

Kim Sowles, Town Clerk (Signature)

KIM SOWLES (Printed)



APPENDIX A: TECHNICAL RESOURCES

NH Homeland Security and Emergency Management.....271-2231
<http://www.nh.gov/safety/divisions/HSEM/>

Hazard Mitigation Section271-2231
<http://www.nh.gov/safety/divisions/hsem/HazardMitigation/index.html>

Federal Emergency Management Agency..... (617) 223-4175
<http://www.fema.gov/>

FEMA, National Flood Insurance Program, Community Status Book
<http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book>

NH Regional Planning Commissions:

Central NH Regional Planning Commission.....796-2129
<http://www.cnhrpc.org/>

Lakes Region Regional Planning Commission279-8171
<http://www.lakesrpc.org/>

Nashua Regional Planning Commission.....883-0366
<http://www.nashuarpc.org/>

North Country Council444-6303
<http://www.nccouncil.org/>

Rockingham Regional Planning Commission.....778-0885
<http://www.rpc-nh.org/>

Southern New Hampshire Regional Planning Commission669-4664
<http://www.snhpc.org/>

Southwest Regional Planning Commission.....357-0557
<http://www.swrpc.org/>

Strafford Regional Planning Commission742-2523
<http://www.trafford.org/>

Upper Valley Lake Sunapee Regional Planning Commission448-1680
<http://www.uvlsrc.org/>

NH Governor’s Office of Planning and Development.....271-2155
<https://www.nh.gov/osi/>

New Hampshire Floodplain Management Program
<https://www.nh.gov/osi/planning/programs/fmp/index.htm>

NH Department of Transportation271-3734
<http://www.nh.gov/dot/index.htm>

NH Department of Cultural Affairs271-2540
<http://www.nh.gov/nhculture/>

Division of Historical Resources271-3483
<http://www.nh.gov/nhdhr/>

NH Department of Environmental Services.....271-3503
<http://www.des.state.nh.us/>

Dam Bureau 271-63406
<http://www.des.state.nh.us/organization/divisions/water/dam/index.htm>

NH Municipal Association224-7447
<http://www.nhmunicipal.org/LGCWebsite/index.asp>

NH Fish and Game Department.....271-3421
<http://www.wildlife.state.nh.us/>

NH Department of Resources and Economic Development.....271-2411
<http://www.dred.state.nh.us/>

Division of Forests and Lands271-2214
<http://www.nhdf.org/>

Natural Heritage Inventory.....271-2215
<http://www.nhdf.org/about-forests-and-lands/bureaus/natural-heritage-bureau/>

Division of Parks and Recreation271-3255
<http://www.nhstateparks.org/>

NH Department of Health and Human Services.....271-9389
<http://www.dhhs.state.nh.us/>

Northeast States Emergency Consortium, Inc. (NESEC) (781) 224-9876
<http://www.nesec.org/>

US Department of Commerce (202) 482-2000
<http://www.commerce.gov/>

National Oceanic and Atmospheric Administration (202) 482-6090
<http://www.noaa.gov/>

National Weather Service, Eastern Region Headquarters
<http://www.erh.noaa.gov/>

National Weather Service, Tauton, Massachusetts (508) 824-5116
<http://www.erh.noaa.gov/er/box/>

National Weather Service, Gray, Maine..... (207) 688-3216
<http://www.erh.noaa.gov/er/gyx/>

US Department of the Interior
<http://www.doi.gov/>

US Fish and Wildlife Service225-1411
<http://www.fws.gov/>

US Geological Survey225-4681
<http://www.usgs.gov/>

US Geological Survey Real Time Hydrologic Data
<http://waterdata.usgs.gov/nwis/rt>

US Army Corps of Engineers..... (978) 318-8087
<http://www.usace.army.mil/>

US Department of Agriculture
<http://www.usda.gov/wps/portal/usdahome>

US Forest Service (202) 205-8333
<http://www.fs.fed.us/>

New Hampshire Electrical Cooperative (800) 698-2007
<http://www.nhec.com/>

Cold Region Research Laboratory646-4187
<http://www.crrel.usace.army.mil/>

National Emergency Management Association (859) 244-8000
<http://nemaweb.org>

National Aeronautics and Space Administration

<http://www.nasa.gov/>

NASA Optical Transient Detector – Lightning and Atmospheric Research

<http://thunder.msfc.nasa.gov/>

National Lightning Safety Institute

<http://lightningsafety.com/>

The Tornado Project Online

<http://www.tornadoproject.com/>

National Severe Storms Laboratory

<http://www.nssl.noaa.gov/>

Plymouth State University Weather Center

<http://vortex.plymouth.edu/>

Drought Resources for New Hampshire

<https://www.drought.gov/states/new-hampshire#web-resources-state>

APPENDIX B: MITIGATION FUNDING RESOURCES

There are numerous potential sources of funding to assist with the implementation of mitigation efforts. Two lists of state and federal resources are provided below. Some of these may not apply or be appropriate for Tilton. The NH Homeland Security and Emergency Management Field Representative for Belknap County provided some assistance during the meetings and should be contacted for further grant assistance.

- 404 Hazard Mitigation Grant Program (HMGP) NH Homeland Security and Emergency Management
- 406 Public Assistance and Hazard Mitigation NH Homeland Security and Emergency Management
- Community Development Block Grant (CDBG) NH HSEM, NH OEP, also refer to RPC
- Dam Safety Program NH Department of Environmental Services
- Emergency Watershed Protection (EWP) Program..... USDA, Natural Resources Conservation Service
- Flood Mitigation Assistance Program (FMAP) NH Homeland Security and Emergency Management
- Highway Safety Improvement Program..... NH Department of Transportation
- Mitigation Assistance Planning (MAP)..... NH Homeland Security and Emergency Management
- Mutual Aid for Public Works.....NH Municipal Association
- National Flood Insurance Program (NFIP) NH Office of Planning & Development
- Project Impact NH Homeland Security and Emergency Management
- Roadway Repair & Maintenance Program(s)NH Department of Transportation
- Shoreline Protection Program NH Department of Environmental Services
- Various Forest and Lands Program(s)..... NH Department of Resources & Economic Development
- Wetlands Programs NH Department of Environmental Services
- State Aid Bridge Program for CommunitiesNH Department of Transportation
- Contribution to Damage Losses (RSA 235:34).....NH Department of Transportation

Federal Emergency Management Agency (FEMA)

FEMA makes funds available for mitigation efforts to reduce future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Flood Mitigation Assistance Program (FMA)	Provides funding to implement measures to reduce or eliminate the long-term risk of flood damage http://www.fema.gov/government/grant/fma/index.shtm	States and localities
Hazard Mitigation Planning Grant (HMPG)	Provides grants to implement long-term hazard mitigation measures after a major disaster declaration http://www.fema.gov/government/grant/hmpg/index.shtm	Open
National Flood Insurance Program (NFIP)	Enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages http://www.fema.gov/business/nfip/	States, localities, and individuals
Pre-Disaster Mitigation Program (PDM)	Provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event http://www.fema.gov/government/grant/pdm/index.shtm	States, localities, and tribal governments

Environmental Protection Agency (EPA)

The EPA makes funds available for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulation. http://www.epa.gov/OWOW/NPS/cwact.html	Funds are provided only to designated state and tribal agencies
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals, and others for high-priority water-quality activities. http://www.epa.gov/owow/wetlands/initiative/srf.html	States and Puerto Rico
Wetland Program Development Grants	Funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. http://www.epa.gov/owow/wetlands/initiative/#financial	See website

Floodplain, Wetland and Watershed Protection Programs

US Army Corps of Engineers (USACE) and the U.S. Fish and Wildlife Service offer funding and technical support for programs designed to protect floodplains, wetlands, and watersheds.

Mitigation Funding Sources Program	Details	Notes
USACE Planning Assistance to States (PAS)	Fund plans for the development and conservation of water resources, dam safety, flood damage reduction and floodplain management. http://www.lre.usace.army.mil/planning/assist.html	50 percent non-federal match

USACE Flood Plain Management Services (FPMS)	Technical support for effective floodplain management. http://www.lrl.usace.army.mil/p3md-o/article.asp?id=9&MyCategory=126	See website
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse of dredged materials. http://el.erdc.usace.army.mil/index.cfm	See website
U.S. Fish & Wildlife Service Coastal Wetlands Conservation Grant Program	Matching grants to states for acquisition, restoration, management or enhancement of coastal wetlands. http://ecos.fws.gov/coastal_grants/viewContent.do?viewPage=home	States only. 50 percent federal share
U.S. Fish & Wildlife Service Partners for Fish and Wildlife Program	Program that provides financial and technical assistance to private landowners interested in restoring degraded wildlife habitat. http://ecos.fws.gov/partners/viewContent.do?viewPage=home	Funding for volunteer-based programs

Bureau of Land Management

The Bureau of Land Management (BLM) has two technical assistance programs focused on fire mitigation strategies at the community level.

Mitigation Funding Sources Program	Details	Notes
Community Assistance and Protection Program	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas across the country at-risk for wildland fire to work with local residents. http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html	See website
Firewise Communities Program	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts. http://www.firewise.org/	See website

Housing and Urban Development

The Community Development Block Grants (CDBG) administered by HUD can be used to fund hazard mitigation projects.

Mitigation Funding Sources Program	Details	Notes
Community Development Block Grants (CDBG)	Grants to develop viable communities, principally for low and moderate income persons. CDBG funds available through Disaster Recovery Initiative. http://www.hud.gov/offices/cpd/communitydevelopment/programs/	Disaster funds contingent upon Presidential disaster declaration
Disaster Recovery Assistance	Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes. http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm	Individuals

Neighborhood Stabilization Program	Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis. http://www.hud.gov/offices/cpd/communitydevelopment/programs/neighborhoodspg/	State and local governments and non-profits
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U.S. Department of Agriculture

There are multiple mitigation funding and technical assistance opportunities available from the USDA and its various sub-agencies: the Farm Service Agency, Forest Service, and Natural Resources Conservation Service.

Mitigation Funding Sources Agency Program	Details	Notes
USDA Smith-Lever Special Needs Funding	Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html	Population under 20,000
USDA Community Facilities Guaranteed Loan Program	This program provides an incentive for commercial lending that will develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population under 20,000
USDA Community Facilities Direct Loans	Loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Community Facilities Direct Grants	Grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Farm Service Agency Disaster Assistance Programs	Emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/	Farmers and ranchers
USDA Forest Service National Fire Plan	Funding for organizing, training, and equipping fire districts through Volunteer, State and Rural Fire Assistance programs. Technical assistance for fire related mitigation. http://www.forestsandrangelands.gov/	See website
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. http://www.fs.fed.us/spf/coop/programs/eap/	80% of total cost of project may be covered
USDA Natural Resources Conservation Service Emergency Watershed Protection Support Services	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. http://www.nrcs.usda.gov/programs/ewp/	See website
USDA Natural Resources Conservation	Funds for soil conservation; flood prevention; conservation, development, utilization and disposal of	See website

Service Watershed Protection and Flood Prevention	water; and conservation and proper utilization of land. http://www.nrcs.usda.gov/programs/watershed/index.html	
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Health and Economic Agencies

Alternative mitigation programs can be found through health and economic agencies that provide loans and grants aimed primarily at disaster relief.

Federal Loans and Grants for Disaster Relief Agency Program	Details	Notes
Department of Health & Human Services Disaster Assistance for State Units on Aging (SUAs)	Provide disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. http://www.aoa.gov/doingbus/fundopp/fundopp.asp	Areas designated in a Disaster Declaration issued by the President
Economic Development Administration (EDA) Economic Development Administration Investment Programs	Grants that support public works, economic adjustment assistance, and planning. Certain funds allocated for locations recently hit by major disasters. http://www.eda.gov/AboutEDA/Programs.xml	The maximum investment rate shall not exceed 50 percent of the project cost
U.S. Small Business Administration Small Business Administration Loan Program	Low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster damaged property. http://www.sba.gov/services/financialassistance/index.html	Must meet SBA approved credit rating

APPENDIX C: PUBLICITY, INFORMATION, & PUBLIC INPUT

Committee meetings were announced on the town of Tilton and LRPC webpage calendars. Press releases similar to the one below were sent to the local papers *The Laconia Daily Sun*, *The Laker*, the *Home Town Voice*, *The Weirs Times* as well as the state-wide *Concord Monitor* prior to the Committee meetings. This provided an opportunity for all members of the community, including those representing people who are vulnerable or typically underrepresented, to participate. Additionally, some of the meetings were held via Zoom further providing access. Several informational handouts and the 2015 Hazard Mitigation Plan were distributed to the committee and available at all meetings.

Additionally, a survey was made available locally and the responses received were discussed by the committee during meetings. The results of the survey are included in this section.

