

# ***Town of Bridgewater, Vermont***

## ***Local Hazard Mitigation Plan***

**February 2015 Draft**

***Prepared by the Two Rivers-Ottawaquechee Regional Commission and  
the Town of Bridgewater***

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## I. Introduction

Natural and human-caused hazards may affect a community at any time. They are not usually avoidable; however, their impact on human life and property can be reduced through community planning.

Accordingly, this Local Hazard Mitigation Plan (hereafter referred to simply as the Plan) seeks to provide an all-hazards mitigation strategy that will make the community of Bridgewater more disaster resistant.

“Mitigation” is defined as any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Previous Federal Emergency Management Agency (FEMA), State and Regional Project Impact efforts have demonstrated that it is less expensive to anticipate disasters than to repeatedly ignore a threat until the damage has already been done. While hazards cannot be eliminated entirely, it is possible to identify prospective hazards, anticipate which might be the most severe, and recognize local actions that can be taken ahead-of-time to reduce the damage. These actions, also known as ‘hazard mitigation strategies’ can (1) avert the hazards through redirecting impacts by means of a structure or land treatment, (2) adapt to the hazard by modifying structures or standards or, (3) avoid the hazard through improved public education, relocation/removal of buildings in the flood zone, or ensuring development is disaster resistant.

## II. Purpose of the Plan

The purpose of this Plan is to assist Bridgewater in identifying all hazards facing the town, ranking them, and identifying strategies to reduce risks from known priority hazards.

The Town of Bridgewater seeks to be in accordance with the strategies, goals, and objectives of the State Hazard Mitigation Plan.

The 2015 Bridgewater Local Hazard Mitigation Plan is the first stand-alone mitigation plan drafted for the Town. Previously, the Town had a town-specific 2009 Annex in the Regional Pre-Disaster Mitigation Plan. This new Plan has been reorganized and new sections have been added:

- Program eligibility subsequent to plan approval
- Authority for plan development
- Participating jurisdictions
- Funding for plan development
- Brief information about the community

Old assumptions have been challenged throughout, and new information has been added to make the plan stronger and more useful for the Bridgewater town officials and residents who will implement the hazard mitigation strategies in the future.

### III. Community Profile

The Town of Bridgewater is situated in the central portion of Windsor County, Vermont. It comprises an area of approximately 28,657 acres or 44.8 square miles. Bridgewater is located within two physiographic areas. The major portion of the Town is characterized by mountainous terrain, narrow valleys, and a few peaks with elevations over 2,500 feet. A small part of the Town, to the east of the ridge formed by Pinnacle, Montague, and Ohio Hills, is characterized by a more subdued terrain, where the valleys are less narrow, and the slopes less steep.

Near the southern edge of the Town flows the Ottauquechee River, from west to east. It rises several miles away in Killington, and flows through Bridgewater, Woodstock, Hartford and Hartland on its way through the famous Quechee Gorge and into the Connecticut River. Almost all of Bridgewater, except for the northeastern section, is drained by this river and the streams that run into it.

U.S. Route 4, Vermont Routes 100 and 100A serve the town from West Bridgewater to Bridgewater Corners. However, from Bridgewater Corners east through Bridgewater Village, Route 4 is very busy, narrow and winding, and in need of some improvement to provide better safety and convenience. As one would expect, Route 4 serves as a major commuting facility for residents leaving town for their jobs and those working in Bridgewater living elsewhere.

Bridgewater's rate of population growth (expressed as the percent of population change) has fluctuated over the past few decades. The population grew slowly (by 3.2%) between 1980 and 1990 and then more quickly (by 9.5%) between 1990 and 2000. However, after the year 2000, Bridgewater's population began to decline or experience negative growth (it declined by -4.5% between the years 2000 and 2010). The negative growth rate is likely due to the lack of available land. In 2010, the population of Bridgewater was 936.

The majority of Town lies within the service area of Green Mountain Power (GMP), which supplies electrical power to the town.

Bridgewater is serviced by the Bridgewater Volunteer Fire Department, which is a member of the Connecticut River Valley Fire Mutual Aid Association and the Upper Valley Mutual Aid Association, where towns provide assistance to one another in the case of a serious fire. The equipment used by the Fire Department includes: one two-wheel drive pumper; one all-wheel drive pumper; one all-wheel drive tanker; one all-wheel drive rescue truck and 1 6x6 Polaris UTV. Funding is provided through fund raising activities plus annual support from the Town. All future development within the Town should be in accord with the capabilities of this Department to service the development.

An elected constable provides limited police security and traffic control services when needed. All other police functions are performed by the Windsor County Sheriff or Vermont State Police, Troop "D" located in South Royalton.

Ambulance services are provided in cooperation with the Woodstock Ambulance Service and the Bridgewater Fast Squad. The Squad consists of nine volunteers and is available to respond to accidents as needed. The closest hospitals are Mount Ascutney Hospital and Health Center, located in Windsor,

Rutland Regional Medical Center in Rutland, and Dartmouth-Hitchcock Medical Center in Lebanon. Medivac services are available by the DHART helicopter, which typically transports patients to Dartmouth-Hitchcock Medical Center.

## IV. The Planning Process

### A. Plan Developers

Samantha Holcomb, a Land Use Planner at the Two Rivers-Ottawaquechee Regional Commission (TRORC), assisted the Town of Bridgewater with updating its Hazard Mitigation Plan. Committee members who assisted with the revisions include:

This section of the Plan satisfies 44 CFR 201.6(b)(1) and 201.6(c)(1) (or, A3.a and A3.b of FEMA’s Local Mitigation Plan Review Guide, 2011).

Name	Role/Organization	How Participation Was Solicited
Norman (Nope) Martin II	Selectboard Chair	On 09/02/2014, Samantha Holcomb and Ellie Ray (TRORC staff) reached out to the Bridgewater Selectboard, the Town Emergency Management Coordinator (Josh Maxham) and the Town Clerk (Nancy Robinson). TRORC staff coordinated with Bridgewater town officials to set up an introductory meeting. The first meeting was scheduled for 11/12/2014. TRORC’s staff attended that meeting, followed by many more meetings in which participants revised and developed the HMP. See below for more meeting-specific details.
Mary Oldenburg	Selectboard, Vice Chair and Fast Squad Member	
John Timken	Selectboard Member	
Josh Maxham	Emergency Coordinator	
Ed Earle	Fire Chief	
Randy Kennedy	Road Foreman	
Nancy Robinson	Town Clerk	

### B. Plan Development Process

The 2009 Bridgewater Annex was originally part of the 2008 multi-jurisdictional Regional Hazard Mitigation Plan, drafted by Two Rivers-Ottawaquechee Regional Commission, and approved by FEMA on September 30, 2008 with its first local annex. The Bridgewater Annex received subsequent FEMA approval, but, since it was part of a larger plan, FEMA treats its start date as September 30, 2008, meaning the Bridgewater Annex expired on September 30, 2013.

This section of the Plan satisfies the Element A: Planning Process requirements set out in 44 CFR 201.6.

This Plan has been reconstructed now as a single jurisdiction, stand-alone Bridgewater Local Hazard Mitigation Plan that will be submitted for individual approval to FEMA. As such, several sections have been added or updated to include all necessary information.

The changes to this Plan include:

- **General**
  - New sections: Plan Development Process, 2009 Mitigation Strategies Status Update chart, Existing Hazard Mitigation Programs, Projects & Activities, Plan Maintenance;
  - Data updates: New hazard incidents, emergency declarations, Census data;
  - Hazards have been reevaluated with the hazard ranking system used by the Vermont Division of Emergency Management and Homeland Security.
- **Hazards Analysis**
  - Hazardous Material Spills Structure Fire, and Flash Flood/Flood/Fluvial Erosion remain on the list of “top hazards,” which reflects Town official’s belief that Bridgewater is still vulnerable to these hazards, and Town’s intentions to continue mitigation planning for these hazards;
  - Wildfire/Brushfire has been added to the list of “top hazards,” which reflects the Town’s intention/priority to expand their analysis of hazards that the Town is or may vulnerable to in the next five years;
  - For each hazard, a location/vulnerability/extent/impact/likelihood table has been added to summarize the hazard description.
- **Maps**
  - A map of the Town of Bridgewater depicting critical facilities, town infrastructure, and the NFIP designated floodway and 100-year floodplain has been added.

The following represent the avenues taken to draft the Bridgewater Hazard Mitigation Plan:

- **Activities**
  - 11/12/2014: Met with the Bridgewater HMP committee members to introduce the update/plan development process, reviewed Bridgewater’s existing Hazard Mitigation Plan (adopted in January 2009), considered the status of various mitigation actions, potential hazards, and the data collection/research process. The Bridgewater committee also discussed and ranked hazards to determine the “Top Hazards” in the Town. Explained to the committee what the next steps in the process are (draft plan, and then schedule a meeting to review and discuss it).
  - 12/2014—01/05/2015: Each committee member reviewed the draft separately and the Town Clerk collected comments from committee members. The comments were then submitted to TRORC staff to use in revising the draft.
  - 01/29/2015: Met with the Bridgewater HMP Committee to discuss and identify Hazard Mitigation Strategies for each “Top Hazard” addressed in the Plan.
- **Public participation and involvement (44 CFR 201.6(b)(1))**
  - 11/12/2014: Met with the Bridgewater HMP committee members to introduce the update/plan development process, reviewed Bridgewater’s existing Hazard Mitigation Plan (adopted in January 2009), considered the status of various mitigation actions, potential hazards, and the data collection/research process. The Bridgewater committee also discussed and ranked hazards to determine the “Top Hazards” in the Town.

Explained to the committee what the next steps in the process are (draft plan, then schedule a meeting to review and discuss it). Prior to the meeting, the agenda was posted on the Town's website, and the meeting was included on the Town's online calendar. After the meeting, the minutes were posted on the Town's website.

