

**Town of Williamstown, VT**  
Local Hazard Mitigation Plan Update  
May 29, 2012  
Prepared by Williamstown and CVPRC  
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## **1. Introduction**

The impact of expected, but unpredictable natural and human-caused events can be reduced through community planning. The goal of this Plan is to provide an all-hazards local mitigation strategy that makes the community of Williamstown more disaster resistant.

Hazard mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. Based on the results of previous Project Impact efforts, FEMA and State agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This Plan recognizes that communities have opportunities to identify mitigation strategies and measures during all of the other phases of emergency management – preparedness, response, and recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe and identify local actions that can be taken to reduce the severity of the hazard.

Hazard mitigation strategies and measures alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or land treatment, adapt to the hazard by modifying structures or standards, or avoid the hazard by preventing or limiting development.

## **2. Purpose**

The purpose of this Local Hazard Mitigation Plan is to assist Williamstown in recognizing hazards facing the region and their community and identify strategies to begin reducing risks from acknowledged hazards.

Williamstown strives to be in accordance the strategies, goals and objectives of the State Hazard Mitigation Plan, including an emphasis on proactive pre-disaster flood mitigation for public infrastructure, good floodplain and river management practices, and fluvial erosion risk assessment initiatives.

The 2012 Williamstown Local Hazard Mitigation Plan is an update of the 2009 plan. The plan has been reorganized and new sections have been added regarding:

- Plan Update Process
- Plan Maintenance
- Worst threat hazards
- Moderate threat hazards
- Updates of Local Areas of Concern Map
- Status update of 2009 mitigation strategies
- Identification of new mitigation strategies

## **3. Community Profile**

The Town of Williamstown is located on the northwest quadrant of Orange County and is bounded by the towns of Barre to the north, Washington to the east, Brookfield to the south,

and Northfield and Berlin to the west. Williamstown is located 6 and 15 miles from the twin Cities of Barre and Montpelier, respectively. As of the 2010 US Census, Williamstown had a total population of 3,389 people living in 1,379 housing units. The population has increased by 5% from the 2000 Census, while the number of occupied housing units has increased by 10%.

The majority of Williamstown is within the Winooski Watershed with the Stevens Branch of the Winooski River following Route 14 from Cutter Pond in the southern portion of the Town and exits the Town at the Barre Town boarder. Other principal rivers include Martin Brook and Cold Springs Brook, both of which are located in the northern portion of the Town and serve as tributaries of the Stevens Branch. A portion of the southern section of town drains into the White River basin.

Interstate 89 follows Williamstown's western border and according to the Town Plan Williamstown is anchored by two villages, Foxville and Williamstown. The terrain is hilly, broken and uneven keeping the two villages somewhat isolated from one another. *Foxville Village*, locally known as Graniteville (alt.1137), is located about 4 miles from Williamstown Village. Foxville Village borders the town of Barre. The village has no structural hub: post office, stores, municipal offices, community buildings, or common areas. The Foxville Village homes are compact. Forests in this area are shaped by discarded granite deposits from neighboring quarries. *Williamstown Village* center is well-situated just 6 miles south of Barre City and 13 southeast of Montpelier, which has plenty of shopping and services, including the Central Vermont Hospital. Williamstown Village (alt 872) sits along a large valley floor, a long winding hill road provides access to Interstate 89 via Route 64 (Williamstown Access Road) or by Route 14 that stretches from Barre through the village into Brookfield. Smooth-sloped hills rising on each side surround the village. Chartered in 1781, the village has managed to retain some of its historical appeal. The following old Main Street homes and buildings remain: the churches, Beckett Block, the Town Hall, Historical Society, and Feedstore building. Williamstown Village offers a mix of stores, library, homes, businesses, churches, and Town offices. Williamstown has a regionally approved Municipal Plan and does not have zoning bylaws. Williamstown does however have stand alone flood hazard bylaws adopted in 1990. A Geomorphic Assessment of the Dog River was completed and a Fluvial Erosion Hazard zone in the process of being developed. New development is primarily is scattered, low-density residential outside of the village center.

