

Town of Sharon, Vermont
2021 Local Hazard Mitigation Plan



Prepared by Threat Owl, LLC. And the Town of Sharon

Date of Town Adoption: September 8, 2021 by Sharon Selectboard

Date of Final Approval by FEMA: _____

CERTIFICATE OF ADOPTION

8 September 2021

TOWN OF Sharon, Vermont Selectboard

A RESOLUTION ADOPTING THE Sharon, Vermont 2021 Local Hazard Mitigation Plan

WHEREAS, the Town of Sharon has historically experienced severe damage from natural hazards, and it continues to be vulnerable to the effects of the hazards profiled in the Sharon, Vermont 2021 Local Hazard Mitigation Plan, which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Sharon has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Sharon, Vermont 2021 Local Hazard Mitigation Plan (Plan) under the requirements of 44 CFR 201.6; and

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

WHEREAS the Plan recommends several hazard mitigations actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Sharon with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS adoption of this Plan will make the Town of Sharon eligible for funding to alleviate the impacts of future hazards; now therefore be it.

RESOLVED by Town of Sharon Selectboard:

1. The Sharon, Vermont 2021 Local Hazard Mitigation Plan is hereby adopted as an official plan of the Town of Sharon.
2. The respective officials identified in the mitigation action plan of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them.
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and
4. An annual report on the process of the implementation elements of the Plan will be presented to the Selectboard by the Emergency Management Director or Coordinator.

IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Sharon this 8th day of Sept. 2021.

DocuSigned by:

Joseph Roman
F78024DE0D9C4731
DocuSigned by: **Selectboard Chair**

K. Y. Gae
4971
DocuSigned by: **Selectboard Member**

Mary Gavin
6A8DF920315F4954
DocuSigned by: **Selectboard Member**

ATTEST

Ashlene Foster S.C.
Town Clerk

FEMA Letter (insert here)

Table of Contents

Introduction	5
Purpose of the Plan	6
Community Profile	7
The Planning Process	9
Plan Developers	9
Planning Committee Members	9
Plan Committee Membership Solicitation	9
Plan Development Process	9
Planning Process External Involvement	12
Review of Existing Plans, Studies, Reports and Technical Information	12
Town Capabilities for Implementing Mitigation Strategies	13
Plan Maintenance	19
2015 Mitigation Actions Status	22
2021 Hazard Identification and Scoring	24
Hazard Profiles for Top Threats	27
Flash Flood / Flood / Fluvial Erosion	27
Extreme Cold / Snow / Ice Storm	33
Hazardous Materials Spill	44
Severe Weather (Thunderstorms, Lightening, Tornado, High/Strong Winds, Hail, Microburst)	48
Vulnerability Summary	58
2021 Mitigation Actions	59
Mitigation Goals	59
Town Plan Goals and Objectives Supporting Local Hazard Mitigation	59
Hazard Mitigation Strategies: Programs, Projects, and Activities	60
2021 Plan Appendix	66
Appendix A: Critical Stream Crossing	66
Appendix B: Five-Year Review and Maintenance Plan	68
Appendix C: Fluvial Building Intersect Map of Sharon	69
Appendix D: Fujita Tornado Intensity Scale	70

Introduction

Natural and human-caused hazards may affect a community at any time. Natural hazards cannot be prevented; however, their impact on human life and property can be reduced through community planning. Accordingly, this Plan seeks to provide an all-hazards mitigation strategy that will make the community of Sharon more resilient.

Mitigation is defined as any action that reduces or eliminates long-term risk to people and property from a natural and human-caused hazard and their effects. Previous Federal Emergency Management Agency (FEMA), State and Regional Programs and projects have demonstrated that it is beneficial to invest in hazard mitigation projects. While hazards cannot be eliminated entirely, it is possible to identify potential hazards, anticipate which might be the most severe and recognize location actions that can be taken ahead of time to reduce the damage. These actions, known as hazard mitigation strategies, can 1) avert the hazard by redirecting its impacts by means of structure, land treatment or land use pattern change, 2) adapt to the hazard by modifying structures or standards and 3) avoid the hazard through improved public education, relocation/removing buildings in the flood zone, or ensuring development is disaster resilient.

The 2021 Hazard Mitigation Planning process allowed the community to revisit the community's hazards, hazard ranking, and prioritization of mitigation projects based on current threats and concerns. The town adopted the State's hazard ranking calculation to better align with the State's assessment of hazards. During the review of the hazards, the planning committee added Disease Outbreak as a hazard, given the COVID-19 Pandemic and future potential Pandemics or disease outbreaks. The 2021 hazard rankings reflect the town's growing concern of climate change. Weather related event are only going to become more frequent and more intense. The 2021 Hazard Mitigation Plan hazard ranking, and mitigation projects better reflect the community's current concerns and priorities than the 2015 Plan.

Purpose of the Plan

The purpose of this Local Hazard Mitigation Plan (LHMP) is to assist the Town of Sharon in identifying local hazards, ranking them according to local vulnerabilities and identifying strategies to begin reducing the associated risks. Implementation of this Plan will make the Town more resistant to harm and damages in the future and will help reduce public costs associated with disasters.

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

The 2021 Sharon Local Hazard Mitigation Plan is the second single jurisdiction plan drafted for the Town. Previously, the Town had a town-specific 2009 Annex in the Regional (multi-jurisdiction) Pre-Disaster Mitigation Plan.

Previous assumptions have been reviewed throughout the planning process and new information was added to make the plan stronger and more useful to Sharon town officials and residents who will implement the hazard mitigation strategies in the future.

Community Profile

The Town of Sharon is located along the banks of the main stem of the White River. Bordered by the mountains on three sides, Sharon consists of approximately 40 square miles of fertile land. Interstate 89 and Route 14 and 132 transport visitors and residents alike in and out of town.

According to the U.S. Census Bureau American Community Survey, Sharon's 2019 population was 1,437 as compared to 1,502 in 2010. The median age in Sharon is 45.9 as compared to the State's average of 42.9. There are approximately 599 households in Sharon as compared in 663 in 2010. There are 695 housing units in Sharon, of which 86% are occupied and 14% vacant.

The Town lies within the service area of Green Mountain Power, which supplies electrical power to all sections of Town.

The Sharon Volunteer Fire Department. provides fire protection services in Sharon. Through mutual aid agreements, the Town provides backup services to Hartford, Norwich, Pomfret, Strafford and Royalton. Fire equipment and vehicles are housed in a 30' X 45' structure located on an approximately one-half acre site west of village at 5808 Route 14. Both land and building are owned by the Town of Sharon. Emergency rescue services are provided by the South Royalton Rescue Squad and Hartford Ambulance Service. The Town annually appropriates funds to these squads for services. Nearby hospitals included Dartmouth Hitchcock Medical Center, located in Lebanon, NH; Gilford Memorial Hospital, located in Randolph, VT; Alice Peck Day Memorial Hospital in Lebanon, NH; and the VA Medical Center in White River Junction, VT. Medivac services are available through the DHART helicopter.

Traffic Control Services for Sharon residents are provided by the Windsor County Sheriff's Department. Police protection is also provided by the Vermont State Police, headquartered in Royalton, VT on Route 107.

The Sharon Elementary School and the Sharon Academy reside in Sharon, Vermont. Recently, the Sharon Academy was awarded a \$1.9 million loan to fund the construction of a new science and arts wing. The addition will house modern classroom and laboratory space for students 7-12. USDA made project funds available through its Community Facilities Direct Loan & Grant program, the source of \$59.9 million in Vermont school investments over the last three years, including a \$57.8 million loan to the Winooski School District in 2020. The loan funds will also be used to expand the parking lot with EV chargers, add new fire sprinklers and a radiant ceiling heat system, update gym changing areas, set the foundation for an outdoor education barn, and create a commercial kitchen to support local food production.

Since the 2015 Hazard Mitigation Plan, there have been so substantial changes in development within the town of Sharon, that impacts Hazard Mitigation. Currently, there are two projects before the Development Review Board. application one: To reconstruct a home & accessory on existing footprint within a regulated flood hazard area (with flood proofing, as required) application two: to install a 1,000-gallon underground propane tank, associated gas lines and

tank anchoring system within a regulated flood hazard area (and to remove existing above ground tank).

The Planning Process

Plan Developers

Shawna Pinette and Bill Raymond, Threat Owl LLC., assisted the Town of Sharon with updating its Local Hazard Mitigation Plan.

Planning Committee Members

Name	Role / Organization
Margy Becker	Sharon Administrative Assistant
Nathan Potter	Fire Chief / EMD
Frank Rogers	Road Foreman
Becky Owens	Emergency Coordinator / South Royalton Rescue
Susan Root	Emergency Coordinator
Mary Gavin	Selectboard Member
Kevin Gish	Selectboard Member
Joseph Ronan	Selectboard Chair

Plan Committee Membership Solicitation

On 2/4/2021, Threat Owl LLC. Met with Margy Becker to review the Local Hazard Mitigation Planning Process and requested names and contact information for potential committee members to revise Sharon's Hazard Mitigation Plan. Margy Becker emailed town officials, including members of the 2016 Hazard Mitigation Planning Team, to request their involvement. Threat Owl LLC. provided a proposed schedule to the Town of Sharon and met with Planning Team members until the Local Hazard Mitigation Plan was adopted by the Selectboard.

Plan Development Process

The Town of Sharon and Threat Owl LLC. conducted the following hazard mitigation planning meetings:

1. 12/14/20: Select board Introductory Meeting.
2. 2/4/21: Planning Kick-Off Meeting
3. 3/26/21: Previous Mitigation Review Meeting
4. 3/29/21: Town Capability Review Meeting
5. 4/22/21: Hazard Scoring Review Meeting
6. 5/20/21: 2021 Hazard Mitigation Actions Review Meeting
7. 6/28/21: 2021 Hazard Mitigation Plan Review Meeting

Threat Owl LLC. and Margy Becker also conducted frequent phone calls and email exchanges to review Plan sections and data. Threat Owl LLC. also consulted with Vermont Emergency Management, Caroline Massa, for her subject matter expertise on hazard mitigation. The following represents avenues taken to draft the Sharon Local Hazard Mitigation Plan:

- ***12/14/20:** Bill Raymond, Threat Owl LLC., attended the Sharon Selectboard Meeting to provide an overview of Threat Owl and the proposed Planning Process. No public comments were received.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- **2/4/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC., met with Margy Becker to review the Local Hazard Mitigation Planning Process and requested names and contact information for potential committee members to revise Sharon's Hazard Mitigation Plan. Margy Becker emailed town officials, including members of the 2010 Hazard Mitigation Planning Team, to request their involvement.
- **3/26/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC., met with Margy Becker to review and status the previous (2009 and 2015) Mitigation Actions. Margy Becker met with various town officials to confirm information and the status of various projects.
- ***3/29/21:** Public meeting rescheduled until 3/30/21 due to power outages throughout the Town.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- ***3/30/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC., met with the larger Planning Team to review and status the Town's Capabilities for implementing Mitigation Strategies. The team reviewed and updated this section of the plan to reflect the most current information. No public comments were received.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- ***4/22/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC., met with the larger Planning Team to review and status the Community Vulnerability by Hazard Section. The team reviewed and updated this section of the plan to reflect the most current information. No public comments were received.
 - **The public meeting was noticed via:**

- Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- ***5/13/21:** Public meeting rescheduled until 5/20/21 to allow for greater participation.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- ***5/20/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC., met with the larger Planning Team to review the Hazard Mitigation Actions, Goals and Town Strategies. The team reviewed and updated this section of the plan to reflect the most current information. No public comments were received.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- **6/28/21:** Shawna Pinette and John Broker-Campbell, Southern Region Floodplain Manager, discussed the White River Watershed mapping project and how it would potentially impact the 2021 Sharon Hazard Mitigation Plan.
- ***6/28/21:** Shawna Pinette and Bill Raymond, Threat Owl LLC. provided an overview of the plan updates to the Town of Sharon. The Plan summary was reviewed.
 - **The public meeting was noticed via:**
 - Hard copy notices posted in town at three locations.
 - Posted on the Sharon website
 - Posted to the Sharon Listserv
 - Posted on the Sharon Community Facebook page
 - Emailed to various distribution lists (boards/commissions/meeting participants)
- A copy of the Plan was sent to the neighboring towns of Norwich, Royalton, Pomfret, and Strafford for review and input. No comments or concerns were noted by the towns.

*Denotes a public meeting.

Planning Process External Involvement

To ensure public, neighboring community and local and regional agency input, the Town of Sharon publicly noticed meetings by the following methods:

- Hard copy notices posted in town at three locations.
- Posted on the Sharon website
- Posted to the Sharon Listserv
- Posted on the Sharon Community Facebook page
- Emailed to various distribution lists (boards/commissions/meeting participants)

The public, neighboring communities and local and regional agencies were provided multiple opportunities to participate in the update and review of the Sharon Hazard Mitigation Plan.

Review of Existing Plans, Studies, Reports and Technical Information

The following documents were reviewed and referenced during the Sharon Hazard Mitigation Plan update process:

- **State of Vermont Hazard Mitigation Plan, 2018**
 - o The Town reviewed the State's Hazard Scoring.
- **State of Vermont Hazard Mitigation Website**
 - o The State's website was referenced and reviewed throughout the update process.
- **Sharon Hazard Mitigation Plan, 2015**
 - o This Plan was referenced extensively during the update process.
- **Sharon Town Plan, 2021 (currently being updated)**
 - o This Plan was referenced during the Town's Capability review meeting and provided an overview for the Threat Owl Staff with background information on the community.
- **Sharon Subdivision Regulation, 2016**
 - o The Subdivision Regulations were referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Plan.
- **Sharon Flood Hazard Area Bylaws, 2010**
 - o The Bylaws were referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Local Hazard Mitigation Plan.
- **River Corridor Plan for the White River and Tributaries in Sharon, VT (Sharon's Phase II Stream Assessment), 2010**
 - o The River Corridor Plan was referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Plan.
- **Sharon Local Emergency Operations Plan, 2020**
 - o This Plan was referenced during the Town's Capability review meeting.
- **Flood Insurance Rate Map (FIRM), 2007**
 - o The FIRM was referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Plan.
- **Sharon Town Road and Bridge Standards, 2019**
 - o The Town Road and Bridge Standards was referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Plan.