- 01/29/2015: Met with the Bridgewater HMP Committee to discuss and identify Hazard Mitigation Strategies for each "Top Hazard" addressed in the Plan. Prior to the meeting, the agenda was posted on the Town's website, and the meeting was included on the Town's online calendar. After the meeting, the minutes were posted on the Town's website.
- Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Bridgewater's efforts to receive more information and how to find out about upcoming meetings.
  - Valley News—ran 01/15/2015
  - The Herald of Randolph—ran 01/15/2015
  - Journal Opinion— ran 01/15/2015
  - Vermont Standard— ran 01/15/2015
- February 2015: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Bridgewater was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan. Contact information was provided in the notice to allow those interested in Bridgewater's efforts to receive more information and how to find out about upcoming meetings.
- **Governmental participation and involvement (44 CFR 201.6(b)(2))**
  - Sent revised draft to Planning Commission Chair and provided contact information for receiving comments via hard copy —02/05/2015
  - Sent draft to Northwest Regional Planning Commission—02/05/2015
  - Sent revised draft to Division of Emergency Management and Homeland Security.
- **Neighboring community participation and involvement (44 CFR 201.6(b)(2))**
  - Posted a notice in four local papers alerting the public to the Hazard Mitigation Planning process that was taking place. Contact information was provided in the notice to allow those interested in Bridgewater's efforts to receive more information and how to find out about upcoming meetings.
    - Valley News— ran 01/15/2015
    - The Herald of Randolph— ran 01/15/2015
    - Journal Opinion— ran 01/15/2015
    - Vermont Standard— ran 01/15/2015
  - February 2015: A notice was placed in the Two Rivers-Ottawaquechee Regional Planning Commission Newsletter alerting recipients that Bridgewater was engaging in hazard mitigation planning and updating their Hazard Mitigation Plan. Contact information was provided in the notice to allow those interested in Bridgewater's efforts to receive more information and how to find out about upcoming meetings.

- Sent revised draft to neighboring towns' Selectboards for comment and provided contact information for receiving comments via hard copy — 02/05/2015
  - Towns of: Barnard, Woodstock, Plymouth, and Killington
- **Review of existing plans, studies, reports, and technical information** (44 CFR 201.6(b)(3))
  - Bridgewater Hazard Mitigation Plan (Adopted 01/13/2009)
    - This Plan was referenced extensively during the plan development process, especially in regard to the worst threats and mitigation action strategies identified in 2009.
  - Bridgewater Town Plan (Adopted 09/24/2013)
    - The Town Plan provided TRORC's staff with background information on the community, as well as more detail on their emergency services.
  - Bridgewater Flood Hazard Area Regulations (Adopted 11/28/2006)
    - The Flood Hazard Area Regulations provided information on the Town's regulation of the Special Flood Hazard Area (SFHA).
  - Bridgewater Local Emergency Operations Plan (LEOP) (Adopted 05/20/2014)
    - The Bridgewater LEOP was referenced for general knowledge regarding the Town's emergency operations.
  - Ottauquechee River Watershed Stream Geomorphic Assessment, Bridgewater and Woodstock, Vermont (01/29/2013)
    - The Ottauquechee River Watershed Stream Geomorphic Assessment was referenced for information regarding a critical waterbody in the Town of Bridgewater. The Corridor Plan was referenced when drafting the Flash Flood/Flood/Fluvial Erosion section of this Local Hazard Mitigation Plan. The information from the Stream Geomorphic Assessment was also incorporated into the mapping/GIS components of this Plan.
  - Bridgewater Community Wildfire Protection Plan (Dated 04/2011)
    - The Community Wildfire Protection Plan was referenced for information pertaining to the Town's wildfire/brushfire risks and vulnerabilities. This information was then incorporated in the Wildfire/Brushfire section of this Plan.
  - Flood Insurance Study for Windsor County, Vermont (Dated 09/28/2007)
    - The Flood Insurance Study was referenced for general knowledge of the Ottauquechee River and peak discharge information.
    - Relevant peak discharge information for the Ottauquechee River can be found on page 24 of Volume 1.
    - This information was incorporated into the mapping/GIS components of this Plan; specifically in determining the number of structures that are vulnerable to SFHA, and into the Flash Flood/Flood/Fluvial Erosion section of this Plan.

This section of the Plan satisfies 44 CFR 201.6(b)(3) (or, A4.a and A4.b of FEMA's Local Mitigation Plan Review Guide, 2011).

### C. Status Update on Mitigation Actions Identified in 2009

The following table outlines the mitigation actions that were proposed in Bridgewater’s 2009 All-Hazard Pre-Disaster Mitigation Plan for the Town of Bridgewater (adopted on January 13, 2009 as an appendix to the Two Rivers-Ottawaquechee Regional Commission’s multi-jurisdictional Pre-Disaster Mitigation Plan).

This section of the Plan satisfies the requirements of 44 CFR 201.6(d)(3).

Participants in the new Plan update process reviewed these actions and reported on the status of each:

MITIGATION ACTION	WHO (LEADERSHIP)	WHEN (TIMEFRAME)	HOW (FUNDING/SUPPORT)	STATUS UPDATE—2015
<u>ALL HAZARDS</u>  1. Ensure that the Rapid Response Plan (RRP) is current.	Selectboard	Yearly	With TRORC assistance	The newest iteration of the RRP is the Local Emergency Operations Plan (LEOP). The Bridgewater LEOP undergoes an annual update of this document and it was last updated and approved on 05/20/2014.
2. Use the Pre-Disaster Mitigation (PDM) plan for Hazard Identification and Mapping.	Emergency Management Coordinator	Ongoing	Local resources	The Town has received assistance from TRORC to develop floodplain maps. As part of the 2013 Town Plan, TRORC provided the Town of Bridgewater with a “Future Land Use” map displaying the 100-year floodplain.
3. Re-write and update existing Emergency Operations Plan.	Emergency Management Coordinator	2009	Local resources	The newest iteration of the RRP is the Local Emergency Operations Plan (LEOP). The Bridgewater LEOP undergoes an annual update of this document and it was last updated and approved on 05/20/2014.
4. Encourage the utilities to continue a regular schedule of tree trimming along power lines.	Emergency Management Coordinator	Ongoing	Local resources	Green Mountain Power services the Town of Bridgewater and they have done a satisfactory job trimming trees along the power lines.

MITIGATION ACTION	WHO (LEADERSHIP)	WHEN (TIMEFRAME)	HOW (FUNDING/SUPPORT)	STATUS UPDATE—2015
<u>FLASH FLOOD</u> 5. Continue the planned road maintenance program that addresses culvert survey and upgrade and ditching.	Highway Department	Ongoing	Local resources	The Town of Bridgewater replaces culverts according to their most recent culvert inventory, completed in 2005. There are plans to upgrade ditching, which will begin in 2015.
6. Work with State staff to plan removal of fallen trees in areas with remote, steep streams.	Highway Department	2010	Local resources	This action has not been completed, but Town officials expressed some interest in continuing to pursue this collaborative effort.
7. Stabilize Wayside Road in area used as a dam.	Highway Department	2010	Local and state resources	The stabilization of Wayside Road was completed in 2010.
8. Stabilize riverbanks along Chateauguay Road.	Highway Department	2010	Local and state resources	Permanent repairs to stabilize the riverbanks were completed after Tropical Storm Irene, in the fall of 2011.
<u>HAZMAT</u> 9. Ensure that all emergency response and management personnel continue to receive HAZMAT awareness training.	Fire Department	2009	Funded by Fire Service Training Academy	This action is complete for 2014, and is completed annually. There are currently 5 members of the Bridgewater Volunteer Fire Department that have received Operations-level training.

MITIGATION ACTION	WHO (LEADERSHIP)	WHEN (TIMEFRAME)	HOW (FUNDING/SUPPORT)	STATUS UPDATE—2015
10. Analyze potential hazards that might be associated with the Long Trail Brewery and the Sewage Treatment Plant.	Emergency Management Coordinator	2010	Local resources	This action has not been completed specifically, but both facilities made it out of Tropical Storm Irene relatively unscathed and Town officials believe this was a good test in determining the hazards associated these facilities. During Tropical Storm Irene, the only problem to present itself was the loss of power at the Sewage Treatment Plant due to issues with the generator. The issues with the generator have since been resolved.
<u>FIRE</u> 11. Outfit town buildings with smoke detectors and emergency lights.	Fire Department (or Selectboard)	2009	Local resources	This action has not been completed—per adopted codes the town buildings are not required detection (NFPA 101 2012 edition). Emergency lights are not required if the exit is obvious. That said, emergency lighting is required in most buildings. The Vermont State Fire Marshal would be able to determine whether emergency lights are needed.
12. Develop additional dry hydrant sites in rural locations.	Fire Department	Ongoing	Local resources, George Aiken RC&D	At least 5 new dry hydrants have been installed throughout the Town of Bridgewater since 2009. A number of dry hydrants were also repaired after they were damaged during Tropical Storm Irene.

There is minimal development occurring in the Town of Bridgewater. There are very few new residential structures being built, and the majority of development related to residential properties are additions to existing structures and the construction of accessory structures. After Tropical Storm Irene, there were four property buyouts that occurred in the Town of Bridgewater. As of early 2015, the structures on these parcels of land have all been razed. These properties will be maintained as open space, with little or no enhancements to the property (ex. park with picnic tables, and the like) to mitigate the potential for future structural damage caused by flooding. In the future, the Bridgewater Volunteer Fire Department would like to build a new firehouse, which will require the purchasing and/or development of land. There are no plans for large-scale development on the horizon. However, Town officials are

anticipating that the Bridgewater Village School will be closed in the future due to the regionalization of the school system in the immediate region.

