2018 Hazard Mitigation Plan Update

Town of Hopkinton, Rhode Island

PREPARED FOR

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February 7, 2018

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A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF HOPKINTON AUTHORIZING THE ADOPTION OF THE 2018 HOPKINTON HAZARD MITIGATION PLAN UPDATE

WHEREAS, the Town of Hopkinton recognizes exposure to natural hazards that increase the risk to life, property, environment, within our community; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre and post disaster hazard mitigation programs; and

WHEREAS; the 2018 Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Hopkinton from impacts of future hazards and disasters; and

WHEREAS, adoption by the Town Council demonstrates their commitment to hazard mitigation and achieving goals outlined in the 2018 Hopkinton Hazard Mitigation Plan Update.

NOW, THEREFORE, BE IT RESOLVED that the Town of Hopkinton

1) Adopts in its entirety, the 2018 Hopkinton Hazard Mitigation Plan Update (the "Plan") as the jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions identified in the Plan that pertain to this jurisdiction.
2) Will use the adopted and approved portions of the Plan to guide pre- and post-disaster mitigation of the hazards identified.
3) Will coordinate the strategies identified in the Plan with other planning programs and mechanisms under its jurisdictional authority.
4) Will continue its support of the Hazard Mitigation Committee as described within the Plan.
5) Will help to promote and support the mitigation successes of all participants in this Plan.
6) Will incorporate mitigation planning as an integral component of government and partner operations.
7) Will provide an update of the Plan every five years.

PASSED AND ADOPTED: March 5, 2018

William McGarry, Town Manager

ATTEST: Elizabeth J Cook-Martin

Elizabeth Cook-Martin, Town Clerk

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Executive Summary

This Hazard Mitigation Plan (HMP) is a product of the Hopkinton Hazard Mitigation Committee (HHMC). It has been approved by the Hopkinton Town Council, the Rhode Island Emergency Management Agency, and the Federal Emergency Management Agency in accordance with the Disaster Mitigation Act of 2000.

The HHMC's overview of past natural hazard occurrences verifies that the Town is vulnerable to diverse events including hurricanes, winter storms, flooding, and high winds. The discussion puts the likelihood of these events into historical perspective and recognizes that although the probability of thunderstorm, high wind and lightning events may be higher; the intensity and potential impacts from less likely events such as hurricanes and earthquakes can be far greater.

The risk assessment portion of the plan confirms that the Town has much to lose from these events. The identified vulnerabilities include flood prone drainage systems, bridges, wastewater, water supply systems, dry hydrants, communication towers, dams, critical municipal hazard response facilities, populations, businesses, schools, recreation facilities, and historic resources.

To address these risks the 2017 HMP put forth a clear mission, a distinct set of goals and 18 specific mitigation actions. The Town's hazard mitigation mission is *to* develop and maintain strategies that protect all of the citizens, businesses and property from the damaging effects of disasters within the Town of Hopkinton. The specific goals include protecting the lives and property of the Town of Hopkinton's residents, promoting rapid recovery after a disaster, provide guidance to businesses, protecting the Town of Hopkinton's critical facilities and maintain a hazard mitigation committee. Each of the subsequent mitigation actions for achieving these goals summarizes specific problems and possible solutions, details the primary tasks to be undertaken, identifies an appropriate lead and anticipated funding sources.

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Introduction

Plan Purpose

The purpose of the Hopkinton Hazard Mitigation Plan is to set forth guidelines of short-term and long-term actions, which will reduce the actual or potential loss of life or property from hazardous events such as hurricanes, nor'easters, ice storms, snow storms, and flooding, and high wind. This plan was constructed using input from a variety of municipal and private stakeholders and the general public involved in the planning process. This plan serves as guidance to help the Town reduce their losses and vulnerabilities relating to natural hazards.

Hazard Mitigation and its Benefits

Hazard mitigation planning consists of a series of actions taken to identify specific areas that are vulnerable to natural and human-caused hazards within a town, and seek to permanently reduce or eliminate the long-term risk to human life and property. It coordinates available resources and identifies community policies, actions, and tools for implementation that will reduce risk and the potential for future losses town-wide. The process of natural hazard mitigation planning sets clear goals, identifies appropriate actions, and produces an effective mitigation strategy that can be updated and revised to keep the plan current. In short, 'it's where we were, where we are and where we're going' in terms of hazard mitigation.

States and communities across the country are slowly, but increasingly, realizing that simply responding to natural disasters, without addressing ways to minimize their

potential effect, is no longer an adequate role for government. Striving to prevent unnecessary damage from natural disasters through proactive planning that characterizes the hazard, assesses the community's vulnerability, and designs appropriate land-use policies and building code requirements is a more effective and fiscally sound approach to achieving public safety goals related to natural hazards.

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation to improve this planning process. It reinforces the importance of natural hazard mitigation planning and establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP) or other annual funding opportunities. Section 322 of the Act specifically addresses mitigation planning at the state and municipal levels of government. It identifies new requirements that allow HMGP funds to be used for planning activities. As a result of this Act, states and communities must now have a FEMA-approved natural hazard mitigation plan in place prior to receiving post-disaster HMGP funds. In the event of a natural disaster; municipalities that do not have an approved natural hazard mitigation plan will not be eligible to receive post-disaster HMGP funding.

The purpose of this Plan is to recommend actions and policies for the Town of Hopkinton to minimize the social and economic loss of hardships resulting from natural hazards. These hardships include the loss of life, destruction of property, damage to critical infrastructure and facilities, loss/interruption of jobs, loss/damage to businesses, and loss/damage to significant historical structures. Hazardous events that affect Hopkinton include severe weather, hurricanes, brushfires, floods, and earthquakes. To protect present and future structures, infrastructure and assets and to minimize the social and economic hardships, the Town of Hopkinton implements the following general actions and policies:

- Revisions to the Town's Comprehensive Plan
- Incorporation of hazard mitigation into the site plan review process
- State and local building code review
- Public education/outreach
- Post-disaster recovery opportunities/strategies

The Town of Hopkinton also recognizes the important benefits associated with hazard mitigation, its interaction with municipal land use and infrastructure planning, and the need for a comprehensive planning approach, which accommodates these interdependencies. The Town's draft Comprehensive Community Plan (2017) addresses natural and cultural resources, land use, housing, services and facilities, traffic circulation, open space, economic development, and future development trends. While the entire hazard mitigation plan will not be formally incorporated into the Comprehensive Plan, certain, applicable mitigation actions will be incorporated during the update process. The Town recognizes coordination between the HMP and the Comprehensive Plan to be of benefit

because it will ensure a unified planning approach into the future and ensure that risk reduction remains a critical element of municipal planning. This is also in alignment with current goals of Rhode Island Statewide Planning.

A second benefit of hazard mitigation allows for a careful selection of risk reduction actions through an enhanced collaborative network of stakeholders whose interests might be affected by hazard losses. Working side by side with this broad range of stakeholders can forge partnerships that pool skills, expertise, and experience to achieve a common goal. Proceeding in this manner will help the Town ensure that the most appropriate and equitable mitigation projects are undertaken.

A third benefit of hazard mitigation would be endorsing a proactive planning approach focused on sustainability, whereby the Town of Hopkinton could minimize the social and economic hardships that have resulted from the occurrence of previous natural disasters. These social and economic hardships include: the loss of life, destruction of property, interruption of jobs, damage to businesses, and the loss of historically significant structures and facilities. This proactive planning approach would look for ways to combine policies, programs, and design solutions to bring about multiple objectives and seek to address and integrate social and environmental concerns. Linking sustainability and loss reduction to other goals can provide a framework within the state and local governments that will bring the comprehensive planning process full circle.

Lastly, the participation in a hazard mitigation planning process will establish funding priorities. The formal adoption and implementation of this plan will allow the Town of Hopkinton and its residents to become more involved in several programs offered by the Federal Emergency Management Agency (FEMA) including: the Community Rating System Program (CRS); the Pre-Disaster Flood Mitigation Assistance Program (FMA); and the Hazard Mitigation Grant Program (HMGP). Money spent today on preventative measures can significantly reduce the cost of post-disaster cleanup tomorrow.

Goals

Mission Statement:

The Hopkinton Hazard Mitigation Committee intends to continue to work together as one to develop and maintain strategies that protect all of the citizens, businesses and property from the damaging effects of disasters within the Town of Hopkinton.

The Town of Hopkinton has established the following mitigation goals:

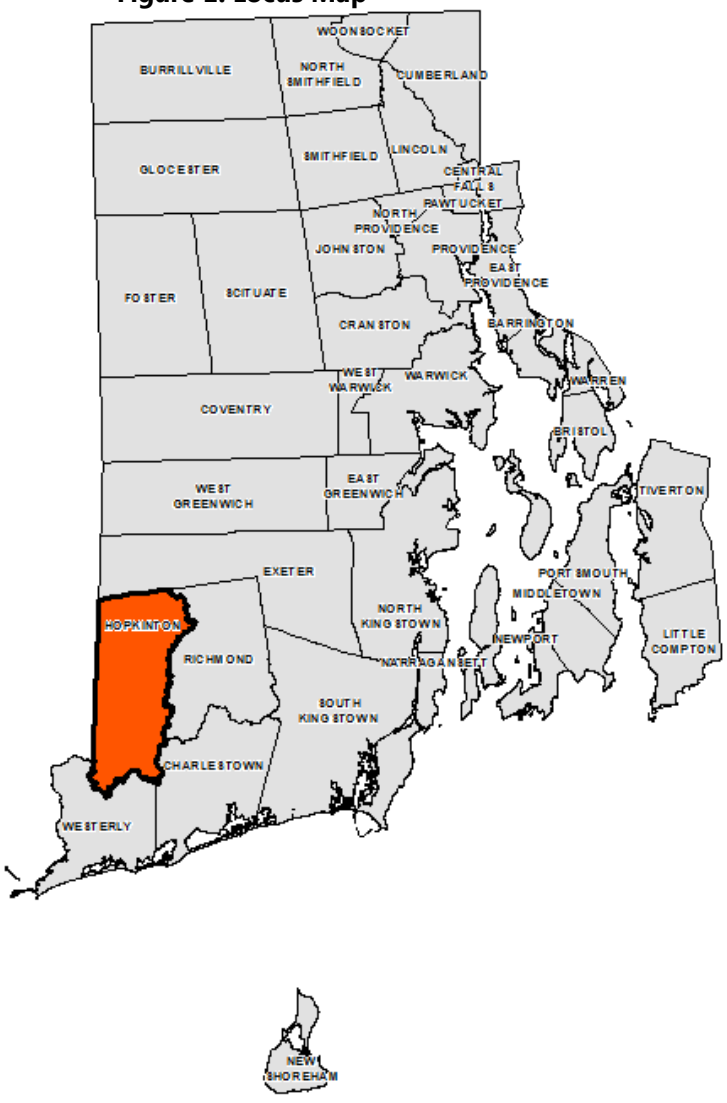
1. Protect life
2. Protect property
3. Promote a rapid recovery process following natural disaster
4. Provide guidance so that Hopkinton businesses are also able to rapidly recover following a disaster.
5. Protect critical infrastructure

6. Establish and Maintain a Hazard Mitigation Committee that not only develops a strategy for mitigation but also assures that the strategy changes as needed and routinely maintains the Hopkinton Hazard Mitigation Plan.

Background

Hopkinton is a historic town located in Washington County, Rhode Island. It is made up of the unincorporated villages of Ashaway, Hope Valley, Hopkinton City and Rockville. In addition, the eastern part of town, adjacent to Alton is known by locals as the Burdickville section and the southeastern portion of town is known as the Bradford section due to the close proximity to Bradford in Westerly and the sharing of the Bradford zip code. Hopkinton is a primarily rural community that is bordered by the Town of Westerly to the south, Exeter to the north, Charlestown and Richmond to the east, North Stonington and Voluntown, Connecticut to the west.

Figure 1: Locus Map



The total square mileage of Hopkinton is 44.1 square miles. Of those, 43.0 square miles are land and 1.1 square miles (2.58%) are water based.

A large majority of the land in Hopkinton is undeveloped forest or wooded areas. In Southern Rhode Island, the typical forest makeup is historically eastern white pine with maple/ash within, showing a transition to the more common oak forest as one progresses northward.

Topographically, the town consists of rolling hills typically interspaced by broad, low gradient stream valleys containing extensive wetlands. The majority of the road system has been built on high ground, away from streams.

History

Hopkinton was established in 1669, as part of the Town of Westerly. However, after the people petitioned the General Assembly to divide it, citing hardships of locals getting to the town meetings, the Town incorporated on March 14, 1757. Hopkinton was named in honor of Stephen Hopkins, who was, at the time, the Governor of Rhode Island and a signer of the Declaration of Independence.

In the years prior to its independence, the Hopkinton side of the Pawcatuck River was the religious, business, and civic center of Westerly. Even earlier, the entire Misquamicut Region located in the southwestern part of what was then Narragansett County was inhabited by Indian Tribes. Today there is evidence of the former presence of Native Americans thousands of years ago in Hopkinton. The Indian Rock shelters, Indian Signal Rocks, and numerous other artifacts found in the area prove this theory. At the location where Hopkinton, Richmond and Westerly meet, stood the first Meeting House in Southern Rhode Island, built by the Seventh Day Baptists in 1680. One member of the church was Samuel Ward, a one-time Governor of Rhode Island who later joined in the founding of Brown University.

As years passed, Hopkinton continued to flourish and grow due to the large number of rivers and lakes that crisscross the Town. Many manufacturing mills and businesses prospered in the mid 1800's through the 1900's as a result of this fact. Even a short-line railroad operated in the late 1800's through the late 1940's in support of the many businesses of Hope Valley and Wyoming. To date, the Ashaway Line and Twine Mfg. Company is currently one of only a handful of waterside mills still in operation in the country. In 1939, they placed the first commercial product made of nylon on the market, the Ashaway Nylon Bait Casting Line.

The historic building cannot always rely on sufficient water supply levels for appropriate fire suppression. There are also no sprinklers. To mitigate widespread fire damage, there are double shifts of fire watch at the building during periods of drought.

A waterside location was also an attraction for Camp Yawgoog in Rockville. Yawgoog remains as the nation's oldest and one of the largest Boy Scouts of America campgrounds, where thousands of boys have been attending each year for over a century.

This seasonal camp in a wooded area of Hopkinton may require special notification or assistance in advance of a dangerous storm or nearby wildfire.

Demographics

According to the 2015 United States Census estimates[1], there are 8,123 persons residing in the Town of Hopkinton. The median age is 47. There are also 3,196 households and 2,244 families residing within the town. There are 3,758 housing units; 78% are owner-occupied and 22% are renter-occupied.

The racial make-up of the town is 96.2 % white, 2.5% African Americans, 0.3% Asian. An estimate, 0.5% of the population identifies as from other races.

Of the 3,374 households, 17% have children under the age of 18 living with them, 16.2% have individuals age 65 and older, and 60% are married couples living together. The average household size is 2.56 persons and the average family size is 3.03 persons. It is also important to note that approximately 16% (1,315) of Hopkinton's total population is over the age of 65.

- 2000 Census: $52,181 Median Household Income
- 2010 Census: $71,104 Median Household Income

Based on 2015 estimates, 5.2% of the Hopkinton population (422 residents) is below the poverty line.

Government

Prior to the Town's official founding, residents prided themselves in being active participants in the local political process. Today the Town of Hopkinton is governed by an elected Town Council with five (5) members, elected every two years. The Town Council President is the Chief Elected Official for the Town of Hopkinton. Day to day operation of the town is delegated to an appointed Town Manager who reports to the Town Council.

1 American Fact Finder, https://factfinder.census.gov Accessed 2/22/17

Land Use Patterns

Table 1 Land Use Patterns

Land Use Type	2004 (%)	2011 (%)	% Change
Residential	8	24	33
Commercial/Industrial	2.3	2.3	0
Forested	79	38	-48
Agriculture/Pasture	5.6	17.7	32
Surface Water	3.3	3	0
Other Open Areas	1.8	15	12

Source: RIGIS Land Use Data from 2003/2004 and 2011 (most recent).

Law Enforcement

The Hopkinton Police Department consists of a Chief, a Captain, three Sergeants and 15 patrol officers as well as two Detectives, and a Juvenile Officer. The Department operates twenty-four hours a day and responds to all criminal complaints and town-wide emergencies. The facility on Woodville Road houses the Police Dispatch Center as well as the Primary EOC and Emergency Management Office.

The Hopkinton Emergency Management Agency is currently staffed by a part-time Emergency Management Director. The Director acts as the day-to-day liaison between the Town Council and the Town's emergency service providers and acts as an advisor on all emergency related affairs in Hopkinton. The Emergency Management Director is responsible for all emergency planning and coordinating response efforts.

Chariho Middle School serves as the local regional emergency shelter. Limited sheltering capabilities are also available at Ashaway Elementary School, Hope Valley School, and the Hopkinton Recreation Center.

Fire Protection

Hopkinton businesses and residents are protected from fires and other emergencies by two separate fire departments. These volunteer departments provide quality protection to Hopkinton and, in fact, have both earned a coveted ISO class 4 fire protection rating, a rarity among rural fire departments without municipal hydrant systems.

The Ashaway area is protected by the Ashaway Fire District. The District is a separate taxing authority that supports the firefighters and equipment of the Ashaway Volunteer Fire Association. The Fire Association responds to all areas within its district with 2 engines, 1 tanker, 1 engine/heavy rescue, 1 brush truck and 1 boat. The department also provides mutual aid support to the Hope Valley Wyoming Fire District in Hopkinton as well as any other areas that may request assistance.

The Hope Valley Wyoming Fire District provides fire and emergency services to the northern segment of Hopkinton. Also a separate taxing district, Hope Valley provides protection not only to the Hope Valley and Rockville areas in Hopkinton but to the Wyoming and Alton sections of Richmond, Rhode Island. The Department operates 3 engines, 1 ladder, 2 tankers, 1 heavy rescue and a hazardous materials team. Hope Valley also participates in the Rhode Island Mutual Aid Pact.

Emergency Medical Services

The Town of Hopkinton is served by 2 ambulance rescue squads. Ashaway Ambulance Association and Hope Valley Ambulance are non-profit emergency medical services that provide advance life care support and transport. The Ashaway Ambulance Association has 2 Ford E-450/LifeLine ambulances. The Hope Valley Ambulance has 3 ambulances, 2 squad vehicles, and one mass-casualty trailer. The Ashaway Ambulance responds within the Ashaway Fire District boundaries and the Hope Valley Ambulance operates within the Hope Valley Wyoming Fire Department. Both teams are comprised of volunteers and per diem staff.

Roads and Bridges

There are approximately 143 miles of streets and highways in Hopkinton. The major roads include over 5.5 miles of Interstate 95 running east/west diagonally bisecting the town. Other major arteries include Route 3 which parallels Interstate 95 to the north and crosses it near the Connecticut border to head in a north/south direction towards Ashaway. Route 138 which runs through the northern half of the town.

The following bridges/overpasses are located throughout Hopkinton:
** indicates single lane bridges*

State-owned

- Route 216 Alton Bradford Road at Pawcatuck River
- Alton Bradford bridge 2010 flooding
- *Chase Hill Road near Ashaway Road
- Laurel Street @ Potter Hill
- Main Street – Over Rte. 95 (exit 1)
- Main Street – Meeting House Bridge
- Mechanic Street (State per DOT GIS)
- Spring Street @ Woody Hill

- Woodville into Richmond

Town-owned

- Aldridge bridge
- Arcadia Rd. (State- RIDOT GIS says local)
- Burdickville Road. (Hopkinton and Charlestown), Built by State
- *Collins Road
- Grass Hill bridge
- Grassy Pond
- *Sawmill- cement culvert
- *Tomaquag Valley Road
- *Wincheck Pond Road
- Woodville Alton – (over Rte. 95 @ Exit 2)
- Woodville Alton Rd. At Golf Course
- *Woody Hill- flooded in 2010, wooden
- *Woody Hill South- wooden

A 2016 flood resiliency study on the Wood-Pawcatuck River Watershed indicated that 20 of Hopkinton's culverts and bridges had a high flood impact potential. A high impact classification was given to sites in high density residential areas or significant commercial/industrial development, are located in a flood zone, and are characterized by a highway or railroad.

Dams

In 2016 the Department of Environmental Management (DEM) identified 40 dams in the Town of Hopkinton. Four of the 40 dams (1 borders Richmond) are classified as high hazard dams and 8 dams (2 of which border Richmond) are identified as significant hazard dams. The remainder are considered low hazard.

Utilities

Public sewers are not currently available and will not likely be available prior to 2025.[2]

Hopkinton has a municipal water service in only two areas of the Town, the Hope Valley area (Main Street) connected to the Richmond system and the Ecclelston Plat area of Ashaway (Bethel Village). The rest of the Town's residents get their water via individual wells.

Due to the lack of adequate infrastructure and significant resource constraints, Hope Valley is presently built beyond carrying capacity. Therefore, any future development

2 Hopkinton 2010 Comprehensive Plan 5-Year Update

within these and the other villages of Hopkinton should be within the capacity of environmental constraints associated with soils, floodplain and wastewater management.[3]

The town is serviced by Verizon (equipment at 6 Ashaway Rd. and 1084 Main Street) and National Grid (equipment at 31 Oak street and 1152 Main Street). There are also various private cell towers within town.

There are five communication towers located in Hopkinton: Industrial Communications at 247 North Road, MCI Tower at 395 Woodville Road, Hope Valley-Wyoming Fire District at 996 Main Street, Hopkinton Police Headquarters at 406 Woodville Road, and at 650 Main Street. The one owned by Industrial Communications is maintained well and is the main tower for fire radio and ambulance.

Forest and Open Space

Conservation and open space lands, managed by the Town contribute to the preservation of Hopkinton's rural character. Hopkinton's recreation, conservation, and open space areas are used regionally by local residents as well as those in neighboring towns in Rhode Island and Connecticut. The State of Rhode Island has considerable land holdings in Hopkinton including the areas of Arcadia, Blue Pond, and Rockville Management Areas which offer fishing, canoeing, and hiking.[4] On a more local level, the Hopkinton Land Trust was established in 2000 to "preserve open space, protect wetlands, ground and surface water, farmland, unusual and exemplary natural habitats, historical or cultural places of significance as well as scenic views through a program of sustained acquisition and stewardship. The Trust will provide public access for recreation and appreciation, and opportunities for research and natural resources educations, where possible, on Land Trust properties."[5] As of 2013, the Trust holds 860 acres in public access properties and non-public easements to 223 acres.[6]

There are approximately 22,190 acres of forested areas in Hopkinton[7]. That that makes up over 78% of the total land area of the town. Most of the forested area distributed throughout the town is made up of deciduous trees (i.e. maples and oaks). The softwood stands (i.e. pines) are primarily in the northern and eastern part of town.

Water Resources

The Town of Hopkinton is traversed by rivers, brooks and streams. The Wood and Pawcatuck Rivers are the largest streams in the community. The Wood River

3 Hopkinton 2010 Comprehensive Plan, 5-year Update

4 Ibid

5 Ibid

6 Hopkinton Land Trust website www.hltri.org Accessed 2/22/17

7 Ibid

originates at the outlet of Porter Pond in Sterling, Connecticut and flows southeast to its confluence with the Flat River in Exeter, Rhode Island. From this point, it flows south through Hope Valley and Woodville until it joins the Pawcatuck River south of Alton. The Wood River is the boundary between the Towns of Hopkinton and Richmond. It drains an area of 89 square miles. The Pawcatuck River originates at the outlet of Worden Pond in South Kingstown, Rhode Island, and flows southwest until it empties in a part of Ashaway and forms Hopkinton's southern boundary. The drainage area above the Hopkinton – North Stonington Connecticut corporate limits is 244 square miles. The four sub-watersheds within Hopkinton are: Upper Wood River, Lower Wood River, Ashaway River, and Tomaquag Brook- Pawtucket River.

Canonchet Brook, a tributary of the Wood River, flows southeast through the central part of the Town of Hopkinton and drains an area of 7.7 square miles. Tomaquag Brook, in the south central part of the community, flows south to its confluence with the Pawcatuck River and drains an area of 8.7 miles. The pattern of settlement in these basins is rural in character. The Ashaway River and Mile Brook flow through the Village of Ashaway. The Ashaway River originates at the confluence of the Fall River and Parmenter Brook, 1-1/2 miles north of Ashaway, and flows south to its confluence with the Pawcatuck River at Ashaway. The drainage area above the confluence is 29.8 miles. Mile Brook rises about one half mile east of Ashaway and flows southwest to the Pawcatuck River. It drains 1.26 square miles.

In the northern part of town, Yawgoog Pond, Wincheck Pond, Blue Pond, Brush Brook, and Wood River align themselves horizontally from the western border to the eastern border of Hopkinton. Ashville Pond, Mill Pond, and Woodville Pond run the north/south meridian.

Figure 2 Water Resources in Hopkinton

Cultural and Historic Resources

The villages of Hopkinton are the cultural and historic centers of the community. Historic mill developments are located on watercourses and clearly define the economic past of the region. The one exception is Hopkinton City, a crossroads development that is now the Town's municipal center.

According to the State of Rhode Island Historic Preservation & Heritage Commission, Hopkinton has 225 historic properties and 6 historic districts[8]. The districts are:

- Rockville Historic District
- Potter Hill Historic District
- Canonchet Village Historic District
- Ashaway Historic District
- Yawgoog Scout Reservation Historic District
- Tomaquag Rock Shelters

Development Trends Since the 2012 Plan

Development has slowed since the real estate market peaked in 2008. Rather than single family homes, the Town is currently seeing a demand for minor (2-5 lot) subdivisions and some commercial development. Near-term future development may include stand-alone solar arrays in presently undeveloped areas.

Table 2 Demographic Changes

	2010	2015	% Change
Housing Units	3,546	3,758	+6%
Population	8,188	8,123	-0.8%

8 State of Rhode Island Historic Preservation & Heritage Commission website, http://www.preservation.ri.gov Accessed 2/22/17

2

Planning Process

Overview

The Town of Hopkinton initiated the hazard mitigation planning effort in February 2017 at the recommendation of the Hopkinton Planning Director. This Hazard Mitigation Plan Update is the result of a dedicated group of individuals working for six months identifying natural hazards and proposing ways to improve Hopkinton's resiliency.

Hopkinton Hazard Mitigation Committee

This Hazard Mitigation Plan (HMP) is a product of the Hopkinton Hazard Mitigation Committee (HHMC). Committee members include:

Jim Lamphere, Town Planner (Project Lead)

Mark Carrier, Police Department

David Caswell, Public Works*

Sherri Desjardins, Acting Building and Zoning Official*

Donna Gilman, Local Business Owner/Resident*

Sean Henry, Planning Clerk

Frank Landolfi, Town Council President

Justin Lee, Hope Valley Fire Department

Ronald MacDonald, Emergency Management Director

William McGarry, Town Manager

David Palmer, Police Department

Ronnie Sposato, Ashaway Fire Department*

Georgia Ure, Local Business Owner/Resident*

Ed Vazquez, IT/GIS Director

* Denotes Hopkinton resident

The Planning Process

This 2017 HMP is the result of a 7-step process that was initiated in January 2017 with the establishment of the HHMC by invitation from the Hopkinton Planning Director. The Town hired a consultant to assist with this planning effort.