- **Sharon Culvert Inventory List, 2015**
 - o The Sharon Culvert Inventory List was referenced when completing the Flood/Flash Flood/Fluvial Erosion section of this Plan.
- **FEMA Hazard Mitigation Guidance Documents**
 - o Various FEMA guidance documents were referenced throughout the planning process to help generate ideas, review best practices and for public outreach ideas.

Town Capabilities for Implementing Mitigation Strategies

The Town of Sharon is currently engaged in the following on-going hazard mitigation program, projects, and activities. These program, projects and activities have been reviewed and updated since the 2016 Hazard Mitigation Plan to address any changes that have occurred.

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
Community Preparedness Activities	Program—Annual update of Sharon’s Local Emergency Operations Plan (LEOP). Last updated and adopted in 2020.	Updated by the Town. Administrative Assistant, assistance from TRORC and 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 and Homeland Security (VEMHS) for their records. The current program works well, no need to expand or improve on.
	Completed Action— Designated Red Cross Shelter— located at the Sharon Fire Station and Sharon Elementary	Staff time from select board assistant and emergency co coordinators. Funding from American Red Cross.	This is a one-time action. There is currently no need to expand on it.
	Completed Action— Town officers certified in ICS-100 level Training (Introductory)	Volunteer time from town officials. Funding from FEMA.	There is a need for constant renewed training as elected officials change.

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
	Program— Participation/attendance in the Local Emergency Planning Committee District 12 (LEPC 12)	Volunteer time from the Sharon Emergency Management Coordinator(s); meetings convened by TRORC. Funding from Vermont DEMHS.	No need to expand or improve on attendance, as it is satisfactory.
	Program - Implementation of the Incident Command (IC) Coordination Team	Volunteer time from town officials.	IC Coordination Team convened to respond to the COVID-19 Pandemic. The team will continue to meet after the conclusion of the COVID-19 Pandemic to discuss critical local equipment, teams, and plans.
Insurance Programs	Authority/ Program— participation in National Flood Insurance Program (NFIP). The Town participates and complies with the NFIP through them. Enforcement of the Flood Hazard Area Bylaw, which was last adopted on 12/06/2010. The bylaw addresses/prohibits development in the FEMA inundation ZONE A; allows certain development activities upon conditional use approval, within the fluvial erosion zone (now called by the State as the river corridor). The Sharon Development Review Board presides over Conditional Use hearings. A permit is required for all development in all regulated flood hazard areas. Sharon's Flood Hazard Area	A contracted individual serves as the NFIP. Administrator. Assistance from TRORC and Vermont ANR. Funding from local resources—annual budget.	Sharon's initial Flood Hazard Boundary Map was identified on 02/04/77 and their initial and current Flood Insurance Rate Map (FIRM) is dated 09/28/07. Please note that elevation was not included on this map. The Town's FIRM and Flood Insurance Study (FIS) has been updated, and the current effective date for both is 09/28/07. The Flood Hazard Area Bylaw is kept up to-date and to regulate new development in the Special Flood Hazard Area (SFHA).

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
	<p>Bylaw regulates both the Federal Special Flood Hazard Area (SFHA), the state Fluvial Erosion Hazard (FEH) Zone, and stream buffers. Affected flood hazard areas of concern are along Broad, Elmer's, Fay, High Pole, Honey, Mitchell, Quation, and Whitewater brooks, the White River, and perennial and/or intermittent streams. The Sharon DRB holds public hearings on applications for development within regulated flood hazard areas. After gathering facts and testimonies through site visit(s) and public hearings, the DRB issues decisions as to whether an application complies with the bylaw. These decisions may be reached during "deliberative sessions" which are non-public sessions. However, the findings, decisions, and permits are public documents filed with the Town. Minutes are kept of all conditional use review hearings and testimonies of landowners, abutters, and the State of Vermont Department of Environmental Conservation and are archived with all application materials as public documents. The Selectboard has appointed an Administrative Officer to administer and enforce its</p>		

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
	Flood Hazard Bylaw and to issue Flood Hazard Area Permits after conditional use approval by the DRB.		
Land Use Planning	Policy/Program— Sharon Town Plan Adopted on 04/06/2015, includes a “Flood Resilience Chapter”	Volunteer time from the Planning Commission, and assistance from TRORC and other state agencies on specific subject matter. Funding from Municipal Planning Grants.	The Town Plan is reviewed/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.
	Policy/Program— “River Corridor Management for the White River and Tributaries in Sharon, VT” - Sharon’s Phase II Stream Assessment report and appendices. Published 03/15/10.	Completed with staff time from Fitzgerald. Environmental Associates LLC and TRORC. Funding from Vermont Department of Environmental Conservation	There is currently no need to expand or improve on this document, but it should be reviewed in conjunction with the Flood Hazard Bylaw and Town Plan.
	Completed Authority—Sharon Flood Hazard Area Bylaws. Last adopted on 12/06/2010.	Volunteer time from the Planning Commission, and assistance from TRORC and Vermont Agency of Natural Resources. Funding	During the Town Plan review/update period, the Flood Hazard Area Bylaws are also reviewed and updated if needed.

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
		from Municipal Planning Grants.	
	Authority— Sharon Subdivision Regulations. Adopted in 2016.	Volunteer time from the Planning Commission. Funding from Municipal Planning Grants.	The Subdivision Regulations may be updated when deemed appropriate by the Selectboard. Currently, there is no need to expand or improve on these regulations.
Hazard Control & Protection of Critical Infrastructure & Facilities	Policy/Program— Sharon Hazard Mitigation Plan. Adopted on 6/20/2016.	Updated with volunteer time from local officials and assistance from TRORC and Vermont DEMHS. Funding from DEMHS/FEMA.	The 2021 Sharon Local Hazard Mitigation Plan will replace the 2015 Plan. Future iterations of the Town's LHMP will be updated by the Town at least every five years.
	Authority— 2019 Town Road and Bridge Standards.	Adopted by the Selectboard, implemented by the Road Foreman, and 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 regular basis. The Town has the authority to require above-and-beyond what is written in the policy. Needs to be recertified each year.

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
	Program/Action—Home Buyouts	Staff time from Town Selectboard Assistant and volunteer time from other Town officials. Administrative assistance from TRORC. Funding from HMGP and CDBG.	Greens Mobile Home Park restored to passive use.
	Program—Projects with White River Partnership for riparian buffers, other water quality improvement projects	Staff time from the White River Partnership and the Selectboard Assistant/other Town Office staff; possibility for volunteer hours or town match requirements (based on grant). Permission/buy in from private landowners for some projects. Funding (state and federal) sought and obtained by the White River Partnership.	The White River Partnership, in coordination with the Town of Sharon has completed several water quality improvement projects in the past and continues to do so. There is no need to expand or improve on this program, as needs are identified and then funding is sought to implement the appropriate project.
	Program—Culvert inventory completed in November 2015 for the Town of Sharon. This inventory includes georeferenced locations and attributes for all culverts/drop inlets in Sharon. The Town received targeted assistance in the culvert inventory and	Staff time from the Sharon Road Foreman; assistance from TRORC. Funding from Better Backroads grant; local personnel time.	The Town will use the culvert inventory to further its culvert mitigation improvement program and seeking funding through various sources for implementation projects. Routine in house updates occur on an on-going basis. There is no need to expand or improve on this program currently.

Category	Type of Existing Authority / Policy / Program / Action	Resources: Staffing & Funding	Ability to Expand/Improve on
	specific priority projects were identified.		
Education/ Public Outreach	Action— Use of Town website and listserv	Staff time from the Selectboard Assistant and other town officials. Funding from local budgets.	This is an ongoing action, and there is a need to expand on the use.
	Action — Public outreach associated with Red Cross Shelter designation	Staff time from Town Office personnel; volunteer time from meeting attendees. Funding from the American Red Cross.	This was a one-time action, and there is no need to expand or improve on it currently.
	Completed Action— Community Recovery Partnership Meeting. Meeting held on Jan. 17, 2012, in Sharon, VT.	Organized by the State of Vermont and partnering organizations for the following towns— Sharon, Royalton, Bethel, and Randolph—in the aftermath of Tropical Storm Irene (Aug. 2011). Staff and volunteer time; funding from the State of Vermont and partnering organizations.	This was a one-time action, and there is no need to expand or improve upon it.

Plan Maintenance

The Town will monitor, evaluate, and update this Local Hazard Mitigation Plan annually at an April Selectboard meeting, at the same time it is reviewing and updating its Local Emergency

Management Plan. Updates and evaluation of this Plan by the Selectboard, Emergency Coordinators, and Emergency Management Director will also occur within three months after every federal disaster declaration directly impacting the Town of Sharon and in accordance with the graphic in Appendix C “Fluvial Map of Sharon”. Public notice of this meeting will include physical postings of the meeting agenda in more than two locations and electronic notifications on the Sharon listserv, town website, Sharon Community Facebook page, and via email distribution groups. When the Plan is evaluated, the Selectboard will consider the Plan’s effectiveness, and it will document progress (or lack thereof) in implementing proposed mitigation strategies. Public comments from local officials and residents will be solicited during this evaluation process, and they will be incorporated into Plan revisions where relevant. This annual evaluation meeting will also be the public’s opportunity to hear about the Town’s progress in implementing mitigation strategies. The Town shall reference the Local Hazard Mitigation Plan when working on Town Plan amendments or changes to the Town’s bylaws.

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, Threat Owl, LLC. will help with Plan updates if assistance is requested by the Town of Sharon and if funding is available. If Threat Owl is unable to assist the Town, the 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 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 should be invited to the meeting; these include area businesses and non-profit organizations, South Royalton Rescue, representatives from The Sharon Academy (middle and high school) and elementary school, and the Vermont Agency of Natural Resources (VT ANR), neighboring municipalities and other government entities. VT ANR may assist 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 Selectboard Assistant and Emergency Co-Coordinators. Updates will address changes in community mitigation strategies; new town bylaws, zoning, and planning strategies if appropriate; progress on the implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities effectiveness in reducing town’s vulnerabilities and meeting plan goals. If new actions are identified in the interim period, the plan can be amended without formal re-adoption during regularly scheduled Selectboard meetings.

Sharon has incorporated 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.

The Sharon Planning Commission will incorporate mitigation strategies directly into goals, policies, and recommendations in future updates to the Sharon Town Plan. 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.

2015 Mitigation Actions Status

The following table outlines the mitigation actions that were proposed in the 2009 and 2015 Hazard Mitigation Plan. Actions related to long-term mitigation of natural hazard are noted so.

Hazard(s) Mitigated	Mitigation Action	POC	Prioritization	Time Frame	2021 Status/Comments
Severe Weather (High Wind)	Support Green Mountain Power Reliability Project (moving power lines to road corridors for easier servicing) to mitigate damage to utility and town infrastructure. (mitigation)	Selectboard	MEDIUM	Fall 2018-2020	Rte. 14 and Rte. 132 lines have been upgraded; In Feb 2021 GMP has begun its preparations for submittal of its statewide land-use permit application (Act 250) to undertake line upgrades on TH3 in Sharon (Sharon/Royalton) line. GMP has also undertaken major vegetation mgmt. improvements along existing utility lines. Long-term mitigation goal. On-going. Carried over to 2021 Plan.
	Complete a hazard tree inventory to ID trees in town highway rights-of-ways to be removed. This would complement GMP's Reliability Project and would mitigate damage to utility and town infrastructure (mitigation)	Road Crew, Town Tree Warden	MEDIUM	Fall 2018-2020	Long-term mitigation goal. On-going. Carried over to 2021 Plan.
Severe Weather//Flash Flood/Fluvial Erosion	Complete georeferenced culvert inventory to identify priority upgrades. Upsized culverts allow greater volume of water to pass through. (Mitigation)	Regional Planning Commission /Selectboard /Road crew	HIGH	Fall 2017	This culvert inventory was completed in 2015 and the Town has been replacing culverts as prioritized with assistance of state grant funds (both VT AOT and VT DEC). Complete.
	Develop Schedule to replace undersized culverts. Properly sized culverts will allow greater volumes of water to be cleared, therefore protecting town	Selectboard Road Crew	HIGH	fall 2017	Schedule has been completed but projects to install are ongoing. Installation is based on schedule priority. Complete.

Hazard(s) Mitigated	Mitigation Action	POC	Prioritization	Time Frame	2021 Status/Comments
	infrastructure from flood damage. (Mitigation)				
	Adopt river corridor regulations which incorporate VT ANR River corridor maps. These updated regulations will prevent further constructions of infrastructure in areas that are prone to flooding and damage. (Mitigation)	Planning Commission	HIGH	Winters 2017-2018	Sharon to work with the Planning Commission. Carried over to 2021 Plan.
	Upgrade culverts on Downer Road, TH16, which will allow greater volumes of water to be cleared therefore protecting town infrastructure from flood events. (Mitigation)	Road Foreman	HIGH	Fall 2017	Town completed two priority cement culvert upgrades 2017-2018. Town crew upsized roadway culverts in vicinity of Downer CCC Pond in 2019-20. The culvert at intersection of Downer/Krivak Roads remains a priority for upgrade; Town anticipates applying for VTRANS Structures grant Spring 2021 for potential construction Summer 2022. (80% complete). On-going. Carried over to 2021 Plan.
	Provide public outreach on flood insurance opportunities and requirements for town residents. Greater public knowledge of flood insurance requirements will help reduce the damage to private infrastructure. (Mitigation)	Planning Commission and Selectboard	HIGH	Winter 2017-18	Long-term mitigation goal. On-going. Carried over to 2021 Plan.