LAKES REGION PLANNING COMMISSION

June 3, 2021

For Immediate Release

Contact: David Jeffers, 279-5341, djeffers@lakesrpc.org

103 Main Street, Suite #3
Meredith, NH 03253
tel (603) 279-8171
fax (603) 279-0200
www.lakesrpc.org



Town of Tilton Hazard Mitigation Plan Meeting

The Tilton Hazard Mitigation Plan Committee is in the process of updating its 2015 Hazard Mitigation Plan. The committee is represented by a variety of local interests including the Fire, Police, and Highway departments, along with the Planning and Select Boards. The group will review the various hazards that put Tilton at risk as well as the development of recommendations to protect the safety and well being of town residents.

The committee will meet on June 9 at 1:00 PM via Zoom (Info below). Residents of Tilton and representatives from neighboring communities are encouraged to attend and provide input.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Tilton are being reviewed and evaluated through this process; in the 2015 Plan these included flooding, fire, nor'easters, and an earthquake.

With the update to the Hazard Mitigation Plan, town leaders will be able to evaluate the status of current plans, policies, and actions then develop and prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Tilton one step closer to that goal.

For more information, please contact Jeanie Forrester, Tilton Town Administrator at 286-04521 x101 or David Jeffers, Planner, Lakes Region Planning Commission at 279-5341.

Via Zoom Conference – No Physical Location

Due to the COVID-19/coronavirus outbreak, the Tilton EMD has determined that the Tilton Hazard Mitigation Planning Committee will meet electronically as allowed under Governor Sununu’s Emergency Order #12 pursuant to Executive Order 2020-04 and as extended by Executive Order 2021-10. The meeting will be accessible by the public via phone or video conference using Zoom. The meeting will be adjourned if the public is unable to access the meeting.

Time: Jun 9, 2021 01:00 PM Eastern Time
Join Zoom Meeting
<https://us02web.zoom.us/j/81720490146?pwd=QWdldm5yNmZlVTdDbThNV1dmZUVVNUtU9>
Meeting ID: 817 2049 0146
Passcode: 264881
Dial by your location
+1 929 205 6099 US (New York)
Meeting ID: 817 2049 0146
Passcode: 264881

Who To Call For Help: If the meeting is not accessible, please call or email 603-279-5341 or djeffers@lakesrpc.org so that the EMD may be alerted

ALEXANDRIA • ANDOVER • ASHLAND • BANRSTEAD • BELMONT • BRIDGEWATER • BRISTOL • CENTER HARBOR • DANBURY
EFFINGHAM • FRANKLIN • FREEDOM • GILFORD • GILMANTON • HEBRON • HILL • HOLDERNESS • LACONIA • MEREDITH • MOULTONBOROUGH
NEW HAMPTON • NORTHFIELD • OSSIPEE • PLYMOUTH • SANBORNTON • SANDWICH • TAMWORTH • TILTON • TUFTONBORO • WOLFEBORO

Public Notice in Laconia Daily Sun

THE LACONIA DAILY SUN, Thursday, December 8, 2022 — Page 19



ngs its funky notes to Hermit Woods on Dec. 8

ade, a soul and funk powerhouse band from New Hampshire, on Thursday, ting and clever arrangements, this performance should not disappoint. They nds to come out of New Hampshire in a long time. The band includes George tar; Chris Noyes, bass; Sky Rubbins, guitar; Jamie Boccia, trumpet; and Chris t 6 p.m. with local composer and pianist David Lockwood on piano. Get tickets 30397887. (Courtesy photo)

T'ai Chi at Gordon-Nash Library, 10-11 a.m., at 69 Main St. in New Hampton.

Read with Rylee the Golden Retriever/Cocker Spaniel mix at Gilman Library, 10:15-11:15 a.m., at 100 Main St. in Alton.

Beginner Line Dancing with Bonnie at Gilford Public Library, 10:30-11:30 a.m., at 31 Potter Hill Road. 603-524-6042.

LEGO & Listen at Gilman Library, 10:30-11:30 a.m., at 100 Main St. n Alton. 603-875-2550.

Sunday, Dec. 11

Music

Bluegrass Christmas Service at 1st Congregational Church of Meredith, 10-11 a.m., at 4 Highland St. 503-279-5682.

Lakes Region Symphony Holiday Spectacular - "Christmas with the Crooners" at Inter-Lakes Community Auditorium, 3 p.m., at

Trees at Wright Museum of World War II, noon-3 p.m., at 77 Center St. 410-596-5931, wolfeborofestivaloftrees.com.

Outreach Project - Packing 10,000 Meals at Congregational Church of Laconia, UCC, 1-4 p.m., at 18 Veterans Square. ruthm.joy@gmail.com, OutreachProject.org.

Monday, Dec. 12

Special Community Events

Conservation Commission Meeting at Northfield Town Hall, 7 p.m., at 21 Summer St. in Northfield.

Library Events

Activities at Gilford Public Library: **Geri Fit**, 9-10 a.m.; **Mah Jongg**, 12:30-1:30 p.m., at 31 Potter Hill Road. 603-524-6042.

Toddler Time at Moultonborough Public Library, 9:30-10

TOWN OF TILTON PUBLIC HEARING NOTICE

The Tilton Selectboard will hold a public hearing on **Thursday, December 15, 2022, at 6:00 p.m.** to discuss the draft updated Hazard Mitigation Plan for Tilton. The meeting will be held at Tilton Town Hall, 2nd floor meeting room, 257 Main Street, Tilton, NH. A copy of the Hazard Mitigation Plan is on the Town's website www.tiltonnh.org, for review.

The Town of Tilton complies with the Americans with Disabilities Act regulations. Please contact the Selectmen's Office, Tilton Town Hall, 257 Main Street, Tilton, NH 03276 or call 603-286-4521 if you need an accommodation to attend this meeting.

OFFICE OF SELECTMEN CENTER HARBOR, NEW HAMPSHIRE

Hearing Notice
State of New Hampshire
Board of Tax and Land Appeals
107 Pleasant Street • Concord, NH 03301
Johnson Hall

Friday, January 6, 2023 • 10:00 a.m.

Notice is hereby given that on **Friday, January 6, 2023 at 10:00 a.m.** the State of New Hampshire Board of Tax and Land Appeals has scheduled a hearing for the Town of Center Harbor to show cause why the exemptions previously granted to LC Center Harbor, Inc. and Legion of Christ Center Harbor, Inc. should not be revoked and the 2022 applications should not be denied.

PLANNING BOARD TOWN OF BELMONT, NH

MONDAY, December 19, 2022 6:00 P.M.
Belmont Mill 4th Floor Tioga Room 14 Mill Street

MEETING AGENDA

1. Plan Submission Meeting and Public Hearing – CJM Industries:

Continuation of:

- a. Request for a Subdivision Plan approval to subdivide two lots into eight. PB #3322P
- b. Conditional Use Permit for alternate access to two lots of the proposed subdivision. PB #3422P

Properties are located at Route 3 & 45 Westview Drive, Tax Lots 201-016-000-000 and 201-025-000-000 in the "C" and "R" Zones.

Notices and agendas were also sent to the NH State Floodplain Manager, the Emergency Preparedness and Response Manager for the Winnepesaukee Partnership for Public Health, the NH Department of Natural and Cultural Resources, the Tilton Health Officer, and the EMDs in all adjacent communities. All had opportunity to attend meetings and provide input.

Tilton HMP meeting

David Jeffers

To Kayla Henderson (Kayla.Henderson@dos.nh.gov); Brian.E.Eaton@dos.nh.gov; Julia Chase - NH HSEM (Julia.Chase@dos.nh.gov); Gilbert, Jennifer; Ebinger, Samara; jbeland@ppnh.org; Thomas.A.Trask@dncr.nh.gov; Finemore, Kent; Steve Doyon (steve.doyon@des.nh.gov); John Raffaely; Chief Mike Newhall; Paul Dexter;

Mon 6/7/2021 12:24 PM

Notice.PR.01_Tilton.doc 44 KB

Agenda01_20210609.docx 105 KB

Good morning,

The Tilton Hazard Mitigation Plan committee will be holding its first meeting this **Wednesday June 9 at 1:00 PM** via Zoom (link is on the attached press release and agenda). You are being notified because you or someone on your staff may be able to contribute to the discussion based on your knowledge or experiences.

Please join us if you can, to meet members, share your knowledge and expertise, and hear about local actions and concerns. If you cannot join us but do have some information that you think may be pertinent, please send me a note regarding this.

The Tilton HMP committee will have additional meetings later this month and in July.

Thank you, and we hope to see you there!

Dave

David Jeffers
 Regional Planner
 Lakes Region Planning Commission
 603.279.5341
 103 Main Street Suite #3
 Meredith, NH 03253



Tilton HMP meeting - postponement



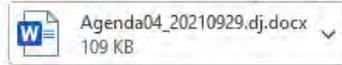
David Jeffers

Reply
 Reply All
 Forward

Mon 9/13/2021 11:29 AM

To Kevin LaChapelle; Abraham Gilman; Michael W Sitar; Kevin Duval;
 Eric Pyra; Pat Consentino; Joseph Jesseman; Jonathan Scanlon;
 Scott Ruggles; Jane Alden; Charles Bodien; Lee Ann Moynihan;
 Bill Lawrence; Katherine Dawson; Tim Joubert; Jeanie Forrester

Cc Julia Chase - NH HSEM (Julia.Chase@dos.nh.gov);
 Hazard Mitigation (hazmitplanning@DOS.NH.GOV); Eaton, Brian



Tilton Hazard Mitigation Plan (HMP) committee members and stakeholders,

The Tilton HMP Committee meeting originally scheduled for this Wednesday (9/15) has been postponed to **Wednesday September 29 at 1:00 PM in the Tilton Emergency Operations Center 45 Sanborn Road.**

Please mark your calendars and plan to attend. The meeting agenda is attached.

Thank you for your flexibility as we work to update this local planning document.

If you have any questions, please do not hesitate to contact me.

Dave

 David Jeffers
 Regional Planner
 Lakes Region Planning Commission
 603.279.5341
 103 Main Street Suite #3
 Meredith, NH 03253



Tilton, NH Hazard Mitigation Plan Update Public Survey

Background: The Tilton Hazard Mitigation Plan Committee has begun the process of updating its 2015 Hazard Mitigation Plan. The committee is represented by a variety of local interests and is focusing on the natural and human-related hazards that put Tilton at risk as well as the development and prioritization of recommendations to protect the safety and well-being of town residents. The committee is seeking your input; please take a few moments to complete this the five questions in this survey regarding hazard mitigation in Tilton.

1. How concerned are you about the following hazards affecting Tilton?

Natural Hazards	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned
Avalanche			✓	✓✓	✓✓✓✓
Drought		✓✓✓✓✓	✓✓✓✓✓		
Earthquake			✓✓✓✓✓	✓✓	✓
Extreme Temperature (Heat or Cold)	✓	✓✓✓✓✓	✓✓✓✓✓		
Flooding	✓	✓✓✓✓✓	✓✓✓✓✓	✓	
High Wind Event		✓✓✓✓✓	✓✓✓✓✓		
Infectious Disease		✓✓✓✓✓	✓✓✓✓✓		
Landslide			✓		✓✓✓✓✓
Lightning		✓✓✓✓✓	✓	✓	
Severe Winter Storm	✓✓✓✓✓	✓✓✓✓✓			
Solar Storms and Space Weather			✓✓✓✓✓	✓✓✓	
Tropical and Post-Tropical Cyclones		✓✓✓✓✓	✓✓✓✓✓		
Wildfires	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓		
Technological Events					
Aging Infrastructure	✓✓✓✓✓	✓✓✓✓✓			
Conflagration – Urban Fire	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓	✓✓✓	
Dam Failure		✓✓✓✓✓	✓✓✓✓✓	✓✓✓	
Hazardous Materials		✓✓✓✓✓	✓✓✓✓✓	✓✓✓	
Known and Emerging Contaminants		✓✓✓✓✓	✓✓✓✓✓	✓✓	
Long-Term Utility Outage		✓✓✓✓✓	✓✓✓✓✓		
Radiological		✓✓✓✓✓	✓✓✓✓✓	✓✓	
Human-Related Events					
Cyber Event	✓✓✓✓✓		✓✓✓✓✓		
Mass Casualty Incident		✓✓✓✓✓	✓✓✓✓✓	✓✓	
Terrorism/Violence		✓✓✓✓✓	✓✓✓✓✓	✓✓✓	
Transportation Accident		✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓	

2. What is the most effective way for you to receive information about how to make members of your household and your home safer from disasters? (Please check up to three).

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Newspapers | <input checked="" type="checkbox"/> Electronic newsletter | <input type="checkbox"/> Fire Department |
| <input checked="" type="checkbox"/> Radio | <input type="checkbox"/> Social media | <input type="checkbox"/> Public workshops |
| <input type="checkbox"/> Television | <input type="checkbox"/> Schools | <input type="checkbox"/> Town Hall |
| <input checked="" type="checkbox"/> Town website | <input checked="" type="checkbox"/> Mailings | |

Tilton, NH Hazard Mitigation Plan Update Public Survey

3. Natural hazards can have a significant impact on a community but planning for these events can help lessen the impacts. The following statements will help determine citizen priorities regarding planning for natural hazards in Tilton.