Step two started the plan development process and included the first meeting of the HHMC on February 16, 2017. The HHMC met monthly at the Police Station/EOC.

The Town's previous plan was dated 2012, so the first meeting focused on re-ranking hazards and discussing the process for updating the plan. At this initial meeting, the group reviewed a set of questions to be included in an online public survey. The purpose of the survey was to capture the local residents' perception of natural hazards.

The link to the survey was widely distributed on social media and on the Town's website. Over 143 people participated! See Appendix A for survey results.

Step three began with the HHMC meeting on March 30, 2017. After reviewing the hazards of concerns and survey results, the HHMC identified critical infrastructure and community assets within the town. Fourteen areas of vulnerability were identified: Flood prone drainage systems, bridges, wastewater, water supply, utility facilities, dry hydrants, communication towners, dams, critical municipal hazard response facilities, populations, businesses, schools, recreational facilities, and historic resources. During discussions, the group decided that although important for the function of the Town, the following are well maintained, and currently the focus of ongoing mitigation actions. Therefore, additional protections were deemed not necessary at this time.

- Wastewater
- Utility facilities
- Dry hydrants
- Communication towers

During this early phase, the Town's consultant reviewed the existing Comprehensive Plan, local ordinances, StormReady plan, and gathered information on current infrastructure projects going on within the Town.

Current town capabilities were discussed at the meeting on April 27, 2017. Many different departments, committees, and programs already engage in activities that help the town become more resilient to a variety of hazards. It is important to highlight these capabilities and show how they support the Town's hazard mitigation efforts.

Step four was creating an updated list of mitigation actions to reduce the impact to the identified vulnerable areas. On May 25, 2017, the HHMC reviewed the mitigation items that were proposed in the 2012 plan. Status updates were given for all the previous actions. The incomplete actions that were still important were rolled into the list of actions for this 2017 plan update.

Step five was completed at the June 22, 2017 meeting where the group brainstormed additional mitigation actions they wanted to include. During this meeting, the group decided that not all critical infrastructure needs a mitigation action within the lifespan of this plan (5 years). Included in this step was proposing new actions, establishing action timelines, costs, and identifying responsible parties.

Step six focused on the prioritization of the mitigation actions. On July 26, 2017, the HHMC met as a group to prioritize their proposed actions and confirm additional action details. After this meeting, the consultant finished the draft of the plan for committee review.

Step seven furthered the public input and review process with the Hopkinton Planning Board, Town Council, and the general public for review and comment. The plan was posted on the Town's website. Facebook, and made available at Town Hall and Library for public review. The Hazard Mitigation Plan was also emailed to Emergency Management Directors in the neighboring towns of Sterling, CT, Exeter, Richmond, Charlestown, and Westerly for their review and comments.

Table 3 below provides a summary of the Committee's meeting dates and the activities that they conducted:

Table 3 Committee Meetings

Date	Meeting Summary
02/16/2017	Kick off meeting with new contractor, VHB. HHMC discussed the plan purpose and hazards of concern. Reviewed survey questions.
03/27/2017	Hazards survey posted online.
03/30/2017	The HHMC reviewed the hazards of concern and listed critical infrastructure and community assets.
04/27/2017	Review of community assets and discussion of current capabilities.
05/25/2017	Discussed the status/need for actions from the 2012 plan.
06/22/2017	Brainstormed new mitigation actions.
07/26/2017	Finalized mitigation actions and discussed prioritization.
08/15/2017	Draft plan sent to HHMC for review.

09/11/2017	Draft of 2017 HMP posted for public comment and promoted through social media and on the Town's website.
09/25/2017	2017 HMP was emailed to the Town Council and neighboring Emergency Management Directors for review.
10/16/2017	2017 HMP was presented to Town Council and public.
10/17/2017	Town's consultant made document changes as per public comments and final edits.
10/19/2017	Sent to RIEMA for review.
02/01/2018	Comments received from RIEMA. Edits made to draft plan by Town's consultant under the guidance of the Hopkinton Planning Director.
02/09/2018	Sent to FEMA for review.
02/01/2018	Plan received FEMA Approval Pending Adoption status
03/05/2018	Plan approved and adopted by Town Council.

Public Input

This hazard mitigation plan benefits from various distinct types of public input strategies that were utilized by the HHMC during the drafting process and prior to its adoption by the Town Council. Public input for the Hopkinton hazard mitigation plan was primarily collected through a public survey, public meetings and an invitation to comment.

Early in the planning process, the HHMC promoted and distributed a "Hazard Perceptions" survey online. The purpose of the anonymous survey was to hear from residents the hazards and neighborhoods they are most concerns about. Over 100 individuals participated in the survey. Not surprisingly, most were concerned about snow/blizzards, street flooding from rain, high winds, and hurricanes/tropical storms. The survey also provided the HHMC with a list of problematic areas that are susceptible to flooding. The HHMC used the input from the survey to focus their mitigation planning efforts.

The 2017 HHMC included town residents and business owners. The HHMC's roles focused on reviewing the content of the risk assessment matrix to ensure proper classification of problems and estimates of potential impacts; formulation of mitigation actions and sequencing of primary tasks; and identification of feasible implementation methods and schedules. Their comments were incorporated into the final 2017 hazard mitigation plan.

Another public input strategy involved consulting with local business owners who may be especially vulnerable. Representatives from two local businesses regularly participated in the hazard mitigation planning process.

Prior to public release of the 2017 HMP, the HHMC drafted the plan through a series of committee meetings. While these meetings did not rise to the level of public hearings and were not advertised, they were open to the public. Local interest groups and businesses did occasionally attend when invited.

Another public input strategy was geared toward the general public as opposed to specific stakeholders. During the draft review portion of the plan development, an electronic copy of the draft 2017 HMP was posted to the Town's website. The public was informed of both the webpage posting and the public hearing. See Appendix B. They were encouraged to review the document, comment on the HMP and attend the meeting. Notice of the public hearing was also posted as an agenda item on the Town's website in accordance with state law.

Both the Hopkinton Planning Board and the Town Council members were given copies of the draft plan for review during the public comment period.

On October 16, 2017, the Town Council held a discussion on the HMP as part of their regular public meeting. At the Town Council meeting, there were a few suggested edits proposed by Council Members. These were subsequently incorporated into the plan. A summary of the Planning Board and Town Council edits include:

- Clarify viability of Exit 1 Development Area
- Change the priority of Action 18A for the Ashaway School from a low to a medium priority
- Include mention of the availability of flood maps online.
- Include the state requirement of baseline data on current wastewater loadings in Action 5 (extending the public water line)
- Create a summary table of the actions and their priorities
- Fix minor typographic errors

At the conclusion of the meeting, the Council approved the plan to be forwarded to RIEMA with the requested edits made.

There were no further comments from the general public or neighboring communities.

Review and comments from FEMA and RIEMA were also incorporated prior to adoption by the Town Council.

Before the HHMPC began meeting regularly, the Town was working on updating their Comprehensive Plan which includes discussions on floodplains, resource protection districts, and development trends. Members of the HHMC will be involved in the Comprehensive Plan update and will be incorporating elements of this document into the other plan.

3

Natural Hazards

Hazards of Concern

The Rhode Island 2016 Hazard Identification and Risk Assessment and 2012 Hopkinton Hazard Mitigation Plan were used as a starting point for identifying hazards that pose the largest threat to the Town. The following table summarizes the hazards identified by the Hopkinton Hazard Mitigation Committee.

Table 4 Hazards Identified by the Hopkinton Hazard Mitigation Plan Committee

Natural Hazards Identified by the State	Identified by the HHMP Committee	Notes
Severe Winter Weather		
Ice Storm	✓	
Snow	✓	
Flood		
Riverine	✓	
Coastal	-	Not a coastal town
Flash	-	Conditions not present
Urban	✓	
High Wind	✓	

Natural Hazards Identified by the State	Identified by the HHMP Committee	Notes
Extreme Heat	✓	
Hurricane and Tropical Storms		
Nor'easter	✓	
Storm Surge	-	Not a coastal town
Extreme Cold	✓	
Thunderstorm		
Hail	✓	
Lightning	✓	
Dam Failure	✓	
Fire		
Urban	-	Not an urban town
Wildfire	✓	
Sea Level Rise	-	Not a coastal town
Epidemic	-	Separate plan through RI HEALTH-MEDS Plan
Drought	✓	
Earthquake	✓	
Tornado	✓	
Human-Caused Hazards		**Notes**
Cyber Security	-	Not covered by this natural hazards plan
Chemical Incident	✓	
Terrorism	-	Not covered by this natural hazards plan
Biological Incident	-	Not covered by this natural hazards plan
Radiological Incident	-	Not covered by this natural hazards plan
Civil Unrest	-	Not covered by this natural hazards plan
Technological Hazards		**Notes**
Infrastructure Failure	-	Not covered by this natural hazards plan

This plan will focus primarily on natural hazards but has included a hazardous material spill hazard. Including it in this plan was important for the Committee to explore all the hazards of concern.

During the beginning phases of the planning process, the Hazard Mitigation Committee participated in an exercise that captured the frequency of various hazards, their potential damage extent, and their impacts (i.e. to populations, infrastructure, natural environment, etc.). The following scales were used during the analysis:

Probability of Future Occurrence
Highly likely: near 100% probability within the next year;
Likely: between 10% and 100% probability within the next year or at least one chance in next 10 years;
Possible: between 1% and 10% probability within the next year or at least one chance in next 100 years;
Unlikely: less than 1% probability in next 100 years

Damage Extent
Low: some local property damage not town wide, minor injuries/ loss of life
Medium: 50% of property could be damaged and possible injuries/ loss of life
High: major town wide property damage, injuries and loss of life

Level of Concern/Risk Rank
Developed by the HHMC to rank the various hazards based on frequency and damage potential.
Low - Not expected to occur with any frequency, damages will be limited.
Medium - Will occur within the next 10 years but the Town has resources to reduce risks.
High - Expected to occur within the next 5 years, and is a major concern for the Town.

Based on a combination of probability of future occurrence, damage extent and impacts, the team assigned each hazard a Level of Concern. The table below summarizes the hazards of concern for the Town of Hopkinton, ranked from a high concern to low concern

Table 5 Hazards Ranked

Hazard	Level of Concern/Risk Rank
Hurricane	High
Nor'easter	High
Ice Storm	High
Snow Storm	Medium/High
Flooding (Riverine)	Medium
Dam Failure	Medium
Drought	Medium
High Winds	Low
Flooding (Street)	Low
Hail	Low
Lightning	Low

Hazard	Level of Concern/Risk Rank
Brushfire	Low
Extreme Heat and Cold	Low
Tornadoes	Low
Earthquake	Low
Hazardous Materials Spill	High Potential, confidence in State and local response. Uncertainty still present.

The above human-caused hazard were discussed as a concern for the Hopkinton Hazard Mitigation Committee. Mitigating this hazard requires a highly facility-specific approach not explored in depth in this plan. However, including them in this plan was important for the Committee to explore all the hazards that they are concerned about.

The following sub-sections are organized by the level of risk as identified in the table above.

Hurricanes (Tropical Cyclones)

Description

Tropical cyclones, a general term for tropical storms and hurricanes, are low pressure systems that usually form over the tropics. These storms are referred to as "cyclones" due to their rotation. Tropical cyclones are among the most powerful and destructive meteorological systems on earth. Their destructive phenomena include very high winds, heavy rain, lightning, tornadoes, and storm surge. As tropical storms move inland, they can cause severe flooding, downed trees and power lines, and structural damage (Rhode Island State Hazard Mitigation Plan 2014).

There are three categories of tropical cyclones:

1. Tropical Depression: maximum sustained surface wind speed is less than 39 mph
2. Tropical Storm: maximum sustained surface wind speed from 39-73 mph
3. Hurricane: maximum sustained surface wind speed exceeds 73 mph

Once a tropical cyclone no longer has tropical characteristics it is classified as an extratropical system (Rhode Island State Hazard Mitigation Plan 2014).

Most Atlantic tropical cyclones begin as atmospheric "easterly waves" that propagate off the coast of Africa and cross the tropical North Atlantic and Caribbean Sea. When a storm starts to move toward the north, it begins to leave the area where the easterly trade winds prevail and enters the temperate latitudes where the westerly winds dominate. This situation produces the eastward curving pattern of most tropical storms that pass through the Mid-Atlantic region. When the westerly steering winds are strong, it is easier to predict where a hurricane will go. When the steering winds become weak, the storm follows an erratic path that makes forecasting very difficult (Rhode Island State Hazard Mitigation Plan 2014).

Hurricanes are categorized according to the Saffir/Simpson scale (Table 6) with ratings determined by wind speed and central barometric pressure. Hurricane categories range from one (1) through five (5), with Category 5 being the strongest (winds greater than 155 mph). A hurricane watch is issued when hurricane conditions could occur within the next 36 hours. A hurricane warning indicates that sustained winds of at least 74 mph are expected within 24 hours or sooner (Rhode Island State Hazard Mitigation Plan 2014).

The Saffir-Simpson scale below is based primarily on wind speeds and includes estimates of barometric pressure and storm surge associated with each of the five categories. It is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall."

Table 6 Saffir/Simpson Hurricane Wind Scale[9]

Wind Speed	Typical Effects
Category 1 – Weak 74-95 MPH (64-82kt)	Minimal Damage: Damage is primarily to shrubbery, trees, foliage, and unanchored mobile homes. No real damage occurs in building structures. Some damage is done to poorly constructed signs.
Category 2 – Moderate 96-110 MPH (83-95kt)	Moderate Damage: Considerable damage is done to shrubbery and tree foliage; some trees are blown down. Major structural damage occurs to exposed mobile homes. Extensive damage occurs to poorly constructed signs. Some damage is done to roofing materials, windows, and doors; no major damage occurs to the building integrity of structures.
Category 3– Strong 111-130 MPH (96-113kt)	Extensive damage: Foliage torn from trees and shrubbery; large trees blown down. Practically all poorly constructed signs are blown down. Some damage to roofing materials of buildings occurs, with some window and door damage. Some structural damage occurs to small buildings, residences and utility buildings. Mobile homes are destroyed. There is a minor amount of failure of curtain walls (in framed buildings).
Category 4 – Very Strong 131-155 MPH (114-135kt)	Extreme Damage: Shrubs and trees are blown down; all signs are down. Extensive roofing material and window and door damage occurs. Complete failure of roofs on many small residences occurs, and there is complete destruction of mobile homes. Some curtain walls experience failure.
Category 5 – Devastating Greater than 155 MPH (135kt)	Catastrophic Damage: Shrubs and trees are blown down; all signs are down. Considerable damage to roofs of buildings. Very severe and extensive window and door damage occurs. Complete failure of roof structures occurs on many residences and industrial buildings, and extensive shattering of glass in windows and doors occurs. Some complete buildings fail. Small buildings are overturned or blown away. Complete destruction of mobile homes occurs.

9 National Weather Service, National Hurricane Center

Storm surge is the abnormal rise in water level caused by the wind and pressure forces of a hurricane or nor'easter (Rhode Island State Hazard Mitigation Plan 2014). Nationally, storm surge flooding has caused billions of dollars in damage and hundreds of deaths. Given today's ever-increasing population densities in coastal communities, the need for information about the potential for flooding from storm surge has become even more important. Further discussion on storm surge is not included in this plan, due to Hopkinton's inland location over 5 miles from Greenwich Bay.

Location

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to hurricanes and the resulting loss of human life and property.

Probability of Future Occurrence

Likely.

Extent (Event Magnitude)

Hurricanes that likely make it up to Rhode Island are usually weak (Category 1) or downgraded tropical systems. The wind speeds may be less but the storms can still bring a lot of rain.

Impact and Damage Extent

Hopkinton is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures.

Climate Change Impacts

Warming global air and water temperatures may increase the intensity of hurricanes that travel along the Atlantic Coast.

History

The unforeseen Great New England Hurricane of 1938 is the most catastrophic weather event in Rhode Island and history. The event occurred slightly before high tide and brought with it winds upward of 120 mph. A tidal surge inundated the city of Providence with over 10' of water.

Hopkinton suffered loss of power and damage to houses and buildings. In western Hopkinton, the dam had to be raised at Roaring Brook in Hopkins Hollow to float logs and trees that came down in the storm.

A Category 1 hurricane struck Rhode Island in August 1954 (Carol). The hurricane resulted in house and tree damage around Hopkinton.

In October 1991, Hurricane Bob hit Rhode Island as a Category 2 storm. The hurricane damaged business and homes as well as took down numerous trees and utility lines in Hopkinton.

In 2011, Hurricane Irene hit Hopkinton as a tropical storm. Despite the relatively low wind speeds, sustained winds over a 6 to 12-hour long duration resulted in widespread tree damage and resulted in power outages to roughly half a million customers throughout the state. Numerous trees, poles, and wires were downed throughout Hopkinton. Wind gusts of 46 knots were observed locally at the nearby Westerly State Airport. Collective effects throughout Massachusetts and Rhode Island resulted in 1 fatality, no injuries, and $127.3 million in property damage (NOAA).

In October 2012, Hurricane Sandy severely impacted coastal Rhode Island as it came ashore with Tropical Storm strength winds. Being inland, Hopkinton was spared the storm surge but was impacted by high winds.

Nor'easters

Description

A strong low pressure system along the Mid-Atlantic and New England, can form over land or over coastal waters. The storm radius is often as large as 1,000 miles, and the horizontal storm speed is about 25 miles per hour, traveling up the eastern United States coast. Sustained wind speeds of 10-40 MPH are common during a nor'easter, with short term wind speeds gusting up to 70 MPH. Typically a winter weather event, Nor'easters are known to produce heavy snow, rain and heavy waves along the coast. Unlike hurricanes and tropical storms, nor'easters can sit off shore, wreaking damage for days.

Also called East Coast Winter Storms, Nor'easters are characterized by:

- A closed circulation.
- Located within the quadrilateral bounded at 45N by 65W and 70W, and at 30N by 85W and 75W.
- Show a general movement from the south-southwest to the north-northeast.
- Contain winds greater than 23 mph.
- The above conditions must persist for at least a 12-hour period[10].

The magnitude or severity of a severe winter storm or Nor'easter depends on several factors including a region's climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration,

10 Hersher, et al. An East Coast Winter Storm Climatology. Northeast Regional Climate Center, Cornell University, Ithaca, NY, 2001.

topography, and time of occurrence during the day (e.g., weekday versus weekend), and season.

The extent of a severe winter storm (including Nor'easters that produce snow) can be classified by meteorological measurements and by evaluating its combined impacts. For measuring wind effects, the Beaufort Wind Scale is a system that relates wind speed to observed conditions at sea or on land (See Figure 4). The snow impact of a Nor'easter can be measured using NOAA's Regional Snowfall Index (See the section Snow Storm).

Location

The Town's close proximity to the Atlantic Ocean renders it particularly susceptible to Nor'easters and the resulting loss of human life and property.

Probability of Future Occurrence

Highly Likely.

Extent (Event Magnitude)

On average, Hopkinton experiences or is threatened by a Nor'easter every couple of years.

Impact and Damage Extent

Hopkinton is an inland community; most damage would be from downed power lines, downed trees, and damage to mobile homes or older structures. The Blizzard of 1978 was the largest Nor'easter on record. Many people in Rhode Island were without heat, food, and electricity for over a week.

Climate Change Impacts

Similar to hurricanes, changes in air and water temperatures may lead to stronger Nor'easters along the Atlantic Ocean. Hopkinton should expect stronger Nor'easters, but not necessarily more frequent storms.

History

Table 7 Nor'easter History[11]

Date	Comments
02/10/1969	Up to 20 inches of snow in parts of Rhode Island.
02/07/1978	27 inches of snow in Providence. State of emergency declared in RI and in surrounding MA and CT.
02/24/1998	The second powerful nor'easter to affect the region in less than a week brought heavy rainfall and strong northeast winds to much of Rhode Island. An extremely intense low

[11] [11] NOAA Storm Event Database for flood events in Washington County. https://www.ncdc.noaa.gov/stormevents/

	pressure system moving to the northeast and passing just to the southeast of Nantucket had a central barometric pressure just under 29 inches of mercury. Rainfall totals for this storm exceeded 2 inches over the eastern and northern part of the state. Strong northeast winds gusted to 40 to 56 mph across the state. Nearby Charlestown experienced wind gusts of 52 mph.
03/21/1998	A strong very early Spring nor'easter brought a mixture of snow, sleet, and rain to Rhode Island. Peak wind gusts were 35-49 mph.
06/06/2000	An unusual June nor'easter brought strong winds and heavy rain to portions of Rhode Island. Most of the state (except for Bristol County) received 2-3 inches of rain.
10/25/2005	A strong coastal storm (i.e. a nor'easter) entrained with energy and moisture from the remnants of Wilma brought rainfall amounts between 2 and 2.5 inches and damaging winds to portions of Rhode Island. The high winds brought down limbs, trees, and wires, resulting in scattered power outages in nearby Exeter.
01/12/2011	A developing nor'easter coastal storm dumped nearly two feet of snow across portions of Rhode Island in a 24 hour period. Ten to eleven inches of snow fell across Washington County.
10/29/2011	A rare and historic October Nor'easter brought very heavy snow to portions of southern New England on Saturday October 29. Low pressure tracked northeast from the North Carolina coast Saturday morning, rapidly strengthening as it passed well south of Nantucket Saturday evening. As the storm intensified, colder air from aloft was drawn into New England resulting in heavy snow in the interior. 10-11 inches of snow fell across Washington County.

Ice Storm

Ice Storm. Source: NOAA.

An ice storm occurs when moisture falls and freezes immediately upon impact. The term ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Freezing rain most commonly occurs in a narrow band within a winter storm that is also producing heavy amounts of snow and sleet in other locations. If extreme cold conditions are combined with low or no snow cover, the cold can better penetrate downward through the ground and potentially create problems for underground infrastructure, as well. When utilities are affected and heating systems

are compromised or do not work, water and sewer pipes can freeze and even rupture.

Location

All of Hopkinton is susceptible to ice storms.

Probability of Future Occurrence

Possible

Extent (Event Magnitude)

Ice storms can be the most devastating winter weather phenomena and are often the cause of automobile accidents, power and communication system outages, personal injury, and death. Moreover, they can hinder the delivery of emergency services needed in response to these catastrophes and endanger the responders. Ice storms accompanied by wind gusts cause the most damage.

The Sperry–Piltz Ice Accumulation (SPIA) Index is a scale for rating ice storm intensity, based on the expected storm size, ice accumulation, and damages on structures, especially exposed overhead utility systems. The SPIA Index uses forecast information to rate an upcoming ice storm's impact from 0 (little impact) to 5 (catastrophic damage to exposed utility systems).

Hopkinton expects at least a level 1- isolated or localized utility interruptions every year due to ice.

Figure 3 SPIA Index

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

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

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

Impact and Damage Extent

The Hopkinton Hazard Mitigation Committee is most concerned about ice taking down trees throughout the heavily forested town. Falling trees have taken out power lines, damaged buildings, and essentially shut down the town. Without power, many residents can't run their wells for drinking water. Icy roads can also cause dangerous driving conditions.

Climate Change Impacts

Warming temperatures may mean less snowfall but if there is enough moisture in the atmosphere, it may fall as freezing rain, coating everything in ice. Hopkinton should expect more ice events.

History

Due to the unique weather in New England, ice storms are usually part of larger snow events. The winter storm event that crippled the state in February 1978 did include a FEMA disaster declaration for snow and ice. Subsequent storms have included ice warnings when there are rapidly warming and cooling temperatures. Rhode Island was spared the brunt of the 2008 ice storm which affected more than a million people across New Hampshire, Vermont, Massachusetts, Maine, Connecticut, and New York.

Snow Storm

Description

The majority of Rhode Island lies outside the heavy snow and ice regions of the northeast. Due to its maritime climate, Rhode Island generally experiences cooler summers and warmer winters than inland areas. However, snow and ice do occur and can be more than an inconvenience and cause extensive damage. The two major threats from these hazards are loss of power due to ice on electrical lines and snow loading on rooftops. Additionally, loss of power could mean loss of heat for many residents.

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of the winter storms. It consists of low temperatures, heavy snowfall, and winds of at least 35 miles per hour. A heavy snow storm is one which drops four or more inches of snow in a twelve hour period. An ice storm occurs when moisture falls and freezes immediately upon impact. For the purpose of this plan, snow storms include heavy amounts of snow and ice. All of which may occur independently or at the same time.

Location

A severe winter storm could have a serious impact in private, and public structures, as well as the general population throughout Hopkinton. Those most at risk to extreme cold are the elderly and those who work outside.

Probability of Future Occurrence

Highly Likely

Extent (Event Magnitude)

On average, Hopkinton receives 27.9 inches of snow throughout the year. The record single day snowfall is 23 inches on February 14, 1899. The average winter temperature in Hopkinton is 41.7 Fahrenheit.[12]

Impact and Damage Extent

The combination of wind, ice, and snow can have a crippling effect on the Town. Wind and ice impacts are described in their respective sections of this plan. Heavy and/or excessive snowfall amounts can stress roofs and slow plowing efforts.

Climate Change Impacts

Hopkinton may likely see less snowfall over the winter season but may see more intense blizzards when they do occur.

History

Hopkinton has been subjected to annual snowstorms and Nor'easters. The Great Blizzard of 1978 blanketed Hopkinton with over 30 inches of snow and closed businesses for several days. In February 2013, Winter Storm Nemo temporarily crippled the town. Power lines were down and road crews had a tough time keeping the roads passable. Some people ignored the warning to evacuate and then asked first responders to come get them when they lost power.

Table 8 History of Blizzard and Winter Storm Events in and Near Hopkinton

Date	Inches	Comments
02/07/2003	6-12	No significant storm damage was reported, mainly due to the fluffy, light nature of the snow.
02/17/2003	12-24	No significant damage was reported due to the storm, primarily since the snow was fluffy and light with temperatures in the teens and 20s. Impact on travel was minimal, since the storm affected the region on Presidents Day and most schools were closed that week.
03/06/2003	6-10	Dozens of minor accidents were reported as a result of poor visibility and slippery roads. 9 inches in nearby Westerly.