2021 Hazard Identification and Scoring

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, given the Town’s vulnerabilities?
- 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. By 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 Sharon a safer place.

It is important that we learn from the past to avoid the same disasters and their outcomes. Disasters that have occurred within the Town of Sharon, 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 Sharon 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.

Table 2 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 Sharon (see Table 1). The top threats (hazard score bolded in the table below) are then followed with a discussion and mitigation strategies throughout the rest of this Plan. It is important to note that those hazards which were not found to pose the greatest threat may still occur in Sharon’s future; however, they were not the focus of this Plan. The Hazard Mitigation Committee identified Structure Fire, Hurricanes/Tropical Storms, Drought, Disease Outbreak, Wildfire, Invasive Species/Infestation, Ice Jams, Landslides/Mudslides, Water Supply Contamination, Dam Failure, Nuclear Facility Accident, Extreme Heat and Earthquake as a possible hazard to the town, but those specific hazards were given hazard score of less than 16 based upon the hazard frequency and impact. Based upon the lower hazard score and due to a lack of resources and capacity at the town, these hazards will not be discussed in detail in this plan. For a detailed description of these hazards, the reader should review the Vermont State Hazard Mitigation Plan.

Table 1: Hazard Scoring Calculation Legend

	Frequency of Occurrence Probability of plausibility significant event	Potential Impact Severity and extent of damage and disruption to population, property, environment, and the economy
1	Unlikely: <1% probability of occurrence per year	Negligible: isolated occurrences of minor property and environmental damage, potential for minor injuries, no to minimal economic disruption
2	Occasionally: 1-10% probability of occurrence per year, or at least one chance in the next 100 years.	Minor: Isolated occurrences of moderate to severe property and environmental damage, potential for injuries, minor economic disruption
3	Likely: >10% but <75% probability per year, at least one chance in the next 10 years.	Moderate: Severe property and environmental damage on a community scale, injuries and fatalities, short-term economic impact
4	Highly Likely: >75% probability in a year	Major: Severe property and environmental damage on a community or regional scale, multiple injuries or fatalities, significant economic impact
Frequency of Occurrence X Potential Impact = Hazard Score		

Table 2: Hazard Scoring

Hazard	Frequency of Occurrence	Warning Time	Potential Impact	Hazard Score
Flash Flood/Flood/Fluvial Erosion	Highly Likely	3-6 hours	Major	16
Extreme Cold/Snow/Ice Storm	Highly Likely	6-12 hours	Major	16
Hazardous Material Spill	Highly Likely	None	Major	16
Severe Weather (Thunderstorm, Lightning, tornado, High Winds, Hail, microburst)	Highly Likely	None/Minimal	Major	16
Structure Fire	Highly Likely	None	Moderate	12
Hurricanes/Tropical Storms	Likely	12+ hours	Major	12
Drought	Likely	12+ hours	Major	12
Disease Outbreak	Likely	N/A	Major	12
Wildfire	Likely	None	Moderate	9
Invasive Species/Infestation	Likely	12+ hours	Moderate	9
Ice Jams	Occasionally	6-12 hours	Moderate	6
Landslides/Mudslides	Occasionally	None	Moderate	6

Water Supply Contamination	Occasionally	None	Moderate	6
Dam Failure	Unlikely	None	Major	4
Nuclear Facility Accident	Unlikely	12+ hours	Major	4
Extreme Heat	Occasionally	12+ hours	Minor	4
Earthquake	Likely	None	Negligible	3

Climate Change: Warming temperatures, shrinking winters, and increasing incidence of intense storm events are beginning to have a significant impact on Vermont’s economy, people and environment and require immediate attention across all planning efforts at the local, regional, state, federal and global levels. Accordingly, and as a guiding principle of this Plan, we have aimed to recognize and include the impacts of climate change throughout Plan development, most notably reflected in the hazard profiles and mitigation actions. Both direct and indirect impacts of climate change are addressed within pertinent hazard profiles, as well as the potential for compounding impacts.

Hazard Profiles for Top Threats

Flash Flood / Flood / Fluvial Erosion

Flooding is one of the worst threats to Sharon's residents and infrastructure. Past instances of flooding in Sharon 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.

Perhaps the worst flood disaster to hit the Town of Sharon, as well as the overarching region and the State of Vermont, occurred on November 3, 1927. This event was caused by nearly 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 the river flowing at an estimated 900,000 gallons per second on the morning of the 4th (Vermont Weatherbook). Like many towns in the region, the Town of Sharon received heavy precipitation.

A more recent flood 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, and 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 one week. Despite the damage wrought, the flooding caused by Tropical Storm Irene is the second greatest natural disaster in 20th and 21st century Vermont; second only to the Flood of 1927.

The Town of Sharon suffered major damage to property and infrastructure during Tropical Storm Irene, although no lives were lost. It is estimated that Tropical Storm Irene dropped 6-7 inches in the Town of Sharon in a noticeably short span of time, and 5-7 inches across the county. Many of Sharon's roads and culverts were damaged by the storm, including parts of Route 132, Quimby Mountain Road, Fay Brook Road, Downer Road, White Brook Road, Cross Road, Keyes Road, Raymond Road, and Moore Road, among others. The county-wide damage totaled \$32.5 million, and Town-wide damage was over \$2.4 million for this flooding event. Following the flood damage, the state of Vermont and FEMA has been coordinating on the home buy-out process across the state. There was one buy-out property: the "Green Trailer Park". The Town of Sharon has evaluated other properties for potential buy-out options.

Flooding is common across the region, with many events impacting the Town of Sharon specifically. The following list indicates the history of occurrence about this hazard in Windsor County and given the relatively small population of Sharon, town-specific data is somewhat limited. Federal disaster numbers are listed when appropriate. No detailed data was available for fluvial erosion damage in Sharon in terms of numbers of acre lost during each event.

History of Occurrences:

Date	Event	Location	Extent and Impacts
10/31/2019 – 11/1/2019 FEMA Disaster 4474	Flooding and Severe Weather	Statewide	Severe storm and flooding during the period October 31 to November 1, 2019. Damage to roads and bridges. Total Public Assistance cost estimate: \$3,862,356
4/15/2019 FEMA Disaster 4445	Flooding	County wide	VEM Sit Rep reported major impacts from flooding in the Town of Ludlow and Ludlow Village overnight with several businesses in Ludlow center damaged. VEM Sit Rep reported major impacts in Rochester, Bethel, Royalton with several town roads closed due to water over roads and isolated washouts.
7/27/2018	Flash flooding	County wide	Heavy rainfall caused a culvert to back up at the intersection of Mineral and Grove Street in Springfield. Additional heavy rainfall caused flash flooding on Union Street and Clinton Street. The flash flooding caused 78 residents of the Louis Whitcomb Building to be evacuated due to an electrical basement being flooded with water.
5/4/2018 – 5/5/2018 FEMA Disaster 4380	Flash flooding	Statewide	Severe storm and flooding during the period on May 4-5, 2018. Damage to roads and bridges. Total Public Assistance cost estimate: \$1,287,788
10/29/2017-10/30/2017 FEMA Disaster 4356	Flooding and Severe Storm	Statewide	Severe Storm and Flooding. Damage to utilities. Total Public Assistance cost estimate: \$3,716,421.
7/17/2017	Flash flooding	County wide	Heavy Rain caused several buildings to be flooded near the Okemo Base.
6/29/2017 – 7/1/2017 FEMA Disaster 4330	Flash flooding	County wide	Flash flooding damaged roads across northern Windsor County. Flowing water covered Route 132 in Sharon, and multiple residences were cut off by high water and damaged roads throughout the area. Residences along

Date	Event	Location	Extent and Impacts
			Sargent Road in Norwich were damaged. Flash flooding damaged local roads in Windsor and Weathersfield.
4/25/2014 FEMA Disaster 4178	Flooding	Region Wide	Severe storms and flooding during the period of April 15-18, 2014. Caledonia, Essex, Franklin, Lamoille, Orange, Orleans, and Washington Counties for Public Assistance.
08/28/2013	Flash flooding	County wide	Thunderstorms with very heavy rainfall developed over east central Vermont, resulting in isolated flash flooding.
Period of 06/25/2013— 07/11/2013 (DR-4140 VT)	Flooding	County and region wide	No data available.
08/28/2011* (DR 4022 VT for period of 8/26/2011 – 9/2/2011)	Severe Flash Flooding	Sharon, county/region wide	5-7” of rain across region, 4.45” in Sharon. Significant damage to state and local roads/culverts/bridges. VT Route 132 was severely damaged, among other local roads/culverts/bridges. White River in West Hartford (just south of Town of Sharon) crested at 28.40 feet, about a foot below the record crest of 29.30 feet set in the great flood of 1927. Following the storm, there was extremely limited access to and from the Town, with most roads being inaccessible for nearly a full day after rains subsided.
5/26/2011 – 5/27/2011 (DR 4001 VT)	Flash & riverine flooding	County-wide	3-5+” of rain county-wide
04/27/2011	Flooding	Sharon	Quickly melting snowpack combined with 0.5-1” of rain lead to flash flooding late on the 26 th , then river flooding on the 27 th . Flood waters from heavy rain and snowmelt

Date	Event	Location	Extent and Impacts
			damaged White Brook Road in Sharon. \$100,000 in damage.
08/07/2008	Flash flooding	Sharon, region wide	Floodwaters covered a bridge on Fay Brook Road along with several driveway culverts being washed out. \$25,000 in damage was reported.
07/21/2008— 08/12/2008 (DR 1790 VT)	Flooding	County-wide	No data available.
07/09/2007— 07/11/2007 (DR 1715VT)	Flash flooding	County-wide	No data available.
5/15/2006	Flooding	County-wide	No data available.
04/04/2000	Flooding	County-wide	Steady rain combined with melting mountain snows.
06/27/1998	Flash flooding	Sharon, County/region wide	3-6” of rain. Extensive flooding occurred along the White River and its branches.
6/28/1973 - 6/30/1973	Flooding	Sharon, County wide	5-8” County-wide.
11/2/1927 – 11/4/1927	Flash flooding	Sharon, County wide	4-9” of rain across the region. Approximately 7” in Sharon. “The Great Flood of 1927”

The Town of Sharon Flood Hazard Area Bylaw prohibits new structures in the Special Flood Hazard Area (also considered the 100-year floodplain) and Fluvial Erosion Hazard Zone/stream buffer area. It also places restrictions on other types of activities within the Special Flood Hazard Area and the Fluvial Erosion Hazard Zone/stream buffer area and specifies structural requirements in both zones. These buffers seek to protect the fragile riparian habitat, improve, or maintain water quality and prevent soil erosion. Fluvial Erosion Hazard Zones have been mapped for Broad, Elmers, Fay and Quation Brooks only. In addition, the Town Subdivision Regulations require that no building envelopes be placed within 150 feet of the top of the bank of any perennial stream on the edge of any wetland, and no ground disturbance or removal of healthy vegetation is permitted within 50 feet of those boundaries, except for permitted crossings.

There are 30 residences and 6 commercial structures within the 500-year floodplain or Special Flood Hazard Area, which is estimated at \$8,588,409 if all properties were damaged/destroyed in a severe flooding event. Disruption of the critical services in the 500-year floodplain could drastically hamper future response and relief efforts in the Town and cause major disruption to business continuity of operations. Putting such an event into context, the flooding that occurred because of Tropical Storm Irene is greater than a 100-year flood event, and likely closer to a 500-year flood, and, during that storm, local businesses and the Town Fire Station were badly flooded. The Town of Sharon would like to take a more protective stance by being proactive and assessing the number of properties that are in the 500-year floodplain. Unfortunately, the 500-year floodplain has not been mapped in the Town of Sharon, and the data needed to complete this type of analysis is currently unavailable.

Due to the development restrictions mountainous terrain places on an area, “at-risk populations,” such as children or the elderly, low-income housing and critical infrastructure are sometimes located in flood hazard areas. Across Vermont, most child and elder care facilities are not registered with the State. Much of the child day care is likely private and in-home in Sharon, but there are two licensed facilities within the Town: Sharon Preschool and Child Care and Sharon Afterschool Program. Neither of these facilities (which are located at the same address) is in a FEMA designated floodplain. There are no elder care facilities in the Town of Sharon. The Green’s Trailer Park, located on a White River shoreline parcel, was demolished during Tropical Storm Irene and the parcel was subsequently restored to passive recreation use with assistance of the FEMA buy-out program.

Studies have shown that most of the flood damage 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 although small, mountainous streams may not be mapped by FEMA in NFIP FIRMs (Flood Insurance Rate Map), flooding along these streams is possible, and should be expected and planned for. Flash flooding in these reaches can be very 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/mountain side

undercutting. Furthermore, precipitation trend analysis suggests that intense, local storms are occurring more frequently. These trends suggest that storms in the Town of Sharon will be high intensity and will cause large volume rain events. Future flooding events are highly likely in Sharon. In the Town of Sharon, there are 60 structures located in the mapped Fluvial Erosion Hazard zone.

Several culverts have been replaced or upgraded since Sharon's 2015 Plan was adopted. To improve the flow of floodwater through the Town, Sharon upgraded a culvert near vicinity of Downer CCC Pond. The Town plans on updating the culvert at intersection of Downer/Krivak. Many of Sharon's major roads run alongside the main stem of the White River and its tributaries, such as Broad Brook, Fay Brook, and Quation Brook. Moore Road, Broad Brook Road, and Fay Brook Road are especially vulnerable to erosion and washouts. Two culverts were upgraded on Downer Street during the 2014 work-season.

