

Plan Expires September 7, 2023

# Town of Boscawen

## New Hampshire

### Hazard Mitigation Plan Update 2018



Goodhue Road Washout after Paving,  
Severe Storm & Flood of October 2017  
Photo courtesy of: Public Works Department

**Adopted by the Boscawen Board of Selectmen  
August 22, 2018**

**NHHSEM/FEMA Approved September 7, 2018**

# Town of Boscawen New Hampshire

Plan Expires September 7, 2023

## Hazard Mitigation Plan Update 2018

Selectmen Adopted August 22, 2018

NHHSEM/FEMA Approved September 7, 2018



### Town of Boscawen

116 North Main Street

Boscawen, NH 03303

Phone: (603) 753-9188

Police Department Phone: (603) 753-9124

[www.townofboscawen.org](http://www.townofboscawen.org)

### Central NH Regional Planning Commission (CNHRPC)

28 Commercial Street, Suite 3

Concord, NH 03301

Phone: (603) 226-6020

[cnhrpc.org](http://cnhrpc.org)



### NH Department of Safety

NH Homeland Security and Emergency Management (NHHSEM)

33 Hazen Drive

Concord, NH 03305 (Mailing Address)



### Incident Planning and Operations Center

110 Smokey Bear Blvd

Concord, NH 03301 (Physical Address)

Phone: (800) 852-3792 or (603) 271-2231

[www.nh.gov/safety/divisions/hsem](http://www.nh.gov/safety/divisions/hsem)

<https://apps.nh.gov/blogs/hsem>



### US Department of Homeland Security

Federal Emergency Management Agency (FEMA)

99 High Street, Sixth Floor

Boston, Massachusetts 02110

Phone: (617) 223-9540

[www.fema.gov](http://www.fema.gov)

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## **1 PLANNING PROCESS**

The Town's Hazard Mitigation Committee reformed to rewrite the Plan into a more concise format and to incorporate the newest material required by FEMA in addition to updating the Town's newest information since 2012. This Planning Process Chapter contains information previously available in the Introduction Chapter of the **Plan Update 2012**. Expanded public participation steps were taken and a new plan development procedure was used as documented in the Methodology section.

### **Certificate of Adoption, 2018**

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Town of Boscawen, NH  
Board of Selectmen  
116 North Main Street  
Boscawen, NH 03303

#### **A Resolution Adopting the Boscawen Hazard Mitigation Plan Update 2018**

WHEREAS, the Town of Boscawen has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the **Hazard Mitigation Plan Update 2018** including but not limited to flooding, high wind events, severe winter weather, and fire, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Boscawen has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its **Hazard Mitigation Plan Update 2018** under the requirements of 44 CFR 201.6; and

WHEREAS, public and Committee meetings were held between **October 2017** through **May 2018** regarding the development and review of the **Hazard Mitigation Plan Update 2018**; and

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

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



## **Town of Boscawen, NH Hazard Mitigation Plan Update 2018**

### **1 PLANNING PROCESS**

RESOLVED by Town of Boscawen Board of Selectmen:

The **Hazard Mitigation Plan Update 2018** is hereby adopted as an official plan of the Town of Boscawen; The respective officials identified in the mitigation action plan of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;

Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution; and

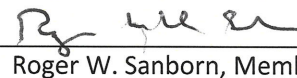
An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by the Emergency Management Director or designee.

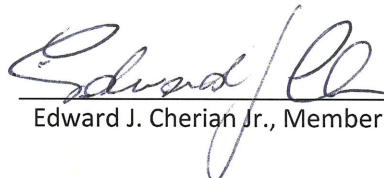
IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Boscawen this 22nd day of August, 2018.

ATTEST

**Board of Selectmen**

 8-22-18  
Mark E. Varney, Chair date

 8-22-18  
Roger W. Sanborn, Member date

 8.22.18  
Edward J. Cherian Jr., Member date

**Town Clerk**

  
Cheryl Mitchell, Town Clerk

## Plan Process Acknowledgments

The Board of Selectmen-appointed Hazard Mitigation Committee was comprised of these individuals on behalf of their respective Departments, Boards or Committees who met between **October 2017** through **May 2018** to develop the **Boscawen Hazard Mitigation Plan Update 2018**:

- **Shawn P. Brechtel**, Boscawen Emergency Management Director
- **Edward J. Cherian Jr**, Boscawen Zoning Board of Adjustment Chair (former), Board of Selectmen Member, Budget Committee Member
- **Bruce Crawford**, Boscawen Planning Board Chair (former) and Penacook Boscawen Water Precinct Commissioner, Budget Committee Member Alternate
- **Adam Egonis**, Boscawen Public Works Crew, Fire Department Member, Penacook Rescue Squad Volunteer, Cemetery Committee Member
- **Kellee Jo Easler**, Boscawen Planning & Community Development Assistant, Hazard Mitigation Staff Coordinator
- **Ray Fisher**, Boscawen Fire Department Chief, Life Safety Officer
- **Alan Hardy**, Boscawen Co-Town Administrator, Code Enforcement Officer
- **Dean Hollins**, Boscawen Public Works Director
- **Nicole Hoyt**, Boscawen Co-Town Administrator, Tax Collector
- **Jason Killary**, Boscawen Police Department Lieutenant

The following Central NH Regional Planning Commission (CNHRPC) staff contributed to the development of the Hazard Mitigation Plan Update:

- **Stephanie Alexander**, CNHRPC Senior Planner
- **Craig Tufts**, CNHRPC Principal Planner (GIS mapping)
- **Samuel Durfee**, (former) CNHRPC Assistant Planner

Members of the public\* **(3)** and other individuals attended one or more Committee meetings and/or contributed information to the content of the Plan:

*\* member of the public*

- **Beverly Drouin\***, Boscawen Congregational Church Trustee
- **Edward (Ted) Merrow\***, NH State Veterans Cemetery Assistant Superintendent of Grounds
- **Shawna-Leigh Morton**, NH Homeland Security and Emergency Management (NHHSEM)
- **Fred Reagan**, Merrimack Valley School District Facilities Supervisor
- **Ronald Reed\***, Boscawen Congregational Church, Trustee and Historian
- **Mark E. Varney**, Boscawen Board of Selectmen Chair, Deputy Emergency Management Director, Planning Board Member Ex-Officio

*\* "Member of the public" means a person who is not a Town, School, state, or federal government staff member or other staff person paid for by local tax dollars, and who is not a current Town volunteer.*

## Authority

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In 2000, the President enacted the Disaster Mitigation Act 2000 (DMA) which requires states and municipalities to have local adopted and FEMA approved natural hazard mitigation plans in place to be eligible for disaster and mitigation funding programs such as the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) programs, including Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, and Pre-Disaster Mitigation Program. New Hampshire is awarded funds based upon the completeness of its State Plan and the number of local plans.

As a result of the DMA, funding was provided to state offices of emergency management, including the New Hampshire Homeland Security and Emergency Management, to produce local (municipal) hazard mitigation plans. To remain in compliance with the DMA, the Town of Boscawen is required to submit for FEMA approval a revised **Hazard Mitigation Plan Update** every five years.

The New Hampshire Homeland Security and Emergency Management (NH HSEM) produced its latest *State of New Hampshire Hazard Mitigation Plan 2013* in 2013. The development of the State's Plan allows for New Hampshire to receive funding programs to provide to communities in the event of disasters or for mitigation.

Prior versions of the Town's Hazard Mitigation Plan are noted in the **Final Plan Dates** section. A 2016 Pre-Disaster Mitigation (PDM) grant provided 75%/25% funding for the Town to update its prior Plan through the Central NH Regional Planning Commission. The 25% match required by the Town was provided by in-kind staff and volunteer time and labor.

This **Boscawen Hazard Mitigation Plan Update 2018** has been developed in accordance with the Disaster Mitigation Act of 2000 and the *FEMA Local Mitigation Plan Review Guide, October 1, 2012* and effective one year later. The most recent Plan development standards provided by FEMA Region I have also been incorporated. The planning effort of the Town is a regular process and this Plan is considered to be a "living document."

The 2018 Boscawen Hazard Mitigation Committee was established by the Board of Selectmen in fall 2017 and guided the development of the Plan. The Committee consisted of the Town's Emergency Management Director, Town Administration, Planning and Land Use Coordinator, Police Department, and Board of Selectmen representatives.

The attendees of the meeting process are noted in the **Acknowledgements**. The Central NH Regional Planning Commission, of which Boscawen is a member, contributed to the development of this Plan by facilitating the meeting and technical processes, working with the Committee and its members to obtain information, preparing the document, and handling the submissions to NH Homeland Security and Emergency Management and FEMA.



## Methodology

The **Boscawen Hazard Mitigation Plan Update 2018** was developed over a six-month period, with a group of Town staff members and volunteers and the CNHRPC comprising the majority of the Hazard Mitigation Committee. The 2018 methodology for Plan development is summarized in this section. The Hazard Mitigation Plan is designed differently from the **2012 Plan** with the intent to shorten the Plan for utility purposes, with easier updating and implementation while meeting FEMA's requirements. The Plan roughly follows the *FEMA Local Mitigation Planning Handbook, 2013* by using its terminology and some of its tasks, ensuring **Boscawen's Plan Update 2018** begins to follow a standardized approach to Plan construction and content endorsed by FEMA. Many of the vital sections of the **2018 Plan Update** will be contained in the **10 APPENDICES** for easier display, usage, sharing, and update.

## Meetings and Duties

The meetings and tasks of the Hazard Mitigation Committee were dictated by Agendas and how much the Committee was able to complete for each Agenda is displayed in **Table 1**. Work Sessions were designed to accomplish what could not be completed at meetings due to time constraints.

**Table 1**  
**Meeting Schedule and Agenda Activities**

Meeting	Date	Agenda Activities – See APPENDIX C
<b>Meeting 1</b>	10-23-17	Discuss Process and Schedule, Hazard Risk Assessment, Critical and Community Facilities Vulnerability Assessment, Review & Revise Maps 1-2-3, Schedule Meetings
<b>Work Session 1</b>	11-13-17	Hazard Risk Assessment, Critical and Community Facilities Vulnerability Assessment, Review & Revise Maps 1-2-3
<b>Meeting 2</b>	11-27-17	Review & Update Goals and Objectives, Critical and Community Facilities Vulnerability Assessment, Review Former Existing Measures -> Now Capability Assessment, Develop List of Existing Mitigation Plans and Documents
<b>Work Session 2</b>	12-18-17	Finish Critical Facilities Vulnerability Assessment, Capability Assessment, List of Existing Mitigation Plans and Documents
<b>Special Workshop 1</b>	01-11-18	Finish Capability Assessment with Departments by appointment
<b>Meeting 3</b>	02-05-18	Review & Revise 2012 Actions, Develop New Actions from Problem Statements (Community Vulnerability Assessment) and Capability Assessment's Future Improvements, Determine 2012 Actions' Status, Determine Action Timeframe
<b>Work Session 3</b>	03-05-18	Work with Actions from Problem Statements, Begin List of Actions
<b>Work Session 3.2</b>	03-19-18	Finalize Actions from Problem Statements, Finalize List of Actions, Determine Action Timeframe, Cost, Responsibility, Prioritize Actions using STAPLEE

Meeting	Date	Agenda Activities – See APPENDIX C
<b>Meeting 4</b>	05-07-18	Review Draft Hazard Mitigation Plan Components (onscreen), Review Sections in Need of Information, Review Outstanding Data and Assignments
<b>Work Session 4</b>	05-14-18	Review Entire Draft Hazard Mitigation Plan, Appendices, and Maps, Prepare for Public Information Meeting, Review Plan Approval Process
<b>Public Information Meeting</b>	05-30-18	HMC members present sections of the Plan to members of the public in a question and answer format. Describe hazards and mitigation Actions. Maps will be available.

*Source: Boscawen Hazard Mitigation Committee Agendas, 2017-2018*

For each meeting, all meeting attendees signed attendance sheets and meeting match timesheets, documenting their time at the meetings. The Committee members worked to complete the Agendas, including developing the **Hazard Risk Assessment**, **Critical and Community Facilities Vulnerability Assessment**, **Capability Assessment**, and **Mitigation Action Plan**, completing the **STAPLEE Action Prioritization**, etc. along with input from members of the public and guests. The agendas and attendance sheets are included in **APPENDIX C** of the Plan.

The specific meeting tasks are described in detail on the Agendas in **APPENDIX C**. CNHRPC staff facilitated the Committee meetings and Work Sessions. Information needed on the Agenda Tasks indicated above was collected from any attendees present, including any members of the public, by CNHRPC, during discussions among attendees. The new and updated information was described in each Chapter under the **2018 Plan Update** section. Maps were reviewed and updated by the Committee and guests and revised in a Geographic Information System (GIS) by CNHRPC.

In between meetings, Town staff and volunteers and CNHRPC staff researched and collected information for the Chapters. CNHRPC updated and rewrote Chapters, tables, and sections as appropriate. The Chapters were also updated by revising the document to the current FEMA standards.

### **Opportunity for Public Participation**

#### Who is a Member of the Public?

For the purposes of this Plan, **“a member of the public”** or **“the public”** means:

Anyone who is not a Town of Boscawen, School District, County, State, or federal government employee; anyone who is not paid for services by Town tax dollars; and anyone who is not a current Town volunteer.

#### Public Input from the Hazard Mitigation Committee Meetings

The public notification is described in the Public Outreach Strategy sidebar. Three (**3**) members of the public regularly attended the meetings as indicated in the **Acknowledgements** and by the Attendance Sheets in **APPENDIX C Meeting Information**. The May 30, 2018 Public Information Meeting was well attended. Members of the public assisted with completing the Agendas, including developing the **Hazard Risk Assessment**, **Critical and Community Facilities Vulnerability Assessment**, **Capability Assessment**, and **Mitigation Action Plan**, completing the new

**Enhanced STAPLEE Action Prioritization**, etc. along with the Committee members. The general public had the opportunity to attend and participate in the **10** posted meetings or to contact the Staff Coordinator for more information.

#### **Public Input from the Public Information Meeting**

The **Public Information Meeting (PIM)** was held on May 30, 2018. The Hazard Mitigation Committee members presented portions of the Plan and had the Maps available for display. The agenda and attendance sheet are included in **APPENDIX C**. Held during the semi-monthly Board of Selectmen's meeting, the PIM involved **several** members of the public who listened to presentations, asked questions and had the opportunity to review the final draft Plan document, Appendices and Maps.

#### **Public Input from the Board of Selectmen**

##### **Adoption Meeting**

The Board of Selectmen meeting to adopt the **Hazard Mitigation Plan** was held on August 22, 2018. Although the Plan's APA had been received, the Board permitted public comment prior to adoption although Plan changes could not be made at this time. Discussion was held prior to the unanimous adoption of the Plan by the Board.

#### **Completion of the Plan Steps and Dates**

On May 30, 2018, the Committee held the **Public Information Meeting**. The same extensive public notification described in the Public Outreach Strategy sidebar occurred to obtain review and comment from the public for the Plan.

On June 15, 2018, this Plan, Appendices and Maps were submitted to the NH Homeland Security and Emergency Management (NHHSEM) for

#### **Public Outreach Strategy**

Many individuals were personally invited to attend and participate in the Boscawen Hazard Mitigation Plan Committee meetings. They included local businesses, Boscawen School District, Boscawen Congregational Church, State Veterans Cemetery, Penacook-Boscawen Water Precinct, Town Boards. Unitil and Eversource were invited but they have policies not to attend general meetings. The NH Homeland Security and Emergency Management (NHHSEM) Field Representative was also invited and attended some of the meetings.

The Hazard Mitigation Committee itself was comprised of most primary Town Departments, including Town Administration, Police, Land Use, Board of Selectmen and Emergency Management.

The public process for this Plan included posting the public notices in local newspapers (monthly Merrimack Voice, serving 11 local towns/7500 residences) and the Concord Monitor (regional daily paper, over 40 towns) and posting at the Municipal Building. All interested parties were invited to participate, including media, residents, businesses, organizations, local communities, non-profits, and State and federal agencies. The meeting notices were posted on the Town's online calendar and website at [www.townofboscawen.org](http://www.townofboscawen.org) on the Municipal Building bulletin board and at the Library. All local interests had an opportunity to attend and participate in the meetings. Copies of publicity for the Plan are included in **APPENDIX C**.

The Central NH Regional Planning Commission, a quasi-governmental regional organization of which Boscawen is a member, contributed to the development of this Plan by facilitating the meetings and guiding the planning process, and preparing the Plan documents, Appendices, and Maps.

As a final attempt to obtain additional public input, a specially noticed Public Information Meeting was held on May 30, 2018 at a Board of Selectmen's meeting at which many members of the public participated. This meeting was publicly noticed at the Town Office bulletin boards (upstairs and downstairs) and on the Town's website. Paper copies of the Plan were available for review, and CDs were also available, in advance of the meeting. The attendees and publicity of the public planning process are noted in the **Acknowledgements**.

compliance review and revision to apply for Approved Pending Adoption (APA) status, also known as conditional approval.

On August 9, 2018, Boscawen received an **Approved Pending Adoption (APA)** notification from NHHSEM. The APA states the Plan will be approved by FEMA after proof of adoption by the local governing body, a Certificate of Adoption from the Board of Selectmen, is submitted.

On August 22, 2018, the Board of Selectmen **adopted the Hazard Mitigation Plan Update** for the Town at a duly noticed public meeting. Copies had been made available at the Town Office and on the Town Website for public review. Copies of the public notice and flyers are included in **APPENDIX C**. The signed Certificate of Adoption was sent to NHHSEM/FEMA.

On September 7, 2018, Boscawen received a **Notification of Formal Approval** from NHHSEM, with the Plan approval granted effective that day. A **Letter of Formal Approval** from FEMA confirming the notification was received. The next Hazard Mitigation Plan update is due five (5) years from this date of approval, on September 7, 2023.

### Final Plan Dates

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

**Table 2**  
**Plan Adoption History**

Year of FEMA-Approved Hazard Mitigation Plan	Adoption by Boscawen Board of Selectmen	NHHSEM/ FEMA's Formal Approval	Plan Expiration
Original 2007	08/22/07	10/17/07	10/17/12
Update 2012	11/14/12	12/04/12	12/04/17
Update 2018	08/22/18	09/07/18	09/07/23

## **2 COMMUNITY PROFILE**

It has been over five years since the last Plan was written, with the new decennial Census 2010 having been taken. The best available new data has been used in this Chapter to portray the population, housing, and overall demographic picture of present day Boscawen. The former **Relation to Natural Hazards** section has been updated within **4 HAZARD RISK ASSESSMENT** as **Built Environment Changes**. The tables clearly identify the facilities in Town and which natural, human, and technological hazard events could most likely occur in those areas, as described in **5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION**.

A simplified description of how the Town's population and housing have grown within the last four decades follows. Relationships of the locations of people and buildings to natural hazard events are generally explored. Examination of this information will allow the Town to better understand the land use and demographic trends within its borders and how emergency and preventative services can best serve the growing and changing population and landscape.

### **Geographic Context**

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The Town of Boscawen is located in Central New Hampshire within Merrimack County. The Town is bordered by the Town of Salisbury and the City of Franklin to the north, the Towns of Northfield and Canterbury to the east, the City of Concord to the south, and the Town Webster to the west. The State's capital of Concord is about 6-8 miles from the Boscawen Municipal Facility along US Route 3, or a bit further along I-93. In northern Concord, just on the Boscawen town line is the village of Penacook, a historic, redeveloped high density area with a hydroelectric dam on the Contoocook River as it empties into the Merrimack River. Boscawen has a rich industrial history here too, and Penacook is often mistaken as part of Boscawen. The Town shares Exit 16 with Concord and Canterbury across the Merrimack River to quickly access the highway. Following US 3 north, travelers can enter the City of Franklin. Along the King Street Corridor, US Route 3 and US Route 4 split at the Boscawen Congregational Church and (former) Old Town Hall. US 4 travels north into Salisbury. Portions of an old railroad corridor along the Merrimack has been converted into a rail trail. Boscawen's accessibility, rural character with farms, forests and the Merrimack River, and existing industry make it a prime location for residences and businesses alike.

The Contoocook River flows northeast from Concord into the Merrimack River in Boscawen at the hydro dam along the Penacook (Concord) border. The Merrimack River meanders along the entire eastern border of Boscawen, lining large agricultural lands and floodplains alike. The wide, fairly shallow stretch



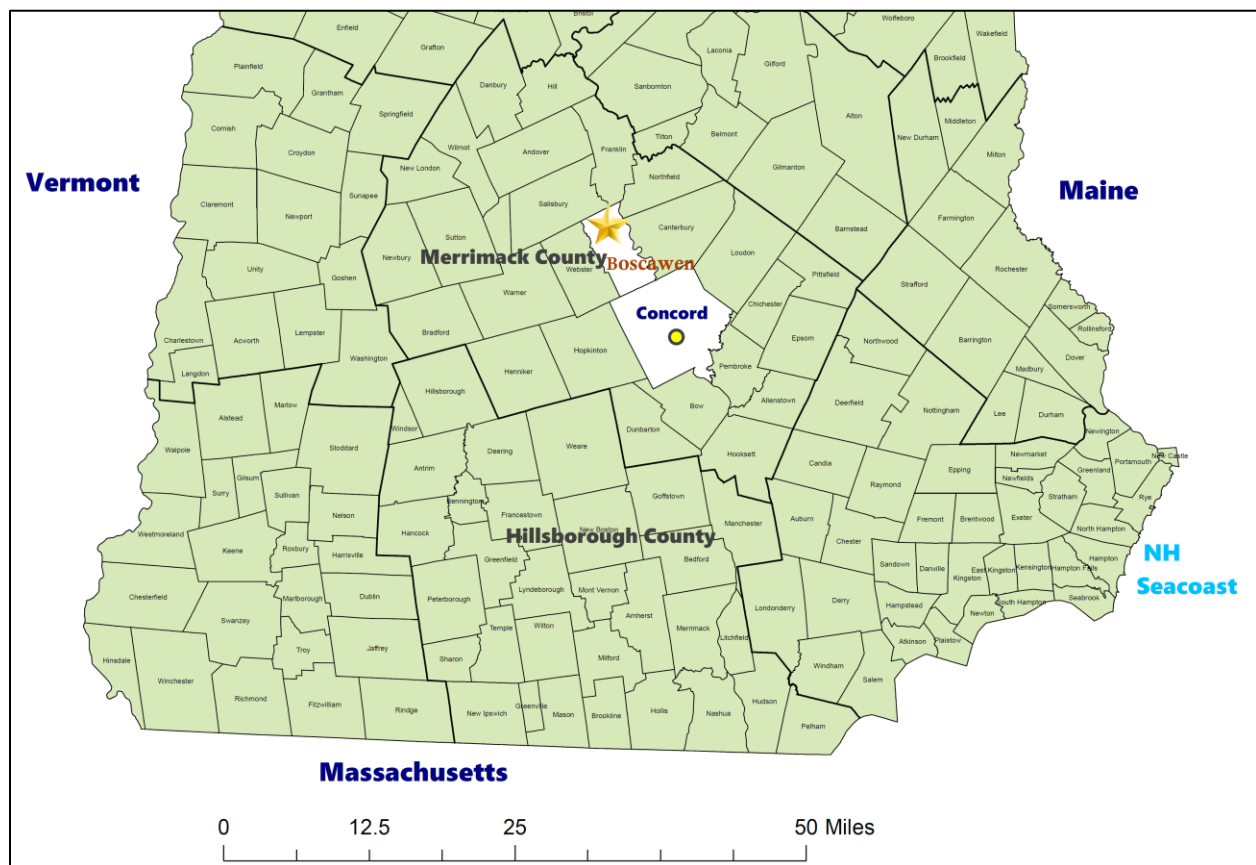
of river through Boscawen is actively used by boaters and recreationalists. Boat ramps are located at the Hannah Dustin site, at Jamie Welch Park, and at the Merrimack County Correctional Facility.

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

Concord is about 50 miles from the Massachusetts state border, the Vermont state border, the Maine state border, and the seacoast traveling along New Hampshire's Interstates, US Routes, NH Routes, and local roadways. Boscawen is also at the geographical midpoint between Maine and Vermont.

Boscawen's context within Merrimack County and the State of New Hampshire are shown in **Figure 1**.

**Figure 1**  
**Boscawen in the State**

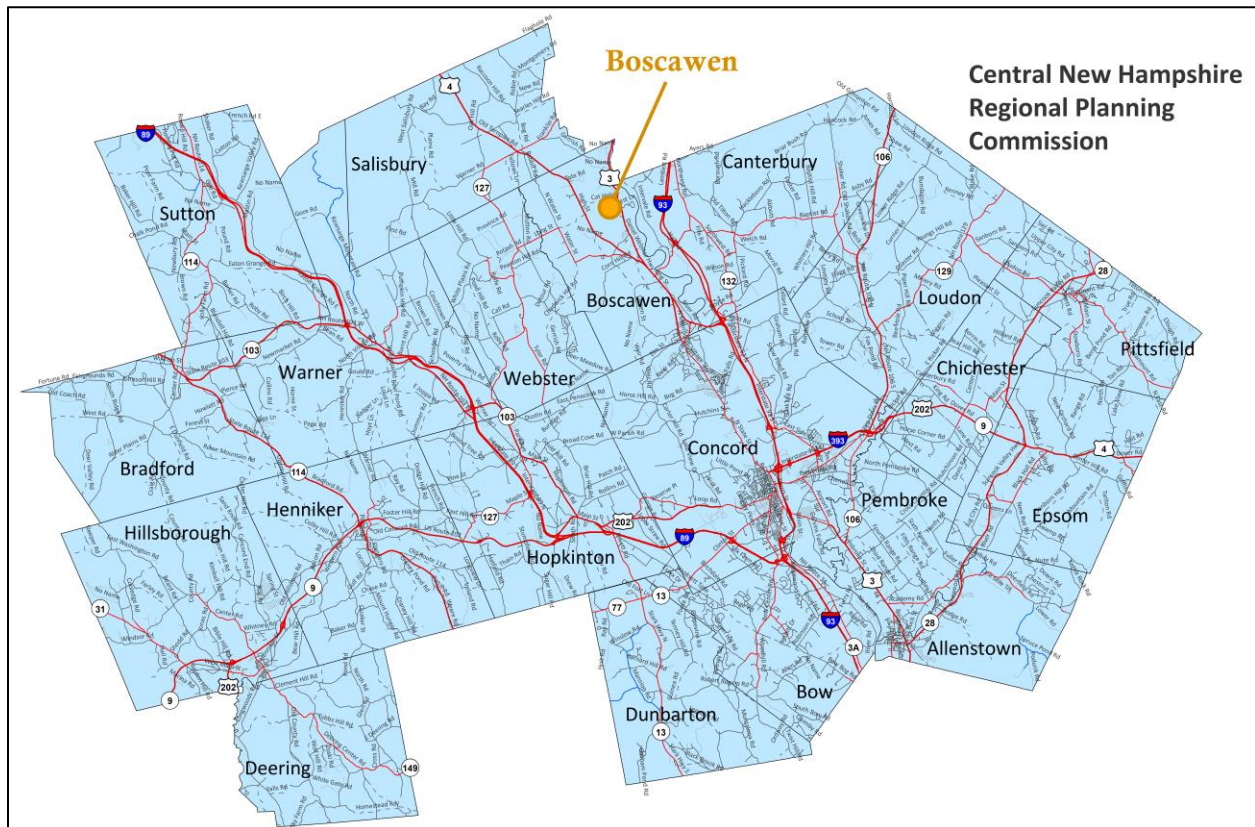


*Source: Central NH Regional Planning Commission*

Boscawen is closely associated with the Central NH Region, one of the nine legislatively-boundaried planning regions in the State. The Town is a voluntary member of the Central New Hampshire Regional Planning Commission. The **19** Towns and **1** City comprising the Central NH Region contain several major rivers and important highways. The Blackwater River and Warner River flow into the Contoocook River. The Contoocook River flows in a north-easterly direction through Hillsborough, Henniker, Hopkinton, Concord, and Webster until its confluence with the Merrimack River in Boscawen/ Penacook. The Contoocook and the Merrimack Rivers effectively bisect the region into three sections. The Soucook River flows south through Loudon along the Concord/Pembroke border and enters the Merrimack River. The Suncook River originates in Belknap County, flowing south through Pittsfield, Chichester, Epsom, Pembroke, and Allenstown until it also converges into the Merrimack River in Bow.

In the Central NH Region, Interstates 89, 93 and 393 stretch in north, northwest, east, and south directions, meeting in Concord and Bow. Major traffic routes of US Route 3 travels north-south and US Routes 4/202 traverses in an east-west direction. Boscawen hosts a branch of US 3 & US 4, both of which travels the entire north-south length of the Town. Dozens of state highways crisscross the entire region. A map of the Central NH Region and its major routes is displayed in **Figure 2**.

**Figure 2**  
**Boscawen in the Region**



*Source: Central NH Regional Planning Commission*

## Population and Housing Growth

The Boscawen Master Plan was adopted in **February 2002**, developed by the Planning Board with assistance from the CNHRPC. Chapters include detailed information on History and Culture; Population and Economics; Housing; Conservation, Preservation, and Open Space; Community and Recreational Facilities and Utilities; Transportation; and Existing and Future Land Use. The Master Plan influences the Zoning Ordinance and the Subdivision and Site Plan Review Regulations along with the Capital Improvements Program.

The following tables in contain the newest available data on housing and population growth which depict development trends over time. Shown in **Table 3**, Boscawen's population and housing increases have remained relatively constant over the decades, varying only as much as **8.6%** in the **1970-1980** decade. The estimated **2016** population and housing units, based off the **2010** Census, counted **3,952** people and **1,513** housing units in Boscawen.

**Table 3**  
**Overall Population and Housing Growth Trends in Boscawen, 1970-2016**

Growth	Population	Net Change		Housing Units	Net Change	
		#	%		#	%
1970 Census	3,162	N/A	0	912	N/A	0
1980 Census	3,435	273	8.6%	1,114	202	22.1%
1990 Census	3,586	151	4.4%	1,221	107	9.6%
2000 Census	3,672	86	2.4%	1,295	74	6.1%
2010 Census	3,965	293	8.0%	1,453	158	12.2%
Total Change from 1970 – 2010 Census	---	803	25.4%	---	541	59.3%
2016 Population & Housing Estimates*	3,952	-13	-0.3%	1,513	60	4.1%
46 years of Increase		+790 People			+601 Housing Units	

Sources: 1970-1990 US Census CPH-2-31 Table 9 Population and Housing Unit Counts;

US Census 2000 & 2010 Data \*includes all housing units, including vacant and seasonal and 2016 Group Quarters (562) . NH Office of Strategic Initiatives (NHOSI) Population Estimates, Aug 2016, NHOSI Current Estimates and Housing Trends 2010-2016, Dec 2017

In **Table 3**, Boscawen's **2010** Census population of **3,965** shows an overall increase of about **25%** in population over the previous four decades, up from **3,162** people in **1970**. Between **2000-2010**, the Town's population increased by **8.0%** (**293** people). The population growth numbers and percentages in Boscawen are much lower than other small communities in the Central NH region. During the last decade, little development occurred in the Region and in one community a large decline was noted over these last 10 Census years.

The growth of housing units in Boscawen has always been higher than the respective population rates since **1970**. The Town grew from **912** units in **1970** to not quite double that number in **2010**, totaling

**1,453** units, an overall growth rate of **59%**. Between **2000-2010**, housing increased by **12%** (**158** units). These housing rate increase are more comparable to the other small communities in the Central NH region than population, but still lower.

The number of people per housing unit has continued to decline from its high of **3.5** people in **1970** to **2.7** people per housing unit in **2010**. These are both high numbers of people per units in the Central NH Region. The influence of the Merrimack County Correctional Facilities and Nursing Home (Group Quarters population of **562** in **2016**) has helped keep these figures high. Boscawen's overall growth since **1970** has increased by **790** people and **601** homes by **2015**.

A good measurement of community population and housing change is population density, or how many people live in a square mile of land area. As displayed in **Table 4**, the overall population density between 1970 and 2010 has increased about **25%**, from **127** people per square mile in **1970** to **144** people in **1990** and to **169** people in **2010**. Boscawen is geographically the smallest community in the Central NH region at **24.9** square miles, and combined with the Group Quarters population, the number of persons per square mile is high compared with other small Central NH towns.

**Table 4**  
**Population Density in Boscawen, 1970-2016**

Municipality Size		Persons per Square Mile					
Land Acreage	Land Area in Square Miles	1970	1980	1990	2000	2010	2016
15,936	<b>24.9</b>	127	138	144	147	159	159

Sources: **Table 3**, Office of Strategic Initiatives GIS acreage calculations, 2013

With the small community in land area at **24.9** square miles in size, development opportunities are limited primarily to the existing built environment and the highly forested and agricultural areas of the community. In **Table 5**, Boscawen's new home and building construction permits over the last **6** years are higher than expected. Between **2012-2017**, a total of **22** new construction permits for single family homes were issued, averaging less than **4** permits per year. During this same time period, **51** new construction permits were issued for multi-family homes, **9** new permits for manufactured homes and **3** new permits for non-residential buildings. The most active year was **2016** when **50** multi-family permits were issued. The six-year total was **85** new building construction permits issued, higher than in most local small communities.

**Table 5**  
**New Construction Permits Issued by Building Type, 2012 – 2017**

Building Type	2012	2013	2014	2015	2016	2017	6-Year Totals
Single Family Homes	0	5	1	4	2	10	22
Multi-family Homes	0	0	1	0	50	0	51
Manufactured Homes	0	1	0	5	3	0	9
Non-Residential Buildings	1	0	0	1	1	0	3
<b>Totals</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>10</b>	<b>56</b>	<b>10</b>	<b>85</b>

*Source: Town of Boscawen Annual Building Permit Spreadsheets, 2012-2017; NH Office of Strategic Initiative Trends in Housing Supply, 2010-2016*

It is important to note that the number of permits issued does not necessarily equate to buildings constructed. The NH Office of Strategic Initiative (NH OSI) estimates between **2012-2016, 58** new housing units overall were built, which differs from the **72** new permits recorded by the Town. This means approximately **14** of the **72** new home construction permits issued were not used.

## Land Use and Zoning

According to NH Office of Strategic Initiative's **2013** geographic information system (GIS) calculations, Boscawen has a total land area of **15,936** acres, or **24.9** square land miles. An additional **339** acres (about **0.5** square miles) is water area. The acreage figure is not comparable to the recent **2018** MS-1 reporting calculation of **21,441** land and water acres for the Town. This is mainly because certain acreages are posted in more than one land use category for taxation purposes. Alternatively, certain dual-use acreages are placed into only one category when they fit into more than one. Reviewing the assessing information closely should clarify the answer as to why this large discrepancy exists. Small differences between the actual taxable land calculations from the assessing records and the acreage from the basic GIS calculations are not unusual.

For New Hampshire and specifically the Central NH Region, Boscawen is considered a small-sized community in terms of land area. Boscawen's proportion of residential land and commercial land are similar to many small towns in the region. The Town's main differences with the average Central NH community are increased farmland acreage, increased exempt acreage because of the Merrimack County facilities, and decreased forested land acreage. The Town of Boscawen is highly rural and forested, so here is one situation where land use categorization does not accurately reflect the acreage situation on the ground.

**Table 6** provides a snapshot of the Town's **2018** land use data provided by **Avitar Associates**. Residential land use is the most extensive land use type, comprising **46%** of the Town's land area. Forested land, both with and without steward ship (**27%**) is followed exempt institutional land (**12%**), followed by



farmland (**7%**). Commercial land (**4%**) and wetlands (**4%**) share similar acreages. Utilities land and unproductive land are both **<1%**.

**Table 6**  
**Land Use Acreage, 2018**

Land Use Category 2018	Acre	% of Town
Residential Improved	9,906	46.2%
Commercial Improved	815	3.8%
Utilities	1	0.0%
Exempt	2,659	12.4%
Farm Land	1,392	6.5%
Forest Land	3,313	15.5%
Forest Land with Stewardship	2,350	11.0%
Unproductive	72	0.3%
Wet	933	4.4%
<b>Total</b>	<b>21,441</b>	<b>100.00%</b>

*Source: Avitar Assessing Software MS-1 Report, Jan 2018*

The perspective of the Town's Zoning Districts offers another way to view how the land is utilized within Boscawen in **Table 7**. A full table of uses is available within the Zoning Ordinance which states which uses are allowed within each district. A table of dimensional and density regulations pertaining to water and sewer, lot frontages and lot sizes, and minimum pervious surfaces complement the table of uses.

**Table 7**  
**Zoning Districts, 2018**

Zoning District	Abbreviation
Agricultural-Residential	A-R
Residential-Low Density	R-1
Residential-Medium Density	R-2
Commercial	C
Industrial	I
Mill Development District	MRD
Village District	VD
Zoning Overlay District	Abbreviation
Floodplain Development District	SFHA

*Source: Town of Boscawen Zoning Ordinance, March 2018*

The overlay districts are superimposed upon the zoning districts so additional regulations shall apply. For any conflicting regulation, the more restrictive shall apply. The Zoning Ordinance has sections amended every year at the annual March Town Meeting and is vigorously used and applied by the Land Use Department.

The community's **Built Environment Changes** describe how and where the community has grown, to which hazards vulnerable areas are susceptible, and states the overall change in hazard vulnerability in **4 HAZARD RISK ASSESSMENT**.



Boscawen Municipal Facility, 116 North Main Street

### 3 GOALS AND OBJECTIVES

The overall purpose of this Plan is to reduce future life and property losses caused by hazard events before they occur by the identification of appropriate **Actions** that are implemented during the five-year duration of this Plan.

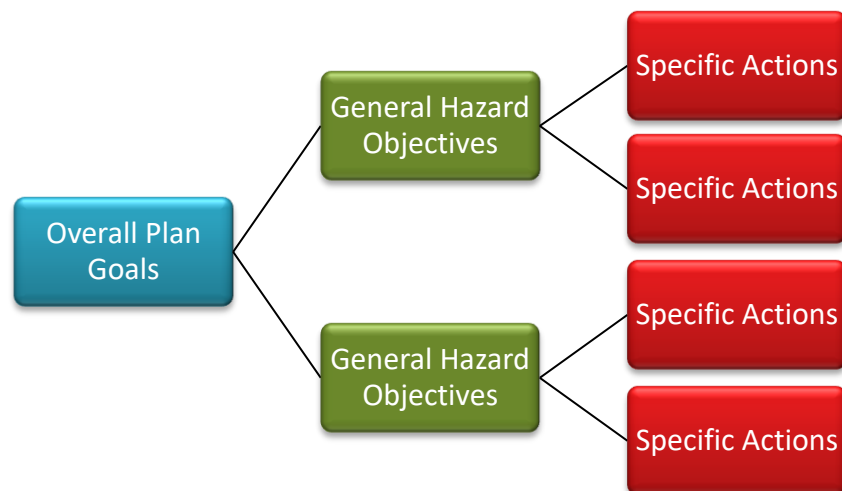
Inspired by the [State of New Hampshire Hazard Mitigation Plan](#), the following **Goals** were initially developed in a previous Plan version and thus were reviewed and updated as applicable by the Hazard Mitigation Committee during a public meeting. While the hazard incidents have remained essentially the same as from the **2012 Plan** with a few disaster additions over the course of the last five years, it was important to reassess the continued relevancy of **Goals** and **Objectives** to influence the development of the best and most relevant hazard mitigation **Actions**.

#### What Are Goals, Objectives and Actions

Goals, Objectives and Actions are used in the Hazard Mitigation Plan to define different levels of meaning. Their relationship is displayed in **Figure 3**.

The overall **Goals** of this Hazard Mitigation Plan provide a macro-level view of what emergency managers want to accomplish to keep the Town's life, property and infrastructure safer from natural disasters. Statements of overall **Goals**, beginning with "To", describe the desired vision of mitigation and safety for the community. **Goals** enable the development of thoughtful hazard **Objectives** designed to generally fulfill those **Goals**.

**Figure 3**  
Relationship of Goals, Objectives and Actions



**Objectives** begin to narrow down the focus of the overall **Goals** into hazard minimization statements. Main hazard categories of **Flood**, **Fire**, **Severe Wind**, **Extreme Temperature (Cold-Hot)**, **Human**, and **Technological** guide the direction of mitigation efforts. These hazard **Objective** statements, beginning with “Minimize”, state Town’s desired outcome for each hazard category. The **Objectives** support the overall **Goals** by placing a focus on hazard mitigation or minimization.

Finally, **Actions** are the specific activities or projects which can be undertaken to accomplish an **Objective**. **Actions** begin with a verb to portray a direction for accomplishment. The **Action** is the target to reach to help mitigate hazards in the community. The completed **Action** fulfills the associated **Objectives**. The Actions will be listed and reviewed later in the **Mitigation Action Plan** tables.

### Overall Hazard Mitigation Plan Goals

The following **3** Goals for the **Hazard Mitigation Plan 2018** were developed by the Hazard Mitigation Committee as the vision for the community with respect to the declared disaster declarations, general hazard events, seasonal weather events and changing climate patterns resulting in unexpected events. Collectively, the **Goals** guided the formulation of **Objectives** for each of the main hazard categories. These **Goals** were revised from the **2012 Plan** to emphasize hazard mitigation instead of preparedness, response and recovery which are covered in the **Emergency Operations Plan**. Mitigation **Goals** more closely aligned with sustained risk prevention or reduction of long-term risk to people, property and infrastructure.

#### **Boscawen Hazard Mitigation Plan Goals**

1. To reduce the risk of injury and the loss of life in the Town from all natural hazards and disasters and impacts from secondary hazards.
2. To reduce the risk of potential damages in Town to public and private property, critical facilities, infrastructure, historic resources and the natural environment from all natural hazards and disasters.
3. To promote public awareness of hazard mitigation planning and activities to the Town’s residents, visitors and businesses.

## General Hazard Mitigation Objectives

### Boscawen Hazard Mitigation Objectives

#### FLOOD HAZARDS

1. Minimize the damages from floodwaters of the Merrimack River and Contoocook River, the Brooks, Ponds, wetlands, and other water bodies to life, property, and infrastructure.
2. Minimize the damages caused by erosion and flooded roads, culvert washouts, dam failures or debris (tree limbs, leafy material/ sediment) to life, property, and infrastructure.

#### FIRE HAZARDS

3. Minimize the damages from fire, lightning, and wildfire to life, property, and infrastructure, including the Town Forests and Town-owned property and all telecommunications towers.

#### WIND HAZARDS

4. Minimize the damages from severe wind events, including thunderstorms, downbursts, hurricanes and tropical storms, and tornadoes to life, property, and infrastructure.

#### EXTREME TEMPERATURE (COLD-HOT) HAZARDS

5. Minimize the damages from both severe winter weather, including storms, snow, ice, and wind chill events and from excessive heat events such as heat waves, drought, energy consumption, air and water quality, and climate warming to life, property and infrastructure.
6. Minimize the threat of public health events from the cold and warm weather seasons to the public, especially those in close quarters.

Primary hazard event categories such as **Flood**, **Fire**, **Wind** and **Extreme Temperature** hazards are intended to encompass their respective full sub-hazards range described in this Plan. The general Objectives are developed by addressing the primary hazard events that could impact Boscawen. They focus on minimizing or mitigating the hazard events to support the overall Goals while driving the direction of Action development later in the Plan. Because the Hazard Mitigation Committee did not believe much could be reasonably done to mitigate **Earth** hazards, there was no respective **Objective** written. However, some Actions in the **Mitigation Action Plan** tables may address these hazards.

Although human and technological hazards are not natural disasters, many technological hazards are secondary to (caused by) natural hazards such as **Storms**, **Flooding** or **Winter Weather** causing **Power Failure** or **Debris Impacted Infrastructure**. Twelve (12) **General Hazard Mitigation Objectives** were crafted to direct Action development in later Chapters.



**Boscawen Hazard Mitigation Objectives**

**HUMAN HAZARDS**

- 7. Minimize the damages from human threats such as sabotage, vandalism, terrorism, hostage situations and civil disturbance to life, property and infrastructure.**

**TECHNOLOGICAL HAZARDS (Infrastructure and Secondary)**

- 8. Minimize the impact to travelers through blocked transportation systems, including Route 3, Route 4, and others.**
- 9. Minimize the damages from multiple hazards to the operational efficiency of all communications systems, dams, underground water and sewer utilities, bridges, and transportation roadways.**
- 10. Minimize the damages from electrical power failure to life, property, and infrastructure, in both rural and urban environments.**
- 11. Minimize the damages from hazardous materials exposure, chemical spills, radiological materials incidents, or biological incidents to life, property, and infrastructure.**

## 4 HAZARD RISK ASSESSMENT

Natural disasters and technological, and human hazards that have occurred in Boscawen or have the potential to occur in the Town were assessed in a [Hazard Risk Assessment](#) to determine their **Overall Risk** to the community. The major disasters declarations covering the Central NH Region (Merrimack County and Hillsborough County) have been inventoried and additional hazard events occurring in Boscawen and the area have been described. FEMA Public Assistance funding to the Town is detailed for each disaster declaration. A review of climate changes is provided for region to provide perspective on how the weather may change over time.

The [State of New Hampshire Hazard Mitigation Plan, 2013](#) recommends that municipalities examine multiple natural hazards. Two hazards, coastal flooding and snow avalanche, are not discussed in Boscawen's Plan because they have no relevance. Within the **Hazard Mitigation Plan 2018**, natural hazards under these basic categories have been incorporated:

- ➡ **Flood Hazards**
- ➡ **Wind Hazards**
- ➡ **Fire Hazards**
- ➡ **Extreme Temperature (Cold-Hot) Hazards**
- ➡ **Earth Hazards**
- ➡ **Technological (Secondary) Hazards**
- ➡ **Human Hazards**

Within these basic hazard categories are numerous related subcategories, all of which are detailed in a [Hazard Risk Assessment](#). This Assessment provides a measure of **Frequency, Location Area, Impact to the Town, Hazard Magnitude, and Overall Risk** for each hazard in a numerical format as determined by the Hazard Mitigation Committee. Scale definitions and the process to define hazards are discussed.

Many of these examined hazards discussed may pose little threat to the Town. The Hazard Mitigation Committee wanted to acknowledge their possibility as opposed to simply focusing on a handful of top hazards which will certainly occur in the community. Using this broad vision allows Boscawen to contemplate the impact of a variety of hazards and to develop mitigation actions and design emergency planning programs as appropriate. Only the most predominant hazards, or even multiple hazards, will have mitigation actions developed to try to reduce the hazards' impact. These are later discussed in [Potential Mitigation Actions](#) and prioritized in the [Mitigation Action Plan](#).

## Hazard Risk Assessment Rankings

Twenty-seven (27) natural, technological, and human hazards are evaluated within this Plan. The 16 natural hazards (including the technological hazard **Dam Failure** because of its close association with flooding) are ranked within in a **Hazard Risk Assessment**. Some hazards may be more likely to occur in the community than others based on past events and current conditions, and some hazards may have a greater impact than other hazards. How vulnerable Boscawen could be to natural hazards can be measured in terms of **Overall Risk**.

The location of where each hazard has occurred either in the past or may be prone to future hazard occurrences is noted in the **Hazard Locations in Town** column.

Knowing where events may be likely to occur, the 2018 Hazard Mitigation Committee examined each potential hazard for its **Probability of Occurrence** and its potential **Impact to the Town** affecting people, services/infrastructure and property based on past personal recollections and community hazard trends to determine the **Overall Risk** to the community.

The Committee identified each hazard's **Probability of Occurrence** score on a **1-2-3-4** scale from **Unlikely/1** (0-25% chance of occurring in 10 years, which is 2 Hazard Mitigation Plan cycles) to **Highly Likely/4** (76-100% chance in 10 years) as shown below.

### Probability of Occurrence

1	<b>Unlikely=</b>	0 - 25% chance	in 10 years
2	<b>Possible=</b>	25 - 50% chance	in 10 years
3	<b>Likely=</b>	51 - 75% chance	in 10 years
4	<b>Highly Likely=</b>	76 - 100% chance	in 10 years

The Committee determined the likely **Impact to the Town** of an event based on a **1-2-3-4** scale for **3 Impact** characteristics – Human injuries, the length of time Critical Services/Infrastructure are shut down, and Property damage. Not all of these characteristics have to be expected because each hazard differs. The scale runs from **Limited/1** to **Catastrophic/4** and the more specific definitions are described below.

The **Probability of Occurrence** score was multiplied by the average of each **Impact to the Town** (Human, Critical Services/Infrastructure and Property) score to obtain the **Overall Risk** score.

The technological and human hazards were not scored to ensure the natural hazards retained the focus of the **Hazard Mitigation Plan Update 2018**. However, **Dam Failure** was rated because of its close correlation to **Flooding**.

**Impact to the Town: Human, Critical Facilities/Infrastructure/Services, Property**

<b>1</b>	<b>Limited=</b>	<u><b>Human:</b></u> Injuries treatable with first aid. <u><b>Critical Facilities/Infrastructure/Services:</b></u> Minor inconvenience; Shutdown for 3 days or less. <u><b>Property:</b></u> Damaged less than 10%.
<b>2</b>	<b>Significant=</b>	<u><b>Human:</b></u> Significant injuries or illnesses result in no permanent disability. <u><b>Critical Facilities/Infrastructure/Services:</b></u> Shutdown for up to 2 weeks. <u><b>Property:</b></u> Damaged 10% to 25%.
<b>3</b>	<b>Critical=</b>	<u><b>Human:</b></u> Significant injuries or illnesses result in permanent disability. <u><b>Critical Facilities/Infrastructure/Services:</b></u> Complete shutdown for at least 2 weeks. <u><b>Property:</b></u> Damaged 25% to 50%.
<b>4</b>	<b>Catastrophic=</b>	<u><b>Human:</b></u> At least 1 to multiple deaths. <u><b>Critical Facilities/Infrastructure/Services:</b></u> Complete shutdown for 30 days or more. <u><b>Property:</b></u> Damaged greater than 50%.

**OVERALL RISK ASSESSMENT SCORES**

The highest possible **Overall Risk** score a natural hazard could be ranked using this **Hazard Risk Assessment** system is **16** while the lowest score a hazard could be ranked is **1**. The **Overall Risk** numeric score is one which can help the community weigh the hazards against one another to determine which hazards are most detrimental to the community and which hazards should have the most Actions developed to try to mitigate those hazards. The **Overall Risk** is calculated simply by adding the two scores of **Probability of Occurrence** and **Impact to the Town**. The full results of the **Hazard Risk Assessment** are displayed in **Table 8**.

Out of the **16** ranked natural hazards, Boscawen's highest ranking hazards scored an **Overall Risk** between **8 - 12** (out of a possible score of **16**), rounded to whole numbers:

**Highest Overall Risk Hazards Scored 8- 12:**

- Severe Winds, Rain Storms and Thunder Storms **12**
- Hurricanes and Tropical Storms **12**
- Wildfire **11**
- Tornadoes **9**
- Severe Winter Weather, Wind Chill and Ice Storms **8**
- Lightning **8**

Table 8

Hazard Risk Assessment

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Flood	Floods and Flash Floods	Entire Town, including Vulnerable Populations: Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Wooded, forested and remote areas</u> can experience tree fall and become isolated, <u>inaccessible by vehicle</u> : Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. <u>Aboveground utilities</u> : transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 & 4 corridor). Inaccessible locations are vulnerable to wildfire because fire crews and emergency personnel have greater difficulty responding quickly to fires in these locations. Power outages may last for several days before service is restored in a large event. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only six houses on Corn Hill Road as customers of PSNH.	2	1	1	1	1.0	2.0
	Rapid Snow Pack Melt	Entire Town, Telecommunications Tower. <b>Communications systems are detailed in the Community Vulnerability Assessment tables.</b> Communications systems interruptions are unlikely to occur or affect the residents of Boscawen because of the diversity of communications systems available within the town. However, systems failures could affect Town businesses and local government on an isolated scale. In Boscawen, one communications tower and cable/Internet providers are available for residents. Cell phones are good alternatives to telephones, but some residents do not have computers. Communications failure would be worse if it occurred at the Fire and Police Depts, Highway Department or Town Offices, especially during a holiday, or inhibited emergency dispatch and EOC operations. Most Town radios are interoperable, and they are used in more than one location. The Town is serviced by the Capital Area Mutual Aid Compact, which does all the emergency medical service and Fire dispatching. They have redundant capabilities and are currently upgrading their systems.	2	1	1	1	1.0	2.0



**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Flood	River Ice Jams	<b>Most dams, culverts, and bridges</b> could experience debris impacted infrastructure. The bridges, tunnels, and culverts on Raymond's Road, Long Street and River Road may be at risk from debris impacted infrastructure. There are five concrete small tunnels under Commercial Street that have not been well maintained and have been weakened over time by passing trucks and vehicles. These tunnels could create a debris impact hazard. The Corn Hill Road Bridge could also potentially dislodge. If the undersized culverts were regularly maintained, the Town feels that this action would take care of half the flooding problems in Boscawen. Roads with culverts that regularly washout are listed above under Flooding. DIS can also refer to roadways blocked by downed trees and powerlines during storms.	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1.0</b>	<b>2.0</b>
	Riverine Scouring, Erosion, Channel Movement	<b>Route 3, Route 4, Roundabout, King Street, intersections.</b> Serious transportation accidents involving hazardous materials have the greatest possibility of occurring along Routes 3 and 4. Numerous trucks use these routes daily to transport many kinds of materials, goods, chemicals, wastes and gasses. Ross Trucking on North Main Street is a local freight hauler which creates regular truck traffic. King Street (Route 3) is a two lane road, very busy with traffic turning and entering. An accident can back up vehicles onto the I-93 highway. Particularly susceptible is Cumberland Farms, other in & out businesses (winter time especially), and the Park & Ride exits.	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1.7</b>	<b>5.0</b>

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Wind	<b>Tornadoes</b>	<b>Routes 3 &amp; 4</b> , along with businesses in Town that deal with the transportation or storage of hazardous materials include All States Asphalt NH Bituminous on Depot Street and the construction at California Fields (brownfields) on Crescent Street. Filling (gas) stations are also potential sites for a hazardous materials spill. There is a former landfill which is now capped on. Concern also exists over trucks transporting hazardous material through town on Routes 3 and 4. MC Nursing Home potential spill- upright oxygen tanks situated next to propane tanks. Businesses with particular risk include NH Bituminous & Elektrisola. The largest or most dangerous stationary sites that store and/or handle haz mat on site (fertilizer, pesticides, fuel, etc) are listed in Critical and Community Facilities (Appendix A). Occupational haz mat sites where spills could occur include: health care facilities, schools, manufacturing, etc.	<b>3</b>	3	3	3	<b>3.0</b>	<b>9.0</b>
	<b>Downbursts</b>	<b>Congregate populations.</b> Elementary School, health clinics, restaurants, populated areas, large employers, apartments, senior housing, stores and public assembly venues listed in Critical and Community Facilities (Appendix A) - all of these locations increase the risk of exposure to and transfer of illness. The forests, conservation areas, agriculture, wooded areas, ponds can host ticks and mosquitos.	<b>3</b>	2	2	2	<b>2.0</b>	<b>6.0</b>
	<b>Hurricanes and Tropical Storms</b>	<b>Several businesses around Town</b> are potential sites for explosions and serious fires. The vacant Tannery buildings on Commercial Street are potential fire and explosion sites. There are numerous other sites in town that store tires and that have the potential for prolonged burning. These sites include many farms and at the transfer station. Propane tanks that exist at the fire station create a potential for explosion and a large quantity of wood at the Tibo lumber yard has the potential for a large fire. Areas most susceptible include: Downtown, vacant or vulnerable sites, foreclosed homes or seasonal buildings, buildings in densely populated areas or residential manufactured home parks. Vehicle fires could occur anywhere, parking lots, driveways, roadways. See also Critical and Community Facilities (Appendix A). A conflagration potential exists nearby just into Penacook with the old construction, dense housing and manufactured housing parks.	<b>4</b>	3	3	3	<b>3.0</b>	<b>12.0</b>

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Wind	Severe Winds, Rainstorms and Thunder Storms	<b>Unlikely, but Town or County Facilities are potential targets.</b> Most susceptible sites could include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants. See Critical and Community Facilities (Appendix A).	<b>4</b>	3	3	3	<b>3.0</b>	<b>12.0</b>
	Lightning	<b>Town or County Facilities.</b> Sabotage would be most likely to occur at electric utilities, Town/County computer systems & website, Town/County buildings, School, dams, water supplies, cemeteries, vacant buildings (Tannery), under bridges. See Critical and Community Facilities (Appendix A).	<b>4</b>	1	3	2	<b>2.0</b>	<b>8.0</b>
	Wildfire	<b>Unlikely, Isolated events.</b> Locations where hostages could be taken include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants, and domestic home situations. See Critical and Community Facilities (Appendix A).	<b>4</b>	2	3	3	<b>2.7</b>	<b>10.7</b>

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Extreme Temp	Severe Winter Weather, Cold, Wind Chill and Ice Storms	Limited locations, Routes 3 & 4 area, Town and County Facilities. Locations include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Veterans Cemetery, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers, health clinics, grocery or convenience stores, restaurants and establishments serving alcohol. Occasions include: Town Meetings, voting day, local board meetings, during visits from political candidates, at large events such as Old Home Day or Veterans Parade, School sports events or graduation. Small groups of protestors are likely to continue to demonstrate at the Veterans Cemetery. See Critical and Community Facilities (Appendix A).	4	2	2	2	2.0	8.0
	Drought	Entire Town, including Vulnerable Populations: Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Wooded, forested and remote areas</u> can experience tree fall and become isolated, <u>inaccessible by vehicle</u> : Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. <u>Aboveground utilities</u> : transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 & 4 corridor). Inaccessible locations are vulnerable to wildfire because fire crews and emergency personnel have greater difficulty responding quickly to fires in these locations. Power outages may last for several days before service is restored in a large event. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only six houses on Corn Hill Road as customers of PSNH.	4	1	1	2	1.3	5.3

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Extreme Temp	Excessive Heat	Entire Town, Telecommunications Tower. Communications systems are detailed in the Community Vulnerability Assessment tables. Communications systems interruptions are unlikely to occur or affect the residents of Boscawen because of the diversity of communications systems available within the town. However, systems failures could affect Town businesses and local government on an isolated scale. In Boscawen, one communications tower and cable/Internet providers are available for residents. Cell phones are good alternatives to telephones, but some residents do not have computers. Communications failure would be worse if it occurred at the Fire and Police Depts, Highway Department or Town Offices, especially during a holiday, or inhibited emergency dispatch and EOC operations. Most Town radios are interoperable, and they are used in more than one location. The Town is serviced by the Capital Area Mutual Aid Compact, which does all the emergency medical service and Fire dispatching. They have redundant capabilities and are currently upgrading their systems.	4	2	1	2	1.7	6.7
	Earthquake	Most dams, culverts, and bridges could experience debris impacted infrastructure. The bridges, tunnels, and culverts on Raymond's Road, Long Street and River Road may be at risk from debris impacted infrastructure. There are five concrete small tunnels under Commercial Street that have not been well maintained and have been weakened over time by passing trucks and vehicles. These tunnels could create a debris impact hazard. The Corn Hill Road Bridge could also potentially dislodge. If the undersized culverts were regularly maintained, the Town feels that this action would take care of half the flooding problems in Boscawen. Roads with culverts that regularly washout are listed above under Flooding. DIS can also refer to roadways blocked by downed trees and powerlines during storms.	4	1	1	1	1.0	4.0
Earth								



**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Earth	Landslide	Route 3, Route 4, Roundabout, King Street, intersections. Serious transportation accidents involving hazardous materials have the greatest possibility of occurring along Routes 3 and 4. Numerous trucks use these routes daily to transport many kinds of materials, goods, chemicals, wastes and gasses. Ross Trucking on North Main Street is a local freight hauler which creates regular truck traffic. King Street (Route 3) is a two lane road, very busy with traffic turning and entering. An accident can back up vehicles onto the I-93 highway. Particularly susceptible is Cumberland Farms, other in & out businesses (winter time especially), and the Park & Ride exits.	1	1	1	1	1.0	1.0
	Dam Failure or Release	Routes 3 & 4, along with businesses in Town that deal with the transportation or storage of hazardous materials include All States Asphalt NH Bituminous on Depot Street and the construction at California Fields (brownfields) on Crescent Street. Filling (gas) stations are also potential sites for a hazardous materials spill. There is a former landfill which is now capped on. Concern also exists over trucks transporting hazardous material through town on Routes 3 and 4. MC Nursing Home potential spill- upright oxygen tanks situated next to propane tanks. Businesses with particular risk include NH Bituminous & Elektrisola. The largest or most dangerous stationary sites that store and/or handle haz mat on site (fertilizer, pesticides, fuel, etc) are listed in Critical and Community Facilities (Appendix A). Occupational haz mat sites where spills could occur include: health care facilities, schools, manufacturing, etc.	1	1	1	1	1.0	1.0

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Technological	Power/ Utility Failure	Entire Town, including Vulnerable Populations: Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Wooded, forested and remote areas</u> can experience tree fall and become isolated, <u>inaccessible by vehicle</u> : Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. <u>Aboveground utilities</u> : transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 & 4 corridor). Inaccessible locations are vulnerable to wildfire because fire crews and emergency personnel have greater difficulty responding quickly to fires in these locations. Power outages may last for several days before service is restored in a large event. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only six houses on Corn Hill Road as customers of PSNH.	not rated	not rated	not rated	not rated	not rated	not rated
	Communications Systems Failure	Entire Town, Telecommunications Tower. <b>Communications systems are detailed in the Community Vulnerability Assessment tables.</b> Communications systems interruptions are unlikely to occur or affect the residents of Boscawen because of the diversity of communications systems available within the town. However, systems failures could affect Town businesses and local government on an isolated scale. In Boscawen, one communications tower and cable/Internet providers are available for residents. Cell phones are good alternatives to telephones, but some residents do not have computers. Communications failure would be worse if it occurred at the Fire and Police Depts, Highway Department or Town Offices, especially during a holiday, or inhibited emergency dispatch and EOC operations. Most Town radios are interoperable, and they are used in more than one location. The Town is serviced by the Capital Area Mutual Aid Compact, which does all the emergency medical service and Fire dispatching. They have redundant capabilities and are currently upgrading their systems.	not rated	not rated	not rated	not rated	not rated	not rated

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Technological	Debris Impacted Infrastructure	<b>Most dams, culverts, and bridges</b> could experience debris impacted infrastructure. The bridges, tunnels, and culverts on Raymond's Road, Long Street and River Road may be at risk from debris impacted infrastructure. There are five concrete small tunnels under Commercial Street that have not been well maintained and have been weakened over time by passing trucks and vehicles. These tunnels could create a debris impact hazard. The Corn Hill Road Bridge could also potentially dislodge. If the undersized culverts were regularly maintained, the Town feels that this action would take care of half the flooding problems in Boscawen. Roads with culverts that regularly washout are listed above under Flooding. DIS can also refer to roadways blocked by downed trees and powerlines during storms.	not rated	not rated	not rated	not rated	not rated	not rated
	Transportation Accidents	<b>Route 3, Route 4, Roundabout, King Street, intersections.</b> Serious transportation accidents involving hazardous materials have the greatest possibility of occurring along Routes 3 and 4. Numerous trucks use these routes daily to transport many kinds of materials, goods, chemicals, wastes and gasses. Ross Trucking on North Main Street is a local freight hauler which creates regular truck traffic. King Street (Route 3) is a two lane road, very busy with traffic turning and entering. An accident can back up vehicles onto the I-93 highway. Particularly susceptible is Cumberland Farms, other in & out businesses (winter time especially), and the Park & Ride exits.	not rated	not rated	not rated	not rated	not rated	not rated

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Technological	Hazardous/Radiological Materials Spills	<b>Routes 3 &amp; 4</b> , along with businesses in Town that deal with the transportation or storage of hazardous materials include All States Asphalt NH Bituminous on Depot Street and the construction at California Fields (brownfields) on Crescent Street. Filling (gas) stations are also potential sites for a hazardous materials spill. There is a former landfill which is now capped on. Concern also exists over trucks transporting hazardous material through town on Routes 3 and 4. MC Nursing Home potential spill- upright oxygen tanks situated next to propane tanks. Businesses with particular risk include NH Bituminous & Elektrisola. The largest or most dangerous stationary sites that store and/or handle haz mat on site (fertilizer, pesticides, fuel, etc) are listed in Critical and Community Facilities (Appendix A). Occupational haz mat sites where spills could occur include: health care facilities, schools, manufacturing, etc.	not rated	not rated	not rated	not rated	not rated	not rated
	Public Health Issues	<b>Congregate populations.</b> Elementary School, health clinics, restaurants, populated areas, large employers, apartments, senior housing, stores and public assembly venues listed in Critical and Community Facilities (Appendix A) - all of these locations increase the risk of exposure to and transfer of illness. The forests, conservation areas, agriculture, wooded areas, ponds can host ticks and mosquitos.	not rated	not rated	not rated	not rated	not rated	not rated
Technological	Fire (Vehicle, Structure, Arson)	<b>Several businesses around Town</b> are potential sites for explosions and serious fires. The vacant Tannery buildings on Commercial Street are potential fire and explosion sites. There are numerous other sites in town that store tires and that have the potential for prolonged burning. These sites include many farms and at the transfer station. Propane tanks that exist at the fire station create a potential for explosion and a large quantity of wood at the Tibo lumber yard has the potential for a large fire. Areas most susceptible include: Downtown, vacant or vulnerable sites, foreclosed homes or seasonal buildings, buildings in densely populated areas or residential manufactured home parks. Vehicle fires could occur anywhere, parking lots, driveways, roadways. See also Critical and Community Facilities (Appendix A). A conflagration potential exists nearby just into Penacook with the old construction, dense housing and manufactured housing parks.	not rated	not rated	not rated	not rated	not rated	not rated

**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Human	<b>Terrorism</b>	<b>Unlikely, but Town or County Facilities are potential targets.</b> Most susceptible sites could include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants. See Critical and Community Facilities (Appendix A).	not rated	not rated	not rated	not rated	not rated	not rated
	<b>Sabotage/Vandalism</b>	<b>Town or County Facilities.</b> Sabotage would be most likely to occur at electric utilities, Town/County computer systems & website, Town/County buildings, School, dams, water supplies, cemeteries, vacant buildings (Tannery), under bridges. See Critical and Community Facilities (Appendix A).	not rated	not rated	not rated	not rated	not rated	not rated
	<b>Hostage Situation</b>	<b>Unlikely, Isolated events.</b> Locations where hostages could be taken include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants, and domestic home situations. See Critical and Community Facilities (Appendix A).	not rated	not rated	not rated	not rated	not rated	not rated



**4 HAZARD RISK ASSESSMENT**

Natural, Technological, Human Hazard Events		Susceptible (Existing) Hazard Locations in the Town <i>See also Appendix A. Community and Critical Facility Vulnerability Assessment (CCFVA)</i>	Probability of Occurrence	Human Injury Impact	Critical Services and Infrastructure Impact	Property Damage Impact	Severity of Impact	OVERALL RISK (1-16)
Human	Civil Disturbance/ Public Unrest	Limited locations, Routes 3 & 4 area, Town and County Facilities. Locations include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Veterans Cemetery, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers, health clinics, grocery or convenience stores, restaurants and establishments serving alcohol. Occasions include: Town Meetings, voting day, local board meetings, during visits from political candidates, at large events such as Old Home Day or Veterans Parade, School sports events or graduation. Small groups of protestors are likely to continue to demonstrate at the Veterans Cemetery. See Critical and Community Facilities (Appendix A).	not rated	not rated	not rated	not rated	not rated	not rated

*Source: Boscawen Hazard Mitigation Committee 2018*

## Central NH Region Major Disaster Declarations, 1973-2017

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The Central NH region, which encompasses parts of Merrimack County (**18** communities) and Hillsborough County (**2** communities), has been damaged by **21** presidentially-declared major disasters in the last **44** years, between **1973-2017**.