The Washington Electric Cooperative provides electricity to residences in the southern portion of the Town. The remaining sections of Williamstown are served by Green Mountain Power. According to the town plan much of the drinking water in the town comes from private wells plus a municipal systems services serves most of the dwelling units in the main part of the Williamstown Village and the schools, the source coming from a new well located at an upland well site just north of Mountain View Development off the Rood Pond Road. The village municipal sewer system serves the Town of Williamstown and serves 400 customers and the Graniteville systems serves 26 residents.

Fire coverage in Williamstown is provided by the Williamstown Volunteer Fire Department, which serves as a member of the Capital Fire Mutual Aid System. Water supplies for fighting fires are located at hydrants throughout the Village and beyond, along with a variety of dry hydrants. Ambulance service is provided by the Williamstown Ambulance, housed in the former Teen Center. The Ambulance provides regular backup service for neighboring towns, including Barre City, Barre Town, Brookfield and Northfield. Gordon Murray is the EMS Director.

Police protection is provided by the Orange County Sheriff's Department. In addition, the Vermont State Police provide law enforcement services as a part of their normal delivery of service.

The Town of Williamstown has a Rapid Response Plan dated 2006. The Town's primary emergency shelters consist of the Williamstown Elementary School, the Williamstown Middle/High School and the Lutheran Church.

The Williamstown Municipal Town Plan was adopted on October 2011 and includes goal polices and task regarding safe municipal facilities, protection of natural resources, managing water quality and run-off, managing solid waste, protecting citizen safety and transportation access management. The town does not have zoning regulations but has adopted Flood Bylaws in 1990 which limits the construction of structures within the National Flood Insurance Program's 100-year floodplain. At this time there is not major new development for Williamstown. The Vermont Agency of Natural Resources is in the process of undertaking geomorphic assessments on the Stevens Branch in Williamstown. The town may also consider including information related to fluvial erosion and related mitigation strategies based upon the draft river corridor plan and the Fluvial Erosion Hazard zone which is currently being drafted.

#### **4. Planning Process and Maintenance**

##### **4.1 Planning Process**

The Central Vermont Regional Planning Commission (CVRPC) coordinated the Williamstown Local Hazard Mitigation Plan process. CVRPC contacted the Town Manager, Jackie Higgins, and sent Town-Specific hazard mitigation material for review. After assessing the material, CVRPC staff held a meeting along with Williamstown Staff and residents on January 30, 2012 at the Williamstown High School. The Williamstown Hazard Mitigation Meeting focused on assessing past mitigation projects and compiling information on its current and future hazard mitigation programs, projects and activities.

Attendees included:

- Jacqueline Higgins – Town Manager
- Larry Hebert – Select board Chair
- Rodney Graham – Select board
- Francis Covey – Select board

- Bill Ashe -- Select board
- Paul Zeller -- Planning Commission
- Paige Emory -- Planning Commission

The meeting indicated that the Town is most vulnerable to dam failure, flash flood/flood/fluvial erosion, and hurricanes/severe storms/tropical storms. Previously identified hazards include flooding and hazardous materials. Williamstown is now focusing on flooding and fluvial erosion hazards as these events are the most common and most destructive. Hazardous materials are addressed in the Town's Rapid Response Plan.