12 https://snowfall.weatherdb.com/l/5842/Hopkinton-Rhode-Island

Date	Inches	Comments
12/05/2003	10-20	A major winter storm brought heavy snow and strong winds to southern New England, dumping 1 to 2 feet of snow over a large area as it tracked slowly off the coast. 14 inches in nearby Westerly and 8 inches reported in Hope Valley.
01/27/2004	9	Snowfall totals of 4 to 8 inches were common in areas to the west and south of Providence. 9 inches reported in nearby South Kingstown.
12/26/2004	6-10	A powerful winter storm brought heavy snow and strong winds to Rhode Island. Snowfall totals of 6 to 10 inches were widely observed throughout the state, along with winds gusting as high as 50 mph along the south coast. There were dozens of reports of accidents due to the combination of slick roads and poor visibility. 9 inches reported in nearby South Kingstown, 7 inches in Hope Valley.
01/22/2005	15-25	A major winter storm brought heavy snow, high winds, and coastal flooding to southern New England. In Rhode Island, snowfall totals of 15 to 25 inches were widely observed. Winds gusting as high as 60 mph at times (mainly around greater Providence) created near blizzard conditions at times, making travel impossible during the height of the storm. 22 inches reported in nearby South Kingstown.
03/01/2005	4-9	Heavy snow and gusty winds affected Rhode Island and all of southern New England, as low pressure reformed off the mid Atlantic coast and tracked southeast of the region. Snowfall totals of 4 to 8 inches were widely observed. 9 inches in nearby South Kingstown.
02/12/2006	9-16	Storm created blizzard conditions with high winds and heavy snowfall.
03/16/2007	4-7	Snowfall turned into sleet, freezing rain and then rain. 6 inches reported in nearby South Kingstown.
12/19/2008	9-10	Nine to ten inches of snow fell across Washington County. A large tree on Sea Breeze Drive in nearby Narragansett was downed by heavy snow and 30 mph winds.
02/10/2010	6-10	Heaviest snow confined to only southern Rhode Island and southeastern Massachusetts. Strong winds accompanied the storm across this area, resulting in numerous downed trees and power lines, knocking out power to many.
12/26/2010	6-12	A strengthening winter storm passed southeast of Nantucket and brought heavy snow and strong winds to much of Rhode Island, resulting in near blizzard conditions at times. Snowfall totals of 6 to 12 inches were observed in Washington County. High winds combined with the snow, produced damage in nearby South Kingstown.
01/26/2015	12-18	The Blizzard of January 2015 produced very strong winds late Monday into Tuesday near the Massachusetts and Rhode Island coasts where gusts of 50 to 65 mph were common. The Governor of Rhode Island declared a state wide travel ban beginning at midnight on January 27th and continuing through 8 pm. Blizzard conditions occurred at nearby T.F. Green Airport from approximately 6 am to 9 am. Outside this time frame, near blizzard conditions occurred with gusty winds and limited visibilities. Approximately a foot and a half of snow fell across Washington County.
01/23/2016	5-12	Five to twelve inches of snow fell across Washington County. Snow was difficult to measure because strong, gusty winds occurred simultaneously, resulting in blowing and drifting of snow.

Date	Inches	Comments
01/7/2017	11-16	Eleven to sixteen inches of snow fell on Washington County during the day and evening.
02/9/2017	6-13	Strong winds and heavy snow. 6-13 inches fell across Washington County.
03/10/2017	5-6	Low pressure moved up along the cold front on March 10 and passed south of the region, but close enough to bring snow especially on the South Coast

Flooding (Riverine and Street/Urban)

Description

According to the Rhode Island 2014 Hazard Mitigation Plan Update, "Flooding is a localized hazard that is generally the result of excessive precipitation. Flooding is the most commonly occurring natural hazard, due to the widespread geographical distribution of river valleys and coastal areas, and the attraction of human settlements to these areas. Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss."

"A flood, which can be slow or fast rising but generally develops over a period of days, is defined by the National Flood Insurance Program (NFIP) as:

- A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from: overflow of inland or tidal waters; unusual and rapid accumulation or runoff of surface waters from any source; or a mudflow; or
- The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above."

Severe storms with heavy rain can generate flash floods which strike and end quickly. Flash flooding isn't limited to streams and rivers but also streets.

Flooding due to runoff occurs when water runs over the land's surface impervious surfaces (paved areas, building subdivisions, and highways). Two major environmental modifications are primarily responsible for drastically altering the rain fall-runoff relationship.

1. Making the land surface impervious by covering it with pavement and construction work.
2. Installing storm sewer systems that collect urban runoff rapidly discharging large volumes of water into stream networks and/or freshwater wetland system

FEMA maintains regulatory flood maps called Flood Insurance Rate Maps (FIRM). Insurance companies refer to these when providing coverage to homeowners. These maps are available for viewing at Town Hall and online at The FEMA Map Service Center https://msc.fema.gov. Please note that there is a process for the public to request a change in the flood zone designation for their property.

Location

Flooding at Dow Field during the floods of March 2010.

The Town of Hopkinton is bordered by and divided by rivers and streams. The town has approximately 240 acres of flood hazard areas representing less than 1% of total acres in the town. Regulatory floodplains (Special Flood Hazard Areas) in Hopkinton include "A" and "AE" zones. "A" zones are areas that would be inundated by the 1% annual chance flood. Detailed analyses have not been performed in these areas so no depths or Base Flood Elevations are shown. The source of flooding in an A Zone in Hopkinton can be a stream or river that overflows its banks or a pond. "AE" zones depict the same degree of risk but are depicted using specific elevation data. Base Flood Elevations are provided in these areas. Flood Zone X is an area outside of the SFHA which is usually susceptible to flooding during the 0.2% annual chance event. The Hopkinton Resources map in Appendix C depicts the FEMA flood zones which are mainly clustered along the inland streams, the Wood River to the east, and the Pawcatuck River to the south.

During the March 2010 flood events, several roads were unpassable. Fire Station Square and 138/Spring Street near the ponds was flooded. Several of the state-owned roads which were damaged by the floods were repaired by the Rhode Island Department of Transportation.

Probability of Future Occurrence

Riverine flooding is likely. Street/urban flooding is possible.

Extent (Event Magnitude)

Localized flooding can be expected to occur on an annual basis. The flood event which occurred in March, 2010 was a 250 year +/- event.

Impact and Damage Extent

Heavy rains, quick thaws with precipitation, and hurricanes accompanied by heavy winds and rain make the Town vulnerable to personal, property and environmental damage occasioned by flooding. Flooding of local roads limit access for the population, may strand residents, and hinder emergency response or evacuation efforts.

Flood prone areas and/or areas of concern are Locustville Road and Beechwoods Hollow.

Vulnerable structures include dams, residential homes, mobile home parks, water supply substations, facilities storing hazardous materials, historic buildings, sewer pump stations and electric substations.

During events such as the floods of 2010, water seeped into basements forcing residents to shut off their power for safety.

The Town of Hopkinton also participates in the National Flood Insurance Program (NFIP). There are 8 policies in an A zone, and 22 policies in the X zone.

There are currently 30 NFIP policies in effect covering $7,078,500 in property value. There have been 12 paid losses since 1978, which paid out $152,241 to policyholders. Currently there are no Repetitive Loss properties in the Town of Hopkinton. A Repetitive Loss property is defined as an insurable building for which two or more claims of more than $1,000 were paid out by the NFIP within a 10-year period.

Climate Change Impacts

Changing climate conditions are likely to bring more rainfall events to Hopkinton and fewer snow storms. More intense storms will stress the natural floodplains and stormwater infrastructure.

History

Table 9 History of Flooding in Washington County Since 2000.[13]

Date	Comments
03/28/2005	Low pressure tracking south of New England brought 3 to 4 inches to much of Rhode Island, resulting in significant urban and poor drainage flooding. Minor flooding was reported along the mainstem Pawtuxet River.
10/15/2005	Between 2.5 and 4.5" of rain. Many roads were closed region wide; and approximately 500 evacuations occurred. These evacuations were concentrated mainly along the Pawtuxet, Pocasset, Woonasquatucket, and Blackstone Rivers.
10/28/2006	Rainfall totals of 2 to 4 inches produced significant urban flooding from greater Providence to South Kingstown.
03/02/2007	Low pressure over the mid-Atlantic states strengthened as it tracked over southeast New England. Snow quickly changed to heavy rain as the storm reached Rhode Island, when milder air was drawn into the region. Rainfall totals of 2 to 3 inches caused widespread urban and small stream flooding.
4/16/2007	Slow moving coastal storm. East to northeast winds gusted as high as 60 mph. Many small streams throughout Rhode Island also rose out of their banks and flooded nearby areas, including roadways.

[13] NOAA Storm Event Database for flood events in Washington County. https://www.ncdc.noaa.gov/stormevents/

Date	Comments
07/27/2008	A slow moving cold front moved through southern New England and produced a long line of showers and thunderstorms that tracked east across the area. Much of this line of storms was severe with damaging thunderstorm winds and occasional hail. Heavy rain fell locally.
07/1/2009	The intersection of Main and School Streets in neighboring Westerly was flooded and other nearby streets were rendered impassable by flood waters.
03/14 - 16/2010	Strong winds associated with the low pressure system and the low level jet affected both the east and south coasts, resulting in numerous downed trees and wires and some minor structural damage to a few buildings in neighboring Westerly.
03/29-31/2010	River and areal flooding resulted in millions of dollars of damage across Rhode Island, with numerous homes, businesses, and people affected. Five to ten inches of rain fell across Washington County, resulting in rises on the Pawcatuck River at Westerly and at Wood River Junction. The Pawcatuck River set a record of nearly fifteen and a half feet at Westerly and just over eleven feet at Wood River Junction. Numerous roads were flooded in Exeter, Charlestown, Hopkinton, Narragansett, South Kingstown, and North Kingstown, including the intersection of Route 2 and Mail Road and washing away a portion of Route 102 in Exeter. A section of the Blue Pond Dam in Hopkinton washed away, flooding the area and washing out a portion of Route 3.
08/10/2012	Southerly winds drew tropical moisture over Southern New England, resulting in very heavy rain in showers and thunderstorms that developed. In addition, strong winds in the upper levels and 30-40 knots of deep layer shear resulted in wind damage with the strongest of these storms.
06/7/2013	Three to six inches of rain fell across Washington County. In nearby Charlestown, Route 1, Route 112, Old Coach Road, and Klondike Road all were flooded.
03/30/2014	Four to five inches of rain fell across portions of Washington County. This resulted in flash flooding in neighboring Westerly. Canal Street was flooded. Spring Brook overflowed its banks in the White Rock section of Westerly. Water overflowed four to five yards nearing the foundations of those houses. The Pawcatuck River also overflowed its banks in the White Rock section of town. White Rock Road had 2-3 inches of flowing water over the road near a soccer field entrance.
07/15/2015	Showers and thunderstorms developed across the area as a result of an upper level disturbance and a cold front. A couple of these slow moving storms resulted in flooding or flash flooding.
07/28/2015	A strong upper level disturbance sparked showers and thunderstorms across much of southern New England. A few of these storms became severe, producing damaging winds. Others produced heavy rain that resulted in flooding.

Dam Failure

Description

Dams are classified as high hazard, significant hazard or low hazard. The classification is not based on whether a dam is deemed safe or unsafe. As of 2016, there are 96 high hazard dams, 81 significant hazard dams and 490 low hazard dams in the state. Each dam's hazard classification determines the frequency of inspection. The higher the classification, the more frequently the inspection is conducted.

A *High Hazard* dam is one whose failure or misoperation will result in a probable loss of human life.

A *Significant Hazard* dam is one whose failure or misoperation results in no probable loss of human life but may cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare.

A *Low Hazard* dam is one whose failure or misoperation results in no probable loss of human life and low economic losses.

As part of each Rhode Island Department of Environmental Management (RIDEM) dam inspection, the major components of the dam are subjectively rated as good, fair or poor. The major components are the embankment, the spillway and the low-level outlet. Good means the dam meets the minimum Army Corps of Engineers (ACOE) guidelines. Fair means the dam has one or more components that require maintenance. Poor means a component of a dam has deteriorated beyond maintenance and is in need of repair.

Flood events call into question the structural integrity of dams that would affect Hopkinton. In 2016, RIDEM identified 40 dams in the Town of Hopkinton. Four of the 40 dams are classified as high hazard dams and 8 dams are identified as significant hazard dams

The following summaries set forth the conditions of the twelve dams that are classified as significant or high hazard dams.

Location

See Appendix C for the locations of various dams in Hopkinton.

Probability of Future Occurrence

Possible

Extent (Event Magnitude)

All three dam hazard classifications are represented in Hopkinton. The extent of a failure would vary. The Hopkinton Hazard Mitigation Committee has identified failure as a break in the dam, sending water downstream, or faulty gates which if not opened will cause flooding behind the dam.

Impact and Damage Extent

The Hopkinton Hazard Mitigation Committee recognizes that a dam failure is not a natural hazard in itself but several of the hazards listed in the hazard list could bring dam failure upon the Town of Hopkinton. Severe winter storms, flooding, and a hurricane could all bring enough rain and or snowfall to cause a dam failure. The age of these dams also pose a risk to the structural integrity of these dams. A failure of the antiquated gates could cause considerable loss to lives, property and economy.

Climate Change Impacts

Related to flooding, more intense rain events may stress the structural integrity of dams which would lead to failure.

History

During the March 2010 floods, Blue Pond Dam failed. Fortunately, it drains into a forested, undeveloped area and there were no impacts to human health or safety. During that same storm, the Wincheck Pond Dam was close to failing but held. Many surrounding houses would have been damaged if the earthen had dam failed.

Drought

Description

Drought in nearby Connecticut.
Source: Bob Luckey Jr./ Hearst Connecticut Media

Drought is characterized as a continuous period of time in which rainfall is significantly below the norm for a particular area over a multi-year period. The American Meteorology Society defines drought as a period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance. Drought differs from other natural hazards in that they occur suddenly. Rather, a drought evolves over months or even years and, while causing very little structural damage, can have profound economic, environmental, and social impacts.

There are four different ways that a drought can be defined:

1. Meteorological – A measure of departure of precipitation from normal. Due to climatic differences, what is considered a drought in one location may not be a drought in another location.
2. Agricultural – refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop.

3. Hydrological- occurs when surface and subsurface water supplies are below normal.
4. Socioeconomic- refers to the situation that occurs when physical water shortage begins to effect people.

Characteristics and impacts of drought differ in many ways, so it is difficult to quantify drought. An existing index called the Palmer Drought Severity Index (PDSI) that uses temperature and precipitation levels to determine dryness, measuring a departure from the normal rainfall in a given area. The advantage of the PDSI is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions. A monthly PDSI value below -2.0 indicates moderate drought, and a value below -3.0 indicates severe drought.

The U.S. Drought Monitor tracks drought conditions in Rhode Island and in the rest of the nation. They create maps based on climate data, hydrologic and soil conditions, as well as reported impacts and observations from over 350 contributors nationwide.

Table 10 Drought Severity [14]

Severity	PDSI Index Value	Drought Level	Possible Impacts
Exceptional Drought	-5 or less	Emergency	Widespread crop/pasture losses, shortages of water creating water emergencies
Extreme Drought	-4 to -4.9	Warning	Major crop/pasture losses, widespread water shortages or restrictions
Severe Drought	-3 to -3.9	Watch	Crop or pasture losses likely, water shortages common, water restrictions imposed
Moderate Drought	-2 to -2.9	Advisory	Some damage to crops/pastures, developing water shortages, voluntary water-use restrictions requested
Mild Drought/Abnormally Dry	-1 to -1.9	Normal	Short term dryness slowing planting or crop growth
Incipient Dry Spell	-0.9 or less	-	-

Rhode Island, as with most states within the United States, uses both the Palmer Drought Severity Index (PDSI) and the Crop Moisture Index (CMI) as indices for a drought occurrence. The CMI (a derivative of the PDSI) provides information on the

14 http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx

short-term or current status of purely agricultural drought or moisture surplus. The PDSI is most effective for determining long-term drought conditions, while the CMI is effective at helping determine short-term drought.

The RI Drought Steering Committee assigns drought levels for the seven designated drought regions in the state, based on hydrological indices such as precipitation, groundwater, stream flow, and the PDSI, as well as on local supply indices such as static groundwater levels and reservoir levels. The Normal, Advisory, and Watch levels are issued statewide. The Warning and Emergency levels are issued on a regional basis and consider local conditions, source of water supply, and water storage capacity issues.

Location

According to the Rhode Island Water Resource Board the potential for a drought exists every eleven years in Rhode Island. Although temporary drought conditions may occasionally exist in Rhode Island, affecting Hopkinton devastating, long term drought conditions are not indicative of this temperate region.

Probability of Future Occurrence

Likely

Extent (Event Magnitude)

According to The National Weather Service Rhode Island receives on average 39" to 54" annually. Notwithstanding the same, the State experiences extended periods of dry weather. Some type of drought in Rhode Island occurs approximately once every 11 years.

Impact and Damage Extent

The main impact of meteorological drought is periods of very high fire danger. In addition, small pond levels are reduced and the water table drops thereby impacting private wells. With the exception of a few buildings in Hope Valley that area connected to the Town of Richmond's water line, most of Hopkinton residents are on wells.

Drought conditions have been known to trigger the rapid increase of the gypsy moth populations in the region. The extended period of dry weather (specifically in May and June) slows the fungus that usually keeps the gypsy moth caterpillars at bay. Denuded trees can have cascading effects on the local ecosystem.

Drought conditions can also cause farmers to lose livestock or crops, or invest more money in alternate water sources.

Climate Change Impacts

Even though rain events may intensify due to climate change, the periods between them may be longer. Rhode Island expects longer periods of drought. According to

the 2016 Rhode Island Hazard Identification and Risk Assessment, "Recent climate change studies[15] have indicated that although precipitation is projected to increase throughout this century, it will be in the form of short duration, intense, and less frequent events. In addition, it is projected by the Northeast Climate Impacts Assessment Group (NECIA) and the New York City Panel on Climate Change (NPCC) that most of this increased precipitation may occur during colder times of the year, such as winter, in the form of snow or ice. Furthermore, it is projected that the frequency and intensity of both long-term and short-term droughts throughout the Northeast will increase throughout the century with the impacts beginning to occur with a greater degree of frequency beginning in the mid-century (2050s)."

History

Extended droughts are rare in Rhode Island with a record of six major droughts (those lasting for more than one year) since 1929 (Table 11; USGS: Rhode Island Floods and Droughts). The longest and most severe drought occurred in 1963-67 and affected most of the northeast (USGS: Rhode Island Floods and Droughts). Water shortages affected most communities in Rhode Island and several municipal-supply wells were drilled to augment declining public supplies (USGS: Rhode Island Floods and Droughts).

Table 11 History of Droughts

Date	Area Affected	Remarks
1930-31	Statewide	Stream flow of 70% normal.
1941-45	Statewide	Stream flow of 70% normal in Blackstone and Pawtuxet Rivers.
1949-50	Statewide	Stream flow of 70% normal.
1963-67	Statewide	Water restrictions/well replacements common.
1980-81	Statewide	Groundwater deficient in eastern part of state. Considerable crop damage.
1987-88	Southern part of the State	$25 million crop damage.
1998-99	Statewide	Spring through summer the State experienced 75% of normal flow.
2012	Statewide	January –April 2012. Meteorological drought due to precipitation levels one half of normal.
2016	Statewide	Drought Advisory.

High Winds

Description

Wind is the movement of air caused by a difference in pressure from one place to another. Local wind systems are created by the immediate geographic features in a given area such as mountains, valleys, or large bodies of water. National climatic

[15] Information derived from two recent studies: Confronting Climate Change in the Northeast, by the Northeast Climate Impacts Assessment Group, July 2007, and Climate Risk Information, by the New York City Panel on Climate Change, 2/17/09.

events such as high gale winds, tropical storms, thunderstorms, nor'easters, hurricanes, and low-pressure systems produce wind events in Rhode Island. Wind effects can include blowing debris, interruptions in elevated power and communications utilities, and intensification of the effects of other hazards related to winter weather and severe storms.

The Beaufort Wind Scale is a 17-level scale used to describe wind speed and

Figure 4: Wind Speed

Beaufort Wind Chart – Estimating Winds Speeds

Beaufort Number	MPH Range	MPH Average	Terminology	Description
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	**Severe gale**	**Light structure damage.**
10	55-63	60	**Storm**	**Trees uprooted. Considerable structural damage.**
11	64-73	70	**Violent storm**	**Widespread structural damage.**
12	74-95	90	**Hurricane**	**Considerable and widespread damage to structures.**

observed wind conditions at sea and on land. A wind classification of 0 has wind speeds of less than 1mile per hour are considered calm. On the other end, a classification of 10 with wind speeds reaching 63 miles an hour will blow down trees and cause considerable damage.

Location

Wind events are expected throughout the year in Hopkinton.

Probability of Future Occurrence

Highly Likely

Extent (Event Magnitude)

Wind speeds are not monitored in Hopkinton. However, wind speeds in nearby Providence are indicative of Hopkinton. "With an average wind speed of 9.3 MPH, Providence is a windy city, 1.00 MPH higher than the national average. The average wind speed in Providence is about the same as the State average. The windiest season in Providence is spring, with spring wind speeds reaching 10.27 MPH on average, 1.17 MPH higher than in the rest of the U.S..[16]

Impact and Damage Extent

Strong wind gusts of 40 miles an hour (Beaufort Scale of 8) can blow twigs and small branches from trees. Occasional gusts and sustained winds at this speed (and above) are of concern to the Town. Damages from wind events range from power outages, property damage to vehicles and buildings and fallen trees/limbs. Wind events in Hopkinton have resulted primarily in power outages and downed tree limbs with minimal property damage. It is important that the Town of Hopkinton maintain their public tree trimming program that will reduce the likelihood of fallen trees/limbs from disrupting transportation routes and/or taking down power lines.

Climate Change Impacts

Changes in atmospheric circulation are predicted to occur. See "Hurricanes" and "Nor'easters".

History[17]

Table 12 History of High Winds

Date	Magnitude (kts)	Comments
12/12/2000	50	
12/17/2000	50	
11/13/2003	50	
03/08/2005	62	Large trees downed in the East Bay.
10/25/2005	60	Nor'easter. Large tree knocked down on interstate 95, partially blocking the northbound side.

16 WeatherDB https://wind-speed.weatherdb.com/l/206/Providence-Rhode-Island accessed 3/3/2017.

17 National Climate Data Center (2017)

Date	Magnitude (kts)	Comments
12/09/2005	70	Near-blizzard conditions across Rhode Island. Wind brought down trees, branches, and wires.
10/28/2006	50	
04/16/2007	50	
11/03/2007	50	
12/03/2009	50	
01/25/2010	50	
03/13/2010	50	
02/25/2011	50	
12/08/2011	59	
01/13/2012	50	
10/29/2012	75	Hurricane Sandy. Numerous trees were downed throughout Washington County.
12/27/2012	53	
01/31/2013	50	
02/08/2013	55	
11/27/2013	51	
01/09/2015	51	
02/08/2016	53	
02/16/2016	50	
04/03/2016	35	
10/09/2016	35	
11/21/2016	35	
01/23/2017	53	A tree was down on power lines on Skunk Hill Road and wires were reported down on High Street in Hopkinton.

Hail

Hail is formed in towering cumulonimbus clouds (thunderheads) when strong updrafts carry water droplets to a height at which they freeze. Eventually, these ice particles become too heavy for the updraft to hold up, and they fall to the ground at speeds of up to 120 MPH. Hail falls along paths called swaths, which can vary from a few square acres to up to 10 miles wide and 100 miles long. Hail larger than 0.75 inch in diameter can do great damage to both property and crops, and some storms produce hail over two inches in diameter. Hail causes about $1 billion in damages annually in the U.S. (Rhode Island State Hazard Mitigation Plan 2014).

Table 13 Hail Size

Hail Diameter	Size Description
1/4"	Pea Size
1/2"	Mothball Size

Hail Diameter	Size Description
3/4"	Penny Size
7/8"	Nickel Size
1" (Severe Criteria)	Quarter Size
1 1/4"	Half Dollar Size
1 1/2"	Walnut or Ping Pong Ball Size
1 3/4"	Golf Ball Size
2"	Hen Egg Size
2 1/2"	Tennis Ball Size
2 3/4"	Baseball Size
3"	Teacup Size
4"	Grapefruit Size
4 1/2"	Softball Size

Location

All of Hopkinton is susceptible to hail.

Probability of Future Occurrence

Possible.

Extent (Event Magnitude)

The hail in Hopkinton is usually 1 inch or smaller.

Impact and Damage Extent

Structure vulnerability to hail is determined mainly by construction and exposure. Metal siding and roofing is better able to stand up to the damages of a hailstorm than many other materials, although it may also be damaged by denting. Exposed windows and vehicles are also susceptible to damage. Crops are extremely susceptible to hailstorm damage, as even the smallest hail stones can rip apart unsheltered vegetation.

Human vulnerability is largely determined by the availability and reception of early warnings for the approach of severe storms, and by the availability of nearby shelter. Swimming, boating, and fishing are particularly dangerous during periods of frequent lightning strikes, which can also cause power outages, topple trees, and spark fires. Individuals who immediately seek shelter in a sturdy building or metal-roofed vehicle are much safer than those who remain outdoors. Early warnings of severe storms are also vital for aircraft flying through the area.

Climate Change Impacts

There is uncertainty about the effects of climate change on hail storms in Hopkinton. It is likely that the changes in weather patterns may bring more severe hail events.

History

Table 14 History of Hail in Hopkinton[18]

Date	Type	Comments
07/01/2012	¾" Hail	A weak cold front produced showers and thunderstorms, a few of which became severe producing both large hail and gusty winds.

Lightning/Thunderstorms

Description

Thunderstorms are formed when the right atmospheric conditions combine to provide moisture, lift, and warm unstable air that can rise rapidly. Thunderstorms occur any time of the day and in all months of the year, but are most common during summer afternoons and evenings and in conjunction with frontal boundaries. The National Weather Service (NWS) classifies a thunderstorm as severe if it produces hail at least one inch in diameter, winds of 58 MPH or greater, or a tornado. About 10 percent of the estimated 100,000 annual thunderstorms that occur nationwide are considered severe. Thunderstorms affect a smaller area compared with winter storms or hurricanes, but they can be dangerous and destructive for a number of reasons. Storms can form in less than 30 minutes, giving very little warning; they have the potential to produce lightning, hail, tornadoes, powerful straight-line winds, and heavy rains that produce flash flooding.

All thunderstorms contain lightning. Thunderstorms can occur singly, in clusters, or in lines. Therefore, it is possible for several thunderstorms to affect one location in the course of a few hours. Thunderstorms usually bring heavy rains (which can cause flash floods), strong winds, hail, lightning, and tornadoes.20 Lightning is caused by the attraction between positive and negative charges in the atmosphere, resulting in the buildup and discharge of electrical energy. Lightning is one of the most underrated severe weather hazards, yet ranks as the second-leading weather killer in the United States. "Hundreds of people across the nation are injured annually by lightning, most commonly when they are moving to a safe place but have waited too long to seek shelter. Lightning strike victims often suffer long-term effects such as memory loss, sleep disorders, weakness and fatigue, chronic pain, depression and muscle spasms. Lightning has the potential to start both house fires and wildfires. Lightning causes an average of 55-60 fatalities, 400 injuries, and over $1 billion in insured losses annually nationwide." Lightning often strikes as far as 10 miles away from any rainfall.

Location

All of Hopkinton is susceptible to lightning/thunderstorms.

18 National Climate Data Center, 2017

Probability of Future Occurrence

Highly Likely.

Extent (Event Magnitude)

There is no universally accepted standard for measuring the strength or magnitude of a lightning storm. Similar to modern tornado characterizations, lightning events are often measured by the damage they produce. Building construction, location, and nearby trees or other tall structures will have a large impact on how vulnerable an individual facility is to a lightning strike. A rough estimate of a structure's likelihood of being struck by lightning can be calculated using the structure's ground surface area, height, and striking distance between the downward-moving tip of the stepped leader (negatively charged channel jumping from cloud to earth) and the object. In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions such as steeples or poles which the stepped leader can jump to.

Impact and Damage Extent

Lightning can strike buildings and accessory structures, often causing structure fires. Electrical and communications utilities are also vulnerable to direct lightning strikes. Damage to these lines has the potential to cause power and communication outages for businesses, residencies, and critical facilities.

Electrical and communications utilities are also vulnerable to direct lightning strikes. Damage to these lines has the potential to cause power and communication outages for businesses, residencies, and critical facilities.