While a natural disaster typically befalls multiple counties in New Hampshire, only those damaging either Merrimack County or Hillsborough County were identified in this section. Over the last **12** years (**2005-2017**), the number of presidentially-declared natural major disasters have increased significantly compared to the first NH declarations from the severe storm and floods of **1973** to the **1998** ice storm (**25** years).

Between **2005-2017**, the most recent round of major disasters afflicting the Central NH Region, **13** natural disasters within **12** years were declared for Merrimack and/or Hillsborough Counties, **5** of which were floods, **5** snow/ice storms, and **3** rain/wind storms.

*Emergency declarations* (EM-) are often proclaimed for counties in New Hampshire to help communities receive funding for less serious hazard events that may have caused more damage in nearby declared declaration (DR-) counties or states. Neither the **4** Snow Emergency declarations that occurred between **2005-2018** nor **2012** Hurricane Sandy were counted within the **13** declared disasters, although the **2011** Halloween Snow Storm, a declared disaster (DR-) in Hillsborough County but not in Merrimack County (emergency declaration), was counted in this tally.

The last declared disaster in Merrimack County, in which Boscawen is located, was the severe wind storm and flooding in **October 2017** for which Boscawen did not request federal Public Assistance funding. Details of disasters since **1973** and federal funding provided to the Town of Boscawen are displayed in **Table 9**. Most of these disasters will be described within the following [Recent Disaster Events Summary](#) section.

**Table 9**

**Central NH Region Major Disaster Declarations, 1973 to 2017**

FEMA DR-	Local Disaster Name	Incident Period	FEMA Disaster Name	Includes County*		FEMA Public Assistance Funding to Boscawen**
				Merr	Hill	
4355	2017 October Wind Storm	Oct 28-20, 2017	Severe Storm and Flooding	M	---	\$0
4209	2015 January Blizzard	Jan 26-28, 2015	Severe Winter Storm and Snowstorm	---	H	N/A
4105	2013 Snowstorm NEMO	Feb 8-10, 2013	Severe Winter Storm and Snowstorm	M	H	\$0
4095 EM-3360	2012 Hurricane Sandy Emergency	Oct 26-Nov 8, 2012	Hurricane Sandy <i>emergency declaration only for Merr and Hill Cty</i>	EM- M	EM- H	\$0
4049 EM-3344	2012 Halloween Snow Storm	Oct 29-30, 2012	Severe Storm and Snowstorm <i>emergency declaration for Merr Cty</i>	EM- M	H	\$0
4026	2012 Tropical Storm Irene	Aug 26-Sep 6, 2012	Tropical Storm Irene	M	---	\$0
1913	2010 March Flooding & Winds	Mar 14-31, 2010	Severe Storms and Flooding	M	H	\$0
1892	2010 Winter Storm	Feb 23-Mar 3, 2010	High Winds, Rain, Snow	M	H	\$0
1812	2008 December Ice Storm	Dec 11-23, 2008	Severe Winter Storm	M	H	\$0
1799	2008 September Flood	Sep 6-7, 2008	Heavy Rains and Floods	M	H	\$0
1782	2008 July Tornado	Jul 24, 2008	Tornado, Severe Winds, Heavy Rains	M	---	\$0
1695	2007 April Spring Flood	Apr 15-23, 2007	Severe Storms and Flooding	M	H	\$944
1643	2006 Mother's Day Flood	May 12-23, 2006	Severe Storms and Flooding	M	H	\$10,761
1610	2005 Columbus Day Flood	Oct 7-18, 2005	Severe Storms and Flooding	M	H	\$8,457
EM-3207	2005 Snow Emergency	Jan 22-23, 2005	Snowstorm	M	H	\$3,548
EM-3193	2003 Snow Emergency	Dec 6-7, 2003	Snowstorm	M	H	\$3,997
EM-3177	2003 Snow Emergency	Feb 17-18, 2003	Snowstorm	M	H	\$2,276
EM-3166	2001 Snow Emergency	Mar 5-7, 2001	Snowstorm	M	H	\$2,954
1231	1998 Flooding	Jun 12-Jul 2, 1998	Severe Storms and Flooding	M	H	\$0
1199	1998 December Ice Storm	Jan 7-25, 1998	Ice Storms	M	H	\$0
1144	1996 Storms and Flooding	Oct 20-23, 1996	Severe Storms and Flooding	M	H	\$0
1077	1995 Flood	Oct 20-Nov 15, 1995	Storms and Floods	M	---	\$0
917	1991 Hurricane Bob	Aug 18-20, 1991	Severe Storm	---	H	N/A
876	1990 Flooding and Severe Storm	Aug 7-11, 1990	Flooding and Severe Storm	M	H	No data
789	1987 Storms and Flooding	Mar 30-Apr 11, 1987	Severe Storms and Flooding	M	H	No data
771	1986 Storms and Flooding	Jul 29-Aug 10, 1986	Severe Storms and Flooding	---	H	N/A
399	1973 Storms and Flooding	Jul 11, 1973	Severe Storms and Flooding	M	H	No data
<b>Total Public Assistance (PA) FEMA Funding to Boscawen, 1993-2017**</b>						<b>\$32,936</b>

Source: [http://www.fema.gov/disasters/grid/state/33?field=disaster\\_type&term\[tid\]=All](http://www.fema.gov/disasters/grid/state/33?field=disaster_type&term[tid]=All)

\*M = Merrimack County (18 towns in CNH region) H = Hillsborough County (2 towns in CNH region)

\*\* Dollar figures are rounded to the nearest \$100 and does not yet include DR-4355 (TBD)

## Recent Disaster Events Summary

The Town of Boscawen has been affected by several significant natural disasters within the last decade and applied for and received Public Assistance (PA) funding for many of these events. Severe natural hazard events have been occurring more frequently in Merrimack County than in the past. While these events on occasion disrupted the flow of the community and isolated residents for days, the disaster impacts were relatively mild as few injuries were reported. FEMA provided Public Assistance funding to the Town for tasks such as cleanup, road repairs, tree and brush cutting, and culvert replacement.

The Hazard Mitigation Committee helped provide anecdotal descriptions of how the recently declared natural disasters or emergency declarations for the Central NH Region affected Boscawen and its residents. Public Assistance disaster funding opportunities open to communities when a disaster is declared within a county. The Town of Boscawen applied for and received this funding for several recently declared disasters. Also identified were numerous hazard events that occurred locally in the community and within the area. The disaster event listing dates from the 1936 floods to present day.

### PUBLIC ASSISTANCE GRANT FUNDING

To help reclaim some of the costs these disasters wrought on town property and infrastructure, Boscawen applied for and received FEMA Public Assistance (PA) funds, Categories A-G, a 75% grant and 25% match program for several declared Merrimack County disasters. These PA funds have been used for overtime wages for Town employees, equipment rentals, snow removal, washout repair, road reconstruction, bridge repair, debris removal, and more.

The database where the Public Assistance funding information resides is available from **1993** to present (**2017**). The Public Assistance disaster funding was sought for and received by Boscawen for **7** of the **15** eligible *Declared* disasters in Merrimack County during this timeframe. *Emergency declaration* funding was sought and received by Boscawen for **3** of the **4** eligible snowstorms between **2001-2005**, plus for the **2012** Hurricane Sandy. This data is available through FEMA at <https://www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1>.

The most expensive disaster for Boscawen in terms of FEMA Public Assistance funds received for recovery was the **April 2007 Spring Floods** after which Boscawen received **\$62,400** for **7** projects to help repair the roads and bridges. The last time the Town was awarded funding should be **\$6,490** is for the roads and bridges and debris removal from the **October 2017 Storm and Flood**. This was the last major disaster declaration for Merrimack County to date. All Public Assistance funding to date, from **1993** to **October 2017** totals **\$179,653**. This detail is rounded to the nearest \$100 in **Table 10** for each disaster and is summarized previously in **Table 9**.

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

COLOR KEY for Table 10:

Declared Disasters in Merrimack County or Hillsborough County (Central NH Region)	PA Funding \$ Received by Boscawen	Other Boscawen Local Hazard Event	Regional Hazard Event with Boscawen Impacts
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**Table 10**

### Local and Area Hazard Event and Disaster History

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
ADD NEW EVENT ROWS HERE								Boscawen Hazard Mitigation Committee
Regional Thunderstorm, Severe Winds and Tornado Watch <b>May 2018</b>	No	2018	May 4	N/A	All across the northern Central NH region, the evening of May 4 experienced heavy downpours along with strong wind gusts, straight line winds (microbursts) and possible tornadic activity. Many communities suffered significant tree and structure damage. Tornado watch (10% chance) for northwest NH was issued by NWS Storm Prediction Center. Officials should investigate the local claims.	In Boscawen, severe winds blew straight across Walker Pond from Webster, to the area of Queen Street and Corn Hill Road and across the Merrimack River into Canterbury. Several of the downed trees were twisted in every direction. Roots were exposed of toppled trees and bark was completely stripped of several trees.	Wind, Downburst Storms, Tornado, Debris	Boscawen Hazard Mitigation Committee, CNHRPC, wmur.com,
Contoocook Earthquake 2.4M <b>Mar 2018</b>	No	2018	Mar 7	N/A	A significant 2.4M earthquake was recorded by the USGS in March 2018. Its epicenter was around the Blackwater River in Hopkinton at a depth of 3.4km. Weak to light shaking was reported by a great number of people in Henniker, Hopkinton, Webster, Salisbury (felt the greatest intensity), Boscawen and Concord. The Concord area has experienced 9 earthquakes in the past 365 days (earthquake track)	Reports were made of rattling windows in their frames and a brief shaking of homes. Contoocook is only 6 miles to the southeast of Boscawen.	Earthquake, Earth	Boscawen Hazard Mitigation Committee, Earthquake track.com, usgs.gov
Severe Wind Storm and Flood <b>Oct 2017</b>	4355	2017	Oct 28-30	\$0	Merrimack and Hillsborough Counties experienced downed trees on powerlines, debris to clean up, and some flooding of drainage catch basins and culverts. The storm impacted northern NH, with 6 counties declared disasters. Power	<b>Boscawen did not apply for or receive federal funds.</b> Concerns about high flow of water under the Fessenden MHP, FD & HD examined culvert system and seemed to be working; in a past event, the flow of water had been more than it could handle. Trees down, power outages- Water Street, Route	Wind, Storms, Debris, Flood, Rainstorm	Boscawen Hazard Mitigation Committee

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					was out for an estimated 270,000 customers.	3/King Street, Queen Street, Lower Queen, only out 6-8 hours, Terrace Hill out 18 hours. In process of cutting back the trees working way up Water Street. Many pines were taken down by the windstorm before able to seed. Saw wind shear, with top of the tree taken down, bottom of the tree left. All of King Street experienced power loss, rendering the community vulnerable. Siltation at Valley of Industry occurred during severe storm. The rail trail (owned by the state), with buried fiber optic underneath, experienced washouts with a lot of silt flowing into Merrimack River.		
<b>Boscawen Beaver Dam Infrastructure 2017</b>	No	2017	Summer	N/A		Many beaver dams have become critical infrastructure and are at risk of failure and resulting flood damage to Water Street and Corn Hill Road. Beaver dam problems have been experienced on Water Street below Richardson's (regularly backed up) and Corn Hill Road (backed up).	Dam Failure, Biological, Flood	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Severe Storms and Flooding Jul 2017</b>	4329	2017	Jul 1-2	N/A for Boscawen	The entire State, North Country and Central NH region experienced severe storms with rain, wind, lightning, thunder and flooding. Not a declared disaster in Merrimack or Hillsborough counties.	<b>Boscawen did not apply for or receive federal funds.</b> Boscawen participated in debris clean up along roads but noted the storm was not out of the ordinary in Town. Route 4, Valley of Industry experienced large washouts that included landslides	Severe Winds Rain Storm, Thunder Storm, Lightning, Downburst	Boscawen Hazard Mitigation Committee, FEMA CNHRPC, WMUR, NOAA
<b>Boscawen Lightning Strikes May 2017</b>	No	2017	May	N/A	N/A, although it is likely other neighboring communities were impacted by this storm.	Municipal Building (Town Office and Police Department) was struck by lightning through a modem. Strike took out \$25,000 in electronics, including computers, phones, fire alarm panel and all communications. The strike burned the PD's fire walls, radios, backup system, and server; Town Office operations were disrupted for up to a week. The PD was able to use mobile phones, but lost all software, radio base station, repeaters, and communication systems the	Severe Winds Rain Storm, Thunder Storm, Lightning	Boscawen Hazard Mitigation Committee, Concord Monitor



# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
						from lightning strike. During the same storm, Avaloch Farms Music institute lost its fire alarm panel.		
Boscawen Cybersecurity Attack Apr 2017	No	2017	Apr	N/A	N/A, although many threats exist in the Central NH region on a regular basis	Cybersecurity is a Town Office issue, last attack prior to lightning strike (which enabled purchase of new equipment and upgraded software). Had 2 instances where people sent malware to Town. Now, Town is able to be backed up multiple times daily. Town staff must seek cybersecurity training to maintain server health.	Human, Sabotage, Cybersecurity	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Rapid Snow Melt Spring 2017	No	2017	Spring	N/A	N/A, although snow melt occurs in other communities during warm spring days	Route 4, Valley of Industry experienced large washouts that included landslides during spring melt.	Flood, Rapid Snow Pack Melt, Erosion, Landslide	Boscawen Hazard Mitigation Committee, CNHRPC
Severe Snowstorm-Town Meeting Blizzard Mar 2017	4316	2017	Mar	N/A for Boscawen	Many other NH towns had to choose whether to close or not to accommodate the blizzard, which became a legal issue to sort out. Not a declared disaster in Merrimack or Hillsborough counties.	<b>Boscawen did not apply for or receive federal funds.</b> A state-wide blizzard occurred during Town Meeting, (Election Day Storm). Boscawen delayed their Town Meeting.	Winter Weather, Extreme Temp, Snow Storm	Boscawen Hazard Mitigation Committee
Webster Pillsbury Lake Earthquake 1.9M Feb 2017	No	2017	Feb 27	N/A	Residents of Contoocook, Webster and Warner in Central NH communities also felt this earthquake. Since it occurred overnight, there were fewer reports. Its epicenter was at Pillsbury Lake.	Around about midnight on Feb 27, a 1.9M earthquake jolted the Town. Boscawen residents reported waking up. Webster abuts Boscawen to the west.	Earthquake, Earth	Boscawen Hazard Mitigation Committee, Earthquake.rack.com, Earthquake.usgs.gov
Boscawen Civil Disturbance at Route 3/4 Traffic Circle Jun 2017	No	2017	Jun	N/A	N/A, although regional traffic depends on the US3/4 Route through Boscawen	Black Lives Matter staged a peaceful protest on Route 3/4 traffic circle.	Civil Disturbance, Human, Public Unrest, Protest	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Excessive Heat 2016-2017	No	2016	-2017	N/A	NH and the Central NH region experienced high heat records throughout 2016 and 2017.	Many people don't have AC, lots of 90 degree days, humid, more elderly people in Boscawen including MC Nursing Home. Livestock (cows) are stressed during high heat conditions. On High Street, the egg farm has cooling fans for the 20,000 chickens.	Extreme Temperature, Excessive Heat	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen US Routes 3 & 4 Traffic Circle Accidents 2012-2017	No	2012	-2017	N/A	N/A, although regional traffic depends on the US3/4 Route through Boscawen	At the newly installed traffic circle on US 3/4, repeated vehicle accidents occur. A similar situation occurs at the Route 3/4 split at the	Traffic Accidents, Human, Technological	Boscawen Hazard Mitigation Committee, CNHRPC

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
						Boscawen Congregational Church		
<b>Boscawen/Merrimack County Drought Severe Emergency 2015-2016</b>	No	2015	-2016	N/A	Severe Drought (D2), Moderate Drought (D1) and Abnormally Dry (D0) intensities were found in communities of Merrimack County and Hillsborough in 2016. The State's counties had been experiencing levels of drought for over a year. The NH DES issued a series of statements and tips for homeowner water conservation. Residents and municipalities had been requested to voluntarily conserve water. Some communities or water precincts enacted water restrictions or bans for certain water usage.	The Severe Drought (D2) conditions as of 09/16 caused some problems in Boscawen. Some fire ponds evaporated, dug wells dried up, no potable water available at Town Departments for residents. Town experienced more rain but also more drought. The Penacook-Boscawen Water District had enough water for residents, no problems.	Drought, Extreme Temperature, Rain Storm	Boscawen Hazard Mitigation Committee US Drought Monitor NH, NH DES
<b>NH Severe Wind Rain &amp; Thunder Storm Jul 2016</b>	No	2016	Jul 23	N/A	The entire region and the State experienced a severe storms with rain, wind, lightning and thunder. A possible microburst was reported. As many as 72,000 customers lost electricity. A similar storm earlier in the week brought several confirmed microbursts and also downed trees.	Boscawen participated in debris clean up along roads. A lot of trees down in Weir Town Forest, unusual number down, but not traced to just this particular event. Forest wasn't being cut often enough. Trees down and power outages on Water Street, Route 3/King Street, Queen Street, Lower Queen. Electricity only out 6-8 hours in these locations, but Terrace Hill was out 18 hours. In process of cutting back the trees working way up Water Street.	Severe Winds Rain Storm, Thunder Storm, Lightning, Downburst	Boscawen Hazard Mitigation Committee Concord Patch, CNHRPC, WMUR, NOAA
<b>Earthquake 1.8M Andover Epicenter Oct 2016</b>	No	2016	Oct 31	N/A	Epicenter in Andover/Salisbury 1.8M with a depth of 6.1 km. Two other earthquakes occurred within 10 minutes on this day in the same area.	Lots of calls to dispatch whenever an earthquake is felt. Never any injuries or damage. Andover is 5 miles to the north.	Earth, Earthquake	Boscawen Hazard Mitigation Committee, Earthquake rack.com, Earthquake.usgs.gov, CNHRPC
<b>Boscawen Rapid Snow Pack Melt 2016</b>	No	2016	Spring	N/A	N/A, although it is likely many surrounding communities experienced similar conditions	Multiple snow melts during the winter. Big melts & 50 degree weather, then heavier snow, a lot of fluctuation. Many situations of slow roof collapsing. Fire Dept helping residents to clear roofs, PWD trying to clear culverts to accommodate ice melt.	Extreme Temperature, Winter Weather, Snow, Rapid Snow Pack Melt, Flooding	Boscawen Hazard Mitigation Committee,, CNHRPC

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Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
<b>Earthquake 2.8M Warner Epicenter Mar 2016</b>	No	2017	21-Mar	N/A	Epicenter in Warner/Hopkinton area, 2.8 magnitude. Felt in the Central NH Region/most of Merrimack County, light in Hillsborough County. Felt most strongly in Hopkinton, Henniker, Warner, Webster, Salisbury, Franklin, Webster, Concord, and Hillsborough	Reports were likely made from Boscawen. Warner is 10 miles to the west.	Earth, Earthquake	Boscawen Hazard Mitigation Committee, Earthquake rack.com, Earthquake.usgs.gov, CNHRPC
<b>Boscawen Walker Pond Wildfire 2015</b>	No	2015	Summer	N/A	Walker Pond resides half in Webster, although there were no reports from this community	Wildfire occurred at outlet of Walker Pond. This 3-day fire kept rekindling, it was burning so deeply down.	Wildfire, Fire, Drought	Boscawen Hazard Mitigation Committee
<b>Earthquake 2.2M Epsom Epicenter Aug 2015</b>	No	2015	2-Aug	N/A	Epicenter around Epsom in the Central NH Region in Merrimack County, felt in nearby locations including Concord, Hopkinton, Allentown, Loudon Chichester and Epsom	Although this event did not seemingly impact Boscawen, this illustrates Central NH region earthquakes can occur on any side of the community. Epsom is 4 towns to the southeast of Boscawen.	Earth, Earthquake	Earthquake rack.com, Earthquake.usgs.gov, CNHRPC
<b>Earthquake 2.3M Boscawen Epicenter May 2015</b>	No	2015	May 24	N/A	Epicenter in lower Boscawen around Queen Street with 2.3M at a depth of 5km. A lot of reports were made at the USGS.	Reports were made of rattling windows in their frames and a brief shaking of homes. Epicenter in lower Boscawen around Queen Street	Earth, Earthquake	Earthquake rack.com, Earthquake.usgs.gov, CNHRPC
<b>Tornado, Severe Thunderstorms Jul 2015</b>	No	2015	31-Jul	N/A	In Warner, NWS confirmed an EF-0 tornado touched down in the evening. It had a maximum wind speed of 75 mph and was 100 yards wide. Town officials said the tornado ripped the roof off a barn, but there were no injuries reported.	N/A, although Warner is located in the Central NH Region, 2 towns to the west of Boscawen. The Town had severe winds and some limbs down but no major damage.	Severe Wind, Tornado, Thunderstorm	WMUR, CNHRPC
<b>Boscawen Landslides and Erosion Circa 2015</b>	No	2015	---	N/A	N/A	All of High Street from Cornhill Road south to the Church (not a natural slope, built up) became dangerous to travel from a possible landslide on this unstable slope	Scouring and Erosion, Debris, Flooding, Landslide, Mass Failure	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Boscawen Haz Mat Incident Circa 2015</b>	No	2015	---	N/A	N/A, although regional traffic depends on US3 /4 Route through Boscawen	A 55-gallon barrel of hazardous substances tipped over at Ross Express. Luckily their spill response plan and solidity of the barrel ensured there was no significant incident	Hazardous Materials, Public Health, Fire	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Severe Winter Storm and Snowstorm -</b>	4209	2015	Jan 26-28	N/A for Boscawen	Predicted at near blizzard conditions, the end of January, 2015 snowstorm's major declaration ended up having a Hillsborough	<b>Boscawen could not apply for/receive funding.</b> The storm was not particularly notable by the Town. No recollections of anything	Severe Winter Weather, Extreme Temp,	Boscawen Hazard Mitigation Committee, fema.gov,

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<b>January Blizzard 2015</b>					County wide per capita impact of \$3.88, making the storm a fairly expensive one at \$3.3 million dollars in Public Assistance over three southern NH counties. Snow approached 30" in some areas with heavy snow and 50 mph whiteout wind conditions. The closest reporting weather station, Concord Airport (CON), had accumulated 29" of heavy snow, 50 mph whiteout wind conditions in the region. <u>Not declared in Merrimack County.</u>	other than a typical winter storm	Snow, Ice, Power Failure, Severe Winds, Debris Impacted Infrastructure	Boston Globe
<b>Thanksgiving Day Snowstorm Nov 2014</b>	No	2014	27-Nov	N/A	Large amount of snowfall fell in a very short period of time ahead of typical seasonal expectations. Power outages were prolific, with a peak of about 200,000 outages, from the Public Service of New Hampshire, Unitil (Concord area), and NH Electric Co-op. Nearby Concord and the towns on the eastern side of the Central NH region accumulated only 6-12" of snow according to PSNH, far less snow than southern and western NH. This was not a presidentially declared disaster in NH.	Boscawen experienced power outages ranging 24-72 hours in most locations in town. This was an unexpected snowstorm. At tree took out the windshield of a truck driving up Water Street by high winds. The rock maple yanked out of the ground.	Extreme Temp, Snow, Power Failure, Severe Wind	Boscawen Hazard Mitigation Committee, Concord Monitor, CNHRPC
<b>Regional Communications Failure by Lightning 2014</b>	No	2014	Summer	N/A	Regional event- Plausawa Hill (Pembroke) Lightning Strike - affected Capital Area Fire Compact Dispatch. Fairpoint (Webster) went down due to equipment failure so Merrimack County dispatch went down.	Both of these events affected Boscawen as the Town uses the Capital Area Fire Dispatch.	Lightning, Communications Failure	Boscawen Hazard Mitigation Committee
<b>Boscawen Merrimack River Bank Scouring and Erosion 2013-2014</b>	No	2013	-2014	N/A	N/A, although Boscawen shares the banks of the Merrimack with Canterbury	Riverbank erosion and scouring are present at Depot Street/Jamie Welch Park. Boscawen bank of the Merrimack was scoured when Canterbury/Boscawen bridge was removed; Town had previous practice of burying cars to reduce erosion, all have been removed (now, flow is clear.) Multiple areas in Town have	Scouring and Erosion, Debris, Flooding, Mass Failure	Boscawen Hazard Mitigation Committee, CNHRPC

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						suffered from stream bank erosion. Merrimack side of Boscawen is swept clean (scoured) and the silt is on the Canterbury side. They include the Boat Ramp at Jaime Welch Park and Stirrup Iron Road. Stream bank erosion occurred on the banks of Town House Brook which runs down Queen Street and along King Street.		
NH Severe Storms, Flooding and Landslide <b>Jun-Jul 2013</b>	4139	2013	Jun 26 – Jul 3	N/A	This declared disaster for Grafton, Sullivan and Cheshire Counties included landslides from the heavy rain. Public Assistance (PA) was available for these 3 Counties and Hazard Mitigation Assistance (HMA) became available statewide. Damage per capita was high – Grafton (\$39.58), Sullivan (\$24.48), and Cheshire (\$21.46). <u>Not declared in Merrimack or Hillsborough Counties.</u>	<b>Boscawen was not within the declared disaster area and did not apply for HMA funding.</b> There were no specific issues in Town noted. Any flooding or other problems were handled as normal business.	Landslide, Severe Storms, Flood, Wind, Rain, Debris Impacted Infrastructure	FEMA, CNHRPC
Earthquake 2.6M Warner Epicenter <b>Oct 2013</b>	No	2013	11-Oct	N/A	Epicenter in Warner, 2.6 magnitude. Felt in the Central NH Region/ northern Merrimack County, most strongly in Hopkinton, Henniker, Warner, Boscawen, Concord, Salisbury, Franklin.	Reports were likely made to the USGS from Boscawen residents feeling the earthquake as a rumble or loud noise. Warner is about 10 miles to the west of Boscawen.	Earthquake, Earth	USGS, CNHRPC
Severe Winter Storm and Snowstorm - <b>Winter Storm NEMO 2013</b>	4105	2013	Feb 8-10	\$0	Winter Storm "Nemo". FEMA-3360-DR. Blizzard conditions with winds gust of 50-60 MPH and over 20 inches snow hit New Hampshire and the New England area. Disaster declaration received for emergency protective measures in eight counties of the State.	<b>Boscawen did not apply for or receive federal funds.</b> The Town treated this event like other snowstorms. Power was likely lost for a period of time.	Severe Winter Weather, Extreme Temp, Snow, Ice, Wind	FEMA, Boscawen Hazard Mitigation Committee, CNHRPC, Boscawen Historical Society
Hurricane Sandy <b>Oct 2012</b>	4095 EM-3360	2012	Oct 26-Nov 8	\$0	Merrimack County and Hillsborough County received a disaster declaration for Emergency Protective Measures. Five counties experienced severe damage from heavy winds and moderate flooding, 218,000 customers without power. Fallen trees and debris closed roads, building and vehicle damage.	<b>Boscawen did not apply for or receive federal funds.</b> This storm was reportedly very mild in Boscawen.. Trees were down on power lines and on roads. Debris clean up and restoring electricity were the main outcomes from the hurricane.	Wind, Flood, Severe Storm, Hurricane, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, FEMA, Nashua Telegraph

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<b>Boscawen Rapid Snow Pack Melt 2013</b>	No	2013	Spring	N/A	N/A, although the Central NH region likely experienced high waters and rapid snow pack melt.	Hardy Lane reportedly had 8" of water. Melt runoff from impervious surfaces and roadways or from tree cover and fields have caused floods over the Entire Town. Runoff & snowmelt regularly occurred along Water Street, North Water Street (high catch basin regularly fills with debris, needs regular cleaning). Situation is made worse by flow from an unnamed tributary into Tannery Brook. Snowmelt flooding began just below Richardson's Farm on Water St. Additional snowmelt flooded the area between Corn Hill Road and Long Street backed up with water to the bridge	Severe Winter Weather, Extreme Temp, Snow, Ice, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Earthquake 4.0M Hollis ME Epicenter Oct 2012</b>	No	2012	16-Oct	N/A	With the epicenter near Hollis Center, Maine, a 4.0 earthquake was measured and felt not only in Central NH, but throughout New England. Reportedly sounding like a jumbo jet and lasting for 10 seconds, calls came in to local Fire Departments inquiring about the event. By two hours later, no calls reporting damages or injuries had been received.	Reports may have been made to the USGS from Boscawen with an earthquake of this magnitude as it was felt around the Central NH Region. Hollis is several communities to the south of Boscawen	Earthquake, Earth	Concord Monitor, Earthquake-track.com, CNHRPC
<b>NH Severe Storm and Flooding May 2012</b>	4065	2012	May 29-31	N/A	This declared disaster for Cheshire County. Public Assistance (PA) was available and Hazard Mitigation Assistance (HMA) became available statewide. Damage per capita was high – Cheshire (\$26.04). <u>Not declared in Merrimack or Hillsborough Counties.</u>	<b>Boscawen was not within the declared disaster area and did not apply for HMA funding.</b> There were no specific issues in Town noted. Any flooding, tree fall or other problems were handled as normal business.	Flood, Severe Storms, Wind, Rain	FEMA, CNHRPC
<b>Halloween Snow Storm Oct 2011</b>	4049	2011	Oct 29-30	N/A for Boscawen	FEMA-4049-DR. Towns in Central NH were impacted by this shocking, early severe snowstorm, although a major disaster declaration was <u>not declared in Merrimack County.</u> Halloween festivities were cancelled in most communities, to the heartbreak of young children. In Hillsborough County, damages were at	<b>Boscawen could not apply for/receive funding.</b> Heavy wet snow totaling nearly 22 inches effectively cancelled door to door trick or treating on Gate Night in parts of town as sidewalks were impassable.	Extreme Temp, Snow	FEMA, Boscawen Hazard Mitigation Committee, CNHRPC



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					the equivalent of \$5.11 per capita (400,721 people in 2010). The storm was also declared in Rockingham County.			
<b>Tropical Storm- Irene Aug-Sep 2011</b>	4026	2011	Aug 26-Sep 6	\$0	Carroll, Coos, Grafton, and Merrimack Counties suffered severe impacts to roads and bridges as a result of flooding from Tropical Storm Irene, which also caused power outages. Merrimack County reimbursement to towns was \$4.29 per capita (146,455 people in 2010), a total of \$11m was allocated. Disaster was not declared for Hillsborough County.	<b>Boscawen did not apply for or receive federal funds.</b> The Town experienced minor power outages and downed trees. Despite the Town's preparations, the event was considered to be insignificant to Boscawen. In previous, historical hurricanes (1869-1954), the Town had more significant damages throughout, including large hail, silo roofs blown off, bridges carried downstream. Minor power loss was experienced from Tropical Storm Irene, ranging from three days in the north to one day in the south. However, power is typically lost for a period of time during major snowstorms, severe winds, and declared disasters.	Wind, Flood, Severe Storm, Rainstorm, Tropical Storm, Debris Impacted Infrastructure	FEMA, Boscawen Hazard Mitigation Committee, CNHRPC
<b>Boscawen School Bus Sabotage Apr 2011</b>	No	2011	April	N/A	N/A, although the Merrimack Valley School District serves many communities in the Central NH Region and it is unknown if they were affected (Loudon, Webster, Salisbury, Boscawen, Penacook)	The Merrimack Valley School District canceled class after pranksters deflated the tires of 27 of the 29 buses, giving students a jumpstart on school vacation week. Police identified suspects involved in the incident made arrests	Sabotage, Human	Boscawen Hazard Mitigation Committee, CNHRPC
<b>April Fool's Snowstorm Apr 2011</b>	No	2011	1-Apr	N/A	A Nor'easter snowstorm impacted the State, causing over 30,000 power outages, most by PSNH. Snow fell in depths of up to 8", but stopped by noon. Although dozens of accidents were reported, no serious injuries were reported.	This severe winter snowstorm affected Boscawen normally, with power outages and minor traffic accidents, with no significant damages	Extreme Temp, Snow	Boscawen Hazard Mitigation Committee, wmur.com, CNHRPC
<b>Earthquake 3.4M Webster/ Boscawen Epicenter Sep 2010</b>	No	2010	26-Sep	N/A	"A magnitude 3.4 earthquake rattled buildings and nerves across much of New Hampshire Saturday night. The quake occurred at 11:28 p.m. and was centered about 10 miles north of Concord, according to the U.S. Geological Survey. State police said they received reports from residents	This 3.2M earthquake was believed to be centered in Boscawen on Corn Hill Road and woke many residents around midnight. Residents thought the earthquake sounded more like a rumble or a freight train or an explosion and caused minor damage in the form of broken dishes and glassware in residences.	Earth, Earthquake	Boscawen Hazard Mitigation Committee, Union Leader, USGS, CNHRPC

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					across the state who reported what they thought was an explosion. The quake was felt in places like Fremont, Derry, Durham, Henniker, Penacook and Raymond. There were no reports of damage." The quake was felt all over the state, Southern Maine and Massachusetts, but most reports were received from the Central NH region.			
<b>Quebec-Ottawa Earthquake 5.0M Jun 2010</b>	No	2010	Jun	23	Earthquake lasted about 30 seconds, epicenter near Buckingham, Quebec 35 north of Ottawa. Ottawa declared this earthquake the most powerful in 65 years. Tremors felt in Central NH.	Boscawen likely experienced rattling windows but no damage was reported.	Earthquake, Earth	Boscawen Hazard Mitigation Committee
<b>Severe Storms and Flooding Mar 2010</b>	1913	2010	Mar 14-31	\$0	Severe storms and flooding occurred over two weeks and damaged roads and bridges. Merrimack County reimbursement to towns for repair was \$0.28 per capita (146,455 people in 2010), and in Hillsborough County reimbursements were \$1.80 per capita (400,721 people in 2010)	<b>Boscawen did not apply for/receive funding.</b> Much of the damage from the previous storm was still being cleaned up and repaired. The Town did not experience much snow and ice damage from this snow, wind, rain, and flooding event	Severe Winds, Flooding, Power Failure, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, FEMA
<b>Severe Winter Storm Feb-March Storm and Flooding 2010</b>	1892	2010	Feb 23-Mar 3	\$0	This severe weather event included high winds, rain, and snow over a week-long period. The primary impact was debris removal and repair reimbursement for fallen trees and powerlines. In Merrimack County, the reimbursement to communities was the equivalent of \$10.39 per capita (146,455 people in 2010), with Hillsborough County at \$3.68 per capita (400,721 people in 2010). In the Concord area, 21,000 Unittel customers were out of power at the peak outage period.	<b>Boscawen did not apply for/receive funding.</b> The wind was reported to have sounded like a freight train. Part of northern section of Town lost power for three days, while the southern section lost power for up to one day.	Extreme Temp, Snow, Wind, Flood, Wind Chill,	Boscawen Hazard Mitigation Committee, FEMA, Unittel
<b>Boscawen Scabies Outbreak 2009</b>	No	2009	--	N/A	N/A, although the rest of the Central NH region also struggled with Lyme during this timeframe	In 2009, the Merrimack County Correctional Facilities had an outbreak of scabies. A POD was held later that year for H1N1 at the facility.	Biological, Public Health, Technological	Boscawen Hazard Mitigation Committee, CNHRPC

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<b>Boscawen Haz Mat Incident Circa 2008-2009</b>	No	Circa 2008	-2009	N/A	N/A, although regional traffic depends on the US3 /4 Route through Boscawen	A huge truck fire involving 3 fueling tanks occurred on King Street. The Town has 3 gas stations along King Street (US 3/ 4), all nearby on another.	Hazardous Materials, Public Health, Fire, Explosion	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Severe Winter Storm - Dec 2008 Ice Storm</b>	1812	2008	Dec 11-23	\$0	Accumulating ice, snow, rain, and strong winds caused downed trees and power lines, with power outages and traffic accidents resulting. In Merrimack County, debris removal and repair cost reimbursement FEMA the equivalent of \$10.07 per capita (146,455 people in 2010). In Hillsborough County, debris removal costs were \$6.35 per capita (400,721 people in 2010). The major disaster was declared in all 10 counties. New England was blanketed with ice and snow during the winter storm. The weight of the ice caused branches to snap, and trees to either snap or uproot, and brought down power lines and poles across the region. About 400 thousand utility customers lost power during the event, with some customers without power for two weeks. Property damage across northern, central and southeastern New Hampshire was estimated at over \$5 million. Event was the largest power outage in New Hampshire's history.	<b>Boscawen did not apply for/ receive funding</b> . Buildings lost power from 12 hours to three to four days depending on their location. Residents, businesses, and the Town were affected. Trees had fallen across roads, houses, and powerlines.	Extreme Temp, Ice, Wind, Technological, Power Failure, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, FEMA, CNHRPC
<b>Severe Storms and Flooding - Sep Flood 2008</b>	1799	2008	Sep 6-7	\$0	Heavy rain from the remnants of tropical storm Hanna resulted in flooding on small rivers and streams in the Central NH area. The remains of tropical storm Hanna moved through eastern New England dumping 3 to 6 inches of rain in New Hampshire in about 8 hours causing rapid rises on area streams. In Merrimack County, damage to road systems totaled the	<b>Boscawen did not apply for/ receive FEMA Public Assistance funding</b> for roads & bridges and protective measures. This event was handled as a normal storm.	Flood, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, FEMA

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					equivalent of \$1.48 per capita (146,455 people in 2010) for town reimbursement. Hillsborough County's damage was much higher at \$6.90 per capita (400,721 people in 2010)			
Severe Winds, Heavy Rains July Tornado 2008	1782	2008	Jul 24	\$0	An F2-F1 tornado touched down in Rockingham County then proceeded into another county. Then in Merrimack County, the tornado was rated up to an F-3 and killed a woman in Deerfield trapped in a collapsed house. In the county, there was substantial damage totaled the equivalent of \$1.12 per capita (146,455 people in 2010) for the towns' debris removal reimbursement costs. A total of 123 residences statewide were affected, with 17 destroyed and another 37 suffering major damage. Damage was estimated to exceed \$10 million. Hillsborough County	Boscawen did not apply for/receive FEMA Public Assistance funding for debris removal and protective measures. The path of the tornado was nowhere near but on the other side of the region 20 miles to the southeast.	Wind, Tornado, Downburst, Severe Storm, Debris Impacted Infrastructure	FEMA, Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Snowstorm Feb 2008	No	2008	Feb	N/A	N/A, although the Central NH region likely experienced heavy snowfall during this time.	Heavy snow and back to back storms caused heavy and wet snow loads that stressed buildings to the point of collapse – Residential and Commercial buildings suffered damage totaling 12 roof collapses	Extreme Temp, Snow, Wind, Flood, Wind Chill	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen MRSA Fatality Oct 2007	No	2007	Oct	N/A	N/A, although the rest of the Central NH region was vulnerable too.	A preschool student at the Boscawen Elementary School died at Boston Children's Hospital from pneumonia caused by Methicillin-resistant Staphylococcus aureus, often called MRSA, a bacteria that can be passed from child to child by skin contact. School officials took criticism when they had acted on the advice of state officials and had not cancelled school or notified parents.	Biological, Public Health, Technological	Boscawen Hazard Mitigation Committee, CNHRPC

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## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
Severe Storms and Flooding - April Spring Flood 2007	1695	2007	Apr 15-23	\$1,000	Extensive flooding caused by severe storms impacted seven counties. Indirect peak discharge measurements on stream gages on the Suncook River at Short Falls Road in Webster were 14,100 ft <sup>3</sup> , which was determined to be greater than 100-year flood discharge levels. The heavy rain combined with snow melt to cause small rivers and streams in much of New Hampshire to flood. Over land, the strong winds downed numerous trees. The downed trees caused widespread power outages, especially near the coast, and numerous road closures. The storm also brought heavy rain to the region which, when combined with snow melt, produced widespread flooding across much of the region.	Boscawen received \$1,000 in FEMA Public Assistance funding for roads & bridges and protective measures. Many roads were damaged during this storm, although Boscawen was not as impacted as other towns. Again, the Town experienced the same washouts. Undersized culverts still could not accommodate the water volume. The Town applied and received FEMA funding to fix the washouts, some of which were not as extreme this time. Jaime Welch Park is situated off of Route 3 (King Street) along the Merrimack River; the boat launch at the park has had to be replaced twice already because of flood damage.	Flood, Wind, Debris Impacted Infrastructure, Rapid Snow Pack Melt	FEMA, USGS Flood of 2007, Boscawen Hazard Mitigation Committee
Boscawen Domestic Hostage and Shooting Fatality Feb 2007	No	2011	Feb	N/A	N/A	Domestic dispute caused a father to shoot his ex-wife and hold his young son hostage in an April Avenue home. Father committed suicide after injuring son.	Hostage, Human, Active Shooter	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Lyme Disease Circa 2007-2011	No	2007	-2011	N/A	N/A, although the rest of the Central NH region also struggled with Lyme during this timeframe	2007-2011 Lyme disease has been a problem in Town recently for dogs as well as humans. Riverside Veterinary Hospital has been treating a number of local dogs for Lyme Disease and during the past five years, a number of local residents tested for and confirmed with Lyme disease.	Biological, Public Health, Technological	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Civil Disturbance Protest at Correctional Facility Jun 2006	No	2006	Jun	N/A	N/A	About a dozen jail workers picketed over the Merrimack County Jail's use of part time employees, the frequency of double shifts and rules governing overtime, because they worked 15 months without a contract.	Civil Disturbance, Human, Public Unrest, Protest	Boscawen Hazard Mitigation Committee, CNHRPC
Boscawen Landslides Mother's Day Flood 2006	1643	2006	May 12-23	N/A	N/A	Private property experienced landslides as a result of the Mother's Day Flood. Crutchfield property on Route 3/4 across from Crete's Farm experienced	Flood, Erosion, Landslide	Boscawen Hazard Mitigation Committee, CNHRPC

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
						landslide. Since State placed riprap 5-6 years ago on site, the steep slope is more stable. On Route 3, the hill across from Veterans Cemetery known as the "former sledding hill", was excavated at 3:1, but it was still was undercut during this event. Vegetation is difficult to grow on this sandy soil hill.		
<b>Severe Storms and Flooding – Mother's Day Flood 2006</b>	1643	2006	May 12-23	\$10,800	Extensive flooding caused by severe storms impacted seven counties including Merrimack and Hillsborough. The USGS recorded the highest flows on record for several rivers including the Contoocook River in Davisville village, Soucook in Concord, and Piscataquog in Goffstown.	<b>Boscawen received \$10,800 in FEMA Public Assistance funding</b> for roads & bridges and protective measures. This flooding event was very similar to the Columbus Day 2005 flooding. With heavy rains several inches higher than average mixed with strong winds, brooks, streams, and rivers overflowed their banks flooding every nearby field, peoples' yards and basements, and undermining many roadways causing washouts throughout the Town. A culvert filled with debris located at the lights in Central Boscawen caused River Road to flood with several feet of water and the evacuation of a nearby home in the same area because there was fear of the house washing into a ravine filled with 20 to 30 feet of backed up water. Many roadside ditches and culverts were washed out or damaged. Corn Hill Road was totally underwater near Boscawen-Webster town line, closing the road for several days. A major washout by the Water Precinct also became a concern. Routes 3/4 just past the lights heading north on the left (white house). Highway View Farm (Crete) on River Road - siltation, washouts.	Flood, Wind, Debris Impacted Infrastructure, Erosion, Landslide	Boscawen Hazard Mitigation Committee, FEMA, USGS, CNHRPC
<b>Webster Severe Winds and Fire Feb 2006</b>	No	2006	Feb 26	N/A	N/A, although it is likely the surrounding towns and region were impacted by this storm. Very windy conditions caused numerous trees to fall	Boscawen is a close neighbor to Webster and likely responded to these events. Some of the mentioned roads are shared.	Wind, Debris Impacted Infrastructure, Wildfire	Webster Hazard Mitigation Committee



# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					down in Webster, along Clough and Sanborn Hill Roads, Battle Street/Route 127, on Corn Hill Road, Roby Road, Pleasant Street, Gerrish Road, Clothespin Bridge Road, Chadwick Hill Road, and Tyler Road. On Rolfe Road, two downed trees across an electric line started a small brush fire. Volunteer firemen living nearby immediately responded, put out the fire and then cleared the road so residents could return home. PSNH electric customers had to wait days to have their service restored.			
Severe Storms and Flooding - Columbus Day Flood 2005	1610	2005	Oct 7-18	\$8,500	Extensive flooding caused by severe storms impacted five counties, including Merrimack and Hillsborough. Alstead experienced several fatalities as the result of dam failure.	Boscawen received \$8,500 in FEMA Public Assistance funding for roads & bridges and protective measures. See the Mother's Day Flood for details. The two storms impacted Boscawen nearly identically. Merrimack River erosion caused several feet of banking behind properties at the southern end of King Street to wash away during the 2005-2006 storms. The Canterbury side of Merrimack River was eroded, a mass failure occurred during the storm where Wheelabartor was going to use the land as an ash landfill.	Flood, Wind, Debris Impacted Infrastructure, Erosion, Scouring, Mass Failure	Boscawen Hazard Mitigation Committee, FEMA
Boscawen Flooding and Debris Impacted Infrastructure Jun 2005	No	2005	Jun	N/A	N/A	The culvert under the road to the Fessenden Manufactured Housing Park collapsed due to lack of regular maintenance and debris became impacted in the mouth of the culvert creating a two acre pond that rose to the level of King Street. The south end of Town suffered from debris impacted infrastructure during a storm event.	Flood, Storms, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, CNHRPC
Regional Thunderstorms and Lightning Jun 2005	No	2005	12-Jun	N/A	During a thunderstorm, lightning struck and severely damaged the historic Loudon Town Hall on Clough Hill Road. Winds from a severe	Boscawen likely experienced the thunderstorm and lightning event. A fire occurred on Water Street behind Walker Pond. Various fire events have impacted	Thunderstorm, Lightning, Severe Winds	Boscawen Hazard Mitigation Committee, CNHRPC, Area Hazard

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					thunderstorm knocked down trees and power lines down in the towns of Warner, Hopkinton, Concord, Bow, Loudon, and Hopkinton in Merrimack County.	the community over time but none notable by the Haz Mit Committee.		Mitigation Committees
<b>Snow Emergency Jan 2005</b>	EM-3207	2005	Jan 22-23	<b>\$3,500</b>	Record and near record snowstorm for 8 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	<b>Boscawen received \$3,500 in FEMA Public Assistance funding</b> for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
<b>Boscawen West Nile Infection 2005</b>	No	2005	Summer	N/A	N/A, although similar arboviral problems were likely occurring in the region. In 2005, neighboring Webster had to be put down 1 horse on Mutton Road after being infected with EEE.	West Nile Virus was discovered in a horse on Route 4. Several birds tested positive for West Nile following a public awareness campaign initiated after the horse incident.	Public Health, Biological	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Earthquake 2.2M Henniker-Hopkinton Epicenter Jan 2004</b>	No	2004	20-Jan	N/A	An earthquake measuring 2.2 on the Richter Scale was centered in the Henniker-Hopkinton area. Shaking and noise were reported, but no damage occurred.	Reports were likely made to the USGS by Boscawen residents feeling the earthquake as a rumble or loud noise. The epicenter was within a couple miles of Boscawen, to the west.	Earth, Earthquake	Concord Monitor, January 2004, USGS, Earthquake Monitor, CNHRPC
<b>Boscawen Cold Snap 2004</b>	No	2004	Jan	N/A	N/A, although it is likely the entire Central NH Region was affected by this cold snap	A cold snap affected Boscawen residents in mid-January. For a period of time, no heat was available to homes and pipes froze. 2012-2017- more or less effected everywhere,	Extreme Temp, Windchill, Excessive Cold	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Snow Emergency Dec 2003</b>	EM-3193	2003	Dec 6-7	<b>\$4,000</b>	Record snow fall event impacting much of New England. In NH, 8 counties received emergency protective measures, including Merrimack and Hillsborough.	<b>Boscawen received \$4,000 in FEMA Public Assistance funding</b> for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
<b>Snow Emergency Feb 2003</b>	EM-3177	2003	Feb 17-18	<b>\$2,300</b>	Record and near record snowstorm for 5 NH counties including Merrimack and Hillsborough. Emergency protective measures declared for reimbursement.	<b>Boscawen received \$2,300 in FEMA Public Assistance funding</b> for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
<b>Boscawen Downbursts Circa 2000-2005</b>	No	Circa 2000 - 2005	--	N/A	N/A. Any summer storm is not isolated to one community. It is highly likely other Central NH Region towns experienced this severe storm, with	In the 2000s, high winds caused trees to blow down and destroy a manufactured home. High wind events are fairly regular occurrences in the area but usually do not cause much damage.	Downburst, Wind, Storm	Boscawen Hazard Mitigation Committee, CNHRPC

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					high winds and/or downbursts			
<b>NH Drought Emergency 2002</b>	No	2002	Aug	N/A	All counties in the State of NH except Coos County. One of the hottest Augusts on record in Concord along with drought conditions since March made for a high fire danger in New Hampshire. Numerous forest fires were reported, including a 30-acre blaze in New Durham.	N/A, although Boscawen was likely affected by dug wells going dry	Drought, Extreme Temperatures, Earth, Fire	Concord Monitor 8/20/02
<b>Snow Emergency Mar 2001</b>	EM-3166	2001	Mar 5-7	\$3,000	Record and near-record snowfall from late winter storm, emergency declaration was issued for protective measures. Merrimack, Hillsborough and 5 other counties declared eligible.	<b>Boscawen received \$3,000 in FEMA Public Assistance funding</b> for protective measures, including snow removal.	Extreme Temp, Snow	FEMA, CNHRPC
<b>Boscawen Haz Mat Incident Circa 2000s</b>	No	Circa 2000	--	N/A	N/A, although regional traffic depends on the US3 /4 Route through Boscawen	Businesses on King Street have experienced problems with fuel storage tanks, Kapelli's propane tank and Cumberland Farm's gasoline tank. The Town has 3 gas stations along King Street (US 3/ 4), all nearby on another.	Hazardous Materials, Public Health Fire	Boscawen Hazard Mitigation Committee, CNHRPC
<b>Regional Downbursts and Severe Winds Jul 1999</b>	No	1999	6-Jul	N/A	Severe storms in July 1999 bring strong damaging winds and 3 downbursts. Two deaths occurred. The roof of the Pill building in Concord is blown off during a storm. The downburst was designated a macroburst (at least 2.5 miles in diameter). Other communities in the Central NH Region experienced damages	N/A, although Boscawen likely experienced some heavy winds as it is located in the region.	Severe Wind, Downburst	Concord Monitor, NH HSEM, CNHRPC
<b>Severe Storms and Flooding Summer 1998</b>	1231	1998	Jun 12-Jul 2	No	Heavy flooding in six counties, including Merrimack and Hillsborough Counties. Damages of \$3.4m for all counties.	<b>Boscawen did not apply for/receive funding.</b> As Boscawen is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood, Wind, Debris Impacted Infrastructure	FEMA
<b>Ice Storm of Jan 998</b>	1199	1998	Jan 7-25	\$0	This ice storm was the first to test our statewide and local emergency management systems and utility providers. Tree and infrastructure damage was extensive and power failures lasted up to two weeks in some parts of the state. In The Central NH Region, many lost power	<b>Boscawen did not apply for/receive funding.</b> The Town functioned as it normally does during ice storms and power outages.	Extreme Temp, Ice Storm, Power Failure, Communications Failure	FEMA, US Army Corps of Engineers NH Storms database, Boscawen Hazard Mitigation Committee, Bow Times