Once the draft was updated, CVRPC placed a notice for public comments of the draft update on the CVRPC blog and newsletter, Williamstown School, Behind the Scenes, Municipal Website, Pump and Pantry, Times Argus and Randolph National Bank. The draft update was also available at Williamstown Municipal offices and by request from CVRPC for public review and comments from 2/7/2012 to 2/17/2012. The announcement of the draft update in the CVRPC newsletter reached over 150 people and businesses in the Region's 23 towns, including the adjacent towns of Northfield, Berlin, Barre Town, and Washington. No comments were received by CVRPC or Williamstown Staff. Public comments submitted, in the future, will be reviewed by the Town Manager (and CVRPC Staff dependent on funding) and attached as an appendix. In the future, the draft plan will be made available during Town Meeting Day and local meetings with State and local officials to allow for more public comment and review. After Approval Pending Adoption, the plan will go before the Select Board for adoption.

#### **4.2 Plan Update Process**

The Williamstown Local Hazard Mitigation Plan was originally adopted by the Town as an Annex to the Central Vermont Regional Local Hazard Mitigation Plan in October 2009 and received FEMA final approval in November 2009. The 2012 update is intended to be submitted as a single jurisdiction Local Hazard Mitigation Plan.

The current plan is an overhaul of the 2009 plan. Below is a list of the revisions that have been made from the past plan and the appropriate sections for reference. New hazards identified include hurricane/severe storms.

#### **General Updates**

- General reorganization/restructuring of the plan according to future FEMA/VEM checklist
  - New sections added – 4.2 Plan Update Process, 4.3 Plan Maintenance, 5.2 Dam Failure, Flash Flood/Flood/Fluvial Erosion, Hurricane/Severe Storms/Tropical Storms, 5.3 Avalanche/Landslide, High winds, Extreme Cold/Ice Storm/Winter Storm, Structure Fire
- Update of all data and statistics using 2010 Town Report and US Census Data (Section 3)
- Revaluation, identification and analysis of all significant hazards (Section 5)
- Acknowledgment of implemented mitigation strategies since 2009 – see matrix below (section 4.2)

- Identification of on-going mitigation projects and strategies – see Existing Mitigation Programs, Projects and Activities section (section 4.2)

**Hazard Analysis Updates (Sections 5 and 6)**

- New hazards added – Dam Failure, Hurricane/Severe Storm/Tropical Storm, High Wind, Extreme Cold/Ice Storm/Winter Storm, Structure Fire
- Updated location/vulnerability/extent/impact/likelihood table for each hazard to summarize hazard description (Section 5.1-5.3 – after each hazard)
- Review of Vermont Hazard Mitigation Plan (Section 5 – hazard analysis table)

**Maps**

- Review of 2009 Areas of Concern map and Local Hazards Analysis map – added additional flooding areas and forest layer

Preparation for the meeting included a review of Williamstown’s planning documents, including the Williamstown Municipal Plan (2011), Williamstown Rapid Response Plan (2006), and Stevens Branch/Jail Branch Watershed River Corridor Plan (2009). Information from these documents was incorporated into various sections of the mitigation plan.

The following chart provides an overview of Williamstown’s proposed 2009 hazard mitigation actions along with their current status. Planning mitigations strategies since the 2009 include the Town developing new flood hazard bylaws.

2009 Mitigation Action	2012 Status
Adopt and enforce Vermont Agency of Transportation’s “Codes & Standards for Roads”	Adopted in April 2011
Upgrade culverts to mitigate effects of flash flooding, especially those on South Hill, Graham Road, Winchester Hill, Baptist Street , Gilbert Road, Flint Road and Chelsea Road.	Upgrades on South Hill and Chelsea Road were completed
Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	The health officer is participating in all flood/NFIP related trainings

Identify and become knowledgeable of non-compliant structures in the community.	Town is still interested – would like to map structures
Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM.	Still interested -- could be responsibility of health officer
Prepare, distribute or make available NFIP, insurance and building codes explanatory pamphlets or booklets.	Pamphlets are available in Town Offices
Improve communications between Town Departments.	Communication has been improved due to changes in staff and committees – ongoing process
Create a directory of radio frequencies and establish protocol.	Fire Dept and EMS have established a list a frequencies and chain of command call list
Install a flash flood/ hazardous materials release/ all hazards warning system.	Using Fire Department alarm and looking into using school's "robo-call" system
Train town departments in hazardous materials response and clean-up protocols.	Performed by Fire Dept.
Train staff for active response in the event of a disaster.	Performed by Fire Dept and now use chain of command list members
Develop an all hazards public outreach campaign which includes: evacuation maps, explanation of warning systems.	Looking into integrating into next Town Plan update. Also interested in updating Rapid Response Plan/ Basic Emergency Operations plan and making information available on website.