## D. Existing Hazard Mitigation Programs, Projects & Activities

The Town of Bridgewater is currently engaged in the following hazard mitigation programs, projects and activities:

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3).

	<b>Type of Existing Authority / Policy / Program / Action</b>	<b>Resources: Staffing &amp; Funding</b>	<b>Ability to Expand/Improve on</b>
<b>Community Preparedness Activities</b>	Program—Annual update of Bridgewater’s Local Emergency Operations Plan (LEOP). Last updated and approved on 05/20/2014.	Staff time from the Town Clerk, volunteer time from the Emergency Management Director/ Coordinator; assistance from TRORC. Funding from Vermont DEMHS.	This document is reviewed and updated each year to ensure that the contact information of emergency response personnel is up-to-date. This information is then sent to Vermont Emergency Management for their records. There is no need to expand on this program at this time.
	Completed Action—Red Cross Shelter Designation—Bridgewater Village School	Staff time from the Town Clerk, volunteer time from Selectboard, Emergency Management Director/ Coordinator. Funding from American Red Cross.	One time action.
	Program—attendance/participation at Local Emergency Planning Commission (LEPC) #12 meetings.	Volunteer time from the Fire Department/Selectboard members/Emergency Coordinator. Funding from Vermont DEMHS.	No need to expand or improve on attendance, as attendance is satisfactory.
<b>Insurance Programs</b>	<p>Authority/ Program— participation in National Flood Insurance Program (NFIP)</p> <p>The Town of Bridgewater participates in and is compliant with the NFIP by enforcing its most currently adopted Flood Hazard Area Regulations (11/28/2006). The Town enforces the Flood Hazard Area Regulations based on the 09/28/2007 FIRMs.</p> <p>[Note: This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii).]</p>	The Bridgewater Town Clerk serves as the NFIP Administrator. Assistance from TRORC and Vermont ANR. Funding from local resources—annual budget.	The Town’s initial Flood Hazard Boundary Map (FHBM) was dated 08/16/1974. The Town’s initial Flood Insurance Rate Map (FIRM) was dated 07/02/1980. The Town’s current Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) has been updated, and the current effective date for both is 9/28/07.
<b>Land Use Planning</b>	Policy/Program— Bridgewater Town Plan (Adopted 09/24/2013). Includes a “Flood Prone Areas” discussion within the “Critical Natural Areas” section of the Town Plan.	Volunteer time from Planning Commission, and assistance from TRORC/ other state agencies on specific subject matter. Funding from Municipal	The Town Plan is updated every five years, as required by statute. The Planning Commission may expand or improve on any section it deems necessary, or that is required by changes in state statute.

		Planning Grants.	
	<b>Type of Existing Authority / Policy / Program / Action</b>	<b>Resources: Staffing &amp; Funding</b>	<b>Ability to Expand/Improve on</b>
	Authority—Bridgewater Flood Hazard Area Regulations (Adopted 11/28/2006)	Volunteer time from the Planning Commission, and assistance from TRORC and Vermont ANR. Funding from Municipal Planning Grants.	During the Town Plan review/update period, the Flood Hazard Area Regulations are also reviewed and updated if needed.
	Policy/Program—Bridgewater Hazard Mitigation Plan (Adopted on 01/13/2009)	Volunteer time from Town officials; assistance from TRORC and Vermont DEMHS. Funding from FEMA; Vermont DEMHS; TRORC.	The 2015 Bridgewater Hazard Mitigation Plan will replace the 2009 Plan. The 2015 HMP has evolved from the 2009 Plan and has greatly expanded and improved upon it. Future iterations of the Town’s LHMP will be updated by the Town at least every five years.
<b>Hazard Control &amp; Protection of Critical Infrastructure &amp; Facilities</b>	Completed Action— Culvert inventory with TRORC assistance in 2005	Staff time from the Road Foreman; with assistance from TRORC. Funding from VTrans.	The Town is currently using the culvert inventory to further its culvert improvement program, but the inventory could be improved upon by completing an update with georeferenced culvert locations.
	Authority— Town Road and Bridge Standards (Adopted 05/14/2013)	Adopted by the Selectboard, implemented by the Road Foreman, assistance from TRORC. Funding from VTrans and the local budget to implement.	Specifies minimum construction standards for roadway, ditches, culverts and bridges and guardrails. VTrans updates the Town Road and Bridge Standards on a fairly regular basis. The Town has the authority to require above-and-beyond what is written in the policy.
	Program/Action—Property buyouts following Tropical Storm Irene	Staff time from the Town Clerk, volunteer time from the Selectboard. Assistance from TRORC and Vermont DEMHS, and funding from FEMA HMGP and HUD CDBG.	Two on U.S. Route 4; one on Cram Trail; one on VT100A. This is a one-time action, and improving/expanding upon it is not necessary.
	Policy/Action— Bridgewater Community Wildfire Protection Plan (Dated 04/2011)	Volunteer time from the Planning Commission and assistance from TRORC and other agencies/organizations. Funding from the Vermont Rural Fire Protection Task Force.	This is a one-time action, and improving/expanding upon it is not necessary. This document has not yet been adopted.
<b>Education/ Public Outreach</b>	Completed Action— Public Training related to the Red Cross Shelter designation—May 2013	Volunteer time— Selectboard, Emergency Management Director/ Coordinator. Funding from American Red Cross.	This is a one-time action, and improving/expanding upon it is not necessary.

<b>Type of Existing Authority / Policy / Program / Action</b>	<b>Resources: Staffing &amp; Funding</b>	<b>Ability to Expand/Improve on</b>
Ongoing Action— The Town/Fire Department has public preparedness information at the Town Office	Time from the Volunteer Fire Department and funding from Fire Department budget.	This is an ongoing action and there is no need to expand upon it.
Ongoing Action— Education/Communication to community regarding structure fire prevention or important information. The Bridgewater Volunteer Fire Department visits the Bridgewater Village School during fire prevention week. The Bridgewater Volunteer Fire Department also places signs outside of the firehouse to communicate important information to residents and passersby (ex. Fire Prevention Week, etc.)	Time from the Volunteer Fire Department and funding from Fire Department budget.	This is an ongoing action, and there is no need to expand or improve on this action.
Action—Participation in Front Porch Forum	Staff time from the Town Office (as needed) and funding from Front Porch Forum.	The Town is not actively participating in Front Porch Forum; but this service is available to disseminate information out to the community on a large-scale should the need arise. This would be used while the Town waited for the information to be published in the local newspaper.
Ongoing Action—Bridgewater Volunteer Fire Department has a Facebook page where preparedness information is posted and posts pictures of the Fire Department’s activities. There are currently 201 followers of the Facebook page.	Time from the Volunteer Fire Department and funding from Fire Department budget.	There is no need to expand or improve on this action.

## E. Plan Maintenance

This Plan (the Bridgewater Local Hazard Mitigation Plan) will be updated and evaluated, by discussing its effectiveness and making note to incorporate any necessary revisions in the update process, annually at an April Selectboard meeting, along with the review of their Local Emergency Operations Plan (LEOP). At this meeting, the Selectboard will monitor the implementation of the hazard mitigation strategies outlined in this Plan, by noting those that have been completed and any comments from local officials and the public will be incorporated when relevant. This meeting will constitute an opportunity for the public and other town officials to hear about the town's progress in implementing mitigation strategies and to give input on future activities and Plan revisions. The public will be given the opportunity to comment at this meeting.

Updates and evaluation of this Plan by the Selectboard and the local Emergency Coordinator/Director will also occur within three months after every federal disaster declaration directly impacting the Town of Bridgewater. The Town will monitor, evaluate and update this Local Hazard Mitigation Plan at an April Selectboard meeting and after every federally declared disaster directly impacting the Town according to the graphic on page 41. The Town shall reference the Local Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town's bylaws.

This section of the Plan satisfies 44 CFR and 201.6(c)(4)(i), 201.6(c)(4)(ii), and 201.6(c)(4)(iii).
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At least one year before the Plan expires, the update process will begin (through annual updates, monitoring of progress and evaluation that will occur at the April Selectboard meeting). For this next Plan update, the Two Rivers-Ottawaquechee Regional Commission (TRORC) will help with Plan updates if assistance is requested by the Town of Bridgewater and if funding is available. If TRORC is unable to assist the Town, then Bridgewater's Town Clerk, Administrative Assistant, or Selectboard will update the Plan, or the Selectboard may appoint a committee of interested citizens (including the current local Emergency Coordinator/Director) to draft changes. Ultimately, it will be the Town's responsibility to update their Local Hazard Mitigation Plan.

The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice within the municipal building, and notice in the Vermont Standard and the TRORC newsletter and blog, inviting the public to the scheduled Selectboard (or specially scheduled) meeting. The public will be given the opportunity to comment during this process. Additional stakeholders may be invited to the meeting; these include: Woodstock Ambulance, VTrans, and the Vermont Agency of Natural Resources (VT ANR). VT ANR may be invited because they can provide assistance with NFIP outreach activities in the community, models for stricter floodplain zoning regulations, delineation of fluvial erosion hazard areas, and other applicable initiatives. These efforts will be coordinated by the Town Clerk.

Updates may include changes in community mitigation strategies; new town bylaws, zoning and planning strategies; progress on the implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. If new actions are

identified in the interim period, the plan can be amended without formal re-adoption during regularly scheduled Selectboard meetings.

The Town of Bridgewater shall also incorporate mitigation planning into their long-term land use and development planning documents. The 2013 Vermont Legislature passed a law requiring all towns to incorporate flood resiliency elements into their town plans as of July 2014. To do so, flood hazard and fluvial erosion hazards will be identified, and strategies and recommendations will be provided to mitigate risks to public safety, critical infrastructure, historic structures and public investments. This Local Hazard Mitigation Plan will help the town to comply with the new community flood resiliency requirement for town plans adopted after July 2014.