Statements	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	✓✓✓✓	✓✓			
Protecting critical facilities (such as transportation networks, fire stations, medical facilities)	✓✓✓✓	✓			
Limiting development in hazard areas		✓✓	✓✓✓		
Enhancing the functions of natural features (such as streams and wetlands)	✓✓	✓✓✓	✓		
Protecting historical and cultural landmarks	✓✓✓✓	✓	✓		
Protecting and reducing damage to utilities	✓✓✓✓	✓✓✓			
Strengthening emergency services (police, fire, ambulance)	✓✓✓✓	✓✓	✓		
Disclosing natural hazards during real estate transactions	✓✓✓	✓	✓	✓	
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	✓✓✓	✓✓	✓		

4. We would appreciate any information that you are willing to share regarding you and your household. (Check all that apply.)

- Resident of Tilton
- Resident of a nearby community
- Visitor
- Work in Tilton
- Tilton business owner
- Homeowner
- Renter

5. Please feel free to provide any other information related to hazard mitigation in Tilton in the space below.

Presently the Wm River runs through town the river runs parallel to RR 3. along the bank just east of RR tracks and taking the road is washing out. How would we deal with a flood that takes out or damages RR 3

After completing the survey, please return it to the Tilton Town Office: 257 Main St, Tilton, NH 03276 by June 15, 2021. For more information, please contact Town Administrator Jeanie Forrester at 286-4521 or jforrester@tiltonnh.org.

Local Hazard Mitigation Planning

Hazard Mitigation:

"Hazard Mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards"

Questions to address:

- Where are potential hazards?
- What are the risks?
- What are we already doing?
- Where are the gaps?
- What actions can be taken?
- What actions are feasible?
- What are our priorities?
- How will these actions be implemented?
- How will the plan be monitored?

What is a Hazard Mitigation Plan?

In cooperation with the NH Bureau of Emergency Management (BEM), the Lakes Region Planning Commission (LRPC) is working with several of its member communities each year to develop local Hazard Mitigation Plans.



The Hazard Mitigation Plans are designed to address each particular community's vulnerability to natural and man-made hazards. The local plan serves as a means to reduce future losses from hazard events before they occur. This local initiative is guided by a community-based Hazard Mitigation Planning Committee, with the LRPC providing technical support. The structure for plan development is provided through the *Guide to Hazard Mitigation Planning for New Hampshire Communities* which ensures that the community has considered the content of the State of New Hampshire Hazard Mitigation (409) Plan.

MITIGATION PROCESS

- IDENTIFY HAZARDS
- PROFILE HAZARD EVENTS
- INVENTORY ASSETS
- ESTIMATE LOSSES
- PRIORITIZE ACTION STEPS
- ADOPT THE PLAN
- IMPLEMENTATION

Why create a plan?

Development of a local Hazard Mitigation Plan is a chance for the community to assess the hazards that have the potential to threaten residents and their property. It also gives the community an opportunity to identify at-risk populations as well as resources within the community that might be at risk. The committee can then explore a variety of steps that might be put into place to help the community reduce damage and loss.

Having a Hazard Mitigation Plan in place, enables many communities to allocate their resources more effectively. It can also be a useful tool for leveraging additional sources of funding in the event of a disaster.

Federal Emergency Management Agency (FEMA) Requirement:

In order for communities to be eligible for the full spectrum of mitigation program funding, local hazard mitigation plans must be approved by FEMA. The staff of LRPC attend semi-annual hazard mitigation meetings and training programs that are designed to expedite the approval process.

Lakes Region Planning Commission
103 N. Main St., Suite #3
Meredith, NH 03253

(603) 279-8171 - phone
(603) 279-0200 - fax



Frequently asked questions

- **What will a Hazard Mitigation Plan cost?**

Since this project is funded by the NH Bureau of Emergency Management, the only cost to the community is the dedication of committee members' time and energy.

- **How is a Hazard Mitigation Plan different from an Emergency Action Plan?**

Although there is some overlap, these are different plans, each serving a different function in helping a community to minimize the potential for damage and loss in a community.

Emergency Action Plans (EAP) identifies potential hazard events and the resources available to address them; it also addresses how a community responds to an emergency.

A Hazard Mitigation Plan (HMP) also identifies potential hazard events and community resources. However, an HMP looks at the situation in terms of prevention instead of response. Gaps in coverage, programs, and structural needs are analyzed and specific mitigation steps are recommended and potential funding sources are identified.

- **Is this a community plan, a state plan, or a federal plan?**

The state of New Hampshire does require that each community develop an HMP. Once a plan is approved by FEMA and adopted by the community, should there be a need for Federal Mitigation money, more funding would be available. However, local public involvement is required. The local Emergency Management Director or a committee of citizens should help in plan development; there should also be several public presentations where citizens can make recommendations, provide input, and participate in development of the plan. In the end, the Board of Selectmen need to approve the plan.



Alton dam breach, 1996



The Essentials

At a minimum, each local Hazard Mitigation Plan should contain the following sections:

- An evaluation of the potential hazards within the community
- A description and analysis of local, state, and federal hazard mitigation policies, programs, and capabilities to mitigate the identified hazards in the area
- Goals, objectives, strategies and actions to reduce long-term vulnerability to hazards
- An evaluation of the costs and benefits of the recommended mitigation projects.



Building stronger and safer

Hazard mitigation planning is the process state, local and tribal governments use to identify risks and vulnerabilities associated with natural disasters and to develop long-term strategies for protecting people and property in future hazard events. The process results in a mitigation plan that offers a strategy for breaking the cycle of disaster damage, reconstruction and repeated damage and a framework for developing feasible and cost-effective mitigation projects. Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and Tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

Reducing risks through mitigation planning

A hazard mitigation plan is a long-term strategy for reducing disaster losses. The planning process promoted by the Disaster Mitigation Act of 2000 is as important as the resulting plan because it encourages jurisdictions to integrate mitigation with day-to-day decision-making regarding land-use planning, floodplain management, site design and other functions.

Mitigation planning elements

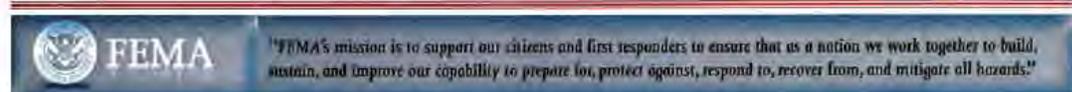
- Public involvement – In addition to government agencies involved in incident management, floodplain management and economic development, the planning process usually involves a range of stakeholders, including representatives of neighborhood groups, civic organizations, academia, environmental groups, the business community and individual citizens. Involving stakeholders is essential to determining the

most vulnerable populations and facilities in the community and to assuring community wide support for the plan.

- Risk assessment – A risk assessment is the process of identifying natural hazards and risks associated with them, including threats to public health and safety, property damage and economic loss. The assessment answers the fundamental question, “What would happen if a natural disaster occurred?” and provides a factual basis for the mitigation activities proposed in the strategy. The assessment includes a description of the type, location and extent of natural hazards; the jurisdiction’s vulnerability to the hazards; and the type and numbers of buildings, infrastructure and critical facilities located in identified hazard areas.
- Mitigation strategy – Based on the risk assessment, State, local and Tribal governments develop mitigation goals and objectives and a strategy for mitigating disaster losses. The strategy sets forth an approach for implementing activities that are cost-effective, technically feasible and environmentally sound.

Hazard mitigation plan required to receive HMGP Project Grants

Local jurisdictions are required by federal law to have a FEMA-approved hazard mitigation plan in order to receive Pre-Disaster Mitigation (PDM) or Hazard Mitigation Grant Program (HMGP) project grant funding. However, in extraordinary circumstances, HMGP funds can be awarded to communities that agree to develop a hazard mitigation plan within 12 months of receiving the project grant. Every State has a FEMA-approved hazard mitigation plan, though many local jurisdictions still do not.



Fact Sheet

State and Local Mitigation Planning



Mitigation Examples

History shows that the physical, financial and emotional losses caused by disasters can be reduced significantly through mitigation planning. Mitigation focuses attention and resources on solving a particular problem (such as reducing repetitive flood losses) and thereby produces successive benefits over time. Through implementation of local floodplain ordinances, for example, it is estimated that \$1.1 billion in flood damages are prevented annually.

Mitigation includes a broad range of activities designed to protect homes, schools, public buildings and critical facilities. Examples include the following types of projects:

- Adopting and enforcing more stringent building codes, flood-proofing requirements, seismic design standards, or wind-bracing requirements for new construction or the retrofit of existing buildings.
- Exceeding the National Flood Insurance Program (NFIP) floodplain management regulations by elevating structures above the base flood elevation (BFE) in high-risk areas.
- Adopting stricter development regulations and zoning ordinances that steer development away from areas subject to flooding, storm surge, or coastal erosion.
- Retrofitting public buildings, schools and critical facilities, such as police and fire stations, to withstand hurricane-strength winds or ground shaking from earthquakes.
- Using public funds to acquire damaged homes or businesses in flood-prone areas, demolish or relocate the structures and use the property for open space, wetlands, or recreational uses.
- Building community shelters and “safe rooms” to help protect people in public buildings and schools in hurricane- and tornado-prone areas.

Planning tool available for government agencies

FEMA has developed a number of planning tools to help government agencies develop mitigation plans. These include how-to guides, CD ROMs and online information about organizing a planning team, involving stakeholders, conducting risk assessments, evaluating potential mitigation measures, conducting benefit-cost analyses and other planning issues.

For more information

Please visit: <http://www.fema.gov/plan/mitplanning/index>.

For state name disaster recovery, visit www.fema.gov or your state Web-site.



"FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

APPENDIX D: MEETING AGENDAS

This section contains copies of the Committee meeting agendas and a summary of participation. The Committee meetings were held either at the Tilton Police Station or via Zoom. Several meeting dates had to be adjusted due to illness or scheduling conflicts. Agendas were developed by the LRPC planner and meetings were coordinated by the Town Administrator. At each meeting there was an opportunity for public input. A final review meeting was held at the Tilton Town Hall and via Zoom.

Tilton Hazard Mitigation Plan Update

June 9, 2021 1:00 PM

Via Zoom Conference – No Physical Location

Due to the COVID-19/coronavirus outbreak, the Tilton EMD has determined that the Tilton Hazard Mitigation Planning Committee will meet electronically as allowed under Governor Sununu’s Emergency Order #12 pursuant to Executive Order 2020-04 and as extended by Executive Order 2021-10. The meeting will be accessible by the public via phone or video conference using Zoom. The meeting will be adjourned if the public is unable to access the meeting.

Time: Jun 9, 2021 01:00 PM Eastern Time

Join Zoom Meeting

<https://us02web.zoom.us/j/81720490146?pwd=QWdidm5yNmZlVTdBbThNVldmZUVNUT09>

Meeting ID: 817 2049 0146

Passcode: 264881

Dial by your location

+1 929 205 6099 US (New York)

Meeting ID: 817 2049 0146

Passcode: 264881

Who To Call For Help: If the meeting is not accessible, please call or email 603-279-5341 or djeffers@lakesrpc.org so that the EMD may be alerted

AGENDA

1. Introductions
2. Plan Update Process
 - a. Hazard Identification
 - b. Risk Analysis
 - c. Identify Problems
 - d. Identify Mitigation Actions
 - e. Prioritize Mitigation Actions
 - f. Address Implementation
 - g. Draft Plan
 - h. Review & Adoption
3. Hazards
4. Critical Resources
5. Opportunities for Public Input
6. Scheduling



FEMA



Tilton Hazard Mitigation Plan Update

June 30, 2021 1:00 PM
Tilton Emergency Operations Center
45 Sanborn Road, Tilton, NH

AGENDA

1. Introductions
2. Status of Committee member assignments
3. Hazards
4. Risk Analysis
5. Problem Identification
6. Opportunities for Public Input
7. Scheduling

Plan Update Process

- A. Hazard Identification
- B. Risk Analysis
- C. Identify Problems
- D. Identify Mitigation Actions
- E. Prioritize Mitigation Actions
- F. Address Implementation
- G. Draft Plan
- H. Review & Adoption



FEMA



Tilton Hazard Mitigation Plan Update

August 25, 2021 1:00 PM

Join Zoom Meeting

<https://us02web.zoom.us/j/82560492324?pwd=eWhzVER4VEhMOXdxWlVPV2ZlVWtUWU09>

Meeting ID: 825 6049 2324

Passcode: 732503

One tap mobile

+13017158592,,82560492324#,,,,*732503# US (Washington DC)

+13126266799,,82560492324#,,,,*732503# US (Chicago)

Dial by your location

+1 301 715 8592 US (Washington DC)

+1 312 626 6799 US (Chicago)

+1 929 205 6099 US (New York)

Meeting ID: 825 6049 2324

Passcode: 732503

AGENDA

1. Introductions
2. Risk Analysis Review
3. Problem Identification
4. Potential Mitigation Actions
 - Costs associated with Potential Mitigation Actions
5. Scheduling

Plan Update Process

- A. Hazard Identification
- B. Risk Analysis
- C. Identify Problems
- D. Identify Mitigation Actions
- E. Prioritize Mitigation Actions
- F. Address Implementation
- G. Draft Plan
- H. Review & Adoption



FEMA



Tilton Hazard Mitigation Plan Update

October 13, 2021 1:00 PM
Tilton Emergency Operations Center
45 Sanborn Road, Tilton, NH

AGENDA

1. Introductions
2. Mitigation Actions
 - a. At least one Action for each identified hazard
 - b. List existing Actions
 - c. New Actions
3. Costs associated with Potential Mitigation Actions
 - a. Estimated costs
 - b. Potential sources of funding
4. Prioritization of Mitigation Actions
 - a. STAPLEE
5. Next Steps

Plan Update Process

- A. Hazard Identification
- B. Risk Analysis
- C. Identify Problems
- D. Identify Mitigation Actions
- E. Prioritize Mitigation Actions
- F. Address Implementation
- G. Draft Plan
- H. Review & Adoption



FEMA



From the minutes of the December 15, 2022 Tilton Board of Selectmen meeting.

the Board was to extend the policy through April 2023 and revisit at that time to see if changes need to be made.