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					for over a week. This ice storm had severe impacts throughout most of the State, with 52 communities impacted. FEMA Disaster Declaration #1199, Six injuries and one death resulted. Damage totaled \$12,446,202. In addition, there were 20 major road closures, 67,586 people left without electricity, and 2,310 people without phone service.			
Severe Storms and Flooding Oct 1996	1144	1996	Oct 20-23	\$0	Heavy rains caused flooding in six counties, including Merrimack and Hillsborough Counties. Damage totaled \$2.3m for all counties.	<b>Boscawen did not apply for/receive funding.</b> As Boscawen is within Merrimack County, it is likely experienced heavy rains and possibly some flooding.	Flood	FEMA, NH HSEM, CNHRPC
Storms and Floods Oct-Nov 1995	1077	1995	Oct 20-Nov 15	\$0	Four NH counties were damaged by excessive rain, high winds and flooding, including Merrimack (not Hillsborough).	<b>Boscawen did not apply for/receive funding.</b> As Boscawen is within Merrimack County, it is likely experienced heavy rains, trees down and power outages.	Flood, Severe Winds	FEMA, Federal Register, CNHRPC
Severe Storm-Hurricane Bob Aug 1991	917	1991	Aug 18-20	N/A for Boscawen	Public assistance was available for Hillsborough County and 2 other counties (not declared in Merrimack County) as a result of damages caused by Hurricane Bob. The 2 seacoast counties fared the worst.	As Boscawen is within Merrimack County, it likely experienced heavy rains, wind gusts, tree debris, power outages and possibly some flooding.	Severe Winds, Hurricane	FEMA, CNHRPC
Flooding and Severe Storm Aug 1990	876	1990	Aug 7-11	No data available	Moderate to heavy rains caused flooding in eight counties, including Merrimack and Hillsborough Counties. Damage totaled \$2.3m for all counties	As Boscawen is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	Flood, Severe Winds	FEMA, NH HSEM
Severe Storms and Flooding Mar-Apr 1987	789	1987	Mar 30-Apr 11	No data available	Flooding caused by snowmelt and intense rain was felt in seven counties, including Merrimack and Hillsborough Counties. Nearly \$5m in damages.	As Boscawen is within Merrimack County, it likely experienced heavy rains, tree debris, power outages and possibly some flooding.	Flood, Rapid Snow Pack Melt, Debris Impacted Infrastructure	FEMA, NH HSEM, US Army Corps of Engineers
Severe Storms and Flooding Jul-Aug 1986	771	1986	Jul 29-Aug 10	N/A for Boscawen	Severe summer storms with heavy rains, tornadoes, flash floods, and severe winds, damaged the road network statewide. Disaster declared in Cheshire, Sullivan and Hillsborough	Crete's Farm on River Road was believed to have sustained damage during the flooding event. Boscawen experienced heavy rains and possibly some flooding.	Flood, Wind	Boscawen Hazard Mitigation Committee, FEMA, NH HSEM, CNHRPC

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
					Counties (not declared in Merrimack County).			
<b>Earthquake 4.5M Sanbornton Jan 1982</b>	No	1982	18-Jan-82	N/A	An earthquake originating near in Sanbornton in Belknap County measured 4.5M and was felt in various locations throughout the State. The area it was felt includes all of northern Merrimack County including the Concord area communities in Central NH.	A Sanbornton-centered earthquake caused little physical damage in Merrimack County but did cause cracking of walls and ceilings in Boscawen's newly restored church. Sanbornton is only a few miles to the northeast.	Earthquake	Boscawen Hazard Mitigation Committee, CNHRPC, Earthquake-track.com
<b>Concord Beaver Meadow Tornado Jul 1979</b>	No	1979	Jul 27	N/A	In Concord, a small twister was sighted at Beaver Meadow, where 13 trees were toppled, including a 100-foot tall pine. The duration was about 15-20 seconds.	N/A, although Concord abuts Boscawen to the south	Wind, Tornado	Concord Monitor
<b>NH Blizzard of Feb 1978</b>	No	1978	Feb 5-7	N/A	RSI Index of Category 5 (Extreme). This snowstorm is described as "a natural disaster of major proportions" and stunned all of New England. The storm was caused by an intense coastal Nor'easter that produced winds in excess of hurricane force and very high snow totals. Most of southern New England received more than three feet of snow, 25-33" in NH and higher throughout New England. Abandoned cars along roadways immobilized infrastructure and blocked major interstates. For over a week, New England remained paralyzed by the storm. All of New Hampshire was impacted. Governor Meldrim Thomson Jr. declared a state of emergency.	Although it is unknown what Boscawen experienced, it is likely many of the same depths and effects occurred across the Town.	Extreme Temperatures, Severe Snow Storms, Windchill, Power Failure	American Meteorological Society, Northeast States Emergency Consortium, CNHRPC
<b>Boscawen Contoocook River Ice Jams 1970 &amp; 1976</b>	No	1970	1976	N/A	N/A although the Contoocook River flows through multiple communities. Ice Jams could have formed anywhere along its length	In January 1970 and 1976, the Contoocook River reportedly had 3 ice jams in Penacook/Boscawen at the same location, along Eel Street just before Tremont Street. The Contoocook River has had dozens of ice jams in the past, particularly in Henniker and Peterborough.	Ice Jam, Flood, Rapid Snow Pack Melt, Debris Impacted Infrastructure	CNHRPC, US Army Corps of Engineers Ice Jam Database

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
<b>Quebec Earthquake 4.8M Jun 1973</b>	No	1973	15-Jun	N/A	An earthquake originating near the Quebec border at a scale of 4.8 was felt in various locations throughout NH.	N/A, although some Boscawen residents may have felt the effects.	Earthquake	Northeast States Emergency Consortium
<b>Severe Storms and Flooding Jul 1973</b>	399	1973	Jul 11	No data available	All counties in the State of NH experienced storm damage and were declared disaster areas, including Merrimack and Hillsborough Counties.	No information available for Boscawen.	Flood, Wind	FEMA
<b>Older Hurricanes 1954-1991</b>	No	1954	to 1991	N/A	Many older hurricanes have impacted New Hampshire including the 1954 – 1991 Hurricanes: Carol on August 31, 1954 (tree and crop damage), Edna on September 11, 1954, Donna on April 12, 1960 (heavy flooding), Dora on August 28, 1971, Bell on August 10, 1976, Gloria on September 27, 1985, and Bob in 1991.	Downed trees, wind damage, and flooding were likely experienced in Boscawen during many of these hurricanes.	Wind, Flood, Hurricane, Tropical Storm, Debris Impacted Infrastructure	NH Homeland Security and Emergency Management,
<b>10 Severe Snowstorms 1940-1978</b>	No	1940	to 1978	N/A	Ten severe snowstorms are documented in south-central New Hampshire during this time span, February 14-15, 1940 (depths over 30" and high winds), February 14-17, 1958 (20-33"), March 18-21, 1958 (22-24"), March 2-5, 1960 (up to 25"), January 18-20, 1961 (up to 25", blizzard conditions), January 11-14, 1964 (up to 12"), January 29-31, 1966 (up to 10"), February 22-28, 1969 (24-98", slow-moving storm), December 25-28, 1969 (12-18"), January 19-21, 1978 (up to 16").	Although it is unknown what Boscawen experienced, it is likely many of the same depths occurred.	Extreme Temperatures, Severe Snow Storms, Ice, Windchill, Power Failure	American Meteorological Society
<b>Regional Snow Storm and Rapid Snow Pack Melt Mar 1953</b>	No	1953	Mar	N/A	N/A, although similar rain or snow storms and rapid snow pack melt likely impacted the region. The highest level of water in the Blackwater Dam was measured, with the capacity at 93%. No flooding was reported. Uncertain as to exactly what type of storm caused this effect. A total of nearly 8" of precipitation in March 1953.	The storm was not particularly notable by the Town. Likely, Boscawen experienced both the heavy snow and rapid melt impacts throughout the community.	Flood, Rapid Snow Pack Melt, Debris Impacted Infrastructure	FEMA, NH HSEM, US Army Corps of Engineers



## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 4 HAZARD RISK ASSESSMENT

Event	Declared Disaster DR-	Year	Date	FEMA Public Assistance	Area Effects Surrounding Boscawen	Local Effects Occurring in Boscawen	Hazard Category	Source
<b>Regional &amp; Boscawen Hurricane of Sep 1938</b>	No	1938	Sep 21	N/A	Hurricane made landfall as a 3 on the Saffir-Simpson Scale, killed about 682 people and damaged or destroyed over 57,000 homes. Most deadly New England hurricane. Central New Hampshire was inundated with water. Downed trees caused extensive damage to homes, businesses and community infrastructure. President Roosevelt ordered emergency aid be sent to NH, including Merrimack County	The Town was severely impacted by this storm. Many photos are archived in the Historical Society	Wind, Hurricane, Flood, Debris Impacted Infrastructure	Wikipedia, Concord Monitor, Boscawen Historical Society, CNHRPC
<b>Regional &amp; Boscawen Flood of Mar 1936</b>	No	1936	Mar 11-21	N/A	Simultaneous high snowfall totals, heavy rains, and warm weather combined to hit all of New England. Floods killed 24 people, caused \$133,000,000 in damage, and made 77,000 people homeless in New England. The great flooding of 1936 resulted from heavy rains and rapid snow pack melt. Snow north of Concord contributed to the higher waters in the Winnepesaukee, Contoocook and Pemigewasset rivers that were largely responsible for the destruction in Concord and the surrounding area. NH issued boil water warnings to everyone.	The Town was severely impacted by this storm. Many photos are archived in the Historical Society	Flood, Ice Jams, Rapid Snow Pack Melt	Concord Monitor, Union Leader, Army Corps of Engineers Ice Jam Database, Boscawen Historical Society, CNHRPC
<b>Regional &amp; Boscawen Tornado Spring 1927</b>	No	1927	Spring	N/A	N/A, In the spring of 1927 a cyclone (tornado) and a flood hit New Hampshire that downed trees in Boscawen and Concord. Water height peaked at 12 feet, 2 inches over Sewall's Fall Dam in Concord.	In the spring of 1927 a cyclone (tornado) and a flood hit New Hampshire that downed trees in Boscawen and Concord.	Tornado, Wind, Debris Impacted Infrastructure	Boscawen Hazard Mitigation Committee, CNHRPC

*Source: Compilation of Events by Boscawen Hazard Mitigation Committee; CNHRPC*

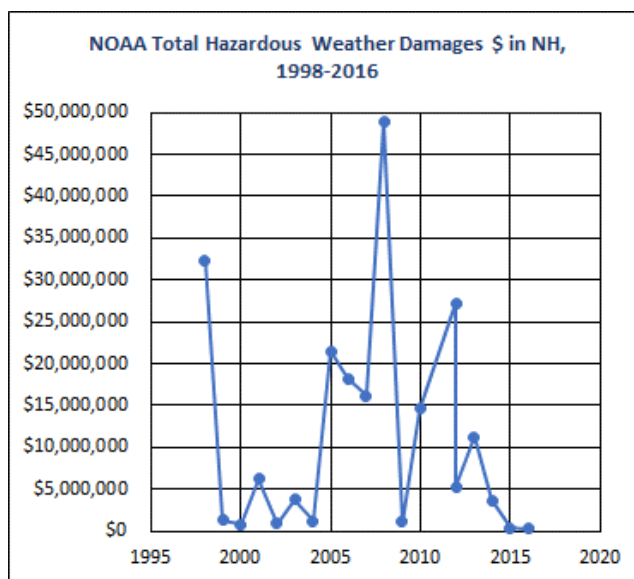
### Local Climate Changes and Extreme Weather

In the State and the Central NH Region, like any other areas, exist our own “micro-climate” areas that can be analyzed for future susceptibility to disasters and hazard events. New Hampshire has obtained high costs of damage over time due to hazardous weather and declared disasters. A review of the state and area history can provide a perspective on what Boscawen can expect to see in terms of extreme weather in the future.

Table 11

Summary of Hazardous Weather Fatalities, Injuries, and Damage Costs in NH, 1998-2016

Year	Fatalities	Injuries	Total Damages \$
2016	1	1	\$270,000
2015	2	34	\$370,000
2014	0	2	\$3,700,000
2013	0	30	\$11,250,000
2012	1	4	\$5,280,000
2012	1	2	\$27,280,000
2010	1	6	\$14,630,000
2009	1	0	\$1,130,000
2008	2	5	\$48,890,000
2007	0	3	\$16,150,000
2006	1	9	\$18,200,000
2005	4	9	\$21,500,000
2004	0	11	\$1,200,000
2003	2	29	\$3,800,000
2002	0	7	\$900,000
2001	0	2	\$6,200,000
2000	2	6	\$800,000
1999	3	17	\$1,300,000
1998	1	23	\$32,400,000



Source: National Oceanic and Atmospheric Administration, last accessed 03/18  
<http://www.nws.noaa.gov/om/hazstats.shtml>

Injuries to people and the costs of damages in New Hampshire have increased as a result of hazardous weather. These increases of injuries and damages can be generally applied to the major disasters declared in the State. As displayed in **Table 11**, the highest numbers of damage costs correlate to the 1998 (**\$32m**) and 2008 (**\$49m**) ice storms between 1998 and 2015.

The number of injuries and fatalities have a less distinct association, with the highest numbers shown in 2013 (**30**) and 2003 (**31**). However, the greatest number of fatalities during this time period occurred in 2005 (**4**), likely during the time of the Columbus Day floods that hit the southwestern section of the State very hard.

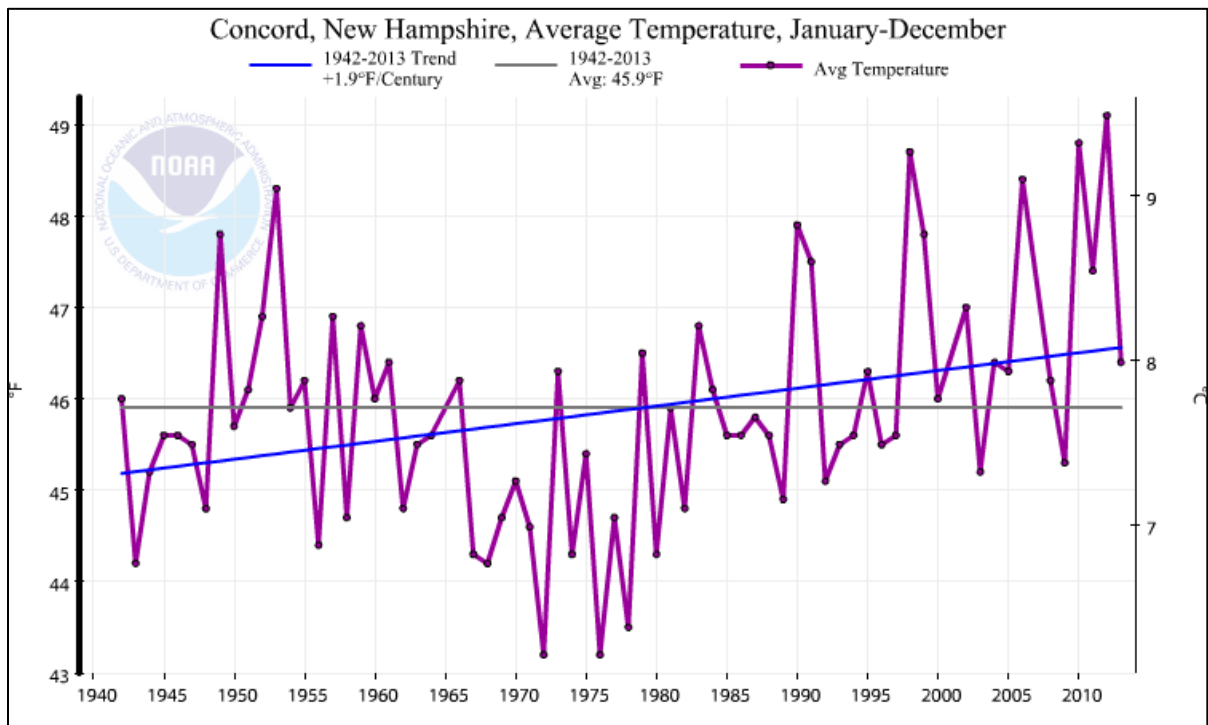
Much of the rest of the discussion in this section has been directly excerpted or paraphrased from the *Central NH Regional Plan 2015*. The Central NH Region’s weather history is summarized to provide a view of the trends around the Concord area where the weather measurements have taken since 1939 at the

Concord Airport. Boscawen is geographically close to the City of Concord (within **15** miles), so these measurements should have some reasonable basis in Boscawen.

**Figure 4** displays Concord's average annual temperature between 1942 (**46.0°F**) and 2013 (**46.4°F**). Earlier data was not available. As with typical New Hampshire weather, the seasonal temperatures can vary year after year and without obtaining an average, changes are difficult to see. The displayed trend line allows a definitive way of averaging all of the temperatures and illustrates a **+2.8°F** increase in average annual temperature during this 70-year time period.

**Figure 4**

**Average Annual Temperature for Concord, 1942-2013**

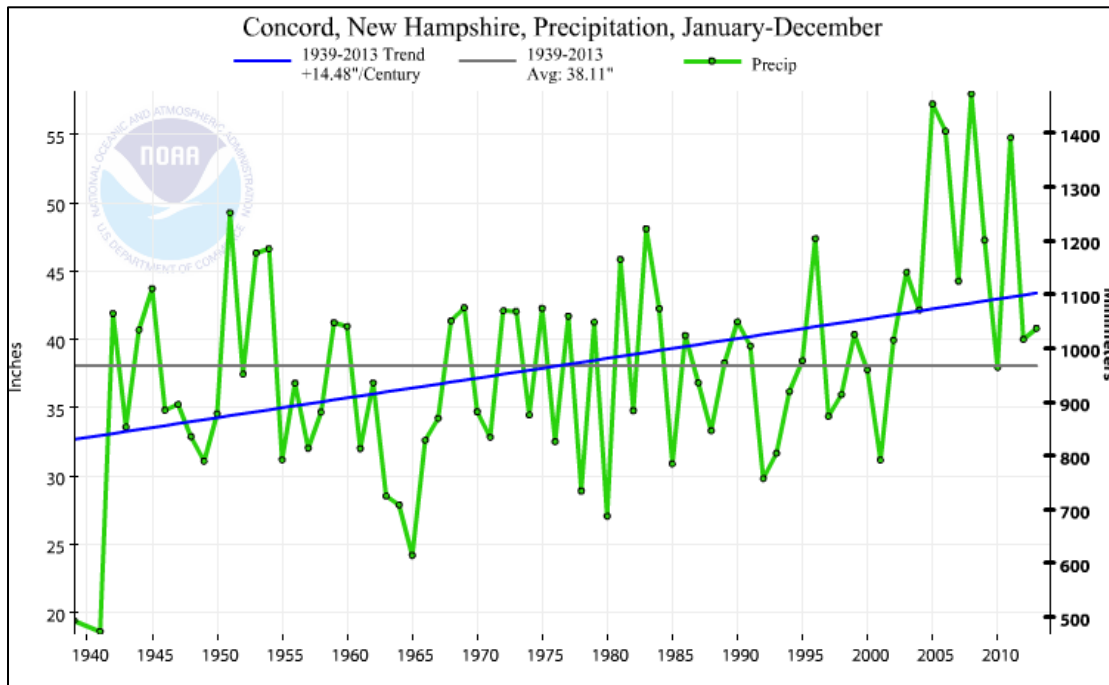


Source: National Oceanic and Atmospheric Administration

For precipitation changes, **Figure 5** displays Concord's average annual precipitation rates between 1939 and 2013. Varying seasonal rainfall amounts continue over the decades. The trend line serves the same purpose to illustrate an overall increase of **+14.48"** in precipitation over the 74-year time period from 1939 to 2013.

Figure 5

Average Annual Precipitation for Concord, 1939-2013

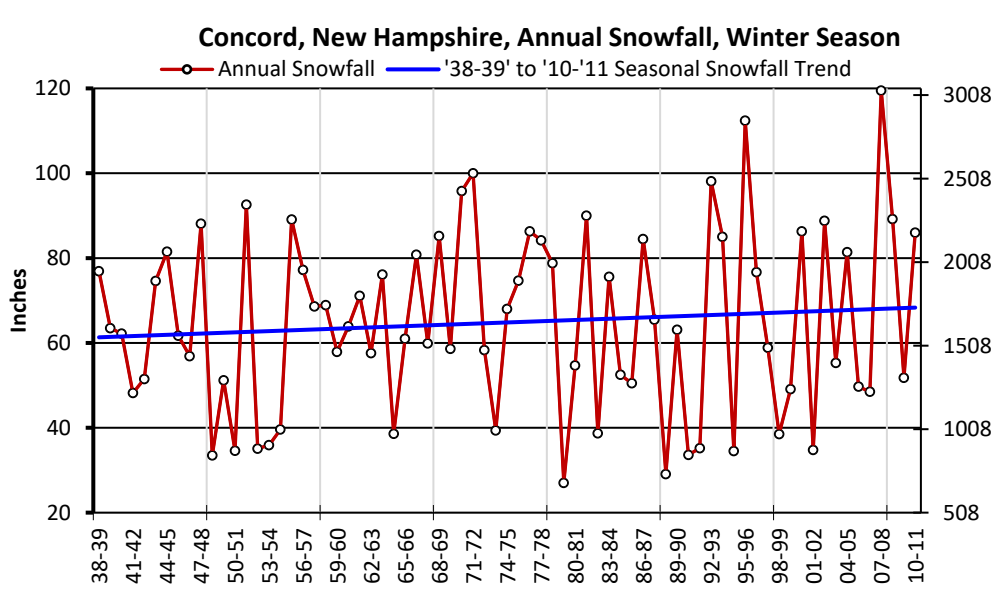


Source: National Oceanic and Atmospheric Administration

Similar to temperature and precipitation, annual snowfall amounts as reported by NOAA were observed for Concord starting in the **1938-1939** winter season through the **2010-2012** winter season. Snowfall data from **2012-2013** was not available. As displayed in **Figure 6**, the amount annual of snowfall has varied greatly over the past century. Overall, the trend line indicates a slight increase in annual snowfall inches, from about **60"** in the **1938/39** season to about **68"** in **2010/11**, totaling an increase of **+8"** of snowfall over the 72-year time span.

Figure 6

Average Annual Snowfall for Concord, Winter Seasons 1938/39 - 2010/11



Source: NOAA Compiled by: CNHRPC

This climate data may certainly be relevant to the entire Central NH Region which includes the Town. The Central NH region climate summation is that the temperature is getting warmer, the precipitation is increasing, and the snowfall is slightly increasing according to the National Oceanic and Atmospheric Administration's data collection at the Concord airport. There are no indications to see these trend lines reverse although the snowfall varies greatly from one season to the next, almost in an alternating pattern.

The Southern NH Climate Change Assessment, formally entitled ***Climate Change in Southern New Hampshire: Past, Present, and Future, 2014*** by the University of New Hampshire, reviewed current climate conditions and projected future conditions of Southern New Hampshire under potential low and high emission scenarios. Their past and future climate overview is illustrated in **Figure 7**.

Figure 7

Southern NH Climate Assessment Projections

As a result of anticipated extreme weather continuing and climate changes in Central NH and Boscawen, consideration should be given for potential impacts to the community. A few new issues are considered, although the list is not detailed. For more information on these topics, refer to the **Central NH Regional Plan 2015**.

**More Human Health Emergency Events**

- ☞ Illnesses such as heatstroke, fainting, and heat exhaustion.
- ☞ Excess heat especially dangerous for the aging population and residents without air conditioning.
- ☞ Increase in greenhouse gas emission, energy demand, and air conditioning use and cost.
- ☞ More favorable conditions for insects carrying viruses and diseases, such as West Nile Virus.
- ☞ Increases risk of waterborne illnesses caused by pollutants entering the town's water supply, commonly through stormwater runoff and sewage overflow.
- ☞ Infrastructure failure by adding additional stress, leading to potential injury or loss of life.
- ☞ More air pollution, leading to asthma and breathing disorders.

**Natural Environment Disruption**

- ☞ Too much water and/or lack of water can disrupt trees and plants natural growing cycle, potential leading the tree, plant, and surrounding area to die.
- ☞ Additional water and drought conditions affect wetland discharge, stream flow, and water quality, affecting the habitat's quality of life and species' health within the area.
- ☞ Debris will be a result of harsh flooding, including trash and downed trees, polluting waters, harming habitats, and damaging property and infrastructure.

**Past Data and Future Climate Overview**

**SOUTHERN NH CLIMATE ASSESSMENT Projections**

**TEMPERATURE**

What have we seen since 1970?

- Average maximum temperatures have warmed by 2.0°F (annual) and 2.9°F (winter)
- Average minimum temperatures have warmed by 3.2°F (annual) and 6.1°F (winter)

What can we expect?

- Summers will be hotter: 16-47 days above 90°F
- Winters will be warmer: 20-45 fewer days below

**RAINFALL**

What have we seen since 1970?

- Annual precipitation has increased by 8-22%
- Frequency and magnitude of extreme events

What can we expect?

- Precipitation annual average will increase: 15-20%
- More frequent and severe flooding

**SNOW**

What have we seen since 1970?

- Fewer days with snow cover
- Lake ice-out dates occurring earlier

What can we expect?

- Significant decrease of 20-50% in number of snow covered days

Source: *Climate Solutions of New England, 2014*



### **Declining Forest Health**

- ☞ Large weather events such as heat stress, drought, and periods of winter thaw followed by intense cold can lead to loss of trees.
- ☞ Become susceptible to invasive species and diseases, such as the Hemlock Woolly Adelgid.
- ☞ Loss of trees can have a direct impact on portions of the region's economic components, including declining tourism.

### **Fewer Recreation Opportunities**

- ☞ Weather Impacts on Recreational Trails such as debris, flooding and erosion.
- ☞ Snowmobiling, ice fishing, snow shoeing, skiing and snowboarding provide numerous sources of winter recreation and winter tourism, enhancing the quality of life and economy, will be affected with shorter seasons.

### **Risks to the Built Environment**

- ☞ Critical infrastructure such as roads, bridges, culverts, stormwater drainage systems, water and wastewater treatment facilities, natural gas lines, electric lines and poles might be at risk of severe damage or failure if the anticipated extreme weather events occur.
- ☞ Damaged infrastructure cannot provide services to homes and businesses, disrupting the economy and may endanger public health.
- ☞ Culverts are at risk to extreme precipitation events, including rain, snow, and ice.
- ☞ Residents who experience damage with flooding to their homes and personal belongings may lack proper flooding insurance, placing the resident in financial hardship.
- ☞ Dams with High Hazard and Significant Hazard classifications are the most likely to cause the largest amount of damage or loss of life.

### **Increasing Municipal Transportation Systems Maintenance Needs**

- ☞ Volume of flooding is expected to increase, potentially closing roads and increasing the travel time for drivers and increasing the cost and energy use.
- ☞ Flooding can also cause damage to pavement and embankments, increasing maintenance, repair, and replacement costs to municipalities.
- ☞ Extreme precipitation will also increase erosion, decreasing certain infrastructure components design life span.

### **Aging and Inadequate Stormwater Infrastructure**

- ☞ Stormwater infrastructure such as catch basins, pipes, discharge points, and culverts that redirect stormwater runoff can be impacted by flooding and cannot perform their function.
- ☞ Blocking of water can lead to flooding of the area and roadways, potential leading to the closure of nearby roads.

- ☞ Components of stormwater infrastructure are outdated, and increased flows are added stress to the system, more money to maintain and higher replacement costs.
- ☞ Increased development with increased amounts of impervious surface adds the volume of stormwater runoff within more urban area.

#### **Decreasing Water Resources**

- ☞ Water quality and quantity are both threatened by projected changing weather events, with threats of flooding, drought, erosion and stormwater runoff.
- ☞ By preventing groundwater from replenishing, additional runoff and sediments can lead to intensify flows in rivers and streams with higher contamination levels of unwanted nutrients and pathogens.
- ☞ Additional water treatment may be necessary, potentially overloading treatment systems.
- ☞ Contamination can pollute sewage, threatening the performance of wastewater treatment facilities.
- ☞ Increased occurrences in flooding can also intensify flows, causing overloading of treatment system.
- ☞ When the ground is frozen, rapid snow melt from warm days or intense rain is not able to infiltrate the ground, leading to drought conditions.

#### **Changing Food and Agriculture Production**

- ☞ Merrimack County is the top county in the State for agriculture sales. Higher temperatures might promote a longer growing season for most crops, benefiting a larger number of local crops.
- ☞ Negative impacts can potentially alter the region to a climate not suitable for growing valuable local crops such as apples and blueberries.
- ☞ Temperature are expected to slow weight gain and lower the volume of milk produced by dairy cows.
- ☞ Higher overnight temperatures are anticipated to prevent the dairy cows and cattle from recovering from heat stress.
- ☞ Warmer temperatures and increase in carbon dioxide in the air creates a more ideal environment for pests and weeds, potentially increasing the use of herbicides and pesticides on crop.
- ☞ The maple industry may not persevere with warmer winters and lower water tables.

This is a sampling of how changing climate and severe weather impacts can affect communities in New Hampshire, in the Central NH Region and in Boscawen. Consideration should be given to applicable items during the development and update of the **Hazard Mitigation Plan**.

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## Detailed Hazard Events in Boscawen

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A compilation of hazards that have occurred in Boscawen and the Central NH Region area is provided in the prior Table of **Local and Area Hazard Events**. **Hazard Locations in Town** are areas to watch, areas of particular susceptibility and may be vulnerable to future events. **Potential Future Hazards** are determined based on the past hazard events, possibilities, and existing issues in Town to provide focus to future potential problem areas and to help with mitigation action development.

Each hazard is generally described and then is noted how and where it could occur in Boscawen. For all hazards examined in this Plan, a table of the **Hazard Locations in Town** and the **Potential Future Hazards** is provided at the end of this Plan Chapter.

Hazard events were researched using a wide variety of sources for the **original Boscawen Hazard Mitigation Plan 2007** which were the basis for many of the past disaster events and updated to the present. The **Hazard Mitigation Plan Update 2012** provided recent information on many of the extreme disasters experienced between 2005-2008. Sources and techniques included interviewing local townspeople, researching Town Histories and related documents, and collecting information from governmental or non-profit websites. Presidentially declared disasters or other significant hazard events are described for the surrounding area or Merrimack County for the **Hazard Mitigation Plan Update 2018** and some of them may have affected the community. These disasters were also considered by the Committee when determining the risk evaluation.

Committee member experiences, knowledge, and recollections generally comprise the **Local and Area Hazard Events** and **Hazard Locations in Town**. While additional hazards might have occurred in Town, those events in the Plan are what the Committee chose to list, or were familiar with to list, to comprise the hazard events within the in Tables. The same is true for the **Potential Future Hazards** section.

### FLOODING

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. However, floods can be beneficial to the low lying agricultural areas which are used for active farm lands by enriching the soil.

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term *100-year flood* does not mean that a flood will occur once every 100 years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase *1% annual chance flood*. This phrase means that there is a 1% chance of a flood of that size happening in any year.

Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow, yet floods can occur at any time of year. A sudden thaw during the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to drain. Flooding is the most common natural disaster to affect New Hampshire, a common and costly hazard.

There are several types of **Flooding** hazards examined in the **Hazard Risk Assessment**:

- ☒ **Floods and Flash Floods**
- ☒ **Rapid Snow Pack Melt**
- ☒ **Ice Jams**
- ☒ **Riverine Fluvial Hazard Flooding, Erosion, Channel Movement**

### Magnitude of Flooding

Flooding magnitude, or how bad flooding could get in Boscawen, can be measured by the following SFHA Flood Zone scale in **Table 12**. “Flooding” encompasses all types of flooding including **Floods and Flash Floods**, **Rapid Snow Pack Melt**, **River Ice Jams** and **Fluvial Hazard Erosion and Channel Movement**.

**Table 12**  
Special Flood Hazard Area (SFHA) Zones on 2010 DFIRMS

Special Flood Hazard Areas on Boscawen DFIRMS	
<b>Zone A</b>	<b>1% annual chance of flooding</b> <ul style="list-style-type: none"> <li>• <b>100-year</b> floodplains <i>without</i> Base Flood Elevations (BFE)</li> </ul>
<b>Zone AE</b> (with or without floodways)	<b>1% annual chance of flooding</b> <ul style="list-style-type: none"> <li>• <b>100-year</b> floodplains <i>with</i> Base Flood Elevations (BFE)</li> <li>• some identified as <b>floodways</b> with stream channel and/or adjacent floodplain areas</li> <li>• areas must be kept free of encroachment so 1% annual chance of flood will not substantially increase flood height</li> </ul>
<b>Zone X</b>	<b>0.2% annual chance of flooding</b> <ul style="list-style-type: none"> <li>• <b>500-year</b> floodplain <i>without</i> Base Flood Elevations (BFE)</li> <li>• sheet flow flooding less than 1-foot deep</li> <li>• stream flooding where the contributing drainage area is less than 1 square mile</li> <li>• areas protected from 100-year floodplains by levees</li> <li>• OR areas determined to be outside the 0.2% annual chance of flood (see DFIRMS)</li> </ul>


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


**Boscawen DFIRMS** can be viewed online at and downloaded from the [NH Geographically Referenced Analysis and Transfer System \(NH GRANIT\)](#) website. Alternatively, the DFIRMS’ respective paper FEMA 2009 Floodplain Maps in the Town Office could be consulted. Should the **Zone A** or **Zone X** or **Zone AE** flood to either the 100-year or 500-year level, the DFIRM areas will help **measure the location of the floodplain and potential magnitude of the flood**.

## Flooding in Boscawen

Boscawen has a few areas particularly susceptible to flooding. Rapid pack snow melt affecting roadways and drainage, old waterline infrastructure breaking and washing out roads, culvert debris, Merrimack River flooding of Town and County facilities, manufactured park drainage systems are the most likely locations to be damaged by flood events. There are many hilly roads in Town that could washout during flash flooding and heavy rain events. Some key culvert need to be up-sized to address the increased water load and these are listed as Actions in **8 MITIGATION ACTION PLAN**. The Town has been communicating with the State to upgrade some of their culverts.

These small brooks, ponds and wetlands in Boscawen contribute to flooding these and other areas in Town:

 **Watercourses:** Merrimack River, Contoocook River, Tannery Brook, Town House Brook, Pond Brook, Beaverdam Brook, Stirrup Iron Brook, tributaries of the Contoocook River and Merrimack River, and several unnamed brooks.

 **Waterbodies:** Hirst Marsh, Patenaude's (Flagpole) Pond, Walker Pond, several Farm Ponds and fire pond, and several unnamed ponds and wetlands.

## Road and Drainage System Washouts

Roads in Boscawen are vulnerable to washouts and floods but do not consistently washout during flash flooding and heavy rain events. A listing of past and future potential road washouts is shown on [Map 1 Potential Hazards](#) and [Map 2 Past Hazards](#). A [Table](#) of undersized Town-owned culverts to be upgraded to ensure their carrying capacity can be found in **5 COMMUNITY VULNERABILITY ASSESSMENT**. These roads are either most common, regular locations of **road washouts** or water flooding over the roadways or are locations which could be washed out during a very heavy rain or snow pack melt event:

- Corn Hill Road (Pond Brook)
- Commercial Street (Contoocook River, rapid snow pack melt)
- Crescent Street (Contoocook River, rapid snow pack melt)
- Depot Street/ Jamie Welch Recreational Park (Merrimack River flooded out boat launch, erosion)
- Eel Street (washouts, historic ice jams, rapid snow pack melt)
- Long Street
- Merrimack County Correctional Facility Boat Launch (Merrimack River flooded out boat launch, erosion)
- North Water Street
- Queen Street (Town House Brook washout)
- River Road (drainage erosion, siltation, Merrimack River)

- NH Route 3 (Fessenden Park, Hodges Apartments drainage washouts)
- NH Route 4 / King Street (erosion)
- Stirrup Iron Road (Stirrup Iron Brook)
- Valley of Industry (washouts and landslide)
- NH Water Street (runoff, snowmelt)
- Many other gravel roads (ditching, flood over road, washouts)

#### **Dam Failure**

There are a few dams in Boscawen with potential for flooding damage *if* breached. One **(1) Significant Hazard** dam, the Penacook Lower Falls Dam (Essex Hydroelectric), could have severe consequences if a failure occurred. The dam is situated just north of downtown Penacook, which has nearby commercial and residential properties. The height of the dam and embankments make this scenario unlikely unless a catastrophic failure occurs. Three **(3) Low Hazard** dams are also located in the community at Flagpole (Patenaude's) Pond (Dam and Dike) and at Hirst Marsh. The following is a listing of the dams, downstream of which would be immediately susceptible to the impacts of dam failure or release **flooding**.

- ↻ Penacook Lower Falls Dam, Significant Hazard (S)
- ↻ Flagpole (Patenaude's) Pond Dam, Low Hazard (L)
- ↻ Hirst Marsh Dam, Low Hazard (L)
- ↻ Flagpole (Patenaude's) Pond Dike, Low Hazard (L)

#### **Special Flood Hazard Areas (SFHAs)**

**Base Flood Elevations (BFEs)** are abundant within Central NH along the Merrimack River, Contoocook River, Blackwater River, Warner River, Soucook River, and Suncook River on the DFIRMs of 2010. In Boscawen (**330105**) New Hampshire (**D33013C**), there are several DFIRMs identifying floodplains. DFIRM panels are not printed when floodplains are not present in an area. There are **14** DFIRMs in Boscawen of which **6** panels contain floodplains of the **Merrimack River**: **#0169, #0307, #0309, #0330, #0336, #0337**. The **Contoocook River** floodplains are displayed in **#0336** and **#0337** as it flows north to join the **Merrimack** in Boscawen. The **Tannery Brook** floodplains are depicted in **#0305, #0306**, and then DFIRMs display **BFEs** from a detailed flood study after crossing US Route 4: **#0308, #0309**, and **#0330** where the brook joins the **Merrimack River**. These DFIRMs include **Zone AE** floodways (1% annual risk of flooding), **Zone AE** floodplains with **BFEs** (1% annual risk of flooding) or **Zone X** (0.2% annual risk of flooding) locations in Town. A total of **7** DFIRMs out of the **14** in Boscawen contain **Base Flood Elevations**. These are highlighted gray in **Table 13**.

Seven **(7)** DFIRMs, **#0168, #0305, #0306, #0320, #0318, #0319** and **#0338** (**Alley Brook, Beaverdam Brook, Tannery Brook, Little Pond, Walker Pond, Pond Brook, Stirrup Iron Brook, Glines Brook, Cold Brook, Patenaude's (Flaghole) Pond, Hirst Wildlife Management Area (WMA) Wetlands**, and **unnamed brooks**



and wetlands) display Special Flood Hazard Area (SFHA) **Zone A** (1% annual risk of flooding) and/or **Zone X** (0.2% annual risk of flooding). These are the white rows in **Table 13**.

**Table 13**

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

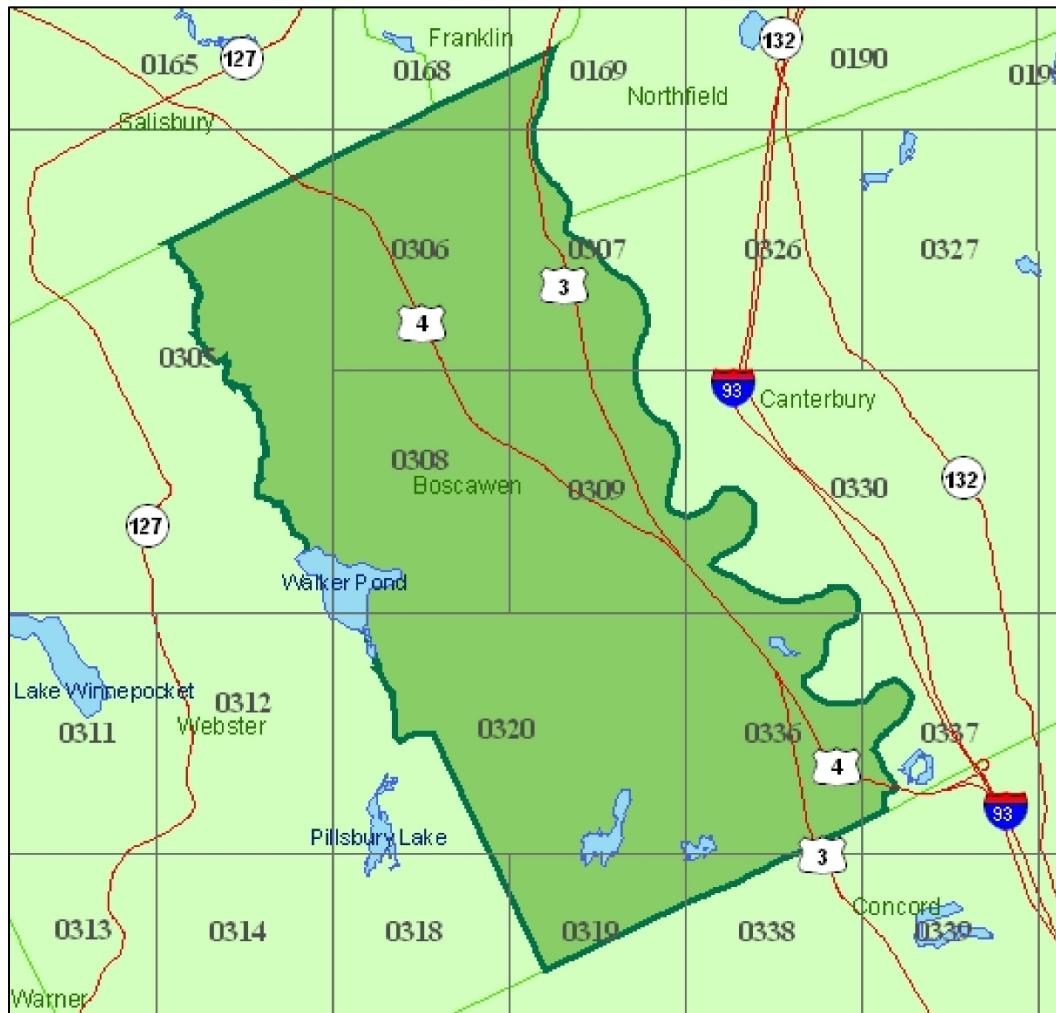
<b>Panel NH (D33013C)</b>	<b>Flood Zones in Boscawen (330105)</b>	<b>Base Flood Elevations (BFEs)</b>	<b>Water Body Areas in Floodplains</b>	<b>Community of Boscawen Geographic Location</b>
<b>#0168</b>	A	N/A	<b>Alley Brook</b>	Northeast edge of Boscawen, bordering Franklin. Stirrup Iron Road
<b>#0169</b>	AE with floodway, AE, X	267, 266	<b>Merrimack River</b>	Northeast corner of Boscawen, abutting Franklin and Northfield. Merrimack River forms eastern border. US Route 3 and old railroad.
<b>#0305</b>	A, X	N/A	<b>Beaverdam Brook, Tannery Brook, Little Pond, Walker Pond, Pond Brook, Unnamed Wetlands, Unnamed Brook</b>	Northwestern boundary abutting Webster and Salisbury to the north. Route 4, North Water Street, Long Street, Hardy Lane, Sanborn Agricultural Easement area.
<b>#0306</b>	A, X	N/A	<b>Unnamed Brook, Stirrup Iron Brook, Glines Brook, Tannery Brook</b>	Northcentral section of Boscawen. Contains Route 4, Morse Hill Road, Stirrup Iron Road. State Forest Nursery area
<b>#0307</b>	AE with floodway, AE, A, X	266, 265, 272, 285, 265, 264, 263, 262	<b>Merrimack River, Stirrup Iron Brook, Glines Brook, Unnamed Brook</b>	Northeast edge of Boscawen, bordering Canterbury and Northfield along the Merrimack River. US Route 3 and old railroad, Stirrup Iron Road, Forest Lane. State Forest Nursery area
<b>#0308</b>	A, X	419, 417 (Tannery Brook)	<b>Walker Pond, Tannery Brook (dam), Unnamed Wetlands, Unnamed Brooks</b>	Western edge abutting Webster at Walker Pond. Morse Hill Road, Water Street, Chadwick Hill Road, Route 4, Merrill Corner Road.
<b>#0309</b>	AE with floodway, AE A, X	262, 260, 267, 261 (Merrimack) 419, 417, 412, 405, 402...369, 365, 363, 352...320... 304, 300, 297, 296, 293, 292, 276, 269 (Tannery)	<b>Merrimack River, Tannery Brook, Unnamed Wetlands, Unnamed Brooks</b>	Eastern central Boscawen, eastern border with Canterbury. US Route 4, US Route 3, Goodhue Road, Water Street, old railroad, Newbury Road, Marlboro Road, Corn Hill Road, Knowlton Road, Sanborn Agricultural Easement area.
<b>#0330</b>	AE with floodway, AE, A, X	261 (Tannery), 260, 259, 258 (Merrimack)	<b>Merrimack River, Tannery Brook</b>	Eastern edge with Canterbury. Tannery Brook joins Merrimack River meanders, US Route 3, old Railroad, The Acres.
<b>#0320</b>	A, X	N/A	<b>Walker Pond, Pond Brook, Cold Brook, Patenaude's (Flagpole) Pond,</b>	Western central edge, abutting Webster and sharing Walker Pond. Corn Hill Road, Queen Street, Marlboro Road, Weir Road.

<b>Panel NH (D33013C)</b>	<b>Flood Zones in Boscawen (330105)</b>	<b>Base Flood Elevations (BFEs)</b>	<b>Water Body Areas in Floodplains</b>	<b>Community of Boscawen Geographic Location</b>
			<b>Unnamed Brooks, Unnamed Wetlands</b>	
<b>#0336</b>	AE with floodway, AE, X	256, 257, 256, 255, 254 (Merrimack) 297, 287, 277, 274, 270, 264 (Contoocook)	<b>Merrimack River, Contoocook River, Hirst WMA Wetlands, Unnamed Brooks, Unnamed Wetlands</b>	Southeastern section of Town bordering Canterbury with the Merrimack River and Concord (Penacook) to the south. Queen Street, King Street, Route 3, River Road, Commercial Street, Hoit Road (Route 4) Main Street, Hirst Wildlife Management Area (WMA).
<b>#0337</b>	AE with floodway, AE, X, A	255, 254, 254, 253, 252, 251 (Merrimack). 254, 254 (Contoocook)	<b>Merrimack River, Contoocook River,</b>	Southeast corner bordering Canterbury with the Merrimack River and Concord / Penacook to the south. River Road, Hoit Road (Route 4), Hannah Dustin Road.
<b>#0318</b>	A	N/A	<b>Unnamed Wetlands</b>	Southeastern border with Webster. No roads traverse this section of Boscawen
<b>#0319</b>	A, X	N/A	<b>Little Pond, Patenaude's (Flagpole) Pond, Unnamed Wetlands</b>	Southwest corner of Boscawen, bordering Webster on the west and Concord to the south. No roads traverse this section of Boscawen
<b>#0338</b>	X	N/A	<b>Hirst WMA Wetlands</b>	Southern border with Concord. Contains portions of the Hirst WMA.

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

**Figure 8** displays the relative location of each of the DFIRM panels in the community used in **Table 13**. This set of DFIRMs is excerpted from the *Merrimack County Flood Insurance Study (FIS) of 2010*. The graphic illustrates the numbering system of the DFIRMs, how they are not always consecutive.

**Figure 8**  
**DFIRM Panel Location, 2010**



Source: Boscawen DFIRMS can be downloaded at <http://www.granit.unh.edu/dfirms/d-townhtmls/boscawen.html>, last accessed 04-20-18

**Figure 9** displays an example of a DFIRM's zoomed-in view of the **Contoocook River** as it meanders from Concord into Boscawen at the Penacook Falls Dam, looping north past School Street and running parallel to Eel Street / Tremont Street. This is where most of the area's ice jams occur. The Contoocook River then crosses East Street and flows south again into Concord (Penacook) along Bridge Street until the **Contoocook** quickly meanders north, flowing parallel to Commercial Street in Boscawen. The floodplains are depicted in relation to US Route 3 (Main Street).

**Figure 9**  
Zoom View of Boscawen DFIRM Panel Location #0336



Source: FEMA DFIRMS 2010 for Boscawen NH, #0336

DFIRMs illustrate the location of floodplains as a significant upgrade from the previous series of outdated paper maps, known as FIRMs. These new 2010 maps are now set on an aerial photography background that displays roads, buildings, forested areas, waterbodies and watercourses. Boscawen's Zoning Ordinance contains the new maps as the official Special Hazard Flood Areas (SFHAs).

### **Rapid Snow Pack Melt**

Warm temperatures and heavy rains cause rapid snowmelt. The water cannot seep into the frozen ground in early spring and so it runs off into streets and waterways. Quickly melting snow coupled with moderate to heavy rains are prime conditions for flooding.

There is the possibility of damages from the rapid snow pack melt because of the flooding from the **Merrimack River**, **Contoocook River** and **Tannery Brook** and the various brooks along the roads, roadside wetlands, and from the culverts of the watercourses. Locations in Boscawen that may be vulnerable to rapid snow pack melt include undersized or unmaintained culverts, roads, driveways, slopes, yards or fields, or any of the Town's fast moving brooks or drainage areas. Damage to roads is expected.

### **Magnitude of Rapid Snow Pack Melt**

**Rapid snow pack melt** is a type of flooding. On its own, it has no known magnitude measurement. However, the hazard can share **Flooding's** Special Flood Hazard Areas (SFHAs) table.

### **Rapid Snow Pack Melt in Boscawen**

Melt runoff from impervious surfaces and roadways or from tree cover and fields can cause floods over the Entire Town. Road washouts and/or culvert failure locations or other areas flooded have included over the years: Commercial Street, Corn Hill Road, Crescent Street, Eel Street, Forest Lane (drainage), Long Street, North Water Street, Queen Street (washout), River Road, Route 3 (State), Route 4 (State), and Water Street (State), and Goodhue Road. Several of these roads have closed at least 3 to 4 times since the 2006 floods. Close proximity to the Franklin Falls and Blackwater Dams via the Merrimack and Contoocook Rivers and the condition of State-owned bridge culverts along US Routes 3/4 and Water Street means increased flooding potential.

Homes near the **Merrimack River** are at risk of flooding. The **Merrimack** floodplain hosts 750 acres of crops along River Road that can be damaged. The Jaime Welch Park recreation area on Depot Street could experience significant river flooding damages; the boat launch has washed away more than once.

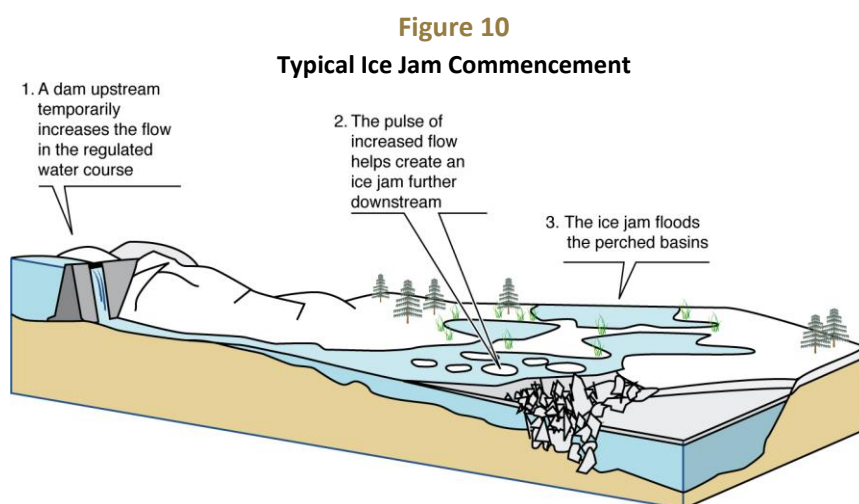
The culverts on US Routes 3 and 4 (State responsibility) are undersized and need to be upgraded to a larger size. Water Street is also a State road that needs to be upgraded. Its existing culverts and drainage system requires regular cleaning and maintenance because it always floods (**Tannery Brook**). The Hodges apartments and Fessenden manufactured housing park on US Routes 3/4 each have only 1 private road entrance into their developments. A shared waterway caused the large washout flooding in 2007, where water flowed under the roads through non-maintained undersized culverts. The Penacook- Boscawen Water Precinct is vulnerable to flood events.

These are examples of flooding locations in Boscawen. On these and other gravel roads, the road beds may be washed away, preventing traffic from passing. All areas of Town could be susceptible to rapid snow pack melt, particularly those near the wetlands and brooks.



### River Ice Jams

Rising waters in early spring often break ice into chunks, which float downstream, pile up and cause flooding. Small rivers and streams pose special flooding risks because they are easily blocked by jams. Ice in riverbeds and against structures presents significant flooding threats to bridges, roads, and the surrounding lands. A visual of how ice jams often form is displayed in **Figure 10**.



Source: USGS, Internet Accessed May 2014

### Magnitude of River Ice Jams

There is no known widely-used magnitude scale for **river ice jams**. River ice jams can cause debris impacted infrastructure when they apply pressure to bridges and dams.

### River Ice Jams in Boscawen

The **Contoocook River** has hosted **ice jams** in the community. These specific locations are capable of **ice jam** conditions include Crescent Street, Eel Street/Tremont Street, River Road, and Commercial Street, where nearby homes and businesses may be at risk of **flooding** in the case of river **ice jams**. Roads in general are always susceptible to the effects of winter ice and snow melts. The Town is susceptible to river ice jams because of the proximity to the Franklin Falls and Blackwater Dams via the Merrimack River and Contoocook River. Homes near the Merrimack River, especially in low-lying areas, could be at risk, although the Merrimack River has had no reported ice jams in the Central NH Region since 1936 (Bow/Pembroke). Jams could recur between Tremont and Eel Streets, in the open bend in the **Contoocook River**, particularly during high water and heavy **rain/snow melt** conditions. Bridges and dams are identified in **APPENDIX A Critical and Community Facility Vulnerability Assessment**.

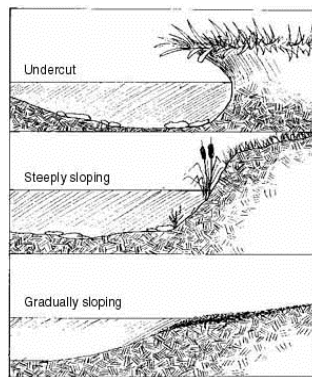


### Fluvial Erosion, Bed Scouring and Channel Movement

Fluvial erosion is the wearing away of the river/stream bank and floodway. Bed scouring is the wearing away of the bed of the river or stream, typically shown as a pool type formation at downstream culvert outflows. Watercourses with high elevation change (stream gradient) are particularly prone to flash-flooding conditions and most vulnerable to erosion and scouring. During flooding or even high flow events, rivers can erode their banks and migrate into their floodplains. A migrating river, when channel movement is occurring, has the potential to impact nearby structures (berms, dams, buildings, etc.) or infrastructure such as river or stream crossings (culverts and bridges) or transportation features (roads, drainage structures, rail, etc.) in its migration path.

**Fluvial geomorphology** is the study of how processes of flowing water in rivers work to shape river channels and the land around them. Fluvial assessments are a collection of field data undertaken within designated river reaches. A **river reach** is a length of stream that has characteristics similar enough that condition data collected within that length is representative of the entire reach. **Figure 11** displays visual bank erosion characteristics.

**Figure 11**  
**Bank Erosion Characteristics**



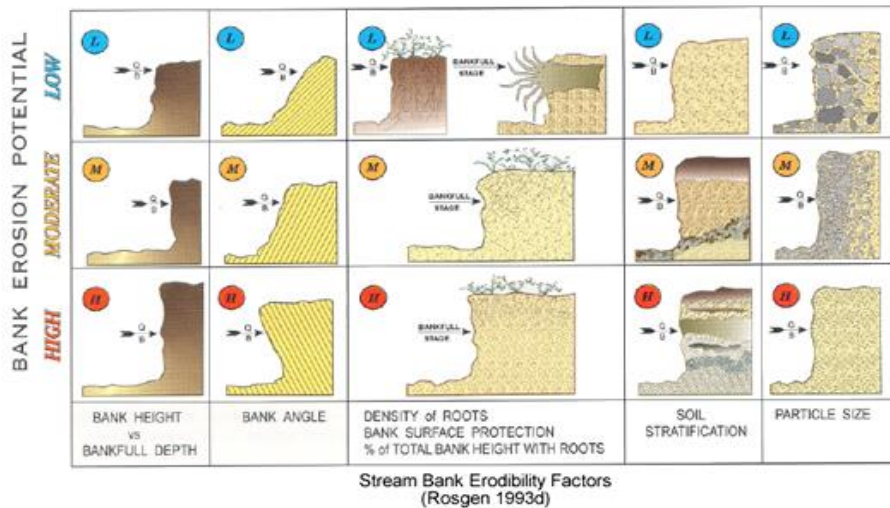
*Source: US Geological Survey (USGS)*

### **Magnitude of (Fluvial) River Bank Erosion**

**River and streambank erosion** magnitude can be measured by the US EPA Bank Erosion Prediction Index (BEHI), which is used with the Near Bank Stress (NBS) quantification. Taken into consideration for the BEHI are the bank height versus bankfull depth, bank angle, density of roots, soil stratification, and particle size at a river reach. **Figure 12** displays the visual version of the index.

Figure 12

Bank Erosion Prediction Index (BEHI)



Source: US Environmental Protection Agency (US EPA)

### Fluvial Erosion, Bed Scouring and Channel Movement in Boscawen

Erosion can occur along the Merrimack River, Contoocook River, Tannery Brook, Town House Brook, Pond Brook, Beaverdam Brook, or Stirrup Iron Brook which are the largest watercourses in the Town and some run under or alongside local roads. Erosion can occur along banks when development (roads, homes) or human activities (parks, paths, recreational vehicles) are too close or if stream crossing alignments are not adequate for their locations. The Town should remain alert for potential developing erosion sites. Bridges can be contributors to scouring of the Merrimack River streambed. Erosion effects have been felt on Hannah Dustin Island, US Route 3, and River Road.

The Hazard Mitigation Committee identified the following as existing or potential future hazards in the case of **stream bank erosion and scouring**:

- US Route 3 and King Street residents and businesses
- Farmland on River Road
- New California Fields development on Crescent Street.
- Vacant structures on Commercial Street
- Hannah Dustin Island

## **WIND HAZARDS**

Hurricane season begins on June 1 and continues through the end of November. August and September are the most active hurricane months. It is not uncommon for New England to be impacted by a hurricane more than once in a season. River and flooding due to heavy rains is a risk to Boscawen during hurricanes. Numerous hurricane events in recent history have occurred in the State, region, and the local area surrounding Boscawen that may have also had an impact on the Town.