The last official culvert inventory completed for the Town of Sharon was in November 2015. A road erosion inventory of hydraulically connected road segments was completed in 2019 by the Two Rivers Ottawaquechee Regional Commission (TRORC) and Sharon Road crew.

No development projects are planned in Sharon in areas that would be vulnerable to flooding. There are no repetitive loss properties in Sharon on FEMA's NFIP list.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Flooding	Route 132, Quimby Mountain Road, Fay Brook Road, Downer Road, White Brook Road, Cross Road, Keyes Road, Raymond Road, and Moore Road (all damaged during Tropical Storm Irene). Many other roads in the Town subject to erosional flooding.	Culverts, bridges, road infrastructure, public and private property. 30 residences and 6 commercial structures within the 500-year floodplain.	Most recent severe flooding event, Tropical Storm Irene- 5-7" across county (6-7" in Sharon). No detailed data are available for fluvial erosion damage in Sharon in terms of numbers of acre lost during each event.	From TS Irene: \$2,456,547.00 in damages. Irene FEMA and FHWA expenses incurred by the Town of Sharon since August 2011 until the 10/31/2014.	Highly likely

Extreme Cold / Snow / Ice Storm

Winter storms are a regular occurrence in Vermont. Severe winter storms can cause serious damage, including collapse of buildings due to overloading with snow or ice, brutal wind chills, downed trees, downed power lines, and stranded vehicles. People can be at risk of freezing in extended power outages if they lack wood heat or backup power, and individuals shoveling large accumulations of snow can also be at risk from frostbite, hypothermia, and heart attacks due to cold and overexertion. While snow removal from the transportation system is standard fare in Vermont winters, extreme snow or ice can close rail and road systems, further jeopardizing any stranded persons that are in danger of freezing or needing medical assistance.

Severe winter storms included a blizzard on February 15-17 in 1958 that dumped over 30 inches and resulted in 26 deaths in New England. On December 26-27 in 1969, another blizzard left 18-36 inches of snow in northwestern Vermont and 45 inches in Waitsfield. A string of storms in March 2001 hit the state, beginning with 15-30 inches on March 5-6 (later declared a federal disaster), 10-30 inches on the 22nd and 10-20 inches on the 30th. Recent years have seen wet snowstorms that have leveled trees and caused widespread power outages.

The worst winter storm in terms of damage to hit the state recently was not a snowstorm, but an ice storm. In January of 1998, just the right combination of precipitation and temperature led to more than three inches of ice in spots, closing roads, downing power lines, and snapping thousands of trees. This storm was estimated as a 200–500-year event. Power was out up to 10 days in some areas and 700,000 acres of forest land were damaged in Vermont. Amazingly, there were no fatalities in Vermont, unlike Quebec where 3 million people lost power and 28 were killed.

Over the past few winters, Sharon has received numerous snowstorms that have dropped significant amounts of snow over a day or two. However, the details of these events and the damage they caused are overshadowed by winter weather events of the past. This is not to say such extreme events will not repeat themselves. It should be assumed that extreme winter weather events will occur at some point in the future. The following table documents the occurrence of extreme cold/snow/ice storms in the Town of Sharon and Windsor County.

History of Occurrences:

Date	Event	Location	Extent and Impacts
12/16/2020	Winter Storm	County-wide	Mesoscale band of snowfall rates of 2 to 4+ inches per hour remained quasi-stationary for 6 to 8 hours across southern Rutland and much of Windsor County. Storm total snowfall ranged from 8-12 inches in the north to 30-40 inches in the southeast upslope hilly terrain. Some specific totals include: 38 inches in Danby and Ludlow, 34 inches in Reading, 32 inches in Shrewsbury, 30 inches in Hartland, 20 inches in Wilder and

Date	Event	Location	Extent and Impacts
			White River Junction, 19 inches in Rutland. There were a few unofficial reports of 40 inches as well.
3/23/2020	Winter Storm	County-wide	A period of heavy snow with 2-3 inches per hour rates moved through during the evening hours with storm total snowfall of 7-10 inches. This led to some minor, isolated power outages.
2/7/2020	Winter Weather	County-wide	Storm total snowfall of 4 to 8 inches fell across the region, greater totals across the north, with nearly a half falling on the 6th and the 7th. Some localized icing up to a tenth or two occurred as well.
1/18/2020	Winter Weather	County-wide	A widespread 4 to 7 inches of snow fell with minimal impacts.
1/16/2020	Winter Weather	County-wide	Snowfall observations of 3 to 6 inches with minimal impacts, except normal slippery travel.
12/29/2019	Winter Weather	County-wide	A wintry mix of sleet, freezing rain and snow fell across the region with a combined snow and sleet accumulation of 3 to 5 inches and ice accumulations around 0.1 inch and less.
12/1/2019	Winter Storm	County-wide	Snowfall accumulations across Windsor County ranged from 4 inches across northern sections to 10 inches in the south. Ludlow and Springfield received 10 inches with 6 inches in Woodstock. Typical traffic impacts as well as delayed or canceled schools.
3/22/2019	Winter Storm	County-wide	A heavy wet snow fell across Windsor County with snowfall totals of 8 to 12 inches with the higher totals in the higher elevations. Some specific totals include 11 inches in Pomfret, 10 inches in Weston, 9 inches in Barnard and 8 inches in Ludlow.
2/12/2019	Winter Storm	County-wide	A widespread 5 to 10 inches of snow fell across Windsor County, mixed with freezing rain at times.

Date	Event	Location	Extent and Impacts
1/29/2019	Winter Storm	County-wide	A widespread 5 to 8 inches of snow fell across Windsor County.
1/19/2019	Winter Storm	County-wide	A widespread snowfall of 10 to 18 inches occurred across Windsor County, including 18 inches in Woodstock, 15 inches in Pomfret and 12 inches in Ludlow.
1/8/2019	Winter Storm	County-wide	A widespread 6 to 10 inches of snow fell across Windsor County. The snow was a denser, wetter snow that led to scattered power outages. some specific snowfall totals include 9 inches in Pomfret, 8 inches in Woodstock, Rochester, and Ludlow with 7 inches in North Hartland.
11/26/2018	Winter Storm	County-wide	Light rain changed to a pasty, heavy wet snow that resulted in downed tree limbs and power outages across VT. In Windsor County, snow accumulated 3 to 6 inches in the valleys but quickly rose to 12 to 20 inches above 1000 feet. Some specific amounts include 18-22 inches in Rochester, 15 inches in Ludlow, 13 inches in Hartland, 10 inches in reading, 9 inches in Norwich and 4 inches in Springfield.
11/15/2018	Winter Weather	County-wide	A widespread 3 to 7 inches fell across Windsor County with the highest totals above 1500 feet.
3/13/2018	Winter Storm	County-wide	Long duration snowfall event eventually delivered 10 to 20 inches across Windsor County, with the heaviest occurring the afternoon of March 13th into the morning hours of the 14th. Some specific snowfall amounts include: 21 inches in Rochester, 20 inches in Pomfret, 18 inches in Hartland and Ludlow with 12 inches in Woodstock. Some isolated to scattered power outages were reported.
3/7/2018	Winter Storm	County-wide	A long duration snow event deposited 12 to 26 inches across Windsor County, with the highest totals along the southern green mountains. Specific totals included: 26 inches in Ludlow, 24 inches in Cavendish, 23 inches in Bridgewater, 20 inches in Pomfret, 18 inches in Chester and 14 inches in Woodstock.

Date	Event	Location	Extent and Impacts
			Scattered to numerous power outages occurred in areas of the heaviest snow fall.
2/7/2018	Winter Storm	County-wide	A widespread 6 to 10 inches of snow fell across Windsor County, including 10 inches in Ludlow with 9 inches at Woodstock and Chester. Snowfall rates of 1 to 2 inches per hour at times was observed.
2/4/2018	Winter Storm	County-wide	A widespread 5 to 10 inches of snow fell across Windsor County.
1/13/2018	Winter Weather	County-wide	Rain changed to a prolonged period of sleet early Saturday morning before ending as snow by mid-morning. Freezing rain and sleet accumulated around 1/2 inch with snowfall of a few inches in spots. A flash freeze made for some hazardous road conditions.
1/4/2018	Winter Weather	County-wide	A widespread 3 to 6 inches was observed.
12/25/2017	Winter Storm	County-wide	A widespread 5 to 9 inches of snow fell.
12/22/2017	Winter Storm	County-wide	Snowfall amounts of 5 to 10 inches were reported.
12/12/2017	Winter Storm	County-wide	A widespread 8 to 16 inches of snow fell across Windsor County, including 17 inches in Rochester, 16 inches in Pomfret, 14 inches in Hartland, Ludlow, and Andover.
4/1/2017	Winter Storm	County-wide	Widespread 8 to 16 inches of a heavy, wet snow fell across the region, some specific totals include 16 inches in Rochester, 15 inches in Woodstock, 14 inches in Ludlow and Proctorsville, 13 inches in Hartland and Pomfret, 12 inches in Bethel and Windsor

Date	Event	Location	Extent and Impacts
			and 10 inches in Tyson. Some scattered power outages resulted from the snow loading on trees and power lines.
3/31/2017	Winter Storm	County-wide	Widespread 8 to 16 inches of a heavy, wet snow fell across the region, some specific totals include 16 inches in Rochester, 15 inches in Woodstock, 14 inches in Ludlow and Proctorsville, 13 inches in Hartland and Pomfret, 12 inches in Bethel and Windsor and 10 inches in Tyson. Some scattered power outages resulted from the snow loading on trees and power lines.
3/14/2017	Winter Storm	County-wide	Snowfall totals across Windsor County generally ranged from 12 to 24 inches. Some specific amounts include 24 inches in Rochester, 23 inches in Pomfret, 20 inches in Hartland, 17 inches in Hartford and Norwich and 15 inches in Woodstock.
2/12/2017	Winter Storm	County-wide	Widespread 6 to 10 inches of snowfall reported, including 10 inches in Woodstock, 9 inches in Ludlow and 8 inches in Hartland.
12/29/2016	Winter Storm	County-wide	A widespread 6 to 12 inches of snow was observed.
11/29/2016	Winter Weather	County-wide	Numerous vehicle accidents due to icy roads. Ice accumulation less than one tenth of an inch. An accident between a vehicle and a tractor-trailer resulted in a fatality of the driver of the vehicle.
2/15/2016	Winter Weather	County-wide	One to three inches of snowfall with some light ice accretion.
12/29/2015	Winter Weather	County-wide	A combination of snow and sleet accumulated 3 to 5 inches across Windsor County along with some light freezing rain at times.

Date	Event	Location	Extent and Impacts
2/7/2015	Winter Storm	County-wide	Widespread snowfall reports of 5 to 9 inches with some localized 12-inch amounts in Windsor County.
2/2/2015	Winter Storm	County-wide	Snowfall across Windsor County was 6 to 15 inches with this event. Some specific snowfall totals included 15 inches in Woodstock, 12 inches in Chester and Proctorsville, 11 inches in Ludlow, 9 inches in Hartland, Pomfret and Windsor with 6 inches in West Hartford. Numerous vehicle accidents.
2/1/2015	Cold/Wind Chill	County-wide	Record Cold February 2015 for much of Vermont. Many communities witnessing the coldest month since December 1989 or January 1994. The average departure was 13 to 17 degrees below normal. It was a RECORD COLD February for Rutland and Montpelier, 2nd coldest for St. Johnsbury and 3rd coldest in Burlington. ALL-TIME cold months it was RECORD COLD for Rutland, 2nd Coldest for Montpelier, 3rd Coldest for St. Johnsbury and 7th Coldest for Burlington. Burlington and St. Johnsbury's records date back into 1890s, while Rutland in the 1910s and Montpelier in the 1940s. Damage to infrastructure, frozen water mains, etc. has totaled at least \$1 million.
1/30/2015	Winter Weather	County-wide	Snowfall reports for Windsor County were generally 1 to 2 inches.
1/27/2015	Winter Storm	County-wide	Snowfall across Windsor County was 6 to 10 inches.
1/18/2015	Winter Weather	County-wide	A heavy wet snow of 1 to 3 inches fell across Windsor County, yet the main culprit was very icy roads due to rain on very cold road surfaces that led to numerous vehicle accidents.
1/7/2015	Extreme Cold/Wind Chill	County-wide	Temperatures by early evening of January 7th were zero to 10 above zero with winds of 15 to 30 mph that created wind chills colder than 20 to 30 below zero through the overnight into the morning hours of January 8th. Actual morning low temperatures on January 8th were 10 below to 20 below zero in Windsor

Date	Event	Location	Extent and Impacts
			County, including 21 degrees below zero in Rochester, 17 below zero in Pomfret, 16 below zero in Woodstock, and Weston, 15 below zero in Hartford, North Hartland, and Ludlow, 13 below zero in Bethel, Weathersfield and Quechee with 12 below zero in Springfield.
1/3/2015	Winter Weather	County-wide	Snowfall accumulations of 2 to 4 inches with ice accumulations up to a tenth of an inch were common.
Period from 12/09/2014 — 12/12/2014 (DR-4207 VT)	Winter storm	Town of Sharon and county-wide	Heavy, wet snowfall totals across Windsor County ranged from 6 to 18 inches. Damage in Sharon was assessed at \$7,848.00.
03/12/2014 — 03/13/2014	Winter storm	Town of Sharon and county-wide	A major snowstorm with near blizzard conditions. In addition to heavy snowfall accumulations, strong northeast-north winds with gusts to 35-40 mph at times caused considerable blowing and drifting of the snow. 26 inches fell in Sharon.
02/03/2014 — 02/04/2014	Winter storm	County wide	Snowfall across Windsor County was 12 to 20+ “. There were two bands of heavy snowfall, snowfall rates of 1-2” an hour, that moved across the region. Thursday evening and especially Friday morning's commute was hazardous with nearly all schools closed due to the storm on 02/14/2014.
02/05/2014	Winter storm	County-wide	Eight to twelve inches of snow fell across Windsor County. Snowfall was at its peak during both the morning and afternoon/evening commutes causing hazardous travel.
01/02/2014 — 01/03/2014	Winter storm	County-wide	A widespread 6 to 9 inches of snow fell across Windsor County.