It is also recommended that the process work both ways and the Town review and incorporate elements of the Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/ fluvial erosion hazards (FEH) bylaws. The incorporation of the goals and strategies listed in the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town should also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas.

## V. Community Vulnerability by Hazard

### A. Hazard Identification

Mitigation efforts must be grounded in the rational evaluation of hazards to the area and the risks these hazards pose. This is done through a process, which in essence asks and answers three basic questions:

- What bad things can happen?
- How likely are they to occur?
- How bad could they be?

This process, which is laid out in the table below, is an attempt to inventory the known hazards, establish the likelihood of them occurring in the future, and then assess the community's potential vulnerability to each. In performing this analysis, we are then able to prioritize actions that are designed to mitigate the effects of each of these disaster types and ultimately make Bridgewater a safer place.

It is important that we learn from the past in order to avoid the same disasters and their outcomes. Disasters that have occurred within the Town of Bridgewater, the larger region, and the State of Vermont can give us good information about what types of disasters we can expect in the future and what kinds of damage they might cause. However, while this historical data can inform our perspective of what might happen in the future, it is by no means a prophecy. While Bridgewater might not have been impacted by a specific hazard in the past, this does not necessarily mean it will never be affected in the future. Indeed, the advance of climate change means that old weather patterns may not hold. For instance, in recent years, Vermonters have seen an increase in the number and severity of storms, especially rainfall events. Armed with historical data and a healthy respect for climate change and the unknown, we have tried our best to identify hazards and prepare for the future.

The following table reflects the hazards that we believe can be expected, or are at least possible, in the central Vermont area. We have considered factors such as frequency of occurrence, warning time and potential community impact to rank each and determine which hazards pose the greatest threats to life and property in Bridgewater.<sup>1</sup> The worst threats (bolded in the table, below) are then followed-up with discussion and mitigation strategies throughout the rest of this Plan.<sup>2</sup> It should be noted that hazards assigned with the same "Hazard Score" are not in order and their placement in the table should not be assumed to reflect their potential to create hazards for the town.

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<sup>1</sup> The ranking methodology used in this Plan (see Appendix A) is closely modeled on that which is used by the Vermont Division of Emergency Management & Homeland Security (VDEMHS). The only changes made were intended to reflect the more limited geographical scope of this analysis, which is focused on a small, rural town rather than the entire State of Vermont (which is the focus of VDEMHS).

<sup>2</sup> It's important to note that those hazards which were not found to pose the greatest threats may still occur in Bridgewater's future; however, they are not the focus of this Plan.

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
Structure Fire	Highly Likely	None	Minor-Moderate	10.5
Hazardous Material Spill	Highly Likely	None	Negligible	10
Wildfire/Brushfire	Highly Likely	None	Negligible	9
Flash Flood/Flood/Fluvial Erosion	Occasionally-Likely	6-12 hours	Minor-Moderate	7
Hail Storms	Likely	3-6 hours	Negligible	7
Extreme Cold/Snow/Ice Storm	Highly Likely	12+ hours	Minor	7
Landslides/Mudslides/Rockslides	Unlikely	None	Negligible	6
Hurricanes/Tropical Storms	Unlikely	12+ hours	Major	6
Ice Jams	Highly Likely	12+ hours	Negligible	6
Earthquake	Unlikely	None	Negligible	6
Severe Weather (Thunderstorm, Lightning, High Wind, Hail, and Flooding)  *Note: We have defined 'Severe Weather' to include two or more of the above hazards.	Highly Likely	12+ hours	Negligible	6
Invasive Species/Infestation	Likely	12+ hours	Minor	4
Extreme Heat	Unlikely-Occasionally	12+ hours	Negligible	3.5
Water Supply Contamination	N/A	N/A	N/A	N/A
Dam Failure	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Tornado	N/A	N/A	N/A	N/A

The Bridgewater HMP committee discussed the results of the hazard ranking activity and decided to focus on hazards that were *Highly Likely* to occur and had no warning time. In addition, the committee decided to focus Flash Flood/Flood/Fluvial Erosion because this hazard, while slightly less likely to occur than Structure Fires, Hazardous Material Spills and Wildfires/Brush Fire, has the potential to impact the

Town on a town-wide scale, and Town officials believe that the Town is still vulnerable to flood damage. Even though Extreme Cold/Snow/Ice Storm was determined to be more likely to occur in the Town of Bridgewater, Town officials were confident that the Town is and will remain well-equipped to deal with winter weather (though it was agreed that ice storms, should they occur, would present more challenges than snow and extreme cold). By contrast, and as mentioned above, Town officials believed the Town remains vulnerable to the hazards caused by Flash Floods/Floods/Fluvial Erosion.

After engaging in discussions using their best available knowledge, the Town of Bridgewater identified the following “top hazards” that they believe their community is most vulnerable to:

- Structure Fire
- Hazardous Material Spill
- Wildfire/Brushfire
- Flash Flood/Flood/Fluvial Erosion

Each of these “top hazards” will be discussed in the following sections. Within each section, previous occurrences of each hazard will be listed, including the County-wide FEMA Disaster Declarations (DR-#), where applicable. Hazards information was gathered from local sources (ex., town history book), the National Climatic Data Center’s (NCDC’s) Storm Events Database (1950-2012 and 2006-2012), the Spatial Hazard Events and Losses Database for the United States (SHELDUS) 1960-2012, and Special Reports produced by the National Weather Service in Burlington, Vermont. This section also includes a description of each “top hazard” and a hazard matrix that will also include the following information (please see each hazard profile for a hazard-specific matrix):

<b>Hazard</b>	<b>Location</b>	<b>Vulnerability</b>	<b>Extent</b>	<b>Observed Impact</b>	<b>Likelihood/Probability</b>
Type of hazard.	General areas in community that may be vulnerable to the hazard.	Community structures affected by hazard.	The strength or magnitude, and details of the most notable event(s).	Dollar value or percentage of damages.	<u>Occasionally:</u> 1–10% probability of occurrence per year, or at least one chance in next 100 years <u>Likely:</u> >10% but <100% probability per year, at least 1 chance in next 10 years <u>Highly Likely:</u> 100% probable in a year

## B. Hazard Profiles for “Top Hazards”

### 1. Structure Fire

Vermont has one of the highest per capita death rates from fire in the nation. This is in fact the deadliest form of disaster throughout the state. In 2012, there were 2,225 reported structural fires in the state, which included 6 fatalities and \$17.8 million dollars in damage. Although there have been requirements for smoke detectors in rental housing for over 20 years, and requirements for smoke detectors in single-family dwellings since 1994, there was only one building involved in the fatal fires in 2000 that had evidence of working smoke alarms.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Structure Fire**.

Structure fires may occur at any point, and are typically initiated within a single fuel object. Smoke produced by the burning object forms a smoke plume and rises, creating a layer of smoke while also transporting heat to the smoke layer. Fire then spreads quickly by radiation from the flames, or from the smoke layer. Once other objects are engulfed, more smoke plumes are formed and heat radiates to other objects. Fire burns and moves across different materials depending on the material’s composition, orientation, surface to mass ratio and air supply in the structure/room.

The Town of Bridgewater is broadly characterized by two forms of terrain: one that is more mountainous with a few higher peaks and narrow valleys and one with more subdued valleys that are broader and surrounded by shorter peaks. Bridgewater physically serves as a midway point between two bustling, year-round tourist areas, Woodstock to the east and Killington to the West; much of its growth has arisen along the routes connecting these areas. The bulk of existing development in the Town largely runs parallel to the Ottauquechee River, its North Branch, and the Broad Brook along U.S. Route 4, VT Route 100A, and Bridgewater Center Road. As with many Windsor County towns, the area is typified by a number of old wooden town buildings, residences, and a few commercial spaces.

Bridgewater has no registered mobile home parks; however, according to American Community Survey data from 2010, mobile homes account for 4.3% of all housing units in the town (roughly 25 units). A structural fire in any one of the mobile homes has the potential to spread to other structures located nearby in the right conditions, as would be true of houses and business in the denser Bridgewater Corners portion of the Town. A review of the fires listed in the “History of Occurrences” chart below demonstrates the potential for all structures, including mobile homes, located in the rural Town of Bridgewater to be completely or severely destroyed by fire.

The following occurrences were reported by the Committee or obtained from local sources. It is reasonable to assume that more structural fires have occurred in the period of time between the entries listed below.

### History of Occurrences:

Date	Event	Location	Extent
02/08/2014	Structure fire	Route 100A	An old farmhouse, built in 1845, was almost entirely destroyed, with losses estimated at \$95,000. A total of 50 firefighters representing the towns of Woodstock, S. Woodstock, Rutland Town, Plymouth, Barnard, Teago, Hartford, Hartland, and Reading responded to the structure fire. The cause of the fire was undetermined.
01/23/2014	Chimney Fire	Route 100A	A chimney fire destroyed part of a house, rooming and lodging building fire burned outside wall and broke through into one room. The homeowner was present when the fire started, and with the aid of several fire departments, the fire was put out in about 1 hour. Losses estimated at \$30,000.
01/11/2014	Chimney Fire	North Bridgewater Road	\$4,480 in losses.
09/03/2013	Chimney Fire	Bridgewater Mill Mall	Bridgewater and Woodstock FD's were called out to the Bridgewater Mill Mall over a chimney fire, where the old boiler chimney was on fire. The fire was not attached to the mill itself, and was determined to be arson.
01/06/2013	Shed Fire	Back Behind Restaurant	A shed that was located mere inches from the Back Behind restaurant on Rte. 4 in W. Bridgewater was involved in a fire, which was subsequently put out by the local fire department. The structure was a complete loss, with some damage sustained on the exterior of the restaurant. \$50,000 in damages.
01/03/2013	Chimney Fire	North Bridgewater Road	Chimney fire on N. Bridgewater Road, where a small fire was found in the basement on the floor joist that was built around the chimney. This fire was quickly extinguished with a water can.
03/24/2012	Porch Fire	Bridgewater Mill Mall	Christmas tree in mulch bed burnt and cause minor damage to the porch. \$500 loss.
09/21/2012	Structure Fire	Route 100A	Comcast drilled through the house main power line catching the floor joist on fire. \$2,000 loss.
12/10/2011	Structure Fire	Cox District Road	Car caught fire in mechanic shop that was attached to a horse riding arena. Fire was contained to the mechanic shop. \$60,000 building loss and \$30,000 contents loss.
01/29/2010	Chimney Fire	Bridgewater Center Road	\$4,100 loss.
10/17/2010	Barn Fire	Phelps Road	Cause of fire undetermined. \$20,000 building loss and \$32,000 contents loss.
09/15/2005	Structure Fire	Gold Coast Road	Fire started from spontaneous combustion of charcoal fire dropped down from deck and burnt into the ground level. \$100,000 building loss and \$80,000 contents loss.
02/12/2002	Structure Fire	Bridgewater Center Road	Fire started in dryer. \$250,000 loss.