Wind is also found in severe winter snow and ice storms, making this hazard likely to occur during the entire year. Significantly high winds occur especially during hurricanes, tornadoes, winter storms, and thunderstorms any time of the year. Falling objects and downed power lines are dangerous risks associated with high winds. Property damage and downed trees are common during high wind occurrences. All utilities, including power lines, are at risk and their damage or destruction would create a hazard to the Town. A communications interruption or failure resulting from damage to telecommunications towers could affect the capabilities of emergency personnel to respond to the hazard event.

There are several types of **Wind** hazards examined in the **Hazard Risk Assessment**:

-  **Tornadoes**
-  **Downbursts**
-  **Hurricanes and Tropical Storms**
-  **Severe Wind, Rain Storms and Thunderstorms**

### **Tornadoes**

Significantly high winds that occur especially during hurricanes, winter storms, and thunderstorms, but can also exist independent of other storms. Falling objects and downed power lines are dangerous risks associated with high winds. In addition, property damage and downed trees are common during high wind occurrences.

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud. They develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one-mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage.

### Magnitude of Tornadoes

A tornado occurring in Boscawen would cause considerable damage. Roofs could be torn off frame houses; dams could be damaged; large trees snapped or uprooted; and light object missiles would be generated by an EF-2 Tornado. Tornado magnitude is measured by the [Enhanced Fujita \(EF\) Scale](#), a 2007 update from the original F-scale (Fujita Scale), which are provided in **Table 14**.

**Table 14**

Enhanced Fujita (EF) Scale

Enhanced Fujita (EF) Scale 2007 – Present	Old Fujita (F) Scale <i>replaced</i>
F Number with 3-Second Gust mph	F Number with 3-Second Gust mph
<b>EF0</b> 65-85 mph	<b>F0</b> 45-78 mph
<b>EF1</b> 86-110 mph	<b>F1</b> 79-117 mph
<b>EF2</b> 111-135 mph	<b>F2</b> 118-161 mph
<b>EF3</b> 136-165 mph	<b>F3</b> 162-209 mph
<b>EF4</b> 166-200 mph	<b>F4</b> 210-261 mph
<b>EF5</b> over 200 mph	<b>F5</b> 262-317 mph

Source: National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center

### Tornadoes in Boscawen

The entire area of Town is vulnerable to a **tornado**. Populated areas include the Boscawen Elementary School, King Street Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. The Town is host to many manufactured housing parks (MHP), Birch & Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP and Woody Hollow Co-op MHP. Several apartment buildings and multi-family developments include Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts, and California Fields. All of these populated areas carry greater risk because of higher density (see **APPENDIX A Critical and Community Facility Vulnerability Assessment** for a complete list of sites).

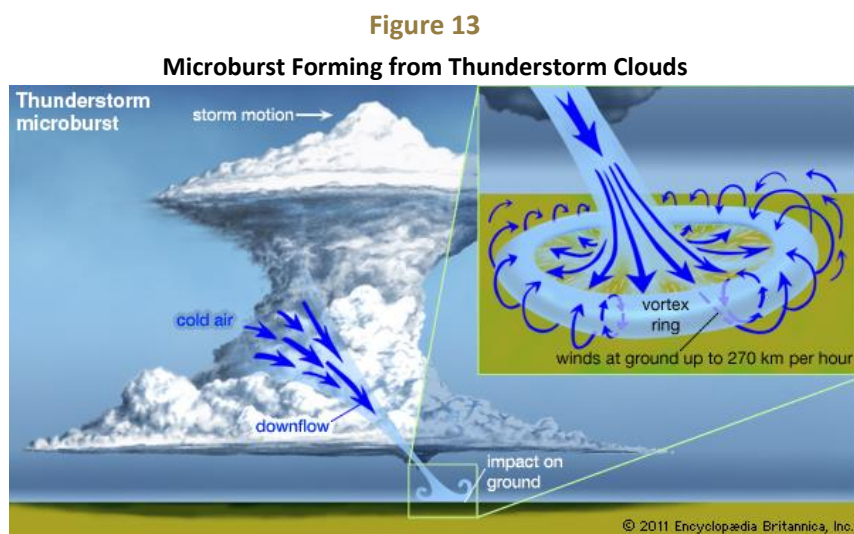
Forested sections of Town run a risk of isolation through debris impacted infrastructure (trees down on roads and powerlines) resulting in power failure with little emergency access until the way is cleared. These areas include: Water Street, Long Street, NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black

Forest Nursery (King St), Forest Lane neighborhood. A tornado occurring in Boscawen would cause considerable damage to this rural community. A tornado occurring in Boscawen would cause considerable damage. Roofs could be torn off frame houses; mobile homes demolished; large trees snapped or uprooted; and light object missiles would be generated as a result of an EF-2 Tornado. Communications towers (Robin Street and Daniel Webster Highway), the Depot Street substation, telephone lines, power lines and other utilities could also be affected by tornadoes.

### Downbursts

A downburst is a severe localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts are capable of producing winds of up to 175 mph and are life threatening. Downbursts are quite common during Central NH's hot weather months. Microbursts and macrobursts have been known to occur here in the region.

Downbursts of both sizes can produce strong wind shear - or large changes in wind speed and direction over a short distance. Trees are regularly snapped off in a singular direction by a macroburst or microburst. Downbursts typically originate from thunderstorm clouds, with air moving in a downward motion until it hits the ground level and then spreads outward in all directions. In fact, the wind pattern of a downburst is the opposite of a tornado's wind pattern, shown in **Figure 13**.



*Source: Internet (Encyclopædia Britannica)*

### Magnitude of Downbursts

**Downburst** magnitude is rated on the same NOAA Enhanced Fujita (EF) scale as tornadoes. In addition, downbursts fall into two categories:

- microburst, which covers an area less than 2.5 miles in diameter and
- macroburst, which covers an area equal to or greater than 2.5 miles in diameter.

### **Downbursts in Boscawen**

**Downbursts** are considered a greater threat than tornadoes in Boscawen. The likelihood of future wind events in Town seems high. **High winds** are unpredictable, and are often more prevalent at higher elevations. The King Street Corridor serves as the Town Center of Boscawen, through which US Routes 3 & 4 travel and lined with businesses and homes.

More populated locations could have the potential for higher injury and property damage from downbursts. These include the Boscawen Elementary, Merrimack County facilities, King Street Corridor, manufactured housing parks, multi-family developments and the various Town Facilities, which run a higher risk of damages than many removed or less dense locations..

The entire Town of Boscawen is forested. The highest elevation, forested or mostly densely populated sections of Town run a risk of isolation through debris impacted infrastructure (trees down on roads and powerlines) resulting in power failure with little emergency access until the way is cleared. These areas include Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and the Queen Street area. Communications towers (Robin Street and Daniel Webster Highway), the Depot Street substation, telephone lines, power lines and other utilities could also be affected by downbursts. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 & 4 corridor supplies power to the entire Town

Agricultural farms and orchards run the risk of high damage from **downbursts** which also brings economic consequences. Some farms are homestead farms which provide food and income for owners. Crop and livestock loss are consequences of downbursts in these locations. In Boscawen, agricultural operations include Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits & vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits & vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). Many households keep farm animals.

### **Hurricanes and Tropical Storms**

A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. Flooding is often caused from the coastal storm surge of the ocean and torrential rains, both of which accompany the storm. The floods and high winds can result in loss of life and property. Hurricanes, high wind and rain events, and thunderstorms can damage Boscawen just like any other community in Central New Hampshire. Forested lands and trees along the transportation infrastructure can be blown down across roads; the above-ground powerlines along the



sides of the road can be snapped either by trees or high winds and fall onto the roads or nearby objects; and runoff flooding and stream/brook and river flooding can occur because of hurricanes and severe storms.

### Magnitude of Hurricanes and Tropical Storms

The [Saffir-Simpson Hurricane Wind Scale](#) measures the magnitude of wind event on a 1 through 5 rating basis. The definitions of Category 1 through 5 sustained wind miles per hour and their respective threats to people, different types of homes, shopping centers, trees, power lines, water, and more are displayed in **Table 15**.

**Table 15**  
Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
<b>1</b>	<b>74-95 mph</b>	<b>Very dangerous winds will produce some damage:</b> Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
<b>2</b>	<b>96-110 mph</b>	<b>Extremely dangerous winds will cause extensive damage:</b> Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
<b>3 major</b>	<b>111-129 mph</b>	<b>Devastating damage will occur:</b> Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
<b>4 major</b>	<b>130-156 mph</b>	<b>Catastrophic damage will occur:</b> Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
<b>5 major</b>	<b>157 mph or higher</b>	<b>Catastrophic damage will occur:</b> A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: National Oceanic and Atmospheric Administration (NOAA)

### Hurricanes and Tropical Storms in Boscawen

**Hurricane Sandy**, which was not a declared disaster in Boscawen, caused many roads to temporarily close while the Public Works Department cleared them of debris. Trees and limbs fell onto the roadways and onto powerlines. If vehicles had been traveling on these roads while the hurricane was in progress, they would have been in danger.

When **hurricanes or tropical storms** occur in Boscawen, the Towns electrical utilities of Eversource (formerly Public Service of NH or PSNH) and Unitil will continue to be prone to power outages. The

response time to these outages could be several days in the more remote or densely populated areas of Town, depending on where debris has fallen onto roads. Areas particularly vulnerable to the combination of **flooding**, **wind**, **tree debris** and **power failure** include forested and highly traveled sections of Town, such as the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, King Street Corridor and the Queen Street area. Communications towers (Robin Street and Daniel Webster Highway), the Depot Street substation, telephone lines, power lines and other utilities could also be affected by **hurricanes**. Several sections of Town would be difficult to access with trees and power lines down on these residential roads, resulting in possible isolation. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 & 4 corridor supplies power to the entire Town. Radio operability for emergency communications could be adversely affected. Land line utilities are at risk of failure during severe storm weather.

### Severe Wind, Rainstorms and Thunder Storms

More commonly experienced are **severe wind storms**, **rainstorms** and **thunderstorms**. The severe wind storms occur during all months of the year while the thunder storms tend to erupt during periods of humidity. On occasion, precipitation in the form of rain or hail is experienced during these storms. Rainstorms bring can flooding and high winds. **Thunderstorms** can also bring lightning hazards in addition to high winds and flooding.

### **Magnitude of Severe Wind and Thunder Storms**

Many of the severe wind storms Boscawen experiences are not hurricanes but are severe wind storms or thunderstorms. Thunderstorms are common in New Hampshire, particularly during the hot weather months. The [Thunderstorm Category Criteria](#) scale in **Table 16** measures the magnitude of thunderstorms with their various weather components, including rain, wind, hail, tornado, and lightning.

**Table 16**  
**Thunderstorm Criteria Scale**

Thunderstorm Categories	Rainfall Inches per hour	Wind Gust max mph	Hail Size in	Tornado Potential Highest Category	Lightning Frequency per 5 minutes	Darkness Aspect	Overall Thunderstorm Impact
<b>T-1</b> <b>Weak</b> <b>Thunderstorms</b> or <b>Thundershowers</b>	0.03" to 0.10"	< 25 mph	None	None	Few strikes during entire storm	<b>Slightly Dark</b> Sunlight may be seen after storm	1. No damage. 2. Gusty winds at times.
<b>T-2</b> <b>Moderate</b> <b>Thunderstorms</b>	0.10" to 0.25"	25-40 mph	None	None	Occasional 1 to 10	<b>Moderately Dark</b> Heavy downpours might cause the need for car headlights	1. Heavy downpours. 2. Occasional lightning. 3. Gusty winds. 4. Very little damage. 5. Small tree branches might break. 6. Lawn furniture moved

Thunderstorm Categories	Rainfall Inches per hour	Wind Gust max mph	Hail Size in	Tornado Potential Highest Category	Lightning Frequency per 5 minutes	Darkness Aspect	Overall Thunderstorm Impact
							around. 7. Power outages are possible.
<b>T-3 Heavy Thunderstorms</b> 1. Singular or lines of storms	0.25" to 0.55"	40-57 mph	1/4" to 3/4"	EF0	Occasional to Frequent 10 to 20	<b>Dark</b> Car headlights used. Visibility low in heavy rains. Cars might pull off the road.	1. Minor damage. 2. Downpours produce some flooding on streets. 3. Frequent lightning could cause house fires. 4. Hail occurs with the downpours. 5. Small tree branches are broken. 6. Shingles are blown off roofs. 7. Power outages are likely.
<b>T-4 Intense Thunderstorms</b> 1. Weaker supercells 2. Bow echoes or lines of storms	0.55" to 1.25"	58-70 mph	1" to 1.5"	EF0 to EF2	Frequent 20 to 30	<b>Very Dark</b> Car headlights used. Some streetlights come on.	1. Moderate damage. 2. Heavy rains can cause flooding to streams and roadway flooding occurs. 3. Hail can cause dents on cars and cause crop damage. 4. Tornado damage. 5. Power outages will occur.
<b>T-5 Extreme Thunderstorms</b> 1. Supercells with family of tornadoes 2. Derecho Windstorms	1.25" to 4"	> 70 mph	1.5" to 4"	EF3 to EF5	Frequent to Continuous > 30	<b>Pitch Black</b> Street lights come on. House lights might be used.	1. Severe damage to trees and property. Damage is widespread. 2. Flooding rains. 3. Damaging hail. 4. Damaging wind gusts to trees and buildings. 5. Tornadoes EF3 to EF5 or family of tornadoes can occur. Tornadoes cause total devastation. 6. Widespread power outages.

Source: Adapted from Accuweather.com, Henry Margusity, Senior Meteorologist

Incidentally, hail can accompany thunderstorms, hurricanes, or severe wind events. The [Hail Size Description Chart](#) describes the potential size of hail during a hurricane or severe storm event, which could occur anywhere in Boscawen. The chart is shown below along with a Hail Size Comparison Chart which is a visual representation of some of the relative sizes of hail (note this chart image is not shown to scale). The **Table 17** hail size description and **Figure 14** size comparison scales measure the magnitude of hailstones that could fall on Boscawen during severe storm events.

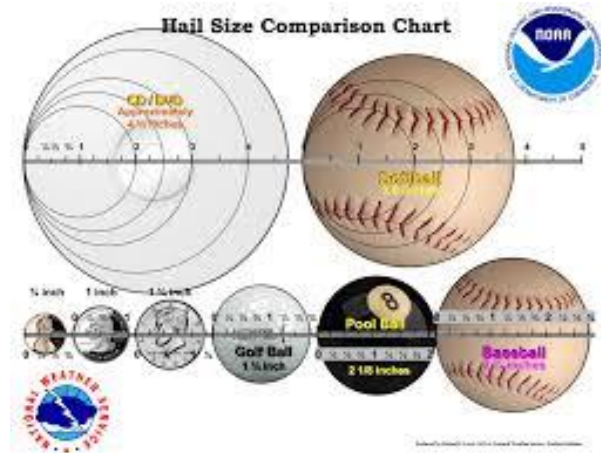
Table 17

Hail Size Description

Hailstone Diameter (inches)	Size Description
< 1/4	bb
1/4	Pea Size
1/2	Mothball Size
3/4	Penny Size
7/8	Nickel Size
<b>Severe Criteria 1</b>	<b>Quarter Size</b>
1 1/4	Half Dollar Size
1 1/2	Walnut or Ping Pong Ball
1 3/4	Golf Ball Size
<b>2</b>	<b>Hen Egg Size</b>
2 1/2	Tennis Ball Size
2 3/4	Baseball Size
<b>3</b>	<b>Teacup Size</b>
3 4/5	Softball Size
<b>4</b>	<b>Grapefruit Size</b>

Figure 14

Hail Size Comparison



Sources: National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS)

### Severe Wind, Rainstorms and Thunder Storms in Boscawen

All of Boscawen has experienced **severe wind**, **rainstorms**, and **thunderstorms**. The Town's electrical utilities of Eversource (formerly Public Service of NH or PSNH) and Unitil (smaller provider) will continue to be prone to power outages. The response time to these outages could be several days in the more remote or densely populated areas of Town, depending on where debris has fallen onto roads. Areas particularly vulnerable to the combination of **flooding**, **wind**, **tree debris** and **power failure** include forested and highly traveled sections of Town, such as the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, King Street Corridor and the Queen Street area. Several sections of Town would be difficult to access with trees and power lines down on these residential roads, resulting in possible isolation. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 & 4 corridor supplies power to the entire Town. Radio operability for emergency communications could be adversely affected. Land line utilities are at risk of failure during **severe storm weather**.

## FIRE HAZARDS

Fire can be caused by several agents and can spread rapidly to consume property and endanger lives. This **2018 Plan** examines **lightning**, and **wildfire** (natural) fire sources and places other **fires (vehicles, structure, arson, explosions)** with **Technological Hazards**.

Wildfire is a significant concern and can quickly get out of control without good infrastructure, easily accessible forested backlots and practiced procedures. Lightning or human folly can cause wildfire. Locations of older narrow graveled roads or densely packed residential areas and other sections of Town or roads with only 1 access/egress are among the most vulnerable locations for fire and wildfire hazards. Rural, forested areas of the community or recreation and conservation areas are often the most vulnerable to both wildfire and lightning.

There are two types of natural **Fire** hazards examined in the **Hazard Risk Assessment**:

-  **Lightning**
-  **Wildfire**

### Lightning

All thunderstorms contain lightning. During a lightning discharge, the sudden heating of the air causes it to expand rapidly. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, a shock wave that can damage building walls and break glass. Lightning strikes can cause death, injury, and property damage. Lightning is often referred to as the “underrated killer”.

### **Magnitude of Lightning**

Lightning can be measured to determine how likely it may be for starting fires. Using a Level system of **1** to **6** corresponding with storm development and the number of lightning strikes, the [Lightning Activity Level \(LAL\)](#) measures the magnitude of lightning strikes as displayed in **Table 18**.

**Table 18**  
**Lightning Activity Level (LAL)**

Level	LAL Cloud and Storm Development	Cloud to Ground Strikes per 5 Minutes	Cloud to Ground Strikes per 15 Minutes
LAL 1	No thunderstorms	n/a	n/a
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a 5- minute period.	1 to 5	1 to 8
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5-minute period.	6 to 10	9 to 15
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a 5-minute period.	11 to 15	16 to 25
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5-minute period.	> 15	> 25
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.	6 to 10	9 to 15

Source: National Weather Service

## Lightning in Boscawen

**Lightning** regularly strikes in Town and can strike at any time at any given location. Specific sites which would cause the greatest impact if struck by **lightning** include the Congregational Church/Old Town Hall (US 3/4), Historical Society, old Historic Library, Boscawen Municipal Facility, Merrimack County Correctional Facility buildings, Merrimack County Nursing Home and Gerrish Manor. Forested areas, parks, conservation areas can be dangerous to people and property: Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). Areas inaccessible by vehicle include Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. Electrical utilities, generators, transformers and either of the **2** telecommunications towers (Robin Street and Daniel Webster Highway) are vulnerable to **lightning**.

The Municipal Facility housing the Town Offices, Police Department and Library buildings does not have lightning rods but has been struck by **lightning** in the past year. The Penacook-Boscawen Water Precinct infrastructure, including waterlines, pumps, and water tanks, could be vulnerable. If Town functions are unavailable, it would be difficult to quickly respond to the needs of the community. Areas of concern include the forested, remote areas, which could not be easily accessed by emergency vehicles. The more remote forested areas, older narrow graveled roads, and densely packed residential areas are among the most vulnerable locations for fire and wildfire hazards. **Lightning** regularly shorts out people's well pumps. Higher elevations are of greater concern Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area, some of which are not accessible by vehicle, in case of **wildfire**.

## Wildfire

Wildfire is defined as any unwanted and unplanned fire burning in forest, shrub or grass. Wildfires are frequently referred to as forest fires, brush fires, shrub fires or grass fires, depending on their location and size. They often occur during drought and when woody debris on the forest floor is readily available to fuel the fire. The threat of wildfires is greatest where vegetation patterns have been altered by past land-use practices, fire suppression and fire exclusion. Because fire is a natural process, fire suppression can lead to more severe wildfires due to vegetation buildup.

Increased severity over recent years has decreased capability to extinguish wildfires. Wildfires are unpredictable and usually destructive, causing both personal property damage and damage to community infrastructure and cultural and economic resources.

### Magnitude of Wildfire

The standard of measuring wildfire magnitude is by the National Wildfire Coordinating Group (NWCG)'s wildfire classification scale. **Table 19** displays the wildfire classification size per the number of acres burned.

**Table 19**  
National Wildfire Coordinating Group Wildfire Classification Scale

Fire Class	Sizes in Acres
Class A	1/4 acre or less
Class B	> 1/4 acre to < 10 acres
Class C	10 acres to < 100 acres
Class D	100 acres to < 300 acres
Class E	300 acres to < 1,000 acres
Class F	1,000 acres to < 5,000 acres
Class G	5,000 acres or more

*Source: National Wildfire Coordinating Group*

### Wildfire in Boscawen

Although **wildfire** damage has been kept to a minimum to date, the potential for losing an immense acreage of Boscawen to this natural hazard is possible, particularly with the abnormal, severe drought conditions currently occurring in **2015-2016**. The heavily forested woodlands of Town are often remote locations and difficult to access by emergency vehicles. The forested, dead-end residential neighborhoods would be difficult to evacuate. Any **debris** left over from **flooding**, **winter storms**, or **wind events** are a **wildfire hazard**. When **droughts** or drier conditions occur, the dry vegetation becomes a significant hazard to the Town Fire Department.



All areas of Boscawen could be impacted by wildfire. Some neighborhoods are more vulnerable than others because of high density, such as the manufactured housing parks and multi-family developments identified in **APPENDIX A Critical and Community Facility Vulnerability Assessment**. Forested areas, parks, conservation areas can be dangerous to people and property: Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). Areas inaccessible by vehicle include the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. Unmaintained Class VI roads and the transmission lines corridor are challenging to access because of the potential lack of emergency vehicle access and the number of people who use them for recreational purposes. **Wildfires** can also be caused by campfires and other human activity.

## **EXTREME TEMPERATURE (COLD-HOT) HAZARDS**

Extreme temperature hazards include diverse hazards such as severe cold and snowstorms, excessive heat, drought, and public health. The snow and ice component often results in communications & power failure for a large segment of the Town. This category is meant to encompass all the hazards which can be influenced by the extreme weather temperatures and climate changes that New England, New Hampshire, the Central NH Region, and Boscawen are experiencing.

There are several types of **Extreme Temperature (cold-hot)** hazards examined in the **Hazard Risk Assessment**:

- ☒ **Severe Winter Weather, Cold, and Ice Storms**
- ☒ **Drought**
- ☒ **Excessive Heat**
- ☒ **Public Health (Epidemics)**

The National Weather Service (NWS) in Gray, Maine which covers New Hampshire collects and reports climate data in addition to issuing warning and advisories. Winter **2015-2016** was one of the warmest and one of the least snowy on record in Concord, their most local reporting station. The average temperature this season since **1868** was **30.9** degrees, topping the previous record of **30.4** degrees in the season of **1879-1880**. Precipitation was **2.01** inches above normal this winter, totaling **10.53** inches. Total snowfall was **24.7** inches, **20.2** inches below normal. Warmest temperature records were also set during **2015**.

### **Severe Winter Weather, Cold, and Ice Storms**

Ice and snow events typically occur during the winter months and can cause loss of life, property damage, and tree damage. Severe winter storms, including Nor'easters, typically occur during January and February. However, winter storms can occur from late September through late May.

A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding, wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period.

An ice storm involves rain, which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects. Ice storms also often produce widespread power outages.

A Nor'easter is a large weather system traveling from South to North, passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a Northeasterly direction. In the winter months, oftentimes blizzard conditions accompany these events. The added impact of the masses

of snow and/or ice upon infrastructure often affects transportation and the delivery of goods and services for extended periods.

Extreme cold temperatures are associated with continental Arctic air masses. The actual temperatures reached depend specifically on the nature of the cold air mass and where it originated. In general, those from the Arctic regions are the coldest. Though cold temperatures are dangerous, they become more so in conjunction with strong winds. The combination produces a wind-chill factor – heat loss measured in Watts per meter squared ( $Wm^{-2}$ ). A wind-chill factor of  $1400 Wm^{-2}$  is equivalent to a temperature of -40 degrees F. At  $2700 Wm^{-2}$ , exposed flesh freezes within a half-minute.

Numerous severe winter events in recent history have occurred in the State, region, and the local area surrounding Boscawen that may have also had an impact on the Town. Unlike the relatively infrequent hurricane, New Hampshire generally experiences at least several Nor'easters each year with varying degrees of severity. They form along the East coast as warm air from the Atlantic Ocean collides with cold arctic winds to the north and west. A hurricane, the nor'easter's warm-weather counterpart, differs in that it has a narrow range of strong winds around a warm, low-pressure core—nor'easter winds are more dispersed around a cold, low-pressure center.

In March **2018**, New Hampshire was hit by 4 cyclonic Nor'easters in a row over a 2- week period because of the changing climate, in a recurring snow-and-melt cycle. These storms have the potential to inflict more damage than many hurricanes because the high storm surge and high winds can last from 12 hours to 3 days, while the duration of hurricanes ranges from 6 to 12 hours.

- March 2-3, 2018 (Winter Storm Riley) – Seacoast flooding, Concord wind gusts 36mph, about 1"
- March 7-8, 2018 (Winter Storm Quinn) – Concord 11"
- March 12-14, 2018 (Winter Storm Skylar) – Concord 11", Epsom 23"
- March 22, 2018 (Winter Storm Toby) – Concord 3"

All winter storms make walking and driving extremely dangerous. The elderly and very young are at high risk during winter storms and may be affected by hypothermia and isolation. During winter storms, there is an increased risk of **fire** because people experience **power failure** and use candles, portable gas stoves, generators, and flammable sources of heat and light.

### **Magnitude of Severe Winter Weather**

Severe Winter Weather magnitude can be measured for windchill, ice accumulation and snowfall using several different scales and indices including the NWS Windchill Chart, Sperry-Piltz Ice Accumulation Index (SPIA) and NCDC Regional Snowfall Index (RSI) for the Northeast. **Figure 15** displays the [Windchill Temperature Index](#) which measures the wind and temperature leading to how quickly frostbite can occur.

Figure 15

Windchill Temperature Index

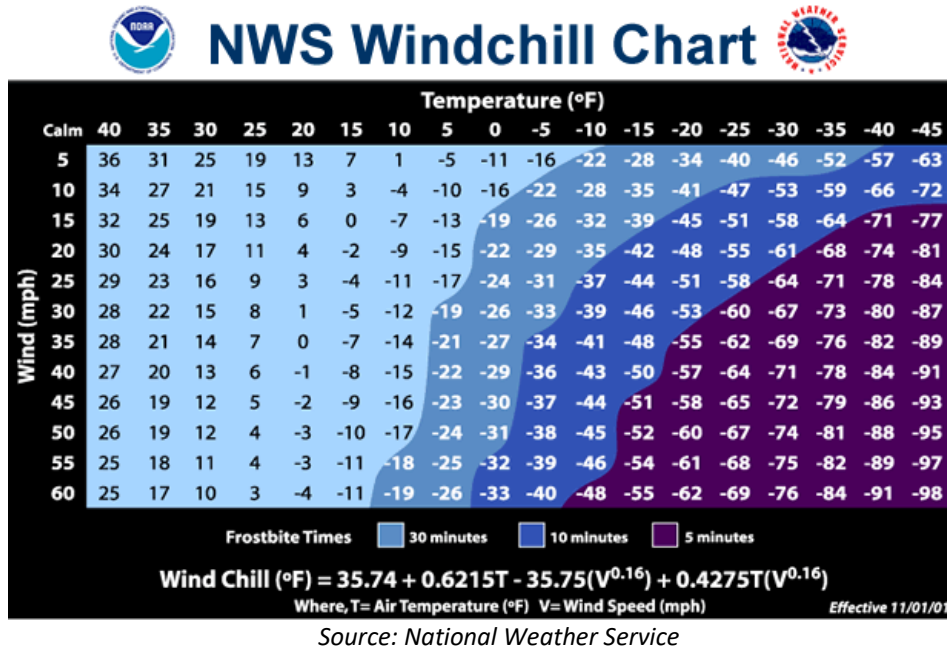


Table 20 displays the [Sperry-Piltz Ice Accumulation Index \(SPIA\)](#) which measure the magnitude of ice damage from severe winter weather. The index is compared to the tornado and hurricane scales note above. Storm total rainfall converted to ice accumulation, wind, and temperatures during the storm period are used to develop SPIA.

**Table 20**  
**Sperry-Piltz Ice Accumulation Index (SPIA)**

Ice Damage Index	Average NWS Ice Amount in Inches	Wind Speed mph	Ice Damage and Impact Descriptions
<b>0</b>	< 0.25	< 15	Minimal risk of damage to exposed utility systems. No alerts or advisories needed for crews, few outages.
<b>1</b>	0.10 to 0.25	15 to 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges might become slick and hazardous.
	0.25 to 0.50	> 15	
<b>2</b>	0.10 to 0.25	25-35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions might be extremely hazardous due to ice accumulation.
	0.25 to 0.50	15-25	
	0.50 to 0.75	< 15	
<b>3</b>	0.10 to 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days. Warming sites needed.
	0.25 to 0.50	25 - 35	
	0.50 to 0.75	15 - 25	
	0.75 to 1.00	< 15	
<b>4</b>	0.25 to 0.50	> = 35	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days. Shelters or warming sites needed.
	0.50 to 0.75	25 - 35	
	0.75 to 1.00	15 - 25	
	1.00 to 1.50	< 15	
<b>5</b>	0.50 to 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 to 1.00	> = 25	
	1.00 to 1.50	> = 15	
	> 1.50	Any	

Source: [www.spia-index.com](http://www.spia-index.com) (adapted by CNHRPC)

The [Regional Snowfall Index \(RSI\) for the Northeast](#) is used to categorize significant snowstorms. The RSI ranks snowstorm effects on a scale from **1** to **5**, similar to the Enhanced Fujita Scale for tornadoes or the Saffir-Simpson Hurricane Wind Scale for hurricanes. The RSI differs from these other indices because it includes population, a social component. The RSI is based on the spatial extent of the storm, the amount of snowfall, and the juxtaposition of these elements with population. The Regional Snowfall Index (RSI) displayed in **Table 21** is a measurement of the magnitude of a snowstorm in the Northeast, which includes New Hampshire.

**Table 21**  
Regional Snowfall Index (RSI) for the Northeast

Storm Category	RSI Value	Snow Description
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

Source: [www.ncdc.noaa.gov/snow-and-ice/rsi/](http://www.ncdc.noaa.gov/snow-and-ice/rsi/) (adapted by CNHRPC)

### Severe Winter Weather in Boscawen

**Winter weather events** are as common in Boscawen as they are in the other areas of Central New Hampshire. The most recent worst winter storm on record was the **December 2008 Ice Storm** with wide-spread power outages that lasting up to **1** week (**7** days) in the most remote areas. Road icing (**transportation accidents**) can occur when **ice and snow storm** events hit. **Communications failure, power failure, extreme cold** and local road impassibility (trees and/or power lines down) occur as well. Areas above 800 feet in elevation are particularly vulnerable to the effects of severe winter weather.

Areas of particular concern include the Boscawen Elementary School, King Street Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. The Town is host to many manufactured housing parks (MHP), Birch & Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP and Woody Hollow Co-op MHP. Several apartment buildings and multi-family developments include Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts, and California Fields. All residential developments are vulnerable to **winter weather** impacts.

Several sections of Town would be difficult to access with trees and power lines down on these residential roads, resulting in possible isolation. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 & 4 corridor supplies power to the entire Town. Electrical power utilities, the communications network and **2** telecommunications towers (Depot Street and Daniel Webster Highway), and older or historic or temporary buildings (roof collapse) are at risk from **severe winter weather conditions**. People may be subject to cold temperature, snow isolation, transportation accidents, power failure and communications failure during winter storm events. See complete list in **APPENDIX A Critical and Community Facility Vulnerability Assessment**.

## Drought

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are becoming less rare in New Hampshire than they have been in the past. They have different, widespread damages compared with floods and are more difficult to define. The effect of droughts is indicated through measurements of soil moisture, groundwater levels, and streamflow. However, not all of these indicators will be minimal during a drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground-water levels or increasing streamflow. Low streamflow also correlates with low ground-water levels and commonly cause diminished water supply because ground water discharge to streams and rivers maintains streamflow during extended dry periods.

In the case of drought, residential (dug wells especially) and Town water supplies would be threatened. Most homes in Town rely on well water which is not easily replenished during periods of drought. During the **2015-2016** drought, many residences notified the Town of their dug wells going dry. The residents either made private arrangements for potable water or they dug new bedrock wells. All farms, orchards, tree farms, and conservation areas in town would be affected by drought. Additionally, wildfires have the potential of being more severe and commonplace during periods of drought, more difficult to contain.

## Magnitude of Drought

**Table 22** displays overall drought magnitude, measured by the [Palmer Hydrological Drought Index \(PHDI\)](#) the extent of hydrological drought in the form of long-term, cumulative monthly moisture conditions. The indices are developed by algorithms taking into consideration precipitation, temperature data, and the local Available Water Content (AWC) of the soil.

**Table 22**  
**Palmer Drought Conditions**

Hydrological Drought Classification	
Extremely Moist	+4 and above
Very Moist	+3 to +3.99
Moderately Moist	+2 to +2.99
Mid-Range	-1.99 to +1.99
Moderate Drought	-2 to -2.99
Severe Drought	-3 to -3.99
Extreme Drought	-4 and below

Source: [www.ncdc.noaa.gov/sotc/drought](http://www.ncdc.noaa.gov/sotc/drought) (as compiled by CNHRPC)



### **Drought in Boscawen**

Periods of **drought** in Boscawen would occur Town-wide and could cause property damage and economic losses. The lack of water would become a community problem to keep people hydrated and the failure of agricultural crops, products and farm animals can occur. Failure of tree farms to thrive can result in economic losses. Increased likelihood of wide-spread **brush fire** and **wildfire** will occur with drier vegetation. **Lightning** strikes could contribute to wildfire risk during droughts. Dug wells can dry up during droughts and interrupt personal water supplies, so few homes remain with dug wells in Town. Property damage and personal injuries or death could occur from drought-related fires or dry wells. The main private community water supply, Penacook-Boscawen Water Precinct, could enact water saving measures for their customers to assist with keeping the groundwater table higher. Overall, Boscawen residents should be encouraged to voluntarily undertake water conservation.

Agricultural farms and orchards run the risk of high damage from **drought** which also brings economic consequences. In Boscawen, these areas include Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits & vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits & vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), and the NH State Forest Nursery (US Route 3).

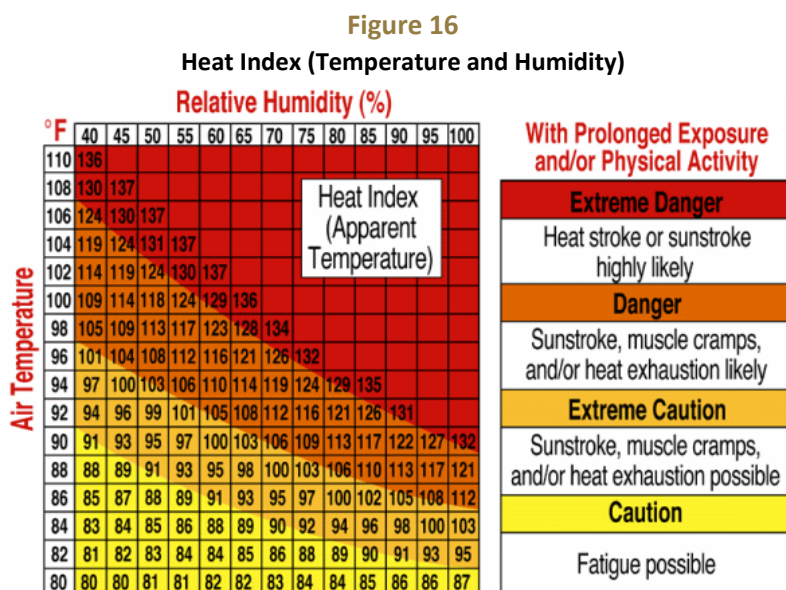
Boscawen has a lot of livestock and the Town would have to find ways of watering them during certain weather events, including drought. During emergencies, with agreements in place the Town can assist people getting their large animals to shelter at locations such as at the Hopkinton Fairgrounds and small animals to the VCA Riverside Veterinary Clinic.

## Excessive Heat

A heat wave is a period of abnormally and uncomfortably hot and unusually humid weather that typically lasts two or more days. The National Weather Services' Heat Index is used to measure humidity against temperature to develop a "real feel" temperature. Heat disorders on the body are quick and can be deadly. These now normal hot temperatures in the summer are commonly known as **excessive heat**.

## Magnitude of Excessive Heat

Excessive heat is measured by the [NWS Heat Index and the NWS Excessive Heat Warning Classifications](#). As both the air temperature and the humidity rise, so will the danger level to people. Heat disorders will become more likely with prolonged exposure or strenuous activity as shown in **Figure 16**.



Source: weather.gov

## Excessive Heat in Boscawen

Boscawen has experienced **heat waves** where temperatures exceeded 90 degrees for several days. During these times, many specific population sites in Town particularly susceptible to excessive heat, including the Boscawen Elementary School, King Street Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor and the aged 55+ residences should have access to either air conditioning or cooling facilities. Older manufactured homes may lack air conditioning. **Excessive heat** can cause dehydration, heat exhaustion and more serious illnesses. The Boscawen Congregational Church, Public Library and/or Boscawen Elementary School could open during these times as Cooling Centers. Other vulnerable facilities are indicated in **APPENDIX A Critical and Community Facilities Vulnerability Assessment**.

## EARTH HAZARDS

Earth hazards include geologic events such as the small earthquake NH residents experience. The Central NH area is seismically active and small earthquakes (less than 2.5 magnitude on the Richter Scale) occur about 1-2 times per year. Landslides can occur as a result of earthquakes, rain, flooding and result in erosion along roadways and watercourses.

Radon is a naturally occurring radioactive gas with carcinogenic properties. The gas is a common problem in many states, including New Hampshire, seeping into homes from basements. Radon may also enter homes dissolved in drinking water from drilled wells. High levels of radon in water from individual drilled wells is a common occurrence in New Hampshire. Radon is no longer being addressed by the State of New Hampshire Hazard Mitigation Plan as no new studies have made specific data available. It is generally known that radon exists throughout in the State and in communities, including the Central NH Region. Arsenic is a new concern that often co-occurs with radon. Radon is known to be present throughout New Hampshire and is addressed on an individual basis, no longer addressed in the **Hazard Mitigation Plan** because of the lack of state monitoring and available action.

There are two types of **Earth** hazards examined in the **Hazard Risk Assessment**:

-  **Earthquake**
-  **Landslide**

### Earthquake

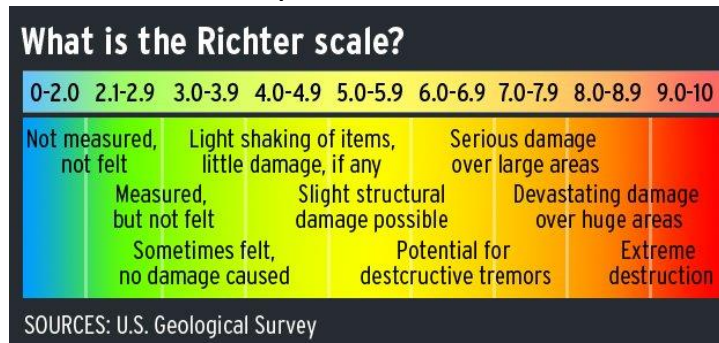
An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. **Earthquakes** can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause **landslides, flash floods, fires**, and avalanches. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and end in vibrations of gradually diminishing force called aftershocks. The underground point of origin of an earthquake is called its focus; the point on the surface directly above the focus is the epicenter. The magnitude and intensity of an earthquake is determined by the use of scales such as the [Richter scale](#) and [Mercalli scale](#). Geologic events are often associated with California, but New England is considered a moderate risk earthquake zone.

### **Magnitude of Earthquake Hazards**

Earthquake hazard magnitude can be measured by the Richter Scale as shown in **Figure 17**. To better place the Richter Scale magnitude in perspective, the Mercalli Scale describes the *intensity* felt at different magnitudes in **Figure 18**.

Figure 17

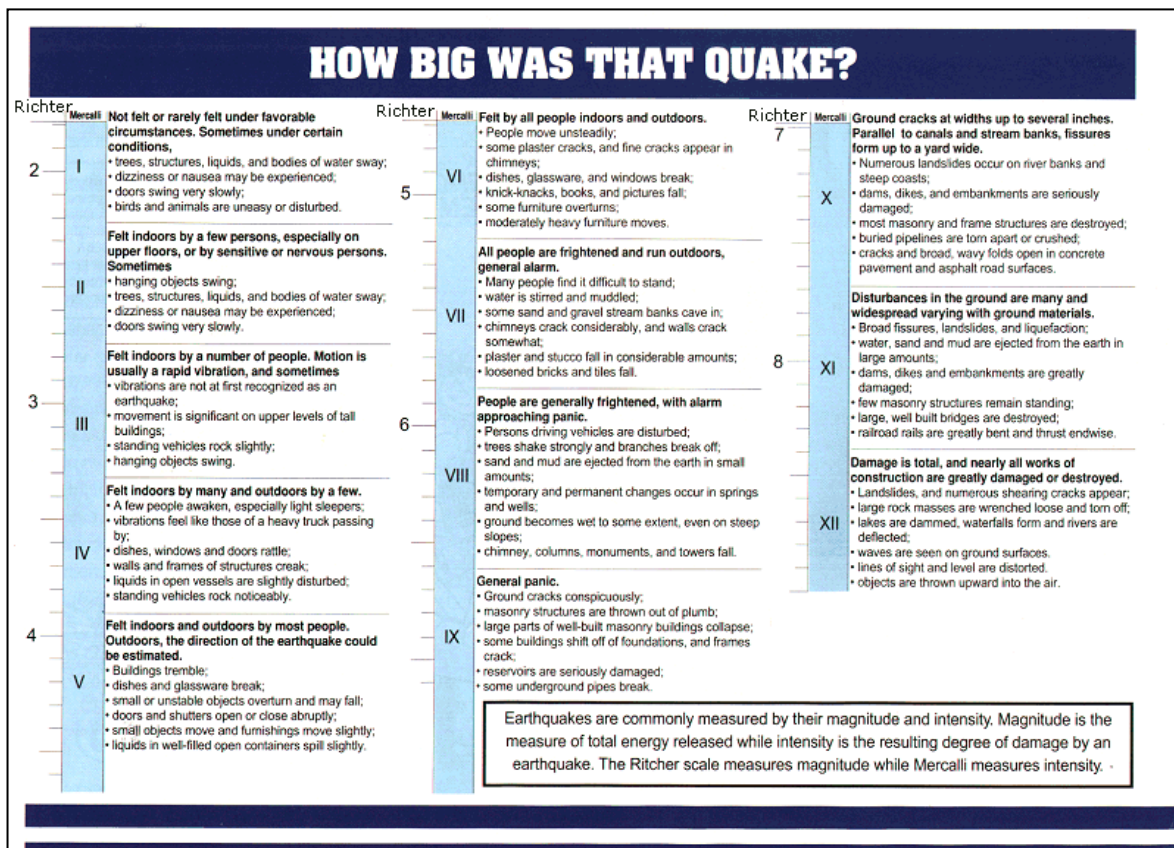
Descriptive Richter Scale



Source: US Geological Survey (USGS)

Figure 18

Earthquake Impacts on the Richter and Modified Mercalli Scales



Source: National Oceanic and Atmospheric Administration (NOAA)

### **Earthquakes in Boscawen**

Multiple small scale **earthquakes**, about **1-2** quake every year, have been felt by Boscawen residents, with their epicenters occurring within the Boscawen, Webster, Hopkinton (Contoocook), Hillsborough, Warner or Franklin area in Central NH or otherwise within **25** miles of Boscawen since **2002** to present day. The Central NH Region is an active seismic area with mild earthquakes. No significant damages or injuries have been reported from these events, mainly because they are so deep underground in bedrock, from 3-6 kilometers from the surface. Nearby earthquakes with a magnitude greater than **2.5**, or that are closer to the earth's surface, would be concerning to the Town.

While It is likely Boscawen residents will continue to feel **earthquakes** in the future, it continues to be likely that no major damage will result from these small earthquakes. Damage to utility poles and wires, roadways and infrastructure (Depot Street station, Contoocook River Dam, Penacook-Boscawen Water Precinct) could be significant should a large earthquake (**>3M**) occur. Areas with underground utilities, community water systems, and the old/historic buildings, Town Buildings, Boscawen Congregational Church, Merrimack County Nursing Home Buildings and Correctional Facility and the Elementary School are particularly at risk because of building size and their large populations. The Penacook-Boscawen Water Precinct water delivery pipes and older buildings may be more prone to damage because of their age and structural integrity. Boscawen is downstream of the large Franklin Falls Dam on the Merrimack River maintained by the US Army Corps of Engineers, which if breached could be disastrous to Boscawen. Loss of these or other community buildings could result in fewer services available to residents.

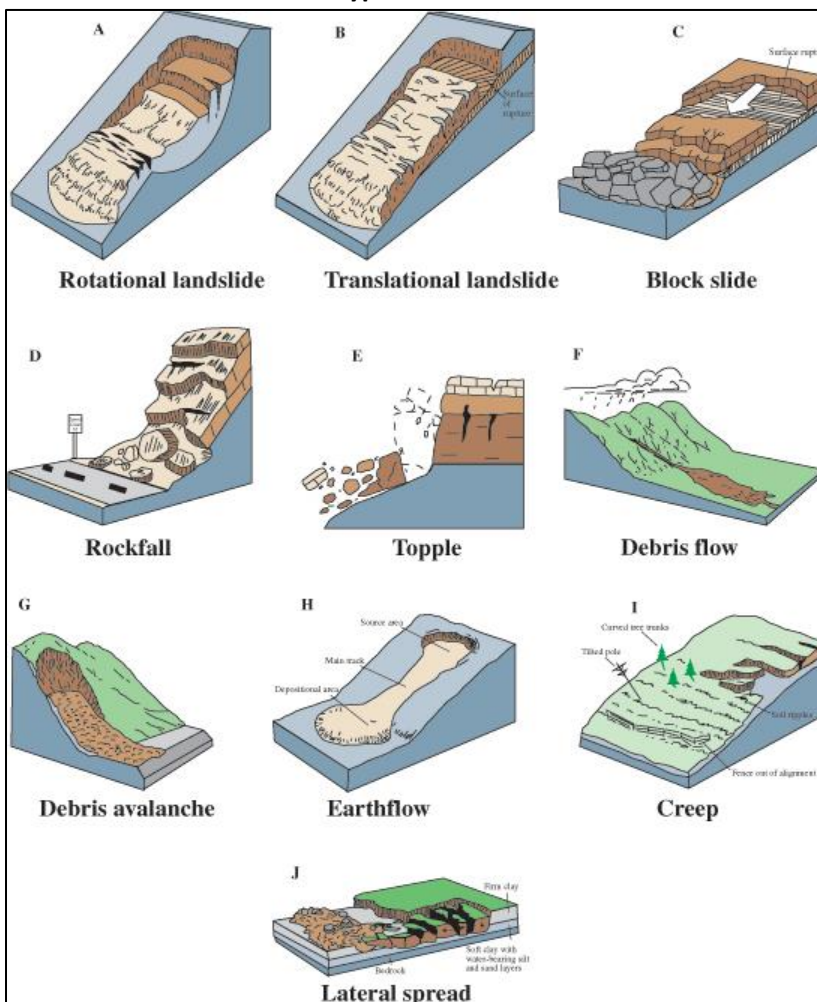
Older buildings (stone foundations) in Town could be susceptible to earthquake damage. Stone walls, dams, bridges, telecommunications towers, utility poles/lines and historic resources could also be susceptible to damage.



## Landslide

A landslide is the downward or outward movement of slope-forming materials reacting under the force of gravity including: mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides, and earth flows. Erosion of soil may also contribute to landslides. **Landslides** have damaged or destroyed roads, electrical and telephone lines, buildings, sewers, bridges, dams, forests, parks, and farms. A display of different types of landslides is shown in **Figure 19**.

**Figure 19**  
**Basic Types of Landslides**



Source: US Geological Survey (USGS)



### Magnitude of Landslide Hazards

There is no known standardized measurement of landslide magnitude available.

### Landslides in Boscawen

Landslide is a possibility in limited areas of Boscawen where certain topological conditions are met. Development in proximity to areas of steep slopes (greater than 15% or 25%) could present a risk to residents. Most potential **landslides** will be in conjunction with another hazard event, such as **flooding**, a severe rain event, **earthquake**, or from the construction of buildings or infrastructure in a topologically vulnerable area. Most roads are gravel roads which already experience washout during heavy rain events, flooding, or rapid snow pack melt. Some of the steeper roads could experience landslide or rockslide erosion during heavy rain events. Although a large-scale road landslide would damage few structures, road (infrastructure) closures are costly and can last for months.

The Merrimack River and brook banks can **erode** or see mass failure. Generally, vegetation in Boscawen is good at preventing **landslides**, except for the gravel pits in Town. Roads with steep ditching or embankments are most vulnerable to landslide. Along Route 4, two areas of concern for potential **landslide** are the Tannery Brook crossing and the land behind National Lumber. Road washouts and flash-flooding could cause **landslides**, especially along Route 4 and Valley of Industry, but otherwise the Town is not particularly susceptible.

## TECHNOLOGICAL HAZARD EVENTS

Many technological hazards could be construed as secondary hazards, as they often occur as the result of a primary (natural) hazard. For example, **power failure** or **transportation accidents** (technological) can result from severe winter weather (natural). Scientific measures of magnitude are generally not available for individual technological hazards, but they are provided for **debris impacted infrastructure** and **dam failure** which are closely related to **flooding** and for **hazardous materials spills** and **radiological incident**.

There are several types of **Technological** hazards examined in the **Hazard Risk Assessment**:

- ☒ **Dam Failure**
- ☒ **Power/Utility Failure**
- ☒ **Communications Systems Failure**
- ☒ **Debris Impacted Infrastructure**
- ☒ **Transportation Accidents**
- ☒ **Fire (Vehicle, Structure, Arson)**
- ☒ **Hazardous Materials Spills**
- ☒ **Public Health Issues**

### Magnitude of Technological Events

Magnitude of most technological hazards are not addressed in this Plan. The only exception is **Dam Failure** because of its close relationship with flooding using the NH DES Dam Hazard Classifications.

#### Dam Failure

Dam breach and the resulting failure cause rapid loss of water that is normally impounded by the dam. These kinds of floods are extremely dangerous and pose a significant threat to both life and property as they are quick, unexpected, and if they occur during a flooding event, dam failures can overload an already burdened water channel.

### Magnitude of Dam Failures

Although dam failure is considered a **Technological Hazard**, it is often a secondary hazard caused by flooding conditions. Classifications of dams and their magnitude of failure can be measured by the [NH DES Dam Hazard Classifications](#) shown in **Table 23**.

Table 23

New Hampshire Dam Hazard Classifications

NON-MENACE Structure		Inspection
<b>NM</b>	Means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is:	Every 6 years if criteria
	<ul style="list-style-type: none"> <li>○ Less than six feet in height if it has a storage capacity greater than 50 acre-feet;</li> <li>○ Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.</li> </ul>	
LOW Hazard Structure		Inspection
<b>LH</b>	Means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:	Every 6 years
	<ul style="list-style-type: none"> <li>○ No possible loss of life.</li> <li>○ Low economic loss to structures or property.</li> <li>○ 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.</li> <li>○ 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.</li> <li>○ Reversible environmental losses to environmentally-sensitive sites.</li> </ul>	
SIGNIFICANT Hazard Structure		Inspection
<b>SH</b>	Means a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:	Every 4 years
	<ul style="list-style-type: none"> <li>○ No probable loss of lives.</li> <li>○ Major economic loss to structures or property.</li> <li>○ Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services.</li> <li>○ Major environmental or public health losses, including one or more of the following:                             <ul style="list-style-type: none"> <li>◆ Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair.</li> <li>◆ The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more.</li> <li>◆ Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.</li> </ul> </li> </ul>	
HIGH Hazard Structure		Inspection
<b>HH</b>	Means a dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of:	Every 2 years
	<ul style="list-style-type: none"> <li>○ 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.</li> <li>○ 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.</li> <li>○ Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services.</li> <li>○ The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII.</li> <li>○ Any other circumstance that would more likely than not cause one or more deaths.</li> </ul>	

Source: NH Department of Environmental Services (NHDES) Dams Bureau, 2012

### Dam Failures in Boscawen

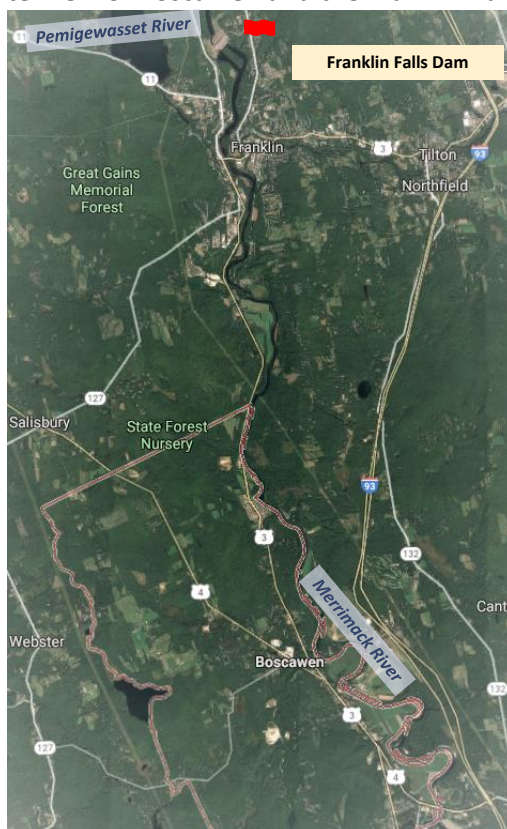
Dam failures, or breaches, are a potential danger to people and property within the dam failure inundation area(s). There are **7** active dams in Boscawen, all listed in **APPENDIX A**.

One **(1)** dam is of Significant Hazard (**S**) classification- Penacook Lower Falls Dam (Contoocook River). Three **(4)** dams are of Low Hazard (**L**) classification- Flagpole Pond (Patenaude's Pond) Dam (tributary of Contoocook), Hirst Marsh Dam (Hirst Marsh), Flagpole Pond Dike (tributary of Contoocook). Two **(2)** dams are of Non-Menace (**NM**) classification- Walker Pond Dam (Pond Brook) and McKerley Recreation Pond Dam (natural swale). In addition, several beaver dams hold back water and are important to the Town's infrastructure: Hirst Marsh Beaver Dam (Queen Street), Town Forest Beaver Dam (Weir Road) and Unnamed Stream Beaver Dam (Corn Hill Road).

Several miles north of Boscawen in Franklin, the High Hazard (**H**) Franklin Falls Flood Control Dam which holds back the Pemigewasset River flowing into the Merrimack is a large concern should the dam breach. This federal dam is monitored by the US Army Corps of Engineers at the Franklin Falls Office on-site. This **1,740'** long dam is **140'** high and was constructed to withstand extreme conditions. **Figure 20** displays the relationship to the Franklin Falls Dam to the Merrimack River flowing through the Town of Boscawen.

**Figure 20**

**Satellite View of Boscawen and the Franklin Falls Dam**



Source: Google Maps,  
Accessed 04-30-18;  
CNHRPC

### Power/Utility Failure

Utilities systems exist everywhere and are subject to damage from construction work, accidents and extreme weather. Many utilities are protected by back-up generators to prevent failure, whatever the cause may be. Nuclear power plants produce roughly 20% of the nation's power, they exist in nearly all states and 3 million Americans live within 10 miles of a nuclear power plant. The greatest risk to life resulting from a nuclear power plant failure is radiation contamination resulting from radiation release into the environment. People in the immediate vicinity are at greatest risk of radiation contamination. Another common source of energy, coal, can be potentially hazardous because coal power plants emit chemicals such as mercury and sulfur dioxide.

New Hampshire contains nuclear, coal and natural gas power plants. There is only one (1) coal power plant in New Hampshire, the Merrimack Station in Bow. The Merrimack Station is the largest coal-fired electrical generating station, formerly owned by Eversource and Public Service of New Hampshire, and supplies power to 190,000 households. Coal fuel generated only 7% of the State's electricity in 2016. The Merrimack Plant may be decommissioned in the future in favor of other sources. Much of the State's electricity (56% in 2016) is provided by the Seabrook nuclear power reactor.

In the harsh environment that New Hampshire residents are subjected to, power and utility failures on an isolated level are commonplace. During nearly every heavy snow storm, ice storm, or other severe weather event, someone, somewhere, loses power and/or other utilities.

### **Power Failure in Boscawen**

Power is disrupted on a regular basis during all seasons, a result of the primary natural hazards occurring. Boscawen depends on Unitil (~1,750 customers) and Eversource (~10 customers) for most of its power needs. Power outages may last for several days before service is restored to residents in a large event. Power outages in the more rural or isolated areas of Town regularly occur during any wind, storm, winter events or hazard events that cause debris impacted infrastructure. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only a few Corn Hill Road Eversource customers.

The Boscawen Elementary School (BES) will serve as the Town Shelter and/or Cooling Center available to Boscawen residents and as a Regional Shelter for other School District towns once the emergency generator installation is completed in **August 2018**. The School District is partnering with the Town on this project and is separately pursuing generators for its other Elementary Schools (Loudon, Salisbury, Webster, and Merrimack Valley Elementary Schools). There are many vulnerable populations identified in the community (see **APPENDIX A**). When the powerlines along US Routes 3 & 4 (King Street) fail, electricity to the entire town is disrupted. As a rule of thumb, all residents should be able to shelter in place in their homes for up to three days, gathering needed supplies and water ahead of time. The multiple businesses in Town rely on electricity provided by powerlines, and in many cases enterprise comes to a standstill during event.

Power failure can cause inconvenience, loss of economy, extra Town expenditures and staffing, and could restrict emergency response because the typical power failure is a secondary hazard caused by a severe wind or severe winter weather event. This problem is applicable to the **Hurricanes and Tropical Storms, Downbursts, Tornadoes, and Severe Winter Weather, Cold, and Ice Storms** hazard events described earlier as well as **Debris Impacted Infrastructure** and **Transportation Accident** hazard events in the following sections.

### **Communications Systems Failure**

Communications systems, like utilities, are found everywhere and are subject to damage by construction work, severe weather and traffic accidents. Because communications systems depend on electricity, any power outage may cause an interruption in a communications system. In addition, many communications systems have buried cables which are particularly vulnerable to being cut. Communications systems interruptions can negatively impact a region, town, neighborhood or household in the case of a natural disaster, catastrophe or other emergency. Power lines often share cables and poles with communications systems. When power fails, cable, telephone and radio services frequently fail as well.

### **Communications Systems Failure in Boscawen**

Any **communications failure** can mean lack of emergency services or delayed emergency services. Police/Fire use digital service and are members of the effective Capital Area Fire Compact Mutual Aid (CAFCMA) Dispatch service. Boscawen has two telecommunications towers which provide coverage to most of the Town, a tower at Robin Street and a tower at Daniel Webster Highway. Beyond that, telephone lines provide service to customers. Traditional broadband cable internet is available in much of the community, especially within the Village and along King Street. Communications failure can result as a secondary effect of a natural disaster such as severe storm or severe winter weather, like power failure is. Such an interruption affect the majority of residents in Town especially if a break occurs along the US Routes 3 & 4 corridor.