Date	Event	Location	Extent and Impacts
12/29/2013 — 12/30/2013	Winter storm	County-wide	A wet, heavy 6 to 10 inches of snow fell across Windsor County.
12/14/2013 — 12/15/2013	Winter storm	County-wide	A widespread 10 to 15 inches of snow fell across Windsor County.
03/18/2013 — 03/19/2013	Winter storm	County-wide	8-14" of snow fell across the county, with higher amounts above 1000 ft. Numerous vehicle accidents.
02/27/2013 — 02/28/2013	Winter storm	County-wide	Snow across the county, 6-12" of snow fell across the southern Green Mountains.
03/01/2012	Winter storm	County-wide	Widespread 4-8" inches of snowfall occurred in Windsor County with 10- 14" inches along the eastern slopes of the Green Mountains.
11/22/2011 — 11/23/2011	Winter storm (heavy, wet snow mixed with rain and sleet)	County-wide	6-12" across the county. Numerous vehicle accidents and scattered power outages occurred due to heavy snow on trees.
12/26/2010 — 12/27/2010	Winter storm	County-wide	Snowfall totals of 6-15" with localized higher amounts occurred as well as considerable blowing and drifting of the snow due to north winds of 15 to 25 mph with gusts approaching 40 mph.
02/23/2010 — 02/24/2010	Winter storm	County-wide	A heavy wet snow fell across Vermont that resulted in snowfall accumulations of 6 to 30 inches with the higher amounts in the higher terrain of central and southern Vermont. 50,000+ customers without power in the region.

Date	Event	Location	Extent and Impacts
12/09/2009	Winter storm	County-wide	6-12" of snow along the eastern side of the Green Mountains. 60-85 mph wind knocked down power lines and caused some structural damage.
02/26/2008 — 02/27/2008	Snow	Town of Sharon, county-wide	6-8" in Sharon. Storm broke previously set all-time snow record for February (42.3" in 2008, as recorded at National Weather Service in Burlington, VT).
04/12/2007	Winter storm (heavy wet snow, sleet, rain)	Town of Sharon, county/region-wide	7" of snow. Dangerous road conditions. Some downed tree limbs and power lines.
03/09/2007	Extreme cold/wind chill	Town of Sharon, county-wide	Morning lows were 10 to 34 degrees below zero.
03/06/2007	Extreme cold/wind chill	Town of Sharon, County/region wide	Exceptionally low temperatures accompanied by 15-20mph winds (recorded as -8F to -25F in nearby towns).
02/14/2007	Snow	Town of Sharon, county-wide	Snowfall totals ranged from 15 to 25" in the Connecticut River valley. The deep snowfall (18-30 inches) and deeper snow drifts (4-6+ feet) caused numerous problems, including the blocking of numerous heat vents that resulted in the build-up of carbon monoxide and sent dozens of people seeking treatment at area hospitals. The weight of the heavy snowfall on some weaker roofs resulted in the partial or total collapse of 20 or more barn roofs and the deaths of more than 100 cattle.
01/25/2007 — 01/26/2007	Extreme Cold/wind chill	County/region-wide	Combination of brisk northwest winds of 10 to 15 mph and temperatures 5 to 20 degrees below zero for wind chill readings of 25 to 40 degrees below zero.

Date	Event	Location	Extent and Impacts
12/30/2006	Snow	County/ region- wide	2-6" of snow. "Extremely dangerous" road conditions.
02/18/2003	Snow	Town of Sharon, county- wide	12" of snow.
01/07/1998 – 01/09/1998 (DR 1201 VT)	Ice Storm	County/ region- wide	No detailed information about this event was available.

The Town of Sharon is no stranger to winter weather and the hazards it brings. Depending on the event, particularly with heavy, wet snow or ice, electricity may be knocked out for a few hours or days. The utility companies currently serving the Town of Sharon, including Green Mountain Power, have followed a regular tree-trimming schedule. Sharon town officials believe this is satisfactory to mitigate damage and the power outages caused by downed trees and tree limbs during a heavy, wet snow or ice event. In the event of an extended power outage, the Town would open emergency shelters at the local Fire House and Sharon Elementary School.

Heavy, wet snow or large quantities of snow may also leave structures vulnerable to roof collapse. Roof collapse occurs when the structural components of a roof can no longer hold the weight of the snow. Flat roofs are most vulnerable to collapse because they do not drain well, and the snow on the roof soaks up water like a sponge, increasing the weight the roof must bear. More common it seems is the collapse of barns commonly used for livestock sheltering and other agricultural purposes. Unfortunately, livestock in the barn are often killed and equipment stored in the barn may be damaged or ruined. It is difficult to determine whether a residential structure or a barn would be rebuilt after a roof collapse, because the decision to rebuild would likely depend on the extent of damage and the property owner's finances. The collapse of a barn roof is likely to be a total loss, and the collapse of a house roof may be a 50% loss. While roof collapse has not occurred in Sharon recently, very heavy snow in the region on February 14, 2007, resulted in the partial or total collapse of 20 or more barn roofs, and led to the deaths of more than 100 cattle.

In general, winter weather is most hazardous to travelers. Icy and snow-covered roads present multiple examples of dangerous driving conditions and situations. In Sharon, the mountainous

terrain, steep slopes, and remoteness of some roads further complicate travel. The Town relies on Travel Advisories issued by the State of Vermont Department of Emergency Management and the National Weather Service to alert residents of dangerous travel weather. However, it is difficult, if impossible, to prohibit people from driving during winter weather events. As a result, emergency services personnel must always be prepared to aid stranded drivers or to those who have been in an accident. To increase awareness in the event of hazardous weather, the Town also encourages residents to utilize 411, social media outlets, and the Town listserv.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Extreme Cold/ Snow/Ice Storm	Town wide	The entire Town is vulnerable: including roads, town and privately owned buildings, utility infrastructure. Power transmission lines and power-critical customers.	Snow fall has varied, from a few inches to over a foot or more. Heavy snow and wind downed trees and power lines. Snow/ice contributed to hazardous driving conditions.	For car crashes due to poor driving conditions: minimal damage to vehicle to totaled vehicle. Health impacts could vary significantly. From DR-4207 VT: \$7848.00.	Highly likely

Hazardous Materials Spill

Based on available VT Tier II data, there are five sites in town that have sufficient types and/or quantities of hazardous materials to require reporting. Sharon's village is located at the junction of I-89 and Vermont Routes 132 and 14. I-89 travels through a portion of the Town that is close to the village center and runs behind both the Sharon Elementary School and Sharon Academy. There are 350 residential and 43 commercial, industrial, or public buildings within 1,000 feet of a potential HAZMAT spill on I-89, Routes 14 and Route 132 and the railroad (in-house estimate). This includes three government/town buildings, the fire station, one cultural center, one church, the Sharon Academy, and the Sharon Elementary School.

If 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$4,622,760. 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 below is used to illustrate the ease with which trucks, trains 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 and Impacts
3/17/2020	Saddle Tank Compromise	MM 12 I-89 SB	Saddle tank compromised. Approximately 140 gallons of diesel was leaked.
7/17/2019	Tractor Trailer (TT) Accident	I-89 NB, MM 12.8	TT Accident. Approximately 95 gallons of diesel was leaked.
9/6/2019	Vehicle Accident	Intersection Rt. 132 & Rt. 14	vehicle collision, gas tank ruptured. Approximately 20 gallons of gasoline was leaked.
8/29/2019	Vehicle Accident	I-89 SB MM 14.45	Two vehicle accidents with fluid release. An unknown amount of Anti-freeze, Lube/Gear/Transmission Oil, Motor Oil was leaked.
1/31/2019	Vehicle Accident	5038 VT Route 14	Vehicle drove off with hose attached. Approximately 15 gallons of gasoline was leaked.
12/23/2018	Vehicle Accident	I-89 NB, mm14	Vehicle/Equipment accident, vehicle fluids lost. An unknown amount of diesel was leaked.

Date	Event	Location	Extent and Impacts
10/20/2016	Tractor Trailer (TT) Accident	I-89 SB - Exit 2	TT unit accident. Approximately 75 gallons of diesel was leaked.
5/22/2014	Equipment Failure	Sharon Rest Area	Equipment failure. Two gallon of anti-freeze was leaked.
11/28/2013	Above ground tank leak	Faybrook Road	Approximately 70 gallons of kerosene released. Kerosene migrated under manufactured home and soaked in.
10/28/2013	Trucked leaked. fuel	I-89 North bound, MM 9	Unknown quantity of diesel fuel leaked. 50'x5' section of pavement impacted, and fuel flowed into soil.
01/08/2013	Amtrak and car crash	Sharhart Road Railroad Crossing and Wood Lane	Extensive damage to the passenger side and rear end of car after being thrown 50 feet and landing in an embankment. Driver taken to hospital due to complaints of back pain. Minimal damage done to train.
09/13/2012	Fuel tank leaking	Cross Road	Unknown quantity of kerosene leaked. Kerosene odor noticed in spring, leak at filter had been occurring for some time. Surficial PID readings of 100-150ppm. Invoice was in the amount of \$10,122.72 for cleanup.
07/20/2012	Tractor transmission leak	Route 14, 1 mile south of village.	Less than 20 gallons of lube/gear/transmission oil leaked. Some spilled on road and some in the soil.
07/11/2012	Mineral oil dielectric oil spilled on roadside	River Road	1 pint transformer oil spilled, cleaned up.
07/20/2011	Tractor trailer hit debris in road,	I-89 South bound	150-gallon diesel tank was half full—approximately 75 gallons spilled. Fire Department contained spill in trench dug on shoulder of road.

Date	Event	Location	Extent and Impacts
	puncturing saddle tank		
06/05/2011	Amtrak Vermonter train derailment	Along part of River Road in Sharon	Train derailed due to set of wheels on rear portion of third car. None of the 85 passengers and 5 crew members were injured.
10/16/2008	Granite slab fell off truck on I-89	I-89 and Rt. 132	A large granite slab weighing 20 tons fell off a truck traveling southbound on I-89. It then crashed onto Rt. 132, nearly causing accidents.
02/15/2008	Fuel tanks overfill	Route 15	30 gallons overfill of an above ground tank.
06/25/2004	Fuel tank leak	I-89 North bound	80 gallons of diesel spilled.
09/11/2002	Train crash	Sharon, VT	A train hit a car on the backside of the river.
08/08/1990	Central Vermont Railway units hit wash out caused by beaver dam. failure.	Sharon, VT	One unit completely destroyed/flattened, four were damaged but returned to service. Three crewmen were injured but fully recovered. Diesel spilled into the river, causing the entire valley to smell.
06/20/1924	Train crash	Sharon, VT	The "Montrealer" collided head-on with another train at the switch of the Sharon track.

While only a small number, or no major hazardous material spills have occurred in the Town of Sharon, the potential for a major spill exists. One of the major risk-areas in the Town of Sharon is along the I-89 corridor. This corridor poses a constant threat to the Town of Sharon. As one of the major highways in Vermont, I-89 is a main thoroughfare for trucks and other motor vehicles transporting a wide-range of goods, including a variety of hazardous materials. Of particular concern to the Town is the proximity of I-89 to the Sharon Elementary School, Sharon Academy, and the village of Sharon. A truck accident and a resulting hazardous material spill could be

exceedingly disastrous for the Town and its residents. In addition, VT Route 132 passes underneath I-89 in the village of Sharon. I-89 passes over the White River on an extremely high bridge less than a mile from the village of Sharon. An accident on this bridge could send debris or whole vehicles into the shallow river below or onto Rt. 14. Materials that are leaked because of the accident could easily reach the White River as well.

Vermont Route 14 parallels I-89 through much of the Town of Sharon. As the more “local route” between the Town of Sharon, the Town of Hartford, and the Town of Royalton, it is likely that trucks and other vehicles carrying hazardous materials frequently travel along this road. The majority of Route 14 in the Town of Sharon is built near the White River, which could create additional water contamination problems if a hazardous material spill occurred on Route 14.

The New England Central Railroad and Amtrak trains run through the village and Town of Sharon. At any given time, there can be hazardous materials aboard the train. As the trains travel through Sharon, they bring not only the daily Amtrak passenger train but several freight trains, some carrying propane and other hazardous cargo. Railroads are not required to disclose the materials they transport through Towns and Cities in Vermont. Within the past couple of years, there has been a train/car crash and a train derailment. Had these accidents involved a freight train, instead of an Amtrak train, there could have easily been a large hazardous material spill in the Town of Sharon. Due to the terrain and location of the rail bed, access to the railroad corridor in some parts of Town is exceedingly difficult. Therefore, in the event of a hazardous material spill or railroad accident, it may be challenging for emergency responders to quickly respond to the situation. To prepare for hazardous material spills in Sharon, half of the members of the Sharon Fire Department are trained to the Firefighter 1 certification level as well as to the HAZMAT Operations level.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Hazardous Materials Spill	I-89, Routes 14 and 132, railroad running along White Rivers. Locations of HazMat storage facilities include the Sharon Town Garage, Sharon Trading Post, Sharon Academy Middle School, and Sharon Town Office.	Road infrastructure, nearby structures, Sharon village, White River.	Initially, local impacts only; but depending on material spilled, extent of damage may spread.	There are 350 residential and 43 commercial, industrial, or public buildings within 1,000 feet of a potential HAZMAT spill on I-89, Routes 14 and Route 132 and the railroad. If 5% of these structures were involved in a HAZMAT incident, the estimated damage would be \$4,622,760.	Likely

Severe Weather (Thunderstorms, Lightening, Tornado, High/Strong Winds, Hail, Microburst)

More common than hurricanes or tropical storms are severe thunderstorms (usually in the summer), which can cause flooding as noted above, and are associated with lightning, high winds, hail, and tornadoes. Hailstorms have occurred in Vermont, usually during the summer months. While local in nature, these storms are especially significant to area farmers, who can lose entire fields of crops in a single hailstorm. Large hail is also capable of property damage. Between 1950 and 2013, there were 698 hail events recorded in the state of Vermont, making hail an annual occurrence in some part of the state. Most of these events had hail measuring .75 inches, but many had hail at least 1.5 inches in size. The largest hail during the period was 3-inch hail that fell in Chittenden County in 1968 (NCDC). Tennis ball-sized hail was reported in the town of Chittenden during a storm in the summer of 2001. Thunderstorms can also generate high winds, such as hit the region on July 6, 1999, downing hundreds of large trees in a few minutes.