As noted, recognized fire protection problems for the community include poor access to fires, limited water supply for firefighting outside the Village area, and distances of homes from the Fire Station, all of which leave Bridgewater vulnerable to the impacts of structure fires. Some recreational and retirement homes with single access roads and no fire-fighting water supply are in jeopardy.

To help provide better fire protection cover in the Town, the Town of Bridgewater/ Bridgewater Volunteer Fire Department have installed at least five new dry hydrants since 2009. Most recently, dry hydrants have been located on the following roads/in the following areas: one in 2011, a pressurized hydrant on Goldcoast Road; three in 2012, one at the Long Trail Brewery, one behind the Bridgewater Grange Hall on River Road, one on the Town’s baseball field; and one in 2013 along U.S. Route 4 in West Bridgewater. In 2012, a hydrant was relocated from the Oak Chapel Church on Bridgewater Center Road to a site on the opposite side of the North Branch River and slightly downriver from the previous site. Many dry hydrants in the Town were damaged as a result of the flooding caused by Tropical Storm Irene in 2011 and were subsequently repaired. The dry hydrants are maintained/cleaned out annually.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
Structure Fire	Town-wide	All housing, municipal buildings, Bridgewater Mill Mall	Depends on the location and extent of the fire.	Varies depending on the location and extent of the fire. Most recent fire, on 02/08/2014, totaled approximately \$75,000 in lost property.	Highly likely

## 2. Hazardous Material Spill

Based on available VT Tier II data, there are two sites in town that have sufficient types and/or quantities of hazardous materials to require reporting.

Bridgewater is predominantly located along U.S. Route 4, VT Route 100A, and Bridgewater Center Road, which run along the Ottauquechee River, the North Branch of the Ottauquechee River, and the Broad Brook. No major,

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Hazardous Materials Spill**.

functioning interstate highways or railways run through or near the Town. There are 25 critical facilities in the Town of Bridgewater, including two hazardous material storage facilities. There are 223 residential and 178 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill on major roads, such as Routes 4 and 100A. This includes the Town Clerk's Office/Town Hall, the Fire Department, the Bridgewater Village School, and the Bridgewater Town Garage. In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$5,788,857.

It should also be noted that the State of Vermont currently has one fully-trained HAZMAT response team, with vehicles located in Essex Junction, Pittsford, and Windsor. The HAZMAT crew chief is available within minutes of a call for the team but on-scene response would be a matter of hours. In the event of a serious accident in Town, there would be little time for evacuation and response would be difficult.

The following data was retrieved from the Vermont Department of Environmental Conservation's Spill List and by searching the archives of local newspapers. The table above is used to illustrate the ease with which trucks and the day-to-day activities in the Town have the potential to create a hazardous material spill and dangerous conditions for emergency responders and town residents.

### History of Occurrences:

Date	Event	Location	Extent
04/30/2014	Fuel Oil Spill	Old Bridgewater Hill Road	An AST holding fuel oil leaked and estimated 400 gallons of oil at a private residence. HEA hand-dug contaminated soil in basement.
01/20/2014	Gasoline Spill	Bridgewater Corner Store	Customer overfilled while pumping gasoline at the corner store, which was contained on the asphalt by the FD.
03/13/2012	Fuel Oil Spill	Back Behind Restaurant	An AST holding fuel oil leaked its contents, leaching an unknown amount of oil into the soil. According to Irving Oil (the responsible party), the spill may have resulted from TS Irene impacts. 10 tons of soil was removed from the site, RWs recovered FP on the water table, and SVE removed vapors from under the business.
09/23/2011	Fuel Oil Spill	Route 4	An AST failed in the basement of a private home following TS Irene, spilling #2 fuel oil. The storm also deposited 6" of silt. Property was ultimately demolished.
09/15/2011	Unspecified	BR44, Rte. 4	A UST that had been washed downstream during TS Irene was found under bridge #44 with 18" of water/oil in its tank. It was secured, pumped, and the waste was removed.

<b>Date</b>	<b>Event</b>	<b>Location</b>	<b>Extent</b>
06/02/2001	Kerosene Spill	Baker Residence (what street is this on?)	An AST containing kerosene tipped over, spilling 30 gallons. Contaminated soil was dug up and drummed from disposal (8 drums total).
04/03/2001	Kerosene Spill	Dailey Hollow Road	Ice broke a fuel line at a private residence, leaking 200 gallons of kerosene, contaminating soils, and requiring soil excavation.
10/02/1991	Unspecified	Bridgewater Elementary School	A small kink in an UST line led to a 900 gallon spill of an unspecified substance.
01/21/1986	Gasoline Spill	General Store	1,200 gallon gasoline leak occurred at the General Store.
06/07/1981	Road Oil Spill	Unspecified	55 gallons of road oil spilled.
02/25/1981	Diesel Spill	Rte. 4	A truck accident led to a 60 gallon diesel spill. Upon investigation, it was determined that no clean-up was possible to remediate the site.
02/04/1981	Gasoline Spill	Exxon Station	A leaking UST led to a 1,000 gallon gasoline spill.

While only a small number, or no major hazardous material spills have occurred in the Town of Bridgewater, the potential for a major spill exists. Routes 4 and 100A, particularly at their point of intersection, pose constant threats to the Town of Bridgewater. These routes serve as the main thoroughfares for trucks and other motor vehicles transporting a wide-range of goods, including a wide range of hazardous materials, within the confines of Bridgewater. A truck accident and a resulting hazardous material spill could be exceedingly disastrous for the Town and its residents, as these two routes intersect in the development-dense Bridgewater Corners area. The length of Route 4 in the Town runs parallel to the Ottauquechee River, while Route 100A runs parallel to the Broad Brook between Routes 4 and 100. As a result, additional water contamination issues could be created if a hazardous material spill were to occur along either of these major routes.

A hazardous material spill in the Town, in addition to impacting residents, businesses and surface waters, may also impact business and residential water supplies. The Town of Bridgewater does not have a municipally owned public water supply, and, instead, residents rely on private, individual wells to serve their needs. As evidenced in the table above, there is potential for contamination to soils and waterways in the town, which could pose a very real threat to the Town's aquifer.

In order to prepare for hazardous material spills in Bridgewater, many members of the Bridgewater Volunteer Fire Department are trained to the HAZMAT Awareness level, and five members are trained to the Operations level.

<b>Hazard</b>	<b>Location</b>	<b>Vulnerability</b>	<b>Extent</b>	<b>Impact</b>	<b>Likelihood/ Probability</b>
Hazardous Materials Spill	U.S Route 4; Vermont Route 100A, and local roads.	Road infrastructure, nearby private and publically-owned structures (Town Clerk's Office/Town Hall, the Fire Department, the Bridgewater Village School), the Ottauquechee River, and Broad Brook.	Initially, local impacts only; but depending on material spilled, extent of damage may spread (ex. into groundwater).	There are 223 residential and 178 commercial, industrial or public buildings within 1,000 feet of a potential HAZMAT spill on major roads (Vermont Routes 4 and 100A). In the event that 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$5,788,857.	Highly Likely

### 3. Wildfire/Brushfire

Wildfire may be sparked by natural or human activities. Lightning is one of two main natural causes of wildfire. However, across the United States, approximately 90 percent of wildfires are started by humans. According to FEMA, there are three types of wildfire that can consume natural landscapes and man-made structures and features: surface fire, ground fire and crown fire. Surface fires are slow moving across the forest floor, and, as a result, kill and damage trees. Ground fires are usually caused by lightning strikes, and burn on or below the forest floor. Crown fires, so called for their location in the crown of trees, effortlessly spread through tree tops, often aided by wind.

The Vermont landscape is especially vulnerable to wildfire during the period of time in early spring when all the snow has melted, vegetation has not begun to develop leaves, and the land and vegetation are very dry and/or dead. The vast majority of the Town of Bridgewater is forest land (totaling 29,500 acres, or 93% percent), including a large swathe of forested area that is included in the Chateauguay – No Town Conservation Project. This project covers multiple tracks of land across multiple towns (Bridgewater, Barnard, Stockbridge, and Killington) to create a no-growth area comprised of largely conserved lands. This Chateauguay area also serves as part of the Appalachian National Scenic Trail. Owing to the fact that such an overwhelming portion of the Town is forestland, Bridgewater is highly vulnerable to the impacts of wild and brush fires if they were to occur within Town bounds.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Wildfire/Brushfire**

The following instances of wildfire were reported by the Committee. Their reports were supported with research of news stories, where possible (indicated with an asterisk\*).