Public Hearing on Hazard Mitigation Plan:

At 6:00 p.m. Selectman Ruggles opened the public hearing to discuss the draft Hazard Mitigation Plan for the Town of Tilton. Notice for this public hearing was posted in the December 8th edition of the Laconia Daily Sun, and was also posted on our website and at the kiosk at Town Hall. Tilton staff members and various committee chairs worked on this update with the Lakes Region Planning Commission and we'd like to thank them for the hours they put into updating the document.

While not required by law, the Selectmen wanted to get public input on the draft document (the draft document is available on our website). Ensuring opportunities for public input is an important element of the process. It is also another opportunity for local officials and the public to become aware of the plan, the process, and the recommendations – and it is the town's plan.

Once input is received

1. Any associated edits will be incorporated into the plan by LRPC;
2. The plan will be submitted to NH Homeland Security & Emergency Management (NH HSEM) for their review,
3. Once NH HSEM grants approval (they occasionally require some revisions) it will come back to the Board of Selectmen for Local Adoption,
4. NH HSEM has a review window of up to 90 days.

Selectmen's Input:

Selectman Scanlon asked about anything regarding natural gas being included and also about 3M chemicals coming in by rail car / tanker car - accidents with chemical spills.

Public Input: None

Selectman Ruggles closed the public hearing at 6:04 p.m.

Selectman Ruggles acknowledged the following for their assistance in the development of the Plan:

Jeanie Forrester, Tilton Town Administrator, Chief Abraham Gilman, Tilton PD, (Lt prior to August 2021); Tilton Police Chief, Cory Piser (summer, 2021), Kevin Duval, Tilton DPW, Jane Alden Tilton Planning Board and Senior Center, Bill Lawrence, Tilton Budget Committee and Business Owner, Tim Joubert Tilton Deputy Fire Chief, Kevin LaChapelle, Tilton Interim Emergency Management Director, Lee Ann Moynihan, Tilton Land Use Coordinator. Julia Chase, Belknap County Field Representative for NH Homeland Security and Emergency Management; Kayla Henderson, Planner for NH Homeland Security and Emergency Management, and David Jeffers, Regional Planner for Lakes Region Planning Commission.

A video recording of the December 15, 2022 Selectboard meeting is available at the town website <http://www.tiltonnh.org/content/select.html>. Discussion of the Plan begins at 11:56 on the video. It can also be directly at <https://www.youtube.com/watch?v=UShpnl1nSUQ>.

6/9/21	6/30/21	7/30/21	8/25/21	10/13/21	12/15/22	Contact Name(s)	Title
Meeting #1	Meeting #2	Meeting #3	Meeting #4	Meeting #5	Review		
						Richard Mann	Tilton Interim Police Administrator
2.0			2.0	2.0	3.0	Jeanie Forrester	Tilton Town Admin.
				2.0		Chief Cory Piser	Tilton Police Chief
2.0	2.0	2.0	2.0		1.0	Lt. Abe Gilman	Tilton PD
2.0			2.0	2.0	1.0	Kevin Duval	Tilton DPW
2.0	2.0	2.0	2.0	2.0	1.0	Jane Alden	Tilton PB & Senior Center
2.0					1.0	Bill Lawrance	Tilton Budget Comm. & business owner
2.0	2.0	2.0	2.0	2.0	1.0	Tim Jubert	Tilton Fire Dept. (Deputy Chief)
1.0	2.0	2.0				Kevin LaChapelle	Tilton Interim EMD
		2.0	2.0	2.0	1.0	Lee Ann Moynihan	Tilton Land Use Coordinator
					1.0	Eric Pyra	Tilton Selectboard
					1.0	Jonathon Scanlon	Tilton Selectboard
					1.0	Scott Ruggles	Tilton Selectboard

APPENDIX E: HAZARD EVENTS PRIOR TO 2015

Hazard	Date	Location	Description	Source
Drought	6/1/1999	Statewide	Governor's Office declaration moderate drought for most of the state.	FEMA
Drought	1929-1936	Statewide	Regional	FEMA
Drought	1939-1944	Statewide	Sever in Southeast	FEMA
Drought	1947-1950	Statewide	Moderate	FEMA
Drought	1960-1969	Statewide	Longest record continuous period of below normal precipitation.	FEMA
Earthquake	6/1/1905	Sanbornton, NH	Gaza Corner	Committee
Flood	3/14/1977	Central and Southern NH	Peak flow for Soucook River	NH OEM
Flood	8/19/1991	Statewide	FEMA DR-917-NH: Hurricane Bob struck New Hampshire causing extensive damage in Rockingham and Stafford counties, but the effects were felt statewide.	NH OEM
Flood	10/15/2005	Statewide	Rainfall amounts ranged from around 3 - 9 inches. This resulting flooding of small rivers and streams caused additional damage to roads that had been damaged earlier in the month. \$625 K in damages statewide.	NOAA
Flood	6/1/1998 – 7/31/1998	Central and Southern NH	FEMA DR-1231-NH: A series of rainfall events. Counties Declared: Grafton, Carroll, Belknap, Rockingham, Sullivan, and Merrimack (1 fatality)	NH OEM
Flood	7/1/1986 – 8/10/1986	Statewide	FEMA DR-771-NH: Severe summer storms with heavy rains, tornadoes; flash flood and severe winds.	NH OEM
Flood	8/ 7/1990 - 8/11/1990	Statewide	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.	NH OEM
Hazard	Date	Location	Description	Source
Hail	7/12/1970	Belknap County	2.00 inch diameter	NOAA
Hail	7/11/1976	Belknap County	1.75 inch diameter	NOAA
High winds	late 1990's	Tilton	Tree fell on main power line during storm; loss of power extensive	Committee
Ice Jam	1/15/1957	Tilton	Affected by backwater from ice, reported at USGS gage Winnepesaukee River at Tilton. Discharge 1,690 cfs	CRREL
Ice	1/5/1979	Statewide	Power and Transportation disruptions	NH OEM

Hazard	Date	Location	Description	Source
Ice	1/7/1998	Statewide	More than \$17 million in power line damage alone	NH OEM
Ice/Freezing Rain	1/27/1996	Belknap County	Cold road surfaces quickly iced up at the beginning of a heavy rain event, leading to numerous automobile accidents over a short period of time. Multiple vehicle accidents and one fatality	NOAA
Lightning Strike	7/26/1994	Belknap County	\$500,000 damage	NCDC
Lightning Strike	6/29/1999	Sanbornton, NH	no property damage	NCDC
Lightning Strike	8/13/2006	Belmont, NH	4 injuries	NCDC
Lightning Strike	7/27/2005	Sanbornton, NH	\$10,000 damage	NCDC
Lightning Strike	7/11/2006	Sanbornton, NH	\$2,000 damage	NCDC
Snow	3/16/1993	Statewide	High winds and record snowfall	FEMA
Snow	4/27/2007	Statewide	Nor'easter caused flooding, damage in excess of \$25 million s of August 2007.	FEMA
Snow	1/17/1994	Statewide	75,000 Residents lost power	NOAA
Snow	3/30/2005	Statewide	\$6.5 million in public assistance	FEMA
Snow	3/28/2001	Statewide		FEMA
Snow	1/15/2004	Statewide		FEMA
Thunderstorm	7/6/1999	Belknap County	Severe winds, downed trees blocked roads, and caused power outages. The winds damaged several buildings, damaged hundreds of trees, closing roads, and damaging homes. Small rivers and streams rose rapidly. Lightning also caused fires. 1 fatality, 1 injury	NOAA
Tornado	5/31/1972	Belknap County	F1 \$250K in damages	NOAA
Tornado	7/3/1972	Belknap County	F2	NH OEM
Tornado	7/23/1978	Belknap County	F1	Torn
Tornado	7/23/1995	Belknap County	F1	NH OEM
Tornado	7/6/1999	Belknap County	F1	NH OEM

Table Sources:

Committee = Discussion with HMP committee

CRREL = Corps of Engineers Cold Regions Research and Engineering Laboratory

FEMA = Federal Emergency Management Agency

NCDC = National Climatic Data Center

NHOEM = New Hampshire Office of Emergency Management

NOAA = National Oceanic and Atmospheric Administration

Torn = <http://www.tornadoproject.com>

APPENDIX F: HAZARDS – SUPPLEMENTARY HAZARD INFORMATION

This section provides statewide or regional information regarding hazards. Some information is about hazards mentioned in the NH Hazard Mitigation Plan. Other information either provides context or extra detail which supplements the locally important information addressed in Chapter III.

I. FLOOD, WILDFIRE, DROUGHT

Flooding

Historically, the state's two largest floods occurred in 1936 and 1938. The 1936 flood was associated with snow melt and heavy precipitation. The 1938 flooding was caused by the Great New England Hurricane of 1938. Those floods prompted the construction of a series of flood control dams throughout New England, built in the 1950s and '60s. They continue to be operated by the US Army Corps of Engineers.³⁹

A series of floods in New Hampshire began in October 2005 with a flood that primarily affected the southwest corner of the state and devastated the town of Alstead. The flood killed seven people. It was followed by floods in May 2006 and April 2007 and a series of floods during the late summer and early fall of 2008. The most recent flooding in the region was associated with Tropical Storm Irene in September 2011.

Flooding in the Lakes Region is most associated with structures and properties located within a floodplain. There are numerous rivers and streams within the region and significant changes in elevation, leading to some fast-moving water. The region also has a great deal of shoreline, making it exposed to rising water levels as well. Although historically, there have not been many instances of shoreline flooding, the potential always exists for a major flood event to occur.

Recent rain events have proven this is becoming an increasing concern as additional development is contributing to flood hazards. As areas are covered with impervious surfaces, less water is allowed to infiltrate, evaporate, or be transpired by vegetative growth and more of it runs off directly into surface drainages and water bodies. This increases the likelihood of flash floods and substantial overland flow. Of greatest concern are the waterfront properties on the lakes, ponds, and associated tributaries.

Culvert improvements and roadwork have been conducted throughout the region as a result of localized flooding events. Of particular concern in the region are areas of steep slopes and soils with limited capacity to accept rapid volumes of rainwater. Roads and culverts in close proximity to these conditions are most at risk of localized flooding.

Flooding due to Dam Failure

Dam failure results in rapid loss of water that is normally held back by a dam. These types of floods can be extremely dangerous and pose a threat to both life and property. Dam classifications in New Hampshire are based on the degree of potential damages that a failure or disoperation of the dam is

³⁹ <http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html> date visited: January 18, 2011

expected to cause. The classifications are designated as non-menace, low hazard, significant hazard, and high hazard and are summarized in greater detail in Table G-1.

The designations for these dams relate to damage that would occur if a dam were to break, not the structural integrity of the dam itself. In the Lakes Region, the Town of Alton was impacted by an earthen dam failure on March 12, 1996. Although listed in the NH Hazard Mitigation Plan as a significant hazard, it did result in the loss of one life.

Table G-1: New Hampshire Dam Classifications⁴⁰

Classification	Description
Non-Menace	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: <ul style="list-style-type: none"> • 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.
Low Hazard	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: <ul style="list-style-type: none"> • 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.
Significant Hazard	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: <ul style="list-style-type: none"> • No probable loss of lives. • Major economic loss to structures or property. • Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services. • Major environmental or public health losses, including one or more of the following: <ul style="list-style-type: none"> • Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair. • The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more. • Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.
High Hazard	A dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of: <ul style="list-style-type: none"> • Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions. • Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot. • Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services. • The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII. • Any other circumstance that would more likely than not cause one or more deaths.

⁴⁰ NH DES Fact Sheet WD-DB-15 "Classification of Dams in New Hampshire", <http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf>. Accessed October 1, 2012.