Vulnerable populations are at greatest risk in rural Boscawen for the effects of **power/utility failure**. There has been a steady migration to cell phone use only with people dropping their landline telephones. A few individuals in Town require oxygen and power failure and the likely accompanying communications systems failure would comprise the most vulnerable populations. The Fire Department has a voluntary registration program for people who want to be checked during emergencies, and the Police Department also conducts welfare checks.

### **Debris Impacted Infrastructure**

Debris impacted infrastructure regularly occurs along the Central NH Region's rivers and streams and also along roadways. Rivers or brooks flowing under bridges or through culverts could get clogged or damaged by woody material or leaves in the watercourse. Culvert maintenance is particularly important before and

during heavy rainfall and floods. Tree limbs falling onto power lines and onto roadways, disrupting both electricity and the roadway, occur during wind or winter storms.

### **Debris Impacted Infrastructure in Boscawen**

Boscawen's watercourses, including the brooks and wetlands can **flood** their banks, **overflow culverts**, or **washout roads** during certain conditions. Trees and limbs falling on roads and power lines cause **power failure** or **road blockage**. Infrastructure in Boscawen can refer to roadways, powerlines, utility lines, culverts, water towers, bridges or dams. These features inventoried in **APPENDIX A Critical and Community Vulnerability Assessment** are those which should be watched carefully before and after storms and should be checked and maintained regularly to reduce the risk of significant **debris impacted infrastructure** events. **Erosion** along the Merrimack River, Contoocook River or Tannery Brook embankments cause sediment and debris to flow downstream and is a hazard to the landowners who have shoreland frontage.

Debris in the form of trees is a constant concern, although they are not considered a particular hazard of concern in Boscawen. The Town can call the NH Department of Environmental Services for emergency removal. Bridges are vulnerable to debris dislodged during storm events. The Town's Long Street Bridge over Beaverdam Brook is state redlisted bridges and structurally deficient. The Board of Selectmen may consider applying for NH Bridge Aid funding to help rehabilitate this small bridge. All outlying roads are susceptible to tree fall and downed powerlines (see **Wind** hazards). Most of the bridges in Boscawen are owned by the State of New Hampshire.

### **Transportation Accidents**

Automobile accidents could occur on any roadway in the Central NH region. A major accident would have the greatest impact for travelers on Interstates 93, 393 or 89, on US Route 202, US Route 4 or US Route 3, on NH Route 3A, NH Route 9, NH Route 13, NH Route 28, NH Route 31 NH Route 49, NH Route 77, NH Route 103, NH Route 106, NH Route 107, NH Route 114, NH Route 127, NH Route 129 and NH Route 132 or on their bypasses, interchanges, Exits and on/off ramps. These are high speed corridors with high traffic volumes. Many local roads allow for residential and commuter vehicles at low speeds.

The railroad lines along the Merrimack River create the potential for a (railcar) transportation accident. Trains could potentially derail, causing injuries or fatalities and hazardous materials spills. In the Central NH Region, the Concord-Lincoln Line runs 73 miles between Concord and Lincoln. The New Hampshire Maine Line runs between Concord, Nashua and Lowell, MA. Several communities through which these lines travel have expressed the concern about hazardous material spills due to transportation accidents or sabotage. Concord Municipal Airport is the major airport in the Central NH Region but Manchester-Boston Regional Airport (MHT) can be accessed via Route 28 in about 45 minutes. Air traffic can also be hazardous to the region's citizens.



### Transportation Accidents in Boscawen

**Traffic accidents** may be the most likely future transportation hazard in Boscawen on King Street, US Route 3, US Route 4, along US 3 Main Street or at the US 4 traffic circle. Accidents can occur at difficult intersections, hills, curves, or straightaways, particularly in **winter weather**. Traffic accidents occur in several locations along hilly and curvy Queen Street, developed and fast-moving King Street, around the US 4 Traffic Circle, along well-traveled straight US 3 Main Street and at intersections such as US Route 4 and Water Street. New sidewalks have been constructed in recent years, connecting the Boscawen Elementary School with King Street. As the local roads become developed with more homes, more vehicles, pedestrians and bicyclists will find themselves vying for the same space. As vehicular traffic increases or as the weather turns bad, there is the likelihood that **transportation accidents** will occur in these and other areas.

### Fire (Arson, Vehicle, Structure)

Fires which are not natural hazards are often associated with vehicles, structures or hazardous materials spills, or sometimes an explosion. These are considered **Technological Hazards**. Arson, the deliberate setting of a fire as an act of sabotage or mischief, is a **Human Hazard** but is described in this section for convenience. No magnitude scales were defined for these types of non-natural fires.

### Fire in Boscawen

The Fire Department annually reports all fires to the NH Fire Marshal's office. The National Reporting System (NRS) provides data on municipal fire events. Over a five-year period between **2013-2017**, a total of **57** fires were reported to the NRS by the Boscawen Fire Department. In **2013**, **10** fires were reported (**4** structure, **2** motor vehicle, **4** natural vegetation fires). In **2014**, **16** fires were reported (**12** structure, **1** motor vehicle, **3** natural vegetation fires). In **2015**, **16** fires were reported (**7** structure, **7** natural vegetation, **2** motor vehicle fires). In **2016**, **5** fires were reported (**2** structure, **2** natural vegetation, **1** manufactured home fires). In **2017**, Boscawen Fire Department reported **10** fires, (**6** structure, **1** natural vegetation, **3** motor vehicle fires) to the NRS.

The Boscawen Fire Department (BFD) provides simplified data for the Town Annual Reports which differs from the National Reporting System. The Capital Area Fire Compact to which Boscawen belongs closely tracks the region's data. In **2015** in Boscawen, there were **194** calls for service but the number of fires were not specified; in **2016**, there were also **194** service calls but the number of fires were not specified; in **2017**, there were **175** calls for service but only **2** structure fires. The BFD responds to all types of calls for service and participates in mutual aid with the Capital Area Fire Mutual Aid Compact, sharing training, drills, dispatching and assisting other communities.

Locations in Boscawen which are particularly vulnerable to **fire** (from any source – **lightning**, human, **wildfire**, electrical, power lines, **hazardous materials**, etc.) include Municipal Facility (Town Offices, Library and Police Department), Boscawen Elementary School, the multiple manufactured housing parks in Town, US Routes 3 & 4 (King Street) homes and businesses, Merrimack County Nursing Home facilities and

the Correctional Facility buildings, various multi-family developments and senior living facilities, and gathering places such as the Winthrop Carter House and Avaloch Farm Institute. Several large businesses in Town have hazardous materials onsite that render them vulnerable should a fire occur. Additionally, there are dozens of agricultural enterprises in Boscawen with fertilizer, old barns and hay fields surrounded by woodlands, a vulnerability to both livestock and people.

A list of hazardous materials facilities which could cause fire or explosions in Town is available in **APPENDIX A Critical and Community Facility Vulnerability Assessment**. Included in these **APPENDIX A** tables is a listing of vulnerable populations that are working or living in close quarters.

### **Hazardous Materials Spills**

Hazardous materials and hazardous wastes contain properties that make them potentially dangerous or harmful to humans. They can be liquids, solids, contained gases or sludge. Hazardous wastes can be the by-product of manufacturing, as well as discarded commercial products. Most households contain cleaning agents that become hazardous waste when disposed of improperly. Chemicals have numerous benefits but can also cause hazards during their production, storage, transportation, use or disposal. Hazardous materials can have adverse health related effects and may even cause death in certain cases. In addition, hazardous materials may damage homes, businesses and other property, as well as natural ecosystems. Chemical accidents in plants or chemical spills during transportation may often release hazardous chemicals.

The risk from hazardous materials spills or releases into groundwater is present if consumers and homeowners make irresponsible decisions regarding the disposal of household chemicals. These household chemicals can contaminate drinking water in wells and cause damage to various ecosystems. Most people contaminate without being aware that they are doing so. Further education may be needed to reduce hazardous waste contamination.

### **Hazardous Materials Spills in Boscawen**

Transportation trucking of hazardous materials on US Route 3, US Route 4, and through the King Street corridor is likely an regular occurrence. These trucks could rollover and spill their contents onto these significant roadways. The *New Hampshire Hazardous Material Commodity Flow Study 2018* and its accompanying maps may provide some enlightening data the Town can use to help protect the community from spills.

Several occupational facilities in Town could handle, store, or use hazardous materials. The Boscawen Transfer Station and Recycling Center on Marlboro Road is open two days per week year round and a third day between April – October and is where residents and businesses take their normal waste. Special collection days are held to collect Household Hazardous Waste (HHW), when large volumes of materials that may otherwise be dumped in the woods or in water bodies are collected from residents. Local auto body shops and garages, large businesses, agricultural operations, fuel stations, excavation and asphalt

businesses, the Elementary School (science lab), industries, and Town Salt Shed are stationary site locations which may experience this type of hazard in the future. Any of these facilities could have a spill or an incident at their location. A listing of known facilities which store or could use hazardous materials has been inventoried in **APPENDIX A Critical and Community Vulnerability Assessment**.

### **Public Health Issues**

Public health issues for the purposes of this **Hazard Mitigation Plan** are considered secondary hazards, occurring from hot or cold temperatures. For other purposes, public health can be measured in many ways. Students and the elderly are vulnerable to seasonal health outbreaks as they tend to congregate in large numbers and in shared environments where physical contact is common. Large groups can make bioterrorism more effective.

It is difficult to predict where an epidemic would occur due to human, mosquito and wildlife mobility. Commonly occurring epidemics following extreme heat or cold can include **influenza**, norovirus, rhinovirus (viruses), Lyme disease, Anaplasmosis and babesiosis (tick-borne diseases), Eastern Equine Encephalitis (EEE), West Nile and Powassan (arboviral or mosquito-borne diseases) and any could occur in Boscawen. The Town has swampy areas around its rivers, wetlands and brooks which are prime breeding ground for **mosquitoes**. Large deer herds that roam can carry **deer ticks** in the Town's heavily forested sections and into State Forests. **Water quality degradation** (failing septic systems, flooding, pipes breaking) could sicken residents using the public water supplies (those serving over 25 people), dug wells or bedrock wells, or could cause aquatic and wildlife deaths. Epidemics could result.

### **Public Health Issues in Boscawen**

Anecdotal widespread **public health** issues involving Lyme disease indicate tickborne viruses are increasing in Boscawen. The Town is a wooded, rural community with the Merrimack River, a small section of the Contoocook River, many brooks, ponds, and wet meadows, and state and Town recreation areas. Arboviral (mosquito-borne) viruses may also increase.





For indoor contamination, the highest risk facilities for pick-up or transfer of viruses and bacteria can include the Boscawen Elementary School, Merrimack County Nursing Home facilities and the Correctional Facility buildings, Municipal Facility, Boscawen Congregational Church, as well as stores, restaurants, recreational facilities and gathering places (see **APPENDIX A**). The Penacook-Boscawen Water District operates and maintains their own water system for residents and the old pipes are known to break frequently. The same populations identified as particularly susceptible to **Excessive Heat** would be most vulnerable to public health issues and epidemics.

To help combat local and area public health epidemics, Boscawen has a plan to join the nearby regional Point of Dispensing (POD) site at the nearby Concord NH Technical Institute, a location where vaccines or other medicines are disseminated to people during an emergency with assistance from the Capital Area Public Health Network (CAPHN).

## **HUMAN HAZARD EVENTS**

Events of human nature include terrorism (ecological, cyber and chemical), sabotage/vandalism, hostage situations, and civil unrest. These are often “behind the scenes” hazards that local Police Departments handle on a regular basis. These events are all caused by direct human action.

There are several types of **Human** hazards examined in the **Hazard Risk Assessment**:

-  **Terrorism**
-  **Sabotage/Vandalism**
-  **Hostage Situation**
-  **Civil Disturbance/Public Unrest**

Human Hazards are examined by descriptions of the types of human hazards and in the **Potential Future Hazards**. Scientific measures of magnitude are not available for individual human hazards.

### **Terrorism**

The use of force or violence against people to create fear, cause physical harm and/or intimidation or for reasons of ransom. Terrorists often make threats to create fear and change public opinion. Cyber terrorism consists of hackers who threaten the economy by attacking the intricate computer infrastructure, affecting business and communication. Biological and chemical terrorism refers to those infectious microbes or toxins used to produce illness or death in people or animals. Large groups or close quarters of people can make bioterrorism more effective. Terrorists may contaminate food or water, thus threatening an unprotected civilian population. Eco-terrorism refers to the destruction of property by persons who are generally opposed to the destruction of the environment or to make a visible argument against forms of technology that may be destructive to the environment.

### **Terrorism in Boscawen**

It is unlikely that the Town would be the target of any act of international terrorism. Domestic terrorism has occurred within the last 15 years both in Boscawen, in the form of hostage situation and cyberattack, and within the Central NH region. Targets are usually public spaces that would do the most damage to send a message. Possible targets could be the Municipal Facility (Town Office, Library and Police Department), Boscawen Elementary School, Merrimack County Nursing Home facilities and the Correctional Facility buildings, and gathering places such as the Boscawen Congregational Church, NH Veterans Cemetery Winthrop Carter House and Avaloch Farm Institute, and all other Town, State or governmental facilities. Although unlikely, there could be a massive impact felt in the community even on a small-scale event.

### **Sabotage/Vandalism**

Sabotage is a deliberate action aimed at someone or some institution in order to weaken that person's or institution's integrity and reputation through subversion, destruction, obstruction or disruption. Sabotage may occur in war, a workplace, in the natural environment, as a crime, in politics or as a direct attack against an individual.

#### **Sabotage /Vandalism in Boscawen**

Any incident of **sabotage** in Boscawen could come from within Boscawen or any nearby Town, or outside of the State or country, but some sabotage efforts would require perpetrators to be on site. **Vandalism** can also be present at cemeteries, vacant buildings, under bridges. While a nuisance, vandalism has a lower potential to harm than sabotage.

Vandalism could occur at NH Veterans Cemetery and other public and private cemeteries, recreational sites such as the Jamie Welch Memorial Field and boat launch. These facilities would be among the most damaging to the community. Vandalism could also occur at vacant buildings in isolated locations.

Technological systems such as computer systems and websites of the Town Office, Police Department, Library, Boscawen Elementary School, Public Works Building, Penacook-Boscawen Water Precinct building, Fire Department, Merrimack County facilities, and other governmental systems could be subject to computer or network sabotage. Utilities or telecommunications towers could be vulnerable to sabotage or vandalism, such as the public Penacook-Boscawen Water Precinct water supply or the Depot Street substation. Many other significant facilities in Boscawen could be subject to sabotage including the powerlines, transmission lines, transformers and utility substations.

### **Hostage Situation**

A hostage situation is an incident where an innocent civilian is held by someone or some group of persons demanding something from another person or group of persons not related to the person or persons being held hostage. The person or persons held are done so pending the fulfillment of certain terms.

#### **Hostage Situations in Boscawen**

**Hostage situations** can occur anywhere, are isolated events and are nearly impossible to predict; none have been reported for this Plan. Hostage situations are not normal events and therefore are nearly impossible to predict. Domestic violence events generally occur in resident homes, perhaps one per year.

Conventional hostage situations would most likely target such locations as the Town Office, Police Department, Library, Boscawen Elementary School, Merrimack County Correctional Facilities, at all other Town or governmental facilities, in Millhouse, or at major businesses such as those along the King Street corridor and US 3 Main Street. There is no longer a Post Office in Town.

### **Civil Disturbance/Public Unrest**

This hazard refers to types of disturbances that are caused by a group of people, often in protest against major socio-political problems including sit-ins or protests against wars and any general and public expression of outrage against a political establishment or policy. Many instances of civil disturbance and public unrest are quelled by a use of force from police. Participants may be victims of personal injury in severe cases.

The most probable locations of larger civil disturbance and/or protest in New Hampshire are at the State House in Concord and at the universities and colleges. They have also occurred at political locations, such as feminist health centers or political party headquarters.

### **Civil Disturbance/Public Unrest in Boscawen**

Large scale incidents of civil disturbance and public unrest are unlikely in Boscawen. Locally, the highest potential for **public unrest** could take place during Town Meetings and School Meetings, on voting day or during visits from political candidates, or at large events such as Old Home Day, Veterans Parades, NH Veterans Cemetery ceremonies, or at Elementary School events. Locations where civil unrest could occur include the NH Veterans Cemetery, Merrimack County Correctional Facilities, Boscawen Elementary School and its recreational fields, the Municipal Facility or Jamie Welch Memorial Recreation Park, or the numerous manufactured home parks. Generally, restaurants and establishments serving alcohol, gathering facilities such as the Winthrop Carter House and Avaloch Farm and within other high density population areas are also more susceptible to **civil disturbance**.

## Existing and Potential Future Hazards

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After the inventory of hazards types and past hazards in Town, hazards that currently exist or that need to be monitored in Boscawen has been completed along with potential future hazards that could occur in other areas. This unique listing of **Existing and Potential Future Hazards** was compiled so the Town can be aware of areas that might need to be watched for recurring hazardous problems or that may experience some of these hazards for the first time. The listing was developed by knowledge of the Hazard Mitigation Committee and past experiences of hazards. Past locations of hazard events, where they exist for each hazard, are listed under the individual hazard narratives in the previous section. The existing and susceptible hazard locations are taken from the **Hazard Risk Assessment**. With this existing and potential future knowledge listed side by side, it becomes easier for a community to plan mitigation measures for the most prominent hazard events in Town.

Included in **Table 24** is the **Overall Risk** score between **1-16** from the **Hazard Risk Assessment** for **16** natural hazards. The name of the magnitude or extent scale of the natural hazard is represented for ease of reference. Technological and human hazards were not rated for their **Overall Risk** to retain the importance of maintaining a natural hazard perspective for the **Hazard Mitigation Plan 2018**. **NR** is the abbreviation for **Not Rated**.



**Table 24**

**Existing and Potential Future Hazards**

Hazard Risk Assessment Hazards	Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measure-ment Scale
<p align="center"><b>Floods and Flash Floods</b></p> <p align="center"><b>Flooding</b></p>	<b>2.0</b>	<p><b>Entire Town, floodplains of Merrimack River</b> result in expanded flooding, Tannery Brook, Town House Brook, Pond Brook, Beaverdam Brook, Stirrup Iron Brook, Hirst Marsh, Patenaude's Pond, Walker Pond are the largest waterbodies and watercourses. Runoff from roadways or heavy rain can cause floods over the Entire Town. Regular road washouts include:</p> <ul style="list-style-type: none"> <li>• Commercial Street • Corn Hill Road • Crescent Street • Eel Street</li> <li>• Forest Lane (drainage) • Long Street • North Water Street • Queen Street (washout) • River Road • Route 3 (State) • Route 4 (State) • Water Street (State).</li> </ul> <p>Several of these roads have closed multiple times since the 2006 floods.</p> <p>Washout potential on Route 3/4 just past the lights heading north on the left (white house) and at Highway View Farm (Crete) on River Road - siltation, washouts. Valley of Industry experiences regular washouts and is vulnerable to landslide.</p> <p>Proximity to the Franklin Falls and Blackwater Dams via the Merrimack and Contoocook Rivers and the condition of State-owned bridge culverts along Routes 3/4 and Water Street means increased flooding potential. Homes near the Merrimack are at risk. Merrimack floodplain hosts 750 acres of crops along River Road that can be damaged. Jaime Welch Park rec area on Depot St off of Route 3/King Street along the River could experience significant river flooding damages. The culverts on NH Routes 3 and 4 are undersized and need to be upgraded to a larger size. Water Street is also a</p>	<p>There are several homes and farms located within floodplains in Boscawen with a potential future flooding potential. Poor drainage exists along Goodhue Road, Corn Hill Road, Water Street, Long Street and Queen Street and numerous culverts should be replaced and the roads repaired. The potential for flooding exists along the Valley of Industry and River Road. Many culverts could be replaced and the road fixed to alleviate some of the problems.</p> <p>Various key bridges over Tannery Brook are maintained by the State (US 4) could be subject to flooding as well. Corn Hill Road Bridge over Pond Brook at the Webster town line is low and subject to regular flooding.</p> <p>Areas listed in the left column are also potential future flooding concerns.</p> <p>The Boscawen Elementary School is working to provide a secondary access road for emergency purposes. At the 2018 annual meeting, approval was granted to purchase property to build an emergency road.</p>	<p>Special Flood Hazard Areas (SFHAs) on 2010 Digital Flood Rate Insurance Maps (Zones A, AE, X)</p>

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			State road that needs to be upgraded. Its existing culverts and drainage system requires regular cleaning and maintenance because it always floods (State responsibility). Tannery Brook's human-made dam is at risk due to non-maintenance. The Hodges apartments and Fessenden MHP off Routes 3/4 each have only 1 private road entrance into the development. Shared waterway caused the large flooding in 2007- water flows under the roads through non-maintained undersized culverts. School also is located on private road (BEST Ave) and has no 2nd egress. Penacook-Boscawen Water Precinct is vulnerable to flood events.		
Flooding	Rapid Snow Pack Melt	2.0	Melt runoff from <b>impervious surfaces and roadways or from tree cover and fields</b> can cause floods over the Entire Town. Susceptible areas include regular road washouts at the roads mentioned above. Homes near the Merrimack River, especially in low-lying areas, are at risk. Crescent Street, Eel Street and Commercial Street homes and businesses may be at risk of flooding in the case of rapid snow pack melt. Roads in general are always susceptible to the effects of winter snow melts. The Penacook-Boscawen Water Precinct is vulnerable to flood events.	<p>There is a possibility of flood damage through future rapid snow pack melt.</p> <p>Melt runoff from impervious surfaces and roadways or from tree cover and fields can cause floods over the Entire Town. Road washouts and/or culvert failure locations or other areas flooded have included over the years: Commercial Street, Corn Hill Road, Crescent Street, Eel Street, Forest Lane (drainage), Long Street, North Water Street, Queen Street (washout), River Road, Route 3 (State), Route 4 (State), and Water Street (State), and Goodhue Road. Several of these roads have closed at least 3 to 4 times since the 2006 floods. The poor condition of State-owned bridge culverts along US Routes 3/4 and Water Street means increased flooding potential.</p> <p>Homes near the <b>Merrimack River</b> are at risk of flooding. The <b>Merrimack</b> floodplain hosts 750 acres of crops along River Road that can be damaged. The Jaime Welch Park recreation area on Depot Street off of could experience significant river flooding damages; the boat launch has washed away more than once.</p> <p>The culverts on US Routes 3 and 4 (State responsibility) are undersized and need to</p>	None specific known but can use SFHAs

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measure-ment Scale
Floodings				<p>be upgraded to a larger size. Water Street is also a State road that needs to be upgraded. Its existing culverts and drainage system requires regular cleaning and maintenance because it always floods (<b>Tannery Brook</b>). The Hodges apartments and Fessenden manufactured housing park off of US Routes 3/4 each have only 1 private road entrance into their developments. A shared waterway caused the large washout flooding in 2007, where water flowed under the roads through non-maintained undersized culverts. The Penacook- Boscawen Water Precinct is vulnerable to flood events.</p> <p>These are examples of flooding locations in Boscawen. On these and other gravel roads, the road beds may be washed away, preventing traffic from passing. All areas of Town could be susceptible to rapid snow pack melt, particularly those near the wetlands and brooks.</p>	
	River Ice Jams	2.0	<p><b>Contoocook River.</b> Crescent Street, Eel Street/Tremont Street, River Road, and Commercial Street homes and businesses may be at risk of flooding in the case of river ice jams. Roads in general are always susceptible to the effects of winter ice and snow melts. The Town is susceptible to river ice jams because of the proximity to the Franklin Falls and Blackwater Dams via the Merrimack River and Contoocook River. Homes near the Merrimack River, especially in low-lying areas, could be at risk, although the Merrimack River has had no reported ice jams in the Central NH Region since 1936 (Bow/Pembroke). Jams could recur between Tremont and Eel Streets, in the open bend in the Contoocook River.</p>	<p>The <b>Contoocook River</b> has hosted <b>ice jams</b> in the community and may do so in the future as well. These specific locations are capable of <b>ice jam</b> conditions include Crescent Street, Eel Street/Tremont Street, River Road, and Commercial Street, where nearby homes and businesses may be at risk of <b>flooding</b> in the case of river <b>ice jams</b>.</p> <p>Roads in general are always susceptible to the effects of winter ice and snow melts. Homes near the Merrimack River, especially in low-lying areas, could be at risk, although the Merrimack River has had no reported ice jams in the Central NH Region since 1936 (Bow/Pembroke). Jams could recur between Tremont and Eel Streets, in the open bend in the <b>Contoocook River</b>, particularly during high water and heavy <b>rain/snow melt</b> conditions. Bridges and dams are identified in <b>APPENDIX A</b>.</p>	No known widely-used scale measuring the magnitude of river ice jams

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/Extent Measurement Scale
Flooding	Riverine Scouring, Erosion, Channel Movement	5.0	<b>Floodplains of Merrimack River.</b> Route 3 and King Street residents and businesses may be at risk from stream bank erosion and scouring. Farmland on River Road is very vulnerable, including the new California Fields development on Crescent Street. The vacant structures on Commercial Street may also be at risk. Tannery Brook, Town House Brook, Pond Brook, Beaverdam Brook, Stirrup Iron Brook, Hirst Marsh, Patenaude's Pond, Walker Pond are the largest waterbodies and watercourses in the Town and some run under or alongside local roads, with the possibility of eroding surrounding areas.	Future <b>erosion and scouring</b> could occur along the <b>Merrimack River, Contoocook River, Tannery Brook, Town House Brook, Pond Brook, Beaverdam Brook, or Stirrup Iron Brook</b> which are the largest watercourses in the Town, some of which run under or alongside local roads.  Erosion could occur along banks when development (roads, homes) or human activities (parks, paths, recreational vehicles) are too close or if stream crossing alignments are not adequate for their locations. The Town should remain alert for potential developing erosion sites. Bridges can be contributors to scouring of the Merrimack River streambed. Erosion effects have been felt on Hannah Dustin Island, US Route 3, and River Road and may continue in the future.	EPA Bank Erosion Risk Index

Hazard Risk Assessment Hazards	Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measure-ment Scale
<p><b>Tornadoes</b></p> <p><b>Wind</b></p>	<p><b>9.0</b></p>	<p><b>Entire Town.</b> <u>Most vulnerable areas</u> include: Elementary School, King Street Commercial Area, Church steeples, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Manufactured Housing Parks (MHP):</u> Birch &amp; Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP, Woody Hollow Co-op MHP. <u>Apartment buildings and Multi-Family:</u> Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts. <u>Wooded and forested sections of Town:</u> NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St). <u>Telecomm towers:</u> Two cell towers in Boscawen, one off Robin Street and on Daniel Webster Hwy. Tall telecomm towers could be damaged by severe storms. A communications interruption or failure resulting from damage to the tower could affect the capabilities of emergency personnel. <u>Electrical power:</u> The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town.</p>	<p>The entire area of Town is vulnerable to a <b>tornado</b>. Populated areas include the Boscawen Elementary School, King Street Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. The Town is host to many manufactured housing parks (MHP), Birch &amp; Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP and Woody Hollow Co-op MHP. Several apartment buildings and multi-family developments include Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts, and California Fields. All of these populated areas carry greater risk because of higher density (see <b>APPENDIX A</b> for a complete list of sites).</p> <p>Forested sections of Town run a risk of isolation through debris impacted infrastructure (trees down on roads and powerlines) resulting in power failure with little emergency access until the way is cleared. These areas include: Water Street, Long Street, NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St). A tornado occurring in Boscawen would cause considerable damage to this rural community. A tornado occurring in Boscawen would cause considerable damage. Roofs could be torn off frame houses; mobile homes demolished; large trees snapped or uprooted; and light object missiles would be generated as a result of an EF-2 Tornado.</p> <p>Communications towers (Robin Street and Daniel Webster Highway), the Depot Street substation, telephone lines, power lines and other utilities could also be affected by tornadoes.</p>	<p>Enhanced Fujita (EF) Tornado Scale</p>

**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Wind	<b>Tornadoes (continued)</b>	<b>9.0</b>	<u>Farms, orchards, agricultural businesses:</u> Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits & vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits & vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). Road network (fallen trees and electrical power lines) is susceptible to damage to debris impacted infrastructure. Areas of the Town would be difficult to access with excessive tree fall.		Enhanced Fujita (EF) Tornado Scale
	<b>Downbursts</b>	<b>6.0</b>	<b>Entire Town.</b> Most vulnerable areas include: Elementary School, King Street Commercial Area, Church steeples, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. Manufactured Housing Parks (MHP): Birch & Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP, Woody Hollow Co-op MHP. <u>Apartment buildings and Multi-Family:</u> Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts. <u>Wooded and forested sections of Town:</u> NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St).	<p>Anywhere the Town could be struck by a straight line wind downburst. See also Tornado vulnerable locations.</p> <p>The likelihood of future wind events in Town seems high. <b>High winds</b> and <b>downbursts</b> are unpredictable, and are often more prevalent at higher elevations. The King Street Corridor serves as the Town Center of Boscawen, through which US Routes 3 &amp; 4 travel and lined with businesses and homes.</p> <p>More populated locations could have the potential for higher injury and property damage from downbursts. These include the Boscawen Elementary, Merrimack County facilities, King Street Corridor, manufactured housing parks, multi-family developments and the various Town Facilities, which run a higher risk of damages than many removed or less dense locations.</p>	Enhanced Fujita (EF) Tornado Scale



**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			<p><u>Telecomm towers:</u> Two cell towers in Boscawen, one off Robin Street and on Daniel Webster Hwy. Tall telecomm towers could be damaged by severe storms. A communications interruption or failure resulting from damage to the tower could affect the capabilities of emergency personnel.</p>	<p>The entire Town of Boscawen is forested. The highest elevation, forested or mostly densely populated sections of Town run a risk of isolation through debris impacted infrastructure (trees down on roads and powerlines) resulting in power failure with little emergency access until the way is cleared.</p>	
Wind	Hurricanes and Tropical Storms	12.0	<p><b>Entire Town.</b> Most vulnerable areas include: Elementary School, King Street Commercial Area, Church steeples, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. Manufactured Housing Parks (MHP): Birch &amp; Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP, Woody Hollow Co-op MHP.</p> <p><u>Apartment buildings and Multi-Family:</u> Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts.</p> <p><u>Wooded and forested sections of Town:</u> NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St).</p> <p><u>Telecomm towers:</u> Two cell towers in Boscawen, one off Robin Street and on Daniel Webster Hwy. Tall telecomm towers could be damaged by severe storms. A communications interruption or failure resulting from damage to the tower could affect the capabilities of emergency personnel. <u>Electrical power:</u> The power grid on Depot Street is an important utility that if damaged would have a negative impact on</p>	<p>When <b>hurricanes or tropical storms</b> occur in Boscawen, the Town's electrical utilities of Unitil and Eversource and will continue to be prone to power outages. The response time to these outages could be several days in the more remote or densely populated areas of Town, depending on where debris has fallen onto roads. Areas particularly vulnerable to the combination of <b>flooding, wind, tree debris</b> and <b>power failure</b> include forested and highly traveled sections of Town, such as the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, King Street Corridor and the Queen Street area. Communications towers (Robin Street and Daniel Webster Highway), the Depot Street substation, telephone lines, power lines and other utilities could also be affected by <b>hurricanes</b>.</p> <p>Several sections of Town would be difficult to access with trees and power lines down on these residential roads, resulting in possible isolation. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town. Radio operability for emergency communications could be adversely affected. Land line utilities would be at risk of failure during severe storm weather.</p>	Saffir-Simpson Hurricane Wind Scale



4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Wind			the Town. The Route 3 & 4 corridor supplies power to the entire Town. <u>Farms, orchards, agricultural businesses</u> : Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits & vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits & vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). <u>Road network</u> (fallen trees and electrical power lines) is susceptible to damage to debris impacted infrastructure. Areas of the Town would be difficult to access with excessive tree fall. <u>The Penacook-Boscawen Water Precinct</u> is vulnerable to flood events.		
	Severe Winds, Rain Storms and Thunder Storms	12.0	<b>Entire Town.</b> Most vulnerable areas include: Elementary School, King Street Commercial Area, Church steeples, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Manufactured Housing Parks (MHP)</u> : Birch & Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP, Woody Hollow Co-op MHP. <u>Apartment buildings and Multi-Family</u> : Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts.	Warm weather storms bring wind, flooding, and lightning hazards. All of Boscawen will continue to experience <b>severe wind, rainstorms, and thunderstorms</b> in the future. The Town's electrical utilities of Eversource (formerly Public Service of NH or PSNH) and Unutil (smaller provider) will continue to be prone to power outages. The response time to these outages could be several days in the more remote or densely populated areas of Town, depending on where debris has fallen onto roads.  Areas particularly vulnerable to the combination of <b>flooding, wind, tree debris</b> and <b>power failure</b> include forested and highly traveled sections of Town, such as the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, King Street Corridor and the Queen Street area. Several sections of Town would be difficult to access with trees and power lines down	Accuweather Thunderstorm Criteria Scale, Hail Size Scale

**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards	Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
		<p>Wooded and forested sections of Town: NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St). <u>Telecomm towers</u>: Two cell towers in Boscawen, one off Robin Street and on Daniel Webster Hwy.</p> <p>Tall telecom towers could be damaged by severe storms. A communications interruption or failure resulting from damage to the tower could affect the capabilities of emergency personnel. <u>Electrical power</u>: The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town. <u>Farms, orchards, agricultural businesses</u>: Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits &amp; vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits &amp; vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). Road network (fallen trees and electrical power lines) is susceptible to damage to debris impacted infrastructure. Areas of the Town would be difficult to access with excessive tree fall. The Penacook-Boscawen Water Precinct is vulnerable to flood events.</p>	<p>on these residential roads, resulting in possible isolation.</p> <p>The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town. Radio operability for emergency communications could be adversely affected. Land line utilities are at risk of failure during <b>severe storm weather</b>.</p>	

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measure-ment Scale
Fire	Lightning	8.0	<p><b>Entire Town.</b> Areas most susceptible include <u>points of higher elevation than surrounding area</u>: Congregational Church/Old Town Hall (US 3/4), Masonic Temple, Historical Society, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Forested areas, parks, conservation areas can be dangerous to people and property</u>: Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). <u>Areas inaccessible by vehicle include</u>: Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. <u>Aboveground utilities</u>: transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 &amp; 4 corridor). Those buildings without lightning rods would be more susceptible to damage from a strike than those buildings with the rods.</p>	<p><b>Lightning</b> regularly strikes in Town and can strike in the future at any time at any given location. Specific sites which would cause the greatest impact if struck by <b>lightning</b> include the Congregational Church/Old Town Hall (US 3/4), Historical Society, old Historic Library, Boscawen Municipal Facility, Merrimack County Correctional Facility buildings, Merrimack County Nursing Home and Gerrish Manor. Forested areas, parks, conservation areas can be dangerous to people and property: Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). Areas inaccessible by vehicle include Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. Electrical utilities, generators, transformers and either of the <b>2</b> telecommunications towers (Robin Street and Daniel Webster Highway) are vulnerable to <b>lightning</b>.</p> <p>The Municipal Facility housing the Town Offices, Police Department and Library buildings does not have lightning rods but has been struck by <b>lightning</b> in the past year. The Penacook-Boscawen Water Precinct infrastructure, including waterlines, pumps, and water tanks, could be vulnerable. If Town functions are unavailable, it would be difficult to quickly respond to the needs of the community.</p> <p>Areas of concern include the forested, remote areas, which could not be easily accessed by emergency vehicles. The more remote forested areas, older narrow graveled roads, and densely packed residential areas are among the most vulnerable locations for fire and wildfire hazards. <b>Lightning</b> regularly shorts out people's well pumps. Higher elevations are of greater concern Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area, some of which are not accessible by vehicle, in case of <b>wildfire</b>.</p>	Lightning Activity Level (LAL)

**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Fire	Wildfire	10.7	<p><b>Entire Town.</b> Areas most vulnerable include historic and/or heavily occupied buildings: Congregational Church/Old Town Hall (US 3/4), Masonic Temple, Historical Society, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Forested areas, parks, conservation areas can be dangerous to people and property:</u> Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). <u>Areas inaccessible by vehicle include:</u> Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. <u>Aboveground utilities:</u> transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 &amp; 4 corridor). Inaccessible locations are vulnerable to wildfire because fire crews and emergency personnel have greater difficulty responding quickly to fires in these locations.</p>	<p>Because of the dry conditions, it takes several times longer to put out fires, and responders have to dig down further with equipment.</p> <p>Although <b>wildfire</b> damage has been kept to a minimum to date, the potential for losing an immense acreage of Boscawen to this natural hazard is possible, particularly during future drought conditions. The heavily forested woodlands of Town are often remote locations and difficult to access by emergency vehicles. The forested, dead-end residential neighborhoods would be difficult to evacuate. Any <b>debris</b> left over from <b>flooding, winter storms, or wind events</b> are a <b>wildfire hazard</b>. When <b>droughts</b> or drier conditions occur, the dry vegetation becomes a significant hazard to the Town Fire Department.</p> <p>Some neighborhoods would be more vulnerable than others because of high density, such as the manufactured housing parks and multi-family developments identified in <b>APPENDIX A</b>. Forested areas, parks, conservation areas can be dangerous to people and property: Jamie Welch Park (Depot St), NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St). Areas inaccessible by vehicle include the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area. Unmaintained Class VI roads and the transmission lines corridor are challenging to access because of the potential lack of emergency vehicle access and the number of people who use them for recreational purposes. <b>Wildfires</b> can also be caused by campfires and other human activity.</p>	NWCG Wildfire Classification
	Severe Winter Weather, Wind Chill and Ice Storms	8.0	<p><b>Entire Town.</b> <u>Particular areas of concern</u> include: Elementary School, King Street Commercial Area, Church steeples, old Historic Library, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home</p>	<p>It is highly likely that Boscawen will be impacted by severe winter weather in the future. Damage and serious conditions can result in any location of the community.</p> <p>Areas of particular concern include the Boscawen Elementary School, King Street</p>	NWS Windchill Index, Sperry-Piltz Ice Accumulation (SPIA), NCDC

Hazard Risk Assessment Hazards	Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measure-ment Scale
		<p>and Gerrish Manor. <u>Manufactured Housing Parks (MHP):</u> Birch &amp; Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP, Woody Hollow Co-op MHP.</p> <p><u>Apartment buildings and Multi-Family:</u> Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts.</p> <p><u>Wooded and forested sections of Town:</u> NH State Forest Nursery (US Route 3), Forest Lane neighborhood, Town Forest (Weir Rd), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St).</p> <p><u>Telecomm towers:</u> Two cell towers in Boscawen, one off Robin Street and on Daniel Webster Hwy. Tall telecomm towers could be damaged by severe storms. A communications interruption or failure resulting from damage to the tower could affect the capabilities of emergency personnel.</p> <p><u>Electrical power:</u> The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town. <u>Road network</u> (fallen trees and electrical power lines) is susceptible to damage to debris impacted infrastructure. Areas of the Town would be difficult to access with excessive tree fall. People may be subject to cold temperature, snow isolation, transportation accidents, power failure and communications failure during winter storm events.</p>	<p>Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. The Town is host to many manufactured housing parks (MHP), Birch &amp; Baker MHP, Bill-Bob MHP, Boscawen MHP Realty, Fessenden Terrace HMP, Giney's MHP, Justin Drive HMP, Kesavan MHP, Oxbow MHP, Sherman MHP, Smith MHP and Woody Hollow Co-op MHP. Several apartment buildings and multi-family developments include Boscawen Green Senior Apts, Concord Village Apts, One Riverside Place Condos, Red Oak Duplexes, Woodland Commons Apts, Riverbend/ Millhouse Apts, and California Fields. All residential developments are vulnerable to <b>winter weather</b> impacts.</p> <p>During these events, many residents are unwilling to leave their homes although there is no electricity or other utilities. Traveling to Concord or points further to find a warm hotel room is not an option for most people, nor is leaving pets or livestock behind. Historic buildings or large roofs are vulnerable to snow loads and roof collapse.</p> <p>Most of the roads in Town have been open during snow storms. People may still have trouble getting out of their homes, may not have power or may be unable to shovel or plow themselves out</p> <p>Several sections of Town would be difficult to access with trees and power lines down on these residential roads, resulting in possible isolation. The power grid on Depot Street is an important utility that if damaged would have a negative impact on the Town. The Route 3 &amp; 4 corridor supplies power to the entire Town. Electrical power utilities, the communications network and <b>2</b> telecommunications towers (Depot Street and Daniel Webster Highway), and older or historic or temporary buildings (roof collapse) are at risk from <b>severe winter weather conditions</b>. People may be subject to cold temperature, snow</p>	Regional Snowfall Index (RSI) for Northeast

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Extreme Temperature				isolation, transportation accidents, power failure and communications failure during winter storm events. See complete list in <b>APPENDIX A.</b>	
	Drought	5.3	<p><b>Entire Town / Region.</b> <u>Areas susceptible include farms and orchards:</u> Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits &amp; vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits &amp; vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). <u>Water Supplies:</u> residences with private dug wells and Town water supplies (Penacook-Boscawen Water Precinct). Drought means increased risk of brush fire with dry vegetation (see Wildfire). Gravel roads are affected because Town cannot grade them when water is low. Fire ponds can run dangerously low. In Boscawen, water = commerce as the Town is an agricultural community.</p>	<p>Periods of future <b>drought</b> in Boscawen would occur Town-wide and could cause property damage and economic losses. The lack of water would become a community problem to keep people hydrated and the failure of agricultural crops, products and farm animals can occur. Failure of tree farms to thrive can result in economic losses. Increased likelihood of wide-spread <b>brush fire</b> and <b>wildfire</b> will occur with drier vegetation. <b>Lightning</b> strikes could contribute to wildfire risk during droughts.</p> <p>Dug wells can dry up during droughts and interrupt personal water supplies, so few homes remain with dug wells in Town. Property damage and personal injuries or death could occur from drought-related fires or dry wells. The main private community water supply, Penacook-Boscawen Water Precinct, could enact water saving measures for their customers to assist with keeping the groundwater table higher. Overall, Boscawen residents should be encouraged to voluntarily undertake water conservation.</p> <p>Agricultural farms and orchards run the risk of high damage from <b>drought</b> which also brings economic consequences. In Boscawen, these areas include Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits &amp; vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits &amp; vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), and the NH State Forest Nursery (US Route 3). Boscawen has a lot of livestock and the Town would have to find ways of watering them during certain weather events, including drought. During emergencies,</p>	Palmer Hydrological Drought Index (PHDI)



4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Extreme Temp				with agreements in place the Town can assist people getting their large animals to shelter at locations such as at the Hopkinton Fairgrounds and small animals to the VCA Riverside Veterinary Clinic.	
	Excessive Heat	6.7	Entire Town / Region. Areas vulnerable to extreme heat include farms and orchards: Highway View Farm (Crete)-dairy, corn (River Rd), Richardson's Farm- fruits & vegetables (Water St), Pustizzi Fruit Farm- blueberries (Corn Hill Rd), Marshall Pumpkin Farm- pumpkin (Main St), Giovagnoli Farms-eggs (High St), Heathfield Farm- dairy/honey (Corn Hill Rd), Hackleboro Orchards Boscawen Farm Stand- fruits & vegetables (King St/Canterbury), Keegan Tree Farm (Corn Hill Rd), Colby Tree Farm (High St), Black Forest Nursery (King St), NH State Forest Nursery (US Route 3). Senior housing and those residences without air conditioning are especially vulnerable to high heat events.	Boscawen could again experience <b>heat waves</b> where temperatures exceeded 90 degrees for several days. During these times, many specific population sites in Town particularly susceptible to excessive heat, including the Boscawen Elementary School, King Street Commercial Area, Boscawen Municipal Building, Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor and the aged 55+ residences should have access to either air conditioning or cooling facilities. Older manufactured homes may lack air conditioning. <b>Excessive heat</b> can cause dehydration, heat exhaustion and more serious illnesses. The Boscawen Congregational Church, Public Library and/or Boscawen Elementary School could open during these times as Cooling Centers. Other vulnerable facilities are indicated in <b>APPENDIX A</b> . Vulnerable population groups contain people who might be among the first to need help during extreme heat events.  The farms and agriculture operations listed previously are susceptible to extreme heat.	NWS Heat Index
	Earthquake	4.0	Entire Town. The Central NH Region is seismically active and earthquakes are regularly felt from area epicenters. Damage to utility poles and wires, roadways and infrastructure (Depot Street station, Contoocook River Dam, Penacook-Boscawen Water Precinct) could be significant. Areas with underground utilities, community water systems, and the old/historic buildings, Town Buildings, County Nursing Home & Corrections Buildings, and the Elementary School are particularly susceptible.	Earthquakes are a regular occurrence in Boscawen's vicinity, now a couple of times annually with a >2.0M.  While It is likely Boscawen residents will continue to feel <b>earthquakes</b> in the future, it continues to be likely that no major damage will result from these small earthquakes. Damage to utility poles and wires, roadways and infrastructure (Depot Street station, Contoocook River Dam, Penacook-Boscawen Water Precinct) could be significant should a large earthquake ( <b>&gt;3M</b> ) occur. Areas with underground utilities, community water systems, and the old/historic buildings, Town Buildings, Boscawen Congregational Church, Merrimack County Nursing Home	Richter Magnitude Scale
Earth Hazards					

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
				Buildings and Correctional Facility and the Elementary School are particularly at risk because of building size and their large populations. The Penacook-Boscawen Water Precinct water delivery pipes and older buildings may be more prone to damage because of their age and structural integrity. Boscawen is downstream of the large Franklin Falls Dam on the Merrimack River maintained by the US Army Corps of Engineers, which if breached could be disastrous to Boscawen. Loss of these or other community buildings could result in fewer services available to residents.	
Earth	Landslide	1.0	Slopes greater than 25%, including roads with steep ditching or embankments are most vulnerable to landslide. Landslide is a fairly uncommon hazard but one that can have devastating effects, including property damage and in some cases, loss of life. The gravel pits in Town are potential sites of landslide. Along Route 4, two areas of concern for potential landslide are the Tannery Brook crossing and the land behind National Lumber. Riverside erosion occurs on the Merrimack River banks. Road washouts and flash-flooding could cause landslides, especially along Route 4 and Valley of Industry, but otherwise the Town is not particularly susceptible.	Generally, vegetation in Boscawen is good at preventing landslides on hillsides. Development in close proximity to several steep slope areas could be at risk for landslides or rockslides (slopes greater than 15%).  In the future, the Town could experience failing reclamation vegetation at the gravel pits, resulting in <b>landslides</b> . Roads with steep ditching or embankments are most vulnerable to landslide. Along Route 4, two areas of concern for potential <b>landslide</b> are the Tannery Brook crossing and the land behind National Lumber. Road washouts and flash-flooding could cause <b>landslides</b> , especially along Route 4 and Valley of Industry, but otherwise the Town is not particularly susceptible.	No known widely-used scale measuring the magnitude of landslides
Technological or Secondary	Dam Failure or Release	1.0	<b>Penacook Lower Falls Dam (state-owned) is a Significant (H) Hazard dam</b> , the highest hazard in Town. Low Hazard (L) include Flagpole Pond (Patenaude's Pond) Dam, Hirst Marsh Dam, Flagpole Pond Dikes and Franklin Falls Dam (Franklin) and Walker Pond Dam (NM). These five dams in Town located at Crescent Street, Commercial Street, Patenaude's Pond, and Walker Pond may potentially breach or fail. It was speculated that at one time, the Tannery Brook dam may have breached. Some dams in the Town	Potential future dam breach or failure along the Merrimack or Contoocook Rivers could be disastrous. One <b>(1)</b> dam is of <b>Significant Hazard (S)</b> classification- Penacook Lower Falls Dam (Contoocook River). Three <b>(4)</b> dams are of <b>Low Hazard (L)</b> classification- Flagpole Pond (Patenaude's Pond) Dam (tributary of Contoocook), Hirst Marsh Dam (Hirst Marsh), Flagpole Pond Dike (tributary of Contoocook). Two <b>(2)</b> dams are of <b>Non-Menace (NM)</b> classification- Walker Pond Dam (Pond Brook) and McKerley Recreation Pond Dam (natural swale). Several beaver dams hold back water and are important to the Town's	NHDES Dam Hazard Classification <i>either/or criteria</i> <i>*Dam Failure causes flooding and therefore is included as natural in this instance</i>

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			have been breached but were not large enough to have caused a problem and are in ruins. Biggest risk would be debris, ice jams, flooding would go over the top of dams. Beaver dams are particularly susceptible. The Town Forest beaver dam on Weir Road dam is important to regulate marsh water flow, and the Town wants to keep it.	<p>infrastructure: Hirst Marsh Beaver Dam (Queen Street), Town Forest Beaver Dam (Weir Road) and Unnamed Stream Beaver Dam (Corn Hill Road). Dams are susceptible to major flood events, including heavy rain from storms or hurricanes.</p> <p>The greatest concern lies several miles north of Boscawen in Franklin. The High Hazard (H) Franklin Falls Flood Control Dam holding back the Pemigewasset River and flowing into the Merrimack is a large concern. This federal dam is monitored by the US Army Corps of Engineers at the Franklin Falls Office on-site. This <b>1,740'</b> long dam is <b>140'</b> high and was constructed to withstand extreme conditions.</p>	
Technological	Power/ Utility Failure	NR	<p><b>Entire Town, including Vulnerable Populations:</b> Merrimack County Department of Corrections, Merrimack County Nursing Home and Gerrish Manor. <u>Wooded, forested and remote areas</u> can experience tree fall and become isolated, <u>inaccessible by vehicle:</u> Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and Queen Street area.</p> <p><u>Aboveground utilities:</u> transformers (power grid on Depot St), the 2 telecommunications towers (Robin St and on Daniel Webster Hwy), and power lines (especially Route 3 &amp; 4 corridor). Inaccessible locations are vulnerable to wildfire because fire crews and emergency personnel have greater difficulty responding quickly to fires in these locations. Power outages may last for several days before service is restored in a large event. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only six houses on Corn Hill Road as customers of PSNH.</p>	<p>In Boscawen, the power is disrupted on a regular basis during all seasons. Although the Unitil trimming schedule has become more regular, it is only once every 5 years unless a disaster looms or has occurred.</p> <p>Expected to continue in the future, <b>power failure</b> is a secondary impact of the primary natural hazards occurring. Boscawen depends on Unitil (~<b>1,750</b> customers) and Eversource (~<b>10</b> customers) for most of its power needs. Power outages may last for several days before service is restored to residents in a large event. Power outages in the more rural or isolated areas of Town regularly occur during any wind, storm, winter events or hazard events that cause debris impacted infrastructure. The substation on Depot Street is a critical facility in Town. The overwhelming majority of the residents are customers of Unitil Power, with only a few Corn Hill Road Eversource customers.</p> <p>The Boscawen Elementary School (BES) will serve as the Town Shelter and/or Cooling Center available to Boscawen residents and as a Regional Shelter for other School District towns once the emergency generator installation is completed in August 2018. The School District is partnering with the Town on this project and is separately pursuing</p>	N/A

**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Technological				generators for its other Elementary Schools (Loudon, Salisbury, Webster, and Merrimack Valley Elementary Schools). There are many vulnerable populations identified in the community (see <b>APPENDIX A</b> ). When the powerlines along US Routes 3 & 4 (King Street) fail, electricity to the entire town is disrupted. As a rule of thumb, all residents should be able to shelter in place in their homes for up to three days, gathering needed supplies and water ahead of time. The multiple businesses in Town rely on electricity provided by powerlines, and in many cases enterprise comes to a standstill during event.	
	<b>Communications Systems Failure</b>	NR	<p><b>Entire Town, Telecommunications Tower. Communications systems are detailed in the Community Vulnerability Assessment tables.</b> Communications systems interruptions are unlikely to occur or affect the residents of Boscawen because of the diversity of communications systems available within the town. However, systems failures could affect Town businesses and local government on an isolated scale. In Boscawen, one communications tower and cable/Internet providers are available for residents. Cell phones are good alternatives to telephones, but some residents do not have computers.</p> <p>Communications failure would be worse if it occurred at the Fire and Police Depts, Highway Department or Town Offices, especially during a holiday, or inhibited emergency dispatch and EOC operations. Most Town radios are interoperable, and they are used in more than one location. The Town is serviced by the Capital Area Mutual Aid Compact, which does all the emergency medical service and Fire dispatching. They have redundant capabilities and</p>	<p>Boscawen communications have been disrupted in the past and could again fail. Any <b>communications failure</b> can mean lack of emergency services or delayed emergency services. Police/Fire use digital service and are members of the effective Capital Area Fire Compact Mutual Aid (CAFCMA) Dispatch service. Boscawen has two telecommunications towers which provide coverage to most of the Town, a tower at Robin Street and a tower at Daniel Webster Highway. Beyond that, telephone lines provide service to customers. Traditional broadband cable internet is available in much of the community, especially within the Village and along King Street. Communications failure can result as a secondary effect of a natural disaster such as severe storm or severe winter weather, like power failure is. Such an interruption affect the majority of residents in Town especially if a break occurs along the US Routes 3 &amp; 4 corridor.</p> <p>Vulnerable populations are at greatest risk in rural Boscawen for the effects of <b>power/utility failure</b>. There has been a steady migration to cell phone use only with people dropping their landline telephones. A few individuals in Town require oxygen and power failure and the likely accompanying communications systems failure would comprise the most vulnerable populations. The Fire Department has a voluntary registration</p>	N/A

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			are currently upgrading their systems.	program for people who want to be checked during emergencies, and the Police Department also conducts welfare checks.	
Technological	Debris Impacted Infrastructure	NR	<p><b>Most dams, culverts, and bridges</b> could experience debris impacted infrastructure. The bridges, tunnels, and culverts on Raymond’s Road, Long Street and River Road may be at risk from debris impacted infrastructure. There are five concrete small tunnels under Commercial Street that have not been well maintained and have been weakened over time by passing trucks and vehicles. These tunnels could create a debris impact hazard. The Corn Hill Road Bridge could also potentially dislodge. If the undersized culverts were regularly maintained, the Town feels that this action would take care of half the flooding problems in Boscawen. Roads with culverts that regularly washout are listed above under Flooding. DIS can also refer to roadways blocked by downed trees and powerlines during storms.</p>	<p>Debris in the form of trees is a constant concern in rural, forested Boscawen. Trees will fall on powerlines or roads, powerlines fall on roads or buildings, causing <b>power failure</b> or <b>road blockage</b>, despite utility company preparation.</p> <p>Boscawen’s watercourses, including the brooks and wetlands can <b>flood</b> their banks, <b>overflow culverts</b>, or <b>washout roads</b> during certain conditions as a result of debris. Town culverts and drainage structures will catch branches, leaves and debris and could back up and runoff if not regularly cleared.</p> <p>Infrastructure in Boscawen can refer to roadways, powerlines, utility lines, culverts, water towers, bridges or dams. These features inventoried in <b>APPENDIX A</b> are those which should be watched carefully before and after storms and should be checked and maintained regularly to reduce the risk of significant <b>debris impacted infrastructure</b> events. <b>Erosion</b> along the Merrimack River, Contoocook River or Tannery Brook embankments cause sediment and debris to flow downstream and is a hazard to the landowners who have shoreland frontage.</p> <p>Bridges are vulnerable to debris dislodged during storm events. The Town’s Long Street Bridge over Beaverdam Brook is state redlisted bridges and structurally deficient.</p>	N/A

4 HAZARD RISK ASSESSMENT

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Technological	Transportation Accidents	NR	<p><b>Route 3, Route 4, Roundabout, King Street, intersections.</b> Serious transportation accidents involving hazardous materials have the greatest possibility of occurring along Routes 3 and 4. Numerous trucks use these routes daily to transport many kinds of materials, goods, chemicals, wastes and gasses. Ross Trucking on North Main Street is a local freight hauler which creates regular truck traffic. King Street (Route 3) is a two-lane road, very busy with traffic turning and entering. An accident can back up vehicles onto the I-93 highway. Particularly susceptible is Cumberland Farms, other in &amp; out businesses (winter time especially), and the Park &amp; Ride exits.</p>	<p><b>Traffic accidents</b> may be the most likely future transportation hazard in Boscawen on King Street, US Route 3, US Route 4, along US 3 Main Street or at the US 4 traffic circle. Accidents can occur at difficult intersections, hills, curves, or straightaways, particularly in <b>winter weather</b>.</p> <p>Traffic accidents could occur in several locations along hilly and curvy Queen Street, developed and fast-moving King Street, around the US 4 Traffic Circle, along well-traveled straight US 3 Main Street and at intersections such as US Route 4 and Water Street. New sidewalks have been constructed in recent years, connecting the Boscawen Elementary School with King Street.</p> <p>As the local roads become developed with more homes, more vehicles, pedestrians and bicyclists will find themselves vying for the same space. With vehicular traffic increases or as the weather turns bad, there is the likelihood that <b>transportation accidents</b> will occur in these and other areas.</p>	N/A
	Hazardous Materials Spills/ Radiological Accidents	NR	<p><b>Routes 3 &amp; 4</b>, along with businesses in Town that deal with the transportation or storage of hazardous materials include All States Asphalt NH Bituminous on Depot Street and the construction at California Fields (brownfields) on Crescent Street. Filling (gas) stations are also potential sites for a hazardous materials spill. There is a former landfill which is now capped on. Concern also exists over trucks transporting hazardous material through town on Routes 3 and 4. MC Nursing Home potential spill- upright oxygen tanks situated next to propane tanks. Businesses with particular risk include NH Bituminous &amp; Elektrisola. The largest or most dangerous stationary sites that store and/or handle haz mat on site (fertilizer, pesticides, fuel, etc) are listed in Critical and</p>	<p>Future transportation trucking of <b>hazardous materials</b> on US Route 3, US Route 4, and through the King Street corridor will likely be a regular occurrence. These trucks could rollover and spill their contents onto these significant roadways. The <i>New Hampshire Hazardous Material Commodity Flow Study 2018</i> and its accompanying maps may provide some enlightening data the Town can use to help protect the community from spills.</p> <p>Several occupational facilities in Town could handle, store, or use hazardous materials. Local auto body shops and garages, large businesses, agricultural operations, fuel stations, excavation and asphalt businesses, the Elementary School (science lab), industries, and Town Salt Shed are stationary site locations which may experience this type of hazard in the future. Any of these facilities could have a spill or an incident at their location. A listing of known facilities which store or</p>	N/A



**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			Community Facilities (Appendix A). Occupational haz mat sites where spills could occur include: health care facilities, schools, manufacturing, etc.	could use hazardous materials has been inventoried in <b>APPENDIX A</b>	
Technological	Public Health Issues	NR	<b>Congregate populations.</b> Elementary School, health clinics, restaurants, populated areas, large employers, apartments, senior housing, stores and public assembly venues listed in Critical and Community Facilities (Appendix A) - all of these locations increase the risk of exposure to and transfer of illness. The forests, conservation areas, agriculture, wooded areas, ponds can host ticks and mosquitos.	The future may bring additional widespread <b>public health</b> issues involving Lyme disease and other tickborne diseases. The Town is a wooded, rural community hosting the Merrimack River, a small section of the Contoocook River, many brooks, ponds, and wet meadows, and state and Town recreation areas. Arboviral (mosquito-borne) viruses may also increase.  For indoor contamination, the highest risk facilities for pick-up or transfer of viruses and bacteria can include the Boscawen Elementary School, Merrimack County Nursing Home facilities and the Correctional Facility buildings, Municipal Facility, and Boscawen Congregational Church as well as stores, restaurants, recreational facilities and gathering places (see <b>APPENDIX A</b> ). The Penacook-Boscawen Water District operates and maintains their own water system for residents and the old pipes are known to break frequently. The same populations identified as particularly susceptible to <b>Excessive Heat</b> would be most vulnerable to public health issues and epidemics.	N/A
	Fire (Vehicle, Structure, Arson)	NR	<b>Several businesses around Town</b> are potential sites for explosions and serious fires. The vacant Tannery buildings on Commercial Street are potential fire and explosion sites. There are numerous other sites in town that store tires and that have the potential for prolonged burning. These sites include many farms and at the transfer station. Propane tanks that exist at the fire station create a potential for explosion and a large quantity of wood at the Tibo lumber yard has the potential for a large fire. Areas most susceptible include: Downtown, vacant or vulnerable sites, foreclosed homes or	Boscawen is a wooded, rural, agricultural community. The entire Town is vulnerable to all types of fire. Locations in Boscawen which are particularly vulnerable to <b>fire</b> (from any source – <b>lightning</b> , human, <b>wildfire</b> , electrical, power lines, <b>hazardous materials</b> , etc.) include Municipal Facility (Town Offices, Library and Police Department), Boscawen Elementary School, the multiple manufactured housing parks in Town, US Routes 3 & 4 (King Street) homes and businesses, Merrimack County Nursing Home facilities and the Correctional Facility buildings, various multi-family developments and senior living facilities, and gathering places such as the Winthrop Carter House and Avaloch Farm Institute.	N/A
Human					

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
			seasonal buildings, buildings in densely populated areas or residential manufactured home parks. Vehicle fires could occur anywhere, parking lots, driveways, roadways. See also Critical and Community Facilities (Appendix A). A conflagration potential exists nearby just into Penacook with the old construction, dense housing and manufactured housing parks.	Several large businesses in Town have hazardous materials onsite that render them vulnerable should a fire occur. Additionally, there are dozens of agricultural enterprises in Boscawen with fertilizer, old barns and hay fields surrounded by woodlands, a vulnerability to both livestock and people.	
Human	Terrorism	NR	<b>Unlikely, but Town or County Facilities are potential targets.</b> Most susceptible sites could include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Contoocook River Dam, Penacook Boscawen Water Precinct, Elementary School, Post Office, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants. See Critical and Community Facilities (Appendix A).	It is unlikely that the Town would be the target of any act of international <b>terrorism</b> , but because there are many forms of terrorism and terrorists, the possibility always exists.  Domestic terrorism has occurred within the last 15 years both in Boscawen, in the form of hostage situation and cyberattack. Targeted locations are usually public spaces that would do the most damage to send a message. Possible targets could be the Municipal Facility (Town Office, Library and Police Department), Boscawen Elementary School, Merrimack County Nursing Home facilities and the Correctional Facility buildings, and gathering places such as the Boscawen Congregational Church, NH Veterans Cemetery Winthrop Carter House and Avaloch Farm Institute, and all other Town, State or governmental facilities. Although unlikely, there could be a massive impact felt in the community even on a small-scale event.	N/A

**4 HAZARD RISK ASSESSMENT**

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Human	Sabotage/ Vandalism	NR	<p><b>Town or County Facilities.</b> Sabotage would be most likely to occur at electric utilities, Town/County computer systems &amp; website, Town/County buildings, School, dams, water supplies, cemeteries, vacant buildings (Tannery), under bridges. See Critical and Community Facilities (Appendix A).</p>	<p><b>Vandalism</b> could occur at NH Veterans Cemetery and other public and private cemeteries, recreational sites such as the Jamie Welch Memorial Field and boat launch. These facilities would be among the most damaging to the community. Vandalism could also occur at vacant buildings in isolated locations.</p> <p>Technological systems such as computer systems and websites of the Town Office, Police Department, Library, Boscawen Elementary School, Public Works Building, Penacook-Boscawen Water Precinct building, Fire Department, Merrimack County facilities, and other governmental systems could be subject to computer or network <b>sabotage</b> from anywhere in the world. Utilities or telecommunications towers could be vulnerable to sabotage or vandalism, such as the public Penacook-Boscawen Water Precinct water supply or the Depot Street substation. Many other significant facilities in Boscawen could be subject to sabotage including the powerlines, transmission lines, transformers and utility substations. Crippling the Town’s data and communications could bring the community to a standstill.</p>	N/A
	Hostage Situation	NR	<p><b>Unlikely, Isolated events.</b> Locations where hostages could be taken include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, Penacook-Boscawen Water Precinct, Elementary School, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers (especially those large quantities of haz materials), health clinics, grocery or convenience stores, restaurants, and domestic home situations. See Critical and Community Facilities (Appendix A).</p>	<p><b>Hostage situations</b> can occur anywhere, are isolated events and are nearly impossible to predict. Hostage situations are not normal events and therefore are nearly impossible to predict. Domestic violence events generally occur in resident homes, perhaps one or two per year.</p> <p>Conventional hostage situations would most likely target such locations as the Town Office, Police Department, Library, Boscawen Elementary School, Merrimack County Correctional Facilities, at all other Town or governmental facilities, in Millhouse, or at major businesses such as those along the King Street corridor and US 3 Main Street. Convenience stores, gas stations and banks are likely locations and Boscawen has all of these businesses. There is no longer a Post Office in Town.</p>	N/A

Hazard Risk Assessment Hazards		Overall Risk	Hazard Locations in Town – Existing (Susceptible) From Hazard Risk Assessment	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scale
Human	Civil Disturbance / Public Unrest	NR	<b>Limited locations, Routes 3 &amp; 4 area, Town and County Facilities.</b> Locations include: Town Offices, Merrimack County Correctional Facilities, Merrimack County Nursing Home, NH Veterans Cemetery, Penacook-Boscawen Water Precinct, Elementary School, all other governmental facilities, state facilities, political offices, churches, telecommunication towers, banks, major employers, health clinics, grocery or convenience stores, restaurants and establishments serving alcohol. Occasions include: Town Meetings, voting day, local board meetings, during visits from political candidates, at large events such as Old Home Day or Veterans Parade, School sports events or graduation. Small groups of protestors are likely to continue to demonstrate at the Veterans Cemetery. See Critical and Community Facilities (Appendix A).	Large scale incidents of <b>civil disturbance</b> and <b>public unrest</b> are unlikely in Boscawen in the future, but certainly possible. Locally, the highest potential for this type of incident could take place at the NH Veterans Cemetery or Merrimack County Correctional Facilities.  Otherwise, civil disturbance could occur during Town Meetings and School Meetings, on voting day or during visits from political candidates, or at large events such as Old Home Day, Veterans Parades, NH Veterans Cemetery ceremonies, or at Elementary School events. Locations where civil unrest could occur include the Boscawen Elementary School and its recreational fields, Municipal Facility, Jamie Welch Memorial Recreation Park, or in the numerous manufactured home parks. Generally, restaurants and establishments serving alcohol and gathering facilities such as the Winthrop Carter House and Avaloch Farm are also more susceptible to <b>civil disturbance</b> .	N/A

Source: Boscawen Hazard Mitigation Committee

Although there are many potential hazards in Boscawen’s future, the community is knowledgeable about where some of the worst occurrences might result with this descriptive **Potential Future Hazards** inventory. A comprehensive, specific community facility inventory that indicates each site’s **Primary Hazard Vulnerabilities** is found next in **5 COMMUNITY VULNERABILITY ASSESSMENT**.