#### History of Occurrences:

Date	Event	Location	Extent
2013	Grassfire	Alongside U.S. Route 4	Consisted of 3 circles that were about a foot or less in diameter. Extinguished by a passerby.
2003	Wildfires	Town of Bridgewater	At least 5 wildfires broke out in 2003, which is an unusually high number of wildfires for the Town in one year.
04/30/2001	Brush Fire	Unknown	A brush fire was started without a permit, leading to 2 acres being burned.
1983	Brush Fire	Free Stone Ledges	Fire burned for a few days and consumed approximately 20 acres.
Late 1970's/Early 1980's	Brush Fire	Chateauguay	100 acres of forest burned.
1970s and 1980s	Brush Fires	Multiple locations in Bridgewater, including Rabbit Hill	Brush and grass fires consumed considerable number of acres.

In recent years, the Town of Bridgewater has experienced about one small brush or wildfire per year; however, this is unusual. There can be as many as 5 or more, as was the case in 2003. The potential exists for these fires to get out of hand rapidly, particularly in areas where there is a 15% slope or greater that impedes firefighting efforts. According to the Committee, areas that are particularly

vulnerable to wildfire are often those that are near residential homes, especially properties that are built on steep banks where fires tend to spread more quickly. In the majority of instances, these fires tend to be man-made— from a property owner burning leaves or brush. As a result, such fires are often within the vicinity of the home. This is a testament to the need for continued, appropriate guidance for landowners.

Forest areas exist where ground-based firefighting efforts would be very difficult, due to their remoteness or steep slopes. This creates the potential for wildfire to impact private land and property and any logging operations occurring at the time of the wildfire. For better or worse, a significant amount of forestland in the Town of Bridgewater is owned by lumber companies, and as a result, has been logged off, which reduces the amount of dead material. A wildfire would likely impact or result in the damage of wildlife habitat and recreational lands used for hunting, hiking, mountain biking, and ATV and snowmobiling trails (maintained by VAST, Vermont Association of Snow Travelers), and/or damage to private property.

Since the writing of the Bridgewater 2009 Annex, the Town has installed a total of 5 new dry hydrants. Most recently, dry hydrants have been located on the following roads/in the following areas: one in 2011, a pressurized hydrant on Gold Coast Road; three in 2012, one at the Long Trail Brewery, one behind the Bridgewater Grange Hall on River Road, one on the Town’s Recreational Field; and one in 2013 along U.S. Route 4 in West Bridgewater. Following Tropical Storm Irene in 2011, a number of the Town’s hydrants were damaged and subsequently repaired.

Hazard	Location	Vulnerability	Extent	Estimated/ Potential Impact	Likelihood/ Probability
Wildfire/ Brushfire	General areas in those having a 15% slope or greater. More specific areas include: Rabbit Hill; Chateauguay; and Free Stone Ledges.	Private property, town buildings, utility infrastructure.	Up to this point, the extent of damage has been minimal but all that is needed are the right conditions to experience a more damaging wildfire, particularly in less developed areas that lack access for firefighting efforts.	Unknown—data gap.	Highly Likely

#### 4. Flash Flood/Flood/Fluvial Erosion

Flooding is one of the worst natural threats to Bridgewater’s residents and infrastructure. Past instances of flooding in Bridgewater have included rain and/or snowmelt events that cause flooding in the major rivers’ floodplains and intense rainstorms over a small area that cause localized flash-flooding. Both kinds of events can be worsened by the build-up of ice or debris, which can contribute to the failure of important infrastructure (such as culverts, bridges, and dams).

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(2)(i), 201.6(c)(2)(ii), and 201.6(c)(2)(iii) for **Flash Flood/Flood/Fluvial Erosion**.

The worst flood disaster to hit the Town of Bridgewater, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by up to 10 inches of heavy rain from the remnants of a tropical storm that fell on frozen ground. Eighty-four Vermonters, including the Lieutenant Governor, were killed. The flooding in the White River valley was particularly violent, with an estimated 120,000 to 140,000 cubic feet/second (cfs) flowing out of the White River at West Hartford, Vermont. Like many towns in the region, the Town of Bridgewater received heavy precipitation, seeing roughly 7-8 inches of rainfall over the storm period.

A more recent flooding event that devastated the region and the state was the result of Tropical Storm Irene, which occurred on August 28, 2011. Record flooding was reported across the state and was responsible for several deaths, as well as hundreds of millions of dollars of home, road, and infrastructure damage. Due to the strong winds, 50,000 Vermont residents were initially without power, and many did not have electricity restored to their homes and businesses for over a week. The Town of Bridgewater lost power during this event; however, it was not due to wind, but the fact that the flood waters washed away many power poles. Many of these needed to be reset. Despite the damage wrought, the flooding caused by Tropical Storm Irene is considered to be the second greatest natural disaster in 20<sup>th</sup> and 21<sup>st</sup> century Vermont, second only to the Flood of 1927.

The Town of Bridgewater suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped 5-7 inches of rain over Bridgewater in a very short span of time, some of the highest precipitation totals in Windsor County (which averaged 4-7 inches over its land area). It is thought that the flooding that occurred as a result of the storm was close to being (or was) a full-fledged 500-year flood in some areas.

Many of Bridgewater's roads were damaged by the storm, including parts of: Vermont Routes 4 and 100A; Braley Road; Blanchard Road; Bridgewater Center Road; Bridgewater Hill Road; Bridgewater Hollow Road; Cram Trail; Chateauguay Road; Cox District Road; Curtis Hollow Road, Dailey Hollow Road; Grandma'Ams Hill Road; Goldcoast Road; Gunderson Road; Hale Hollow Road; Little Sherburne Road; Maple Valley Road; North Bridgewater Road; Perkins Road; Richmond Hill Road; River Road; Robinson Road; Rogers Road; Stevens Road; Town Line Road; and Wayside Road. In West Bridgewater, the area around the Irving Gas Station (near the town line with Killington) was consumed by floodwaters, laying waste to huge swathes of roadway and ruining the structural integrity of many surrounding buildings. Vast amounts of silt were deposited along river and streambeds throughout the town, and large amounts of riparian land were eroded. Portions of the Ottauquechee River in the Bridgewater Corners area and its banks required channelization and restoration work to reset the river's path. The county-wide damage for Windsor County totaled \$32.5 million. Following the flood damage, the State of Vermont and FEMA have been coordinating on the home buy-out process across the state. To date, the Town of Bridgewater has had a total of four buy-out properties in the wake of Tropical Storm Irene along the following roads: Route 4, Route 100A, and Cram Trail.

Unfortunately, flooding is very common across the region, with many events impacting the Town of Bridgewater specifically. Flooding is one of the worst natural threats to Bridgewater's residents and infrastructure. The following list indicates the history of occurrence with regard to this hazard in Windsor County (given the small population of Bridgewater, town-specific data is limited); an asterisk

“\*” denotes the instances in which town-specific data is available, and federal disaster numbers are listed where appropriate.

**History of Occurrences:**

<b>Date</b>	<b>Event</b>	<b>Location</b>	<b>Extent</b>
07/03/2014*	Flash Flooding	Bridgewater	Approximately 1.5” of rain and gusts of up to 65 mph hit the region. No major road damage was reported.
08/28/2013	Flash Flooding	Windsor County	Thunderstorms with very heavy rainfall developed over east central Vermont, resulting in isolated flash flooding, causing \$50k of damage county-wide.
Period from 06/25/2013—07/11/2013 (DR-4140)	Severe Storms and Flooding	Windsor County	Severe storms caused flooding throughout the region, causing damage to some infrastructure and facilities.
08/28/2011 (DR-4022, TS Irene)*	Tropical Storm	Bridgewater, County-wide	Widespread rainfall amounts of 3-5 inches occurred across Vermont with 5 to 7+ inches across much of southern, central Vermont. Devastating flash flooding occurred across much of central and southern Vermont mountain valleys with substantial and some record breaking flood stages on larger rivers. This flood event will likely rank second to the November 1927 flood in the scope of meteorological and hydrological conditions/impacts as well as loss of life (84 in 1927), but likely first in monetary damage ((approx.. \$500. million statewide v. \$350 million (1927 in 2010 dollars)). There were nearly 2,400 roads, 800 homes/businesses, 300 bridges and a half dozen railroad tracks destroyed or damaged from the flooding caused by Irene. According to spotter’s reports, Bridgewater received 5-7” of rain. U.S Route 4 and VT Route 100A were severely damaged, the Mill Mall was flooded, and 4 properties have been bought out by the Town with federal relief money. \$2,043,422.30 in damage total for Bridgewater according to FEMA’s Public Assistance database (captures at least 70% of total damage).
04/27/2011	Flood	Windsor County	High temperatures, snowmelt and rainfall combined to produce significant flooding in places throughout the region.
07/21/2008-08/12/2008 (DR-1790)	Severe Storms & Flooding	Windsor County	Severe storms and flooding hit Windsor County and other parts of Vermont, leaving damage in their wake. Storms on 8/6 caused over \$100k in damage alone in Windsor County.
07/09/2007-07/11/2007 (DR-1715)	Severe Storms & Flooding	Windsor County	Severe storms and flooding struck a number of counties in Vermont, including Windsor.
04/15/2007-04/21/2007 (DR-1698)	Severe Storms & Flooding	Windsor County	Severe storms and flooding hit Windsor and other counties throughout Vermont.
05/14/2006	Flood	Windsor County	Strong storms brought over 3.5” of rainfall to the immediate area, causing flooding and minor washouts on several roads. The Ottauquechee River experienced bankfull conditions and minor field flooding occurred. \$25k in damages reported throughout the county.
10/07/2005-10/09/2005	Heavy Rain	Windsor County	Heavy rains reached over 6” in portions of Windsor County, causing flooding, mudslides, and clogged culverts in places.
07/21/2003-08/18/2003 (DR-1488)	Severe Storms & Flooding	Windsor County	Severe storms and flooding his Windsor County and other portions of the state, causing damage.