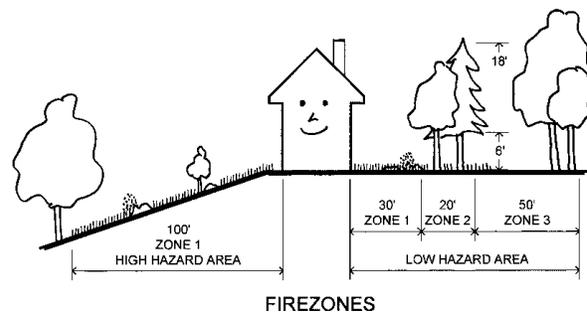
Wildfire

Several areas in the region are relatively remote in terms of access and firefighting abilities. Of greatest concern are those areas characterized by steep slopes and vast woodlands, with limited vehicular access. These areas include the Ossipee, Squam, Belknap, and Sandwich Mountain Ranges. The islands in the region also pose a unique fire safety concern given that access is limited and most of the islands are predominately wooded with residential development. Most of the residential development on the islands is situated on the shores, and inland firefighting capabilities are often limited.

As these once remote areas begin to see more development (the urban wildfire interface), care should be taken to ensure that adequate fire protection and buffers are established. Techniques include increased buffers between wooded areas and residential buildings, requirements for cisterns or fire ponds, a restriction on the types of allowable building materials such as shake roofs, and special considerations for landscaping. While historically massive wildfires have been western phenomena, each year hundreds of woodland acres burn in New Hampshire. The greatest risk exists in the spring when the snow has melted and before the tree canopy has developed, and in the late summer – early fall. Appropriate planning can significantly reduce a community's vulnerability for woodland fires. There are four-zone suggestions from the Firewise community program that could be potentially helpful homeowners in Tilton.⁴¹

ZONE 4 is a natural zone of native or naturalized vegetation. In this area, use selective thinning to reduce the volume of fuel. Removing highly flammable plant species offers further protection while maintaining a natural appearance.

ZONE 3 is a low fuel volume zone. Here selected plantings of mostly low-growing and fire-resistant plants provide a decreased fuel volume area. A few well-spaced, fire resistant trees in this zone can further retard a fire's progress.

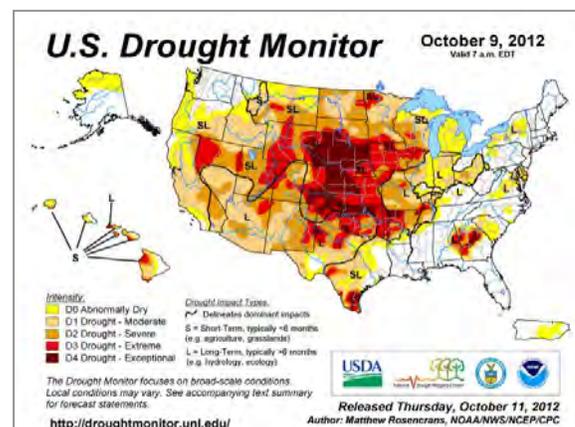


ZONE 2 establishes a vegetation area consisting of plants that are fire resistant and low growing. An irrigation system will help keep this protection zone green and healthy.

ZONE 1 is the protection area immediately surrounding the house. Here vegetation should be especially fire resistant, well irrigated and carefully spaced to minimize the threat from intense flames and sparks.

Drought

Drought occurs when less than the normal amount of water is available for extended periods of time. Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include



⁴¹ <http://www.firewise.org> accessed September 21, 2012.

reduced rain/snowfall, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

Since 1990 New Hampshire has had a state Drought Emergency Plan, which identifies four levels of action indicating the severity of the drought: Alert, Warning, Severe, and Emergency. There have been five extended droughts in New Hampshire in the past century: 1929 – 1936, 1939 – 1944, 1947 – 1950, 1960 – 1969, and 2001 – 2002.⁴² While much of the country experienced drought conditions in 2012, New Hampshire received adequate precipitation.⁴³

II. GEOLOGICAL HAZARDS

Earthquake

Notable New Hampshire earthquakes are listed in Table G-2 with the extent of the hazard expressed in the Modified Mercalli Intensity scale and the Richter Magnitude.⁴⁴

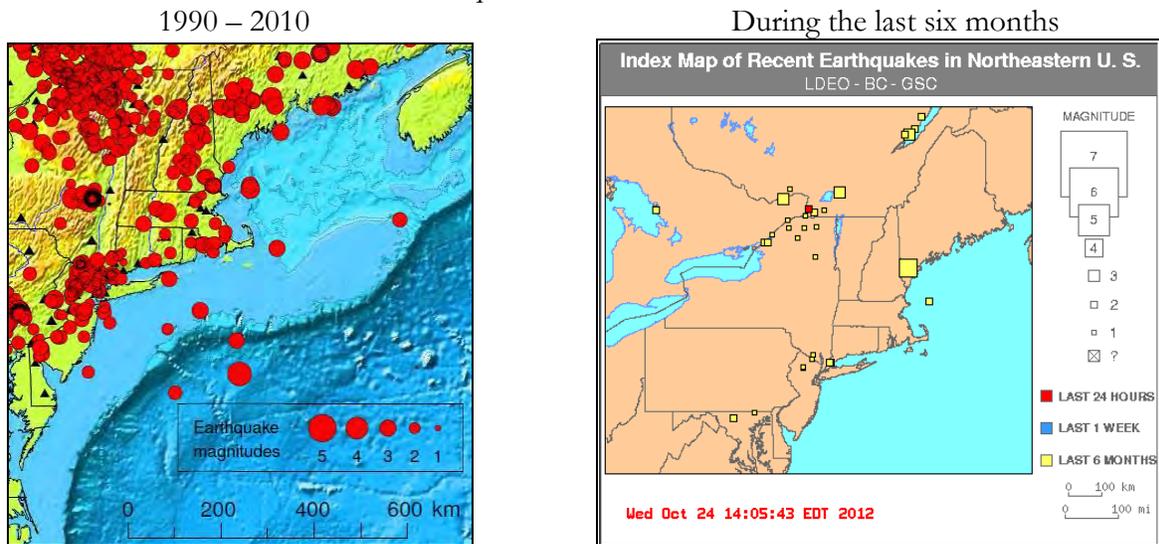
Table G-2: NH Earthquakes of magnitude or intensity 4 or greater (1638-2007).

Location	Date	MMIntensity	Magnitude
Ossipee	December 24, 1940	7	5.5
Ossipee	December 20, 1940	7	5.5
Ossipee	October 9, 1925	6	4
Laconia	November 10, 1936	5	-
New Ipswich	March 18, 1926	5	-
Lebanon	March 5, 1905	5	-
Rockingham County	August 30, 1905	5	-
Concord	December 19, 1882	5	-
Exeter	November 28, 1852	5	-
Portsmouth	November 10, 1810	5	4
Off Hampton	July 23, 1823	4	4.1
15km SE of Berlin	April 6, 1989	-	4.1
5km NE of Berlin	October 20, 1988	-	4
W. of Laconia	January 19, 1982	-	4.7
Central NH	June 11, 1638	-	6.5

⁴² <http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf> visited February 8, 2011.

⁴³ US Drought Monitor <http://droughtmonitor.unl.edu/>. Accessed October 9, 2012.

⁴⁴ http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, visited June 8, 2012.

Earthquakes in the Northeast⁴⁵

Damage from an earthquake generally falls into two types; Structural and Nonstructural.

- **Structural Damage** is considered any damage to the load bearing components of a building or other structure.
- **Nonstructural Damage** is considered any portion not connected to the superstructure. This includes anything added after the frame is complete.

According to the NH Division of Homeland Security and Emergency Management, some of the issues likely to be encountered after a damaging earthquake could be:

- Total or partial collapse of buildings, especially un-reinforced masonry structures and those not built to seismic codes.
- Damage to roads and bridges from ground settlement and structural damage.
- Mass Casualties.
- Loss of electric power.
- Loss of telecommunication systems.
- Fires from gas line ruptures and chimney failures.
- Total or partial loss of potable and fire fighting water systems from pipe ruptures.
- Hazardous Material incidences.
- Loss of critical capabilities from structural and nonstructural damages.
- Lack of mutual aid support.

The NH HSEM also notes that a “cascade of disasters” typically occurs after a damaging earthquake. For example:

- Damage to gas lines and chimneys result in fires that are difficult to extinguish due to damage to the road, water systems, fire and police stations.
- Structural and Nonstructural damage cause many injuries, but because of damage to health care facilities and emergency response facilities, there is a slow or nonexistent response.
- Responders are slowed in their response because of Hazardous Material incidents.
- Flooding due to dam failures.

⁴⁵ Lamont-Doherty Cooperative Seismic Network <http://www.ldeo.columbia.edu/LCSN/index.php>, accessed October 24, 2012

Damage from the 1940 earthquakes in Ossipee included some damage to most of the chimneys in the epicenter region of Ossipee, ranging from cosmetic cracks to total collapse. Sections of several foundations collapsed and at least one house rotated on its foundation. In the town of Conway, 15 miles from the epicenter, one house was lost by fire when sparks in a cracked chimney started the blaze. Splits found in the rafters and trusses temporarily closed Ossipee High School. No damages were associated with the October 2012 earthquake in Maine but the potential does exist for some damages to occur.⁴⁶

III. Severe Wind

The Lakes Region is at risk of several types of natural events associated with high winds, including nor'easters, downbursts, hurricanes and tornadoes. The northeast is located in a zone that should be built to withstand 160 mile an hour wind gusts. A large portion of the northeast, including the Lakes Region, is in a designated hurricane susceptible region.

Tornado/Downburst/Hurricane

An F2 tornado ripped through a 50-mile section of central NH in July of 2008 from Epsom to Ossipee leading to requests for federal disaster declarations in several counties.⁴⁷

The major damage from downbursts come from falling trees, which may take down power lines, block roads, or damage structures and vehicles. New Hampshire experienced three such events in the 1990s. One event occurred in Moultonborough on July 26, 1994 and was classified as a macroburst. It affected an area one-half mile wide by 4-6 miles in length.

The tornado/downburst risk for an individual community in New Hampshire is relatively low compared to many other parts of the country. Though the danger that these storms present may be high, the frequency of these storms is relatively low to moderate.

Hail

Hail can cause damage to crops and structural damage to vehicles. Hail is measured by the TORRO intensity scale, shown in Table G-3. Although hailstorms are not particularly common in the Lakes Region, which averages fewer than two hailstorms per year, several have occurred in New Hampshire in the last decade. In 2007 and 2008 nearby Laconia experienced hail storms with no resulting damage, though reported hail sizes were as large as 1.25 inches (H4).

Table G-3: TORRO Hailstorm Intensity Scale

Code	Diameter	Description	Typical Damage
H0	5-9 mm*	Pea	No damage
H1	10-15 mm	Mothball	Slight damage to plants, crops
H2	16-20 mm	Marble, grape	Significant damage to fruit, crops, vegetation
H3	21-30 mm	Walnut	Severe damage to fruit/crops, damage to glass/plastic structures, paint & wood scored
H4	31-40 mm	Pigeon's egg	Widespread glass damage, vehicle bodywork damage
H5	41-50 mm	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	51-60 mm	Hen's egg	Aircraft bodywork dented, brick walls pitted
H7	61-75 mm	Tennis ball	Severe roof damage, risk of serious injuries

⁴⁶ USGS <http://earthquake.usgs.gov/earthquakes/eventpage/usb000d75b#pager>, accessed October 17, 2012.

⁴⁷ <http://www.fema.gov/news/newsrelease.fema?id=45525> visited March 8, 2011.

H8	76-90 mm	Large orange	Severe damage to aircraft bodywork
H9	91-100 mm	Grapefruit	Extensive structural damage. Risk of severe or fatal injuries to exposed persons
H10	>100 mm	Melon	Extensive structural damage. Risk of severe or fatal injuries to exposed persons
*mm = millimeters (Approximate range since other factors (e.g. number, density of hailstones, hail fall speed, surface wind speed) affect severity Source: http://www.torro.org.uk/torro/severeweather/hailscale.php)			

APPENDIX G: PRIORITIZATION DETAILS

As the Committee began the process of prioritizing these actions, the group considered the standard tool for project prioritization, the STAPLEE Method and agreed that the tool could be expanded to reflect the priorities of the town. In addition to the standard STAPLEE categories (Social, Technical, Administrative, Political, Economic, and Environmental), the committee considered whether a particular action impacted Life Safety and Protected Property within Tilton, as well as whether there was a Local Champion for the project and whether the action augmented other Local Objectives. The STAPLEE term “Economic” was changed to “Cost”.

This section contains a summary of rankings for each of the proposed Mitigation Actions by the Tilton Hazard Mitigation Committee. For each action, the benefits and costs of implementing the action (under each of the eleven categories) was considered and scored -1, 0, 1 with a ‘minus one’ indicating that the costs outweighed the benefits in a particular category, a ‘one’ meant that the benefits were greater than the costs, and a ‘zero’ meant that while there are costs associated with the project, they are balanced out by the benefits. The eleven category scores were summed for an overall project total. The maximum total score is 11, the minimum is -11. Actual results ranged from 11 to 2. These ratings were arrived at through committee discussion and group consensus.