In Sharon, severe weather is quite common, typically in the late spring and summer months when the region experiences high temperatures. Severe thunderstorms tend to bring other hazards such as high winds, hail, and lightning, and flooding. These hazards are often experienced in combinations which create many unique weather and emergency management situations. Over the years, Sharon has been hit with high winds that have downed and uprooted numerous trees and knocked out electricity to residents in the Town. Town-specific wind data could not be easily found, but the “Remarks” section of NCDC Database helps to illuminate the impact strong winds can have on Sharon.

The following list indicates the history of occurrence about this hazard in Windsor County. Given the relatively small population of Sharon, town-specific data is limited. Federal disaster numbers are listed when appropriate. Damage estimates will only be provided when the weather event is only listed for the Town of Sharon, and if that data is available. To capture the individual hazards that may arise, and the different circumstances caused by the hazards in concert, the separate hazards are documented in the table below.

Severe weather events are highly likely to occur in the future in Sharon. Precipitation trend analysis suggests that intense, local storms are occurring more frequently and will continue to do so in the future. More localized severe weather events will occur in the Town of Sharon, which will be high intensity and will likely result in high flooding events, as well.

History of Occurrences:

Date	Event	Location	Extent and Impacts
8/23/2020	Thunderstorm Wind	County wide	Multiple trees downed on utility lines across Springfield.

Date	Event	Location	Extent and Impacts
8/4/2020	Strong Wind	Sharon, County wide	A brief period of gusty winds associated with the approach and passage of weakening Tropical Storm Isaias brought measured and estimated wind gusts of 40 to 50 mph that caused some scattered tree damage that resulted in scattered power outages.
7/5/2020	Thunderstorm Wind	County wide	Trees and power lines downed by thunderstorm winds near or on the following roads: Merrill Street, Will Bean Road, Stanley Road, East Lane, South Ridge Street and Charlestown Road.
5/27/2020	Thunderstorm Wind	County wide	Reports of multiple trees and power lines down near Route 107 and Abbot Road.
5/15/2020	Thunderstorm Wind	County wide	Several reports of downed trees and power lines in the Cavendish-Amsden area including Knapp Brook Road and barn damage on Senna Road.
5/15/2020	Thunderstorm Wind	County wide	Tree down on utility line on Tinkham Hill road.
11/1/2019	Strong Wind	Sharon, County wide	Strong winds with wind gusts more than 50 mph at times caused numerous downed tree limbs and subsequent power outages.
9/4/2019	Hail	County wide	Quarter size hail reported at Okemo Ski resort.
8/17/2019	Thunderstorm Wind	Sharon, County wide	Tree and utility lines down.
8/17/2019	Thunderstorm Wind	County wide	Trees and power lines downed across Plymouth.
8/17/2019	Thunderstorm Wind	Sharon, County wide	Numerous trees and power lines downed by thunderstorm winds.

Date	Event	Location	Extent and Impacts
8/17/2019	Thunderstorm Wind	Sharon, County wide	Many trees and power lines downed by thunderstorm winds.
7/20/2019	Thunderstorm Wind, Microburst	Sharon, County wide	A very localized wet microburst knocked down some trees, limbs that caused power outages.
6/20/2019	Thunderstorm Wind	County wide	Thunderstorm winds knocked multiple trees and tree limbs onto power lines in West Hartford and Hartford.
6/20/2019	Thunderstorm Wind	Sharon, County wide	Thunderstorm winds knocked tree on power lines.
2/25/2019	Strong Wind	Sharon, County wide	Strong west-southwest winds of 20 to 30 mph with gusts up to 45 mph occurred behind a strong storm system in Canada. Power outages across the county were in the hundreds.
11/3/2018	Strong Wind	Sharon, County wide	ASOS observation of 39 mph at Springfield Airport at 643 pm. Most wind gusts in the mid-30s to lower 40s mph. The combination of these winds and saturated soils accounted for more than 8000 outages.
10/16/2018	Strong Wind	Sharon, County wide	Strong down slope westerly winds of 35 to 50 mph caused scattered to numerous tree and utility line damage, especially immediately along the eastern slopes of Vermont's southern Green Mountains. A measured wind gust of 47 mph was recorded at VSF ASOS.
9/3/2018	Thunderstorm Wind	Sharon, County wide	Trees down on wires at the intersection of Camp Brook and Watershed roads.
7/27/2018	Thunderstorm Wind, Microburst	County wide	Several large trees downed by wet microburst across Springfield.

Date	Event	Location	Extent and Impacts
7/10/2018	Thunderstorm Wind	County wide	Social media picture of trees down on Edgewood Lane in Hartland. Also reports of power lines down and power outages in the Hartland area.
6/18/2018	Thunderstorm Wind	County wide	Rotten tree snapped on utility lines.
5/4/2018	Thunderstorm Wind	Sharon, County wide	Trees downed by thunderstorm winds.
10/30/2017	Strong Wind	Sharon, County wide	Scattered tree damage and power outages with measured wind gusts in the 40-50 mph range.
8/22/2017	Thunderstorm Wind	Sharon, County wide	A few trees downed by thunderstorm winds.
7/17/2017	Hail	Sharon, County wide	Quarter size hail reported.
7/17/2017	Hail	Sharon, County wide	Hail size of quarters, as well as damaging winds in form of trees and utility lines down.
7/17/2017	Thunderstorm Wind	County wide	Trees and utility lines down on South Hill Road.
7/17/2017	Hail	Sharon, County wide	Dime size hail.
7/17/2017	Hail	Sharon, County wide	Quarter size hail.
7/1/2017	Thunderstorm Wind	Sharon, County wide	Several trees downed due to winds and saturated soils at Mount Ascutney State Park.
5/31/2017	Hail	Sharon, County wide	Quarter size hail near the Hartford town line.

Date	Event	Location	Extent and Impacts
5/5/2017	Strong Wind	Sharon, County wide	Several wind gusts estimated to be 45-55 mph occurred sporadically across the higher elevations. This resulted in up to one thousand customers without power due to trees on power lines.
9/11/2016	Thunderstorm Wind	Sharon, County wide	Trees downed on power lines in Plymouth and Bridgewater.
7/23/2016	Thunderstorm Wind	Sharon, County wide	Trees down along Interstate 89 from Mile marker 25 to NH state line.
7/23/2016	Thunderstorm Wind	Sharon, County wide	Trees and utility lines down as well as fallen on houses causing structural damage.
7/23/2016	Thunderstorm Wind	Sharon, County wide	A few trees downed by thunderstorm winds.
7/23/2016	Thunderstorm Wind	Sharon, County wide	Trees down throughout town.
2/29/2016	Strong Wind	Sharon, County wide	Estimated and measured wind gusts of 40 to 50 mph impacted the region with scattered to numerous tree limbs and powerlines downed by these winds.
8/3/2015	Thunderstorm Wind	Sharon, County wide	Several trees downed by thunderstorm winds.
5/27/2015	Thunderstorm Wind	Sharon, County wide	Several trees downed by thunderstorm winds in Sharon.
5/27/2015	Thunderstorm Wind	County wide	Trees on power lines at the intersection of Union Village and Bradley Hill roads.
5/27/2015	Thunderstorm Wind	Sharon, County wide	Trees down at intersection of Route 5 and Loveland roads.

Date	Event	Location	Extent and Impacts
5/10/2015	Thunderstorm Wind	Sharon, County wide	Reports of several trees and power lines downed by thunderstorm winds.
5/10/2015	Thunderstorm Wind	Sharon, County wide	A few trees downed by thunderstorm winds.
5/10/2015	Thunderstorm Wind	Sharon, County wide	A few trees downed by thunderstorm winds.
5/10/2015	Thunderstorm Wind	Sharon, County wide	Multiple trees and power lines downed by thunderstorm winds.
05/10/2015	Thunderstorm , Severe Storm, Hail, High Wind	Sharon, County wide	Strong winds caused power outage and tree damage. Power was out for 3.18 hours.
07/27/2014	Thunderstorm , Severe Storm, Hail	County wide	Scattered thunderstorms developed, some of which produced localized large hail (greater than an inch in diameter) with isolated damaging winds. 3.34 inches of rain fell over five days. No power outage occurred in Sharon.
07/03/2014	Thunderstorm , Severe Storm, High Wind	Sharon, County wide	Thunderstorms, high winds, downed trees, and power lines in Windsor County. Power outages occurred in Sharon and lasted between 2.28-5.41 hours.
10/07/2013	High Wind	County wide	Several reports of tree branches on utility lines in several communities in Windsor County. Four Sharon residents were affected by a 1.6-hour power outage.
09/11/2013	Thunderstorm , Severe Storm, Hail, High Wind	Sharon, County wide	High winds and severe thunderstorms downed trees and power lines. 2.07 inches of rain fell in 96 hours. Altogether 210 green mountain power customers in Sharon were affected with power outage ranging from 3.6 hours to 23.77 hours.

Date	Event	Location	Extent and Impacts
Period of 06/25/2013 — 07/11/2013 (DR-4140 VT)	Thunderstorm , Severe Storm, Flooding	Sharon, County wide	Power outages reported in Sharon during this period. 8.3 inches of rain fell in Sharon over this period. Power outage affected 99 Sharon residents and lasted 2.8 hours.
09/08/2012	Thunderstorm , Severe Storm, High Wind	County wide	No power outage occurred.
07/17/2012	Thunderstorm , Severe Storm, High Wind	County wide	No power outage occurred.
06/02/2012	Thunderstorm , Severe Storm, High Wind	Sharon	Tree fell on power lines on Quimby Mountain Road. No power outage occurred.
05/28/2012	Thunderstorm , Severe Storm, High Wind, Lighting	Sharon	State police reported large tree and several other branches down on Howe Hill Road. Wind estimated at 50 knots. \$5,000 in public damage was reported. Most affected green mountain power customers only sustained power outage for .35 hours.
08/28/2011 (DR 4022 VT for period of 08/26/2011 — 09/2/2011)	Thunderstorm , Severe Storm, Flooding	Sharon, County wide	Tropical Storm Irene. 5-7” of rain in Sharon. Severe damage to state and town road infrastructure including VT Route 132, Quimby Mountain Road, Fay Brook Road, Downer Road, White Brook Road, among others. There was \$2,456,547 in public damages*. White River in West Hartford (just south of Town of Sharon) crested at 28.40 feet, about a foot below the record crest of 29.30 feet set in the Great Flood of 1927. Power outages in Sharon lasted from 8/28-8/31 in different locations in the Town. The longest outage lasted 73.45 hours. *Irene-related

Date	Event	Location	Extent and Impacts
			FEMA & FHWA expenses incurred by the Town of Sharon since August 2011 until 10/31/2014.
08/21/2011	Thunderstorm , Severe Storm, Hail, High Wind	County wide	While not in the Town of Sharon, these storms produced a microburst with 70-90mph straight-line winds in Rutland County (to the west of Windsor County.)
07/13/2011	Thunderstorm , Severe Storm, Hail,	Sharon	Nickel-sized hail fell in Sharon. Hail caused a tree limb to fall in Sharon which caused 272 Sharon residents to lose power for 1.8 hours.
07/06/2011	Thunderstorm , Severe Storm, High Wind, Lightning	County wide	15,000+ customers in Vermont lost power. In Sharon, 1,435 Green Mountain Power customers were without power for 2.5 hours.
05/09/2009	Thunderstorm , Severe Storm, High Wind	County wide	High winds and severe thunderstorms knocked down multiple trees in Green Mountain Power right of way. Altogether 267 GMP customers in Sharon were without power for 7-14 hours.
08/07/2008 (DR-1719)	Thunderstorm , Severe Storm, Flooding	Sharon, County wide	Heavy rainfall led to flash flooding in Sharon. Floodwaters covered a bridge on Faybrook Road along with several driveway culverts being washed out. 2.64 inches of rain fell in 72 hours. (No power outage)
08/16/2007	Thunderstorm , Severe Storm, High Wind	County wide	While not in the Town of Sharon, these storms produced 60-80mph straight-line winds in Rutland County (to the west of Windsor County.)
07/11/2007 (DR-1715)	Thunderstorm , Severe Storm, Flooding	County wide	5.3 inches of rain fell in Sharon in 24 hours. Four Sharon Green Mountain Power customers in Sharon were without power for more than 1 hour.