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## **Boscawen's Built Environment Changes Since the 2012 Plan**

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The locations of where people and buildings are concentrated now or where new lands may be developed should be compared to the changing locations of potential natural hazards in order to best mitigate potential property damage, personal injury or loss of life.

### **The Town's Statement of Vulnerability Change**

**The overall vulnerability of the Town to natural disasters is not believed to have increased with the development changes (population and housing increases) experienced by the Town over the last 5 years.** There have been some development increases in the last 5 years, but no extensive natural disasters have occurred that risked life, property or infrastructure during this time. The Town Departments handled the impacts of natural disaster events when they occurred and sought federal Public Assistance funding to help offset some of the costs when necessary. The future may be very different, as temperatures rise and warm weather storms become more violent and commonplace.

Facilities and their locations with vulnerabilities to specific natural hazards are listed in **APPENDIX A Critical and Community Facilities Vulnerability Assessment.**

### **AREAS OF HIGHEST DENSITIES**

Boscawen is a highly rural and forested community with an overall Town population density of **159** people per square mile, since Town itself is just under **25** square miles. Boscawen has clusters of density in the Village (Main Street), along King Street (US Routes 3 & 4), in the Forest Lane neighborhood (off US Route 3), within its multiple manufactured home parks, and within the Merrimack County Correctional Facility and Nursing Complex. Facilities include the Merrimack County Nursing Home [**~290** beds & **~535** staff], MCNH Gerrish Manor Assisted Living [**~29** beds], Merrimack County Correctional Facility [**~246** beds & **~200** staff, + **~80** new beds], Baker & Birch Cooperative MHP [**~4** units], Bill-Bob Mobile Home Park [**~51** units], Boscawen Green Senior Apartments [**~24** units], Boscawen MH Park Realty [**~19** units], Concord Village Apartments [**~32** units], Fessenden Terrace [**~36** units], Forest Lane Housing Area [**~62** homes], Honey's MHP [**~4** units], Justin Drive MHP [**~4** units], Kesavan MHP [**~7** units], King Street Commercial Area, Norac Enterprises Commercial Property, [**~1** unit], One Riverside Place Condominiums [**~38** homes], Oxbow MHP [**~15** units], Red Oak Duplexes 3-Bedroom [**~6** units], Riverbend/ Millhouse [**~19** beds], Sherman MHP [**~11** units], Smith MHP [**~8** units], Woodland Commons [**~33** units], Woody Hollow Co-op MHP [**~32** units], and Merrimack Valley Day Care Service @ MCNH [**~80** children capacity]. **Fire** from any source in a manufactured housing park could be disastrous. The Valley of Industry is a short, densely populated historical road in an actual valley that has the threat of **landslide**.

Several of these roads and facilities have experienced the effects of **flooding events**, **erosion and scouring**, and **severe wind and winter events** that include downed trees and powerlines on roadways and driveways. **Floodwater runoff** from **rapid snow pack melt**, **debris impacted infrastructure** (culverts) or **severe storms** has occurred in several locations. **Lightning** may pose a threat to the Village and Town infrastructure. Many of these facilities do not have a secondary egress for **evacuation**.

Another area of high density is the King Street Corridor (US 3 & 4) where the Historic Center of Boscawen lies and is the main travel way for the Town and is a critical regional highway. The Boscawen Historical Society Building, Public Historical 1913 Library, Winthrop Carter House, Morrill-Lassonde House, Boscawen Congregational Church (and former Town Hall) and other sites of cultural and historic importance line King Street. **Fire** from any source (**lightning**, **wildfire**, or **human-generated**) is a concern for these old buildings. The high-risk area can be **flooding** by rapid snow pack melt or **rainstorms**, but **power failure** (by any **natural hazard**), transportation accidents and the potential for **hazardous materials spills** are the greatest problems along King Street. Rerouting traffic would be very difficult, as would an **evacuation** of the corridor. Along this stretch, icy roads and hazardous driving conditions are often present during **severe winter weather** events. **Severe wind events** can impact every road in the community.

### Changes Since 2012 Plan

The Town has grown some six years since the **2012 Plan** in terms of housing (~**60** units). Most new development is scattered throughout the Town, but the Merrimack County Correctional Facilities has grown with the addition of an new building opening in **2018** and greater inmate capacity. The California Fields (Riverside Place) residential development is being built, and potential development on US Route 3 (near Forest Lane) could add single family homes. Knowlton Road has a new residential subdivision between Corn Hill Road and Queen Street, known as Knowlton Farm. The location where the development is situated may increase the demand for potable water in the area.

### **VULNERABLE POPULATIONS**

Several of the high density neighborhoods mentioned above are vulnerable populations located in areas of potential hazards. These include the Merrimack County Nursing Home on US Route 3 (~**850** people) and across the road, the Merrimack County Correctional Facility (~**530** people). The County Cooperative Extension offices and the now County Sheriff's offices are also situated on the campus, which grew significantly since the **2012 Plan**. An enormous number of people live and work in a small area as shown in **Figure 21**.



Figure 21

## Merrimack County Facilities in Boscawen (US Route 3)



Source: Google Maps accessed 05-03-18, CNHRPC

A large number of institutionalized population and staff in a small geographic area is especially vulnerable to natural and human hazards. At the Correctional Facilities, likely hazards include **hostage situation** and civic unrest. At the MCNH, risks of **public health hazards** and **sabotage** (such as water supply contamination and waste water treatment failure) are of concern. As a health care facility, the Nursing Home facilities have some **hazardous materials** onsite. North of the Correctional Facilities beyond **Figure X** on the same side of US Route 3, the water supply wells for the County facilities host 500 gallon chlorine tanks and tanks with other chemicals which could be released into the wells. Behind the Assisted Living facility is a water storage tank that could be **sabotaged**. The potential for **terrorism** or **civil disturbance** at these County facilities is also concern.

In the Village are other concentrated populations of concern. Boscawen Green, an elderly housing development of about **30** units, is located on North Main Street. **Evacuation** would be a concern.

Boscawen Elementary School has about **250** students and **40** staff within its buildings and is serviced by BEST Avenue off of US Route 3/North Main. **Hostage situations** or **public health outbreaks** could occur at the School.

Vulnerable population could be subject to area hazards such as **downbursts**, **lighting** or **wildfire**, other **severe wind events**, and **snowstorms**. **Power failure** as a result of these events could impact the facilities although emergency generators are onsite. Extra attention may be required at these locations during any natural disaster event.

#### Changes Since 2012 Plan

As noted previously, the Merrimack County campus is increasing, something which the Town of Boscawen has no control over as governmental agencies are exempt from local planning and zoning regulations. The County has emergency communications with Concord and the Capital Area Fire Mutual Aid Compact communication system. The Boscawen Elementary School is gaining both an emergency generator in **August 2018** and a secondary access road, both of which will be important and useful during disasters.

#### **FUTURE DEVELOPMENT IN BOSCAWEN**

Areas which are most likely to experience future growth and development include Queen Street, Main Street and the King Street. **Severe winter weather** and **wind events** will be expected to impact any new facilities or developments in Boscawen.

Housing development is expected to occur in Boscawen eventually. Subdivision of legacy parcels, those family-owned large parcels throughout the Town, may occur at any time when these lots are inherited by the next generation. These legacy parcels, if developed under existing zoning regulations, could quickly outweigh the ability of Town services to appropriately respond to resident needs. The developments could be vulnerable to **wildfire**, **severe winter weather**, and **lightning**.

When developments come before the Planning Board, potential hazards including **flooding**, **fire**, **traffic accidents**, and **evacuation** are regularly considered. Developers try to solve the problem, before a project is approved. The existing roads and bridges experiencing **erosion** and **flooding** will need to be upgraded for additional usage. The Town will continue to grow and develop, and attention should be focused on the hazards any new development could face during the consideration process. At this time, techniques to mitigate identified hazards could be undertaken before the facilities are sited and constructed.

#### Changes Since 2012 Plan

Avaloch Farms Music Institute completed its construction and is host to dozens of students on Hardy Lane. The setting is serene for artistic expression and concerts. Although the facilities may be susceptible to **wildfire**, **severe winds** and **power outages**, emergency access is not considered problematic.

The Merrimack County facilities continues to grow and the Town had been informed of the construction plans and program modifications.

The know Fields and Oak Lawn developments, multi-family residential homes, had constructed some units since the **2012 Plan** and will continue to build out in the future. There may be more home-based businesses and more agricultural operations, which are now inventoried in **APPENDIX A**. Real estate conditions and the economy will dictate the markets.

The main natural hazards for this rural, forested community remain **wildfire, severe wind events, severe winter weather, debris impacted infrastructure** (trees down on powerlines and trees/powerlines down on roads), and **power outages**. The Town will need to ensure Town services are not eclipsed by the needs of new development. One positive new installation is the municipal solar array that generates more electricity than the Town buildings can use.

Any future development in Town could be vulnerable to the various natural hazards identified previously. The Town is heavily forested, rural, and agricultural. New (or replacement) buildings and infrastructure and potential future development appear in **APPENDIX A Critical and Community Facility Vulnerability Assessment**.

## 5 COMMUNITY VULNERABILITY ASSESSMENT AND LOSS ESTIMATION

The Hazard Mitigation Committee developed and/or updated as needed each of the assets tables within this Chapter. Sites were added or removed, and contact information was revised. Modifications were made to the **Primary Hazard Vulnerability** column to reflect changes over the last five years. Revisions were made to the future development section, which now includes a clear table. The Plan's maps were also updated from the **Boscawen Hazard Mitigation Plan 2012**.

The identification of Critical and Community Facilities within Boscawen is integral to determining what facilities may be at risk from a natural disaster. Every Critical and Community Facility can be damaged by multiple hazards listed in **4 HAZARD RISK ASSESSMENT**. A tabular inventory of facilities in Boscawen is provided in **APPENDIX A Critical and Community Facilities Vulnerability Assessment**. The **911 Street Address** and **Phone** number of each facility is supplied, the assessed **Structure Replacement Value \$**, and the **Primary Hazard Vulnerabilities** to which the facility is most susceptible are listed. The hazards identified are primarily natural disasters but regularly include the technological (and secondary disasters) such as power failure and communications systems failure as well as human hazards such as vandalism/sabotage.

Most sites appear on [Map 3: Critical and Community Facilities](#) and [Map 4: Potential Hazards and Losses](#).

Potential dollar losses for each of the facilities' **Structure Replacement Value \$** (not land) have been obtained through the [February 2018 assessments](#) to provide a starting point of the financial loss possible should these structures become damaged or require replacement. These community facility losses are estimated for the value of structure and does not include land (unless indicated), contents, or infrastructure.

**Problem Statements** were then generated for each type of facility when issues were identified by the Hazard Mitigation Committee during discussion of the facility characteristics and **Primary Hazard Vulnerabilities**. These **Problem Statements** are listed here.

Potential dollar losses to buildings in the Boscawen from flooding and other natural hazards are provided using the methods described in the chapter. The Town's participation in the National Flood Insurance Program (NFIP) offers a way for individuals to obtain insurance coverage for flooding. The Town's history with NFIP claims and repetitive losses are examined.

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

<b>Assessment:</b>	<b>Facility Name</b>	<b>Street Address (911)</b>	<b>Phone</b>	<b>Structure Replacement Value* \$</b>	<b>Primary Hazard Vulnerabilities</b>
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## Critical Facilities

**Critical Facilities** are categorized as those Town or State buildings or services that are first-responders in a disaster or that are required to keep the community running during a disaster. The Town Offices, Fire Department, Police Department, Public Works Department, Transfer Station and Penacook-Boscawen Water Precinct services are the minimum services necessary for providing and coordinating everyday and emergency services. Other **Critical Facilities** would include educational facilities, clinics and emergency shelters. Utilities or utility features such as cisterns, culverts, dry hydrants, pump stations, water and sewer lines, and electric transmission lines are included because of the essential communication and power /water services provided.

Many such facilities are located in Boscawen. The assessed structure/building only value is provided for each facility where available, otherwise estimates are provided to help ascertain the financial impact a disaster can have on the community. To view the detailed **Critical Facilities** sites and tables, see **APPENDIX A**. Most of these facilities appear on *Map 3: Community and Critical Facilities*.

**Essential Facilities include:** Municipal Building, Police Department, Emergency Management Office, Fire Department, Public Works Department, Penacook Rescue Squad, and Penacook-Boscawen Water Precinct. Assessed structure (only) replacement values for these essential facilities total **\$3.2m**.

**Utilities include:** PBWP Water Treatment Plant, Communications Tower, **180'** Lattice (Crown Atlantic Company LLC), Communications Tower, **147'** Monopole (Tower Resources Management LLC) , TDS Switching Station, PBWP Water Tank #1, PBWP Water Tank #2, PBWP Water Tanks #3 (**2** tanks), Penacook Boscawen Water Precinct Wells (**3**), Briar Hydro Associates (Essex Hydro), Liberty Utilities (Natural Gas), Eversource Energy (Electric) [**~10** customers], Unitil Energy Systems (Electric) [**1,737** customers], TDS Telecom Kearsarge (Landline), Fairpoint/Consolidated Communications (Landline), National Grid High Voltage Lines, Dry Hydrant Walker Pond, Dry Hydrant Hardy Lane, Dry Hydrant Elektrisola, Dry Hydrant Water Street, and Dry Hydrant Corn Hill Road. Assessed values for these utility structures in Town total **\$16.6m**.

**Dams include:** **1** Significant Hazard (**S**) dam- D26.07 Penacook Lower Falls Dam (Contoocook River). **4** Low Hazard (**L**) dams- D26.10 Flagpole (Patenaude's) Pond Dam (tributary to Contoocook River), D26.12 Tannery Brook Dam (Tannery Brook), D26.13 Hirst Marsh Dam (Hirst Marsh), D26.14 Flagpole (Patenaude's) Pond Dike (tributary to Contoocook River). **2** Non-Menace Dams- D26.01 Walker Pond Dam (Pond Brook), and D26.11 McKerley Recreation Pond Dam (natural swale). Estimated structure (only) repair values for these dams total **\$4.5m**.

Additionally, **3** beaver dams- Hirst Marsh Beaver Dam (Hirst Marsh), Town Forest Beaver Dam (unnamed stream) and Unnamed Stream Beaver Dam (tributary to Contoocook River) also provide important infrastructure services to the Town. The D87.22 Franklin Falls Flood Control Dam in Franklin

(Pemigewasset River) is also a concern but Boscawen has no authority over the US Army Corps of Engineer facility.

**Bridges include:** Corn Hill Road over Pond Brook at Webster town line (066/084 Town), Long Street over Beaver Dam Brook at Webster town line (068/145 State), US 4 over Tannery Brook (107/122 State), Raymond Road over Tannery Brook (111/112 Town), US 4 over Tannery Brook (111/117 State), US 4 over Tannery Brook (116/108 State), US 3 over Tannery Brook (126/099 State), Tremont Street over Contoocook River at Concord town line (131/035 State), US 3 over Stirrup Iron Brook (134/171 State), US 4 over Commercial Street (139/040 State), and US 4 over Merrimack River at Canterbury town line (142/038 State). Only two (2) of these bridges are owned by the Town. Estimated structure (only) rehabilitation values for these 10 bridges total **\$36.0m**.

**Shelters, Schools, and Medical Facilities include:** VCA Riverside Veterinary Hospital [**~40** animal capacity], Town Hall Emergency Shelter with Kitchen Only (no generator) [**~100** capacity], Merrimack County Nursing Home [**~290** beds, **~535** staff], Boscawen Elementary School [**~248** students, **~35** staff, serves as the Town Shelter, Cooling Center and Regional Shelter as needed], and the Fire Station Shelter/ Kitchen. Assessed structure (only) replacement values for these schools, medical facilities and shelters total **\$35.4m**.

## **PROBLEM STATEMENTS AND EVALUATION**

During discussion of these **Critical Facilities**, the Hazard Mitigation Committee identified specific issues or problems that could be further evaluated. **Problem Statements** were developed after ascertaining the **Primary Hazard Vulnerabilities** to the sites and known existing issues. These potential hazards were typically those from the **Hazard Risk Assessment**. The Committee also evaluated these statements to determine whether mitigation actions could be developed.

- The old age of Town facility buildings (Fire Department, Municipal Building, Water Precinct, Public Works) render them vulnerable to lightning, winter weather and downed trees resulting in power failure, and are a fire risk.
  - The Public Works Garage and offices need to be redesigned and rebuilt and this is a Capital Improvements Program (CIP) item. Building is small, outdated, no heat, systems are inadequate, and equipment does not fit. The DPW's response to storm, wind and winter weather events would be stronger with a new building, proper heating and electrical systems, and room for vehicles and equipment used to counteract these events.
  - Fire Department's Torrent building (Fire Dept storage) will eventually collapse and is used seasonally for equipment. As a Town historic building, repairs should be made on the roof, doors, windows and electrical. The building is too full of equipment, but not in CIP. Fire Department needs to expand; an old plan



available but a new study may be required. The Penacook Rescue Squad may not remain with the Town indefinitely and this possible accommodation needs to be considered.

- Penacook-Boscawen Water Precinct - the Town owns land and Precinct owns the office building that houses PBWP operations. The building is substandard and has minimal office hours. Contains a steel 3-bay garage with small office. Contractors are used currently to manage operations. No change at this time.
- Municipal Building will have a standby generator as this has the main EOC.
- A new Safety Complex with Fire, Rescue, Police and Public Works Services and Equipment is not feasible in the long term future.
- The historic brick, 4-story Municipal Building (housing the Town Offices, Police Department and Library) is particularly vulnerable to lightning strikes and earthquakes.
- If any contamination was introduced into the PBWP water wells or water tanks, potential problems for human health can arise. The wells can connect to Concord (both communities assist each other). The tanks provide storage and pressure, are not easy to flush, would be difficult and time consuming to reestablish potable supply. The PBWP owns the wellheads at the Merrimack County Correctional Facilities while the MC retains rights to hay the fields.
- Power lines regularly fail community-wide due to winter weather, wind and lightning strikes. The Depot Street substation is especially vulnerable to damage caused by weather or pests. The power companies have a more rigorous tree trimming schedule.
- New beaver dams cause problems for the Town; if breached, road washouts could occur on Corn Hill Road, North Water Street or Weir Road. The PWD knows the locations and does not feel an inventory or mapping is necessary.
- The Town's bridges are mostly vulnerable to human activities such as sabotage and vandalism, although potential flooding and scouring damage could also occur. They are inspected yearly by NH DOT – Corn Hill Road and Raymond Road.
- The Town will very soon have an official Town Shelter with a generator. As a joint effort, the Merrimack Valley School District (MVSD) worked with the Town to apply for FEMA EMPG funding in 2018. Combined with the Town's Impact fees funding, in August 2018 an emergency generator will be installed at the Boscawen Elementary School for a Town Shelter and/ or Cooling Center, Regional Shelter if needed. Currently, **1** portable generator is available for Town facility usage during emergencies. Also in spring 2018, voters approved purchase and construction of secondary access to the Elementary School with CIP funding. The MVSD will begin by purchasing a new land for the egress this year (2018).

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

## **CULVERT UPGRADES**

A table of culverts in need of upgrade does not appear with the **Critical and Community Facility Vulnerability Assessment** but is included here within this section. Culverts (including box culverts, often considered “almost bridges”) are responsible for carrying large volumes of water safely under roadways, and with the prior severe flooding events it is necessary to keep Town infrastructure in good condition.

**Table 25** displays a listing of culverts in need of upgrade and approximately when the upgrades should occur. The estimated cost for replacement of all these culverts is **\$12,500** for materials; labor for the smaller projects is performed by Town staff and usually considered an in-kind cost. For the larger projects, contracted engineering, design and permitting may need to be occur and is included in the cost estimates.

**Table 25**  
**Town-Owned Culverts in Need of Upgrade**

Location of Culvert(s) to Upgrade	# of Culverts	Intersecting Watercourse	Issue(s) with the Culvert(s)	Upgrade Diameter Inches	Estimated Upgrade Year	Total Approx \$ Cost for All
Corn Hill Road	5	seasonal run-off	Filled with silt and rusted out	18	2018	\$5,000
Goodhue Road	2 catch basin structures	N/A	Concrete walls are failing	N/A	2018	\$2,500
Corn Hill Road	1	wet area	Rusted bottom	N/A	2019	\$1,000
Queen Street	2	seasonal run-off	Rusted out and filled with silt	N/A	2019	\$4,000
<b>Totals</b>						<b>12,500</b>

*Source: Public Works Department April 2018*

This listing of the necessary upgrades to culverts in the community can help begin formulation of a culvert upgrade and maintenance plan. Knowing the location and condition of all culverts to help guide their replacement, maintenance, and monitoring regularly can help alleviate some of the run-off and overtop flooding conditions in Boscawen, particularly those related to washouts.

Some of the culverts listed in **Table 25** have been developed into **Mitigation Action Plan** items in **8 MITIGATION ACTION PLAN**.

## Community Facilities

The **Community Facilities** inventoried in **APPENDIX A** generally vulnerable to disasters and in need of careful consideration. Some facilities are vulnerable populations, places where people gather, the economic assets of the community, contain the history of the town, or could release hazardous materials during hazard or disaster events. While **Critical Facilities** are strong with emergency preparedness and mitigation measures, **Community Facilities** are typically not as well attuned to these issues and would require more emergency services during a hazard event disaster.

**Vulnerable Populations include:** MCNH Adult Daycare, Merrimack County Cooperative Extension, MCNH Gerrish Manor Assisted Living [**~29** beds], Merrimack County Correctional Facility [**~246** beds, **~200** staff], Baker & Birch Cooperative MHP [**~4** units], Bill-Bob Mobile Home Park [**~51** units], Boscawen Green Senior Apartments [**~24** units], Boscawen MH Park Realty [**~19** units], Concord Village Apartments [**~32** units], Fessenden Terrace [**~36** units], Forest Lane Housing Area [**~62** homes], Honey's MHP [**~4** units], Justin Drive MHP [**~4** units], Kesavan MHP [**~7** units], King Street Commercial Area, Norac Enterprises Commercial Property, [**~1** unit], One Riverside Place Condominiums [**~38** homes], Oxbow MHP [**~15** units], Red Oak Duplexes 3-Bedroom [**~6** units], Riverbend/ Millhouse [**~19** beds], Sherman MHP [**~11** units], Smith MHP [**~8** units], Woodland Commons [**~33** units], Woody Hollow Co-op MHP [**~32** units], and Merrimack Valley Day Care Service @ MCNH [**~80** children capacity]. See also Shelters, Schools and Medical Facilities. Assessed structure (only) replacement values for these vulnerable populations total **\$32.6m**.

**Economic Assets include** those businesses and services that employ a large number of people or contribute to the local economy: National Lumber, Raymond Steenbeke Trust (Retail Rentals), Elektrisola, Dunkin Donuts, Alan's Restaurant [**~200** seats], Kapelli's Pizzeria Restaurant [**~60** seats], Smoke Shack BBQ, Colby Lumber Company, Boscawen Office Rentals LLC, Highway View Farm (Crete), Black Forest Nursery & Garden Center, NH State Forest Nursery, Phaneuf Funeral Home [**~75** seats], Richardson's Farm, Marshall Pumpkin Farm, Colby Christmas Tree Farm, Giovagnoli Farms LLC (Chickens), and Morrill Farm Dairy LLC. See also Hazardous Materials facilities. Assessed structure (only) replacement values for these economic assets total **\$12.6m**.

**Hazardous Materials Facilities include:** Ross Express Trucking, Buster's Service Center, Cumberland Farms, Colebrook Gravel, KSD Wood Products, Sunoco Station, Citgo Station, Huckleberry Heating Oil Co., LLC, All States Asphalt NH Bituminous, MJ's Towing & Repair Shop, Boscawen Mini Storage Inc, Davis and Sons Autobody, and Razors Custom Autobody. See also Economic Assets. Assessed structure (only) replacement values for these hazardous material facilities total **\$6.0m**.

**Cemeteries and Churches include:** Boscawen Congregational Church and Sovereign Grace Fellowship Church. For cemeteries: Merrimack County Farm Cemetery, Maplewood Cemetery, High Street Cemetery, NH Veterans Cemetery, Pine Grove Cemetery, and Plains Cemetery.

As cemeteries do not contain structures, broad estimates of headstone or mausoleum replacement value were provided instead. Assessed structure replacement values for these cemeteries and churches total **\$520k**.

**Historic Sites and Buildings** include: Boscawen Historical Society Building, Boscawen Public Historical 1913 Library, Torrent Station & Rescue Building, Hannah Dustin Historic Site, and Morrill-Lassonde House (NRHP). See also Recreational and Gathering Sites. Assessed structure (only) replacement values for these historic sites total **\$1.0m**.

**Recreational and Gathering Sites** of both land and buildings include: Merrimack County Boat Launching Facility (County/NH F&G), Cabot Memorial Forest (SPNHF), Jamie Welch Memorial Field and Boat Ramp (Town), Boscawen Town Forest and Trails (Miller Lots), Winthrop Carter House (Functions) [**~150** in house, **~200** in barn] and Avaloch Farm Music Institute (Convention Center) [**~100** capacity]. Some of these sites can be Economic Assets to the Town even if the land is untaxable. Assessed structure value for the structures within the recreational facilities total **\$2.0m**.

**Future Development** includes mostly residential development potential as most of the land in Boscawen is rural. Approved Planning Board developments: California Fields (1 Riverside Place) and Oak Lawn Development. Legacy parcels (large family lots with development potential): Kelly Lot [**~990** acres], McKerley Lots [**~280** acres], Horizon Lot [**~267** acres], Colby Lot [**~258** acres], Cold Brook Gravel Lot [**~256** acres] and Olsen Lot [**~250** acres]. There are too many large family legacy parcels to identify without an inventory. Large-sized lots currently for sale include: DWH Lot 8 (**25.5** acres), DWH Lot (**260** acres), Water Street Lot (**5** acres) and DWH Lots 67 & 68 (**155** acres). Assessed vacant land not yet built for these locations totals **\$5.8m**.

## **PROBLEM STATEMENTS AND EVALUATION**

During discussion of these Community Facilities, the Hazard Mitigation Committee identified specific issues or problems that could be further evaluated. **Problem Statements** were developed after ascertaining the **Primary Hazard Vulnerabilities** to the sites and known existing issues. These potential hazards were typically those from the **Hazard Risk Assessment**. The Committee also evaluated these statements to determine whether mitigation actions could be developed.

- ⊙ The manufactured (MF) housing parks will be at greater risk of wind and fire hazards than regular homes, particularly MF homes older than 2006 which are not required to be anchored (wind). Existing MF homes have no required setbacks between structures. The newer parks are safer with homes on slabs and built to current codes. Some homes are condemned by the Town for health and safety reasons and demolished. When the Town acquires MF homes for unpaid back taxes, it demolishes the homes. In time, parks should have more space and be safer to live in. To rebuild, new homes and placement have to comply with US HUD standards.

- ⊙ The Town's institutional facilities (Merrimack County Nursing Home and Correctional Facilities) and Boscawen Elementary School have a high public health outbreak potential. Many Boscawen residents work at these facilities and could transmit any diseases when returning to their homes. The Nursing Home isolates locations of outbreaks, and first responders must take precautions. Reporting is done to the State and/or Town. The Town should consider communicating with the County to coordinate protocols, reporting, response, and recovery when public health outbreaks occur. Education of residents and students can be conducted through flyers, social media, websites, posters, school notification system and personal outreach.
- ⊙ (Watch item) A new Merrimack County Correctional Facility (MCCF) treatment/minimum security facility building is going online with 80 additional residents in the program in spring 2018. At the same time, a new County administrative building will be completed that contains operations and services previously undertaken in Concord. As a result, many more people will be working on the premises and visitors on County business could create significant vehicle traffic and foot traffic. Discussions have been held about possible bus company transportation. The Town is concerned about more contraband, more drugs and more public health outbreaks. The MC institutional populations and staff are served by heating and A/C systems. More low-risk inmates with daytime privileges are working in the community.
- ⊙ US 3/ King Street is the main entry through Boscawen and serves as a critical highway for the region. If there was a local road closing near King Street from a fire, haz mat incident, vehicle accident or other reason, massive traffic rerouting would be required. Pre-plan traffic rerouting to prepare for this scenario.
- ⊙ All King Street/Main Street businesses are on the public water supply, so if the Penacook-Boscawen Water Precinct is not operational (pipe breakage, etc), water is unavailable to all businesses. The same issue occurs with an electric outage - affects the entire business area. The King Street Coordination Study (2017) was reviewed to see if there were any mitigation actions to add. Improving King Street through regulations will make the entire area safer from natural hazards (severe storms, winter weather, wind events), as well as from the secondary hazards that occur with natural disasters (power failure, traffic accidents, fire) and hazardous materials spills.
- ⊙ Regarding the Town's hazardous materials facilities, see the US 3/King Street incident and traffic rerouting concern. Most of Boscawen's hazardous materials facilities are located on US 3/King Street.
- ⊙ Trees falling down during storms and wind events may break a cemetery headstone or two. This is not a large issue, but it has happened before.

- ⊙ Flooding and damage to the Sovereign Grace Church could occur from the surrounding two sides. The building and parking area are situated between wetlands. This could impact evacuation of the building if flooding occurred during church services.
- ⊙ During extreme flooding events, the eroding Hannah Dustin Island historic site in the Merrimack River floodplain would be eroded further, and if severe enough, the monument could be swept away in a strong flood. This scenario is unlikely in the near future, although it occurred during the 1936 floods before the major dams and reservoirs were constructed. Presently, the Town owns 2/3 of the Hannah Dustin Island and the State owns 1/3 of the land where the historical monument is located. The State is beginning to maintain its section of the island and has riprapped the side to help protect it from erosion. The historical monument is a lower priority during severe flooding because a high flood would impact the river's nearby houses too. The Historical Society should be the Town group that leads any further preservation or mitigation effort here.
- ⊙ The Fire Department's historic Torrent Station is vulnerable to roof collapse from deferred maintenance. This could happen as a result of any hazard. The building needs reroofing, new framed windows, flagpole replacement and other structural improvements.
- ⊙ There is only one access and egress for the 2 large recreational sites in Town: Avaloch Music Institute and Jamie Welch Memorial Park. No emergency access is available, both roads are Class V Town dead end roads. For the Park, access to the rail trail may be obtained. The FD is working on JWMP evacuation plan. For Avaloch, although Hardy Road is a Town dead end road, emergency access to or egress from the facility can be obtained by driving over the flat fields.
- ⊙ Outdoor water recreational facilities in Boscawen have the potential for public health issues (high bacteria levels), strong currents of the Merrimack River and /or hazardous materials. Civil disturbance is a possibility with the large number of people using the Jamie Welch Memorial Park recreational facilities, some of whom may be inebriated. The JWMP is only a boat launch to the river, not a swimming hole. There is no safe, public place for people to swim because the only easy access place in Boscawen has strong currents and is very unsafe; there have been several fatalities in the last few years. There is a current rough plan being worked on for a Fire Department boat launch at Hannah Dustin for emergency rescue. One obstacle is the Town of Boscawen needs to have the right to cross the railroad tracks but since the Town cannot monitor the location, it should not be a "known" public swimming site. The Parks and Recreation



Department should initiate the formation of a new Committee to work with Merrimack River shoreland owners to create an accessible, safe Town public swimming beach.

- ⊙ Large future developments would require intersection improvements, such as at Queen Street and King Street. Located in the rural sections of Town, there are many parcels or groups of parcels, hundreds of acres in size, owned by families that may be sold for development in the future. As of now, the Town is unable to predict when or where such developments would occur, especially in this economic climate. An inventory of these very large parcels and their locations should be undertaken to help gauge build-out impacts.

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

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## Potential Losses from Natural Disasters

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Natural disasters, including floods, wind events, severe winter storms and ice storms, secondary disasters as a result of the natural disasters (such as power loss) and to a lesser degree, human and technological hazards as documented in **4 HAZARD RISK ASSESSMENT** have occurred in Boscawen. This section estimates Town-wide structure/building damage in Town from natural hazard events. It is difficult to ascertain the amount of damage caused by a hazard because the damage will depend on the hazard's location and magnitude, making each hazard event somewhat unique. Human and technological hazards are typically even more incalculable. Human loss of life was not included in the potential loss estimates for natural hazards, but could be expected to occur, depending on the severity of the hazard.

While this Plan focuses on being pro-active in those geographic areas of Boscawen most prone to recurring hazards (like flooding), some initial estimates of measurable property damage and building damage have been discussed by utilizing simple techniques such as the numbers of structures and assessed valuation. This two-dimensional approach of calculating dollar losses from tangible structures offers a basic yet insightful tool to begin further loss estimation analyses.

### TOOLS FOR COMMUNITIES WITH GIS

For gauging more three-dimensional estimation of damages, FEMA has developed a software program entitled HAZUS-MH (for multi-hazard), which is a powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest Geographic Information Systems (GIS) technology to produce estimates of hazard related damage before, or after, a disaster occurs. Developed for ARCGIS which produced the *Maps* for this Plan, HAZUS-MH takes into account various effects of a hazard event such as:

- Physical damage: damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- Economic loss: lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts: impacts to people, including requirements for shelters and medical aid.

Federal, State and local government agencies and the private sector can order HAZUS-MH free-of-charge from the FEMA Distribution Center. Boscawen should first ascertain whether a municipal geographic information system (GIS) of hardware and software is appropriate, and if so, consider training staff to perform models. With many Town existing and under-development infrastructure GIS data layers available, HAZUS-MH could prove very helpful for estimating losses for the community on a disaster-specific basis. However, much staff time is necessary to train staff and maintain a GIS system. Official map generation is typically subcontracted out to other agencies now, including *the mapping and appraisal company Avitar Associates of New England used by the Town* and the Central NH Regional Planning Commission who developed the Maps for this **Hazard Mitigation Plan**.

## METHODS OF POTENTIAL DOLLAR LOSSES BY NATURAL HAZARDS

A more manageable technique was used for loss estimation for the purposes of this **Hazard Mitigation Plan Update**. Natural hazard losses are calculated based on dollar damage ranges over the entire community, or in the case of flooding, buildings in the Special Flood Hazard Areas (SFHAs) are counted and their value is collected. The number of total parcels in the community as of **February 2018** is **1,641**. Using **February 2018** MS-1 assessment data, **the total assessed value of all residential and non-residential structures ONLY in Boscawen (\$159,618,200) is the basis for loss estimation calculations.**

### Potential Building Dollar Losses by SFHA Flooding

Parcels within the floodplain were identified using Boscawen's 2018 digital online tax maps concurrently with the 2010 FEMA Digital Flood Insurance Rate Maps (DFIRMs). Next, parcels containing buildings were identified using the Town tax assessor's February 2018 database for the Town. Building type was characterized into one of four categories, single-family homes, multi-family homes, manufactured homes, and non-residential buildings. Building number and value were excerpted from the assessing database.

**Land value, building content value and infrastructure were not considered in these calculations. Table 26** summarizes this data.

**Table 26**  
**Building Value in the Special Flood Hazard Areas (SFHAs)**

Building Type	Number of Buildings	Total Value of Buildings in SFHA	Average Replacement Value
Single Family Homes	56	\$7,798,900	\$139,266
Multi-family Homes	0	\$0	\$0
Manufactured Homes	0	\$0	\$0
Non-Residential Buildings	13	\$957,500	\$73,654
<b>Totals</b>	<b>69</b>	<b>\$8,756,400</b>	<b>-----</b>

*Sources: Town of Boscawen Avitar Mapping data, 02-18; 2010 DFIRMs; Community Development Dept*

In **Table 26**, **56** single family residential homes, **0** multi-family homes, **0** manufactured homes, and **13** non-residential buildings were considered to be situated the Special Flood Hazard Areas (SFHAs). The average replacement value is **\$139k** for a single-family home (**\$7.8m** for all single family homes in the SFHA). The total value of all buildings in the Special Flood Hazard Areas is about **\$8.8m** for the **56** structures and **13** non-residential buildings (**\$957k**).

There are alternative ways to calculate potential SFHA losses. In the following tables, the average building replacement value was calculated by adding the assessed values of all structures in the special flood hazard areas and dividing by the number of structures. The Federal Emergency Management Agency (FEMA) has developed a process to calculate potential loss for structures during flooding. The potential loss was calculated by multiplying the average replacement value by the percent of damage expected from the hazard event, and then by multiplying that figure by the number of structures.

The costs for repairing or replacing infrastructure such as bridges, railroads, power lines, roads, drainage systems, telephone lines, or natural gas pipelines, and land value and the contents of structures have not been included in these estimates in the following figures.

**Table 27** represents the **worst case scenario of all** single-family homes, multi-family homes, manufactured homes, and non-residential buildings within the Special Flood Hazard Area that are damaged by a flood hazard event.

**Table 27**

**Dollar Damage Ranges for Total Buildings in Special Flood Hazard Areas (SFHA)**

Building Type	Total Value of Buildings in SFHA	Total Value of Potential Damages in SFHAs by Respective Building Type		
		Eight-Foot Flood 49% Damage	Four-Foot Flood 28% Damage	Two-Foot Flood 20% Damage
Single Family Homes	\$7,798,900	\$3,821,461	\$2,183,692	\$1,559,780
Multi-Family Homes	\$0	\$0	\$0	\$0
Manufactured Homes	\$0	\$0	\$0	\$0
Non-Residential Buildings	\$957,500	\$469,175	\$268,100	\$191,500

Sources: See **Table 26**; FEMA

If all **56** single family homes were damaged by a **Two-Foot Flood (20% Damage)**, the dollar damage to the buildings *only* could be **\$1.6m** while an **Eight-Foot Flood (49% Damage)** could yield **\$3.8m** in damage. There are **0** multi-family homes, **0** manufactured homes and **13** non-residential buildings in the SFHA. If all **13** non-residential buildings were damaged by a **Two-Foot Flood (20% Damage)**, the dollar damage to the buildings *only* could be **\$192k** while an **Eight-Foot Flood (49% Damage)** could yield **\$470k** in damage. Dollar damage estimations vary according to the standard percentages of damage levels associated with flooding levels set by FEMA. Content, land and infrastructure values are not included.

**Table 28** also represents the worst case scenario, but of *individual* single-family homes, multi-family homes, manufactured houses, and non-residential buildings within the Special Flood Hazard Area that are damaged by a flood hazard event.

**Table 28**

**Dollar Damage Ranges for Individual Buildings in Special Flood Hazard Areas (SFHA)**

Building Type	Average Value of Individual Buildings in SFHA	Individual Value of Potential Damages in SFHAs by Respective Building Type		
		Eight-Foot Flood 49% Damage	Four-Foot Flood 28% Damage	Two-Foot Flood 20% Damage
Single Family Homes	\$139,266	\$68,240	\$38,995	\$27,853
Multi-Family Homes	\$0	\$0	\$0	\$0
Manufactured Homes	\$0	\$0	\$0	\$0
Non-Residential Buildings	\$73,654	\$36,090	\$20,623	\$14,731

Sources: See **Table 26**; FEMA

If **1** single family home was damaged by a **Two-Foot Flood (20% Damage)**, the projected dollar damage to the building *only* averages **\$28k** while an **Eight-Foot Flood (49% Damage)** could yield **\$68k** in damages. If **1** non-residential building was damaged by a **Two-Foot Flood (20% Damage)**, the projected dollar damage to the building *only* averages **\$15k** while an **Eight-Foot Flood (49% Damage)** could yield **\$36k** in damages. Content, land and infrastructure values are not included.

### **Potential Building Dollar Losses by Other Natural Hazards**

Flooding is often associated with heavy rains and flash floods, hurricanes, ice jams, rapid snow melting in the spring, and culvert washouts. These are all types of flooding hazards discussed or evaluated previously but can also occur outside of the SFHA.

Building damage by natural disasters in New Hampshire is not limited to SFHA flooding alone, which is easier to quantify and predict. Simple calculations can be made based upon generalizations of a disaster impacting a certain percentage of the number of buildings in the Town. **The assessed value of all residential, commercial, and industrial structures in Boscawen is \$159,618,200 (no land).** Disaster damages are often illustrated in the following section utilizing a percentage range of town-wide building damage. At **1,513** housing units in Boscawen estimated from the **2016** NH Office of Strategic Initiative (NH OSI) population estimates, any type of disaster impact to **10%** of Boscawen housing units would yield **151** damaged homes.

The inventory of Town sites or buildings in **APPENDIX A Critical and Community Facilities**

**Vulnerability Assessment** indicates which hazards each site is most susceptible to and provides its assessed valuation. This dollar value can be used as a damage estimate from the natural hazard events listed below. Yet the potential losses discussed in this section involve all buildings across the community to provide a more distinct portrait of potential losses using the assessed valuation of all town buildings. Damages from natural hazards to anything other than buildings, such as infrastructure, land, humans or building contents, are not examined here. Specific individual studies would be needed to assess more detailed scenarios.

### **Wind Events**

Damage caused by wind events such as **tropical storms & hurricanes, downbursts, tornadoes** and **severe wind storms** can be both excessive and expensive. Boscawen is primarily a wooded, rural community with forested residential neighborhoods along Town roads. The assessed value of all residential, commercial, and industrial structures in Boscawen is **\$159,618,200** (no land).

With a scenario range of **1% to 5%** of buildings damaged by wind events throughout the Town, a wind event could potentially cause up to **\$1.6m** (for more localized **downburst, high winds, or tornadoes**) to **\$8.0m** (for more damaging and widespread **tropical storms and hurricanes**) in building-only damage costs alone, not including contents, infrastructure, or land.

### **Severe Winter Weather**

Heavy **snow loads**, **icy conditions**, **extreme cold**, **wind chill**, and the secondary hazards (including **power failure**, **transportation accidents** and **debris impacted infrastructure**) are result of **winter storms**. Storms with these conditions have been felt in Boscawen in the past. These hazards and secondary impacts are a risk to the community, including isolation, more falls and personal injury (especially by the older residents), and the potential for roof collapse. The most remote locations in Boscawen include the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and the Queen Street area. Damage caused by this type of hazard varies according to wind velocity, snow accumulation, tree/limb fall and duration.

With a scenario range of **1% to 5%** of buildings damaged throughout the Town, **severe winter storms** could potentially cause up to **\$1.6m to \$8.0m** in building-only damage costs.

### **Rapid Snow Pack Melt**

**Flooding** caused by **rapid snow pack melt** is often found along roadways and from watercourses such as the brooks and wetlands in Town. Those locations which are particularly susceptible would be in the floodplain, along US 3 & 4, River Road, Valley of Industry, Corn Hill Road, Crescent Street, Eel Street, Commercial Street, and along hilly gravel roads with limited drainage. Anywhere the water cannot yet percolate into the frozen ground could be vulnerable.

With a scenario of **0.5%** of buildings flooded throughout the Town, **rapid snow pack melt flooding** could potentially cause **\$800k** in building-only damage costs alone, not including contents, infrastructure, or land.

### **River Ice Jams and Debris Impacted Infrastructure**

**Ice jams** on the Contoocook River or the local large brooks would be the major causes of **ice jam flooding** which could recur in the future, particularly along Eel, Crescent Streets. Woody material causing **debris impacted infrastructure** would be more likely to occur to bridges than ice jams, especially along the Corn Hill Road bridge. Two **(2)** bridges in Boscawen are owned by the Town (Raymond Road over Tannery Brook), one of which is owned jointly with the Town of Webster (Corn Hill Road over Pond Brook). Multiple additional small brooks culverts and drainage systems abound. The **2019-2028 NH Department of Transportation Ten Year Plan (TYP)** provides many examples of basic cost estimates bridge replacement and rehabilitation.

This average figure of **\$700,000** can be used for one **(1)** local bridge *replacement* in Boscawen due to the physical damage caused by **river ice jams** or **debris impacted infrastructure**. The same bridge damaged by **ice** or **debris** which only requires *rehabilitation* could cost **\$450,000**.

Or, if half of the **56 (23)** single family homes in the floodplain were damaged by **Two-Foot Flooding (20% Damage)** resulting from **river ice jams** or **debris impacted infrastructure**, there could be up to **\$780k** in building damage costs.



### **Earthquake or Landslide**

**Earthquakes** can cause buildings and bridges to collapse, disrupt water supplies, electricity and phone lines and are often associated with **landslides** and **flash floods**. Buildings that are not built to a high seismic design level or are large in size could be susceptible to structural damage. The old Town Buildings (Municipal Facility, Fire Department, Public Works), Boscawen Congregational Church, Merrimack County Nursing Home and Correctional Facilities, and Penacook-Boscawen Water Precinct water delivery pipes could be more vulnerable to earthquakes. Buildings which are located on or near the sides of river and stream banks or that are located on a hill over **15%** could be subject to **landslide** triggered by rains or **erosion**. The Central NH Region area with Boscawen, Webster, Hopkinton (Contoocook), Henniker, Hillsborough and Warner (Davisville) are frequent epicenters for deep earthquakes.

With a scenario of **0.5%** of buildings damaged throughout the Town, an **earthquake** or **landslide** could potentially cause up to **\$800k** in building-only damage costs alone, not including contents, infrastructure, or land.

### **Wildfire**

The risk of **wildfire** is difficult to predict based on location. Forest fires are more likely to occur during years of **drought**. In addition, areas and structures that are surrounded by dry vegetation that has not been suitably cleared are at high risk. Humans can contribute by accidents in the woods or dry fields, or by the deliberate setting of **fire** in a structure. The heavily forested woodlands of Town are often remote locations and difficult to access by emergency vehicles. The forested dead-end remote residential neighborhoods, include the Water Street area, Walker Pond, Patenaude's Pond, Chadwick Hill, and the Queen Street area. The Fire Department displays a Fire Danger sign visible from High Street. Dollar damage would depend on the extent of the fire, the number and type of buildings burned, and the amount of contents destroyed within the buildings.

With a scenario of **1.0%** of buildings damaged in the Town, a **wildfire** could potentially cause up to **\$1.6m** in building-only damage costs alone, not including contents, infrastructure, or land.

### **Lightning**

Damage caused by **lightning** would not be Town-wide because it typically strikes in smaller areas. Few places in Boscawen are at specific risk but lightning strikes can cause fires. Damages will vary according to the value of the structure and home and the contents inside, and dollar amounts would depend on if the hazard hit an area with a high density of buildings. The Municipal Building will be looking into having lightning rods and grounding equipment installed along the building to help prevent another electrical surge that in Map 2017 destroyed all computer systems, communications, and electronic records.

With a scenario of **0.5%** of buildings damaged throughout the Town, a **lightning strike** could potentially cause up to **\$800k** in building-only damage costs alone, not including contents, infrastructure, land, or through fire spreading.

### **Drought**

**Drought** is often declared on state-wide or region-wide basis, and sometimes by individual town. Dollar damage caused by drought would be difficult to quantify, but would most likely impact the agricultural and economic base of a community. Although everyone could be charged to conserve water, orchards, farms, and nurseries would be most affected.

As physical damage is usually isolated to specific locations, the effects of potential disasters at certain facilities could be researched utilizing the Town's assessor's database for valuation on targeted land. Agricultural land may be among the most affected by drought. Dozens of farm operations have been inventoried in Boscawen. People who rely on well water, which is nearly all of the community, have found their dug wells running dry in **2015-2016**. About **1,392** acres in Town (nearly **7%** of its land) are categorized as agricultural use along with forest land acreage (**3,313** or **48%** of its land) and forest land with stewardship acreage (**2,350** or **11%** of its land) that could be vulnerable to **droughts** and physically and economically damaged by these long-term hazard events.

### **Severe Winds, Rainstorms and Thunder Storms**

This general **storm** hazard crosses into other hazards previously mentioned, including the **wind events**, **flooding** and **lightning**. When summer **rainstorms** or **thunderstorms** occur, they are often regional in nature, but could just as commonly be localized in some areas, easily identifiable when one section of a roadway is dry and another section of the same road is wet. Sometimes **hail** accompanies these storms. **Thunderstorms** and **rainstorms** are more likely to damage trees, powerlines or crops than buildings. These storms typically cover most of, if not the entire, Town, as **winds** and **rainstorms** are large enough and blow through to impact multiple New Hampshire counties.

When buildings are damaged, any of the separate hazard events (**wind**, **flood**, **hail** or **lightning**) could have debilitated the structures. With a scenario of **0.5%** of buildings damaged throughout the Town, a **rainstorm** or **thunderstorm** could potentially cause up to **\$800k** in building-only damage costs alone, not including contents, infrastructure, land or through **fire** spreading from **lightning**.

### **Extreme Heat**

Similar to **drought** cataloged above, **extreme heat** can harm landscaping and agriculture. People will draw more water from their wells to help alleviate these conditions. Extreme heat can sicken people, causing sunstroke, heat exhaustion and dehydration if the environment is not cool enough or water intake is too low. In this manner, extreme heat is not measurable for dollar damage. An inventory of **Vulnerable Populations** was undertaken which can be used by emergency responders to ensure susceptible people remain healthy.

**Critical Facilities Buildings**

These dozens of essential facilities, utilities, dams, bridges, and shelters and medical facilities inventoried in **APPENDIX A Critical and Community Facilities Vulnerability Assessment** provide the **Structure Only Value \$** from the *appraisal systems*. Multiple hazards are identified which may damage each inventoried building. Therefore, if the Town wanted to ascertain the damage cost from any natural hazard to an individual critical facility, this dollar value is available for evaluation. In addition to the **APPENDIX**, critical facilities in Boscawen are displayed on *Map 3 Critical and Community Facilities*.

**Community Facilities Buildings**

Dozens of community facilities such as vulnerable populations, recreation and gathering sites, historic sites, economic assets, hazardous materials facilities, and more are inventoried in **APPENDIX A Critical and Community Facilities Vulnerability Assessment** provide the **Structure Only Value \$** from the *appraisal systems*. Multiple hazards are identified which may damage each inventoried building. Therefore, if the Town wanted to ascertain the damage cost from any natural hazard to an individual critical facility, this dollar value is available for evaluation. In addition to the **APPENDIX**, community facilities in Boscawen are displayed on *Map 3 Critical and Community Facilities*.

## National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities such as Boscawen agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding. For more information on the National Flood Insurance Program, visit [https://www.floodsmart.gov/floodsmart/pages/about/nfip\\_overview.jsp](https://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp).

The initial identification of the Special Flood Hazard Areas (SFHAs) occurred in **January 1979** with the first Flood Insurance Study (FIS) and the first FIRMs were developed **July 16, 1979**. Records indicate Boscawen has been a participant in the National Flood Insurance Program (NFIP) since **July 1979**. Unlike many other Central NH region communities, no amended FIS or FIRMs were developed for the Town until almost four decades later.

In the present day, Boscawen's effective FIRMs are digital (DFIRMs) dated **April 19, 2010** as is the Merrimack County Flood Insurance Study (FIS) which includes Boscawen (community **#330105**); individual community FIS are no longer being developed. These **2010** newest documents were adopted by the Board of Selectmen, supercede all previous NFIP documentation, and are placed into the Town Zoning Ordinance. **Table 29** summarizes the historical background of the Town's NFIP effective dates.

Table 29

NFIP History of Boscawen – Effective Dates

Flood Insurance Study (FIS)	Flood Insurance Rate Maps
January 1979	July 16, 1979
April 19, 2010	April 19, 2010

Source: FEMA Merrimack County Flood Insurance Study (FIS) Table 7, 2010

## BOSCAWEN'S NFIP STATISTICS

In **Table 30** is a cumulative history of the trends and overall totals of flood insurance policies and losses of those property owners utilizing the NFIP insurance in Town. Three snapshots in time, one from each of Boscawen's **Hazard Mitigation Plan** versions, display the number of NFIP policies in force and paid loss statistics between **April 2006 – February 2018**.

From **Table 30**, in **April 2006**, just prior to the **2006 Mother's Day Flood** and succeeding severe flooding events, the number of NFIP flood insurance policies in force in the Town totaled **10**. Five years later, by **January 2012**, **9** flood insurance policies were active on properties across Boscawen. By **February 2018**, the number of policies decreased to **8** total policies. To date, since Boscawen joined the NFIP in **1979**,

there have been less than **\$4k** in paid losses to policyholders for insurance claims. Although the Town of Boscawen experienced flooding conditions over the last few decades, there has been little damage in the Special Flood Hazard Areas, or anywhere else where a policy is held, to place a claim. The overall decrease of only **2** policies between **April 2006** and **February 2018** was nominal. The purchase of flood insurance policies could be influenced by the lack of current flooding events, the recent changes in flood insurance regulation, and the high cost.