ID*	Hazard	Mitigation Actions	Social	Technical	Administrative	Political	Legal	Cost (Economics)	Environmental	Life Safety	Property Protection	Local Champion	Other Objective	STAPLEE Total
H	Flood	Work with the State Floodplain Manager, NH HSEM, and FEMA to update the FIRM maps for Belknap County (Winnepesaukee Basin)	1	1	1	1	1	1	1	1	1	1	1	11
P	Blizzard, Ice Storm, Thunder storm, Nor'easter	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice.	1	1	1	1	1	0	1	1	1	1	1	10
b	Fire - Conflagration	Bury the overhead wires in downtown (\$5 M) Phase I - Put out an RFP to bury the overhead wires in downtown.	1	1	1	1	1	0	1	1	1	1	1	10

ID*	Hazard	Mitigation Actions	Social	Technical	Administrative	Political	Legal	Cost (Economics)	Environmental	Life Safety	Property Protection	Local Champion	Other Objective	STAPLEE Total
N	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for the state's 10-year Transportation Plan to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Construction could be fully federally funded but take longer.	1	1	1	1	1	0	1	1	1	1	1	10
N2	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for discretionary grant opportunities to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Likely faster construction, but requires 20% match.	1	1	1	1	1	0	1	1	1	1	1	10
S	Lightning	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	1	1	1	1	1	0	1	1	1	1	1	10
Q	Severe Winter Weather	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information. Conduct physical inspections of commercial properties	1	1	1	1	1	0	1	1	1	1	1	10
O.1	Flooding/ Erosion	Coordinate with NH DOT to develop plans to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	1	1	1	1	1	1	1	1	1	0	0	9
O.2	Flooding/ Erosion	Coordinate with NH DOT to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	1	1	1	1	1	1	1	1	1	0	0	9

ID*	Hazard	Mitigation Actions	Social	Technical	Administrative	Political	Legal	Cost (Economics)	Environmental	Life Safety	Property Protection	Local Champion	Other Objective	STAPLEE Total
X	Drought	Raise public awareness through drought monitor, including links on municipal webpage (https://www.drought.gov/states/new-hampshire). Post and distribute resources for homeowners regarding water-saving actions that can reduce household water consumption, decreasing the impacts of drought.	1	1	1	1	1	1	1	1	0	0	0	8
j	All Hazards	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	0	1	0	1	1	0	1	1	1	1	0	7
W	Dam failure, ice jam	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	0	1	0	0	1	0	1	1	1	1	0	6
R	Extreme Temps	Distribute information (electronic & hard copies) on improving weatherproofing homes as well as accessing cooling/heating centers.	1	0	1	1	1	1	0	1	0	0	0	6
A	Infectious Disease	Identify who would be lead on becoming more involved & creating a Plan of Action related to infectious disease mitigation.	1	0	0	1	1	1	1	1	0	0	0	6
B	Infectious Disease	Work with LRPPH and target areas to conduct outreach regarding prevention.	1	0	0	1	1	1	1	1	0	0	0	6
V	Wildfire	Conduct outreach to the two dozen residences around Pest House Rd. and north of Lancaster Hill Rd. about protecting their property where there is limited firefighting access including maintaining safe access for fire apparatus and creating defensible space around homes.	0	1	0	0	1	0	1	1	1	1	0	6

ID*	Hazard	Mitigation Actions	Social	Technical	Administrative	Political	Legal	Cost (Economics)	Environmental	Life Safety	Property Protection	Local Champion	Other Objective	STAPLEE Total
I	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Academy St.	0	1	0	0	0	0	1	1	1	1	0	5
J	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Colby St.	0	1	0	0	0	0	1	1	1	1	0	5
K	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	0	1	0	0	0	0	1	1	1	1	0	5
L	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	0	1	0	0	0	0	1	1	1	1	0	5
M	Flood, Nor'easter, T'storm	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	0	1	0	0	0	0	1	1	1	1	0	5
D	Severe Wind	DPW works with homeowners on trimming	0	0	0	1	1	1	0	1	1	0	0	5
C	Severe Wind	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	0	0	0	1	1	1	0	1	1	0	0	5
E	Severe Wind	Work with NH Dept. of Natural & Cultural Resources (DNCR) to address the weakening of trees	0	0	0	0	0	0	1	1	1	0	0	3
T	Lightning	Evaluate lightning rods on town owned buildings susceptible to strikes	0	0	0	0	0	0	0	1	1	0	0	2
T2	Lightning	Install lightning rods on town owned buildings susceptible to strikes	0	0	0	0	0	0	0	1	1	0	0	2

APPENDIX H: EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

Tilton Hazard Mitigation Plan, 2015

Tilton Master Plan, 2013

Tilton Zoning Ordinance

Tilton Subdivision Regulations

Tilton Site Plan Regulations

FEMA Community Information System

Tilton Annual Report, 2021

State of New Hampshire Multi-Hazard Mitigation Plan, 2018

National Oceanic and Atmospheric Administration website, <http://www.ncdc.noaa.gov/>

NH Division of Forests and Lands <http://www.nhdf.org/fire-control-and-law-enforcement/fire-statistics.aspx>

NH Department of Transportation Traffic Volume Mapper,

<https://nhdot.public.ms2soft.com/tcds/tsearch.asp?loc=Nhdot&mod=TCDS>

APPENDIX I: FEMA WEBLIOGRAPHY*

DISASTERS AND NATURAL HAZARDS INFORMATION

FEMA-How to deal with specific hazards	http://www.ready.gov/natural-disasters
Natural Hazards Center at the University of Colorado	http://www.colorado.edu/hazards
National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather.	http://www.websites.noaa.gov
National Climatic Data Center active archive of weather data.	http://lwf.ncdc.noaa.gov/oa/ncdc.html
Northeast Snowfall Impact Scale	http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm
Weekend Snowstorm Strikes The Northeast Corridor Classified As A Category 3 "Major" Storm	http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html

FLOOD RELATED HAZARDS

FEMA Coastal Flood Hazard Analysis & Mapping	http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1
Floodsmart	http://www.floodsmart.gov/floodsmart/
National Flood Insurance Program (NFIP)	http://www.fema.gov/nfip
Digital quality Level 3 Flood Maps	http://msc.fema.gov/MS/MS/statemap.htm
Flood Map Modernization	http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization
Reducing Damage from Localized Flooding: A Guide for Communities, 2005 FEMA 511	http://www.fema.gov/library/viewRecord.do?id=1448

FIRE RELATED HAZARDS

Firewise	http://www.firewise.org
NOAA Fire Event Satellite Photos	http://www.osei.noaa.gov/Events/Fires
U.S. Forest Service, USDA	http://www.fs.fed.us/land/wfas/welcome.htm
Wildfire Hazards - A National Threat	http://pubs.usgs.gov/fs/2006/3015/2006-3015.pdf

GEOLOGIC RELATED HAZARDS

USGS Topographic Maps	http://topomaps.usgs.gov/
Building Seismic Safety Council	http://www.nibs.org/?page=bssc
Earthquake hazard history by state	http://earthquake.usgs.gov/earthquakes/states/
USGS data on earthquakes	http://earthquake.usgs.gov/monitoring/deformation/data/download/
USGS Earthquake homepage	http://quake.wr.usgs.gov
National Cooperative Geologic Mapping Program (NCGMP)	http://ncgmp.usgs.gov/
Landslide Overview Map of the Conterminous United States	http://landslides.usgs.gov/learning/nationalmap/
Kafka, Alan L. 2008. Why Does the Earthquake in New England? Boston College, Weston Observatory, Department of Geology and Geophysics	http://www2.bc.edu/~kafka/Why_Quakes/why_quakes.html
Map and Geographic Information Center, 2010,	http://magic.lib.uconn.edu/connecticut_data.html

"Connecticut GIS Data", University of Connecticut	
2012 Maine earthquake	http://www.huffingtonpost.com/2012/10/17/main-earthquake-2012-new-england_n_1972555.html

WIND-RELATED HAZARDS

ATC Wind Speed Web Site	http://www.atcouncil.org/windspeed/index.php
U.S. Wind Zone Maps	http://www.fema.gov/safe-rooms/wind-zones-united-states
Tornado Project Online	http://www.tornadoproject.com/
National Hurricane Center	http://www.nhc.noaa.gov
Community Hurricane Preparedness Tutorial	http://meted.ucar.edu/hurricane/chp/hp.htm
National Severe Storms Laboratory, 2009, "Tornado Basics",	http://www.nssl.noaa.gov/primer/tornado/tor_basics.html

GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MAPPING

The National Spatial Data Infrastructure & Clearinghouse (NSDI) and Federal Geographic Data Committee (FGDC) Source for information on producing and sharing geographic data	http://www.fgdc.gov
The OpenGIS Consortium Industry source for developing standards and specifications for GIS data	http://www.opengis.org
Northeast States Emergency Consortium (NESEC): Provides information on various hazards, funding resources, and other information	http://www.nesec.org
US Dept of the Interior Geospatial Emergency Management System (IGEMS) provides the public with both an overview and more specific information on current natural hazard events. It is supported by the Department of the Interior Office of Emergency Management.	http://igems.doi.gov/
FEMA GeoPlatform: Geospatial data and analytics in support of emergency management	http://fema.maps.arcgis.com/home/index.html

DETERMINING RISK AND VULNERABILITY

HAZUS	http://www.hazus.org
FEMA Hazus Average Annualized Loss Viewer	http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cb8228309e9d405ca6b4db6027df36d9&extent=-139.0898,7.6266,-48.2109,62.6754
Vulnerability Assessment Tutorial: On-line tutorial for local risk and vulnerability assessment	http://www.csc.noaa.gov/products/nchaz/html/mitigate.htm
Case Study: an example of a completed risk and vulnerability assessment	http://www.csc.noaa.gov/products/nchaz/html/case.htm

DATA GATHERING

National Information Sharing Consortium (NISC): brings together data owners, custodians, and users in the fields of homeland security, public safety, and emergency management and response. Members leverage efforts related to the governance, development, and sharing of situational awareness and incident management resources, tools, and best	http://nisconsortium.org/
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practices	
The Hydrologic Engineering Center (HEC), an organization within the Institute for Water Resources, is the designated Center of Expertise for the US Army Corps of Engineers	http://www.hec.usace.army.mil/
National Water & Climate Center	http://www.wcc.nrcs.usda.gov/
WinTR-55 Watershed Hydrology	http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelpdb1042901
USACE Hydrologic Engineering Center (HEC)	http://www.hec.usace.army.mil/software/
Stormwater Manager's Resource Center SMRC	http://www.stormwatercenter.net
USGS Current Water Data for the Nation	http://waterdata.usgs.gov/nwis/rt
USGS Water Data for the Nation	http://waterdata.usgs.gov/nwis/
Topography Maps and Aerial photos	http://www.terraserver.com/view.asp?tid=142
National Register of Historic Places	http://www.nps.gov/nr/about.htm
National Wetlands Inventory	http://www.fws.gov/wetlands/
ICLUS Data for Northeast Region	http://www.epa.gov/ncea/global/iclus/inclus_nca_northeast.htm

SUSTAINABILTY/ADAPTATION/CLIMATE CHANGE

Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability	http://www.fema.gov/media-library-data/20130726-1454-20490-3505/fema364.pdf
Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards	http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf
NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments)	http://ccrun.org/home
Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use	http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf
U.S. EPA	http://www.epa.gov/climatechange/
NOAA National Ocean Service (NOS)	http://oceanservice.noaa.gov/
The Northeast Climate Research Center (NRCC) folks were heavily involved in climate data in the NCA, below. They have a wealth of historic climate data and weather information, trends, etc.	http://www.nrcc.cornell.edu/
Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management	http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf
National Fish, Wildlife and Plants Climate Adaptation Strategy	www.wildlifeadaptationstrategy.gov
ICLEI Local Governments for Sustainability	http://www.icleiusa.org/
Kresge Foundation Survey	http://www.kresge.org/news/survey-finds-communities-northeast-are-trying-plan-for-changes-climate-need-help-0
New England's Sustainable Knowledge Corridor	http://www.sustainableknowledgecorridor.org/site/
The Strategic Foresight Initiative (SFI)	http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf
Northeast Climate Choices	http://www.climatechoices.org/ne/resources_ne/nereport.html

Northeast Climate Impacts Assessment	http://www.northeastclimateimpacts.org/
Draft National Climate Assessment Northeast Chapter released early 2013	http://ncadac.globalchange.gov/
Northeast Chapter of the National Climate Assessment of 2009:	http://www.globalchange.gov/images/cir/pdf/northeast.pdf
NEclimateUS.org	http://www.neclimateus.org
ClimateNE	www.climateinortheast.com
Scenarios for Climate Assessment and Adaptation	http://scenarios.globalchange.gov/
Northeast Climate Science Center	http://necsc.umass.edu/
FEMA Climate Change Adaptation and Emergency Management	https://www.llis.dhs.gov/content/climate-change-adaptation-and-emergency-management-0
Climate Central	http://www.climatecentral.org
EPA State and Local Climate and Energy Program	http://www.epa.gov/statelocalclimate/index.html

PLANNING

American Planning Association	http://www.planning.org
PlannersWeb - Provides city and regional planning resources	http://www.plannersweb.com