The public safety departments (Police and Fire) are most vulnerable to a lightning strike.

Human vulnerability is largely determined by the availability and reception of early warnings for the approach of severe storms, and by the availability of nearby shelter. Swimming, boating, and fishing are particularly dangerous during periods of frequent lightning strikes, which can also cause power outages, topple trees, and spark fires. Individuals who immediately seek shelter in a sturdy building or metal-roofed vehicle are much safer than those who remain outdoors. Early warnings of severe storms are also vital for aircraft flying through the area.

Climate Change Impacts

Changing weather patterns may lead to more severe thunder and lightning storms.

History

There has been no reported loss of human life in Hopkinton in the past 50 years due to lightning.

Brushfire

Description

Brushfires are fueled by natural cover, including native and non-native species of trees, brush and grasses, and crops along with weather conditions and topography. While available fuel, topography, and weather provide the conditions that allow wildfires to spread, most wildfires are caused by people through criminal or accidental misuse of fire.

Brushfires pose serious threats to human safety and property in rural and suburban areas. They can destroy crops, timber resources, recreation areas, and habitat for wildlife. Wildfires are commonly perceived as hazards in the western part of the country; however, wildfires are a growing problem in the wildland/urban interface of the eastern United States, including Rhode Island.

Brushfires are dependent upon the quantity and quality of available fuels. Fuel quantity is the mass per unit area. Fuel quality is determined by a number of factors, including fuel density, chemistry, and arrangement. Arrangement influences the availability of oxygen. Another important aspect of fuel quality is the total surface exposed to heat and air. Fuels with large area-to-volume ratios, such as grasses, leaves, bark and twigs, are easily ignited when dry.

Climatic and meteorological conditions that influence wildfires include solar insulation, atmospheric humidity, and precipitation, all of which determine the moisture content of wood and leaf litter. Dry spells, heat, low humidity, and wind increase the susceptibility of vegetation to fire. In Rhode Island, common factors leading to large fires include short-term drought, humidity below 20%, and fuel type.

Various natural and human agents can be responsible for igniting wildfires. Natural agents include lightning, sparks generated by rocks rolling down a slope, friction produced by branches rubbing together in the wind, and spontaneous combustion.

Human-caused brushfires are typically worse than those caused by natural agents. Arson and accidental fires usually start along roads, trails, streams, or at dwellings that are generally on lower slopes or bottoms of hills and valleys. Nurtured by updrafts, these fires can spread quickly uphill. Arson fires are often set deliberately at times when factors such as wind, temperature, and dryness contribute to the fires' spread.

The number of structures at risk is far greater today as there are many more homes on the interface than there were in the nineteen fifties during the last major wildfire. Also, early detection efforts have been limited by the discontinuation of fire tower use by the State of Rhode Island Forestry Division. Rhode Island may not have a risk for spontaneous fire ignition due to dry lightning but, there is always a risk of fires from arson or careless fire use.

Location

The forested Western part of Hopkinton is susceptible to fire. Since Hopkinton is mainly a rural community, many residences are bordering or within forest areas. In times when our forest areas burn uncontrollably, homes that abut interface areas are at great risk

Probability of Future Occurrence

Highly Likely

Extent (Event Magnitude)

1-2 acres per year. The extent has decreased over the years due to better response equipment, faster response time, and the widespread use of cell phones used to report fires.

Impact and Damage Extent

Individual buildings may be more or less vulnerable to damage from brushfires based on factors such as the clear distance around the structure and the structure's construction materials. Brushfires primarily impacts timber and forest ecosystems, although the threat to nearby buildings is always present.

Climate Change Impacts

Longer dry periods and droughts may increase the probability of brushfires but their extent has diminished over the years due to advances in detecting and firefighting technologies.

History

The most serious occurrence of a wildland interface fire in Hopkinton took place in the 1950's where thousands of acres of northern Hopkinton and several homes were destroyed by fire. One Hopkinton firefighter also perished in the blaze.[19]

Extreme Temperatures

Description

Extreme cold may accompany winter storms, be left in their wake, or can occur without storm activity. Extreme cold can lead to hypothermia and frostbite, which are both serious medical conditions. The definition of an excessively cold temperature varies according to the normal climate of a region. In areas unaccustomed to winter weather, near freezing temperatures are considered

19 Town of Hopkinton, Hazard Mitigation Plan, March 2011.

"extreme cold." In Rhode Island, extreme cold usually involves temperatures below zero degrees Fahrenheit (Rhode Island State Hazard Mitigation Plan 2014).

The wind chill index attempts to quantify the cooling effect of wind with the actual outside air temperature to determine a wind chill temperature that represents how cold people and animals feel, based on the rate of heat loss from exposed skin. A wind chill index of -5 indicates that the effects of wind and temperature on exposed flesh are the same as if the air temperature alone were five (5) degrees below zero (0), even though the actual temperature could be much higher. The NWS issues a wind chill advisory when wind chill temperatures are potentially hazardous and a wind chill warning when the situation can be life-threatening (Rhode Island State Hazard Mitigation Plan 2014).

The National Weather Service issues **extreme (or excessive) heat** warnings when the maximum expected heat index is expected to be 105° F or higher for at least 2 consecutive days and night time air temperatures are not expected to fall below 75 ° . In the northeast, these criteria are generally modified to a heat index of 92° For higher for 2 consecutive days.

Location

An extreme heat or cold event would be a regional issue affecting Hopkinton and significant portions of Southern New England. Extreme temperatures could have a serious impact on private and public structures, as well as the general population throughout Hopkinton. Those most at risk to extreme temperatures are the elderly and those who work outside.

Probability of Future Occurrence

Likely

Extent (Event Magnitude)

In 2011, T.F. Green Airport reported heat indexes of 105 to 106 over an eight-hour period.

Wind chills of 32 below zero were reported at T.F. Green Airport in 2016.

Impact and Damage Extent

Personal exposure to dangerous heat conditions may lead to heat cramps, heat exhaustion, and heat stroke. These are especially important to monitor in children, and vulnerable populations that are not able to move to cooler conditions.

Extreme cold conditions may occur during, after, or without any connection to a winter storm. Exposure to extreme cold can lead to hypothermia and frostbite.

Climate Change Impacts

Over the coming century, extremely hot days (over 90 degrees F) is projected to increase in New England.[20]

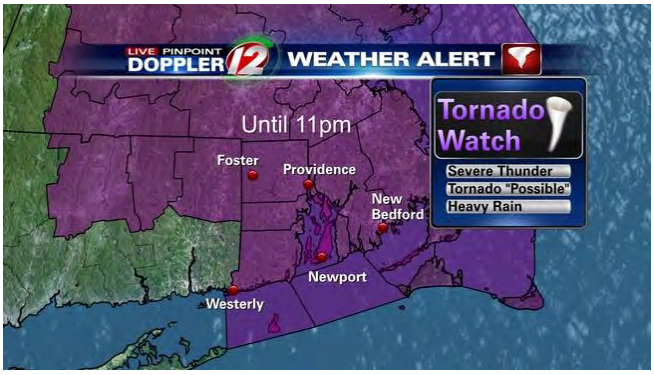
"Extreme cold in Rhode Island is projected to continue as extreme weather events experience an upswing due to climate change. The specific likelihood of extreme cold is unpredictable, as days of frigid, arctic air and below freezing temperatures may be followed by days of mild temperatures in the 40s or 50s."[21]

History[22]

NOAA's Storm Events Database does not have any records specifically for Hopkinton, nor does the Town keep records. The following were temperature records provided by Intellicast which is owned by the same company as the Weather Channel.

- August 2, 1975: record high of 100 degrees
- January 11, 1942: record low of -23 degrees

Tornadoes



A tornado is a violent windstorm with a twisting, funnel-shaped cloud. They are often spawned by thunderstorms or hurricanes. Tornadoes are produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally March through August, although tornadoes can occur at any time of year. Over 80 percent of all tornadoes strike between noon and midnight. During an average year, about 1,000 tornadoes are reported across the United States, resulting in 80 deaths and over 1,500 injuries. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one-mile-wide and 50 miles long.

Tornadoes are categorized according to the damage they produce using the Fujita Scale (F-scale). Below is the Enhanced Fujita (EF) Scale and the Old Fujita (F) Scale. An F0 tornado causes the least amount of damage, while an F5 tornado causes the most amount of damage. Relatively speaking, the size of a tornado is not

20 Confronting Climate Change in the Northeast, by the Northeast Climate Impacts Assessment Group, July 2007

21 RI Emergency Management Agency, State of Rhode Island Hazard Identification and Risk Assessment. November 2016

22 Intellicast http://www.intellicast.com/Local/History.aspx?month=2

necessarily an indication of its intensity. On August, 7th, 1986, a rare outbreak of seven tornadoes occurred in New England. One such tornado, rated F2 on the Fujita Scale, carved its way through Cranston, RI, and Providence, RI, causing twenty injuries and $2,500,000 in damages. **Table 16** highlights more tornado events that have affected, Rhode Island.

Table 15 Fujita Scale

Fujita Scale			Enhanced Fujita Scale		Damage Scale
F Number	Fastest ¼ mile (MPH)	3 Second Gust (MPH)	EF Number	3 Second Gust (MPH)	
0	40-72	45-78	0	65-85	**Light damage.** Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
1	73-112	79-117	1	86-110	**Moderate damage.** Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
2	113-157	118-161	2	111-135	**Considerable damage.** Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	158-207	162-209	3	136-165	**Severe damage.** Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
4	208-260	210-261	4	166-200	**Devastating damage.** Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
5	261-318	262-317	5	Over 200	**Incredible damage**. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Probability of Future Occurrence

Unlikely. Tornadoes rarely occur in this region.

Location

The hazard mitigation committee recognizes that the risk of tornadoes is low for the State of Rhode Island and Town of Hopkinton but with the recent changing weather patterns and touchdowns of tornadoes, it would be unjust not to consider them a possible hazard.

Extent (Event Magnitude)

All of Hopkinton is susceptible to tornadoes.

Impact and Damage Extent

Tornadoes could cause significant damage to structures, trees and utility lines. Flying debris could be cause injuries to residents. Mobile homes are generally more vulnerable to damage than steel framed structures. The town has no year-round mobile or manufactured homes within its borders, these properties would be more susceptible to the threat of a tornado.

Climate Change Impacts

It is uncertain how climate change will affect tornado outbreaks in Hopkinton.

History

Table 16 Recent Tornado Events in Rhode Island[23]

Date	F-Scale	Injuries	Damage	Location
8/16/2000	-	0	$0	Providence County
8/7/2004	-	0	$0	Kent County
7/23/2008	1	0	$47,987	Bristol County
8/10/2012	-	0	$50,000	Washington County

Earthquake

An earthquake (also known as a quake, tremor or temblor) is the result of a sudden release of energy in the Earth's crust that creates seismic waves. The seismicity or seismic activity of an area refers to the frequency, type and size of earthquakes experienced over a period of time. Earthquakes are measured with a seismometer. The size or magnitude is recorded on a device known as a seismograph. Earthquakes with a magnitude 3 or lower are mostly imperceptible (too low to recognize) and magnitude 7 earthquakes cause serious damage over large areas.

Although earthquakes are not considered to be a major problem in the Northeast United States, they are more prevalent than one might expect. Table 13 presents historical seismic activity for Rhode Island. It highlights the earthquake epicenter, the Richter magnitude at the epicenter, and the Mercalli Intensity Level. Richter magnitudes are technical quantitatively based calculations that measure the amplitude of the largest seismic wave recorded. Richter magnitudes are based on a logarithmic scale and are commonly scaled from 1 to 8. See the graphic below. The higher the magnitude on the Richter Scale, the more severe the earthquake. Mercalli intensity levels are based on qualitative criteria that use the observations of

23 Rhode Island Emergency Management Agency (RIEMA), Rhode Island 2014 Hazard Mitigation Plan Update. There have been no reported tornadoes in Hopkinton.

the people who have experienced the earthquake to estimate the intensity level. The Mercalli scale ranges from I to XII. The higher the intensity level on the scale, the closer the person is to the epicenter.

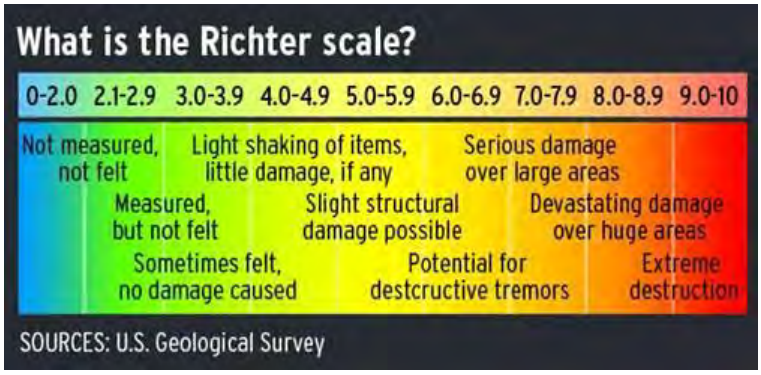


Table 17 Mercalli Scale

Modified Mercalli Intensity	Description of Intensity Level
I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motorcars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level distorted. Objects thrown into the air.

Despite the low probability of a high impact earthquake, physical characteristics in Rhode Island may increase earthquake vulnerability:

- Hard Rock: Due to the geological makeup of New England's base rock, seismic energy is conducted on a greater scale (four (4)-10 times that of an equivalent Richter magnitude earthquake in California).
- Soft Soil: Many coastal regions of New England are made up of soft soils. These soils can magnify an earthquake as much as two times.
- Structures: The New England region, being one (1) of the first settled areas of the United States, has an abundance of older, unreinforced masonry structures that are inherently brittle and very vulnerable to seismic forces.
- Low Public Awareness of Vulnerability: Little public recognition of earthquake threat, and no established system of educating or informing the public of the threat or how to prepare for or respond during an earthquake. Therefore, higher losses will occur here than in other regions of the country.

Location

Rhode Island is located in the North Atlantic tectonic plate and is in a region of historically low seismicity. Only three (3) or four (4) earthquakes of Modified Mercalli Intensity Scale (MMI) V or greater have been centered in Rhode Island, including the 1951 South Kingstown earthquake of magnitude 4.6 on the Richter scale. The Town of Hopkinton is about 13 miles west of South Kingstown.

Probability of Future Occurrence

Unlikely.

Extent (Event Magnitude)

Damaging earthquakes do not normally occur in this region. Rhode Island is located in an area of "moderate" seismicity and "high" risk. Seismic risk applies to the seismic hazard, location demographics, and regional economics to the vulnerabilities of the structure or lifeline on the site. Seismologists have estimated that there is about a 50% probability of a very damaging magnitude 5.0 earthquake occurring anywhere in New England, in a 50-year period.[24] However, based on past occurrences, current geologic makeup and future climate changes, the Town of Hopkinton is not anticipating any disturbances higher than a Class IV intensity.

Impact and Damage Extent

The committee recognizes that the potential for an earthquake to strike the Town of Hopkinton is low but the hazard could afflict town wide damage, causing power outages, building collapses, water main breaks, dam failures, gas leaks, fires and

24 RI Emergency Management Agency, State of Rhode Island Hazard Identification and Risk Assessment. November 2016

injuries or deaths. Buildings that are most at risk from earthquakes are the old masonry buildings and large structures such as those in the Historic Districts.

Climate Change Impacts

It is uncertain how climate change will affect earthquake magnitude in and around Hopkinton.

History

No major earthquakes have happened in Hopkinton.

Table 18 Historic Seismic Activity in/near Rhode Island[25]

Date	Epicenter	Epicenter Magnitude	Mercalli Intensity Level
10/16/1963	Coastal MA	4.5	Caused some cracked plaster (MMI V) at Chepachet, Rhode Island.
6/14/1973	Western Maine	unknown	The intensities in Rhode Island were IV at Charlestown and I-III at Bristol, East Providence, Harmony, and Providence.
03/11/76	Near Newport, RI	3.5	Intensity level VI shock effects felt throughout Southern New England. This earthquake has the distinction of being the largest earthquake to originate in Rhode Island.
04/20/02	Plattsburgh, NY	5.2	Intensity level II to III shock effects felt throughout Rhode Island.
03/11/08	Central Connecticut	2.9	No data reported for Rhode Island
6/23/10	Ontario-Quebec	5.0	Felt throughout Rhode Island.
2011	Rhode Island	0.9	Felt locally.
2012	Rhode Island	1	Felt locally.
2013	Kingston, RI	Unknown	Felt locally.
04/04/13	Hope Valley, RI	1.8	Felt locally.

Hazardous Material Spill/Release

Description

Hazardous materials that pose a danger to human health can be found almost everywhere. A hazardous material incident is the unintended, uncontrolled release of a chemical from its containment.

"Generally, routes of exposure include inhalation, ingestion, and physical contact, and may lead to respiratory distress, organ failure, burns, or death. The rate of absorption via these paths is different for unlike chemicals, and is also affected by the concentration of the chemical in contact with the body (the concentration may change over time), the length of time that the chemical is in contact with the body,

[25] United States Geologic Survey http//neic.usgs.gov/neis/states/rhode_island/rhode_island_history.html and Earthquake Hazards Program "*Did You Feel It*" Archives.

the air temperature, humidity, and the person's age. The severity of a chemical incident depends on the type of material released, the amount of the release, and the proximity to populations or sensitive areas like wetlands or waterways, and environmental factors such as wind velocity and direction and sunlight. The release of materials can lead to injuries or evacuation of thousands of nearby residents.

Injuries vary depending on the chemicals involved. The National Institute for Occupational Safety and Health (NIOSH) pocket guide, Material Safety Data Sheet's (MSDS), the most current Emergency Response Guidebooks (ERG), the Agency for Toxic Substances and Disease Registry (ATSDR) publications, and emergency hotlines such as the Chemical Transportation Emergency Center (CHEMTREC) offer chemical specific injury details and protective measures."[26]

A study was conducted in 2014 to document the transportation of hazardous materials into and out of the state. At the I-95/Woodville Road Overpass (Exit 2), during peak hours for a 2-hour period (June 18, 2014 from 10am to 12pm), there were 11 hazardous material trucks observed (2 northbound and 9 southbound) on the highway. During that period there were also 549 non-hazardous trucks in both travel lanes. The most common hazardous material observed at that location was gasohol gasoline mixed with ethyl alcohol.[27]

Location

The HHMC is specifically concerned about hazardous material incidents that occur along Interstate 95 which runs through about 5.5 miles through the town. If the highway is shut down, there are concerns of trucks being re-routed through the town center.

Another concern is the rail transport of hazardous materials. An active railroad runs in the southern part of Hopkinton south of Alton Bradford Road (Route 91).

Extent (Event Magnitude)

"Hundreds of thousands of hazardous material shipments move through Rhode Island annually. These shipments can occur at any time, day or night, and by means of road, rail, air and water, and often through areas with urbanized, high traffic volume routes."[28] Depending on the type of spill, the effects could be felt nearby or town-wide.

Impact and Damage Extent

A spill can affect waterways and public health.

26 RIEMA, State of Rhode Island Hazard Identification and Risk Assessment, August 2016.

27 EA Engineering, Science, and Technology, Inc. and City of Boston, Rhode Island Hazardous Material Commodity Flow Study, Table A-3, August 2014

28 Ibid

Previous Occurrences

There is no history of a hazardous material release in Hopkinton but the risk is still present. Fortunately, the I-95/Woodville Road Overpass (Exit 2) is not one of the top 10 most frequent accident locations as per the Rhode Island Hazardous Materials Commodity Flow Study. For comparison, according to the same study, from 2001 to 2009 there were between one and eight rail incidents reported per year, yet none involved the release of hazardous materials. During the same period, a total of 201 marine incidents involving a release were reported. Releases were mainly oil and diesel and ranged in quantity from 0.1 gallons to 3,000 gallons.

Climate Change Impacts

It is uncertain how climate change will affect the demand for fuel and oil to be transported along the Northeast Corridor.

Probability of Future Events

"Rhode Island's first line of defense in protecting public health, safety, and welfare in an environmental emergency is the DEM. Like police and fire fighters, DEM's emergency responders are prepared to handle incidents of great variety including everything from a spill of a few gallons to a whole tanker full of petroleum, from a single abandoned drum to biological and chemical weapons. Highly trained first responders are on-call 24-hours a day, seven days a week."[29]

In addition to not knowing how residents should respond to such an incident, Hopkinton residents are concerned of an increased risk of these materials being transported off the highway as truckers may try to avoid the proposed interstate toll booth. Similarly, incidents along the railroad could lead to an uncontrolled release.

Climate Change

Changing climate patterns globally and in Rhode Island will worsen the effects of natural hazards and affect future planning and mitigation efforts. Long-term climate change is likely to cause the following impacts in Hopkinton:

- Heavier, more frequent precipitation events, which may cause more riverine flooding and flash flooding events.
- Longer periods of drought which may affect water availability and increase the threat for wildfires.
- Increasing air and water temperatures.
- More frequent high heat days and heat waves.

29 State of Rhode Island Hazard Identification and Risk Assessment, August 2016.

How rapidly these changes will be felt is debatable but there is certainty within the state that municipalities need to be prepared. The Town aims to become more adaptable/resilient to the changing conditions.

Through the exercise of creating this plan, the Town of Hopkinton is exploring ways to reduce their long and short-term risks to a variety of hazards. Fortunately, being an inland community, Hopkinton does not have to be concerned about storm surge and erosion but being in a coastal state, any storm that comes up the eastern seaboard will likely impact the town which is located about 9 miles from the shore. As climate conditions intensify, the HHMC is prepared to update this plan accordingly.

4

Risk Assessment

Facilities Inventory

The first step in the assessment process was to create the inventory of facilities of special concern to the Town. The HHMC identified the following as community assets:

- Flood Prone Drainage Systems
- Bridges
- Wastewater facilities
- Water supply facilities
- Utility facilities
- Dry hydrants
- Communication towers
- Dams
- Critical municipal hazard response facilities
- Populations
- Businesses
- Schools
- Recreational Facilities
- Historic resources

During the review of these assets, the HHMC came to the conclusion that not all of these are so vulnerable they require a mitigation action within the next 5 years. As infrastructure ages, and climate conditions change, the HHMC will update this plan accordingly.

These most vulnerable assets are identified in the Community Assets Matrix located at the end of this section.

Hazard Mitigation Mapping

The Town's GIS database, including parcel data, orthophotography and FEMA flood zone information, were utilized to complete the assessment. The use of this system allowed the HHMC to estimate potential fiscal and population impacts for individual parcels (see Sections 4.3 and 4.4 for results).

The final output of this exercise is the Town of Hopkinton Resources map in Appendix C. The focus of the maps is not to duplicate all of the spatial information generated through the inventorying process but rather to present the location of the identified risks as they relate to the Town's response facilities.

Fiscal Impact Analysis

The Town of Hopkinton's parcel data and FEMA's 1% annual chance floodplain data were utilized to generate estimates of potential fiscal impacts from natural hazard events such as flooding. The information utilized from the tax assessor's database and GIS included the improvement values, land usage, and unit counts. The analysis showed that Hopkinton is comprised of 39,745 acres of land, with 230 acres (<0.6%) in the regulatory floodplain plus 11 acres of floodway. These 230 acres are mainly located along Moscow Brook and Brushy Brook on either side of Route 138, along the Wood River on the eastern border of town, and along Canonchet Brook, Tomaquag Brook, Perimeter Brook, Ashaway River, and Mile Brook.

HAZUS-MH was used to further understand the potential risk from a large hurricane. HAZUS-MH is a software tool that contains models for estimating potential losses from earthquakes, floods, and hurricanes. For the purpose of this plan, a scenario was run that capture the town's risk from hurricane damage. The table below summarizes some of the potential damages. The hurricane scenario model uses the same path as the hurricane which tracked west of Hopkinton.

In 1954 Hurricane Carol (Category 1, peak gusts at 89 mph) tore through Southern New England, causing extensive damage throughout Rhode Island. If this same storm were to strike again today, it would cause over $50 million dollars in total economic losses (property damage and business interruption loss). About 37 buildings are expected to be at least moderately damaged, none are expected to be total destroyed.

HAZUS Qualitative Damage Description
No Damage or Very Minor Damage
Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.
Minor Damage
Maximum of one broken window, door or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.
Moderate Damage
Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water
Severe Damage
Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.
Destruction
Complete roof failure and/or, failure of wall frame. Loss of more than 50% of roof sheathing.

Table 19 HAZUS-MH Scenarios for Hopkinton, RI

1954 Hurricane Carol Scenario- If It Happened Today	
Estimated Damage	**Amount**
Debris generated	22,036 tons
Buildings destroyed	0
Buildings at least moderately damaged	37
Displaced households	27
Essential Facility Damage (fire, police, schools)	<1 day loss
Residential Property (capital stock)	$806 million
Business interruptions	$420,000

Figure 5 Hurricane Carol Path

Table 20 displays potential damage estimates of property values of parcels that are located wholly or partially within the Town's Special Flood Hazard Area (SFHA, or regulatory floodplain). The parcel information, using the best available data, provides the number of parcels in the SFHA, and values of the buildings on each property. Land value was not considered for this exercise. The values provided are an estimate considering some properties are located in more than one sub-watershed. This percentage was calculated in order to assist with identifying which areas are at greater risk. According to Table 20, the town-wide total potential building damages for these floodplain areas are over $3,000,000. The entire town has only 26 parcels with structures in the SFHA.

The most expensive property in the SFHA belongs to Whispering Pines Campground with an estimated building value of $871,000.

Approximately 72% of Hopkinton's revenue is generated from property taxes.[30] Should any of the properties forming the tax base be destroyed by a hazardous event, a causal effect would be those property owners whose parcels remain intact would carry an increased financial burden with regards to property taxes. It is an important course of action for the Town to protect both lives and property from natural disasters. However, as Hopkinton's population grows, the burden of protecting lives and property grows.

Using data from the RI Geographic Information System (RIGIS) and information from the Hopkinton Tax Assessor, the following table summarizes the value of the insurable buildings that are located within the Special Flood Hazard Areas.

[30] Town of Hopkinton, Rhode Island, Annual Financial Statements for the Fiscal Year Ended June 30, 2015.

Accessory buildings such as sheds located in the SFHA were not included in the summaries.

Table 20 Building Values in Special Flood Hazard Areas

Watershed	# Parcels in SFHA w insurable buildings	Residential	Commercial	Public	Utility	TOTAL
Ashaway River	6	$ 792,400				**$ 792,400**
Lower Wood River	11	$ 955,900	$ 553,400	$ 161,300		**$ 1,670,600**
Tomaquag Brook- Pawcatuck River	5	$ 381,300				**$ 381,300**
Upper Wood River	4	$ 143,900		$ 84,400	$ 9,000	**$ 237,300**
TOTAL	**26**	**$2,273,500**	**$ 553,400**	**$ 245,700**	**$9,000**	**$ 3,081,600**

Most of the buildings located in the SFHA are residential, scattered throughout the perimeter of the town. A few are more centrally located in the village of Rockville near Moscow Brook and Wincheck Pond.

Built Environment

According to HAZUS-MH, Hopkinton has over an estimated 3,412 buildings with a total replacement value (excluding contents) of $981 million. Approximately 92% of which are associated with residential housing.