Date	Event	Location	Extent and Impacts
06/27/2007	Thunderstorm , Severe Storm, High Wind	Sharon, County wide	Trees and power lines blew down 1.2 inches of rain fell in 24 hours. Power outage in Sharon occurred on 6/28 for five hours.
06/19/2007	Thunderstorm , Severe Storm, High Wind	County wide	.75 inches of rain fell in 24 hours. On 6/16/2007 119 Green Mountain Power customers in Sharon were without power for 2.78 hours.
08/12/2004	Lightning	Sharon	A lightning strike caused roof damage and knocked out the telephone system at Sharon Elementary School. There was \$15,000 in damage. Detailed power outage time data for this event are not known.
7/6/1973 (DR 397 VT)	Thunderstorm , Severe Storm, Flooding	County wide	One of the largest flood events of the 20 th century in VT. Landslides reported in the region.
08/11/1966	Tornado	County Wide	F2 tornado (113-157 mph) with zero deaths. Approximately 25,000 dollars in damages.
07/09/1962	Tornado	County Wide	F2 tornado (113-157 mph) with zero deaths. Approximately 2,500 dollars in damages.
07/09/1962	Tornado	County Wide	F2 tornado (113-157 mph) with zero deaths. Approximately 25,000 dollars in damages.
10/24/1955	Tornado	County Wide	F2 tornado (113-157 mph) with zero deaths. Approximately 25,000 dollars in damages.
11/3/1927- 11/4/1927 ("The Great Flood of 1927")	Thunderstorm , Severe Storm, Flooding	Statewide	The White River crested at a record of 29.30 feet.

The Town of Sharon has received high wind events in the past. Thankfully, the damage caused by high winds has been relatively minimal. Often power outages occur because of trees and tree limbs falling on power lines. The Town of Sharon does not follow a regular tree-trimming schedule; however, Green Mountain Power provides this service as part of the utility company's Reliability Project. Green Mountain Power is re-routing power lines to the road corridor for improved access. This will help improve Green Mountain Power's response time during a power outage and decrease the amount of time some residents are without power.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Severe Weather	Town wide for wind, hail, high winds, lightning, and thunderstorm impacts; For damaged during Tropical Storm Irene: Route 132, Quimby Mountain Road, Fay Brook Road, Downer Road, White Brook Road, Cross Road, Keyes Road, Raymond Road, and Moore Road.	Town and private buildings, and utilities; culverts, bridges, road infrastructure.	Tropical Storm Irene-	From TS Irene: \$2,456,547.00 in damages. Irene FEMA and FHWA expenses incurred by the Town of Sharon since August 2011 until 10/31/2014. **	Highly likely

Vulnerability Summary

The 2015 Plan identified Severe weather, flash flood/flood/fluvial erosion, structure fire, extreme cold and hazardous material spills as the top hazards facing the Town of Sharon. Using the State's Hazard Scoring matrix, the 2021 Plan identifies Flash Flood / Flood / Fluvial Erosion, Extreme Cold / Snow / Ice Storm, Hazardous Material Spill and Severe Weather as the top hazards facing the Town of Sharon. The Town of Sharon still recognizes structure fires as a serious threat to the Town, however it does not rank as one of the top threats to the Town. Since the 2015 Hazard Mitigation Plan, the town of Sharon has made great efforts in implementing mitigation projects to help reduce the Town's overall vulnerability. For example, the Fire Department has installed dry hydrants throughout town and has worked with homeowners to request they install dry hydrants on their private properties as well. The Fire Department will continue to implement these mitigation measures, as there is still a need for additional dry hydrants throughout town. Additionally, since the 2015 Hazard Mitigation Plan, weather events (Flash Flood / Flood / Fluvial Erosion, Extreme Cold / Snow / Ice Storm / and Severe Weather) have become more frequent and more intense, due to climate change. Knowing climate change is impacting weather patterns and temperatures, the Planning Committee aimed to address the impacts of climate change in this plan. The 2021 Hazard Mitigation Plan priorities differed from the 2015 Hazard Mitigation Plan because of the progress of certain mitigation projects and the future impacts of climate change.

- **Flash Flood / Flood / Fluvial Erosion**

- Flooding may impact town roads and the village center, especially facilities for children, elders, and community emergency shelters. Under-sized bridges and culverts factor into the threat, with Sharon being home to many known, problematic choke points. Outdated flood hazard mapping also compounds existing threats. Furthermore, flood hazard mapping (Special Flood Hazard Areas) does not adequately encompass all areas that could be flooded, thus potentially making some residents too complacent regarding the threat. In addition, numerous homes, and public facilities, including the Sharon Fire Department, are in the 500-year floodplain and could be impaired by a major flood event. Other areas vulnerable to flooding include areas on Fay Brook Road, Vermont Route 14, and Vermont Route 132.

- **Extreme Cold / Snow / Ice Storm**

- Extreme cold, snow and or ice storms may impact the Town of Sharon and its residents. Power outages, downed lines, downed communication towers because of snow and ice storms could severely impede response efforts and could be especially harmful to vulnerable populations (e.g., the elderly and disabled).

- **Hazardous Materials Spill**

- Hazardous material spills can occur at any time without warning, although some accrete over a long period without anyone's knowledge (e.g., a leaking storage tank or residual waste from historic operations on Brownfield sites). Adjacent or immediate landowners (municipal, businesses, and private homeowners alike) are

anticipated to be most adversely impacted by contaminants at the outset of a spill. In the case of Sharon, impacts are expected to affect roadways, road infrastructure, and railways. Water wells may also be at risk. Hazardous Material storage facilities include Sharon Town Garage, Sharon Trading Post, Sharon Academy Middle School, and Sharon Town Office.

- **Severe Weather (Thunderstorm, Lightning, Tornado, High Wind, Hail and Microburst)**
 - Severe weather incidents can occur at any time with little to no warning. Damage to public and private property and municipal infrastructure can be extensive during severe weather incidents. Prolonged power outages and downed cellular communications can greatly hamper public and business services for indeterminate periods of time.

2021 Mitigation Actions

Mitigation Goals

1. To reduce injury and losses from the natural hazard of severe weather.
2. To reduce injury and losses from the natural hazard of flash flooding/flooding/fluvial erosion.
3. To reduce injury and losses from the natural hazard of extreme cold/snow/ice storms.
4. To reduce injury and losses from the hazard of hazardous material spills.

Town Plan Goals and Objectives Supporting Local Hazard Mitigation

- Selectboard should update the Local Emergency Operations Plan at least once a year or when key emergency management personnel change.
- The Selectboard should adopt a Hazard Mitigation Plan with assistance from the Threat Owl and establish procedures for continued maintenance of the Plan.
- The White River is a well-used scenic and recreational resource that is greatly valued by the town and its residents. It is therefore the policy of the Town:
 - to prohibit development within 150 feet of the top of the riverbank, consistent with the Town's 2009 Stream Geomorphic Assessment.
 - to encourage partnerships between landowners, non-profit organizations, and local and state governments to protect river access, to acquire buffer strips (riparian zones), and to encourage river conservation easements on important segments.
 - to develop appropriate land use at the town level and to foster the protection and management of the White River, its tributaries, and adjacent lands; and
 - to promote better public understanding and involvement in rivers as scenic and recreational assets through improved public education
 - To enhance and maintain wise use of flood hazard areas as open space, greenways, noncommercial recreation and/or agricultural land, and protect these natural resources.
- To retain the Town's eligibility for and participation in the National Flood Insurance Program.

- To maintain maps which reflect as accurately as possible the flood hazard areas, to assist in appropriate land use decisions.
- To identify and protect significant wetlands and the values and functions which they serve, and in so doing to minimize loss of such wetlands.
- To identify and encourage land use development practices that prevent or mitigate adverse impacts on significant wetlands.
- It is a policy of the Town that development within stream buffer areas is prohibited.
- It is the policy of the Town that a vegetated buffer will be maintained adjacent to the White River and all other streams, measured horizontally from the top of the stream bank.
- To extend the design, life, and function of the transportation system of the Town

Hazard Mitigation Strategies: Programs, Projects, and Activities

Vermont Emergency Management 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 aid and resources to towns interested in pursuing hazard mitigation projects.

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, Sharon's need to address the issue, the cost of implementing the strategy, and the availability of potential funding. A range of mitigation strategies was vetted by the committee, and those that were determined to be feasible are included in the table below. The committee also determined preparedness, response, and recovery strategies, which have been included in the table following mitigation actions. Natural Systems Protection actions were considered for inclusion but are currently not a high priority for the 2021 Hazard Mitigation Plan.

Strategies given a "High" prioritization indicate that it is either critical or potential funding is readily available. A "Medium" prioritization indicates that a strategy is less critical, or the potential funding is not readily available. A "Low" prioritization indicates that the timeframe for implementation of the action, given the action's cost, availability of funding.

The Town of Sharon understands that to apply for FEMA funding for mitigation projects that a project must meet FEMA benefit cost criteria. The Town must have a FEMA approved Local Hazard Mitigation Plan as well.

The following strategies will be incorporated into the Town of Sharon'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, subdivision regulations, and flood hazard/ fluvial erosion hazards (FEH) bylaws.

The Sharon Planning Commission will review and incorporate aspects of and mitigation strategies from this Hazard Mitigation Plan during the Sharon Town Plan current update. 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 shall also consider reviewing any future TRORC planning documents for ideas on future mitigation projects and hazard areas.

Hazard(s) Mitigated	Mitigation Action	Local leadership	Prioritization	Possible Resources	Time Frame
Severe Weather (High Wind)	Support Green Mountain Power Reliability Project (moving power lines to road corridors for easier servicing) to mitigate damage to utility and town infrastructure. (mitigation)	Selectboard	MEDIUM	Local private and public entities and Green Mtn Power	2021-2024 (Long-term mitigation goal)
	Complete a hazard tree inventory to ID trees in town highway rights-of-ways to be removed. This would complement GMP's Reliability Project and would mitigate damage to utility and town infrastructure (mitigation)	Road Crew, Town Tree Warden	MEDIUM	Local resources	2021 - 2023 (Long-term mitigation goal)
Flash Flood / Flood / Fluvial Erosion	Adopt river corridor regulations which incorporate VT ANR River corridor maps. These updated regulations will prevent further constructions of infrastructure in areas that are prone to flooding and damage. (Mitigation)	Planning Commission	HIGH	Local, Regional, and state: Town will need grant funds for technical assistance to complete this task	2022- 2023
	Upgrade culverts on Downer Road, TH16, which will allow greater volumes of water to be cleared therefore protecting town infrastructure from flood events. (Mitigation)	Road Foreman	HIGH	Local resources, VTRANS Structures grants	2021- 2022
	Adopt a notice of construction ordinance that serves as a trigger for flood insurance to reduce the risk	Planning Commission	Moderate	Local resources	2022 - 2023

Hazard(s) Mitigated	Mitigation Action	Local leadership	Prioritization	Possible Resources	Time Frame
	to future infrastructure. (Mitigation)				
	Provide public outreach on flood insurance opportunities and requirements for town residents. Greater public knowledge of flood insurance requirements will help reduce the damage to private infrastructure. (Mitigation)	Planning Commission and Selectboard	HIGH	Local resources	2021- 2022 (Long-term mitigation goal)
	Identify flood-safe transportation routes for primary traffic flow in the event of flooding, which will be cleared in a designated order of priority. Access and usage of priority routes will reduce the risk to health of residents during flooding. (Mitigation)	Fire Department and Road Crew	Medium	Local resources	2021- 2023 (On-going)
	Support the elevation or acquisition of vulnerable structures that are already in the flood hazard or erosion areas to improve structure safety, public safety, and lower insurance rates. (Mitigation)	Planning Commission	Medium	Local Resources; FEMA HMGP	2021- 2024 (On-going)
	Work with FEMA to conduct White River Watershed Mapping (mitigation)	Selectboard	High	Federal, State and Local resources	2022 - 2026
Structure Fire	Install additional dry hydrants in strategic locations around town to protect town infrastructure	Selectboard, Fire Department, Road Crew	Medium	Local Resources; Vermont Rural	2021 - 2024 (On-going)

Hazard(s) Mitigated	Mitigation Action	Local leadership	Prioritization	Possible Resources	Time Frame
	from structural fires. (Mitigation)			Fire Protection Task Force	
	Install a live hydrant in the village of Sharon to protect infrastructure in the village from damage from structural fires. (Mitigation)	Fire Department	Medium	Local resources, Vermont Rural Fire Protection Task Force	2021 - 2024 (On-going)
	Request site-specific dry wells be installed for isolated properties to protect them from structural fires. (Mitigation)	Fire Department	Low	Local resources	2021 - 2022 (On-going)
	Identify and map all water sources (i.e., ponds, lakes, etc.) in town and reach out to property owners about assisting FF actions (Mitigation)	Fire Department	Medium	Local Resources	2021 - 2023 (On-going)
Hazardous Materials Spill	Ensure that all emergency response and management personnel continue to receive HAZMAT Awareness training at a minimum. (Preparedness).	Fire Department	High	Local Resources	2021 - 2023 (On-going)
	Identify emergency access points to the railroad corridor in locations where access is presently difficult in the event of a derailment. Create and derailment incident pre-plan (Mitigation)	Fire Department w/ local and state entities	High	Local Resources	2021 - 2022
All hazards	Recruit a representative to regularly attend the Local Emergency Planning Committee (LEPC #12) meetings. (Preparedness)	Co- emergency management coordinators	medium	Local resources	2021 - 2022 (On-going)

Hazard(s) Mitigated	Mitigation Action	Local leadership	Prioritization	Possible Resources	Time Frame
	Study the need for a Hazard operation plan regarding the railroad and potential hazmat spills. Create Incident pre-plan for town and school (mitigation)	Fire Department	High	High	20021 - 022
	Develop a town methodology for consistently documenting infrastructure damage after weather events. (Response)	Selectboard/ Road Foreman	High	TRORC; local resources	2021 - 2023 (On-going)
	Conduct a power resiliency and redundancy study to determine how the town can become more power resilient (mitigation)	Regional Energy Committee/ Planning	2021	Local and regional resources	2021 - 2022
	Create a plan to distribute food to isolated residences during an emergency. Volunteers identified	IC Team	2021	Local resources	On-going
	Build comprehensive broadband access for all residences in the community. Coordinate with cell phone companies to get MiFi boxes (hotspots).	Selectboard	2021	Local resources	On-going
Disease Outbreak	Create Disease Outbreak Plan – attachment to EOP (preparedness)	Co-EM Managers / Selectboard	High	High	2023 - 2024

2021 Plan Appendix

Appendix A: Critical Stream Crossing

Critical crossings in the table below includes stream crossing structures on town highways that cross third order streams or larger. Headwater streams generally include first through third order. Third order was included as these headwater streams will have larger drainage areas and may have larger structures that are more difficult to replace and have a larger impact on the road network. Most of these are bridges.