OTHER FEDERAL RESOURCES

U.S. Army Corps of Engineers: Provides funding for floodplain management planning and technical assistance and other water resources issues.	www.nae.usace.army.mil
Natural Resources Conservation Service: Technical assistance to individual land owners, groups of landowners, communities, and soil and water conservation districts.	www.nrcs.usda.gov
NOAA Coastal Services Center	http://www.csc.noaa.gov/
Rural Economic and Community Development: Technical assistance to rural areas and smaller communities in rural areas on financing public works projects.	www.rurdev.usda.gov
Farm Service Agency: Manages the Wetlands Reserve Program (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farmland set aside programs	www.fsa.usda.gov
National Weather Service: Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood-warning plans.	www.weather.gov
Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning	www.osec.doc.gov/eda/default.htm
National Park Service: Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment.	www.nps.gov
Fish and Wildlife Services: Can provide technical and financial assistance to restore wetlands and riparian habitats.	www.fws.gov

Department of Housing & Urban Development	www.hud.gov
Small Business Administration: SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements.	www.sba.gov/disaster
Environmental Protection Agency	www.epa.gov

OTHER RESOURCES

New England States Emergency Consortium (NESEC): NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Resources are available on earthquake preparedness, mitigation, and hurricane safety.	www.nesec.org
Association of State Floodplain Managers (ASFPM): ASFPM has developed a series of technical and topical research papers, and a series of Proceedings from their annual conferences.	www.floods.org
National Voluntary Organizations Active in Disaster (VOAD) is a non-profit, nonpartisan membership organization that serves as the forum where organizations share knowledge and resources throughout the disaster cycle—preparation, response, recovery and mitigation.	http://www.nvoad.org

FEMA RESOURCES

Federal Emergency Management Agency (FEMA)	www.fema.gov
National Mitigation Framework	http://www.fema.gov/national-mitigation-framework
Federal Insurance and Mitigation Administration (FIMA)	http://www.fema.gov/fima
Community Rating System (CRS)	http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system
FEMA Building Science	http://www.fema.gov/building-science
National Flood Insurance Program (NFIP)	http://www.fema.gov/national-flood-insurance-program
Floodplain Management & Community Assistance Program	http://www.fema.gov/floodplain-management
Increased Cost of Compliance (ICC): ICC coverage provides up to \$30,000 for elevation and design requirements to repeatedly or substantially damaged property.	http://www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage
National Disaster Recovery Framework	http://www.fema.gov/national-disaster-recovery-framework
Computer Sciences Corporation: contracted by FEMA as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities	www.csc.com

Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: A Guidebook for Local Governments	https://www.fema.gov/ar/media-library/assets/documents/89725
Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning	http://www.fema.gov/media-library/assets/documents/4317

Mitigation Best Practices Portfolio <http://www.fema.gov/mitigation-best-practices-portfolio>

FEMA Multi-Hazard Mitigation Planning Website	http://www.fema.gov/multi-hazard-mitigation-planning
FEMA Resources Page	http://www.fema.gov/plan/mitplanning/resources.shtm
Local Mitigation Plan Review Guide	http://www.fema.gov/library/viewRecord.do?id=4859
Local Mitigation Planning Handbook complements and liberally references the Local Mitigation Plan Review Guide above	http://www.fema.gov/library/viewRecord.do?id=7209
HAZUS	http://www.fema.gov/protecting-our-communities/hazus
Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards	http://www.fema.gov/library/viewRecord.do?id=6938
Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials	http://www.fema.gov/library/viewRecord.do?id=7130
IS-318 Mitigation Planning for Local and Tribal Communities Independent Study Course	http://training.fema.gov/EMIWeb/IS/is318.asp

*For the most current version of the FEMA webliography, visit <http://www.fema.gov/about-region-i/about-region-i/hazard-mitigation-planning-webliography>.

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APPENDIX J: MONITOR, EVALUATE, & UPDATE

Table A: Annual Hazard Mitigation Plan Review Record

Meeting Schedule (dates)	Tasks Accomplished	How well (or not-so-well) is implementation progressing? <i>Circle one.</i>	Lead Parties	Public Involvement (citizens, neighboring communities)
Year 1: _____		Good/Fair/Poor Comments:		
Year 2: _____		Good/Fair/Poor Comments:		
Year 3: _____		Good/Fair/Poor Comments:		
Year 4: _____		Good/Fair/Poor Comments:		

Table B: Project Implementation Checklist

Use this matrix during each Annual HMP Review Meeting to track the status of each action. C – Complete, P – Partially Complete, N – No Action this year.

ID*	Hazard	Mitigation Actions	Estimated Cost	Responsible Party	STAPLEE Total	Time Frame	Year 1	Year 2	Year 3	Year 4
H	Flood	Work with the State Floodplain Manager, NH HSEM, and FEMA to update the FIRM maps for Belknap County (Winnepesaukee Basin)	20 hours Staff Time/year	Land Use	11	Short				
P	Blizzard, Ice Storm, Thunder storm, Nor'easter	Develop plans to move above-ground power lines underground for critical facilities in downtown to mitigate impacts of high wind and ice.	\$10K - 15K	EMD, BoS	10	Medium				
b	Fire - Conflagration	Bury overhead wires in downtown (\$5 M) Phase I - Put out an RFP to bury the overhead wires in downtown.	\$10K - 15K	NH DOT, EMD, BoS	10	Long				
N	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for the state's 10-year Transportation Plan to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Construction could be fully federally funded but take longer.	\$10K - 15K	NH DOT (DPW coord.)	10	Long				
N2	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges on state roads (\$3 M). Phase I: Put together a proposal for discretionary grant opportunities to upgrade vulnerable culverts and bridges on state roads, especially Route 132 N. Likely faster construction, but requires 20% match.	\$10K - 15K	NH DOT (DPW coord.)	10	Long				

ID*	Hazard	Mitigation Actions	Estimated Cost	Responsible Party	STAPLEE Total	Time Frame	Year 1	Year 2	Year 3	Year 4
S	Lightning	Post fire and lightning prevention materials on the Fire Department website and refer homeowners and residents to the information.	10 staff hrs/yr	FD	10	Short				
Q	Severe Winter Weather	Post educational materials on the Fire Department website about snow loads and refer homeowners and residents to the information. Conduct physical inspections of commercial properties	40 staff hrs/yr	FD	10	Short				
O.1	Flooding/ Erosion	Coordinate with NH DOT to develop plans to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	\$20,000	DPW, BoS	9	Short				
O.2	Flooding/ Erosion	Coordinate with NH DOT to mitigate the erosion under US Rte. 3/NH Rte. 11 due to movement of the Winnepesaukee River.	\$2 million	DPW, BoS	9	Long				
X	Drought	Raise public awareness through drought monitor, including links on municipal webpage (https://www.drought.gov/states/new-hampshire). Post and distribute resources for homeowners regarding water-saving actions that can reduce household water consumption, decreasing the impacts of drought.	20 staff hours/ year	FD	8	Short				
j	All Hazards	Incorporate the Hazard Mitigation Plan in the Emergency Operations Plan	20 hrs staff time	EMD	7	Medium				
W	Dam failure, ice jam	Ensure that there is coordination between the EMD and the NH Dam Bureau regarding the level of the Winnepesaukee River.	20 staff hrs/yr	EMD	6	Medium				
R	Extreme Temps	Distribute information (electronic & hard copies) on improving weatherproofing homes as well as accessing cooling/heating centers.	40 staff hours/ year	Town Hall	6	Short				

ID*	Hazard	Mitigation Actions	Estimated Cost	Responsible Party	STAPLEE Total	Time Frame	Year 1	Year 2	Year 3	Year 4
A	Infectious Disease	Identify who would be lead on becoming more involved & creating a Plan of Action related to infectious disease mitigation.	30 hr	EMD	6	Short				
B	Infectious Disease	Work with LRPPH and target areas to conduct outreach regarding prevention.	30 hr/yr	Health Officer/EMD	6	Short				
V	Wildfire	Conduct outreach to the two dozen residences around Pest House Rd. and north of Lancaster Hill Rd. about protecting their property where there is limited firefighting access including maintaining safe access for fire apparatus and creating defensible space around homes.	20 staff hrs/yr	FD	6	Medium				
I	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Academy St.	\$60,000	DPW	5	Short				
J	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Colby St.	\$60,000	NH DOT (DPW coord.)	5	Short				
K	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Lancaster Hill Rd.	\$60,000	NH DOT (DPW coord.)	5	Short				
L	Flood, Nor'easter, T'storm	Upgrade vulnerable culverts and bridges, especially Route 3/Brook Rd at Bamford Brook.	\$120,000	NH DOT (DPW coord.)	5	Medium				
M	Flood, Nor'easter, T'storm	Update vulnerable culverts and bridges, especially South Bay/ 822 Laconia Rd	\$120,000	NH DOT (DPW coord.)	5	Medium				
D	Severe Wind	DPW works with homeowners on trimming	30 hr/ yr	DPW	5	Short				

ID*	Hazard	Mitigation Actions	Estimated Cost	Responsible Party	STAPLEE Total	Time Frame	Year 1	Year 2	Year 3	Year 4
C	Severe Wind	Work with local home improvement stores to educate homeowners and residents about protection of people and property.	30 hr/ yr	DPW	5	Medium				
E	Severe Wind	Work with NH Dept. of Natural & Cultural Resources (DNCR) to address the weakening of trees	30 hr/ yr	DPW	3	Medium				
T	Lightning	Evaluate lightning rods on town owned buildings susceptible to strikes	10 hrs	FD	2	Medium				
T2	Lightning	Install lightning rods on town owned buildings susceptible to strikes	<\$10,000	FD	2	Long				
new	Earthquake	Develop and implement an outreach program using established materials to residents and business owners especially in the older, multistory downtown area regarding the risks posed by earthquakes and steps that building owners can take to mitigate those risks.	40 staff hrs/yr	FD	n/a	Medium				
new	Tropical & Post Tropical Cyclones	Compile, distribute and promote outreach materials to residents and business owners regarding the risks posed by cyclones and steps that building owners can take to mitigate those risks including structural and property maintenance actions.	20 staff hrs/yr	FD	n/a	Medium				
new	All Hazards	Update the town's Master Plan (2013), incorporating current information. This will better enable any necessary land use or zoning changes.	approx. \$50K	PB	n/a	Medium				
new	Flooding	Review and revise the Wetlands Conservation District (Zoning) to better define its purpose and administration, reducing the likelihood that development will occur in flood prone areas.	40 staff hours	PB	n/a	Medium				

ID*	Hazard	Mitigation Actions	Estimated Cost	Responsible Party	STAPLEE Total	Time Frame	Year 1	Year 2	Year 3	Year 4
new	Fire - Conflagration	Review and revise the town's land use ordinance regulating removal of damaged structures and reconstruction to better define its purpose and administration, reducing the possibility of hazards further impacting the property.	40 staff hours	CEO	n/a	Short				
new	Fire - Conflagration	Review and revise the town's subdivision regulations to allow for better enforcement, especially of Section 6.7.C - Water for Firefighting Protection. This could reduce the spread of a fire.	40 staff hours	CEO	n/a	Short				
new	Flooding/ Erosion	Update the town's Highway Maintenance Plan and coordinate tasks to ensure efficient use of local resources and reducing the impacts of flooding on local infrastructure.	100 staff hours	CEO	n/a	Medium				

APPENDIX K: OTHER HAZARDS AND NON-MITIGATION RESPONSES

The purpose of this Hazard Mitigation Plan (HMP) is to identify the natural hazards that pose a risk to the assets of Tilton and to develop strategies to mitigate those risks. While it was stressed that the focus was on natural hazards and development of mitigation actions, the committee did identify both human-caused and technological hazards that could impact the town. (Note: At the time of plan development, the New Hampshire State Hazard Mitigation Plan listed human-caused and technological hazards.) Additionally, some preparation and response activities were identified for both natural and non-natural hazards. So, while they are not an integral part of the Tilton HMP, their work is retained here in this appendix for the benefit of the community.

Human-Caused & Technological Hazards

The committee supplemented the evaluation of Natural Hazards with consideration of some of the Human-Caused and Technological hazards identified in the *State of New Hampshire Multi-Hazard Mitigation Plan (2018)*, developed by the New Hampshire Department of Safety's Division of Homeland Security and Emergency Management, focusing on those that might have the most relevance for the town of Tilton. They are listed below. Only those with a high- to medium-risk potential for Tilton are described further.

Human-Caused & Technological Hazards	Probability	Extent	Human Impact	Property Impact	Business Impact	Average Impact	Risk
Conflagration	3	2	2	2	2	2.00	12.00
Transport Accident	3	2	2	2	2	2.00	12.00
Mass Casualty Incident	2	2	2	2	2	2.00	8.00
Terrorism/Violence	3	2	2	1	1	1.33	8.00
Hazardous Materials	3	2	1	1	1	1.00	6.00
Aging Infrastructure	3	1	1	1	1	1.00	3.00
Cyber Event	3	1	1	1	1	1.00	3.00
Known and Emerging Contaminants	2	1	1	1	1	1.00	2.00
Long Term Utility Outage	2	1	1	1	1	1.00	2.00
Radiological	1	1	1	2	2	1.67	1.67

CONFLAGRATION

Conflagration is an extensive, destructive fire in a populated area that endangers lives and affects multiple buildings. Historically, many New Hampshire towns were settled in areas along waterways in order to power the mills. Often the town centers were at a low point in the topography, resulting in dense residential development on the steeper surrounding hillsides. Hillsides provide a natural updraft that makes firefighting more difficult. In particular, structural fires spread more readily in hillside developments because burning buildings pre-heat the structures that are situated above them.