The HHMC has identified critical infrastructure listed in the Community Asset Matrix (Table 21). The list includes: Flood prone drainage systems Bridges, Wastewater Facilities, Water supply systems, Utility facilities, Dry hydrants, Communication Towers, Dams, Critical Municipal Hazard Response Facilities, Special Populations, Businesses, Schools, Recreational Facilities, and Historic Resources. All of these important community resources have the potential to be affected by a natural or manmade hazard. The magnitude of the losses would be dependent upon the type, location, and extent of each unique hazard.

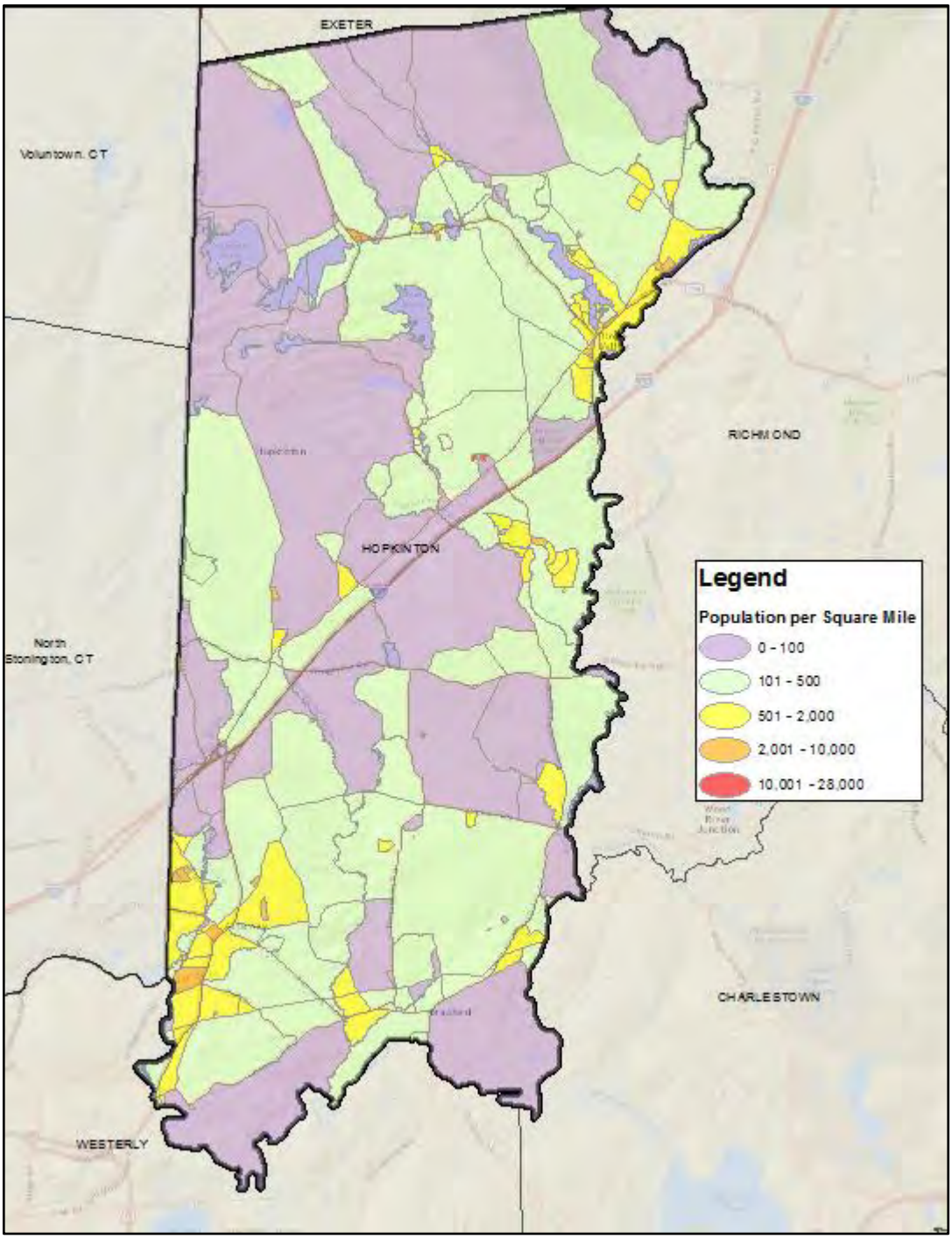
The town's zoning laws help dictate future development while maintaining Hopkinton's rural character. Continued enforcement of Rhode Island State building codes and new regulations as required will lessen potential damage caused by a natural hazard event. The codes adopted by the Town of Hopkinton range from building codes and design standards, to zoning regulations.

Some of the developed parts of Hopkinton are particularly susceptible to flooding. The base flood is an event that has a 1% chance of occurring annually and is the storm event used to identify the flood zones which impact zoning and building requirements throughout the Town. In Hopkinton, the HHMC is most concerned about the Hope Valley and Ashaway areas where many homes and businesses are located in or near the regulatory flood zone.

Population Impact Analysis

Of primary concern during a hazard event is protecting the health and safety of Hopkinton residents. In addition to knowing the total population, it's also important to estimate how many people would be impacted by loss of service or need to evacuate. According to the 2015 US Census, there are 3,758 housing units in Hopkinton supporting a population estimate of 8,123. The population is not spread evenly throughout the town. The larger population centers are in the villages of Hope Valley and Ashaway.

Figure 6 Population Density of Hopkinton



Using the 2014 Tax Assessor's Database, the Rhode Island GIS e911 structure file, and the Town's GIS, it was determined that there are total of 32 non-accessory structures within Town's base flood zones (1 is commercial, 2 are owned by the utilities, 2 are on a campground, 3 are public buildings, and 24 are residential buildings).

In addition to private wells, which serve most of the population, there is limited public water service in the Hope Valley part of town on the Richmond town line.

Due to their non-residential nature, at-risk population estimates could not be developed for historic resources, critical municipal hazard response facilities, and recreational facilities.

Natural Environment

"The quality of the natural environment and landscapes of Hopkinton add to its rural character, creating a sense of place that residents value."[31] The 2016 Comprehensive Plan identifies the following critical natural resources:

- Groundwater
- Surface water body systems and watersheds
- Wetlands
- Habitat for rare plant and animal species
- Highly erodible soils
- Prime agricultural soils
- Floodplains
- Forests

Topographically, the town consists of rolling hills typically interspaced by broad, low gradient stream valleys containing extensive wetlands. While the northern end of the town is laced with freshwater ponds and rivers, the southern border is lined by the Pawcatuck River.

A large majority of the land in Hopkinton is undeveloped forest or wooded areas. There are a few preserved forested areas within Hopkinton but the larger tracts are located to the west in Connecticut (Pachaug State Forest), and east (Carolina Management Area), and south (Burlingame State Park).

"Threats to natural resources are unchecked commercial activities, such as leaking underground storage tanks, unreported spills of hazardous materials or petroleum products and failing septic systems that go unmaintained. These materials can enter ground and surface waters as well as soils, leading to contamination of private and community wells."[32] The Town currently enforces a Primary Groundwater and Wellhead Protection Zone which specifies allowable uses within the zone.

"Also threatening natural resources is sprawling development. This type of development impacts large expanses of land with little to no protection of natural or cultural resources."[33] Transfer of purchase of development rights can protect sensitive lands from future developments. This action moves development rights

31 Town of Hopkinton, 2016 Comprehensive Plan

32 Ibid

33 Ibid

from one area to another that can accommodate the burden on existing infrastructure such as water and sewer services.

Vulnerability of Future Structures

"The Town has several concerns regarding increasing development within Hope Valley due to poor soils, high water table and failing septic systems. Hopkinton does not plan to install public sewers anywhere in town although the town does provide assistance to upgrade existing septic systems. Additionally, water service to Hope Valley from the Town of Richmond extends only to Spring Street although, in April of 2016, the town issued a request for proposal for engineering services to conduct a feasibility study of an expanded system. Due to the lack of infrastructure and significant resource constraints, Hope Valley is presently built beyond carrying capacity. Therefore, any future development within these and the other villages of Hopkinton should be within the capacity of environmental constraints associated with soils, floodplain and wastewater management."[34]

In 2016, an Exit 1 Development Area Study was conducted to address the challenges of preserving the area's rural character while exploring the idea of new growth centers. "The Study proposed new zoning and development guidelines that would create a mixed-use village center at the exit that includes affordable housing, recreational activities and a variety of mobility options. The Town of Hopkinton also committed to an Affordable Housing Plan strategy designed to achieve affordable housing units at Exit 1…. Should a mixed-use village center become viable at Exit 1, strategies should reflect planning practices of New Urbanism and Traditional Neighborhood Development to avoid strip commercial development and large-lot single family subdivisions and there should be an emphasis on walkable communities with smaller lots."[35]

Hopkinton's vulnerability to natural hazards is not expected to change dramatically over the next five years due to increased development. Enforcement of current building codes will ensure that development will be stronger and more resilient than some of the older structures in Hopkinton.

Community Assets Matrix

The matrix (Table 21): Critical Infrastructure/Community Assets represents the culmination of the risk assessment process and is the final product. Its purpose is to gather all the pertinent results in one place for ease of presentation and to serve as a starting point for discussion of specific mitigation actions. It not only lists the specific areas of concern, but provides detailed location information, summarizes the applicable hazard, problem, and mitigation benefits.

34 Town of Hopkinton, 2016 Comprehensive Plan

35 Ibid

Table 21 Hopkinton Critical Infrastructure/Community Assets

At Risk	Location	Hazard/Problem	Mitigation Actions
Flood Prone Drainage Systems/Streets	Many of the flood prone areas identified in the public survey were affected by the Floods of 2010. Improvements have been made since then. The following are town owned roads that still need to be improved. • Locustville Road	Temporary flooding near elementary school during heavy rain events	• 1A: Rebuild catchbasin #3 at Locustville Rd. • 1B: Install 5 rows of infiltration chambers between CB 1 and CB 2 on Locustville Road.
Bridges * single lane bridges	State-owned Route 216 at Route 91 (has been flooded) Alton Bradford bridge (2010 flooding) *Chase Hill Rd near Ashaway Rd. Laurel St. @ Potter Hill Main St. – Over Rte 95 (exit 1) Main St – Meeting House Bridge. Mechanic St. (State per DOT GIS) Spring St @ Woody Hill. Woodville into Richmond Town-owned Aldridge bridge Arcadia Rd. (State- RIDOT GIS says local)) Burdickville Rd. (Hopkinton and Charlestown), Built by State *Collins Rd Grass hill bridge Grassy Pond *Sawmill- cement culvert *Tomaquag Valley Road *Wincheck Pond Road Woodville Alton – (over Rte. 95 @ Exit 2) Woodville Alton Rd. At Golf Course *Woody Hill- flooded in 2010, wooden *Woody Hill South- wooden	All hazards as it relates to access the bridges provide.	• 2A: Inventory all culverts and bridges • 2B: Hire a consultant to inspect all bridges and culverts to assess condition. • 2C: Prioritize repairs • 2D: Fix necessary bridges and culverts • 3A: Assess feasibility of widening 1-lane bridges to 2-lane bridges. • 3B: Widen select bridges from 3A • 4: Replace and elevate the wooden Woody Hill and Woody Hill South bridges with more resilient materials.

At Risk	Location	Hazard/Problem	Mitigation Actions
Wastewater	Septic, denitrification systems in flood area- operated by electricity.	Flooding, Loss of power from other hazards.	• Septic system loan for residents- ongoing • Tree trimming w National Grid- ongoing
Water Supply Systems	Much of the water availability issues are tied into the water behind the dams. If a dam breaks, it lowers the water table. See also "Dams". Community water systems, well-based Echleston Plat (Lynn Lane) Canonchet Cliffs (805 Main St) Hope Valley Village (Main St)- comes from Richmond. Camp Yawgoog has surface water treatment plant. Southern part of Hope Valley has water shortages	Drought, Hazardous material contamination, Loss of power from other hazards. Unreliable water table.	• 5: After feasibility assessment is completed (set to begin in 2017/18), extend public waterline from the Hope Valley Fire Station. • 6: Develop a plan for major water main break which could cause flooding and affect fresh water supplies. Identify required shutoff equipment needed, and who to call
Utility Facilities	These facilities are not owned by the Town but are critical to note as vulnerable systems. *National Grid (31 Oak St.) on pads *National Grid (1152 Main St.) Verizon (6 Ashaway Rd) switch station Verizon (1084 Main St.) switch station *New substation on Ashaway Rd, will eliminate Oak and Main.	Wind Ice	• Working with National Grid on tree trimming program- ongoing. • Voluntary burying of power lines in some newer developments
Dry Hydrants	Hope Valley Fire Station- Station 1 (996 Main St.) Thelma Drive Coastal Plastics (35 Mechanic St.) Kay Dee Designs (177 Skunk Hill Rd.) Rockville Mill Woodville Dam (114 Woodville Rd.)	Drought	• Check for leaks at all dry hydrants twice a year to minimize water supply loses- ongoing.

At Risk	Location	Hazard/Problem	Mitigation Actions
	Stone Bridge Way Hopkinton Hill Road Fairview Road Line and Twine Lower (24 Laurel St.)- abandoned, too low Cisterns at Shady Grove & Rockville Mill • ISO rating figured for tanker shuttles, not dry hydrants or cisterns. Cisterns no longer recommended for fire fighting in the town.		
Communication Towers	Not Town owned. Well maintained but worth nothing as vulnerable infrastructures. Industrial Communications (247 North Rd.) Fire radio, ambulance. MCI Tower (395 Woodville Rd.) Ashaway Volunteer Fire Assoc. (213 Main St.) Hope Valley-Wyoming Fire District (996 Main St.) Hopkinton Police Headquarters (406 Woodville Rd.) 650 Main Street	Wind Lightning	• Town has backup communication for all emergency responder departments
Dams	The high hazard and significant hazard dams are listed below. If they fail, these dams have the potential to impact the most people downstream. Alton Pond (significant)- shared w Richmond- ownership pending Ashville Pond (significant)- ownership pending Barberville Pond (significant)- owned by RIDEM Blue Pond (significant)- owned by Ashville Corporation (maybe out of business) Harris Pond (significant)- owned by Edward Carapezza Hoxie Farm Pond (significant)- owned by RIDOT Langworthy Pond (significant)- owned by Mann and Ankrom Locustville Pond (high)- owned by Georgia Ure Wincheck Pond (significant)- owned by RI Boy Scouts	Flooding upstream and downstream	• 7: Create a public notice/communication plan for emergency evacuation of dams (or other life-threatening hazards). • 8: Consider the following recommendations from the Wood-Pawcatuck Watershed Flood Resiliency Management Plan. The Town still needs to evaluate what is best for residents. o Formalizing partial breach at Blue Pond Dam o Replace culvert w larger structure and lower invert to drain impoundment and decommission Hoxie Farm Pond Dam. o Maintain Locustville Pond Dam

At Risk	Location	Hazard/Problem	Mitigation Actions
	Wyoming Upper Pond (significant)- owned by RIDEM Yawgoog Pond (high)- owned by RI Boy Scouts Potter Hill Dam (low)- removal of fish ladder would enhance aquatic organism passage and flood resiliency.		o Repair Harris Pond Dam o Construct fish passage at Barberville Pond Dam to promote connectivity o Repair Wyoming Pond Upper Dam
Critical Municipal Hazard Response Facilities	<u>Emergency Response</u> Ashaway Ambulance Assoc. (72 High Street) Ashaway Vol. Fire Assoc. (213 Main Street) Hope Valley Ambulance (5 Fairview Ave.) Hope Valley-Wyoming Fire District (996 Main St.)- in SFHA Hopkinton Emergency Management Agency/EOC (406 Woodville Rd) Hopkinton Police Department (406 Woodville Rd.) Hopkinton Public Works (395A Woodville Rd) Hopkinton Highway Department (395 Woodville Rd. Chariho shelter not in Hopkinton.	All hazards.	• 9: Require all new critical facilities to be built 1 foot above the 500-year base flood elevation • 10: Mitigation for riverine flooding at HVFD • 10A: Short term: stabilize the bank • 10B: Long term: relocate station • 11: Lightning protection on all Town and Fire District Buildings • 12A: Prioritize DPW/Highway Department building improvements • 12B: Implement upgrades to Department of Public Works facilities- dependent on Action 12A.
Populations	All residents <u>Group Homes</u> Bridges, Inc.- Fenner Hill Rd Perspectives Corp- Teaberry Lane RI Community Living and Supports- Spring Street RI Special Needs Registry- Town-wide Spurwink- Brook Dr. <u>Public Housing</u> Canonchet Cliffs 1- 825 Main St. Canonchet Cliffs 2- 805 Main St.	Personal safety for all hazards Drought- water supply	• 13: Public relations campaign to advise residents about steps to prevent wildfires, conserve water, safety during extreme temperatures, and smart flood mitigation suggestions (expanded from 2012) • 14: Create an evacuation plan for a chemical release along Interstate 95. • 15: Revise current burn ordinance to prohibit ANY open burning year- round without a permit. • 16: Town to purchase the latest version of ArcGIS Desktop 10.5.1 to continue to provide valuable mapping to residents and Town employees.

At Risk	Location	Hazard/Problem	Mitigation Actions
	Canonchet Cliffs 3- 807 Main St. Saugatucket Springs 15 Town House Rd. Rockville Mill French Village (seasonal). Town checks on them before floods occur		
Businesses	Ashaway Line & Twine- no sprinklers when there is a drought. More rounds of firewatch. Green Plastic- flood Coastal Plastics- flood Hope Valley Industry- flood West Bakery- flood Spring Street Market- flood Tack & Livery- flood SR Avery Funeral Home- flood Langworthy Field Wyoming Fruit & Veg- flood Solar Array at Bank Street owned by S.M. Trombino (floods)	Flooding	• 17: Create and distribute a floodproofing leaflet with FEMA recommendations on how to better protect your business from flooding.
Schools	<u>Elementary Schools</u> Ashaway School/Shelter (12 A/B Hillside) Old Ashaway Elementary School- abandoned Hope Valley School/Shelter (15 Thelma Dr.)	Old School- Fire hazard, student safety and security Loss of power due to wind or ice. Seismic concerns and snow load concerns	• 18A: Form a local advocacy group lead by the local fire chiefs, police chiefs, and school officials to propose building demolition to Town Council. • 18B: Move forward with recommendations for old Ashaway School which creates a fire and safety hazard for nearby elementary school. Dependent upon outcome of Action 18A • Generator for Hope Valley School
Recreation Facilities	Recreation Center/Shelter (188 Main St.) Holly Tree Campground (109 Ashaway Rd.) Frontier Campground (180A/B Maxson Hill Rd.)	All hazards.	• Town communicates with campground owners in advance of a storm threat.

At Risk	Location	Hazard/Problem	Mitigation Actions
	Greenwood Hills Campground (13A,B,C Newberry Lane) Whispering Pines Campground (26A/B Woody Hill Rd.) Camp Yawgoog (BSA) Crandall Field (Main St.) Langworthy Field (Locustville Rd.) Dow Field (Main St.) – floods Arcadia State Management Area (Arcadia Rd) Woodville Alton Boat Ramp Ashaway Pines Campground- culvert floods b/c of beavers Boat launch at Ashville Pond		• 19: Improve boat launch at Ashville Pond to allow for fire rescue boats to access the ponds and rivers.
Historic Resources	Hopkinton City Individual properties Mills throughout	All hazards.	• 20: Local guidance for hazards and historic resources?

5

Programmatic Capabilities

Purpose

This capability assessment examines the existing studies, plans, programs, and policies that have incorporated hazard mitigation and other pro-active tools into the Town system. The purpose of the capability assessment is to highlight successes, identify shortcomings, and to lay the groundwork for possible improvement. Hopkinton recognizes that the inclusion of mitigation initiatives not only benefits the community by reducing human suffering, damages and the costs of recovery, but also helps build and maintain the sustainability and economic health of the Town. Section 5.2 details the Town's existing relevant plans, programs, and policies that were reviewed during the drafting of this plan.

Primary Plans, Regulations, and Departments

Hopkinton Comprehensive Plan

The Hopkinton Comprehensive Plan was adopted on February 13, 2004, revised in 2011, and is currently undergoing an update in 2017. In 2016, the State approved an amendment to address energy production and consumption, and natural hazards with in the Public Services & Facilities and Land Use section of the plan. The Hopkinton Comprehensive Plan provides a future vision for the town providing for the appropriate protection, development, use, and management of land and natural resources with provisions for adequate for services, facilities and a range of housing choices for all income levels and age groups. "It assesses historic and current trends,

presents the vision residents have for the town, and provides the framework for reaching that vision". The plan current plan includes a natural and cultural resources element that focuses on the natural environment. However, it is expected that the new revision will include elements of hazard mitigation and climate change, using this document as a reference.

Zoning Ordinance

Among other things, the Zoning Ordinance of the Town of Hopkinton aims to provide guidance for orderly growth and development which recognizes natural land characteristics, values and considers the unique and valuable natural resources and features in town. The Zoning ordinance promotes safety from fire, flood, and other natural or man-made disasters. The Town of Hopkinton will amend its Zoning Ordinance to be in conformance with the Comprehensive Plan within eighteen (18) months of plan adoption in accordance with the General Laws of Rhode Island, section 45-22.2-5(A)(4). The Town is also working on including solar and wind energy regulations in their zoning ordinance. State building and fire codes have not caught up with roof mounted solar efforts yet.

Appendix A, Section 33 of the Code of Ordinances describes zoning standards for the floodplain overlay district. The zoning ordinance is currently undergoing a re-write and will include language to reflect current date of FIRMS as 2010.

Land Development and Subdivision Regulations

These regulations, last revised September 2, 2014, protect existing natural and built environments and mitigate the significant negative impacts of proposed development on those environments. The Regulations promote design of land developments and subdivisions which are well-integrated with the surrounding neighborhoods with regard to natural and manmade features, and which concentrate development in areas which can best support intensive use by reason of natural characteristics and existing infrastructure.

Further, the regulations do not allow for development in the Areas of Special Flood Hazard without appropriate permitting procedures. Proposed construction in the flood hazard areas must be consistent with the need to minimize flood damage.

These Regulations support hazard mitigation efforts by managing development in areas that absorb floodwaters and promote sustainable buildout practices.

Storm Water Management Plan

Adopted October 7, 2013, the Hopkinton Storm Water Management Plan discusses how Hopkinton meets the minimum State control measures for: public education and outreach, public participation/involvement, illicit discharge detention and elimination, construction site runoff control, post construction runoff control, and good housekeeping/pollution prevention. This Storm Water Plan supports hazard mitigation by requiring mitigation measures for activities that may adversely impact ground or surface waters.

Onsite Wastewater Management Plan

The Hopkinton 2010 Onsite Wastewater Management Plan was created to begin an assessment of the effect of current wastewater treatment and disposal practices and the options available to improve upon them. The Town values both the health of the community and the rural character it is known for. Properly installed onsite systems that protect public health may not, however, protect drinking water supplies, recreational waters, or aquatic habitats from the nutrient loading that onsite systems can add to local waters.

The vulnerable Wood-Pawcatuck aquifer is the main source of drinking water for most of the Hopkinton population. The geologic structure and geographic location of the aquifer make it particularly susceptible to contamination. Drought conditions not only dry up shallow wells, but may impact the efficacy of onsite wastewater treatment systems. This plan is another example of how the Town is working to preserve the public and environmental health.

National Flood Insurance Program (NFIP)

The Town of Hopkinton is an active and compliant member of the National Flood Insurance Program since 1980. As such, Hopkinton residents are able to purchase flood insurance to protect their property against flood losses. The Town of Hopkinton has adopted the most recent (October 2010) Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS). The Town has designated the Town Building Official as the NFIP Coordinator to manage the program.

Departments

Planning Department

The Department serves many functions related to the physical development of the community. The Planning Department utilizes the Comprehensive Plan, the Land Development and Subdivision Regulations, and the Zoning Ordinance to insure healthy and compliant growth in the Town of Hopkinton. The department is continuously developing initiatives and making recommendations related to the Town of Hopkinton's managed growth and preservation of quality of life. The Planning Director was the lead coordinator for this hazard mitigation plan update. It is anticipated that this role will continue with future plan updates.

Emergency Management

The Hopkinton Emergency Management department is currently staffed by a part-time Director. The Director acts as the day-to-day liaison between the Town Council and the Town’s emergency service providers and acts as an advisor on all emergency related affairs in Hopkinton. The Emergency Management Director is responsible for all emergency planning. This department promotes CodeRed Emergency Notification System, manages the Emergency Operations Center (EOC), works with

the RI Department of Health, and promotes the RI Special Needs Emergency Registry. The Hopkinton Emergency Management Director also manages to town's StormReady program.

The Town communicates with property owners in the French Village area of town and warns them if there is a flood warning. This is a seasonal area near the intersection of Chase Hill Rd. and Nooseneck Hill Rd. which is mainly populated during the summer months.

Public Works

The Public Works facility is located across from the Police headquarters on Woodville Rd. This property houses all of the town's maintenance equipment, vehicle repair facilities, sand and salt storage, fueling facilities and the Animal Control building.

Public Works maintains the following ongoing mitigation strategies: snow plowing, storm drain and culvert maintenance, town vehicle repair, road repairs, street sweeping, and tree trimming (in partnership with the utility companies).

Building and Zoning Department

The Town Building/Zoning official is also located within the DPW building. The Building/ Zoning Official is responsible for issuing all building permits, permit inspections and code enforcement as well as being the town's National Flood Insurance Program Coordinator. This department is also responsible for enforcing the floodplain ordinance and land development and subdivision regulations.

Police Department

The Hopkinton Police Department consists of a Chief, a Captain, three Sergeants and 15 patrol officers as well as two Detectives, and a Juvenile Officer. The Department operates twenty-four hours a day and responds to all criminal complaints and town-wide emergencies. The Department is located on Woodville Rd. in a facility that houses the Police Dispatch Center as well as the Primary EOC and Emergency Management Office.

Fire Departments

Hopkinton businesses and residents are protected from fires and other emergencies by two separate fire departments. These volunteer departments provide quality protection to the Hopkinton and in fact have both earned a coveted ISO class 4 fire protection rating, a rarity among rural fire departments without municipal hydrant systems.

The Ashaway area is protected by the Ashaway Fire District. The District is a separate taxing authority that supports the firefighters and equipment of the Ashaway Volunteer Fire Association. The Fire Association responds to all areas within its district with 2 engines, 1 tanker, 1 engine/heavy rescue, 1 brush truck and 1 boat.

The department also provides mutual aid support to the Hope Valley-Wyoming Fire District in Hopkinton as well as any other areas that may request assistance.

The Hope Valley Wyoming Fire District provides fire and emergency services to the northern segment of Hopkinton. Also a separate taxing district, Hope Valley provides protection not only to the Hope Valley and Rockville areas in Hopkinton but to the Wyoming and Alton sections of Richmond, Rhode Island besides. The Department operates 3 engines, 1 ladder, 2 tankers, 1 heavy rescue and a hazardous materials team. Hope Valley and Ashaway also participates in the Rhode Island Mutual Aid Pact.

Emergency Medical Services

The Town of Hopkinton is served 2 ambulance rescue squads. The Ashaway Ambulance Association has 2 Ford E-450/LifeLine ambulances. The Hope Valley Ambulance has 3 ambulances, 2 squad vehicles, and one mass-casualty trailer. Both teams are comprised of volunteers and per diem staff.