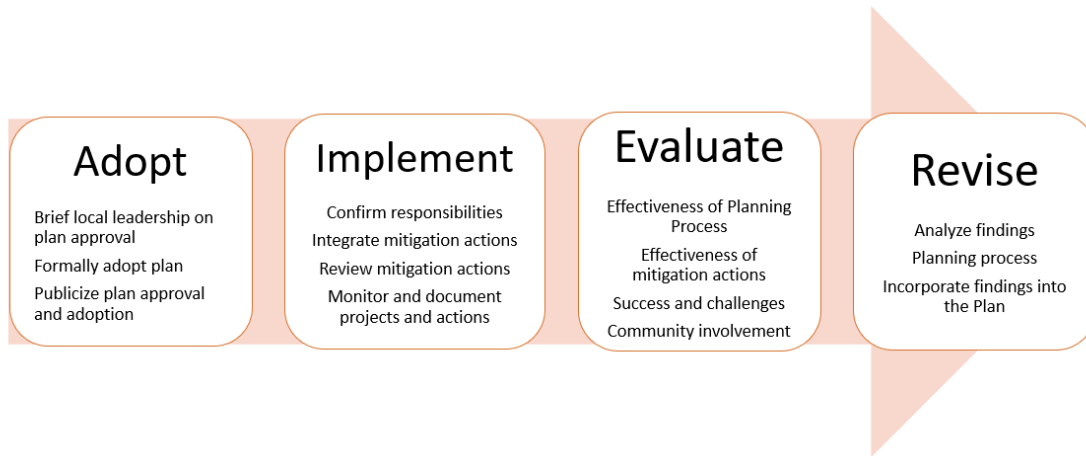
RDFLNAME	STRUCT_NUM	CATEGORY	STRUCTYPE	STRC_LBL	AOTCLASS	X_COORD	Y_COORD
BRIDGE LN	101417002714171	B	TL	B27	0	-72.3945	43.7548
BROAD BROOK RD	101417001314171	B	TL	B13	0	-72.4865	43.779
BROAD BROOK RD	101417001414171	B	TL	B14	0	-72.5014	43.7786
DOWNER RD	600017000114171	C	TU	TU1	0	-72.4157	43.8001
DOWNER RD	600017003914171	C	TU	TU39	0	-72.3707	43.815
FAY BROOK RD	401417001714171	B	TS	B17	3	-72.441	43.8146
FAY BROOK RD	401417002314171	B	TS	B23	3	-72.449	43.8122
FAY BROOK RD	401417002414171	B	TS	B24	3	-72.4612	43.7967
FAY BROOK RD	401417002514171	B	TS	B25	3	-72.4621	43.7959
FAY BROOK RD	401417002614171	B	TS	B26	3	-72.4642	43.7898
HIGHLAKE RD	400011000114171	C	TS	TS1	0	-72.4194	43.8126
KEYES RD	600015000114171	C	TU	TU1	0	-72.3779	43.8156
MOORE RD	401417002014171	B	TS	B20	3	-72.4835	43.7666
OGDEN LN	401417002814171	B	TS	B28	3	-72.4468	43.7925
QUIMBY MTN RD	401417001014171	B	TS	B10	3	-72.4447	43.7731
QUIMBY MTN RD	401417000314171	B	TS	B3	3	-72.4302	43.7754
QUIMBY MTN RD	401417000914171	B	TS	B9	3	-72.433	43.7751
RIVER RD	401417001214171	B	TS	B12	2	-72.4848	43.7859
RIVER RD	401417000814171	B	TS	B8	2	-72.4688	43.7792
RIVER RD	200177001514172	B	SL	B15	0	-72.4597	43.7822
ROUTE 132	401417000414171	B	TS	B4	2	-72.4207	43.8032
ROUTE 132	401417000514171	B	TS	B5	2	-72.4221	43.8029
ROUTE 132	401417000614171	B	TS	B6	2	-72.4259	43.8024
ROUTE 132	401417000714171	B	TS	B7	2	-72.4377	43.7981
ROUTE 132	600051003714171	C	TU	TU37	0	-72.4184	43.8054

The critical crossing in the table below includes significantly undersized structures, usually culverts, which were identified from the ANR-DEC stream geomorphic assessment survey with openness ratios less than 50%. This measure refers to when structure's width is less than half of the stream bank's full width. Several of these structures may have been damaged during TS Irene or other events and may have been replaced. The town, at some point, should look at these sites and assess their status and need for repair/upgrades.

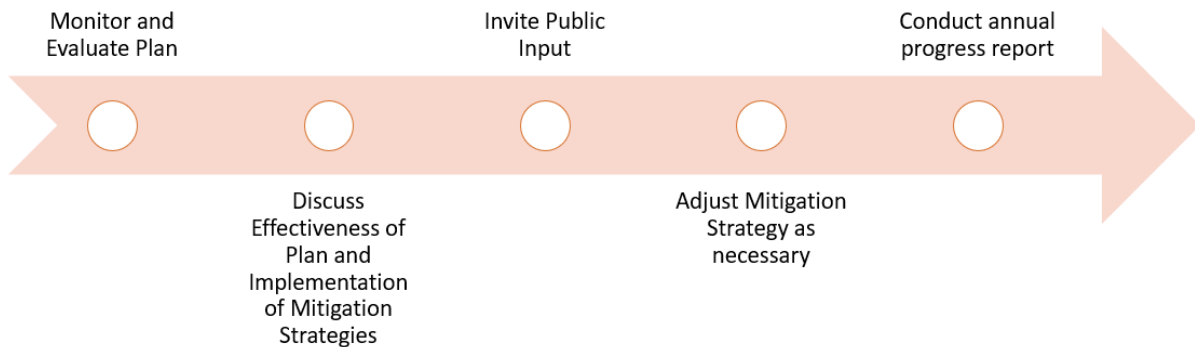
RDFLNAME	GROUP_TWO	CATEGORY	STRUCTYPE	STRC_LBL	X_COORD	Y_COORD	CUL_WIDTH	CUL_HEIGHT	CUL_LEN	OpennessR	ChannelWid
CHAPEL HILL RD	Y	C	TU	TU1	-72.3617	43.788	24	24	25	0.096	9
CHAPEL HILL RD	Y	C	TU	TU3	-72.3601	43.7926	24	24	25	0.07	9
CROSS RD	Y	C			-72.4065	43.8202	24	24	30	0.133333	9.3
DEER MEADOW LN	Y	C	TU	TU4	-72.4017	43.7641	18	18	20	0.080357	8
DOWNER RD	Y	C			-72.3814	43.8162	48	48	30	0.408333	12.3
DOWNER RD	Y	C			-72.3832	43.8159	48	48	28	0.4375	12.3
DOWNER RD	Y	C			-72.3745	43.8154	60	36	56	0.267857	10
FAY BROOK RD	Y	C			-72.4519	43.8116	48	24	60	0.145833	11
KRIVAK RD	Y	C			-72.3697	43.8142	36	36	26	0.393462	15.8
WHITE BROOK RD	Y	B	TS	B29	-72.4749	43.8026	4	3	50	0.2752	7

Appendix B: Five-Year Review and Maintenance Plan

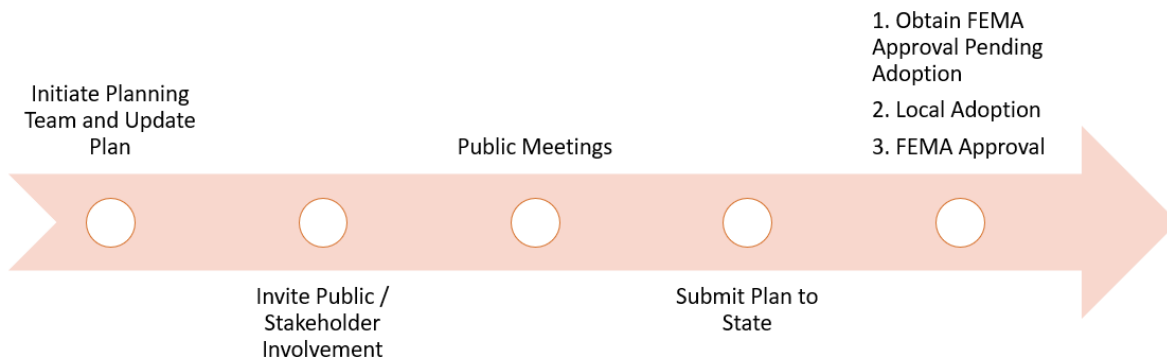
Overall Strategy:



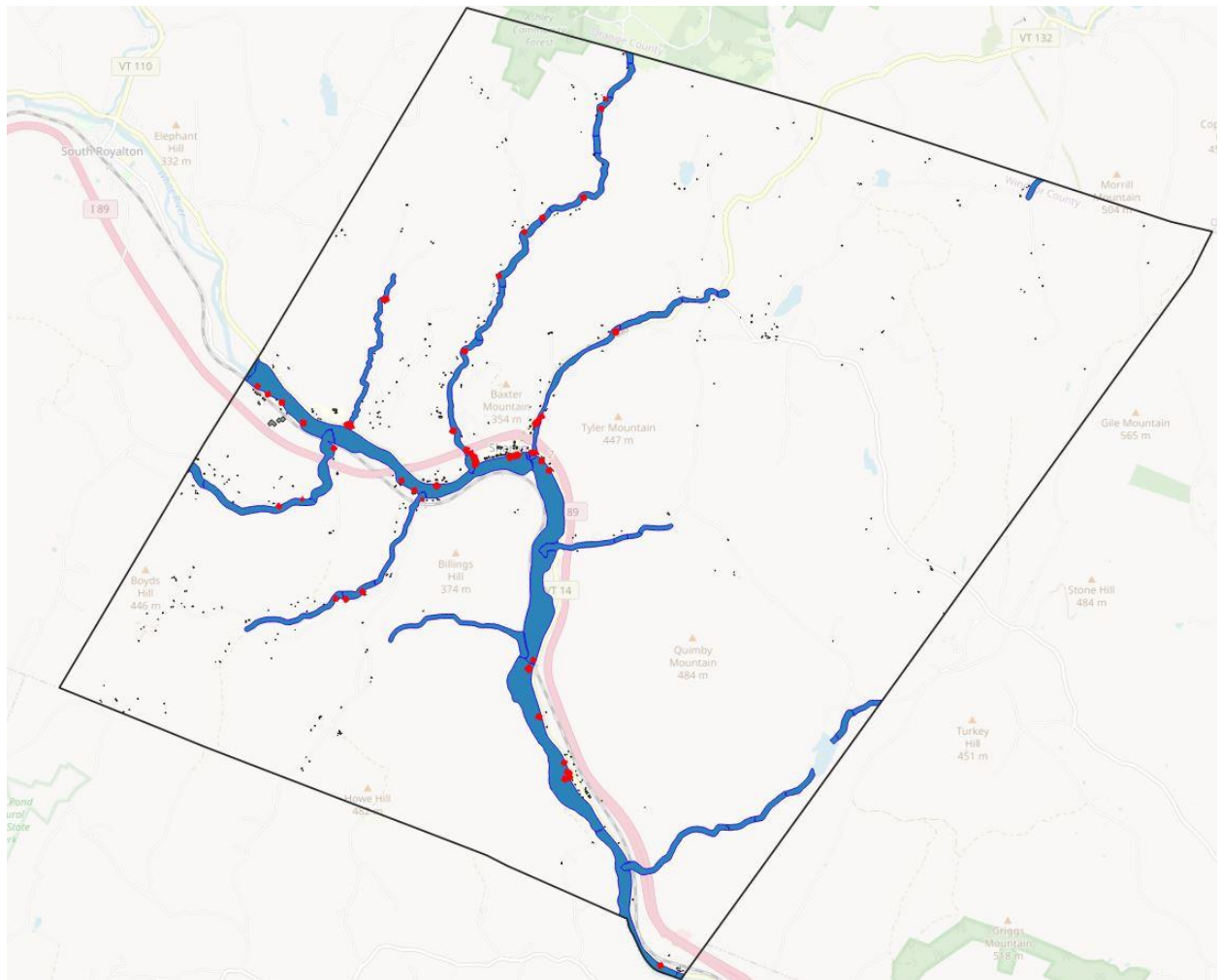
After Plan Adoption: Annually Implement and Evaluate



Fifth Year and After a Major or Federally Declared Disaster Directly Impacting the Town: Evaluate and Revise



Appendix C: Fluvial Building Intersect Map of Sharon



Appendix D: Fujita Tornado Intensity Scale

Category F0: Gale tornado (40-72 mph); light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.

Category F1: Moderate tornado (73-112 mph); moderate damage. The lower limit is the beginning of hurricane wind speed; peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads.

Category F2: Significant tornado (113-157 mph); considerable damage. roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.

Category F3: Severe tornado (158-206 mph); Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.

Category F4: Devastating tornado (207-260 mph); Devastating damage. Well-constructed houses leveled; structure with weak foundation blown off some distance; cars thrown and large missiles generated.

Category F5: Incredible tornado (261-318 mph); Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur.

Source: [National Oceanic and Atmospheric Administration \(NOAA\) - Outlook - Tornadoes - Fujita Tornado Intensity Scale](#)

END OF PLAN