Alton Bay Christian Conference Center,
2009

Within the Lakes Region the city of Laconia was the site of one of the most devastating structural fires to occur in the state of New Hampshire. The 1903 Great Lakeport Fire consumed more than 100 homes: two churches, two factories, a large mill, a power plant, and a fire station. Wolfeboro's history includes a significant fire in the winter of 1956. This event is recognized as the last block fire in town and is considered a small conflagration. On April 12, 2009, the Alton Bay Christian Conference Center complex caught fire, resulting in an 11-alarm fire and destroying more than 40 structures.

Location: Downtown Tilton is a small urban center with dozens of wood and masonry buildings from the 19th and early 20th century buildings. Lakefront communities, Jensen's Trailer Park (Hemlocks), New Franklin Apartments (elderly), Liberty Utilities.

Extent: Moderate

Downtown Tilton's Main Street is lined with commercial storefronts, many of which have upstairs apartments. The committee pointed out that numerous overhead wires here would severely hamper rescue efforts from upper stories of these buildings, especially those that back up to the Winnepesaukee River and therefore limited access from the back.

History: No local occurrences have been reported since the last plan update

Probability of Occurrence: Likely

Impact: Moderate

Conflagration is a greater threat to Tilton than wildfire as it does have so many in close proximity along with many older, wooden structures. The entire downtown area is susceptible to fire due to the age and proximity of the structures. Jensen's Trailer Park is an area of concern, along with the New Franklin Apartments (elderly housing). Liberty Utilities was noted as a place that could be impacted by fire. Assuming 1% town-wide damage to buildings, each year wildfire could result in \$5.1 million in damages.

TERRORISM

Events around the country demonstrate that one or more people intent on inflicting harm and terror on others can occur almost anywhere, not just in urban areas. This type of event can overlap with cyber events.

Extent: While the Lakes Region is known as a vacation destination, it does nevertheless have the potential to be the site of some incidents of terrorism. A determined individual intent on inflicting harm or terror might gain access to several sites where they could do harm to individuals or large groups of people. Potential target sites include the outlet mall, sometimes hosting thousands of people and the two school campuses where several hundred teens learn, play, and in the case of Tilton School, live. Committee members also noted that an explosion at the Exit 20 interchange would be quite disruptive to residents, visitors, and businesses.

History: No local incidents were identified.

Location: Heavily populated areas and places where people congregate are areas of concern. This includes the schools, the mall, and the J. Jill clothing facility, one of the largest employers in the state. Also, a fire or explosion at the I-93 Exit 20 intersection would disrupt a great deal of transportation activity.

Probability of Occurrence: Likely

Impact: Low/Moderate

An act of terrorism would not likely impact structures; rather the impact would be on individuals and businesses, especially those in the tourism sector. Damage to structures is not a likelihood. Only those sites with hazardous materials and the bridges over I-93 were identified by the committee.

HAZARDOUS MATERIALS

A hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors.⁴⁸

Extent:

Oil or chemical spills especially along US3/NH11 or NH 140 could result in the contamination of wells or waterbodies. There could also be fire or explosion associated with a materials accident. Much of the central portion of town sits atop a large, regional high-yield stratified drift aquifer.⁴⁹ Because of its position as an important intersection of transportation arteries for the Lakes Region and home to several distribution centers, there are thousands of vehicles with potentially harmful materials moving through Tilton on a regular basis.

History: No local incidents since the last plan were identified.

Location: Major roadways and railroad, especially in populated areas or near water bodies are areas of concern. The committee noted that a spill at the I-93 Exit 20 intersection would disrupt a great deal of transportation activity. US Route 3/NH Route 11 runs alongside Silver Lake and the Winnepesaukee River as well as running through the center of downtown as Main Street. The committee and Board of Selectmen noted that there are several industrial sites in this area that handle potentially toxic or explosive materials, including Liberty Utilities and 3M (pulp and paper).

Probability of Occurrence: Likely

⁴⁸ <https://www.ihmm.org>

⁴⁹ LRPC Tri-Town Aquifer, http://www.lakesrpc.org/documents/groundw/Aquifer_Fact_Sheet-TRITOWN.pdf.

Impact: Low

The release of hazardous materials either at one of the various businesses or along the various roadways in town or the railroad has the capacity to cause substantial damage. There are many variables that could affect the degree of impact, including the nature of the material, the location of the accident and its proximity to surface and groundwater, as well as structures. There are few places in Tilton where an unexpected release of hazardous materials would not have a substantial impact on the community.

A hazardous materials accident could impact the facility structures as well as staff on-site or local emergency response providers, especially if fire or explosion are involved. Knowledge of the materials involved and Site Emergency Operations Plans is helpful to local emergency response providers.

Additionally, the impact could be environmental. A 2007 report from NH Department of Environmental Services found that a reduction in water quality could lead to well over \$33 million of lost income to the Lakes Region along with hundreds of jobs.⁵⁰

AGING INFRASTRUCTURE

In Tilton, infrastructure includes roadways, power and communication lines, aging town buildings in downtown, and hook-ups to the regional sewer line.

Extent: Weak

History: There have been leaks in the roof in Town Hall, compromising records and services.

Location: Several state and local roadways have needed attention, especially US3/NH11.

Probability: Likely

Impact: Low

The major impact of poor or failing infrastructure will be the impact on services – either cumulative damage such as to vehicles travelling on poor quality roads or immediate such as loss or reduced services when a road fails, or records are lost.

CYBER EVENT

The Department of Homeland Security (DHS) defines a cyber incident as an event occurring on or conducted through a computer network that actually or imminently jeopardizes the confidentiality, integrity, or availability of computers, information or communications systems or networks, physical or virtual infrastructure controlled by computers or information systems, or information resident thereon.⁵¹

⁵⁰

<https://www.nhrivers.org/documents/Econ%20Study%20Brochure.pdf#:~:text=Estimates%20of%20Select%20Econ%20omic%20Val-%20ues%20of%20NH,fishing%2C%20boating%2C%20swimming%20and%20public%20drinking%20water%20supplie>s.

⁵¹ State Multi-Hazard Mitigation Plan https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf p. 177

Extent: Weak

The National Cybersecurity and Communications Integration center (NCCIC) classifies a cyber incident using a scoring system of zero to 100 using the following factors: Functional Impact

- Observed Activity
- Location of Observed Activity
- Actor Characterization
- Information Impact
- Recoverability
- Cross-Sector Dependency
- Potential Impact

History The Tilton Police Department did have a cyber event in 2020. Approximately 75 cyber incidents affecting New Hampshire's public sector were reported in 2017-2018.

Location Any location connected to the internet in the town of Tilton is at risk to a cyber event. Tilton is reliant on technology for regular municipal functions as well as emergency response. The locations that could pose the largest impact are the Police and Fire departments, the Town Hall, and the schools, along with critical communications infrastructure.

Probability: Likely

Impact: Low

The primary impact of a cyber event would be on emergency, municipal, and business services. The 2020 event at the Police Department resulted in the loss of some electronic records and required staff time to attempt retrieval.

TRANSPORTATION ACCIDENT

A transport accident is any accident that occurs during transportation, including passenger vehicles, tractor trailers, airplanes, and other modes of transportation.

Extent: Moderate

Several major highways run through Tilton, including I-93, US 3/NH 11, NH 132, and NH 140. The state routes carry average annual vehicle volumes ranging from 2,000 to more than 18,000 per day. The interstate carries more than 33,000 vehicles per day. The actual volume can be much higher depending on the season and individual events, such as Laconia's Motorcycle Week.

History: It was noted that there have been several fatalities at the SB exit ramp off I-93 (poor lighting and a difficult crossing).

Location: Several sections of US3/NH11 were noted as challenging, including downtown (Main Street), SB Exit 20 of I-93, and from Exit 20 to Mosquito Bridge.

Probability of Occurrence: Likely

Impact: Moderate

The primary impact of a transportation incident would be on response capabilities of emergency services. No quantitative calculations of impact were made as part of this plan. While any vehicular accident has the potential for injury and even death, the impact of a vehicular accident on its own is relatively small. The impacts of such an event increase when multiple accidents occur, when they occur along evacuation routes (which US3/NH11 is), or they occur in conjunction with other hazards. A major transportation accident along US3/NH11 can tie up traffic and could result in delays in some emergency services.

Summary

It is cost prohibitive to make the built environment resistant to the most devastating natural hazards that could occur, though reasonable measures can be taken to minimize loss of life and property damage. Tilton may be affected by an unavoidable extraordinary circumstance such as a violent earthquake, but historically, events of this magnitude have been infrequent. Those natural events that are common to the northeast also have common elements of concern for public safety. These include the potential for long-term power outages, the potential need for short-term sheltering facilities, and the availability of equipment and trained personnel. Key to loss prevention in these relatively common event scenarios is pre-event planning that critically assesses communications within the community, mutual aid resources regionally, public awareness and education, and emergency response training.

Non-Natural Hazards and Preparation/Response Actions

The table below lists the various Non-Natural Hazards that the Tilton HMP Committee felt that it was important to address, along with actions that address problems through preparation/response actions.

ID*	Hazard	Problem	Mitigation Actions	Mitigate/ Prep.Resp	Type	Estimated Cost	Source	Responsible Party
c	Terrorism	There are numerous potential target areas and groups in Tilton (industrial areas, schools, elderly, the mall).	Ensure that there is a high level of participation in the Tilton ALERT communications system. (1CallNow)	Prep.Resp.	Prep.Resp.	\$1,000 plus 60 staff hrs/yr	PD budget, outreach grant	EMD
i	All Hazards	Not all personnel potentially involved in emergency response have a clear understanding of their role.	Train all town employees to be NIMS certified. Ensure that staff are aware/involved with update to Em. Op. Plan	Prep.Resp.	Prep.Resp.	100 hrs staff time	Operating budget	EMD
d	Terrorism	There are numerous potential target areas and groups in Tilton (industrial areas, schools, elderly, the mall).	Conduct outreach to the business and non-profit community regarding steps that they can take to protect their facilities and people.	Prep.Resp.	Prep.Resp.	60 staff hrs/yr	PD budget, outreach grant	EMD
h	Hazardous Materials Accident	Major roadways run near waterbodies and over the aquifer. A spill could quickly impact drinking water and recreational water.	Ensure that adequate initial response equipment is available, and that coordination is maintained with the Central NH HazMat Response Team.	Prep.Resp.	Prep.Resp.	\$20,000	Op. Budget/grant	FD
g	Hazardous Material Accident	If hazardous materials are in the floodplain, the facilities for storing them should be inspected. There are no standards for inspection.	Develop an inspection standard to ensure proper safety precautions are met for hazardous material location in the floodplain	Mitigate	Local Plans and Regs	20 hrs/yr	Operating Budget	FD/Land use
F	All Hazards	Maintaining communication with the public is important, for both prevention and during an emergency. While regular updates is a simple process, it does require some PD or Town staff time.	Maintain the NH ALERTS system	Prep.Resp.	Educ./ Awareness	20hr /yr	Operating Budget	PD/Town Hall
a	Earthquake/ Fire- Conflagration	Tilton's older, multi-story buildings downtown could be impacted in a significant earthquake	Require sprinklers in downtown buildings.	Prep.Resp.	Local Plans and Regs	100 hrs staff time		PB/ FD
f	Hazardous Material Accident	Tilton Highway Dept. staff are exposed to hazardous materials due to poor ventilation on the garage.	Install exhaust ventilation system to reduce worker exposure to harmful chemicals in Hwy Dept building	Mitigate	Struct./ Infrastr.	\$35,000	Warrant art. & grant	DPW

ID*	Hazard	Problem	Mitigation Actions	Mitigate/ Prep.Resp	Type	Estimated Cost	Source	Responsible Party
k	All Hazards	There are still some road names that have not been approved through the 911 system; this could cause confusion.	Work with Dept of Safety 911 Mapping to fix known problems with GIS road data to limit confusion in emergency planning and response.	Prep.Resp.	Prep.Resp.	20 hr staff time	Operating budget	EMD
G	Earthquake	Tilton's older, multi-story buildings downtown could be impacted in a significant earthquake	Develop resource list for Code Enforcement to use.	Prep.Resp.	Local Plans and Regs	20 hours	Operating Budget	PB / Land Use
U	Wildfire	Insufficient access to water limits the ability of the Fire Department to fight fires in some areas of town.	Work with Fire District to identify the needs regarding dry hydrants	Prep.Resp.	Prep.Resp.	40 staff hrs/yr.	Operating Budget	FD
e	Terrorism	Local data and communications may be at risk due to inadequate security.	Improve security to the switching hub on Prospect St, which houses fiber-optic cables	Mitigate	Educ./ Awareness	60 hr/yr	Op. Budget/ grant	EMD