**Table 30**

**History of NFIP Policy and Paid Loss Statistics**

Report Date	Policies in Force	Insurance in Force	Number of Paid Losses Since 1979	Total Losses Paid Since 1979
<b>April 2006</b>	10	\$1,421,100	2	\$3,569
<b>January 2012</b>	9	\$1,670,000	2	\$3,569
<b>February 2018</b>	8	\$1,311,000	2	\$3,569

*Source: Boscawen Hazard Mitigation Plan 2012, FEMA last accessed 05-02-18*

**Table 30** also illustrates that while the entire Town of Boscawen is eligible to purchase flood insurance, only **8** parcels out of the **1,641** total parcels in the entire community are insured against flooding. As described previously, a total of **56** homes and **13** non-residential buildings are approximated to be situated in the Special Flood Hazard Areas (SFHA). Assuming the **8** policies are within the SFHA, **12%** of buildings in the floodplain are insured against flooding.

Most buildings are uninsured in the SFHA for when the next flooding event occurs in Boscawen. However, flooding conditions can occur anywhere in the community due to runoff, debris impacted infrastructure (culverts), drainage overflow, rapid snowpack melt, road washouts, etc which are not limited to the floodplain (SFHAs).

## REPETITIVE LOSS PROPERTIES

A specific target group of properties is identified and serviced separately from other NFIP policies when repetitive losses occur on the same properties. The group includes every NFIP-insured property that, since **1979** and regardless of any change(s) of ownership during that period, has experienced four or more paid flood losses of more than \$5,000 each or two or more separate claim payments (building payments only) where the total of the exceeds the current value of the property. Two of the claim payments must have occurred within 10 years of each other. The loss history includes all flood claims paid on an insured property, regardless of any changes of ownership, since the building's construction or back to **1979**.

Boscawen joined the NFIP in **1979** and has **(0)** repetitive loss properties in the community, even after the significant flooding and infrastructure damage sustained over the active hazard event period of **2005-2012** (See **4 HAZARD RISK ASSESSMENT**). **Table 31** displays the repetitive loss data:

Table 31

Number of Repetitive Loss Properties

Building Type	Number of Repetitive Loss Properties
Single Family	0
Multi-Family	0
Non-Residential	0
<b>Total Properties</b>	<b>0</b>

Source: NH Office of Strategic Initiatives (NH OSI) on behalf of FEMA, April 2018

## FLOODPLAIN ORDINANCE

A major objective for floodplain management is to continue participation in the National Flood Insurance Program. Communities that agree to manage Special Flood Hazard Areas shown on NFIP maps participate in the NFIP by adopting minimum standards. The minimum requirements are the adoption of the Floodplain Ordinance and Subdivision Regulation / Site Plan Review requirements for land designated as Special Flood Hazard Areas (SFHAs). Flood insurance is available to any property owner located in a community participating in the NFIP.

### Community Assistance Visits in Boscawen

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

If the NH Office of Strategic Initiatives (NH OSI) identifies Boscawen as a repetitive loss community in the future, which is based upon **Table 31** data, a new CAV will be undertaken every five years or if there is a severe flooding event. This would classify Boscawen as a Tier 1 community. Otherwise, a telephone call may be made to the community every 5-10 years or otherwise as needed (classified as a Tier 2 community).

The Town of Boscawen contains **0** repetitive loss properties and is a Tier 2 community. Although the Merrimack River borders the community and runs under the US Route 4 bridge which connects residents to I-93, future flooding damage in the floodplains may be minimal. Much of the land is agricultural, forested or fields. For other SFHA locations, several steps have been taken to help plan for the flooding hazard in terms of life and property protection, and possibly provide necessary recovery assistance should such a flooding threat arise.

The most recent CAV was conducted in September 2003. The review included the need for a property completed Elevation or Floodproofing Certificate to be filed with the building permit for approved construction. Discussed was the issue of substantial damage or improvement. Whenever there is a



proposed changed to such a structure, whether from damage or just a desire to improve, and the cost of this work would equal or exceed 50% of the market value of the structure, then the entire structure must comply with the Floodplain Ordinance regulations.

This was the last CAV held in Boscawen. Several rounds of changes were made to the Zoning Ordinance and the Planning Board's Site Plan Review and Subdivision Regulations in following years in accordance with FEMA requirements. Because Boscawen is **Tier 2** community, a follow up phone call should be made NH OSI to request a review of Community Development Department procedures and the contents of the Floodplain Ordinance, Subdivision Regulations and Site Plan Review Regulations prior to **2023**, when this **2018 Plan** expires.

### **Floodplain Ordinance Amendments**

The Town of Boscawen has a Floodplain Development Ordinance that currently contains the required FEMA regulations to remain eligible for the NFIP. The Town of Boscawen approved their first Floodplain Ordinance at Town Meeting in March of **1990** along with the FIRMs.

From the **2003** CAV, although the Zoning Ordinance was compliant, revisions to the Site Plan Review Regulations and Subdivision Regulations were needed. The two revisions were that the Planning Board shall review the proposed development in the SFHAs to assure that all necessary state and federal permits have been received, and Board shall require that all proposals for developments in the SFHAs greater than 50 lots or 5 acres, whichever is the lesser, include Base Flood Elevation (**BFE**) data. The Planning Board approved these revisions.

Revisions were made in **March 2008** and lastly in **March 2010** to correct/ add language and insert the new, adopted effective **April 19, 2010** Digital Flood Insurance Rate Maps (DFIRMs).

The **2018** Boscawen Zoning Ordinance contains all the elements to date requested by FEMA and the NH Office of Strategic Initiative's Floodplain Management Program. An excerpt of the Floodplain Ordinance is displayed in **Figure 22**.

**Figure 22**

**Floodplain Development Zoning Ordinance**

<p style="text-align: center;"><b>Article XV</b> <b>Floodplain Development Ordinance</b></p> <p>The following regulations in this ordinance shall apply to all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its “Flood Insurance Study for the County of Merrimack, N.H.” dated April 19, 2010, or as amended, together with the associated Flood Insurance Rate Maps dated April 19, 2010 or as amended, which are declared to be part of this ordinance and are hereby incorporated by reference.</p> <p>Certain areas of the Town of Boscawen, New Hampshire are subject to periodic flooding, causing serious damages to properties within these areas. Relief is available in the form of flood insurance as authorized by the National Flood Insurance Act of 1968. Therefore, the Town of Boscawen, New Hampshire has chosen to become a participating community in the National Flood Insurance Program, and agrees to comply with the requirements of the National Flood Insurance Act of 1968 (P. L. 90-488, as amended) as detailed in this Floodplain Management Ordinance.</p> <p>Pursuant to RSA 674:57, by resolution of the Board of Selectmen, all lands designated as special flood hazard areas by the Federal Emergency Management Agency (FEMA) in its “Flood Insurance Study for Merrimack County, NH” dated April 19, 2010, together with the associated Flood Insurance Rate Maps dated April 19, 2010, are declared to be part of the Town of Boscawen Zoning Ordinance and are hereby incorporated by reference.</p> <p>This ordinance, adopted pursuant to the authority of RSA 674:16 shall be known as the Town of Boscawen Floodplain Development Ordinance. The regulations in this ordinance shall overlay and supplement the regulations in the Town of Boscawen's Zoning Ordinance, and shall be considered part of the Zoning Ordinance for purposes of administration and appeals under state law. If any provision of this ordinance differs or appears to conflict with any provision of the Zoning Ordinance or other ordinance or regulation, the provision imposing the greater restriction or more stringent standard shall be controlling.</p> <p style="text-align: center;"><b>Definitions</b></p> <p>The following definitions shall apply only to this Floodplain Development Ordinance, and shall not be affected by the provisions of any other ordinance of the Town of Boscawen.</p>
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*Source: Section of Boscawen Zoning Ordinance 2018*

**NFIP Familiarity in Boscawen**

According to NFIP policies, when an applicant files a request for a building permit in the floodplain, the applicant must include an elevation certificate in order to be in compliance. In addition, if an applicant intends to fill onsite, a letter of map of revision must be submitted along with the application. According to NFIP requirements in the Floodplain Ordinance, building permits should be reviewed to assure sites are reasonably safe from flooding and require anchoring to prevent flotation, collapse, or lateral movement and construction out of flood resistant materials.

Ongoing attention and familiarity with the NFIP will keep Town staff and volunteers in top form. In order to reduce flood risks, the Building Inspector, Town Assessor, volunteer Planning Board members, and other Town staff whose duties include review/inspection of development or construction, should be familiar with the Floodplain Ordinance and the NFIP.

Because of their unique position to ensure development conforms with ordinances prior to approval, the Planning Board should be familiar with NFIP policies, especially those regulations that are required to be

incorporated into the Subdivision and Site Plan Review regulations. A workshop sponsored by the NH Homeland Security and Emergency Management (NHHSEM) or the NH Office of Strategic Initiatives (NHOEP) would be appropriate to educate current staff and volunteers. New online courses by FEMA for floodplain management, mapping, elevation certificates and more are available at no charge. For online training taken at the convenience of the individual, see the *FEMA Emergency Management Institute's* current training course index for flooding:

<https://www.training.fema.gov/is/searchis.aspx?search=Flood&all=true>.

An essential step in mitigating flood damage is Town and property owner participation in the NFIP. Boscawen should work to consistently enforce NFIP compliant policies to continue its participation in this program. Currently, Town staff are fielding many property owners asking for assistance because their mortgage lenders are requiring proof that the properties in question are not located in a Special Flood Hazard Area to determine whether NFIP flood insurance is required. The only way to rectify this growing problem is to have a survey done of the property to complete a Certificate of Elevation to keep on file at the Town Office. If the property is shown to be located out of the floodplain, a Letter of Map Amendment should be completed by the owner or by the Town to ensure future flood maps are corrected. This time of interaction with property owners is emotional and intense and may therefore not be the best time to advertise the availability of flood insurance. When possible, Town staff should try promote flood insurance to property owners in Town; only **8** properties out of the **1,641** parcels in Boscawen are protected by flood insurance and currently take advantage of the NFIP insurance opportunity.

## 6 CAPABILITY ASSESSMENT

Local mitigation capabilities are existing authorities, plans, ordinances, policies, mutual aid, programs, staffing, technical skills and assets, funding, outreach, public education, and resources that reduce hazard impacts or that could be used to help implement hazard mitigation activities. These capabilities were inventoried for the **Boscawen Hazard Mitigation Plan Update 2018**.

The **Capability Assessment** contains an inventory of locally-important existing mitigation support activities, or capabilities, which have a positive impact on the way hazard events are handled within the community. Most capabilities are not hazard mitigation Actions but support the Action Plan and help decrease the community's hazard risk. These community-strengthening capabilities are not STAPLEE-rated (Social Technical Administrative Political Legal Environmental and Economics questions) like the Actions, but instead the capabilities serve to sustain and assist the community to maintain and accomplish its hazard mitigation Actions and priorities. Selected **Future Improvements** (mitigation-oriented) to some of these capabilities have the potential to be considered as Actions in **7 PRIOR ACTION STATUS** and **8 MITIGATION ACTION PLAN**.

### Capability Assessment Types

Planning & Regulatory

Administrative and Technical

Financial Resources

Education and Outreach

There are four overall Capabilities considered for which an inventory of mitigation support items was identified by the Hazard Mitigation Committee, **Planning & Regulatory**, **Administrative and Technical**, **Financial Resources**, and **Education and Outreach**.

Each Capability had inventoried the latest version or adoption Date; a Description of the item; the location of the capability in Town; the Level of Effectiveness of the Capability; which Department, Board or other has Responsibility for the capability; what Changes were made to the capability since the **2012 Hazard Mitigation Plan**; and Future Improvements to the Capability.

## Town Capabilities

A summary of the items within the four Capability tables is provided here to offer a portrait of resources Boscawen has at hand to assist with mitigation. Careful consideration of each Capability's **Level of Effectiveness** helped the Departments to determine any clear **Future Improvements** to undertake. Many of the Town's Capabilities involved existing plans, procedures, reports, policies, regulations, and resource documents from individual Departments. These plans and documents were reviewed and incorporated into the **Capability**

**Assessment**. **Future Improvements** to these documents were identified and many later became Action items in **8 MITIGATION ACTION PLAN**. Capabilities of all Town Departments and the School District as related to hazard mitigation are detailed within the following tables.

Level of Effectiveness	Description
High	Capability is working well and is regularly followed
Moderate	Capability could use some revisions but is followed
Low	Capability is not working and needs revisions

### DEPARTMENT ABBREVIATION KEY:

<b>FD</b>	Fire & Rescue Department
<b>EM</b>	Emergency Management
<b>PD</b>	Police Department
<b>CE/BI</b>	Code Enforcement/Building Inspector
<b>PB</b>	Planning Board
<b>PWD</b>	Public Works Department
<b>BOS</b>	Board of Selectmen
<b>CC</b>	Conservation Commission
<b>MVSD</b>	Merrimack Valley School District
<b>PBWP</b>	Penacook-Boscawen Water Precinct

## PLANNING AND REGULATORY CAPABILITIES

The planning and regulatory capabilities displayed in **Table 32** are the plans, policies, codes, and ordinances that reduce the risks or impacts of hazards. There are 3 categories: Plans, Codes, and Regulations. Most of the documents listed below are the Town's documents, but others are School, local, regional, state and federal which support the Town's the hazard mitigation goals, objectives, and/or Actions.

**Table 32**  
**Planning and Regulatory Capabilities**

<b>Latest Adoption or Version Date</b>	<b>Capability Assessment: Planning and Regulatory Resources</b>	<b>Description Related to hazard mitigation planning and coordination</b>	<b>Location of Capability Entire Town or Selected Areas</b>	<b>Level of Effectiveness</b>	<b>Responsibility</b>	<b>Changes Since Last Haz Mit Plan (2012)</b>	<b>Future Improvements to Plans</b>
<b>LOCAL PLANS</b>							
2017	<b>PB Capital Improvements Program</b>	Updated annually, town admin and Planning Board are always referring to it. For Planning Board, it helps with major subdivisions.	Entire Town	High	Planning Board	Updated in 2017	Revise the CIP and adjust annually as needed.
2002	<b>PB Master Plan 2002</b>	The master plan has helped the Planning Board tailor zoning, subdivision regulations, and site plan review regulations.	Entire Town	Medium	Planning Board	The master plan will be updated in 2018. The master plan will be updated regularly.	Additional 2018 public hearings on individual chapters. Constantly being updated.
Mar 2012	<b>EM Emergency Operations Plan 2012</b>	Last updated Mar 2012 in the ESF format. EOP describes who's responsible for what actions during an emergency. Includes general warning systems, chain of command, media, lists of resources, maps and lists.	Entire Town	High	Emergency Mgt	EM continued to use these regulations for relevant developments	Update to 2015 ESF format, Exercise and test the Plan and ESFs. Reaffirm annually
December 2012	<b>EM Hazard Mitigation Plan 2012</b>	Adopted by Town & FEMA in 2012 and currently being updated 12-18	Entire Town	High	Emergency Mgt	Updating as of 12-18	Review & update on an annual basis in accordance with Mitigation Action Plan
2016	<b>MVSD Elementary School Emergency Management Plans</b>	The Elementary School Emergency Management Plan includes procedures during emergencies.	Boscawen Elementary School in MVSD	High	School Principals with EMD support	Penacook elementary is the new reunification site. High school was previously. Boscawen Elementary School will be Town Shelter and/or Cooling Center, Regional Shelter, with a new generator in	Updated plan is expecting approval in 2018. Adjust with addition of emergency egress from Elementary School. Continue to update based on comments from review.



# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
						August 2018. New warrant article, to buy property to add an emergency egress.	
<b>BUILDING CODES, PERMITTING, AND INSPECTIONS</b>							
April 19, 2010	<b>PB FEMA Flood Insurance Rate Maps</b>	Adopted by Town, used for Merrimack & Contoocook Rivers, streams, brooks. Used on a case by case basis to inform zoning. Used for people selling houses – flood insurance.	Floodplains	<b>Moderate</b>	Planning Board/ Land Use Dept Staff	FEMA has not provided new maps since 2010. Current maps added to online assessing data.	Continue using maps in Town offices and noting any substantial deviations
2015	<b>BI State Life Safety Code 2015, construction inspected by the Town Building Inspector and Fire Dept – acting as life safety officer</b>	New construction is continually evaluated during the process with the final inspection conducted by both the Fire and Building Officials prior to the issuance of a certificate of occupancy. Fire chief joins on a case by case basis.	Entire Town	<b>High</b>	Building Inspector with Fire Dept assistance	Updated in 2015 and the Planning Board continues to use these regulations for relevant developments	Would like to see the State adopt the current version. Will update accordingly - pending electrical and building code state updates
2015	<b>BI State Building Code (International Building Code 2015)</b>	Contains a suite of residential, commercial, plumbing, electrical, mechanical, energy, and existing buildings	Entire Town	<b>High</b>	Building Inspector	Town still follows the code from 2009	Would like to see the State adopt the current version.
2009	<b>FD NFPA 101 Life Safety Codes Occupancy Inspections</b>	Contains 15 types of occupancies that may be inspected by Fire Departments <b>- Places of Assembly</b> - Mercantile - Business - Health Care - Ambulatory Health Care - Residential Board and Care <b>- Day Care</b> <b>- Educational</b> - Apartment Buildings - Lodging or Rooming Housing - Hotel or Dormitory - 1 and 2 Family Dwellings - Industrial - Storage - Detention and correctional	Places of Assembly, Day Cares, and Educational sites	<b>High</b>	Fire Dept	Continued inspections for these 3 types	Would like to see the State adopt the current version. May change with a new chief

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Latest Adoption or Version Date	Capability Assessment: Planning and Regulatory Resources	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
2009	FD NFPA 1 Fire Codes Permitting	Section 1:12, and Table 1.12.7a specifically outline instances when permits are required	Select Structures	High	Fire Dept	Continued to issue permits	Would like to see the State adopt the current version
<b>LAND USE PLANNING ORDINANCES AND REGULATIONS</b>							
2010	PB Floodplain Ordinance to Regulate Development in the Floodplains	Ordinance was updated in March 2010 to FEMA requirements of April 19, 2010 maps and revisions.	Floodplain areas – Merrimack & Contoocook	High	Planning Board/ Code Enforce	Planning Board continued to use these regulations for relevant developments.	Continue to update as FEMA requires.
Prior to 2000	PB Industrial Zone	The industrial zone intends to accommodate a variety of business, warehouse, and light industrial uses. Residential uses are generally prohibited.	Industrial areas along US 3/US 4	Medium	Planning Board/ Code Enforce	Planning Board continued to use these regulations for relevant developments.	Review with ZBA for consideration of land use application, best land management.
Prior to 2000	PBWP Ordinance Procedures in Place Against Contamination	The procedures prevent spillage. Must test septage to ensure it is not contaminated with gasoline. Must obtain a DES permit renewed every 5 years. Engineer on staff, created procedures.	PBWP Area	High	PBWP	The procedures are reviewed and updated regularly.	Improved infrastructure may be contingent on partnership with the Town.
2017	PB Shoreland Ordinance	Cites the Shoreland Water Quality Protection Act 483-B	Shorelands and Great Ponds	Moderate	Planning Board	Regular updates and revisions from the NH legislature.	The Planning Board will continue to adhere to State standards.
2013	PB Road Design and Construction Standards (Subdivision /Site Plan Regulations)	PB updated documents recently. Engineer contracted for application to follow the standards	Entire Town	High	Planning Board	Adopted 4/10/2013	The Planning Board will regularly review these standards and make changes as appropriate.
2011	PB Stormwater Construction and Maintenance Standards (Subdivision /Site Plan Regulations)	Engineer contracted for application to follow the standards	Entire Town	High	Planning Board	Planning Board continued to use these regulations for relevant developments.	The Planning Board will regularly review these standards and make changes as appropriate.

Source: Boscawen Hazard Mitigation Committee

## ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capabilities in **Table 33** include staff, volunteers, and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. Smaller jurisdictions without local staff resources often rely on public or shared resources. There are 3 categories: Admin Programs, Staffing, and Technical Capabilities.

**Table 33**

**Administrative and Technical Capabilities**

<b>Latest Adoption or Version Date</b>	<b>Capability Assessment: Administrative and Technical</b>	<b>Description Related to hazard mitigation planning and coordination</b>	<b>Location of Capability Entire Town or Selected Areas</b>	<b>Level of Effectiveness</b>	<b>Responsibility</b>	<b>Changes Since Last Haz Mit Plan (2012)</b>	<b>Future Improvements to Plans</b>
<b>ADMINISTRATIVE PROGRAMS AND POLICIES</b>							
Circa 2007	<b>PD Standard Operations Guidelines (SOGs)</b>	Policies would cover vehicle operation, pursuit driving, accident investigations. Everyday operations are addressed. Maybe 20 years old	Entire Town	High	Police Dept	Worked on updates, to be completed in 2018. Will incorporate CALEA standards	Add a policy or procedure for lock down of schools and PD response to lock down event. To be updated by the end 2018.
2017	<b>PD Mutual Aid Agreement</b>	The Police Dept Mutual Aid Agreement (MUA) is agreements with Northfield, Canterbury, Concord, Webster, Salisbury, Franklin, Warner, Pittsfield, and Hopkinton, Loudon which are signed by both Chiefs. The MUAs are updates when a new Department comes on board in any community. Every surrounding town. Add towns with detail request	Entire Town and Region	High	Police Dept	Department has renewed MUAs with other towns. Updated in 2017 with Canterbury's new chief	Incoming Departments of mutual aid agreement communities will review and renew. Updated when a new chief comes in. Webster needs to be updated
Circa 2007	<b>PD Disaster Response Functions</b>	Police officers perform functions of traffic control and protection of life and property in the event of a disaster. In May 2006 and other times during flooding events, PD made sure roads were passable	Entire Town	High	Police Dept	Maintained the MUAs and kept up to date with surrounding Towns. Added an emergency response trailer from the Capital Area Public Health Network (stage 1 of two trailers). New equipment, Humvee, Gator, and personal equipment	Be more involved with the Capital Area Public Health Network and utilize the assets available. To be determined by needs
2017	<b>PD Member of NH State</b>	Member of Central NH State Police SWAT unit for high risk warrants,	Town-wide	never been tested	Police Dept	Began participating in 2013	Continue participation in

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Administrative and Technical	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
	Police SWAT Unit	missing persons, barricaded subjects, hostage situations.					training. Pay yearly membership fee
2017	PD Merrimack County DWI Task Force Member	Merrimack County DWI Task Force members to provide 12-14 sobriety check points in 6 towns, and 22 saturation speed grants with three other towns.	Entire Town	High	Police Dept	Continued participation.	Utilize DWI State command bus RV. Everything done on scene at sobriety checkpoints with no need to transport off the scene when more officers are hired. Increase the number of speed patrols.
July 1 2017	FD Member of Capital Area Fire Compact Mutual Aid (CAFCMA) and Dispatch	Participate with the Capital Area Fire Mutual Aid Compact of 23 agencies. All dispatching for the Town goes through the CAFCMA. Member for over 20 years.	Entire Town, and resources to other communities	High	Fire Dept	FD participates in exercises and annual drills. Town converted to CAFCMA narrow bandwidth	Working well, continue to participate
Prior to 2000	FD Vehicle Driving Protocol	Vehicle driving protocol states what drivers should do and should not do. State law does not require CDL for fire truck operation, but the Town encourages it.	Entire Town	High	Fire Dept	Supporting activity of the Department to the Mitigation Plan	Encourage all fire fighters to procure a CDL license to drive a fire truck.
Prior to 2000	FD Equipment/ Apparatus Maintenance Programs	Maintenance programs on the equipment, with check off lists done periodically on SCBA, apparatus, and all equipment to ensure proper operating order.	Entire Town	High	Fire Dept	Periodic maintenance programs were set as monthly. Everything is checked yearly	Continue to review apparatus and provide funding for equipment as needed
2017	FD Standard Operating Procedures (SOPs)	Standard operating procedures for discipline, code of conduct, response to calls, personal vehicles, etc	Entire Town	High	Fire Dept	Updated the SOPs with any suggested or required changes	Update to comply with new procedures and protocol
2017	FD Call Response Cards "Run Cards"	Call "Response Cards" indicate who responds to which emergencies or disasters within the Mutual Aid (MUA) Compact. Town was rezoned into 6 different fire protection zones for MUA towns coming in.	Entire Town	High	Fire Dept	Routinely updated the cards	As Boscawen grows, reevaluate the effectiveness of the protection zones.
2018	EM American Red Cross MOU	Close working relationship with Red Cross. All verbal, no signed MOU. No official Town shelter, although one being sought with	Entire Town, Boscawen Elementary School	High	Emergency Mgt	EMPG Generator application submitted for Elementary School to become the	Obtain signed MOU for assistance for emergency shelter

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### 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Administrative and Technical	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
		MVSD at Boscawen Elementary.				Town Shelter and/or Cooling Center, Regional Shelter	
2017	<b>PWD Equipment Maintenance Protocol</b>	Equipment maintenance is verbal. Every 3,000 miles every piece is serviced. All large equipment items have books which are followed for service	Entire Town	High	Public Works Dept	Followed the service manuals for the maintenance. Took steps to institute preventative maintenance on the equipment	Depending on equipment, develop a written policy of how to maintain and service each piece of equipment.
Prior to 2000	<b>PWD Communications Protocol</b>	Communication so everyone knows where everyone is going during the day. All have radios. Foreman keeps track of everyone, six on the crew. Schedules are hard to work out when activities are always changing. Cell phones are used more than radios.	Entire Town	High	Public Works Dept	The number of staff has decreased from seven to six.	Upgrade radios when needed and consider a written protocol
Dec 2017	<b>PWD NH Public Works Mutual Aid Agreement Member</b>	Member of NH PW Mutual Aid Compact. Renewed 12/18 for annual membership	Entire Town, State	Never used	Public Works Dept	Yearly agreement, send and receive mutual aid	Continue to maintain agreement and renew yearly
To be updated spring 2018	<b>PWD Winter Operations Policy for Plowing Routes</b>	Each driver has their own plow route. Routes are split by priority. Not written, but institutional memory. Priority depends on time of day, weather, etc. In process of developing a written policy.	Entire Town	High	Public Works Dept	PWD will be taking over fire hydrant maintenance from Water Precinct	Policy will be updated in 2018
2018	<b>PWD Culvert Maintenance Program</b>	Frequently doing ditch work, inspecting culverts. Clean and remove undersized culverts as budget and time allow.	Roadways	High	Public Works Dept	A greater focus has been placed on replacing undersized culverts.	Increase the size of culverts, which would require additional funding in the culvert maintenance line item of the budget. Consider an inventory, mapped
Every Storm	<b>PWD Procedure to Communicate with Utility Companies to Cutback Overgrown Limbs</b>	Removing overhanging limbs near power-lines will reduce that potential hazard in the Town. Communicate regularly with Unitil & Eversource to make sure that branches are cut back from power lines to	Roadways	High	Public Works Dept	Unitil has frequently aided in cutting back trees	Continue communications as needed, be proactive to ensure elimination of hazardous limbs before they fall

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### 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Administrative and Technical	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
		reduce the potential hazards from wind.					
2018	PWD Annual Road Upgrade Plan	PW chooses a mile of road per year and rebuild from the gravel up to the asphalt. New drainage, ditch work, pavement as the budget allows	Roadways	High	Public Works Dept	Policy has remained the same though the roads slated for upgrades change every year.	Continue to rebuild one mile of road per year. Cost will affect the culvert maintenance line item of the budget.
Dec 2016	MVSD Safe Routes to School (Elementary School)	Project extended a sidewalk from Main St sidewalk into Elementary school. This will make it safer for students to walk to school.	Around Elementary School, King Street B.E.S.T. Avenue	High	MVSD	Completed design work and implemented the results.	Maintain adherence to the plan. Review and update regularly
<b>TECHNICAL SKILLS, ASSETS, AND RESOURCES</b>							
2017	PD Neighboring Community Joint Training	Some neighboring towns do not have a lot of police support. Training with Franklin & Webster is beneficial to all towns. Training should include working with firearms, personal safety, etc. In-service training is shared with those towns.	Entire Town	High	Police Dept	More trainings, firearms, use of force, building searches, taser, etc.	Continue training with Fire Department and Penacook Rescue Squad.
7 full time 2017	PD Annual Officer Training and Certification	Officers and Chief undertake training including ICS, firearms, chemical spray, OC, Taser, munitions, handcuffing, baton, school disasters, hostage situations firearms, mental health emergency, Special Operations Unit (SOU), accident reconstruction, and other training as appropriate. The PD has mandatory in service training once per month. Most training is conducted at the PD, but sometimes instructors are brought in. Outside training is done through the State. Everyone goes to the Academy one or two times per year for formal training.	Entire Town	High	Police Dept	Firearm, use of force, medical, as well as standard trainings and certifications	Continue training (motor vehicle accident, haz mat spill), certifications, add new topics, and certify in higher ICS levels.
2017	PD Active Shooter Drills	School hostage drill of "Active Shooter" was	Elementary School	High	Police Dept	The recent drill in 2012 focused on	Undertake an active shooter drill in Bosc



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		undertaken in summer 2006. Webster also participated. It was the first drill held in a while. 2012 was the last drill, with Webster, Penacook Rescue, Sheriff's Office, Canterbury. Drill at school, room to room clearing.				a school setting with room to room clearing.	Elementary School with Penacook Rescue and the Sheriff's Office, Town of Webster. Plan to do more scenario-based training with Canterbury..
2016	PD OHRVs	Equipment includes two OHRVs, which have been used for missing persons in remote locations for navigating terrain, and patrolling trails. Having this vehicle provides better access which may not have been possible and a higher level of life safety. The vehicle has a computer and GPS installed. A light trailer was also purchased	Entire Town	High	Police Dept	A Gator and Humvee were added to the PD fleet.	Keep an eye on equipment availability from the military. A snowmobile is desirable.
2017	FD/EMS Capital Area Fire Mutual Aid Regional Training	Continual training (at least monthly) in regional incident command and response techniques and skill. Each town is required to host a drill once per year. Host town benefits with learning more than visitor towns.	Entire Town, Region	High	Fire Dept	Upgraded the dispatch center to SimulCast	Ensure monthly training is made more user-friendly and includes more individual participation.
21 certified 22 on call 22 staff	FD Training and Certification	Train twice a month, each of which is different: SCBA, high hazard areas, pumping water, pre-planned etc.	Entire Town,	High	Fire Dept	Supporting activity of the Department to the mitigation Plan	Train professionally at the NH Fire Academy. Investigate burning buildings for training (controlled burning).
5 mobile 18 portable 5 base	FD Digital Radios	FD received 14 portables, 5 mobiles, and 2 mobiles for personal vehicles, and received 5 mobiles and one base station from a2008 grant.	Entire Town	High	Fire Dept	Supporting activity of the Department to the mitigation Plan	Continue to replace and upgrade radios
2017	FD Water Rescue Capabilities	The Town has a boat to use for water rescue in response to the extreme flooding Boscawen experienced. More equipment was obtained to facilitate rescue during flooding conditions: trailer, ice rescue suits, ropes,	Suncook River, Water bodies	High	Fire Dept	The department has obtained new equipment and has conducted ice rescue trainings	Continue to locate and take training related to water rescue, which is not easy to find or coordinate with volunteer schedules. Identify a new good location to insert boat on Contoocook

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## 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Administrative and Technical	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
		personal flotation devices, and water rescue helmets					River / Merrimack River
2018	EM American Red Cross Shelter and Evacuation Training	Training to conform with American Red Cross has been taken by Town Emergency Personnel. MVSD to participate and develop plans	Entire Town, Boscawen Elementary School	High	Emergency Mgt	Elementary School will be Town Shelter and/or Cooling Center, Regional Shelter with a new generator. New warrant article, to buy property to add an emergency egress.	Include MVSD admin and staff with planning and training
6 trained 2016 - chainsaw	PWD Pubic Works Training	Training on-site for equipment operation, drainage, road repairs, chainsaw operation and maintenance, sales etc.	Entire Town	High	Public Works Dept	Trained through LGC, T2, and Primex on Mostly refresher course	Distribute flyers of training opportunities to employees
1 staff	PWD Training, Road Agent Certified as a Master Roads Scholar	This is a consistent effort to improve service delivery through education acquired by participating in online training activities and program offered through the LGC.	Entire Town	High	Public Works Dept	Trained one staff member	Send all Public Works Department staff for training.
2017	BOS Panic Buttons in Town Office	Existing buttons do not work and they are needed upstairs as well.	Municipal Building	Low	Board of Selectmen	Equipment tested to ensure it is operational	Get new buttons and then continue annual or semi-annual testing to ensure operation capability
Prior to 2007	BOS Security System in Town Office	Security system in place, fire and burglary. Cameras are monitored by the PD. Keypad entry for Police. Monthly emergency systems check.	Municipal Building	Moderate	Board of Selectmen	Maintain log of keypad code entries and verify updates with change in staff. Add exterior entry keyless entry system	Update the system and share access code with staff who need it for off-hours
2018	BOS Department Safety Committee	Safety Committee meets quarterly to review safety issues each department has and initiate improvements.	Entire Town	High	Board of Selectmen	Quarterly Joint Loss/Safety Committee meeting. Lost workmen's compensation and liability insurance without it. Now reinstated.	Provide copies of minutes to post on Town website for staff access. Continue to meet benchmark requirements
2012	BOS Emergency Call List	Begins with Town Administrator who then relays to appropriate departments.	Entire Town	High	Board of Selectmen	Call list is used during State Emergency Mgt drills	Hold periodic testing of Town contacts to ensure list is current

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment:</u> Administrative and Technical	<u>Description</u> Related to hazard mitigation planning and coordination	<u>Location of Capability</u> Entire Town or Selected Areas	<u>Level of Effectiveness</u>	<u>Responsibility</u>	<u>Changes Since Last Haz Mit Plan (2012)</u>	<u>Future Improvements to Plans</u>
2016	<b>BOS Professional Computer Maintenance Agreement</b>	Maintenance agreement with professional computer company. Can address hacking, sabotage, etc. Town Admin updates	Entire Town	High	Board of Selectmen	Changed companies to Cybertron	New vendor to provide virtual IT maintenance with security features. Review contracts every 2-3 years

*Source: Boscawen Hazard Mitigation Committee*

## FINANCIAL CAPABILITIES

The financial resources in **Table 34** available for hazard mitigation projects are those the Town has access to, has used in the past, or may be eligible to use in the future for hazard mitigation projects. These often include FEMA Public Assistance Grants (Disaster Recovery Costs), Warrant Articles, Town Capital Improvements Program (CIP) 2018 Project Funding, Department Operating Budgets, Bonds and FEMA and NH Department of Transportation grants.

**Table 34**  
**Financial Capabilities**

<u>Latest Adoption or Version Date</u>	<u>Capability Assessment:</u> Financial	<u>Description</u> Related to hazard mitigation planning and coordination	<u>Location of Capability</u> Entire Town or Selected Areas	<u>Level of Effectiveness</u>	<u>Responsibility</u>	<u>Changes Since Last Haz Mit Plan (2012)</u>	<u>Future Improvements to Plans</u>
<b>FINANCIAL PROGRAM OR FUNDING RESOURCE FOR HAZARD MITIGATION</b>							
2017	<b>BOS FEMA Public Assistance Grants (Disaster Recovery Costs)</b>	Public Assistance Categories A-G may become available when disasters are declared if the community has an unexpired approved Haz Mit Plan. Continue to utilize the FEMA funding to help recover from declared disasters.	Entire Town	High	Town Admin with EM	Used for PA-B Protective Measures	Continue to utilize the FEMA PA program to help with disaster costs
2013	<b>BOS NH Department of Transportation (NH DOT) Bridge Program</b>	The bridge program is an 80/20 funding opportunity, with only 20% required by towns. Using the CIP Capital Reserve Funds, communities can set aside money for the several years it takes for the state to undertake a local bridge project.	Town Bridges	High	Board of Selectmen	2013 removal of the Boscawen – Canterbury bridge	Maintain a list of potential bridge project in town that fit the program

<b>Latest Adoption or Version Date</b>	<b>Capability Assessment: Financial</b>	<b>Description Related to hazard mitigation planning and coordination</b>	<b>Location of Capability Entire Town or Selected Areas</b>	<b>Level of Effectiveness</b>	<b>Responsibility</b>	<b>Changes Since Last Haz Mit Plan (2012)</b>	<b>Future Improvements to Plans</b>
2017	<b>CC Conservation Easement Fund</b>	The Conservation Easement Fund protects water supplies through purchase of conservation easements. 100% of land use change tax. Funding added nearly yearly	Priority locations	<b>High</b>	Conservation Commission	Deposits to the fund continued when current use land converted to developable land.	Consider using fund for water and flood protection

*Source: Boscawen Hazard Mitigation Committee*

## EDUCATION AND OUTREACH CAPABILITIES

In **Table 35**, identifying Town Department education and outreach programs and methods already in place or those which could be implemented can supplement or encourage mitigation activities and communicate hazard-related information to residents, businesses and the general public.

**Table 35**

**Education and Outreach Capabilities**

<b>Latest Adoption or Version Date</b>	<b>Capability Assessment: Education and Outreach Programs</b>	<b>Description Related to hazard mitigation planning and coordination</b>	<b>Location of Capability Entire Town or Selected Areas</b>	<b>Level of Effectiveness</b>	<b>Responsibility</b>	<b>Changes Since Last Haz Mit Plan (2012)</b>	<b>Future Improvements to Plans</b>
<b>PUBLIC OUTREACH PROGRAM</b>							
2018 daily	<b>BOS Town Website</b>	Used by multiple Town Depts, available to residents and visitors, hosts Zoning amendment changes. Have an emergency management page with registration for emergency notification system	Entire Town, General Public	<b>High</b>	Town Admin	Regularly updated, Virtual Town Hall & Schools	Continue to add as opportunity arises. Make more user friendly
Oct 2017	<b>PD Drug "Take Back Box"</b>	People can drop off narcotics or whatever people have with immunity and also unused prescription medication. Getting people to turn their medicine in is difficult.	Police Station	<b>High</b>	Police Dept	Participated in program in 2017	Waiver to accept drugs on a day-to-day basis. Obtain a Drug Take Back Box like other surrounding communities
2017	<b>FD Public Education Program</b>	Held informal programs for seniors on emergency preparedness, and maintain daily call lists Fire safety month – kids, October	Entire Town, Elementary School	<b>High</b>	Fire Dept	Participated in Elementary School program	Continue to hold fire safety month in October for kids.
2018	<b>MVSD School District</b>	Used only for emergencies. Automated phone, text, email service	MVSD	<b>High</b>	MV School District.	Used Call multiplier for	Update to ALMA – new service in 2018-2019

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 6 CAPABILITY ASSESSMENT

Latest Adoption or Version Date	Capability Assessment: Education and Outreach Programs	Description Related to hazard mitigation planning and coordination	Location of Capability Entire Town or Selected Areas	Level of Effectiveness	Responsibility	Changes Since Last Haz Mit Plan (2012)	Future Improvements to Plans
	<b>Automated Calling System</b>	to parents for alert. Used for snow delays and snow days. A new version is being tested - text, then audio from Department. Through PowerSchool. Announcing snow days, two-hour delays. Emergencies			Superintendent, HR manager, super. Sec.	parental notification	
2017	<b>CC Conservation and Wetland Monitoring</b>	Conservation Commission monitors open space and conservation lands and wetlands through data collection. The data includes Class VI Roads. This project helps mitigate the effects of natural disaster events	Entire Town	High	Conservation Commission	Monitored and improved trails to ensure debris is minimized and trails are safe for users.	Continue to monitor conservation lands on an annual basis

*Source: Boscawen Hazard Mitigation Committee*

## Review of Existing Plans

As described above, during the Hazard Mitigation process and the identification of existing mitigation **Capabilities**, the Hazard Mitigation Committee used their knowledge of the existing plans, policies, procedures and other documents utilized for their Department duties to develop Capability **Future Improvements**. However, several additional documents not listed in the **Capability Assessment** are also utilized by the community and have a positive relationship to the **Hazard Mitigation Plan 2018**. Most of the documents below are not the Town's documents, but the hazard mitigation goals, objectives, and/or Actions in this Plan are supported by the **Mitigation Support and Resource Documents** listed below in **Table 36**.

**Table 36**  
**Mitigation Support and Resource Documents**

Latest Adoption or Version Date	Mitigation Support and Resource Documents Not Listed within Capability Assessment Tables
Feb 2007	NH DHHS NH Influenza Pandemic Public Health Preparedness & Response Plan 2007
2009	NFPA 1 Fire Code 2009
2010	NWS Thunderstorms, Tornadoes, Lightning. Preparedness Guide
Apr 2010	FEMA Flood Insurance Study for Merrimack County 2010
Apr 2010	NH Hospital Mutual Aid Network MOU
2011	NH DES Management of Collected Debris Following Severe Storm Events fact Sheet
Dec 2011	NH DHHS Disaster Behavioral Health Response Plan
Feb 2012	NH DHHS Child Care Center Emergency preparedness Guide
Oct 2013	State of NH Multi-Hazard Mitigation Plan Update 2013
Jul 2014	NH DOS Statewide Fire Mobilization Implementation Master Plan 2014
Jul 2014	American Red Cross of NH Strategic Plan – Humanitarian Services FY 2014-2019
Jul 2014	NH DHHS NH Excessive Heat Emergency Response Plan 2014
2015	NFPA 101 Life Safety Code 2015
Feb 2015	Central NH Regional Plan 2015
Mar 2015	NH State of NH Tickborne Disease Plan 2015
Sep 2015	NH DOS Bureau of Emergency Management Services EMS Provider Manual 2015
Jul 2015	NHHSEM NH Recovery Plan with RSFs 2015
Jan 2016	Eversource Energy Electric Operations Response Plan
Sep 2016	Unitil Electric Emergency Response Municipal Information
Oct 2016	CNHREPC Central New Hampshire Regional Emergency Planning Committee Regional Hazardous Materials Emergency Plan 2016
Aug 2016	CAPHN Capital Area Public Health Network Public Health Emergency Preparedness and Response Plan for the Capital Area 2016
Jul 2017	NH DHHS NH Arboviral Illness Surveillance, Prevention and Response Plan & Map 2017
Mar 2018	NH DOT Recommendations for the Ten-Year Transportation Improvement Plan (Projects) 2019-2028

*Source: Boscawen Hazard Mitigation Committee*



## 7 PRIOR ACTION STATUS

The **Hazard Mitigation Plan Update 2012** provided a basis to begin Action development, many of which originated from the previous **2007 Plan** and were encompassed as **2012** Actions. A review of the **2012** Actions is provided by the Hazard Mitigation Committee, determining which Actions have been **Completed**, **Deleted**, or **Deferred** to the **2018 Plan**.

### Action Status Determination

The status of all Hazard Mitigation Plan Actions varies. Priorities over the previous five years can change, budgets are uncertain, and staff are allocated time for certain tasks. To accommodate the **2012 Plan's 54 total** Actions in addition to the **New** Actions from the **2018 Plan**, there are four designated Action types to describe the detailed Actions following within the **7 PRIOR ACTION STATUS** and/or **8 MITIGATION ACTION PLAN**:

- ☐ **Completed**
- ☐ **Deleted**
- ☐ **Deferred**
- ☐ **New**

The prior **2012 Plan** actions were developed to consider strategies to mitigate hazard impacts to both new and existing buildings, infrastructure, properties and developments.

Actions which were **Completed** from the **2012 Plan** are listed in **Table 37** along with completion dates.

Actions which were **Deleted** from the **2012 Plan** might have been no longer necessary or a priority to the Town, no longer relevant to the Town's situation or objectives, could not realistically be undertaken, were not financially feasible, were modified and incorporated into other existing Actions, or duplicated existing efforts of Boscawen's activities. Deleted Actions are listed in **Table 38**.

Actions which were **Deferred** from the **2012 Plan** are still important to the Town but were not completed because they did not have the staff capability or the funding to undertake them, other Actions took higher priority, more time was required for completion, or they may need to be repeated to be effective. These **Deferred** Actions are in **Table 39** and have been re-prioritized with the **New** Actions in the **Mitigation Action Plan**.

Changes in priority of the **Deferred** 2012 Actions occurred over the last five years. The **2012 Plan** also used the **12-36 Priority Score enhanced STAPLEE** system while the **2018 Plan** included both a **Ranking Score** and an **Action Timeframe** to determine priorities with a more useful **15-75 Priority Score enhanced STAPLEE** system. Both methods are described.

**New** Actions are described later in **8 MITIGATION ACTION PLAN**.

## DEFINITIONS

The following definitions were used to ascertain which Actions should be considered *mitigation* Actions versus which should be considered *preparedness* Actions more suitable for incorporation into the **Town Emergency Operations Plan**. The mitigation Actions are those which are carried forth in this **2018 Plan** into the **Mitigation Action Plan**.

Action Type	Duration	Definition or Characteristics
<b>Mitigation</b>	<b>Long Term</b>	Action supports sustained risk prevention or reduces long-term risk to people, property and infrastructure. ↳ Best suited for <i>Town Hazard Mitigation Plan</i> .
<b>Preparedness</b>	<b>Short Term</b>	Action assists or supports planning, protective activities, public education, training and exercise. ↳ Best suited for <i>Town Emergency Operations Plan</i> .
<b>Response, Recovery, Other Related</b>	<b>Short Term</b>	Action supports preventative, response, recovery-related, repeated or deferred maintenance activities. ↳ Best suited for <i>Town Emergency Operations Plan</i> .

## HAZARDS CONSIDERED

With **26** different hazards examined in this Plan, it is not always practical to list each one when describing location vulnerabilities or solutions. Brevity will suffice where possible. In many cases, simply listing the more encompassing main hazard group names taken from **4 HAZARD RISK ASSESSMENT**, such as **Flood, Wind, Fire, Extreme Temperature, Earth, Technological** and **Human**, will cover most of the situations.

For further detail at a specific location, the addition of specific hazards such as **Scouring & Erosion** from the *Flood* category, **Storm** (applying to the warm weather all-encompassing storms) from the *Wind* category, **Winter** from the *Extreme Temperature* category, or **Dam Failure** from the *Technological* category can provide the necessary amount information needed to understand certain hazard issues in Boscawen. These are already used as sub-grouped hazards in the **APPENDIX A Critical and Community Facilities Vulnerability Assessment**.

When the main hazard group names or sub-group hazards names are not precise enough, the exact hazard name from the group of **26** examined will be utilized for accuracy. Where possible however, simply using the main hazard group name (for example, **Flood** or **Wind** instead of each of its sub-hazards), can reduce the need for listing every type of hazard that may impact a certain location and be better accommodated in its broadness.

## Review of 2012 Actions

The **2012 Hazard Mitigation Plan** was written in a different format and its content had to comply with less specific review guidelines before the *Local Hazard Mitigation Review Guidebook (FEMA), 2012* became standardized and tailored by each FEMA Region over the years.

Boscawen's **54** Actions from **2012**, which included the original **2007 Plan's** Actions, were allocated **Action Numbers** and each **Project's** status was determined by the Hazard Mitigation Committee as either **Completed**, **Deleted** or **Deferred**. Out of the **54** Actions, **10** were **Completed** as shown in **Table 37**. Thirty-four (**34**) Actions were **Deleted** as shown in **Table 38** and the remaining **10** were **Deferred** (**Table 39**) and appear within the **Mitigation Action Plan**.

**Table 37**  
**Completed Mitigation Actions**

Priority Score (2012)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
<b>34</b>	<b>#01-2012</b>	Town-Wide Sprinkler Ordinance	<b>Feb 2005</b>	Building Inspector	\$0	Lightning, Wildfire, Other Fires
<b>34</b>	<b>#02-2012</b>	Digital Radio Acquisition	<b>Jun 2004 (first) 2008 (second)</b>	Fire Department Chief	\$0	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Wind, Storms, Winter, Lightning, Wildfire
<b>33</b>	<b>#03-2012</b>	Improve Goodhue Road/Raymond Road/Route 4 Intersection	<b>Sep 2009</b>	Public Works Commission	\$0	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms
<b>32</b>	<b>#04-2012</b>	Develop a Town Website	<b>Jan 2012</b>	Town Admin	\$900 upfront \$300/yr	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Wind, Storms, Winter, Lightning, Wildfire
<b>35</b>	<b>#15-2012</b>	Trim Trees of Damaged Limbs	<b>Feb 2018</b>	Department of Public Works	\$0 - \$3,000	Flood, Wind, Storms, Winter, Lightning, Wildfire, Fire
<b>33</b>	<b>#16-2012</b>	Upgrade Forest Lane Drainage System	<b>May 2016</b>	Public Works Commission with Dept of Public Works	\$800,000	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms
<b>32</b>	<b>#21-2012</b>	Install Dry Hydrant at Hardy Lane	<b>Jun 2013</b>	Land Use Department	\$0	Lightning, Wildfire, Other Fires

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 7 PRIOR ACTION STATUS

Priority Score (2012)	Action Number	Action	Completed By Date	Who is Responsible	Approx \$ Cost	Natural Hazards Addressed
36	#33-2012	Educate the Public about Outdoor Fires	Sep 2017	Fire Department	\$0	Lightning, Wildfire, Other Fires
36	#44-2012	Develop Road Construction Standards	July 2013	Land Use Dept	\$2,000	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Winter
22	#54-2012	Develop and Adopt Gravel Excavation Regulations	Dec 2015	Planning Board	\$0	Flood, Landslide, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Earthquake

*Source: Boscawen Hazard Mitigation Committee*

The pink highlighted rows indicate the **34 Deleted** Actions in **Table 38**. Many of the Actions were deleted because they were preparedness, response or recovery items and more appropriately belonged in the Town's [Emergency Operations Plan](#).

**Table 38**  
**Deleted Mitigation Actions**

Priority Score (2012)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
34	#05-2012	Emergency Telephone at Jamie Welch Community Park	Feb 2012	Police Dept	\$0	Was incorporated into another Town activity
31	#06-2012	Satellite Television in Town Office/ Police Department/ EOC	Feb 2012	Emergency Management	\$600/year	Was not financially feasible
31	#07-2012	Bullet Proof Glass in Town Office	Feb 2012	Board of Selectmen	\$8,000	Was not a realistic activity to undertake
33	#08-2012	Cooperative Regional Fire District	Feb 2012	Fire Dept	\$0	Was not a realistic activity to undertake
32	#09-2012	Collect Baseline Data of Erosion Areas	Mar 2012	Public Works	\$0	Was incorporated into another Town activity
30	#10-2012	Develop Personal Alarm Policy for Employees	Mar 2012	Town Admin	\$0	Was not relevant to the Town's situation or was contrary to objectives
30	#11-2012	Publicize the Availability of Radon Meter for Borrowing	Mar 2012	Emergency Management	\$0	Was no longer a priority or necessary to the Town
33	#12-2012	Reconfigure Routes 3 & 4 Intersection	Apr 2012	Public Works Comm	\$0	Was not relevant to the Town's situation
32	#13-2012	Obtain Containment Plans for Commercial Underground Storage Tanks	Apr 2012	Board of Selectmen	\$300	Was not a realistic activity to undertake
36	#14-2012	Hold Regular Safety Committee Meetings	Jan 2018	Town Admin	\$0	Was a preparedness, response or recovery activity
32	#19-2012	Install Dry Hydrant at National Lumber on East Side of Route 4	Jan 2018	Fire Dept	\$60,000 2 culverts	Duplicates existing efforts

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 7 PRIOR ACTION STATUS

Priority Score (2012)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
32	#22-2012	Redirect Water Flow at King Street Intersection at Crete's Farm by State NHDOT	Jan 2018	Public Works Comm w/ Public Works	\$0	Was not a realistic activity to undertake
31	#24-2012	Install Dry Hydrant on Route 4 at Colby Lumber	Jan 2018	Public Works Comm w/ Public Works	\$0	Was not a realistic activity to undertake
30	#25-2012	Encourage NHDOT to Upgrade State Culverts	Jan 2018	Public Works Comm w/ Public Works	\$0	Was not a realistic activity to undertake
36	#26-2012	Barricade the Site of Downed Power Lines and Downed Trees	Jan 2018	Police Dept, Fire Dept, Public Works	\$0	Was a preparedness, response or recovery activity
36	#27-2012	Acquire Narrow Band Radio Programming for Departments	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
36	#28-2012	Explore Ability to Utilize Reverse 911 Notification or Similar Service (NIXLE) to Residents	Jan 2018	Police Dept	\$500	Was a preparedness, response or recovery activity
36	#29-2012	Maintain Telephone Service for Summer Recreation Program	Jan 2018	Parks and Recreation	\$50	Was a preparedness, response or recovery activity
32	#31-2012	Facilitate Meeting with Utility Companies to Expedite the Response to Utility Failure	Jan 2018	Fire Dept	\$0	Was a preparedness, response or recovery activity
24	#32-2012	Encourage Commercial Drivers Licenses for All Fire Fighters	Jan 2018	Fire Dept	\$0	Was a preparedness, response or recovery activity
36	#36-2012	Undertake Practical Fire Fighting Training	Jan 2018	Fire Dept	\$0	Was a preparedness, response or recovery activity
36	#37-2012	Hold Quarterly Disaster Drills with Departments	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
36	#38-2012	Require ICS & NIMS Certification for Town Emergency Personnel	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
36	#39-2012	Train Fire Department to Respond to Weather-Related Building Collapses	Jan 2018	Fire Dept	\$0	Was a preparedness, response or recovery activity
35	#40-2012	Participate in National Flood Insurance Program (NFIP) Training	Jan 2018	Land Use Dept	\$0	Was a preparedness, response or recovery activity
36	#42-2012	Develop Disaster Response Plan for Town Office Employees	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
36	#43-2012	Develop List of Local Equipment and Transportation Resources	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
35	#45-2012	Develop Maintenance Policy for Public Works Equipment	Jan 2018	Public Works	\$0	Was a preparedness, response or recovery activity

Priority Score (2012)	Action Number	Action	Deleted Date	Who is Responsible	Approx \$ Cost	Why Deleted? The Action...
34	#46-2012	Develop List of Public Generators	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
33	#47-2012	Develop Public Works Capital Equipment Schedule	Jan 2018	Public Works	\$0	Was a preparedness, response or recovery activity
31	#49-2012	Establish Emergency Response Training Fund	Jan 2018	Emergency Management	\$12,000	Was a preparedness, response or recovery activity
30	#51-2012	Develop Vulnerable Occupant Identification and Evacuation Plan	Jan 2018	Emergency Management	\$0	Was a preparedness, response or recovery activity
28	#52-2012	Develop Relocation Plan for Residents Requiring Services	Jan 2018	Welfare	\$0	Was a preparedness, response or recovery activity
26	#53-2012	Review the Existing Impact Fee Ordinance	Jan 2018	Planning Board	\$5,000	Was a preparedness, response or recovery activity

*Source: Boscawen Hazard Mitigation Committee*

The tan highlighted rows in **Table 39** indicate the **10 Deferred** mitigation Actions which also appear in the forthcoming **Mitigation Action Plan** for **2018**. Many Action titles will be revised to reflect the new focus on mitigation although the principle for each remains the same. They will all be reevaluated to accommodate **2018** needs.

**Table 39**  
**Deferred Mitigation Actions**

Priority Score (2012)	Action Number	Action	Deferred Date	Who is Responsible	Approx \$ Cost	Why Deferred? Because...	Hazards Addressed
35	#17-2012	Upgrade Water Street Hydrant System from the Corner of Raymond Road by Water Precinct	Mar 2018	Water Precinct and Town	\$135,000	More time is required for completion	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris, Earthquake
33	#18-2012	Upgrade North Water Street Culverts	Mar 2018	Public Works	\$120,000 4 culverts	Other activities took higher priority	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris
32	#20-2012	Upgrade Corn Hill Road Culverts	Mar 2018	Public Works	\$60,000 2 culverts	Other activities took higher priority (scheduled for 2018)	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris
31	#23-2012	Collect Baseline Data and Develop Inspection Program	Mar 2018	Public Works	\$300	Other activities took higher priority	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris



## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 7 PRIOR ACTION STATUS

Priority Score (2012)	Action Number	Action	Deferred Date	Who is Responsible	Approx \$ Cost	Why Deferred? Because...	Hazards Addressed
		for Culverts and Erosion-Prone Areas					
36	#30-2012	Establish an EOC with Appropriate Equipment for Emergency Response and Operations	Mar 2018	Emergency Management	\$6,000	Town did not have the funding or staff capability	Flood, Scouring & Erosion, Wind, Rapid Snow Pack Melt, Storms, Debris Earthquake, Landslide, Wildfire
36	#34-2012	Educate the Public about Unsafe Trees	Mar 2018	Public Works	\$0	Other activities took higher priority	Flood, Wind, Storms, Winter, Lightning, Wildfire, Fire
36	#35-2012	Educate Homeowners about Snow Load Damage Prevention	Mar 2018	Life Safety	\$0	Other activities took higher priority	Winter Weather, Wind
36	#41-2012	Develop Town Snow Plow Policy	Mar 2018	Public Works	\$0	More time is required for completion	Winter Weather, Wind
32	#48-2012	Update the Zoning Ordinance to Comply with NFIP Requirements	Mar 2018	Planning Board	\$0	Needs to be repeated to be effective	Flood, Rapid Snow Pack Melt, Ice Jams
30	#50-2012	Update the 2001-2002 Master Plan	Mar 2018	Planning Board	\$15,000	Needs to be repeated to be effective (many Chapters reviewed annually)	Flood, Scouring & Erosion, Rapid Snow Pack Melt, Storms, Debris, Earthquake, Landslide, Wildfire

*Source: Boscawen Hazard Mitigation Committee*

## **8 MITIGATION ACTION PLAN**

The Chapter provides a summary discussion of the Actions the community can consider completing to help mitigate the effects of hazard events.

The **Mitigation Action Plan** is the culmination of the work of the previous Assessments, inventories, and evaluations from the previous Chapters. Actions to help Boscawen mitigate the damages caused by disasters have been developed and prioritized by Hazard Mitigation consensus in consideration of both existing and new development.

### **SOURCES OF ACTIONS**

After determining the status of the existing Actions, **New** Actions can be determined. **New** Actions were evaluated by Hazard Mitigation Committee the using the **Problem Statements** determined during discussion of critical facility and community facility sites' potential vulnerability to hazards in the **Critical Facility and Community Vulnerability Assessment**. Many of these problems were further evaluated and developed into **New** mitigation Actions.

The **Capability Assessment** yielded a wealth of information from the **Future Improvements** of the plans, programs, ordinances, policies, agreements, technical skills, financial resources, and other resources the Town Departments, School District, and Stakeholders had available. These activities are important to the community. They assist Departments with the procedures, training, regional coordination, mutual aid, planning and purchases needed to perform their duties effectively. These activities in turn increase the capability for mitigating hazard events. For the **2018 Plan**, most of the **Capability Assessment's Future Improvements** activities were not utilized as Actions since they are more appropriate for the Town's **Emergency Operations Plan** recommendations.

Other community ideas were introduced to or by the Hazard Mitigation Committee as a result of Department, Board, Commission or Town discussions. Where appropriate, supported activities were introduced as New mitigation Actions.