### **Existing Programs, Projects and activities**

The ongoing or recently completed programs, projects, policies and activities are listed by strategy.

#### Community Preparedness Activities

- Rapid Response Plan, 2006
- Capital Equipment Plan
- Emergency Operations Plan, 09/1996
- Williamstown Safe Routes to School Team

#### Hazard Control & Protective Works

- Culvert Survey, 2010

#### Insurance Programs

- Participation in NFIP

#### Land use Planning/Management

- Town Plan, 2011
- Flood Hazard Bylaw, 1990
- Stevens/Jail Branch Corridor Plan - 2009

#### Protection/Retrofit of Infrastructure and Critical Facilities

- Fire Hydrants
- Dry Hydrants - 2
- Shelters – Fire Department, High School, Elementary School
- Backup generators at Shelters

#### Public Awareness, Training & Education

- CPR Trainings
- School Fire Safety Program

### **4.3 Plan Maintenance**

The Williamstown Local Hazard Mitigation Plan will be updated and evaluated annually at a January Select Board meeting along with the review of the Basic Emergency Operations Plan. Updates and evaluation by the Select Board will also occur within three months after every federal disaster declaration and as updates to town plan/zoning and river corridor plans come into effect. The plan will be reviewed by the Select Board, Town Manager and public at the above mentioned January Select Board meeting. CVRPC will help with updates or if no funding is available, the Town Clerk and Select Board will update the plan.



The process of evaluating and updating the plan will include continued public participation through public notices posted on the municipal website, notice in the municipal building, Times Argus, Randolph National Bank, Pump and Pantry, Williamstown Schools, Behind the Scenes Cafe and CVRPC newsletter and blog inviting the public to the scheduled Select Board (or specially scheduled) meeting. Additional stakeholders invited to the meeting will be the Williamstown Schools, Historical Society. Also invited in the future will be the VT Agency of Natural Resources (VT ANR), as they are able to provide assistance with NFIP outreach activities, models for stricter floodplain zoning regulations, delineation of fluvial erosion hazard areas, and other applicable initiatives. These efforts will be coordinated by the Town Manager.

Monitoring of plan progress, implementation, and the 5 year update process, will be undertaken by the Town Manager and Select Board. . Monitoring updates may include changes in community mitigation strategies; new town bylaws and planning strategies; progress of implementation of initiatives and projects; effectiveness of implemented projects or initiatives; and evaluation of challenges and opportunities. The plan is to be a "living document" to allow for new actions to be identified in the five year interim period and amended without formal re-adoption during regularly scheduled Select Board meetings. Prior to the end of the five year period, the plan will be undergo a formal update and submitted to FEMA for re-adoption following the process outlined the schematic found in the Attachments section.

Williamstown shall also incorporate mitigation planning into their long term land use and development planning documents. It is recommended the Town review and incorporate elements of the Local Hazard Mitigation Plan when updating the municipal plan and flood hazard/FEH bylaws. The incorporation of 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 future Stevens/Jail Branch planning documents for ideas on future mitigation projects and hazard areas.

**5. Community Vulnerability by Hazard**

**5.1 Hazard Identification**

The following natural disasters were discussed and the worst threat hazards were identified based upon the likelihood of the event and the community's vulnerability to the event. Hazards not identified as a "worst threat" may still occur. Greater explanations and mitigation strategies of moderate threat hazards can be found in the State of Vermont's Hazard Mitigation Plan.