<b>Date</b>	<b>Event</b>	<b>Location</b>	<b>Extent</b>
04/13/2002-04/14/2002	Flood	Windsor County	A combination of snowmelt and rainfall of 1-3" across the area caused flooding in areas. \$50k in damage reported throughout the county.
12/17/2000-12/18/2000	Flash Flood	Windsor County	Small streams overflowed their banks, causing some road and low-land flooding. \$5k in damage reported throughout Windsor County.
07/31/2000	Flash Flood	Windsor County	A strong storm brought heavy rainfall to the region, causing many smaller rivers to reach or exceed bankfull conditions. \$10k in damage reported in Windsor County.
07/14/2000-07/18/2000 (DR-1336)	Flash Flood	Windsor County	Strong showers and thunderstorms across the state resulted in especially heavy rainfall. \$500k in reported damage throughout the county
04/04/2000	Flash Flood	Windsor County	Mild temperatures and steady rains resulted in melting mountain snows, which led to many rivers and streams rising up bankfull or above and some flooding in areas. \$5k in damage reported in Windsor County.
03/28/2000	Flash Flood	Windsor County	Steady rain and melting snow resulted in rising water levels on country rivers and streams. \$5k in damage reported in the county.
09/16/1999-09/21/1999 (DR-1307)	Tropical Storm	Windsor County	Tropical Storm Floyd brought heaving rains, high winds, and flooding to many counties in Vermont, including Windsor.
06/27/1997*	Flash Flood	Bridgewater, Windsor County	Heavy rains brought 3 to 6 inches of rainfall to northern portions of Windsor County, causing extensive flood damage. \$1m in damages were reported throughout the county. The Ottauquechee River in Bridgewater peaked at 7.7", with a peak flow of 1,960 cfs.
01/19/1996-01/20/1996	Flood	Windsor County	Above normal temperatures and high winds compounded flooding effects from rainfall and snowmelt. Numerous roads were washed out due to the flooding statewide, and power outages were reported throughout the state.
07/06/1973 (DR-397)*	Severe Storms, Flooding, Landslides	Bridgewater, Windsor County	Extensive rains fell on already soaked watersheds, including the Ottauquechee. Neighboring Woodstock was recorded to have had 6.30" of rainfall over the course of the storm, forcing evacuations. Rivers and streams throughout the area reached or breached bankfull conditions, causing widespread damage. In Bridgewater, river flooding led to the eventual closure of the Bridgewater Woolen Company at the Mill.
11/03/1927-11/04/1927*	Flood	Windsor County	The greatest recorded flood disaster in Vermont history devastated the state, losing countless homes, 1,285 bridges, hundreds of miles of roadways and railway tracks, and taking a total of 84 lives, including then-Lt. Gov. S. Hollister Jackson. Rain totals over the 3rd and 4th reached 7-8" in Bridgewater, causing major flooding along the Ottauquechee.

The Town of Bridgewater has standalone flood hazard area regulations that were adopted in 2006, requiring a permit for all proposed construction or other development in areas of special flood hazard. Development within the floodway is prohibited, with the exception to minor improvements to existing structures or infrastructural or public health and safety improvements (which still require a conditional use permit).

There are 64 residential (including 51 single family dwellings and 13 mobile homes) and 24 commercial/industrial/public structures in the 500-year floodplain. If all of the residential and commercial/industrial/public properties were damaged/destroyed in a severe flooding event, the damage would equal \$19,891,192. There are nine critical facilities located in the 500-year floodplain,

including an emergency operations center, two emergency shelters, the fire station, three public water supply wells, and two hazardous materials storage facilities.

Across Vermont, most child and elder care facilities are not registered with the State. Most child day care in Bridgewater is likely private in-home care, as there are no licensed childcare providers or registered childcare homes in the Town. It is also likely that residents, particularly commuters, utilize childcare facilities in neighboring towns and job centers. There are also no elder care facilities in the Town of Bridgewater that may be at risk of flood damage. Finally, low income housing is not registered with the State, but there are currently no mobile home parks located in Bridgewater that are registered with the state. There may, however, be mobile homes that are vulnerable to flood risks in other areas. A mobile home, used as a storage shed, was dislodged during Tropical Storm Irene

Recent studies have shown that the majority of flooding in Vermont is occurring along upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. These areas are often not recognized as being flood prone, and property owners in these areas are not typically required to have flood insurance (DHCA, 1998). It should be noted that, while small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Maps), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be extremely erosive, causing damage to road infrastructure and to topographic features including stream beds and the sides of hills and mountains. The presence of undersized or blocked culverts can lead to further erosion and stream bank/mountainside undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently. Currently, the data is not available to determine the number of structures located in the fluvial erosion hazard area.

The Town of Bridgewater has engaged in culvert upgrading since the 2009 Bridgewater Annex was drafted, and the Town is continuously upgrading culverts to allow additional floodwaters to pass through the structure. One culvert was upgraded since Tropical Storm Irene—a 6' culvert was upgraded to an 8' culvert at the “dive” in Dailey Hollow. All other culverts damaged during Tropical Storm Irene were subsequently replaced with the same size culvert.

The Town’s last comprehensive culvert inventory was completed in 2005, and routinely updates the inventory in-house as needed. In addition to upgrading culverts to improve the flow of floodwaters, it is important to restore floodplain, improve areas and/or increase the number of areas for retention of floodwaters to reduce the risk to structures and road infrastructure wherever possible. Like upgrading culverts, protecting and restoring floodplain will help protect structures and road infrastructure.

Currently, there is little residential development taking place in Bridgewater; however, there is a possibility that the fire station may be replaced in coming years. That said, there is presently no planned development within the floodplain. In the Town of Bridgewater, there is one repetitive loss property, a single family residence, which has two claims, according to FEMA’s NFIP list.

Hazard	Location	Vulnerability	Extent	Observed Impact	Likelihood/ Probability
Flash Flood/ Flood/ Fluvial Erosion	All properties along the Ottauquechee River, its North Branch, Broad Brook; major and local roadways, such as US Rte. 4 and VT Rte. 100A Gold Coast Road and Cox District Road.	Culverts, bridges, road infrastructure, public and private infrastructure. There are 64 residential (including 51 single family dwellings and 13 mobile homes) and 24 commercial/industrial/public structures in the 500-year floodplain. If all of the residential and commercial/industrial/public properties were damaged/destroyed in a severe flooding event, the damage would equal \$19,891,192.	Tropical Storm Irene—4-7” across county (5”+ in Bridgewater).	\$2,043,422.30 in damage total for Bridgewater according to FEMA’s Public Assistance database (captures at least 70% of total damage).	Likely

## VI. Mitigation

### A. Mitigation Goals

- To reduce injury and losses, including loss of life and to infrastructure, structures and businesses, from the hazard of structure fire.
- To reduce injury and losses, including loss of life and to infrastructure, structures and businesses, from the hazard of hazardous material spill(s).
- To reduce injury and losses, including loss of life and to infrastructure, structures and businesses, from the natural hazard of wildfire/brushfire.
- To reduce injury and losses, including loss of life and to infrastructure, structures and businesses, from the natural hazard of flash flooding, flooding and fluvial erosion.

### B. Excerpted Town Plan Goals & Objectives Supporting Local Hazard Mitigation

- To support local, regional, and State efforts to foster conservation of the Area through planning, land acquisition, conservation easements, and tax incentives (page 35).
- To ensure the protection and management of upland watersheds comprising the Area, specifically that they remain in their pristine or natural state (page 35).
- The Town follows federal flood hazard regulations (“Bridgewater Flood Hazard Area Regulations” adopted on November 28, 2006) that are compliant with the National Flood Insurance Program for the management and protection of flood-prone areas for a 100-year flood (a flood that has a probability of occurrence of one percent for any given year). Under these regulations, only certain non-structural land uses can be permitted in the floodway portion of these areas. The current regulations specify where, under what conditions, and in what manner any development can be undertaken in these hazardous areas within the Town. Development in the floodplain outside of floodways should be very limited, must take place in a manner that does not lead to increased flooding elsewhere, and is safe from the damages of floods. It is the policy of this Bridgewater Municipal Plan that development in flood-prone areas follow the town’s current flood hazard regulations (as referenced by name, above) (page 43).
- Development shall not take place within 50 feet from the top of stable river or stream banks (page 44).
- It is the goal of the Town of Bridgewater to ensure that wetland areas are maintained in their natural state because they provide certain public benefits, including valuable wildlife habitat, filtration of pollutants, and flood protection (page 45).
- To maintain the inventory of roads and culverts in Town to keep opportunities for state grants available (page 59).

The Bridgewater Town Plan was updated and adopted on 09/24/2013, and has a 5 year lifespan.

## B. Hazard Mitigation Strategies: Programs, Projects & Activities

Vermont’s Division of Emergency Management & Homeland Security encourages a collaborative approach to achieving mitigation at the local level through partnerships with Vermont Agency of Natural Resources, VTrans, Vermont Agency of Commerce and Community Development, Regional Planning Commissions, FEMA Region 1 and others. That said, these agencies and organizations can work together to provide assistance and resources to towns interested in pursuing hazard mitigation projects.

This section of the Plan satisfies the requirements of 44 CFR 201.6(c)(3)(ii), 201.6(c)(3)(iii) and 201.6(c)(3)(iv).

With each mitigation strategy, general details about the following are provided: local leadership, possible resources, implementation tools, and prioritization. The prioritization category is based upon the economic impact of the action, Bridgewater’s need to address the issue, the cost of implementing the strategy, and the availability of potential funding. The cost of the strategy was evaluated in relation to its benefit as outlined in the STAPLEE guidelines. A range of mitigation strategies were vetted by the committee, and those that were determined to be feasible (economically, politically, environmentally, etc.) are included in the table below.