**Mitigation Actions were developed to emphasize both new and existing buildings and infrastructure, and developments to better protect the populations and properties of Boscawen.**

Several uncompleted **Deferred** (2012) Boscawen mitigation Actions have been carried forward into the **2018 Plan** with the updates to the evaluation, cost, prioritization, etc.

## ACTION MATRIX

A listing of **10 Deferred** mitigation Actions from **2012** and **10 New** mitigation Actions from **2018** important to the Town of Boscawen was developed for evaluation. Each Action identifies at least one **Hazard Mitigated** which correlates to **3 GOALS AND OBJECTIVES**, describing how it can mitigate these identified natural hazard objectives. A short **Description and Evaluation** is provided and the **Affected Location** is listed to ensure easier understanding and reassessment of the Actions in the future during implementation.

The Actions are numbered for easier tracking. The **2012** Actions received the designation of **#01- 2012** through **#54- 2012**. The **2018** Actions picked up where the prior Actions left off, beginning with **#55- 2018** through **#64- 2018**. Over time, the Actions can be tracked to see which have been **Deferred** and to organize the **Completed** or **Deleted** Actions. For those with funding needs, the ability to reference an Action within the Capital Improvements Program or in a Warrant Article can alleviate confusion and further support the mitigation Actions.

Each Action is sorted into one of these four mitigation Action categories, although it might identify with several:

Local Planning and Regulation  
Structure and Infrastructure Projects  
Natural Systems Protection  
Education and Awareness

Within the **Mitigation Action Plan**, the **Deferred 2012** Actions and the **New 2018** Actions are evaluated by the relative ease of completion using a numeric **Ranking Score** generated by the enhanced STAPLEE prioritization, by the **Action Timeframe** by which the Hazard Mitigation Committee would like to see the Action implemented, and by a basic **Cost to Benefit Analysis** as contained within the STAPLEE.

The **Responsible Department** is indicated for each Action as the party who will ensure the Action gets completed. An **Approximate Cost** is provided, although no definitive cost estimates or quotes have been obtained now. Ways the Action can be **Funded** is identified and offered as an avenue to explore during implementation. The purpose is to offer an idea of how much funding is provided for each Action and how it may be paid for.

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## Boscawen's Mitigation Action Plan 2018

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At the meetings, the Hazard Mitigation Committee identified by consensus these mitigation Actions from the various **Assessments** and evaluations conducted. The process for Action development has been described in previous Chapters and sections. Combined with the visual Maps of the **Hazard Mitigation Plan 2018**, the **Mitigation Action Plan** shown in **Table 40**, **Table 41**, **Table 42** and **Table 43** should be able to guide future hazard mitigation efforts in the Town through an annual implementation process.

Ten (**10**) **Deferred** Actions from **2012** and **10** **New** Actions from **2018** combine to develop the **20** Actions of the **2018 Mitigation Action Plan**. The **Deferred** Actions' cells are highlighted in tan.

Table 40  
Local Planning and Regulation Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#41-2012	Develop Town Snow Plow Policy to Reduce Winter Weather Impacts	<u>Short Term</u> 1-2 Years	75	Public Works Department	\$500	A written policy will state when the roads are plowed so there is no conflict. It may help with liability and/or insurance, and employees will know the what/when/how/where of plowing.	Storms, Winter, Debris	Town Roadways	Cost is for legal review.	Town Legal Budget
#48-2012	Update the Zoning Ordinance to Comply with NFIP Requirements to Regulate Building in the Floodplain	<u>Long Term</u> 4-5 Years then Ongoing	75	Planning Board	\$0	The Zoning Ordinance needs to be updated as new requirements to the National Flood Insurance Program are necessary for retention of NFIP participation. The Floodplain Ordinance protects life and property by regulating distance of structures to flood hazard areas, regulating elevation, clarifying definitions, regulating new structures and encroachments, stating duties of the Code Enforcement Officer, etc. In 2008, the Town adopted the recommended updates to the ordinance, and in 2010 the new NFIP maps were adopted. The existing ordinance is amended with federal updates on an occasional basis.	Flood, Ice Jams, Erosion & Scouring	Floodplains	Cost is for in-kind staff and volunteer labor.	N/A
#50-2012	Update the 2001-2002 Master Plan to Support the Development of Zoning Ordinances and Regulations that	<u>Short Term</u> 1-2 Years then Ongoing (Annual)	75	Planning Board	\$300	The project will maintain a balance between the Town's needs and the growth of the Town. A couple of Chapters will be updated every year. This document is the basis for regulations and ordinances,	Flood, Ice Jam, Scouring & Erosion, Wind, Storms, Lightning,	Entire Town	Cost is for printing the new chapters.	Planning Board Printing Budget

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
	Help Protect the Town from Natural Hazards					including those that mitigate natural hazards.	Wildfire, Winter, Drought, Heat, Earthquake, Landslide, Dam Failure, Debris, Hazardous Materials, Public Health			
#55-2018	Hold Discussions on the Merits of Requiring New Developments to Install Underground Utilities to Reduce the Impact of Storms, Wind and Winter Events to the Community	<u>Short Term</u> 1-2 Years	68	Planning Board	\$1,500	Power lines regularly fail, community-wide, due to winter weather and lightning strikes. The Depot Street substation is especially vulnerable to damage caused by weather or pests. The power companies have a more rigorous tree trimming schedule.	Wind, Storms, Winter, Lightning, Wildfire	King Street Corridor	Cost is for contracting (CNHRPC) and legal review.	Planning Board Budget
#56-2018	Continue the Manufactured Home Acquisition and Demolition Program Where Appropriate to Ensure Park Neighborhoods are Safer from Storms, Wind Events, and Fires	<u>Short Term</u> 1-2 Years then Ongoing (Annual)	62	Tax Collector, then Board of Selectmen	Est. \$5,000 / per unit	The manufactured housing parks will be at greater risk of wind and fire hazards than regular homes, particularly MF homes older than 2006 which are not required to be anchored (wind). Existing MF homes have no required setbacks between structures. The newer parks are safer (Smith) with homes on slabs and built to current codes. Some homes are condemned for health reasons and the same situation could occur. In time, should see that	Flood, Wind, Storms, Lightning, Wildfire, Winter, Heat, Earthquake, Hazardous Materials, Public Health	Manufactured Home Parks	Cost is for legal fees and demolition (PWD)	Tax Deeded Properties and Legal Fees Budgets



## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						parks should have more space and be safer. Town acquires MF homes for back taxes and demolishes the homes. To rebuild, new ones have to comply with HUD standards. Costs the Town more money to obtain & demolish than the value of back taxes.				
#57-2018	Develop a Policy for the Provision of Potable Water to Downtown Businesses During a Storm, Wind or Winter Event That Causes Utility Failure	<u>Short Term</u> 1-2 Years then Ongoing (Annual)	57	Emergency Management with Water Precinct	\$500	All King Street/Main Street businesses are on the public water supply, so if the Penacook Boscawen Water Precinct is not operational water is unavailable to all businesses.	Wind, Storms, Lightning, Wildfire, Winter, Drought, Heat, Earthquake, Debris, Hazardous Materials, Public Health	King Street Corridor and Main Street	Cost is for legal review.	Property and Legal Fees Budgets
#58-2018	Improve the Site Plan Review Regulations and Establish Standards, Including Building Design, Landscaping, Access Management, and Stormwater Drainage, to be Met by All New Developments Along the King Street Corridor to Be Safer from Storms, Wind, Winter Weather and Other Hazards	<u>Short Term</u> 1-2 Years	72	Planning Board	\$0	All King Street/Main Street businesses are on the public water supply, so if the Penacook Boscawen Water Precinct is not operational water is unavailable to all businesses. Same as electric outage - affects the entire business area. The King Street Coordination Study (2017) was reviewed to see if there were any mitigation actions to add. Improving King Street through regulations will make the entire area safer from natural hazards (severe storms, winter weather,	Flood, Scouring & Erosion, Storms, Wind, Winter, Debris, Hazardous Materials	King Street Corridor	Cost is for in-kind staff and volunteer labor.	N/A

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						wind events), as well as from the secondary hazards that occur with natural disasters (power failure, traffic accidents, fire) and hazardous materials spills.				

Source: Boscawen Hazard Mitigation Committee

**Table 41**  
**Structure and Infrastructure Projects**

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#17-2012	Upgrade Water Street Hydrant System from the Corner of Raymond Road by Water Precinct to Ensure Safe Water Delivery	<u>Long Term</u> 4-5 Years	61	Water Precinct	\$500,000 - \$1,000,000	Existing problems at this site are the small pipes and the inability to feed the amount of water necessary. An upgrade is essential, to include a pump to get the required amount of water and supply faucets. Penacook-Boscawen Water Precinct owns the pipes and hydrants, and system is outdated. However, it works fine at this time for normal usage but would not work with a fire truck. Costs provided from the Precinct engineer are to upgrade the pump to be larger, upgrade the wiring, and purchase and install a bigger emergency generator.	Flood, Ice Jam, Scouring & Erosion, Wind, Storms, Winter, Drought, Earthquake, Landslide, Debris, Public Health	Water Street area, Raymond Road	Cost is for putting in a pump system or put in a water tank at the top of Water Street. Perhaps the Town could share costs.	Water Precinct User Fees, Bond
#18-2012	Upgrade North Water Street Culverts to Protect from Floods and Debris	<u>Long Term</u> 4-5 Years	73	Public Works	\$5,000	The four culverts are small enough to trap debris and North Water Street floods out. The culverts all need to be engineered and upgraded. NHDES regulation states culverts can only increase by 1 size without NHDES permits or engineering. Paving needs to be done at the same time, waiting for paving to make improvements.	Flood, Scouring & Erosion, Storms, Debris	North Water Street	Cost is for permitting and materials.	PWD Road Resurfacing Budget
#20-2012	Upgrade Corn Hill Road Culverts to Protect from Floods and Debris	<u>Short Term</u> 1-2 Years	75	Public Works	\$6,000	Corn Hill Road Culverts are undersized and trap debris. Flood waters cannot run through culverts, so it runs over the top and flood Corn Hill Road. Corn Hill	Flood, Scouring & Erosion, Storms, Debris	Corn Hill Road	Cost is for permitting and materials.	PWD Road Resurfacing Budget

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						Road is an important local collector road connecting nearby Webster residents to I-93.				
#23-2012	Collect Baseline Data and Develop Inspection Program for Culverts and Erosion-Prone Areas	<u>Short Term</u> 1-2 Years	75	Public Works	\$60,000	To develop an Asset Management Plan. There is an erosion problem on River Road and in other areas of Boscawen. Baseline data needs to be collected to ascertain the existing conditions of problem areas, and regular inspection needs to occur to see how the erosion areas have changed. Regular inspection will prevent damages and catastrophic failures, and will increase safety and save money. An inspection program will provide a better awareness of culvert conditions, potential flooding, and future expenses.	Flood, Scouring & Erosion, Storms, Debris	Town Roadways	Cost is for a study, collection by PWD and contractor, software, hardware, etc.	Warrant Article, 2/3 vote 2018. Bond Principle forgiveness through NHDES Asset Mgmt Program through State Revolving Fund (100% will be paid for by bond ultimately)
#30-2012	Establish an EOC with Appropriate Equipment for Emergency Response and Operations	<u>Long Term</u> 4-5 Years	75	Emergency Management	\$50,000	Currently, no dedicated space for an EOC exists in Town, although the Police Department would be used in a disaster event. The goal is to establish an EOC with appropriate equipment for emergency response and operations. Space must be made on site or in the Police Department. Equipment and service needs include television,	Flood, Ice Jam, Scouring & Erosion, Wind, Storms, Lightning, Wildfire, Winter, Drought, Heat,	Entire Town, Municipal Building	Cost is for a dedicated space, television, radio, base radio, computers, phone, and internet installation	EMPG (50/50), Warrant Article

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
						radio, base radio, computers, phone, internet. The EMD will transfer existing emergency response equipment over to store in the new EOC. Older computers cycled out from the Town Office operations may be used.	Earthquake, Landslide, Dam Failure, Debris, Hazardous Materials		and equipment.	
#59-2018	Construct a New Public Works Garage to Current Code to Enable Better Response to Storms, Winds, and Winter Events	<u>Long Term</u> 4-5 Years	75	CIP Committee, then the other Depts	\$500,000 - \$750,000	The old age of Town facility buildings (Fire Department, Municipal Building, Water Precinct, Public Works) render them vulnerable to lightning, winter weather and downed trees resulting in power failure, and are a fire risk. **DPW- Public Works Garage and offices need to be redesigned and rebuilt, a CIP item. Small, outdated, no heat, systems inadequate, equipment does not fit. The DPW's response to storm, wind and winter weather events would be stronger with a new building, proper heating and electrical systems, and room for vehicles and equipment used to counteract these events. Room for expansion, for may have a new structure - engineering study to determine.	Flood, Ice Jam, Scouring & Erosion, Wind, Storms, Lightning, Wildfire, Winter, Drought, Heat, Earthquake, Landslide, Dam Failure, Debris, Hazardous Materials, Public Health, Sabotage, Vandalism, Human	Blueberry Lane, existing PWD	Cost is to survey, hire an engineer, and construct a new Public Works facility to code that accommodates staff and equipment.	CIP, Public Works Building Capital Reserve Fund, Warrant Article
#60-2018	Investigate the Utility of Lightning Rods along the Municipal Building Rooftops and Associated Grounding Systems to Mitigate Lightning Strikes	<u>Medium Term</u> 3-4 Years	65	Building Dept	\$5,000	The historic brick, 4-story Municipal Building (housing the Town Offices, Police Department and Library) is particularly vulnerable to lightning strikes and earthquakes.	Lightning	Municipal Building, Police Dept, EOC	Cost is for installation, lightning rods, surge protectors, grounding system for	Warrant Article or Building Fund

## Town of Boscawen, NH Hazard Mitigation Plan Update 2018

### 8 MITIGATION ACTION PLAN

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
									the building. Estimates \$2,500 per 2,500 square feet of roofing.	
#61-2018	Upgrade Goodhue Road Catch Basins from Erosion and Scouring	<u>Short Term</u> 1-2 Years	75	Public Works	\$2,500	Rebuild before final paving. Basins had salt scouring away at concrete, new catch basins will be replaced with concrete too.	Flood, Scouring & Erosion, Storms, Debris	Goodhue Building	Cost is for materials.	PWD Road Resurfacing Budget
#62-2018	Install a Generator at the Town Office to Run the EOC and Town Office Functions During Storms, Winds, Winter and other Hazard Events	<u>Short Term</u> 1-2 Years	75	Town Admin	\$60,000	Although the Police Department has its own generator, the Town Office and EOC do not have backup electricity in the event of power failure. The Town administration needs to be able to access its records and take care of business while the EOC needs to be able to run the incident command system. A generator for these Departments is needed.	Wind, Storms, Lightning, Wildfire, Winter, Heat, Earthquake, Dam Failure, Debris	Town Office, EOC	Cost is concrete pad, wiring, and generator.	EMPG 50/50, Warrant Article

*Source: Boscawen Hazard Mitigation Committee*



Table 42  
Natural Systems Protection Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#63-2018	Establish a Partnership between the Town and State to Protect the Hannah Dustin Island Historical Monument by Reducing Erosion	<u>Short Term</u> 1-2 Years	45	Historical Society	\$0	During extreme flooding events, the Hannah Dustin historic site in the Merrimack River floodplain, monument or swept away in a strong flood or the island could be flooded and eroded. Town owns 2/3 of island, State owns the 1/3 where monument is located. The State is beginning to maintain its section of the island, mowing, chipping. The monument is a lower priority because a high flood would take out the river's nearby houses as well. Unlikely to flood that badly in the near future, although it occurred during the 1936 floods. Historical Society should be the Town group that leads this effort.	Flood, Scouring & Erosion, Storms	Hannah Dustin Island	Cost is for in-kind staff and volunteer labor.	N/A
#64-2018	Obtain Access for a Fire Department Boat Launch on the Merrimack River by Grading Existing Gravel Farm Road	<u>Medium Term</u> 3-4 Years	75	Fire Department	\$20,000	Must involve the State because they own the land that landlocks the Town's parcel. There is a current rough layout for access at Commercial Street at old Boscawen bridge to add parking across the tracks. This plan could include a Fire Department boat launch at Hannah Dustin for emergency rescue.	Scouring	Behind Hannah Dustin Parking Lot, Farm Road off of River Road and Commercial Street	Cost is for legal easement documentation and road grading, a gate may be required.	CIP, Warrant Article

Source: Boscawen Hazard Mitigation Committee

Table 43

Education and Awareness Actions

Action Number	Action	Action Timeframe	Ranking Score	Who is Responsible	Approx Cost to Town	Description and Evaluation of Action	Hazards Mitigated?	Affected Location in Town	What Cost Will Pay For	How Funded
#34-2012	Educate the Public about Unsafe Trees to Reduce Storm Damage	<u>Short Term</u> 1-2 Years Ongoing	75	Public Works Department	\$0	An article could be placed in the Newsvine and conversations would be had with the public to educate them about removing dangerous trees from their property along the roadway. It can also be placed on the Town's website. Until cuts intermittently. The DPW gets phone calls regularly from homeowners.	Wind, Storms, Winter, Lightning, Wildfire	Entire Town	Cost is for in-kind staff and volunteer labor.	N/A
#35-2012	Educate Homeowners about Snow Load Damage Prevention to Prevent Building Collapse	<u>Short Term</u> 1-2 Years Ongoing	75	Building Department	\$0	The project would consist of placing an article in the Newsvine during the winter snow season, developing a brochure in-house, and placing the information on the Town's website. NH Fire Marshal's Office advertises, Town can hyperlink to their site: <a href="https://www.nh.gov/safety/divisions/firesafety/">https://www.nh.gov/safety/divisions/firesafety/</a>	Wind, Storms, Winter	Entire Town	Cost is for in-kind staff and volunteer labor.	N/A

Source: Boscawen Hazard Mitigation Committee

### Great Projects... And the Realities of Project Implementation in New Hampshire

These important but costly and/or time consuming mitigation projects identified in the **Mitigation Action Plan** represent the best case scenarios (or to some, “wish-list” items) for completion. There are many barriers to successful implementation of any project which is outside the typical duties of a Town staff member. The annual struggle to obtain municipal funding at Town Meetings and the uncertainty of political & local support needed for hazard mitigation projects, the limited staff time available to administer and complete the projects, and dwindling volunteer support to help locate grants and work on the Action Plan items all reduce the Town’s ability to complete successful hazard mitigation projects within the Plan’s **5**-year lifespan. Town staff and volunteers are usually forced to be reactive to their numerous daily duties or annual processes and have little availability to be proactive. This is especially true for the Central NH region’s smaller communities that rely on voter support for staff hiring and/or hazard mitigation project budget funding, which is 19 out of 20 municipalities.

Therefore, mitigation and other projects are generally completed on an “as-needed basis” or on an “as-available basis” despite the different ways of evaluation and prioritization shown within the **Hazard Mitigation Plan 2018**. Small New Hampshire communities do the best they can with the resources available to them to make ends meet, particularly in times of economic duress or hardship and our aging population. Town Meeting voters decide whether to approve new zoning ordinances which can help mitigate hazards, vote to approve Department Budgets which usually are sustainable and do not allow enough flexibility to plan ahead, and vote to approve Warrant Articles for a hazard mitigation project. Town Volunteers are relied upon to do much of the hazard mitigation work as Town staff are already engaged in real-time, constant public engagement issues and have little additional time available for planning. Few younger people are stepping up to the plate of community volunteering when our existing volunteers are retiring. Indeed, many staff or volunteers have dual or triple roles in the community to fill vacancies, such as a Town Administration serving as Health Officer and Human Services Officer and a volunteer Fire Chief serving as volunteer Emergency Management Director.

NH communities are used to “toughing it out” and will try to accomplish all they can with the time, funding and resources available to them. However, many of these **2018** Actions may end up **Deferred** to **2023** simply because of the unique nature of our independent State and community culture.

## Action Evaluation and Prioritization Methods

A variety of methods were utilized to evaluate and prioritize the Actions. These methods include the enhanced STAPLEE (Social Technical Administrative Political Legal Environmental and Economics) criteria, designating the Action to be completed within a certain timeframe, and completing a basic **Cost to Benefits Analysis**, a later section. These prioritization methods are meant to enable the community to better identify which Actions are more important and are more feasible than others.

### ENHANCED STAPLEE METHOD

An enhanced provided a better methodology for prioritization the Actions against one another. The Hazard Mitigation Committee ranked each of the mitigation Actions derived from the evaluation process. The total **Ranking Score** serves as a guide to the relative ease of Action completion by scoring numerous **societal and practical impact questions** and does not represent the Town's Action *importance* priority. Instead, the STAPLEE process evaluates each Action and attempts to identify some potential barriers to its success. A score of **75** would indicate that the mitigation strategy, or Action, would be relatively among the easiest Actions to complete from a social and practical standpoint.

All enhanced STAPLEE answers are subjective and depend on the opinions of the Committee members discussing them. The Committee answered these **15** questions with a numeric score of "**1**" indicating a **NO** response, "**2**" indicating an **UNCERTAIN** response, "**3**" indicating a **MAYBE** response, "**4**" indicating a **LIKELY** response or "**5**" indicating a **YES** response, about whether the Action can fulfill the criteria:

- Does the action reduce damage and human losses?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Does the action offer reasonable benefits compared to its cost in implementing?
- Is the action legal?
- Is the action support or protect the environment?
- Have the funding necessary for completion?
- Have the necessary staff or volunteers to undertake?
- Support historic preservation?

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

# Town of Boscawen, NH Hazard Mitigation Plan Update 2018

## 8 MITIGATION ACTION PLAN

The STAPLEE scores can range from a low of **15** to a high **75**. Boscawen's **Enhanced STAPLEE Ranking** of the **2018 Mitigation Actions** is shown in **Figure 23**.

**Figure 23**

### Enhanced STAPLEE Ranking of Mitigation Actions

Action Number	Does the Action..... or Is the Action.....	Reduce Damage?	Contribute to Town Objectives? (Supported by Master Plan or current thinking?)	Meet Regulations? (If there are any)	Protect Sensitive Structures? (Buildings, roads, culverts, human-made things?)	Implement ed Quickly? (See also Action Plan for Timeframe)	Socially Acceptable? (People like it)	Politically Acceptable? (Public Officials like it)	Administratively Realistic? (Have admin skills or time for paperwork)	Technically Feasible? (Have tech skills or special equipment)	Have a Reasonable Cost to Benefits Gained?	Legal? (Or will be legal upon completion)	Support or Protect the Environment?	Have the Funding?	Have Necessary Staff or Volunteers?	Support Historic Preservation?	Ranking Score 15-75
#17- 2012	Upgrade Water Street Hydrant System from the Corner of Raymond Road by Water Precinct to Ensure Safe Water Delivery	5	5	5	5	1	5	5	1	5	3	5	5	1	5	5	61
#18- 2012	Upgrade North Water Street Culverts to Protect from Floods and Debris	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	73
#20- 2012	Upgrade Corn Hill Road Culverts to Protect from Floods and Debris	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#23- 2012	Collect Baseline Data and Develop Inspection Program for Culverts and Erosion-Prone Areas	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#30- 2012	Establish an EOC with Appropriate Equipment for Emergency Response and Operations	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#34- 2012	Educate the Public about Unsafe Trees to Reduce Storm Damage	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#35- 2012	Educate Homeowners about Snow Load Damage Prevention to Prevent Building Collapse	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#41- 2012	Develop Town Snow Plow Policy to Reduce Winter Weather Impacts	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#48- 2012	Update the Zoning Ordinance to Comply with NFIP Requirements to Regulate Building in the Floodplain	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#50- 2012	Update the 2001-2002 Master Plan to Support the Development of Zoning Ordinances and Regulations that Help Protect the Town from Natural Hazards	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#55- 2018	Hold Discussions on the Merits of Requiring New Developments to Install Underground Utilities to Reduce the Impact of Storms, Wind and Winter Events to the Community	5	5	5	3	5	5	4	5	5	2	5	5	5	5	4	68
#56- 2018	Continue the Manufactured Home Acquisition and Demolition Program Where Appropriate to Ensure Park Neighborhoods are Safer from Storms, Wind Events, and Fires	5	5	5	1	5	3	5	5	5	4	5	4	5	4	1	62
#57- 2018	Develop a Policy for the Provision of Potable Water to Downtown Businesses During a Storm, Wind or Winter Event That Causes Utility Failure	3	3	3	3	3	5	5	3	5	3	5	3	5	5	3	57
#58- 2018	Improve the Site Plan Review Regulations and Establish Standards, Including Building Design, Landscaping, Access Management, and Stormwater Drainage, to be Met by All New Developments Along the King Street Corridor to Be Safer from Storms, Wind, Winter Weather and Other Hazards	5	5	5	5	3	5	5	5	5	4	5	5	5	5	5	72
#59- 2018	Construct a New Public Works Garage to Current Code to Enable Better Response to Storms, Winds, and Winter Events	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#60- 2018	Investigate the Utility of Lightning Rods along the Municipal Building Rooftops and Associated Grounding Systems to Mitigate Lightning Strikes	4	5	5	5	2	5	5	3	5	5	5	1	5	5	5	65
#61- 2018	Upgrade Goodhue Road Catchbasins from Erosion and Scouring	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#62- 2018	Install a Generator at the Town Office to Run the EOC and Town Office Functions During Storms, Winds, Winter and other Hazard Events	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
#63- 2018	Establish a Partnership between the Town and State to Protect the Hannah Dustin Island Historical Monument to Reduce Erosion	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	45
#64- 2018	Obtain Access for a Fire Department Boat Launch on the Merrimack River by Grading Existing Gravel Farm Road	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	75
																	0

Source: Boscawen Hazard Mitigation Committee

## ACTION TIMEFRAMES

The Actions are also prioritized by an estimated **Action Timeframe** for completion based upon the other Town activities (hazard mitigation-related or not), funding potential for the Action, the need for the Action project, and possible staff time and volunteers available to complete the Action. This relative Action importance priority is measured by the **time indicated for project completion**. All Action projects within the **Mitigation Action Plan** have been assigned an **Action Timeframe**.

Those projects which are designated as **Ongoing** mean the Action should be undertaken on a regular basis throughout the five-year lifespan of the Plan. Actions that could qualify as **Ongoing** include public education, zoning ordinance or regulation revisions, essential mitigation maintenance and more. However, even **Ongoing** Actions are completed once before repetition. As a result, those Actions with an **Ongoing Action Timeframe** also include a duration (**Short**, **Medium** or **Long Term**) included.

Action Timeframe	Description of Timeframe
<b>Ongoing</b>	Action undertaken throughout the life of the 5-year Plan
<b>Short Term</b>	Action should be undertaken during Years 1-2 of the Plan
<b>Medium Term</b>	Action should be undertaken during Years 3-4 of the Plan
<b>Long Term</b>	Action should be undertaken during Years 4-5 of the Plan

**Short Term** projects are those which are the more important Actions and should be undertaken during **Years 1-2** of the Plan's lifespan if possible. **Medium Term** Actions are recommended by the Hazard Mitigation Committee to be undertaken during **Years 3-4** of the Plan's lifespan, while **Long Term** Actions are those which should wait until last, with suggested implementation undertaken during Plan **Years 4-5**. It is important to remember the **Action Timeframes** are relative to each other and are another indication of Action importance. If an Action cannot be completed within the **Action Timeframe**, it may still be a higher priority than other Actions but was unable to be implemented for some reason.

Both the **Action Timeframe** and the **Ranking Score** are incorporated into the **Mitigation Action Plan** to assist the Town with implementing the hazard mitigation Actions. The Actions can be sorted within their Action Category by either priority for easy display of the desired characteristic; Actions can also be sorted by **Responsible Department** to keep them all together for ease of completion.

## COST TO BENEFIT ANALYSIS

A simple **Cost to Benefit Analysis** ranking is contained within the enhanced STAPLEE criteria.



## Natural Hazards Evaluated for Which Specific Actions Were Not Identified

The Hazard Mitigation Committee assessed each of hazards and made determinations whether to specifically develop mitigation Actions for all natural hazards. Nearly all the potential Actions can be applied to multiple natural or other hazards based upon the generality of the Action's effect. Still, there could be no solutions or mitigation Actions developed for some of the more difficult to mitigate natural hazards. Many possible reasons are considered such as feasibility, prohibitive cost, jurisdiction, staff availability to develop and administer the project, lack of local support, unrealistic favorable outcome for the effort and more, all resulting in the point that for some natural hazards, potential Actions would not have worked for the Town.

Many Actions are general in nature and have the capacity to mitigate multiple types of natural hazards. Those hazards for which no specific or feasible Action was identified are displayed in **Table 44**.

**Table 44**

### Committee Assessment of Natural Hazards with No Mitigation Actions

Natural Hazard	Committee Assessment
Excessive Heat	The Committee believes <b>Excessive Heat</b> issues may be better addressed at the public education level than by mitigation projects. The Fire Department has lists of vulnerable residents to check on. Along with Heat comes the potential for more severe arboviral and tick-borne diseases. The Boscawen Congregational Church and Library offer Cooling Centers, as could the Boscawen Elementary School upon request. <b>The Committee did not feel additional mitigation Actions could be proposed for Excessive Heat beyond those which generally cover public health education.</b>
Tornadoes	The Committee felt <b>Tornadoes</b> would be a difficult, unpredictable hazard event to mitigate. Although if a <b>Tornado</b> were to occur, existing activities such as the State Building Code, current practices Public Works Department or utility company hazardous tree removal, and generators are in place. Several of the <b>Severe Wind</b> -related Actions could also apply to <b>Tornadoes</b> . <b>The Committee felt no specific Actions were within the scope of their jurisdiction.</b>
Downbursts	The Committee's assessment of <b>Downbursts</b> is the same as <b>Tornadoes</b> . They felt <b>Downbursts</b> could be mitigated by those Actions that addressed <b>Wind</b> or <b>Storm</b> events. <b>The Committee did not feel specific mitigation Actions for Downbursts could be pursued.</b>

*Source: Boscawen Hazard Mitigation Committee*



## **9 ANNUAL IMPLEMENTATION AND EVALUATION**

The Town received FEMA approval for the prior **Hazard Mitigation Plan** in **December 2012**. The completion of a planning document is merely the first step in its life as an evolving tool. The **Hazard Mitigation Plan Update** is a dynamic document that should be considered by all Town Departments, Boards, and Committees within their normal working environments. While evaluating the effectiveness of Actions in its everyday implementation, everyone should be able to contribute to the relevancy and usefulness of the Plan and to communicate with the Hazard Mitigation Committee where changes should be made. An annual effort will be undertaken to complete Actions and add new Actions as old tasks are completed and new situations arise. This Chapter will discuss the methods by which the Town of Boscawen will review, monitor, and update its new **Boscawen Hazard Mitigation Plan Update 2018**.

### **Annual Monitoring and Update of the Mitigation Action Plan**

The Board of Selectmen should vote to establish a permanent Hazard Mitigation Committee within **3 months** of receiving the FEMA **Letter of Formal Approval** as indicated in **1 PLANNING PROCESS**. The purpose is to meet on a regular basis to ensure the **Hazard Mitigation Plan's** Actions are being actively worked on and the Plan is evaluated and revised to fit the changing priorities of the Town.

The Emergency Management Director or Board of Selectmen designee should continue to serve as Chair of the Committee for Hazard Mitigation meetings, and should be appointed to such a capacity by the Board of Selectmen. Current Hazard Mitigation Committee members can be appointed to continue to participate as members of the permanent Committee. More information is provided in **APPENDIX B**.

Committee membership should include:

- |   |                                    |
|---|------------------------------------|
| ✓ Emergency Management Director           | ✓ 1 Board of Selectmen member      |
| ✓ Town Administration                     | ✓ 1 Planning Board member          |
| ✓ Fire Chief                              | ✓ 1 Conservation Commission member |
| ✓ Police Chief                            | ✓ 1 Agricultural Commission member |
| ✓ Public Works Director                   | ✓ 1 School District Representative |
| ✓ Building Inspector/ Life Safety Officer | ✓ Members at Large (Stakeholders)  |
| ✓ Land Use Coordinator                    |                                    |

Stakeholders who should be solicited to attend meetings and to participate equitably in the Plan development process include the Historical Society, Library, NH Veterans Cemetery, Penacook-Boscawen Water Precinct, Boscawen Congregational Church, Merrimack County, Merrimack Valley

School District, Business Community members, Non-profits, and local, State or Federal agency representatives and members of the public. This composition provides a wide spectrum of potential interests and opportunities for partnership to develop and accomplish Actions.

This Committee will **aim to meet up to 4-6 times per year** with the following potential future meeting activities to update the **Mitigation Action Plan** and complete the Plan's annual evaluation as displayed in **Table 45**.








**Table 45**

**Hazard Mitigation Committee Preliminary Annual Future Meeting Activities**

Meeting Month	Preliminary HMC Interim Meeting Agenda Items
<b>February</b>	HMC sends <b>Progress Reports #3</b> to Departments for completion by beginning of March. HMC continues update to the <b>Mitigation Action Plan</b> using <b>Department Mitigation Action Progress Reports</b> and an updated <b>Action Status Tracking sheet</b> . HMC provides revised copies to Department Heads, keeps original Word and Excel files accessible on Town computer system.
<b>MARCH</b> <b>HMC Meeting</b> <i>\$ available</i>	<b>Annual funding is received from Town Meeting.</b> HMC completes annual update of the <b>Mitigation Action Plan and the associated Plan Chapter and sections (CHAPTER 8)</b> with <b>Progress Reports #3</b> . HMC determines Action Plan items to pursue for this year, including \$0 cost items.
<b>March – June</b>	<b>HMC ensures Department Heads are provided with information to work on their Actions.</b> HMC meets with Department Heads to inform about the Action priorities and requests attention to <b>Short Term (1-2 Years)</b> Actions. Departments begin working on Actions.
<b>JUNE</b> <b>HMC Meeting</b> <i>Infrastructure projects underway</i>	<b>Infrastructure projects will be underway.</b> HMC provides a <b>Progress Report #1</b> for all Actions to responsible Depts/Boards for response by beginning of July. HMC reviews <b>Annual Evaluation of the Plan (CHAPTER 9)</b> . HMC works with the CIP Committee to get certain projects placed into CIP. Depts to begin placement of next year's high-cost Action Plan items into the CIP.
<b>August</b>	HMC to assist Department Heads with their budget requests to include <b>Action Plan</b> items, and to determine which Actions should have warrant articles. HMC continues assistance to Departments for <b>Action Plan</b> items. HMC begins to update the <b>Action Status Tracking Sheet</b> . HMC ensures Haz Mit Actions are added into the CIP.
<b>SEPTEMBER</b> <b>HMC Meeting</b>	HMC will identify projects to accomplish (including \$0) for the upcoming year. HMC provides a <b>Progress Report #2</b> for all Actions to responsible parties for response by beginning of October. The <b>Action Status Tracking Sheet</b> is sent to Department/ Boards to display Action progress and request updates. HMC attends Board of Selectmen budget meetings and suggests warrant articles for Action Plan items. HMC attends Budget Committee meetings scheduled through January to champion Action item funding.
<b>DECEMBER</b> <b>HMC Meeting</b> <i>Budget determined</i>	<b>Town operating budgets are determined for the next year.</b> HMC assists Board of Selectmen and Budget HMC with getting their mitigation projects funded and written into budgets. Action implementation continues. HMC continues update to the <b>Action Status Tracking Sheet</b> using the <b>Department Mitigation Action Progress Reports #2 from October</b> .

*Sources: Boscawen Hazard Mitigation Committee*

Annually and independent of the Town's budget cycle, a simpler listing of the Hazard Mitigation Committee's tasks should include:

-  **Document New Hazard Events that Occurred in Town**
  - Hazard Risk Assessment (**CHAPTER 4** table)
  - Local and Area History of Disaster and Hazard Events (**CHAPTER 4** table)
-  **Coordinate Completion of Annual Mitigation Actions by Assigning to Departments**
  - Appendix B Mitigation Action **Progress Report**
-  **Seek and Help Departments Acquire Funding for Actions & Fill in Tracking File**
  - Appendix B Mitigation **Action/Project Status Tracking**
-  **Evaluate Effectiveness of the Plan and Its Actions Yearly**
  - Appendix B Plan **Evaluation Worksheet**
-  **Obtain Semi-Annual Progress Reports from Departments & Update Tracking File**
  - Appendix B Mitigation **Action/Project Status Tracking**
-  **Update & Reprioritize Mitigation Action Plan and Update Supporting Plan Document Sections**
  - Mitigation Action Plan (**CHAPTER 8** table)
  - Enhanced STAPLEE Prioritization (**CHAPTER 8** table)
  - **Hazard Mitigation Plan Update 2018** sections as needed
  - Make note of the new information added/changed for the **2023 Plan** update!
  - Remember to invite the Stakeholders and public to all meetings and take minutes
-  **Repeat**

For each of the Hazard Mitigation Committee meetings, the Emergency Management Director (or Staff Coordinator) will invite other Department members, Board and Committee members, Town Staff, Boscawen School District representatives, and other participants of the **2018 Plan** Committee meetings. Identified and general members of the public will also be invited as indicated previously. Their purpose is to attend and participate in the meetings as full participants, providing input and assisting with decision making. Public notice will be given as press releases in local papers, will be posted in the public places in Boscawen, and will be posted on the Town of Boscawen website at [www.townofboscawen.org](http://www.townofboscawen.org).

The **Hazard Mitigation Plan's Mitigation Action Plan** will be updated and evaluated annually generally following the suggestions outlined within the Chapter. All publicity information, Agendas, and Attendance Sheets, should be retained and compiled for inclusion into **APPENDIX C**.

The Emergency Management Director and Department heads will work with the Board of Selectmen to discuss the funding of Action projects as part of the budget process cycle in the fall of each year. The

projects identified will be placed into the following fiscal year's budget request if needed, including the Capital Improvements Program (CIP), Town Operating Budgets, and other funding methods.

The Federal Emergency Management Agency (FEMA) encourages communities to upload their Hazard Mitigation Plan Actions into an online database. The updated **Mitigation Action Tracker**, under [FEMA's RiskMap](#) program, follows municipal Actions through their completion. This added attention to the Town's Actions could enable additional support for grant opportunities when it is shown the Town can complete its mitigation projects. The Town would need to set up an account to enter their Actions into the **FEMA Mitigation Action Tracker** at <https://mat.msc.fema.gov>.

## Tasks of the Plan Update

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A number of tasks will be accomplished for the complete (five-year, FEMA approved) update to the Hazard Mitigation Plan. Note that information from many Chapters will be used or referenced by other Chapters. The annual **Mitigation Action Plan** update tasks for the Hazard Mitigation Committee are indicated in bulleted list above and are noted below under the brief instructions for chapter updates.

### 1 PLANNING PROCESS

Add the new Hazard Mitigation Committee members, contributors, and the public who participated in meetings. Add any new Agendas to the Table. Retain all meeting, attendance, publicity and invitation documents in updated **APPENDIX C Meeting Information**.

### 2 COMMUNITY PROFILE

Revise the Tables with new demographic and housing information as it becomes available. Update the building permit figures. Revise land use data from the [Avitar Appraisal System](#) and compare to previous years' data. Update any zoning changes. The text analysis will need to be revised to reflect all changes.

### 3 GOALS AND OBJECTIVES

Review and update the general and hazard-specific objectives (Flood, Wind, Fire, Extreme Temperature, Human, Technological) to ensure their continued relevance.

### 4 HAZARD RISK ASSESSMENT - ANNUAL UPDATE (TABLES)

Review and update the **Hazard Risk Assessment**. Add new disasters, new Public Assistance funding received, and significant new hazard events since the last Plan into the Tables and Appendices. Determine the magnitude of new declared disasters. Add any specific narrative dialogue about new hazard events occurring in Boscawen. Update **Local and Area Hazard Event History** with new disasters or hazard events and review the **Hazard Risk Assessment** for necessary changes. Update **Potential Future Hazards** to document the possible new hazards that could occur in Town based on historic or current evidence.

## **5 COMMUNITY VULNERABILITY AND LOSS ESTIMATION**

Review and update the **APPENDIX A Critical and Community Facility Vulnerability Assessment** Tables to ensure accuracy. Update the Structure Valuation cost when new assessing data becomes available. Generate additional **Problem Statements** that arise because of issues with facilities. Update the Culvert Upgrade Table. Revise the number and type of buildings in the Special Flood Hazard Areas (floodplains) including new structure valuation and recalculate the discussion values. Once the new structure assessments are available, recalculate the building dollar losses by the other natural hazards. Update the NFIP Tables and changes to the Floodplain Ordinance.

## **6 CAPABILITY ASSESSMENT**

Each Department and Board are to review and update the **Capability Assessment** for adoption date revisions, changes since the last plan, or future improvements. List additional example capabilities in the Chapter. Add additional mitigation support resource documents to the Table.

## **7 PRIOR ACTION STATUS**

Review **Mitigation Action Plan** Actions for validity and revise as needed to place them in different categories: Completed, Deferred or Deleted. Explain why each Action was Deleted or Deferred and indicate when each Action was Completed.

## **8 MITIGATION ACTION PLAN - ANNUAL UPDATE**

Remove Completed and Deleted Actions and move to **7 PRIOR ACTION STATUS**. Add New Actions to the **Mitigation Action Plan 2018** and ensure they are reviewed in the previous Chapter, listed above. Reevaluate Actions not yet completed, remove the Deleted, and evaluate any New Actions utilizing the enhanced **STAPLEE Mitigation Action Prioritization** matrix. Modify the approximate cost, date for completion, and funding changes as needed.

## **9 ANNUAL IMPLEMENTATION AND EVALUATION - ANNUAL ACTIVITY**

The Hazard Mitigation Committee (HMC) should be permanently appointed by the Board of Selectmen to hold up to **4-6** meetings yearly to review, implement, and evaluate the Plan. Updates any procedures or processes in the Chapter. Use the **APPENDIX B Annual Plan Evaluation and Implementation Worksheets** to guide the annual update of **8 MITIGATION ACTION PLAN**. Keep track of publicity, Department Reports, and all progress made towards the identified Actions. Add progress since the last Plan for implementation programs. Review continued public involvement for accuracy. Add other new information to the Chapter or revise as needed if new information becomes available.

## **10 APPENDICES**

Revise the **APPENDICES A-E** as needed to update the data and documentation for Boscawen. Ensure all the publicity documents, Agendas, Attendance Sheets, revised files and more are available for transfer to CNHRPC when the **5-year** Plan update is due. These interim files will be placed into an updated **APPENDIX C Meeting Information**.

## **11 MAPS**

Update [Map 1](#), [Map 2](#), [Map 3](#), and [Map 4](#) of the **Plan** as needed to reflect the changes of the hazard event locations and site locations. Mapping assistance may be sought elsewhere, such as with the Central NH Regional Planning Commission (CNHRPC).

## **Implementing the Plan through Existing Programs**

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In addition to work by the Hazard Mitigation Committee and Town Departments, several other mechanisms exist which will ensure that the **Boscawen Hazard Mitigation Plan Update 2018** receives the attention it requires for optimum benefit. Incorporating Actions from the Plan is often the most common way the Hazard Mitigation Plan can be integrated into other existing municipal programs, as described below.

### **MASTER PLAN**

The **Boscawen Master Plan** was adopted in **February 2002**, developed by the Planning Board with assistance from the CNHRPC. Chapters include detailed information on History and Culture; Population and Economics; Housing; Conservation, Preservation, and Open Space; Community and Recreational Facilities and Utilities; Transportation; and Existing and Future Land Use. The Master Plan influences the Zoning Ordinance and the Subdivision and Site Plan Review Regulations along with the Capital Improvements Program. The Planning Board is currently working with the CNHRPC to update the Master Plan Chapters.

The Planning Board should consider adopting the Hazard Mitigation Plan Update as a separate Chapter to its Master Plan in accordance with **RSA 674:2.II(e)**. The **Hazard Mitigation Plan** should be presented to the Planning Board after FEMA's **Formal Approval**. The Plan can be considered for adoption after a duly noticed public hearing, just as any typical Chapter of a Master Plan.

### **Process to Incorporate Actions**

The Hazard Mitigation Committee will present the approved **Hazard Mitigation Plan** to the Planning Board within **6** months after FEMA's **Letter of Formal Approval** is received for consideration and adoption into the Master Plan after a duly noticed public hearing. This is the same process used to adopt other components of the Master Plan. The NH State law supporting the development of a natural hazard mitigation plan as a component of a community Master Plan is **RSA 674:2-III(e)**. The Hazard Mitigation Committee will oversee the process to begin working with the Planning Board to ensure that the relevant **Hazard Mitigation Plan** Actions are incorporated into the Master Plan.



### **Implementation Progress through the Master Plan Since the 2012 Plan**

The existing **2002** Master Plan developed by the Planning Board does not contain the **Hazard Mitigation Plan 2012** (or **2018**) as an Appendix.

#### **How Was This or Will This Be Accomplished?**

The **2005** Master Plan may be updated by the Planning Board within the **5-year** Plan cycle. This is an opportune time to integrate the **Hazard Mitigation Plan 2018**. The Planning Board will be given a copy of the **2018 Plan** and can choose to incorporate several Action items that pertain to the Planning Board or incorporate the entire Plan by reference. Several Actions include revisions to Board regulations and to Capital Improvements, Zoning Amendments, or Subdivision and Site Plan Review regulations. The Emergency Management Director or designee will recommend that the Board incorporate the identified Planning Board-responsibility Actions as appropriate into the Future Land Use, Natural Resources, and Community Facilities and Services Chapters and include the **Hazard Mitigation Plan** into the Master Plan Appendix whenever the Planning Board updates the Master Plan.

### **CAPITAL IMPROVEMENTS PROGRAM**

Boscawen's latest **Capital Improvements Program (CIP)** is a **6-year** plan for **2014-2019** with the intention of a **6-year** update. The HMC would like to ensure Actions requiring capital improvements funding from the **Hazard Mitigation Plan Update** will be inserted into the Capital Improvements Program for funding during the CIP's next update. Depending on the Town's funding needs, a Capital Reserve Fund for Hazard Mitigation Program Projects may be established to set aside funding for the many projects identified in the Hazard Mitigation Plan Update.

### **Process to Incorporate Actions**

The Hazard Mitigation Committee will oversee the process to begin working with the Planning Board's CIP Committee to incorporate the various Hazard Mitigation Plan projects into the updated CIP. As the CIP is amended, a representative from the Hazard Mitigation Committee could request to sit on the CIP Committee or submit a CIP Project Application to ensure the mitigation projects are added, especially if the CIP is not updated as frequently as intended.

### **Implementation Progress through the CIP Since the 2012 Plan**

Many of the Completed Actions could be finalized because of their placement into and purchase out of the Town's new Capital Improvements Program (CIP). The **2014-2019** CIP could have contained specific mitigation Action projects related to culvert upgrades or other improvements, but the listing of CIP projects did not seem to contain hazard mitigation actions.



**How Was This or Will This Be Accomplished?**

The Town Departments and Town Administration will work together with Planning Board to identify the items needed for the **Hazard Mitigation Plan** Action implementation. The Actions identified will be requested to be added to the next CIP or any of its interim updates.

**ZONING ORDINANCE AND REGULATIONS**

Several of the implementation strategies proposed involve revisions to the Zoning Ordinance, Subdivision Regulations, and/or the Site Plan Review Regulations. The Town Staff and/or Planning Board annually draft Zoning Ordinance amendments for Town Meeting approval. The Land Use Coordinator and Board may be requested to draft zoning amendments in order to accommodate Actions. The Land Use Regulations (Subdivision Regulations and Site Plan Review Regulations) are updated by the Planning Board as needed.

**Process to Incorporate Actions**

A Hazard Mitigation Committee member, perhaps the Town Administration or Land Use Coordinator, will work with Planning Board to develop appropriate language for modifications to the Zoning Ordinance and the Subdivision and Site Plan Review Regulations as they deem appropriate as appropriate to accommodate Actions in the **Hazard Mitigation Plan**. Other Committee members, if requested, could help Town staff draft language for respective changes to the Regulations or the Zoning Ordinance, and assist Town staff with presenting the language to the Planning Board for consideration.

The Hazard Mitigation Committee representative will request from the Planning Board a copy of future required language for any FEMA Zoning Ordinance Updates for incorporation into the Plan.

**Implementation Progress through Zoning Since the 2012 Plan**

The Town adopted the **April 19, 2010 NFIP** DFIRM Maps and respective updates to the Zoning Ordinance via the Board of Selectmen, a very special power granted by the NH Statutes **RSA 674:57**. Other Zoning Ordinance changes must be voted on at the Boscawen Town Meeting held annually in March. Revisions to Subdivision Regulations and Site Plan Review Regulations do not require Town Meeting approval, but occur after duly noticed Planning Board public hearings.

**How Was This or Will This Be Accomplished?**

The Planning Board directly obtains the required NFIP floodplain ordinance revision information from the NH Office of Strategic Initiatives and provides it to the Board of Selectmen for approval, a legislative power granted to them. For any future updates to the Floodplain Development Ordinance not required by FEMA, the changes will have to be approved at Town Meeting.

## **TOWN MEETING**

In Boscawen, the annual Town Meeting is held in March where the voters of the Town vote to raise money for capital projects and approve the annual operating budget of the Town. This is an opportunity to get some of the Actions of the **Hazard Mitigation Plan Update** funded.

### **Process to Incorporate Actions**

The Hazard Mitigation Committee members will work with the Budget Committee and Board of Selectmen to develop warrant article language for appropriate Actions. The HMC members may also request deposits to appropriate Capital Reserve Funds for some of the larger projects. A representative from the Hazard Mitigation Committee will provide a copy of the current **Mitigation Action Plan** to both the Budget Committee and Board of Selectmen and validate the need for funding at the annual Town Meeting to accomplish the projects. The representative will work with the Town Administration to write warrant article language for approval Action items if needed or to get the items placed into Department Operating Budgets.

### **Implementation Progress through Town Meeting Since the 2012 Plan**

Town Meetings are used to accomplish many of the Action purchases. **Mitigation Actions Completed** could be implemented through various local funding sources: separate warrant articles, warrant articles to remove funds from the Capital Reserve Funds, or through adoption of Department Operating Budgets and the General Fund.

### **How Was This or Will This Be Accomplished?**

The Emergency Management Director or designee, a member of the Hazard Mitigation Committee, brings Action items to be purchased to the Board of Selectmen and Budget Committee for consideration. The CIP contains many of the Actions, as discussed previously. The Board of Selectmen and Budget Committee bring Actions to the Town Meeting via warrant articles, as well as the Operating Budgets, additional warrant articles which may include Action items in the CIP, and warrant articles to add funding into the capital reserve funds. Many of the Action items are funded in this manner.

## **OPERATING BUDGETS**

Many of the Actions will not require specific funding but are identified as requiring in-kind Staff labor to perform the work required to undertake the Actions. Town Departments and Staff have rigorous job functions that demand their undivided attention to the tasks required to run their respective Departments. Additions to the work load to accommodate the Actions can put a strain on their ability to serve the public during performance of their normal job duties. When possible, Boscawen Departments and Staff will be able to prioritize their tasks to work on **Hazard Mitigation Plan Update 2018** Actions. The in-kind work performed comes out of the Operating Budget for that particular Department.

### **Process to Incorporate Actions**

With obtaining assistance from the HMC, the Department or Board is given the responsibility to ensure their Actions are completed, either by working on the Actions allocated to him/her when their normal job duties permit or by delegating the Action to another person. The funding for the Actions comes out of the Department's operating budget as work is undertaken by the Staff person on an as-time-permits basis unless the Action is a component of the Town staff members' normal work duties. Staff or volunteers will attempt to follow the **Action Timeframe** as a guideline for completion. A yearly review of the **Mitigation Action Plan** by the Hazard Mitigation Committee will reprioritize the Actions, and the members can report on their progress, asking for assistance or more time as needed.

### **Implementation Progress through Operating Since the 2012 Plan**

The Operating Budgets of the Town Departments typically served to implement many of the Actions displayed in **Mitigation Action Plan**. Most of the Completed projects required small amounts of funding from the respective Department Operating Budget or were completed in-kind using staff or volunteer time. In small New Hampshire communities like Boscawen, many mitigation projects are completed with the existing staff and materials within the Operating Budget or are completed by volunteers. In either case, Action completion may take longer to implement to help reduce taxpayer costs.

### **How Was This or Will This Be Accomplished?**

Department heads who participated in the Hazard Mitigation Committee submitted their Action items to Board of Selectmen and Budget Committee for consideration. Individual Department needs are recognized as part of their respective Operating Budgets and are proposed to the Board of Selectmen and Budget Committee. All Operating Budgets are approved (and often amended) by voters at the annual March Town Meeting.

## Continued Public Involvement

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On behalf of the Hazard Mitigation Committee, the Emergency Management Director and the Staff Coordinator, under direction of the Town Administration, will be responsible for ensuring that Town Departments and the public have adequate opportunity to participate in the planning process. Administrative staff may be utilized to assist with the public involvement process.

For each interim meeting in the annual update process, and for the five-year update process procedures that will be utilized for public involvement include:

- Provide personal invitations to Town volunteer Board and Committee Chairs, and Budget Committee members;
- Provide personal invitations to Town Department heads;
- Provide personal invitations to the following entities listed below;
- Post public meeting notice flyers on the Town's website at [www.townofboscawen.org](http://www.townofboscawen.org) and in the Town Offices, Town Library, and/or local business(es);
- Submit media releases to the Concord Monitor (a regional daily newspaper serving over **40** communities around the Concord area) and the Merrimack Voice (monthly free newspaper serving **11** local communities).

Agencies and businesses to invite to future **Hazard Mitigation Plan Update** meetings include the Historical Society, Library, NH Veterans Cemetery, Penacook-Boscawen Water Precinct, Boscawen Congregational Church, Merrimack County, Merrimack Valley School District, and representatives from Business and Non-profit communities (see **APPENDIX A Critical and Community Facilities Vulnerability Assessment** Tables: Vulnerable Populations, Economic Assets and Recreational and Gathering Sites). The Emergency Management Directors of the neighboring communities will again be invited as will the NH Homeland Security and Emergency Management Field Representative for Merrimack County. The Town will provide the Central NH Regional Planning Commission with Agendas, Minutes and other materials for archiving, to be used when the **5-year** update again becomes necessary (email to [salexander@cnhrpc.org](mailto:salexander@cnhrpc.org)).

All meetings should be posted to the Town's Calendar and announced on the Town's website home page at [www.townofboscawen.org](http://www.townofboscawen.org). The Town Administration and the HMC should consider developing a new section of the Town website dedicated to Hazard Mitigation Committee activities and the **2018 Plan** (perhaps use [www.townofboscawen.org/hazard-mitigation-committee](http://www.townofboscawen.org/hazard-mitigation-committee)). This webpage should be kept updated with meeting notices and materials used by the Hazard Mitigation Committee. A new section would be an optimal location to place the final **2018 Plan** and its **Maps** and **Appendices** and to continue adding materials for annual Plan updates. A number of **Action Plan** items to be undertaken

relate to public education and involvement and this website would be an exemplary method of getting the word out.

## Implementation and Evaluation of the Plan

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During the Committee's annual review of the **Mitigation Action Plan**, the Actions are evaluated as to whether they have been **Completed**, **Deleted**, or **Deferred**. Those Action types are placed into their respective Tables. Any **New** Actions will be added as necessary. Each of the Actions within the updated **Mitigation Action Plan** will undergo the enhanced STAPLEE ranking as discussed in **8 MITIGATION ACTION PLAN**.

A set of comprehensive **Annual Interim Plan Evaluation and Implementation Worksheets** is available to assist the community with Plan implementation in **APPENDIX B**. These worksheets are to be used during the Hazard Mitigation Committee basic meeting schedule outlined previously in **Table 45**.

The worksheets include administrative and organizational documents, those that are used with the Appendices spreadsheets developed, and two Agendas to get started with HMC Interim Update meetings:

- **Permanent Hazard Mitigation Committee Establishment**
- **Organization of Public Invitees to Join Meetings**
- **HMC Interim Meeting (IM) Publicity Tracking 2018-2023**
- **Annual Interim Plan Update Evaluation Worksheet 2018-2023**
- **Hazard Mitigation Actions Status Tracking 2018-2023**
- **Department Mitigation Action Progress Report 2018-2023**
- **Attendance Sheet Example**
- **Agenda IM1 Example**
- **Agenda IM2 Example**

The **5-year** full Plan update will evaluate the Actions in the same manner in addition to fulfilling all of the **TASKS OF THE PLAN UPDATE** earlier in this Chapter.

## 10 APPENDICES

The following **APPENDICES A-D** are included under a separate electronic or paper document to maintain the relative brevity of this **Hazard Mitigation Plan Update**.

### Listing of Boscawen Hazard Mitigation Plan Update 2018 Appendices

Some of these documents should be updated annually as part of the interim Action implementation and Plan evaluation process\*. The remaining **APPENDICES** could be amended as a result of the new or revised annual information, but they are optional. It is necessary to establish a location for placing any new or updated hazard, Action, meeting or Plan data over the **5-year** interim until the Plan is fully updated again.

**A Critical and Community Facility Vulnerability Assessment**

**B Annual Plan Evaluation and Implementation Worksheets \***

**C Meeting Information \***

**D Plan Approval Documentation**

**E Photographic History of Hazard Events \*\***

**\*\*** Take photos of hazard events and natural disasters occurring in Boscawen. Place them into **APPENDIX E Photographic History of Hazard Events** to document the types of severe weather impacting the community from now until the **2023 Plan Update**. Place the photos in a cloud-based system accessible to residents, perhaps on the [Town's website](#). Encouraging residents to upload their best photos – nothing gets a mitigation discussion going faster than a visual aid of a problem. On each photo, ensure the location is identified, the storm event and date are provided, and note who gets the photo credit. This could be a fun Town activity once started.

## 11 MAPS

Four detailed Maps were created during the development of the **Boscawen Hazard Mitigation Plan 2018**. Data from the previous Plan maps were used, new standardized data layers were available, and Hazard Mitigation Committee members added their own knowledge of sites and hazard events.





### Plan Update 2018 Maps

*Map 1 - Potential Hazards* illustrates potential hazard event locations in Boscawen that have the possibility of damaging the community in the future. The *Map 1* legend includes (technology) infrastructure hazards such as dams, bridges, electric transmission lines and evacuation routes. Natural hazards are displayed such as Special Flood Hazard Areas (SFHAs), locations of potential flooding/washout, fire/wildfire, ice and snow, steep slopes (>15%) and more.

*Map 2 - Past Hazards* illustrates the locations of where hazard events have occurred in Boscawen in the past, including areas of SFHA, flooding/washout, snowmelt, dam breach, fire/wildfire, wind damage, ice damage, vehicle crash locations, and more.

*Map 3 - Critical and Community Facilities* includes the infrastructure included in *Map 1 Potential Hazards* on a background of aerial photography and the SFHAs to give viewers a better, real world perspective. The locations of all critical facilities and community facilities as recorded in the **APPENDIX A Critical and Community Facilities Vulnerability Assessment** are displayed on the Map. Each of these sites is numbered on a key listing the names of each facility.

*Map 4 - Potential Hazards and Losses* utilizes all the features of *Map 3* on an aerial photography background and includes the *Map 1 Potential Hazards* and any realistic *Map 2 Past Hazards* locations where hazard events can occur again in Boscawen.

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