Hazard	Probability <sup>1</sup>	Community Vulnerability <sup>2</sup>	Worst Threat
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<sup>1</sup> High likelihood of happening: Near 100% probability in the next year.  
 Medium likelihood of happening: 10% to 100% probability in the next year or at least once in the next 10 years.

Avalanche/ Landslide	Med	No	
Dam Failures	Low	Yes	X
Drought	Low	No	
Earthquake	Low	No	
Extreme Cold/Winter Storm/Ice Storm	High	No	
Flash Flood/Flood/Fluvial Erosion	Med	Yes	X
High Wind/Tornado	Med	No	
Ice Jam	Low	No	
Hurricane/Severe Storms	Med	Yes	X
Structure Fire	Med	No	
Water Supply Contamination	Low	No	
Wildfire/Forest Fire	Low	No	

The Town of Williamstown identified the following disasters as presenting the worst threat to the community:

- ..... Dam failure
- ..... Flash Flood/Flood/Fluvial Erosion
- ..... Hurricane/Severe Storms

The Town is interested in focusing a majority of mitigation efforts into reducing impacts from flooding, as the events occur most frequently, severely and cause the most damage to public and private infrastructure.

Non worst threat hazards include:

- Avalanche/Landslide
- High Wind/Tornado
- Extreme Cold/Ice Storm/Winter Storm
- Structure Fire

A discussion of each significant hazard is included in the proceeding subsections and a map identifying the location of each hazard is attached (See map titled *Areas of Local Concern*.) Each subsection includes a list of past occurrences based upon County-wide FEMA Disaster

<sup>1</sup> Low likelihood of happening: 1% to 10% probability in the next year or at least once in the next 100 years.

<sup>2</sup> Does the hazard present the threat of disaster (Yes)? Or is it just a routine emergency (No)?

Declarations (DR-#) if available, plus information from local records, a narrative description of the hazard and a hazard matrix containing the following overview information:

Hazard	Location	Vulnerability	Extent	Impact	Probability
Type of hazard	General areas within municipality which are vulnerable to the identified hazard.	Types of structures impacted	Magnitude of hazard – scale dependent on hazard	Dollar value or percentage of damages.	<p><u>High:</u> Near 100% probability in the next year</p> <p><u>Medium:</u> 10% to 100% probability in the next year or at least once in the next 10 years.</p> <p><u>Low:</u> 1% to 10% probability in the next year or at least once in the next 100 years.</p>

## 5.2 Worst Threat Hazards

### Dam Failure

The dam of concern within Williamstown is the Rood Pond Dam. The dam is privately owned and located outside the Village. The dam is about 15' high and 3' thick concrete. There is a considerable amount of silt behind the dam. The dam is privately owned and has had a State performed engineering study. During the May storm, water did come over the top of the dam. The Town is concerned that if the dam were to breach the library and roughly 12 private properties would be affected. There are no occurrences of the dam breaching. The impoundment area and extent of flooding is unknown due to lack of historical breaches. In the future, Williamstown can work with the State to determine impoundment areas and depths. Williamstown does experience damages from flooding at depths of 3 feet.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Dam Failure	Downstream of dam to Village area	Private property and public infrastructure – roads, culverts	Data Gap for inundation areas/depths; effects felt at 3' of flooding	\$500,000	Low

### Flash Flood/Flood/Fluvial Erosion

Recent History of Occurrences (presidential declarations and NCDC query search information. The closest flood gauge is located in Montpelier on the Winooski River, approximately 15 miles downstream):