Strategies given a “High” prioritization indicate they are either critical or potential funding is readily available, and should have a timeframe of implementation of less than two years. A “Medium” prioritization indicates that a strategy is less critical or the potential funding is not readily available, and has a timeframe for implementation of more than two years but less than four. A “Low” prioritization indicates that the timeframe for implementation of the action, given the action’s cost, availability of funding, and the community’s need to address the issue, is more than four years.

The Town of Bridgewater understands that, in order to apply for FEMA funding for mitigation projects, a project must meet more formal FEMA benefit cost criteria. A project seeking FEMA funds would undergo a full benefit-cost assessment in the FEMA-approved format. The Town must have a FEMA-approved Hazard Mitigation Plan as well.

The following strategies will be incorporated into the Town of Bridgewater’s long-term land use and development planning documents. In addition, the Town will review and incorporate elements of this Local Hazard Mitigation Plan into updates for the municipal plan, zoning regulations, and flood hazard/fluvial erosion hazards (FEH) bylaws. The incorporation of the goals and strategies listed in the Local Hazard Mitigation Plan into the municipal plan, zoning regulations and flood hazard/FEH bylaws will also be considered after declared or local disasters. The Town should also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas.

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources</b>	<b>Time Frame</b>
All Hazards	<i>Ensure that Bridgewater's Local Emergency Operations Plan (LEOP) is kept up-to-date and identifies vulnerable areas and references this Plan.</i>	Selectboard	High	Local resources; TRORC; Vermont Emergency Management	1 Year from Date of Plan Approval
	<i>Develop a town methodology for consistently documenting infrastructure damage after weather events.</i>	Town Office	High	Local resources; Vermont Emergency Management/ Vermont Agency of Natural Resources	1 Year from Date of Plan Approval/ As needed
	<i>Encourage residents to sign up for VTAlert, a weather-related and emergency notification system that will alert residents to risks and threats that they may face.</i>	Selectboard	Medium	Local resources; Vermont Emergency Management; VT Alert	2-3 Years from Date of Plan Approval
Structure Fire	<i>Ensure that fire department personnel maintain their Firefighter certifications.</i>	Bridgewater Volunteer Fire Department	High	Local/FD resources; Vermont Fire Academy	Annually
Structure Fire// Wildfire/Brushfire	<i>Complete a comprehensive survey of potential dry hydrant sites to determine the need for additional sites and potential location, and install dry hydrants.</i>	Bridgewater Volunteer Fire Department	Medium	Local/FD resources	2-3 Years from Date of Plan Approval
	<i>Develop a plan to build a new fire station.</i>	Bridgewater Volunteer Fire Department	Low	Local/FD resources	5 Years from Date of Plan Approval
Hazardous Material Spill	<i>Ensure that all emergency response and management personnel continue to receive HAZMAT Awareness training at a minimum.</i>	Bridgewater Volunteer Fire Department	High	Local/FD resources; Vermont State HAZMAT Team	1 Year from Date of Plan Approval
	<i>Continuously stock gear to help contain small spills when they occur (booms, absorbent materials, etc.).</i>	Bridgewater Volunteer Fire Department	High	Local/FD resources; polluting party	As needed

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources</b>	<b>Time Frame</b>
Wildfire/Brushfire	<i>Develop a public education program to educate residents about wildfire/brushfire risks and how to minimize the occurrence of wildfire/brushfire.</i>	Bridgewater Volunteer Fire Department	Low	Local/FD resources	5 Years from Date of Plan Approval
	<i>Complete a comprehensive survey of potential dry hydrant sites to determine the need for additional sites and potential location, and install dry hydrants.</i>	Bridgewater Volunteer Fire Department	Medium	Local/FD resources	2-3 Years from Date of Plan Approval
Flash Flood/ Flood/ Fluvial Erosion	<i>Maintain and update town bridge and culvert inventories. Regularly inspect and maintain town bridges and culverts; and develop a schedule to replace undersized culverts.</i>	Selectboard/Road Foreman	High	Local resources; VTrans	1-2 Years from Date of Plan Approval
	<i>As part of Town Plan updates, review the Town's Flood Hazard Area Regulations to ensure that they are compliant and consistent with state and federal guidelines and statutes.</i>	Planning Commission; Selectboard	Low	Local resources; TRORC; Municipal Planning Grants; NFIP	5 Years from Date of Plan Approval
Flash Flood/ Flood/ Fluvial Erosion	<i>Support town or conservation organization assistance to landowner(s) of property(ies) in Bridgewater on the NFIP's repetitive and severe repetitive loss list to reduce flood damages, through elevation, floodproofing, acquisition or relocation, or an infrastructure project if one is found to address the source of flooding.</i>	Selectboard (as needed)	Low	Local resources; NFIP	5 Years from Date of Plan Approval

<b>Hazard(s) Mitigated</b>	<b>Mitigation Action</b>	<b>Local Leadership</b>	<b>Prioritization</b>	<b>Possible Resources</b>	<b>Time Frame</b>
	<i>Support projects to protect or restore strategic areas of floodplain to provide areas for flood storage, which will help alleviate peak flood flows.</i>	Selectboard/ Road Foreman	Medium	Local resources	2-3 Years from Date of Plan Approval
	<i>Develop a plan for the reuse of Bridgewater's Tropical Storm Irene buyout properties as river access or green space, and maintain the undeveloped character of the land to allow for future flooding.</i>	Selectboard/Town Officer	Medium	Local resources; HMGP; third party consultants	3-4 Years from Date of Plan Approval
	<i>Develop a program to upgrade undersized culverts and upgrade/improve ditches on Gold Coast Road to improve the resilience of the entire road to flood damage.</i>	Selectboard/Road Foreman	High	Local resources/Local road budget	1 Year from Date of Plan Approval
	<i>Develop a program to upgrade undersized culverts and upgrade/improve ditches on Cox District Road to improve the resilience of the entire road to flood damage.</i>	Selectboard/Road Foreman	High	Local resources/Local road budget	1 Year from Date of Plan Approval
	<i>Upgrade culvert on Dailey Hollow Road to improve the flow of floodwaters and increase flood resilience.</i>	Selectboard/Road Foreman	Low	VTrans Structures grant; Local resources	5 Years from Date of Plan Approval
	<i>Upgrade 5'x7' box culvert on Bridgewater Hill Road to a 10' arch (multi-plate) culvert.</i>	Selectboard/Road Foreman	Medium	VTrans Structures grant; Local resources	2-3 Years from Date of Plan Approval

\*Depending on the mitigation action, local resources may include the following: personnel/staff time; volunteer time; budget line items, donations, cash from capital campaigns, among others.

# Certificate of Adoption

The Town of Bridgewater  
Select Board  
A Resolution Adopting the Local Hazard Mitigation Plan  
\_\_\_\_\_, 2015

WHEREAS, the Town of Bridgewater has worked with the Two Rivers-Ottawaquechee Regional Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

WHEREAS, the Bridgewater Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Town of Bridgewater; and

WHEREAS, a duly-noticed public meeting was held by the Town of Bridgewater Select Board on \_\_\_\_\_, 2015 to formally adopt the Bridgewater Local Hazard Mitigation Plan;

NOW, THEREFORE BE IT RESOLVED that the Bridgewater Select Board adopts and implements the Bridgewater Local Hazard Mitigation Plan Update.

\_\_\_\_\_  
Chair of Select Board

\_\_\_\_\_  
Member of Select Board

ATTEST

## Appendices

### Appendix A: Hazard Ranking Methodology

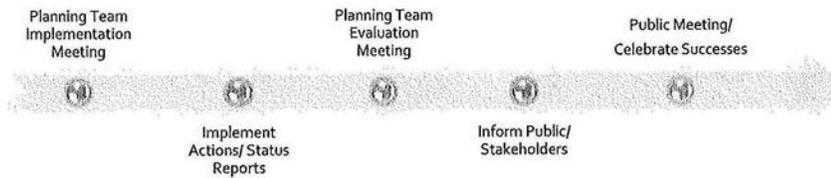
<u>Frequency of Occurrence</u> Probability	<u>Warning Time</u> Amount of time generally given to alert people to hazard	<u>Potential Impact</u> Severity and extent of damage and disruption
<p>1 = <i>Unlikely</i>            &lt;1% probability of occurrence in the next 100 years</p> <p>2 = <i>Occasionally</i>            1–10% probability of occurrence per year, or at least one chance in next 100 years</p> <p>3 = <i>Likely</i>            &gt;10% but &lt;100% probability per year, at least 1 chance in next 10 years</p> <p>4 = <i>Highly Likely</i>            100% probable in a year</p>	<p>1 = More than 12 hours</p> <p>2 = 6–12 hours</p> <p>3 = 3–6 hours</p> <p>4 = None–Minimal</p>	<p>1 = <i>Negligible</i>            Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries</p> <p>2 = <i>Minor</i>            Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries</p> <p>3 = <i>Moderate</i>            Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities</p> <p>4 = <i>Major</i>            Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities</p>

## Appendix B: Five-Year Review and Maintenance Plan

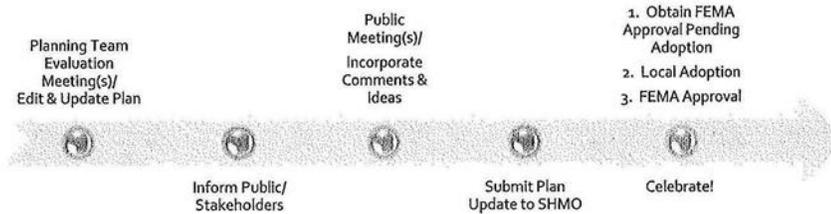
### 5-Year Plan Review/Maintenance



#### After Plan Adoption-Annually Implement and Evaluate



#### Fifth Year, and After Major Disaster Evaluate and Revise



## **Attachments**

### **Attachment A: Map of the Town of Bridgewater**