StormReady Community

Hopkinton has recently proven that they have taken the necessary steps outlined by NOAA's National Weather Service to improving local hazardous weather operations. Weather radios are located at Camp Yawgoog, the Parks & Recreation department, the Police and Fire departments, and both schools. Lightning detection devices have also been distributed. As part of this accreditation, local emergency managers have developed a formal hazardous weather plan allowing the Town to become eligible to receive up to $2,500 in RIEMA grant funding.

Town Council & Town Manager

The 5-member Town Council appoints the Town Manager who is the chief administrative officer of the Town. The Town Manager is responsible to the Town Council for the administration of all town affairs.

The Town Council approves local hazard mitigation plans and zoning ordinances.

Conservation Commission

The Conservation Commission consists of seven members, appointed by the Town Council for terms of three years. The Conservation Commission was created to promote and develop the natural resources, to protect the watershed resources, and to preserve natural esthetic areas within the town.

Planning Board

The 5-member (and 2 alternate) Board shall act in an advisory capacity to the director of planning and development, the Town Manager and the Town Council, in all matters concerning the physical growth and development of the Town as such growth and development affects the general health, safety and welfare of the

inhabitants of the Town. The Planning Board has encouraged developers to utilize residential cluster developments rather than conventional subdivision techniques. Cluster developments reduce the amount of impervious surface of roadways and provide more open space. The Planning Department, Planning Board, and Building official have engaged in regulatory implementation measures targeted towards mitigating the potential impacts of natural disasters.

Hopkinton Land Trust

The Land Trust consists of seven members, appointed by the Town Council for variable terms of up to 7 years. The mission of the Hopkinton Land Trust is to protect the Town Hopkinton's rural character and natural heritage. This is accomplished by preserving land as open space through acquisition and conservation easement while maintaining, where possible, public access to these natural resources.

Wood-Pawcatuck Watershed Association

Wood-Pawcatuck Watershed Association (WPWA) has fostered a mission to promote and protect the integrity of the lands and waters of the Pawcatuck Watershed. The Wood-Pawcatuck Watershed covers about 300 square miles of land in Connecticut and Southern Rhode Island. In 2014 WPWA was awarded a $720,000 grant to develop a watershed wide management plan for flood resiliency. This project addresses the problems caused by extreme weather events. It is funded by the Hurricane Sandy Coastal Resiliency Competitive Grant Program which supports projects, such as this, that reduce communities' vulnerability to the growing risks from coastal storms, sea level rise, flooding, erosion and associated threats through strengthening natural ecosystems that also benefit fish and wildlife. The draft was released in May 2017 and was reviewed during the hazard mitigation plan development.

State Programs

Rhode Island State Building Code

All municipalities within the State of Rhode Island share a single building code (RIGL 23-27.3-100 et. al.). The Code itself (which incorporates the International Building Code) was last amended in 2012 and provides comprehensive construction requirements designed to mitigate the impacts from natural hazards, such as high wind events. The Code is enforced by the Hopkinton Building Department and provides an additional layer of regulatory control to those discussed above.

Rhode Island State Fire Code Regulations

Hopkinton has adopted the RI Fire Safety Codes to safeguard life and property from the hazards of fire and explosives in accordance with safe practice. The Code is

enforced by the Hopkinton Fire Departments and provides reasonable minimum requirements for fire prevention and protection.

Rhode Island State Dam Safety Program

The Town of Hopkinton participates in the State Dam Safety Program because of the 4 high hazard and 8 significant hazard dams in the town. The State Dam Safety Program was created to facilitate the enforcement of the primary dam inspection law (RIGL 46-19, Inspection of Dams and Reservoirs). RIGL 46-19 states that dam owners are responsible for the safe operation, maintenance, repair, and rehabilitation of a dam, which are the essential elements in preventing dam failure; furthermore, dam owners are liable for the consequences of accidents or failures of their dams. According to the State of Rhode Island 2016 Dam Safety Program Report, the following have been identified as program limitations: unclear ownership of numerous high hazard dams, construction of buildings within inundation areas below dams, lack of funding to repair of remove privately owned dams, inadequate spillway capacities and engineering analyses, lack of Emergency Action Plans across the state, inadequate staffing, increase in rainstorm intensities. Of the 11 high and significant hazard dams in Hopkinton, all have approved Emergency Action Plans on file. Two or three of the state dam plans are completed as of September 2017. The Town of Hopkinton has completed eight and are awaiting approval on Yawgoog, Locustville, Alton, Blue Pond, Langworthy, Ashville, Wincheck and Harris.

Rhode Island DEM Wetland Regulations

The RIDEM is responsible for regulating alterations of the freshwater wetlands throughout the State. Since many floodplains are also wetlands, appropriately managing these resources help maintain proper floodplain function. These regulations ensure that actions in this plan which will alter the physical landscape will not do so at the expense of wetlands.

Rhode Island Emergency Management Agency

The Rhode Island Emergency Management Agency (RIEMA) is the State agency assigned to reduce the loss of life and property for the whole community while ensuring that as a state we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all natural, human-caused, and technological hazards. RIEMA is also the pass-through agency for FEMA mitigation funding.

Rhode Island Department of Health

The Rhode Island Department of Health (HEALTH), not only strives to prevent disease and increase health and safety, but they also promote the Special Needs Emergency Registry. By voluntarily enrolling in this list, local police, fire, and other local first responders can better prepare for and respond to an individual's needs during a disaster.

6

Mitigation Actions

Mission Statement

The Hopkinton Hazard Mitigation Committee vows to continue to work together as one to develop and maintain strategies that protect all of the citizens, businesses and property from the damaging effects of natural disasters within the Town of Hopkinton.

Mitigation Goals

The goals of the Hopkinton Hazard Committee are as follows:

1. Protect life
2. Protect property
3. Promote a rapid recovery process following natural disaster
4. Provide guidance so that Hopkinton businesses are also able to rapidly recover following a disaster.
5. Protect critical infrastructure
6. Establish and Maintain a Hazard Mitigation Committee that not only develops a strategy for mitigation but also assures that the strategy changes as needed and routinely maintains the Hopkinton Hazard Mitigation Plan.

Status of Proposed 2012 Actions

Table 22 Status of Proposed 2012 Actions

Action	Status	Reason why it is not complete (shift in focus, funding, etc.)	Other comments
Flood Control System designed to prevent repetitive flood issue on South Drive.	Completed	✓	
Remove fire alarm hardwire system in Ashaway fire department and replace with radio system	Not done	Not a Town responsibility.	Owned by Ashaway Fire District
Utilize GIS to develop a storm drain database and map	Completed	✓	
Public relations campaign to advise residents about steps to prevent wildfire damage	Not complete	Unknown	Move to 2017 plan
Add shatter resistant coating to all windows and re-design HVAC system	Not complete	Not a priority	
Install appropriately sized generator to Crandall property	Completed	✓	
Update current GIS hardware and software to meet standards	Completed	✓	
Revise current burn ordinance to match State Code.	Not complete	Unknown	Most residents know that you need a local permit to burn during certain months. This calendar differs from DEM who enforces it. Propose no open burning year-round w/out permit.
Revise current 911 numbering ordinance to add stricter penalty for non-compliance	Currently underway	Not a priority	
Install house numbers and posts at all residences	Currently underway	Not a priority	
Install special alarms to notify campgrounds of impending tornadoes, severe weather, and wildfire	Not complete	Cost prohibitive. No longer needed	Code Red system in place and weather apps used by campground owners
Establish large group of volunteers to assist with prevention and response	Ongoing effort	✓	
Remove all trees or limbs that overhang wires or roadway	Ongoing effort	✓	
Develop an ordinance to dictate the design and construction of cisterns	Not complete	Cisterns are not a primary source of water for firefighting.	

Mitigation Actions

The Hopkinton Hazard Mitigation Plan Committee decided to propose actions that addressed certain vulnerabilities that were identified earlier in the planning process. See Chapter 4.

The text following the table below summarizes the specific problem and proposed possible solution, details the primary tasks to be undertaken, identifies an appropriate lead and anticipates financing options. Each action was given a priority ranking of low, medium, or high as determined by the Committee. The Committee understands that implementation of many of these proposed actions require the Town to secure external funding.

There are necessary planning elements that need to be completed before additional mitigation actions can be considered. The Committee has identified a range of actions below, some of which are planning. However, there is a mitigation action identified for each vulnerable area where applicable.

Priority Level

High: Reduces the greatest risks, is important to accomplish first

Medium: May need other actions to be completed first

Low: Less of an impact on safety and property

Time Frame (from date of plan adoption)

Short Term: within 1-3 years

Medium Term: within 3-5 years

Long Term: greater than 5 years

Table 23 VULNERABLE AREA: Flood Prone Drainage Systems

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
1A- Rebuild catchbasin #3 at Locustville Road. Replace corrugated pipes with smooth ones. 1B- Action 1A may include 5 rows of infiltration chambers in between CB 1 and 2 on Locustville Rd.	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☒2 ☐3 ☐4	☒5 ☐6	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Flooding at Locustville Ave. during heavy rain events creates a public safety issue and impacts road infrastructure.

BENEFITS	OBSTACLES
Improve capacity of undersized drainage system built in the 1970s.	

LEAD/CHAMPION	SUPPORT
Hopkinton DPW	Hopkinton Planning Department

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
1A CDBG 1B RI Dept. of Environmental Management, CDBG	1A $30,000 1B $120,000	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
Engineering study being done as of July 2017. Through this planning process, numerous flood prone areas were identified by residents and committee members. During mitigation action discussions, the committee as able to confirm that most of the named areas were flooded in 2010 and subsequently repaired or improved.

Table 24 VULNERABLE AREA: Bridges

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
2A- Inventory all local culverts and bridges **2B**- Hire an engineering consultant to inspect and assess the condition of all locally owned bridges and culverts	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☒2 ☐3 ☐4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
The bridges in town are a mix of privately and publicly owned structures but their conditions are largely unknown. These bridges are used daily by residents and emergency personnel.

BENEFITS	OBSTACLES
Prioritize bridge repairs	

LEAD/CHAMPION	SUPPORT
Hopkinton DPW	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
2A Town Capital Improvements budget **2B** RI Dept. of Environmental Management, CDBG	**2A** Staff time **2B** $45,000	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
Cost to inspect and assess all structures will depend on how many are identified in the inventory.

Table 25 VULNERABLE AREA: Bridges

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
2C- Prioritize bridge and culvert repairs **2D**- Fix necessary bridges and culverts	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☒2 ☐3 ☐4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
The bridges in town are a mix of privately and publicly owned structures but their conditions are largely unknown. These bridges are used daily by residents and emergency personnel.

BENEFITS	OBSTACLES
Secure access for residents and first responders, improve road drainage and reduce flooding.	

LEAD/CHAMPION	SUPPORT
Hopkinton DPW	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
2C Staff time **2D** RI Dept. of Transportation TIP funds	**2C** - $1,000 **2D-** Unknown	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

Table 26 VULNERABLE AREA: Bridges

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
3A- Hire an engineering consultant to assess feasibility of widening 1-lane bridges to 2-lane bridges	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Narrow bridges hinder traffic flow, especially when the shoulders are snow-covered.

BENEFITS	OBSTACLES
Improve bridge safety especially during snow storms when already narrow bridges are difficult to pass.	
LEAD/CHAMPION	**SUPPORT**
Hopkinton DPW	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
3A RI Dept. of Transportation TIP funds	**3A** - $20,000	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)
OTHER NOTES		

Table 27 VULNERABLE AREA: Bridges

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
3B- Depending on outcome of Action 3A, widen select 1-lane bridges to 2-lanes as funds allow.	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Narrow bridges hinder traffic flow, especially when the shoulders are snow-covered.

BENEFITS	OBSTACLES
Improve bridge safety especially during snow storms when already narrow bridges are difficult to pass.	
LEAD/CHAMPION	**SUPPORT**
Hopkinton DPW	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
3B RI Dept. of Transportation TIP funds	**3B** - Unknown	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

Table 28 VULNERABLE AREA: Bridges

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
4- Replace and elevate the wooden Woody Hill and Woody Hill South bridges	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☒High ☐Medium ☐Low
				ACTION STATUS
				New

RATIONALE- WHY IS THIS IMPORTANT?
Narrow, old bridge prohibits fire vehicle access to the northern part of town, vehicles must go a longer route. Improvements will also benefit driver safety. Prioritized as #1 and #2 for the Town Transportation Improvement Program

BENEFITS	OBSTACLES
Improve bridge safety and usability by emergency vehicles	
LEAD/CHAMPION	**SUPPORT**
Hopkinton DPW	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
RI Dept. of Transportation TIP funds	$30,000	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 29 VULNERABLE AREA: Water Supply Systems

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
5- After feasibility assessment is completed (set to begin in 2017/18), extend public waterline from the Hope Valley Fire Station.*	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☐2 ☐3 ☐4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Much of the town water comes from wells or surface water. This limits the availability for residential use and firefighting efforts. However, there are public water lines near Hope Valley at the Richmond border.

BENEFITS	OBSTACLES
Provides more reliable water sources for residents, businesses, and firefighting efforts during droughts. Encourages economic growth for the Town. Supports clean water for public health.	

LEAD/CHAMPION	SUPPORT
Hopkinton Planning Department	None.

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
US Dept. of Agriculture FEMA Fire Prevention and Safety Grants CDBG	To be determined by feasibility study	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

*There has been concern that the extension of the waterline will increase the population and subsequently stress the septic systems which may lead to greater likelihood of land and water contamination. The State requires The Town to develop baseline data on current wastewater loadings in order to assure that no net increase in wastewater loadings to groundwater or surface water beyond the baseline will be allowed. This data collection needs to occur before the waterline is extended.

Table 30 VULNERABLE AREA: Water Supply Systems

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
6- Develop a plan for a major watermain break which could cause flooding and affect water supplies. Identify required shutoff equipment needed and whom to call.	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☒2 ☒3 ☐4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
In the event of an emergency, there is currently no response plan or understanding of the coordinated effort that would be required.

BENEFITS	OBSTACLES
Public safety, reduce potential flooding damages to nearby infrastructure	

LEAD/CHAMPION	SUPPORT
Hopkinton Planning Department	Hope Valley Fire Department

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town Capital Improvement budget	$2,500	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

Table 31 VULNERABLE AREA: Dams

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
7- Create a public notice/communication plan for emergency evacuation of dams (or other life-threatening hazards).	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☒3 ☐4	☐5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Being able to notify residents if an evacuation is necessary and where to go will improve public safety.

BENEFITS	OBSTACLES
Public safety	

LEAD/CHAMPION	SUPPORT
Hopkinton Emergency Management Agency (EMA)	Police and Fire Departments

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town Capital Improvement budget	$2,500	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
There are 40 dams in Hopkinton. As of September 2017, the Town was awaiting approval on dam emergency action plans.

Table 32 VULNERABLE AREA: Dams

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
8- Consider the following recommendations from the Wood-Pawcatuck Watershed Flood Resiliency Management Plan. The Town still needs to evaluate what is best for residents. • Formalizing partial breach at Blue Pond Dam • Replace culvert w larger structure and lower invert to drain impoundment and decommission Hoxie Farm Pond Dam. • Maintain Locustville Pond Dam • Repair Harris Pond Dam • Construct fish passage at Barberville Pond Dam to promote connectivity • Repair Wyoming Pond Upper Dam	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☒4	☐5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Being able to notify residents if an evacuation is necessary and where to go will improve public safety.

BENEFITS	OBSTACLES
Public safety	No obstacles to evaluate the recommendations. Future obstacle may be determining ownership of some dams.
LEAD/CHAMPION	**SUPPORT**
Town Council	Planning Department, EMA, Fire Departments

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Staff time	none	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
The 2017 Wood-Pawcatuck Watershed Flood Resiliency Management Plan provides recommendations to protect the flood resiliency of communities in the 300-acre Wood-Pawcatuck watershed and improve river and stream ecosystems, including water quality and habitat. The Hopkinton decision-makers have yet to decide how the recommendations in the plan further the community's goals.

Table 33 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
9 - Require all new critical facilities to be built 1 foot above the 500-year base flood elevation.	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Some current facilities are located in the Special Flood Hazard Area. This action aims to protect future development from the flood risk.

BENEFITS	OBSTACLES
Protect response ability of emergency personnel, promote flood-resilient structures.	

LEAD/CHAMPION	SUPPORT
Building and Zoning Departments	

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Staff time	none	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

Table 34 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
10A- Stabilize the riverbank behind the Hope Valley Fire department building for short term structure protection.	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
During heavy rain events, the high water levels of Brushy Brook erode the banks upon which the Hope Valley Fire District station is built. The station has experienced flooding.

BENEFITS	OBSTACLES
Reduces erosion and flooding behind the fire department. Temporary protection while looking for a place to relocate to.	

LEAD/CHAMPION	SUPPORT
Building and Zoning Departments	RI Department of Environmental Management

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
RIDEM Riparian Buffer Grant USDA Dept. of Agriculture, Rural Emergency Response Initiative U.S. Dept. of Homeland Security, Assistance to Firefighters Grants U.S. Dept. of Homeland Security, Pre-Disaster Mitigation Grant Program	Unknown	☐Short Term (0-3 years) ☐Medium Term (3-5 years) ☒Long Term (more than 5 years)

OTHER NOTES

Table 35 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
10B- Relocate Hope Valley Fire Department out of the floodplain	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
During heavy rain events, the high water levels of Brushy Brook erode the banks upon which the Hope Valley Fire District station is built. The station has experienced flooding.

BENEFITS	OBSTACLES
Permanent protection from flooding.	

LEAD/CHAMPION	SUPPORT
Building and Zoning Departments	RI Department of Environmental Management

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
US Dept. of Agriculture FEMA Fire Prevention and Safety Grants	Unknown	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 36 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
11- Install lightning protection systems on Town and fire district buildings	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Lightning strikes are probable may cut out power for an extended period of time to Town facilities.

BENEFITS	OBSTACLES
Reduce damage and power outages from lightning strikes.	

LEAD/CHAMPION	SUPPORT
Hopkinton EMA	

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
FEMA Fire Prevention and Safety Grants	$1,511 each	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
Lightning Protection System: A complete system of strike termination devices, conductors (which could include conductive structural members), grounding electrodes, interconnecting conductors, surge protective devices, and other connectors and fittings required to complete the system. http://www.fireengineering.com/articles/2013/04/construction-concerns-for-firefighters--lightning-protection.html https://howmuch.net/costs/electric-lightning-rod-install

Table 37 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
12A- Prioritize Department of Public Works structure resiliency	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
The DPW facilities are outdated and in need of numerous repairs. In the past, the garage has been used as a voting location for area residents.

BENEFITS	OBSTACLES
Improve the ability for the DPW building and garage to remain operational so staff can appropriately do their jobs safely.	

LEAD/CHAMPION	SUPPORT
Hopkinton DPW	Planning Department

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
DPW budget for staff	Staff times	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 38 VULNERABLE AREA: Critical Municipal Hazard Response Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
12B- Implement upgrades to Department of Public Works facilities- dependent on Action 12A.	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☐1 ☐2 ☐3 ☐4	☒5 ☐6	☐High ☐Medium ☒Low
				ACTION STATUS
				New

RATIONALE- WHY IS THIS IMPORTANT?
The DPW facilities are outdated and in need of numerous repairs. In the past, the garage has been used as a voting location for area residents.

BENEFITS	OBSTACLES
Improve the ability for the DPW building and garage to remain operational so staff can appropriately do their jobs safely.	

LEAD/CHAMPION	SUPPORT
Hopkinton DPW	Planning Department

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Hopkinton Capital Improvement Funds	Unknown	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 39 VULNERABLE AREA: Populations

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
13- Create public outreach bulletins on advising all residents on how to prevent wildfires, conserve water, safety during extreme temperatures, and smart flood mitigation suggestions.	☐Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☒Education and Awareness	☐1 ☐2 ☒3 ☒4	☐5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** Enhanced from 2012 Action

RATIONALE- WHY IS THIS IMPORTANT?
Part of the Hopkinton general population is living in group homes, public housing, or are part of the seasonal resident communities.

BENEFITS	OBSTACLES
More informed residents make better choices to prevent risk to their property and the Town. Encourages a paradigm shift, allowing residents take ownership of their own mitigation measures.	

LEAD/CHAMPION	SUPPORT
Hopkinton Police Department	Hopkinton EMA

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget U.S. Dept. of Homeland Security, Pre-Disaster Mitigation Program NOAA Education and Environmental Literacy Grants	$2,000	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
Use the following for guidance: https://smokeybear.com/en/prevention-how-tos https://www.epa.gov/watersense/start-saving http://www.riema.ri.gov/resources/citizens/prepare/threats/documents/Heat%20Safety.pdf http://www.riema.ri.gov/resources/citizens/prepare/threats/winterweather/Winter%20Weather%20Preparedness.pdf http://www.riema.ri.gov/resources/citizens/prepare/threats/flooding/Flood%20Safety.pdf

Table 40 VULNERABLE AREA: Populations

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
14- Create an evacuation plan for a hazardous release event along Interstate 95.	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☒2 ☒3 ☒4	☒5 ☐6	☒High ☐Medium ☐Low
				ACTION STATUS
				New

RATIONALE- WHY IS THIS IMPORTANT?
Safety of all residents during a hazardous release event.

BENEFITS	OBSTACLES
Public safety	RI Dept. of Transportation plan may delay local efforts.
LEAD/CHAMPION	**SUPPORT**
Hopkinton EMA	RIDOT, DPW, State EMA, State and Local Police

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget FEMA Pre-Disaster Mitigation grant	Unknown	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 41 VULNERABLE AREA: Populations

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
15- Revise current burn ordinance to prohibit ANY open burning year round without a permit.	☒Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☒2 ☒3 ☒4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** From 2012
RATIONALE- WHY IS THIS IMPORTANT?				
Most residents know that you need a local permit to burn during certain months. This calendar differs from DEM who enforces it. A blanket rule of no open burning without a permit is easiest.				
BENEFITS	**OBSTACLES**			
Public safety	May be some initial confusion or pushback from residents. Enforcement may be difficult- requires additional man hours.			
LEAD/CHAMPION	**SUPPORT**			
Fire Departments	RI Dept. of Environmental Management			
POTENTIAL FUNDING SOURCES	**ESTIMATED COST**	**TIMELINE**		
Town budget	Staff time	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)		
OTHER NOTES				

Table 42 VULNERABLE AREA: Populations

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
16- Planning Department to purchase latest version of ArcGIS Desktop 10.5.1	☐Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☒Education and Awareness	☒1 ☒2 ☒3 ☒4	☒5 ☐6	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
In order for the town to continue using GIS we need to have support from ESRI, however to gain support we need to get the latest version of ArcGIS Desktop. This tool is applied widely through many planning projects.

BENEFITS	OBSTACLES
Smarter development	None anticipated.
LEAD/CHAMPION	**SUPPORT**
IT Department	Planning Department

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget	$8,000-$16,000	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 43 VULNERABLE AREA: Businesses

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
17- Direct mail to businesses in the floodplain about dry floodproofing non-residential structures (strengthening walls, sealing openings, using waterproof compounds or plastic sheeting on walls to keep water out).	☐Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☒Education and Awareness	☐1 ☐2 ☐3 ☒4	☐5 ☐6 ☐7	☒High ☐Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Property owners may think the federal government will bail them out if there are flood damages. By using appropriate mitigation measures, they may lessen their damages in the first place.

BENEFITS	OBSTACLES
Reduce flood damage	
LEAD/CHAMPION	**SUPPORT**
Police Department	Hopkinton EMA

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget FEMA Pre-Disaster Mitigation grant	$2,000	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 44 VULNERABLE AREA: Schools

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
18A- Form a working group lead by the local fire chiefs, police chiefs, and school officials to consider demolition or renovation of old, abandoned Ashaway School and present to Town Council.	☐Local Plans and Regulations ☐Structure and Infrastructure ☐Natural Systems Protection ☒Education and Awareness	☒1 ☒2 ☐3 ☐4	☐5 ☐6 ☐7	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Old Ashaway School presents a fire and wind hazard.

BENEFITS	OBSTACLES
Improve student safety risk by removing the deteriorating, vacant building adjacent to operational school.	Historic preservation supports may place great value on the building

LEAD/CHAMPION	SUPPORT
Fire Department, Police Department	Hopkinton EMA, Town Council

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget- staff time	Staff time	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 45 VULNERABLE AREA: Schools

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
18B- Move forward with recommendations for old Ashaway School which creates a fire and safety hazard for nearby elementary school. Dependent upon outcome of Action 18A	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☒2 ☒3 ☐4	☐5 ☐6 ☐7	☐High ☒Medium ☐Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
Old Ashaway School presents a fire and wind hazard.

BENEFITS	OBSTACLES
Improve student safety risk by removing the deteriorating, vacant building adjacent to operational school.	Historic preservation supports may place great value on the building

LEAD/CHAMPION	SUPPORT
Fire Department, Police Department	Hopkinton EMA, Town Council

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
Town budget- staff time	Staff time	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

Table 46 VULNERABLE AREA: Recreation Facilities

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
19- Rebuild boat launch at Ashville Pond to maintain rescue boat access.	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☐Education and Awareness	☒1 ☐2 ☐3 ☐4	☐5 ☐6 ☐7	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?
The current boat launch is not able to handle a rescue zodiac

BENEFITS	OBSTACLES
Improve safety of boaters and emergency personnel	

LEAD/CHAMPION	SUPPORT
Fire Department, Police Department	Hopkinton EMA, Town Council

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
RI Dept. of Environmental Management	$25,000	☐Short Term (0-3 years) ☒Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES
Low priority because of the low number of calls for water rescues on Ashville Pond.

Table 47 VULNERABLE AREA: Historic Resources

MITIGATION ACTION	MITIGATION TYPE	ALIGNMENT WITH PLAN GOALS		ACTION PRIORITY
20- Provide guidance to Hopkinton Historical Association on mitigating for natural hazards	☐Local Plans and Regulations ☒Structure and Infrastructure ☐Natural Systems Protection ☒Education and Awareness	☒1 ☐2 ☐3 ☐4	☐5 ☐6 ☐7	☐High ☐Medium ☒Low **ACTION STATUS** New

RATIONALE- WHY IS THIS IMPORTANT?	
Historic resources are part of the local character and economy.	
BENEFITS	**OBSTACLES**
A more resilient town.	
LEAD/CHAMPION	**SUPPORT**
Hopkinton EMA	

POTENTIAL FUNDING SOURCES	ESTIMATED COST	TIMELINE
None	None	☒Short Term (0-3 years) ☐Medium Term (3-5 years) ☐Long Term (more than 5 years)

OTHER NOTES

See FEMA document here:

Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. https://www.fema.gov/media-library/assets/documents/4317

Not all of the identified vulnerable facilities have mitigation actions at this time. The following summarizes current efforts.

Utility Facilities

The Town of Hopkinton is continuing efforts for coordinating a tree trimming program with National Grid. Keeping tree limbs away from power lines reduces power outage risk due to wind or icing. Further, a few newer developments have voluntarily buried power lines to provide uninterrupted power after severe winds. The utility facilities are not owed by the Town; there are no proposed mitigation actions at this time.

Dry Hydrants

Hopkinton operates two fire districts that are independently owned and operated. Each use dry hydrants to aid in fire-fighting efforts. Local officials depend on State drought monitoring efforts throughout the year. They also check for leaks at all dry hydrants twice a year to minimize water supply loses. There are no proposed mitigation actions for dry hydrants at this time.

Communication Towers

Communication towers are located throughout the town at the 2 fire districts and police buildings. The Town has backup communication for all emergency responder departments. There are no proposed mitigation actions for communication towers at this time.

Table 48 Summary of Actions

Action	Priority Level	Action	Priority Level	Action	Priority Level
2A- inventory bridges and culverts	HIGH	**13**- Public outreach bulletins	HIGH	**18B**- Mitigate Ashaway School	Medium
2B- inspect bridges and culverts	HIGH	**14**- Evacuation plan along I-95	HIGH	**9**- Critical facilities 1ft above 500 yr. base flood elevation	Low
2C- prioritize bridge and culvert repairs	HIGH	**15**- Prohibit any open burning year-round w/out a permit	HIGH	**10B**- relocate Hope Valley FD out of floodplain	Low
2D- fix necessary bridges and culverts	HIGH	**16**- Purchase GIS software	HIGH	**11**- Lightning protection systems	Low
4- Elevate Wood Hill and Wood Hill South bridges	HIGH	**17**- Educate businesses in the floodplain	HIGH	**12A**- Prioritize DPW upgrades	Low
5- Extend public waterline	HIGH	**1A &1B**- Locustville Rd. catch basins	Medium	**12B**- Implement DPW upgrades	Low
6-Plan for watermain break	HIGH	**3A & 3B**- widen 1 lane-bridges	Medium	**19**- Rebuilt boat launch at Ashville Pond	Low
7- Public communication plan	HIGH	**10A**- Stabilize riverbank behind Hope Valley FD	Medium	**20** – Hazard guidance for Hopkinton Historical Assoc.	Low
8- Consider recommendations of Wood-Paw. Watershed Flood Resiliency Mgmt. Plan	HIGH	**18A**- Working group for Ashaway School safety	Medium		

7

Implementation and Adoption

Prioritization of Mitigation Actions

Implementing the Plan

The Town of Hopkinton and the Hopkinton Hazard Mitigation Committee realize that successful hazard mitigation is an ongoing process that requires implementation, evaluation, and updates to this plan. The Town also understands the importance of integrating appropriate sections of the plan into the Town's Comprehensive Plan, Emergency Operations Plan, and site plan review process. It is intended that this plan and the ongoing efforts of the HHMC will preserve and enhance the quality of life, property, and resources for the Town of Hopkinton.

Adoption of this mitigation plan increases Hopkinton's eligibility for federal hazard mitigation grants. These grants originate from FEMA's Pre-Disaster Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM) and post-disaster Hazard Mitigation Grant (HMGP) Programs. (Refer to Appendix D for further information.)

Monitoring

The HHMC, under the leadership of the Town's Planning Director, will meet annually (or more frequently if necessary), to monitor and evaluate the actions contained in the plan. At each meeting, the committee members will discuss the actions assigned to them to ensure continual progress with mitigation efforts. The status of each mitigation action will be documented and minutes recorded for the record. The

HHMC will also continue to re-evaluate membership on the committee to ensure effective engagement of the appropriate parties. New members may be invited to serve on the HHMC as priorities shift.

Evaluation

At the annual meetings, the HHMC will evaluate both the actions and the planning process. The HHMC will base its evaluation on whether or not the actions have met the following criteria: increased public awareness/education, reduction in hazard damage, actions being implemented in the designated time frames, and actions staying within the cost estimate. The committee will document and report its findings to the Planning Board and Town Council. The HHMC will involve the public in the action evaluation process by holding an annual advertised public meeting in order to review the evaluation and solicit input.

During the annual evaluation process, the plan will be promoted online, in the local library, at Town Hall, and the Community Center for public review. Comments and suggests can be sent directly to the Emergency Management Director or brought up at the advertised public meeting.

Revisions

Recognizing that this is a living document, the HHMC will make changes to it after each annual revision or a disaster, as conditions warrant. These revisions will also reflect changes to priorities and funding strategies that may have been implemented.

A full revision of the plan will commence a year in advance of the current plan expiration date in order to ensure the Town always has an approved plan. The update will be completed every five years and will incorporate a formalized process for prioritizing actions and weighing the cost/benefit of such actions. All updates or revisions to the plan will be submitted to the RIEMA. The Town Council will involve the public in the plan revision process by holding an annual advertised public meeting to present recommended revisions and solicit input. Revised plans will also be sent to the neighboring communities for comment.

All future meetings will again be open to the public and it is the hope of the HHMC Committee that once the public education and outreach actions begin, public involvement in the Plan will increase and will be reflected in future revisions. The HHMC will involve the public in the annual meeting by posting it on the website, in the local library, and in the local newspaper to encourage involvement.

Adoption

After each evaluation cycle (every 5 years), the Hopkinton hazard mitigation plan will be presented to and adopted by the Town Council. The associated ordinance documentation will be kept as part of this plan.

Appendices

A Survey Results

B Public Notices

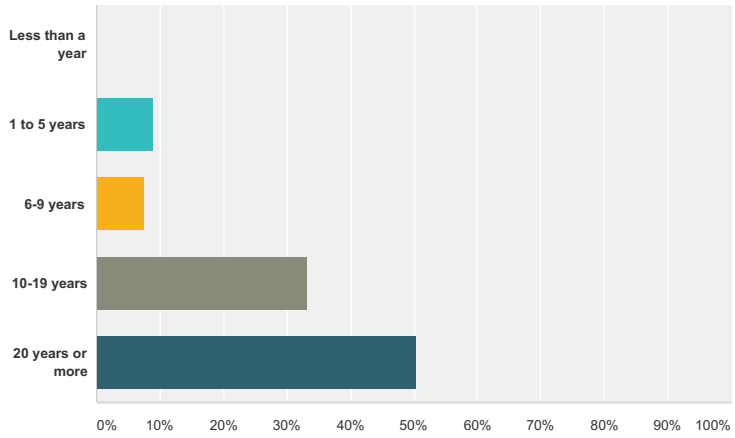
C Resources Map

D Additional Resources

Appendix A: Survey Results

Q1 How long have you lived in Hopkinton, Rhode Island?

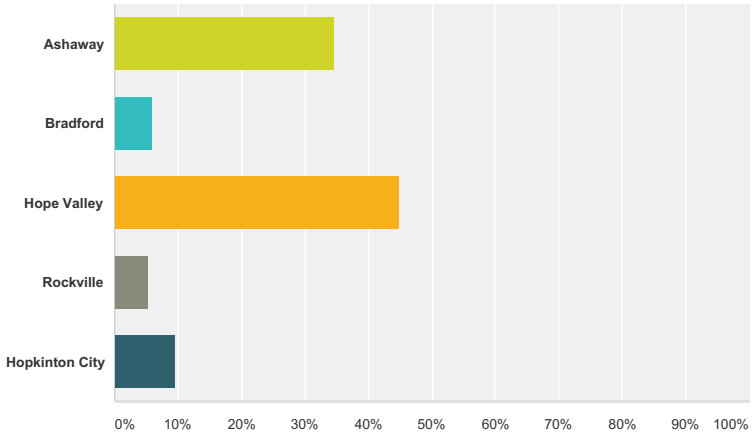
Answered: 145 Skipped: 1



Answer Choices	Responses	
Less than a year	**0.00%**	0
1 to 5 years	**8.97%**	13
6-9 years	**7.59%**	11
10-19 years	**33.10%**	48
20 years or more	**50.34%**	73
Total		**145**

Q2 What neighborhood do you live in?

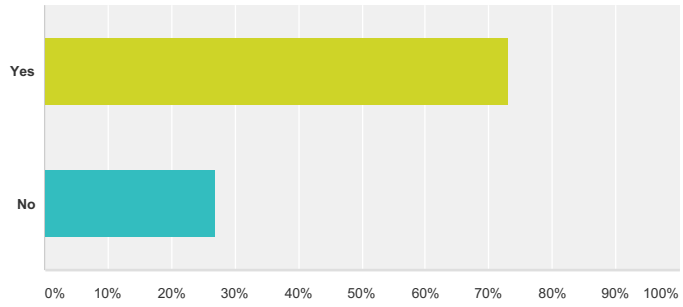
Answered: 136 Skipped: 10



Answer Choices	Responses	
Ashaway	**34.56%**	47
Bradford	**5.88%**	8
Hope Valley	**44.85%**	61
Rockville	**5.15%**	7
Hopkinton City	**9.56%**	13
Total		**136**

Q3 Have you ever experienced or been impacted by a natural disaster/event in Hopkinton?

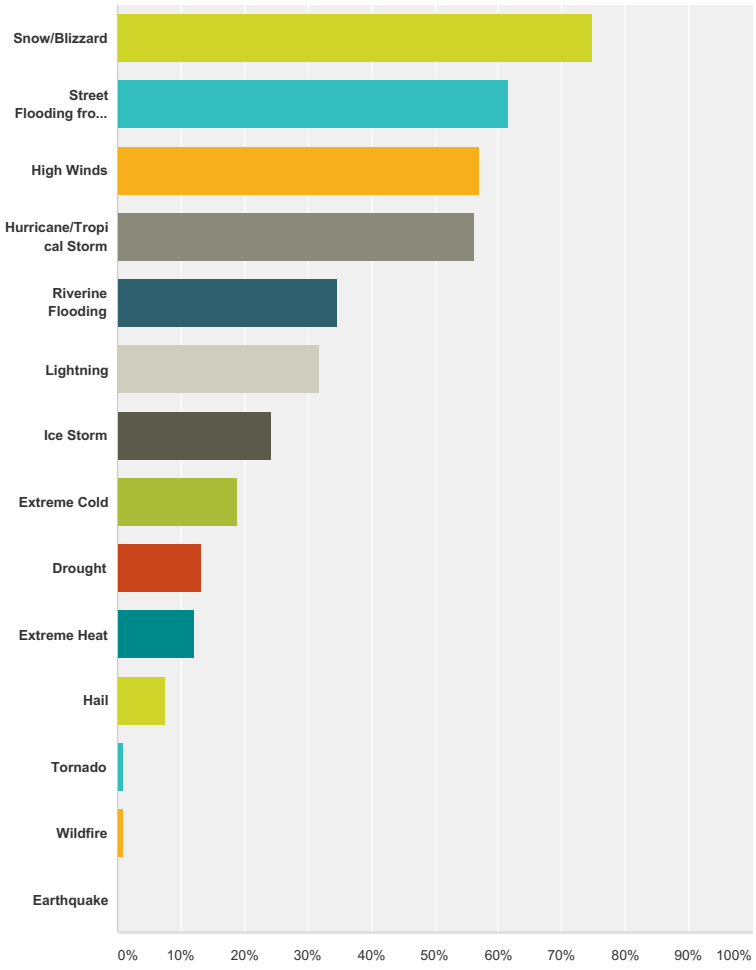
Answered: 145 Skipped: 1



Answer Choices	Responses	
Yes	**73.10%**	106
No	**26.90%**	39
Total		**145**

Q4 If yes, what types of disasters? Check all that apply.

Answered: 107 Skipped: 39



Answer Choices	Responses	
Snow/Blizzard	74.77%	80
Street Flooding from Heavy Rain	61.68%	66
High Winds	57.01%	61
Hurricane/Tropical Storm	56.07%	60
Riverine Flooding	34.58%	37
Lightning	31.78%	34
Ice Storm	24.30%	26
Extreme Cold	18.69%	20
Drought	13.08%	14
Extreme Heat	12.15%	13
Hail	7.48%	8
Tornado	0.93%	1
Wildfire	0.93%	1
Earthquake	0.00%	0
Total Respondents: 107		

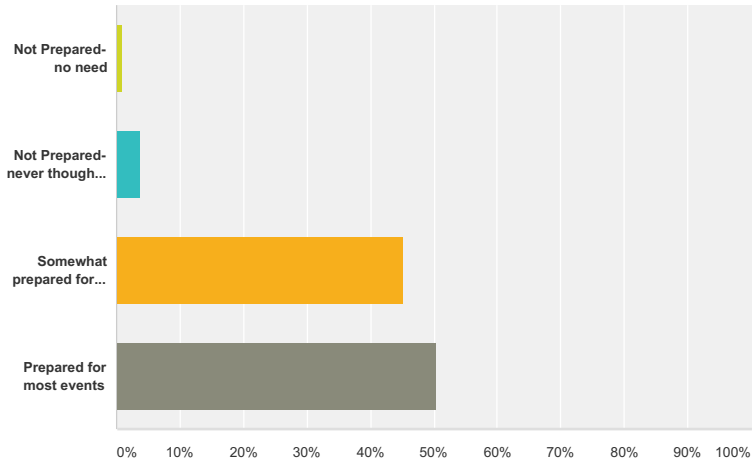
Q5 When was the last time you experienced a natural disaster in Hopkinton?

Answered: 85 Skipped: 61

Blizzard last month
Late February rain, street flooding, high winds
Drought the past couple of summers
February 2016 blizzard
Hurricane Sandy
3 years ago (blizzard)
2013 flooding
2010 (flood)

Q6 How prepared do you feel that you and your household/business are for the probably impacts of natural hazards?

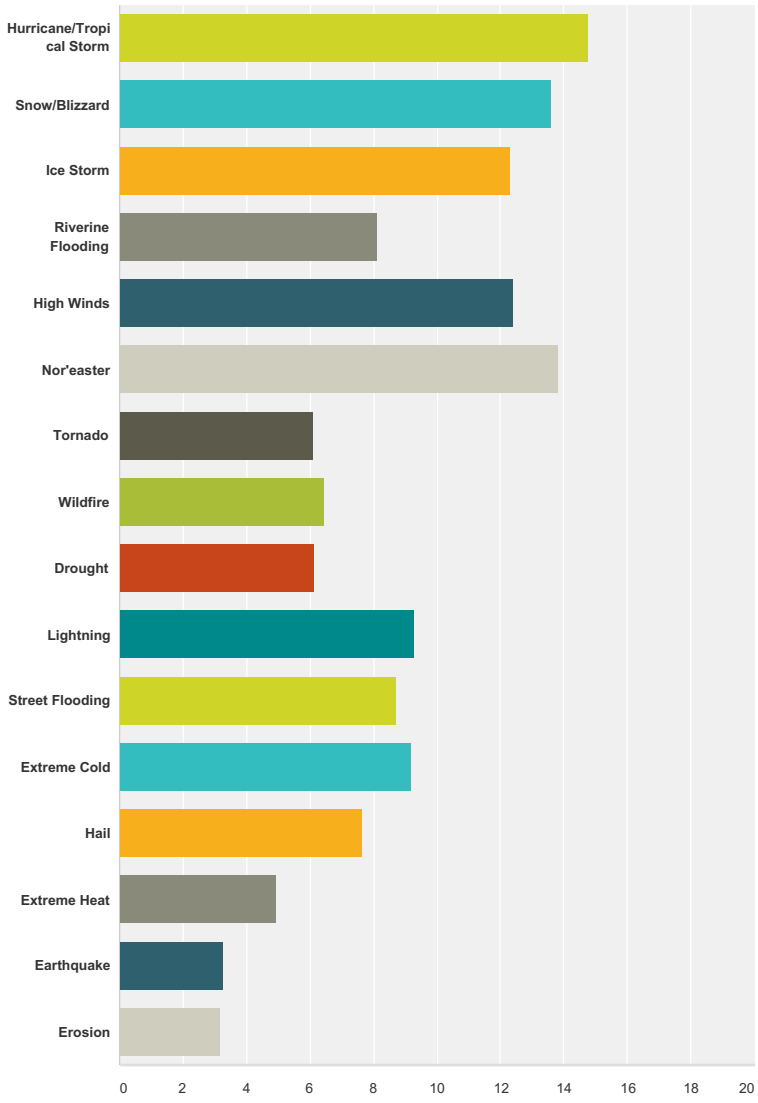
Answered: 135 Skipped: 11



Answer Choices	Responses	
Not Prepared- no need	**0.74%**	1
Not Prepared- never thought about it	**3.70%**	5
Somewhat prepared for some events	**45.19%**	61
Prepared for most events	**50.37%**	68
Total		**135**

Q7 Click and drag the each hazard so that the one that you are most concerned about is in the #1 spot at the top.

Answered: 107 Skipped: 39

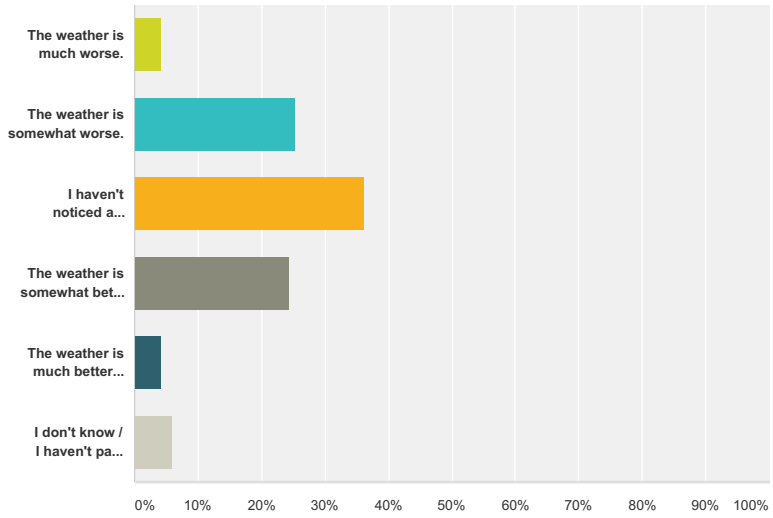


	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total	Score
Hurricane/Tropical Storm	55.10% 54	14.29% 14	12.24% 12	9.18% 9	2.04% 2	4.08% 4	1.02% 1	0.00% 0	0.00% 0	1.02% 1	0.00% 0	0.00% 0	1.02% 1	0.00% 0	0.00% 0	0.00% 0	98	14.78
Snow/Blizzard	22.58% 21	13.98% 13	25.81% 24	21.51% 20	5.38% 5	3.23% 3	1.08% 1	1.08% 1	1.08% 1	1.08% 1	0.00% 0	1.08% 1	1.08% 1	1.08% 1	0.00% 0	0.00% 0	93	13.61
Ice Storm	6.90% 6	9.20% 8	10.34% 9	28.74% 25	14.94% 13	11.49% 10	6.90% 6	5.75% 5	1.15% 1	1.15% 1	3.45% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	87	12.31
Riverine Flooding	7.79% 6	3.90% 3	2.60% 2	6.49% 5	3.90% 3	3.90% 3	3.90% 3	6.49% 5	5.19% 4	23.38% 18	2.60% 2	6.49% 5	7.79% 6	7.79% 6	3.90% 3	3.90% 3	77	8.10
High Winds	5.81% 5	12.79% 11	9.30% 8	9.30% 8	40.70% 35	11.63% 10	5.81% 5	2.33% 2	0.00% 0	0.00% 0	1.16% 1	0.00% 0	0.00% 0	1.16% 1	0.00% 0	0.00% 0	86	12.42
Nor'easter	3.37% 3	39.33% 35	30.34% 27	8.99% 8	10.11% 9	3.37% 3	1.12% 1	1.12% 1	2.25% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	89	13.83
Tornado	3.80% 3	2.53% 2	0.00% 0	2.53% 2	2.53% 2	0.00% 0	0.00% 0	2.53% 2	22.78% 18	10.13% 8	10.13% 8	7.59% 6	3.80% 3	8.86% 7	8.86% 7	13.92% 11	79	6.10
Wildfire	2.56% 2	3.85% 3	0.00% 0	2.56% 2	2.56% 2	1.28% 1	6.41% 5	1.28% 1	1.28% 1	6.41% 5	14.10% 11	37.18% 29	6.41% 5	8.97% 7	5.13% 4	0.00% 0	78	6.41
Drought	2.56% 2	2.56% 2	3.85% 3	0.00% 0	2.56% 2	2.56% 2	8.97% 7	2.56% 2	7.69% 6	2.56% 2	6.41% 5	6.41% 5	12.82% 10	32.05% 25	6.41% 5	0.00% 0	78	6.15

Lightning	**1.32%** 1	**0.00%** 0	**2.63%** 2	**5.26%** 4	**3.95%** 3	**28.95%** 22	**14.47%** 11	**18.42%** 14	**0.00%** 0	**9.21%** 7	**3.95%** 3	**3.95%** 3	**0.00%** 0	**1.32%** 1	**3.95%** 3	**2.63%** 2	76	9.25
Street Flooding	**1.25%** 1	**8.75%** 7	**5.00%** 4	**7.50%** 6	**6.25%** 5	**8.75%** 7	**2.50%** 2	**6.25%** 5	**3.75%** 3	**6.25%** 5	**27.50%** 22	**7.50%** 6	**2.50%** 2	**2.50%** 2	**2.50%** 2	**1.25%** 1	80	8.71
Extreme Cold	**0.00%** 0	**1.33%** 1	**2.67%** 2	**4.00%** 3	**2.67%** 2	**9.33%** 7	**30.67%** 23	**16.00%** 12	**13.33%** 10	**8.00%** 6	**6.67%** 5	**0.00%** 0	**4.00%** 3	**1.33%** 1	**0.00%** 0	**0.00%** 0	75	9.17
Hail	**0.00%** 0	**0.00%** 0	**0.00%** 0	**0.00%** 0	**0.00%** 0	**2.74%** 2	**6.85%** 5	**28.77%** 21	**31.51%** 23	**13.70%** 10	**1.37%** 1	**4.11%** 3	**4.11%** 3	**2.74%** 2	**1.37%** 1	**2.74%** 2	73	7.64
Extreme Heat	**0.00%** 0	**0.00%** 0	**1.37%** 1	**0.00%** 0	**0.00%** 0	**1.37%** 1	**2.74%** 2	**1.37%** 1	**4.11%** 3	**8.22%** 6	**6.85%** 5	**15.07%** 11	**42.47%** 31	**10.96%** 8	**4.11%** 3	**1.37%** 1	73	4.93
Earthquake	**0.00%** 0	**1.35%** 1	**1.35%** 1	**0.00%** 0	**1.35%** 1	**2.70%** 2	**1.35%** 1	**1.35%** 1	**0.00%** 0	**5.41%** 4	**1.35%** 1	**1.35%** 1	**4.05%** 3	**8.11%** 6	**51.35%** 38	**18.92%** 14	74	3.26
Erosion	**0.00%** 0	**0.00%** 0	**1.33%** 1	**0.00%** 0	**1.33%** 1	**0.00%** 0	**4.00%** 3	**1.33%** 1	**2.67%** 2	**2.67%** 2	**8.00%** 6	**5.33%** 4	**5.33%** 4	**8.00%** 6	**9.33%** 7	**50.67%** 38	75	3.16

Q8 Looking back over the past 5 years, which statement about Hopkinton weather do you believe to be true?

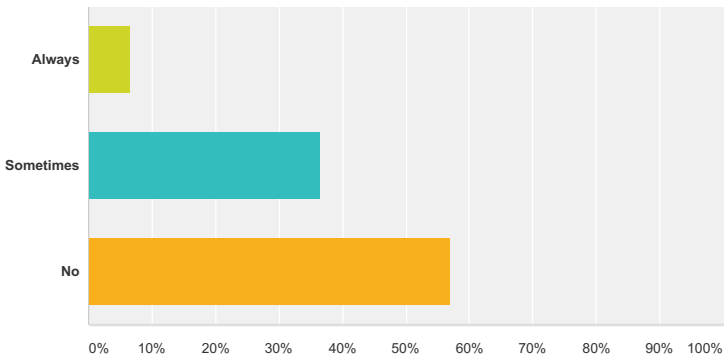
Answered: 119 Skipped: 27



Answer Choices	Responses	
The weather is much worse.	4.20%	5
The weather is somewhat worse.	25.21%	30
I haven't noticed a difference.	36.13%	43
The weather is somewhat better than usual (fewer storms)	24.37%	29
The weather is much better than usual.	4.20%	5
I don't know / I haven't paid attention.	5.88%	7
Total		119

Q9 Does your street flood when it rains?

Answered: 123 Skipped: 23



Answer Choices	Responses	
Always	**6.50%**	8
Sometimes	**36.59%**	45
No	**56.91%**	70
Total		**123**

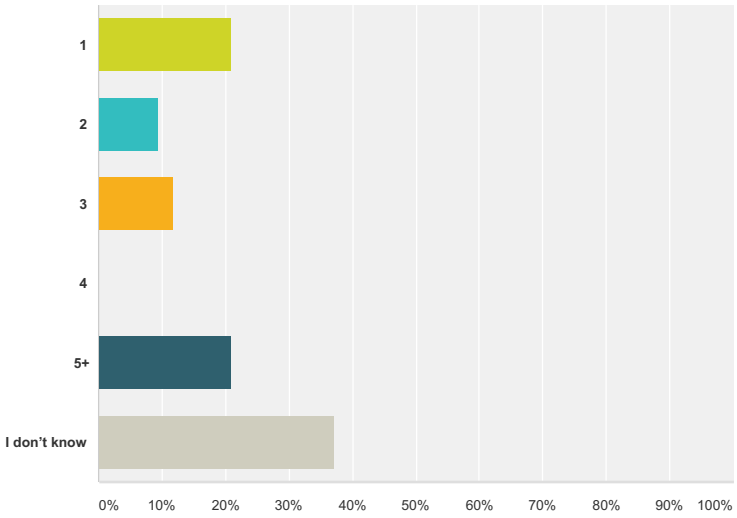
Q10 If yes, please provide the street name and nearest cross street. Or tell us of a place you know that floods.

Answered: 39 Skipped: 107

Ashaway Bridge
Beechwoods Hollow neighborhood- drain in cul de sac is uphill from lowest point
Church and Laurel
Collins Road (170 Block)
North Road
Canonchet Rd/Stubtown Rd.
Cemetery Lane
Highview/Route 3
Laurel
Lawton Foster Rd. South/Route 3
Main St. & Brookdale
Main Street at Bank Street
Main Street near 216 intersection
North Road, just as you come in from main St. about 300 ft.
North Rd. and Stubtown Rd.
Oak Street- storm drain to Chippers needs to be cleared
River Meadow Drive
River Rd. and Laurel
Riverview and 91
Spring Street/Route 3
Spring Street/Main Street
Spring Street causeway over Moscow Pond
West St. and Park Place
Willow Dr.
Woodville Rd.
Woodville/Tomaquag Rd.
Yeles Lane, down from Conanchet

Q11 How many times has that street flooded in the last 12 months?

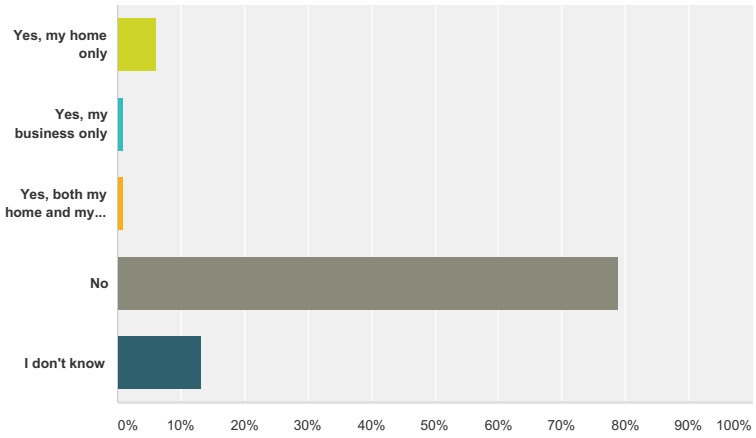
Answered: 43 Skipped: 103



Answer Choices	Responses	
1	**20.93%**	9
2	**9.30%**	4
3	**11.63%**	5
4	**0.00%**	0
5+	**20.93%**	9
I don't know	**37.21%**	16
Total		**43**

Q12 Is your home/business located in a floodplain?

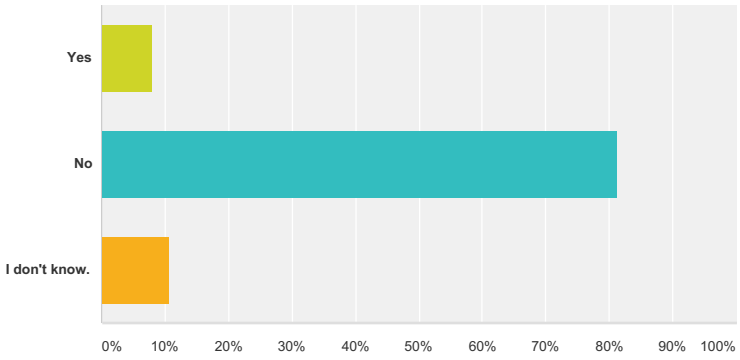
Answered: 114 Skipped: 32



Answer Choices	Responses	
Yes, my home only	**6.14%**	7
Yes, my business only	**0.88%**	1
Yes, both my home and my business	**0.88%**	1
No	**78.95%**	90
I don't know	**13.16%**	15
Total		**114**

Q13 Do you currently have flood insurance on your house?

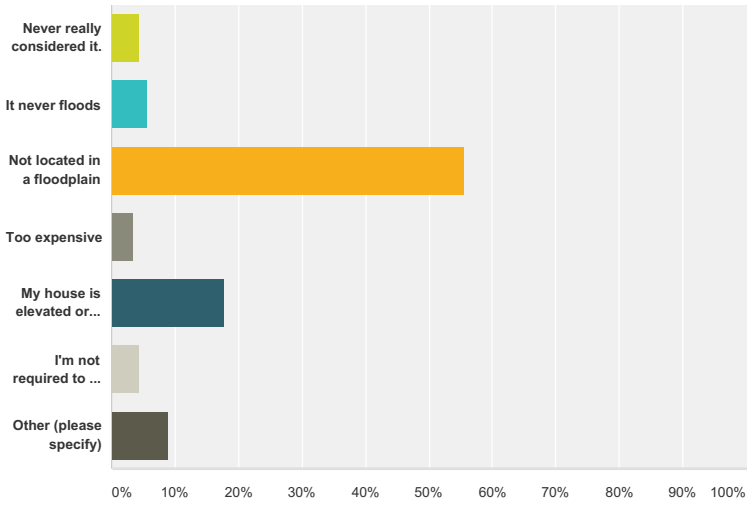
Answered: 112 Skipped: 34



Answer Choices	Responses	
Yes	**8.04%**	9
No	**81.25%**	91
I don't know.	**10.71%**	12
Total		**112**

Q14 If you don't have flood insurance, please indicate why.

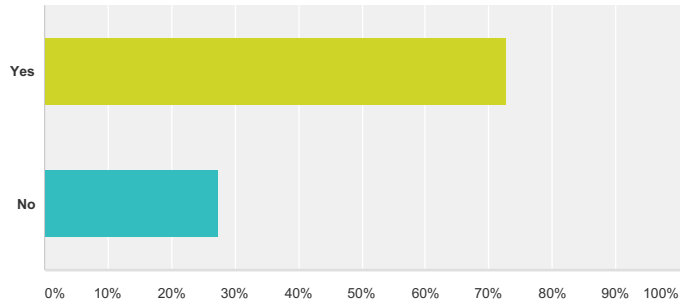
Answered: 90 Skipped: 56



Answer Choices	Responses	
Never really considered it.	4.44%	4
It never floods	5.56%	5
Not located in a floodplain	55.56%	50
Too expensive	3.33%	3
My house is elevated or otherwise protected from floodwaters	17.78%	16
I'm not required to do so (I don't have a federally backed mortgage)	4.44%	4
Other (please specify)	8.89%	8
Total		**90**

Q15 Have you taken any actions to make your home, business or neighborhood more resistant to natural hazards?

Answered: 113 Skipped: 33



Answer Choices	Responses	
Yes	**72.57%**	82
No	**27.43%**	31
Total		**113**

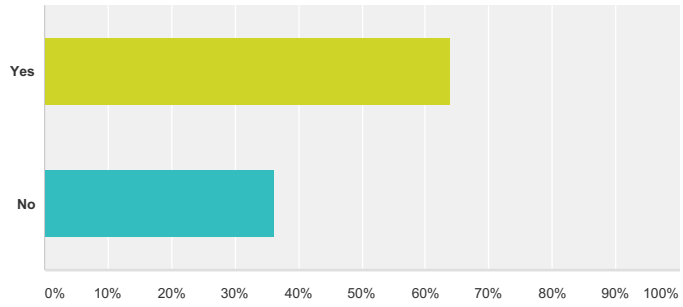
Q16 If yes, please explain.

Answered: 56 Skipped: 90

Better landscape drainage
Storm planning
New roof
Roof heaters
New windows
Sealed windows
Insulated
Clearing or installing gutters
Generator
Wood stove
Tree trimming and removal
Sand bags at entrance to prevent flooding
Secure outdoor objects before high wind event
Sump pump
Tarps
Fuel
Plywood
Roof snow shovel
Air conditioners

Q17 Are you interested in ways to make your home, business or neighborhood more resilient?

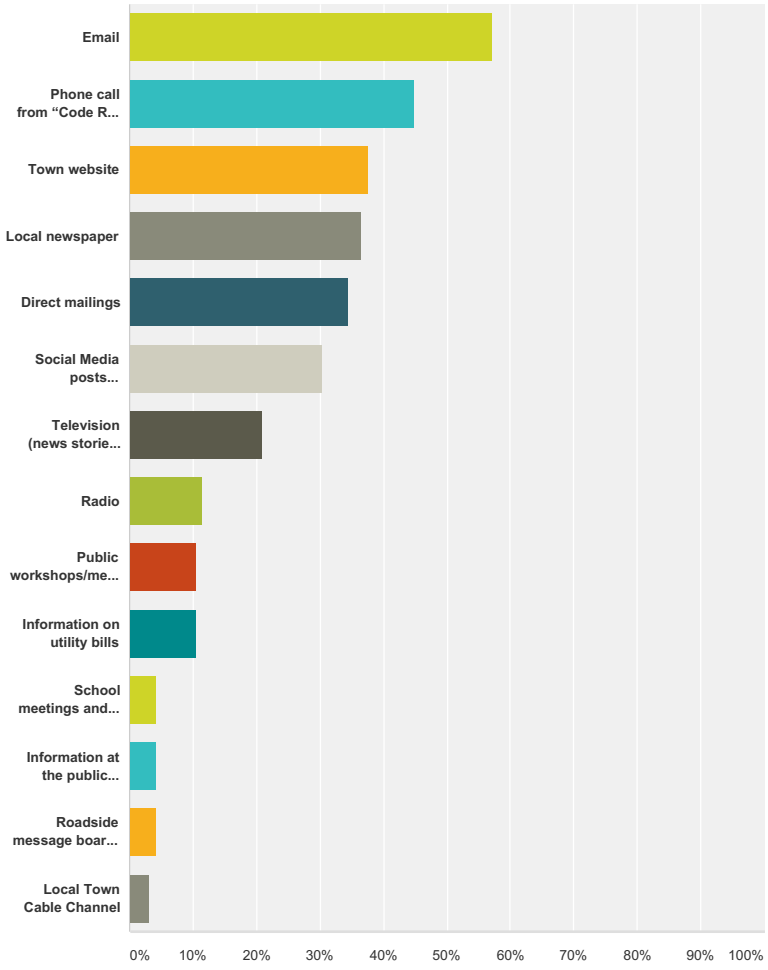
Answered: 97 Skipped: 49



Answer Choices	Responses	
Yes	**63.92%**	62
No	**36.08%**	35
Total		**97**

Q18 How do you prefer to receive information about how to better protect your home, business, or neighborhood? Check all that apply. (Don't worry, we aren't adding you to a list.)

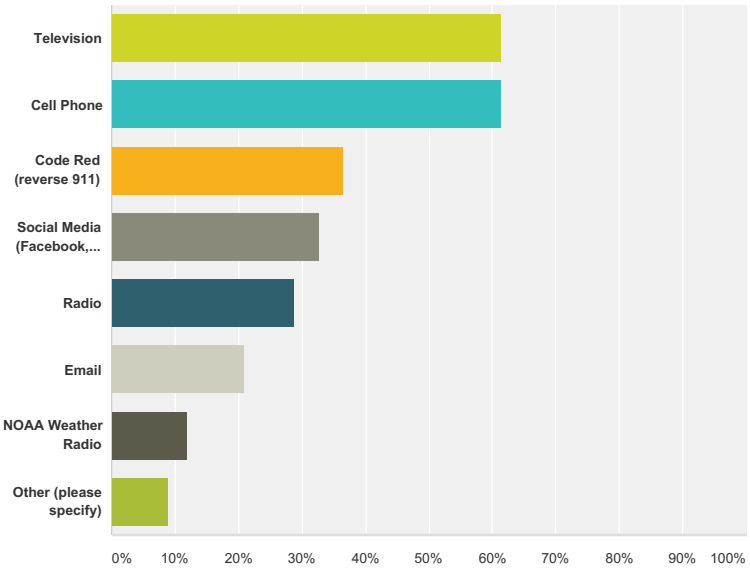
Answered: 96 Skipped: 50



Answer Choices	Responses	
Email	57.29%	55
Phone call from “Code Red” Systems	44.79%	43
Town website	37.50%	36
Local newspaper	36.46%	35
Direct mailings	34.38%	33
Social Media posts (Facebook, Twitter, etc.)	30.21%	29
Television (news stories, Public Service Announcements)	20.83%	20
Radio	11.46%	11
Public workshops/meetings	10.42%	10
Information on utility bills	10.42%	10
School meetings and messages	4.17%	4
Information at the public library	4.17%	4
Roadside message boards or billboards	4.17%	4
Local Town Cable Channel	3.13%	3
Total Respondents: 96		

Q19 How do you currently receive weather alerts?Check all that apply.

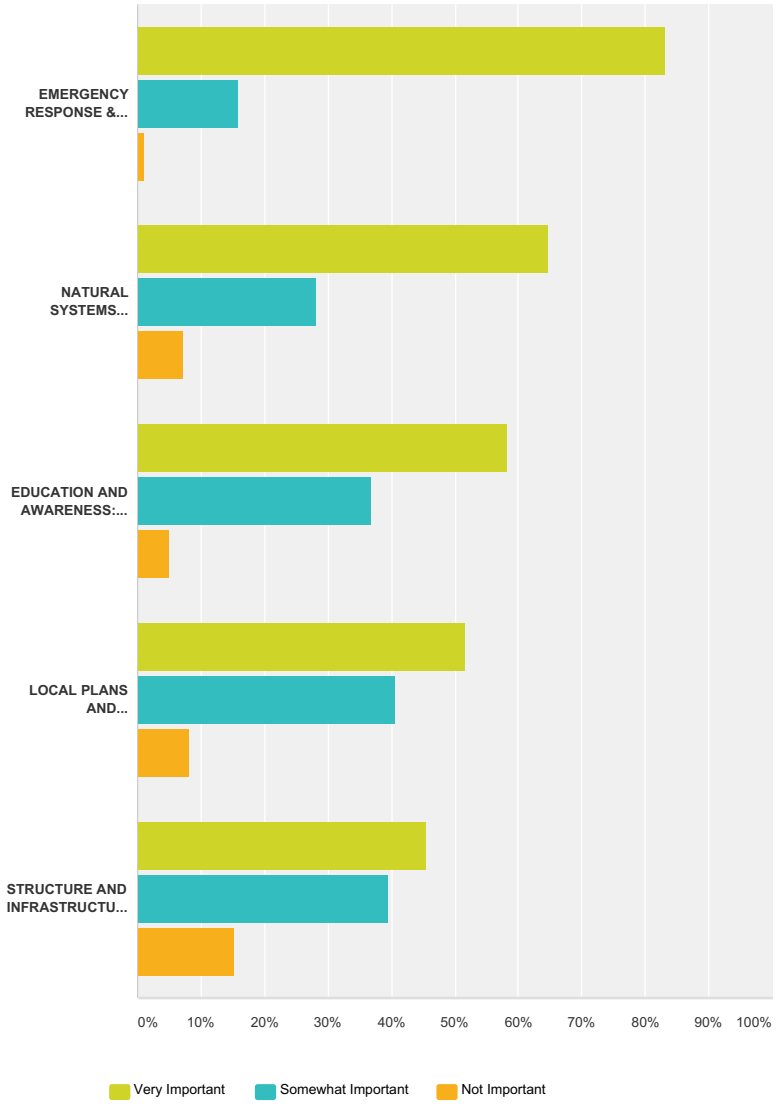
Answered: 101 Skipped: 45



Answer Choices	Responses	
Television	**61.39%**	62
Cell Phone	**61.39%**	62
Code Red (reverse 911)	**36.63%**	37
Social Media (Facebook, Twitter, etc.)	**32.67%**	33
Radio	**28.71%**	29
Email	**20.79%**	21
NOAA Weather Radio	**11.88%**	12
Other (please specify)	**8.91%**	9
Total Respondents: 101		

Q20 There are many ways Hopkinton can reduce the risk from natural hazards. Overall, these actions fall into one of the five categories. Please indicate how important each one is for your neighborhood.

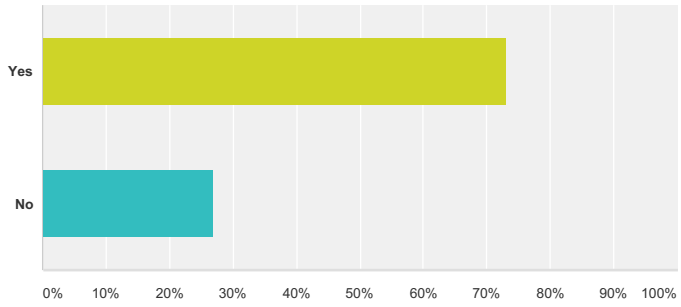
Answered: 101 Skipped: 45



	Very Important	Somewhat Important	Not Important	Total
EMERGENCY RESPONSE & SERVICES: Actions that protect people and property during or immediately after a disaster or hazardous event. Examples include Code Red emergency warning systems, and emergency response training.	**83.17%** 84	**15.84%** 16	**0.99%** 1	101
NATURAL SYSTEMS PROTECTION: Actions that not only reduce the impact of hazards but also preserve and restore natural habitats. Examples include open space preservation and wetland restoration.	**64.65%** 64	**28.28%** 28	**7.07%** 7	99
EDUCATION AND AWARENESS: Citizen preparedness seminars, direct mailings, public meetings, public service announcements, Q&A sessions.	**58.16%** 57	**36.73%** 36	**5.10%** 5	98
LOCAL PLANS AND REGULATIONS: Policies to reduce the impact of hazards such as zoning, planning, and building codes.	**51.52%** 51	**40.40%** 40	**8.08%** 8	99
STRUCTURE AND INFRASTRUCTURE PROJECTS: Modifications of existing homes and buildings to protect them from hazards, such as elevation of electrical equipment. Engineering of structures (such as levees) to reduce the impacts of hazards.	**45.45%** 45	**39.39%** 39	**15.15%** 15	99

Q21 Are you in favor of spending tax dollars on mitigation projects for the benefit of the entire community?

Answered: 100 Skipped: 46



Answer Choices	Responses	
Yes	**73.00%**	73
No	**27.00%**	27
Total		**100**

Q22 Please provide additional thoughts on how Hopkinton can better prepare for and recover from the next disaster.

Answered: 25 Skipped: 121

- *Cut back trees along town roadways. 20 ft buffer on each side of the road with no trees*
- *Renewable resources and natural systems protection should be highest on the list for consideration.*
- *During the flood of 2010, it was difficult to exit from Bradford due to street flooding from the Wood River. Better evacuation directions would be appreciated. I was unable to reach Rt 95 with a sick child because every street I took was flooded during that time.*
- *Enforce the zoning rules and regulations. Both local and state.*
- *Need to make sure that our trees are taken care of so that in the case of high winds, ice storms etc., they don't come down on the power lines.*
- *I am against spending tax money only because I know it will not be spent in Rockville. Guardrails are needed on the bridges of the brook and trench coming out of Wincheck pond*
- *Use a site like this to organize your relief effort and provide information to town residents: https://recovers.org/*
- *Tree limbs, we are always losing power*
- *communication is always best*
- *I think all in all Hopkinton does a good job. It's the residents I'm concerned about. If you are affected by a ND and take no steps afterwards to mitigate you are just going to suffer the consequences once again.*
- *Planning ahead is always a good plan.*
- *When town has homes without electricity for extended time- a place to shower, be warm and eat.*
- *No money for increased taxes*
- *I think we're on top of things actually.*
- *Hope Valley had flooding due to higher than normal ground water, poor drainage systems on side streets, poor cleaning of Catch Basins and attached pipes. One pipe that is visible on property is 65% full.*
- *While my road doesn't flood, it is used as an alternate route when Rte. 3 floods. The road is too small for large trucks and heavy traffic.*
- *The tax rate is Hopkinton makes it absolutely impossible for us to live comfortably in the town, although we have two professional-level incomes. If disaster strikes we are in extreme trouble!*
- *I appreciate having the opportunity to reply to this survey. I truly believe Town Leadership has the best interest of the residents and our community, I greatly appreciate this very much.*
- *Keep equipment maintained and training for town employees!*
- *fix the washout on Rt 3 near Frontier Rd so as to provide access to interstate 95*
- *Have state fix walls that line the brook [mile brook] on both sides of Route 3, main street, Ashaway.*
- *don't mind some tax dollars but taxes are already high, depends what it is used for. Prepare for and recover from a disaster should be a community effort - neighbor helping neighbor.*
- *traffic flow due to the obvious increase over the last several years. Evac routes clearly marked.*
- *Cut back on the trees near powerlines*
- *low income grants or loans to restore residential damage from disasters*

Appendix B: Public Notices

Hazard Mitigation Plan-Draft

To View the 2017 Hopkinton Hazard Mitigation Plan

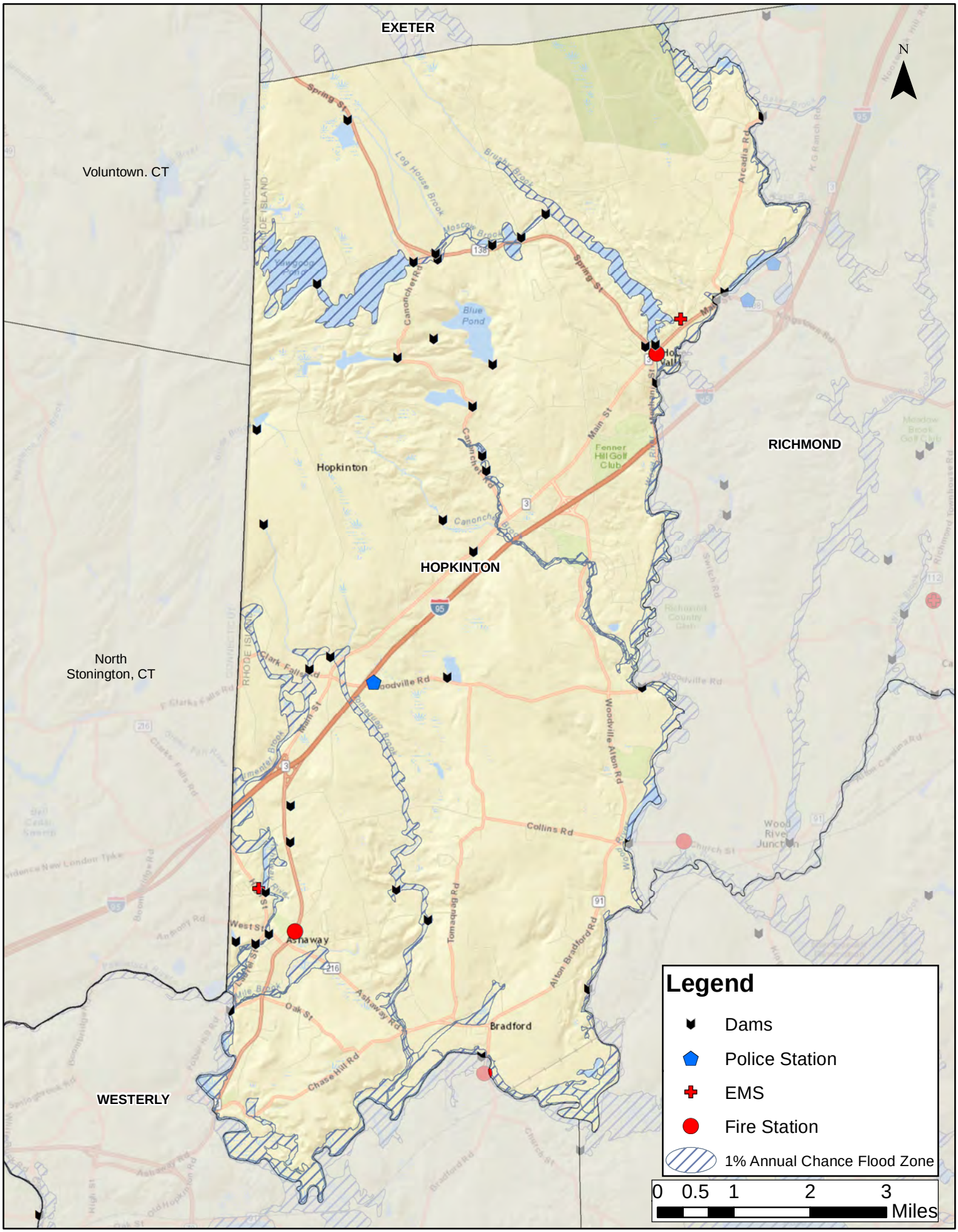
Please click on the link below to Review the Plan.

Hopkinton Hazard Mitigation Plan -Draft

The public is encourage to submit any comments to the Hopkinton Planning Department. By any of the following:

- E-mail (Planning Department)
- Phone Calls (401) 377-7770
- Walk-Ins

Appendix C: Resource Map



Source: Rhode Island GIS. Dams (2012), Law Enforcement (2014), EMS (2008), Fire Stations (2014), FEMA flood zones (2013)

Appendix D: Additional Resources

Technical and Financial Assistance for Mitigation
State Resources

Coastal Resources Center
University of Rhode Island
Narragansett Bay Campus
Narragansett, RI 02882
(401) 874-6224

Coastal Resources Management Council
Stedman Government Center
4808 Tower Hill Road
Wakefield, RI 02879
(401) 222-2476

Department of Administration/Division of Planning
One Capitol Hill
Providence, RI 02908
(401) 222-6478

Department of Environmental Management
235 Promenade Street
Providence, RI 02908
(401) 222-6800

Rhode Island Banking Commission/Associate Director
233 Richmond Street
Providence, RI 02903
(401) 222-2405

Rhode Island Builders Association
Terry Lane
Gloucester, RI 02814
(401) 568-8006

Rhode Island Department of Business Regulations
233 Richmond Street
Providence, RI 02903
(401) 222-2246

Rhode Island Emergency Management Agency
645 New London Avenue
Cranston, RI 02920
(401) 946-9996

Public Utilities Commission
100 Orange Street
Providence, RI 02903
(401) 222-3500 Ext. 153

State Fire Marshal's Office
272 West Exchange Street
Providence, RI 02903
(401) 222-2335

State of Rhode Island Building Committee Office
Building Commissioner's Office
One Capitol Hill
Providence, RI 02903
(401) 222-3529

Technical and Financial Assistance for Mitigation

Federal Resources

Economic Development Administration
Philadelphia Regional Office
The Curtis Center
601 Walnut Street, Suite 140 South
Philadelphia, PA 19106-3323
(215) 597-8822

Federal Emergency Management Agency
Mitigation Division
Mitigation Division
Region I Office
99 High Street
Boston, MA
(617) 223-9561

Small Business Administration
10 Causeway Street
Room 265
Boston, MA 02222
(617) 565-5590

U.S. Department of Agriculture
Natural Resources Conservation Service
451 West Street
Amherst, MA 01002
(413) 253-4362

U.S. Department of Commerce
National Weather Service Forecast Office
445 Myles Standish Boulevard
Taunton, MA 02780 (508) 823-2262

U.S. Department of Housing and Urban Development
Community Development Block Grants
Region I – O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
(617) 565-5354

U.S. Department of the Interior
National Park Service
Rivers and Trails Conservation Program
Regional Office
15 State Street
Boston, MA 02109
(617) 223-5203

U.S. Environmental Protection Agency
Region I Offices
5 Post Office Square - Suite 100
Boston, MA 02109-3912
(617) 565 3400

U.S. Fish and Wildlife Service
Northeast Regional Office
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
(413) 253-8200

Other Resources

National/Regional Resources

The Association of State Floodplain Managers (ASFPM)
http://www.floods.org

A professional association with a membership of almost 1,000 state employees that, assists communities with the NFIP. ASFPM has developed a series of technical and topical research papers and a series of proceedings from their annual conferences. Many mitigation "success stories" have been documented through these resources and provide a good starting point for planning.

The Rhode Island Flood Mitigation Association (RIFMA):
http://www.riflood.org

The goal of the organization is to form a network of associates who could bring their ideas and experiences to a forum for people to share and learn from. The result of the Association is a network of floodplain managers who can improve the effectiveness and efficiency of all aspects of floodplain management in the State of Rhode Island. RIFMA regularly provides training opportunities and an annual floodplain conference.

Natural Hazards Center at the University of Colorado, Boulder
Tel: (303) 494-6818
http://www.colorado.edu/hazards

The Natural Hazards Center is an international/national information center that provides information on natural hazards and human adjustments to hazards and disasters, by providing information dissemination, free library and referral services, research, and an annual workshop.

Flood Relief Funds
After a disaster, local businesses, residents, and out-of-town groups often donate money to local relief funds. They may be managed by the local government, or by one or more churches. No government disaster declaration is needed. Local officials should recommend that the finds be held until an applicant exhaust all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

Volunteer Organizations
Organizations, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith, and the Mennonite Disaster Service, are often available to help after disasters. Service organizations, such as the Lions, Elks, and VFW are also available. These organizations have helped others with food shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuild damaged buildings incorporating mitigation or flood proofing concepts. The offices of individual organizations can be contacted directly, or the FEMA Regional Office may be able to assist.

New England States Emergency Consortium (NESEC)
Lakeside Office Park
http://www.serve.com/NESEC

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videotapes are available on such topics as earthquake preparedness, mitigation, and hurricane safety tips.

Institute for Business and Home Safety (IBHS)
http://www.ibhs.org

An insurance industry-sponsored, nonprofit organization dedicated to reducing losses-deaths, injuries, and property damage-resulting from natural hazards. IBHS efforts are directed at five specific hazards: floods, windstorms, hail, earthquakes, and wildfires. Through its public education efforts and information center, IBHS communicates the results of its research and statistical gathering, as well as mitigation information, to a broad audience.