Date	Event	Location	Extent
8/28/2011	Flood/Tropical Storm	Statewide, Williamstown	Montpelier Flood gauge at 19.05 feet (flood stage is at 15 feet) DR 4022
5/27/2011	Flash Flood	Williamstown	Montpelier flood gauge at 17.59 feet, 3-5" of rain DR 4001
8/02/2008	Flash Flood	Williamstown	No extent data
7/11/2007	Flash Flood	Williamstown	3-6" of rain in 2 hrs, DR 1715
12/17/2000	Flood	County Wide	3" of rain, \$1 M in damages
9/16/1999	Tropical Storm Floyd	County Wide	Montpelier flood gauge at 9.30 feet, 5-7" rain county wide DR 1307
6/27/1998	Flash Flood	County Wide	\$5M in damages, 3-6" rain across county DR 1228
1/19/1996	Flood; ice jam	County Wide	Montpelier flood gauge at 14.64 feet
8/4/1995	Flood	County wide	Montpelier flood gauge at 6.94 feet; \$1.5M damages county wide
8/5/1976	Flood	County Wide	Montpelier flood gauge at 12.31 feet DR 518
6/30/1973	Flash Flood	Williamstown	Montpelier flood gauge at 17.55 feet DR 397
9/22/1938	Flood, Hurricane	County Wide	Montpelier flood gauge at 14.11 feet
11/03/1927	Flood	County Wide	Montpelier flood gauge at 27.10 feet

Flooding/flash flooding/fluvial erosion is Williamstown's most commonly recurring hazard. Flooding is the overflowing of rivers, streams, drains and lakes due to excessive rain, rapid snow melt or ice. Flash flooding is a rapidly occurring flood event usually from excessive rain. Fluvial erosion is the process of natural stream channel adjustments. Fluvial erosion causes erosion of sediment in some areas, while causing aggradation of sediment in other. Fluvial erosion processes occur more quickly and severely during flood events.

Specific extent data for flood levels in Williamstown is lacking as the closest flood gauge is located in Montpelier. During Tropical Storm Irene, the Montpelier flood gauge was 4 feet above flood stage. The worst flooding event in Williamstown's history was the 1927 event; however, exact data from that event is not available. In 1927 event, the Montpelier flood gauge

was at 27.10 feet; however, since the 1927 flood a number of flood control dams have been installed in the region to prevent the same flooding extent. Lesser but more regular flooding occurs in Williamstown, with generally 1-2 feet of water in areas designated on the areas of concern map. Williamstown can expect to experience damages at flood depths of 3 feet. Most flooding is of the flash flooding nature. For the next update, Williamstown can better monitor flood waters by having individuals record flood water levels locally and submit to the Town Manager for the Town's records.

The principal bodies of water within Williamstown are: the Stevens Branch of the Winooski River, Martin Brook, Cold Springs Brook, Cutler Pond, Limehurst Pond, Staples Pond and Rood Pond. While the Steven's Branch dominates the drainage pattern, flowing north to the Winooski River, the southern section of the Town is drains into the White River Watershed.

The majority of the Town's National Flood Insurance Program (NFIP) designated 100-year floodplain is located along the Steven's Branch. Based on the results of overlaying the FIRM flood maps with the location of the E911 points, there exist 79 properties in the Town which are vulnerable to potential flooding. The estimated loss for a severe flooding event for all properties located within the Town's 100-year floodplain is approximately \$9,930,300. This flood loss potential represents 4.75% of the total properties within Williamstown.

Williamstown has 529 properties located in the fluvial erosion hazard zone. The total potential loss for these properties is \$66,495,300 which represents 2% of the total land area in Williamstown.

Williamstown does participate in the National Flood Insurance Program. According to the Federal Emergency Management Agency's National Flood Insurance Program Williamstown does not have any repetitive loss properties. Williamstown has 12 active policies for a total coverage of \$1,456,000. The Town is interested in updating their flood hazard regulations. The Health Officer is responsible for enforcement of the regulations.

In recent years, such as the flood events of July 11 and 12, 2007, July 21 through August 12, 2008, steady rains and saturated water tables caused extensive damage to the southern part of Town. Sections of South Hill, Graham Road, Winchester Hill, Baptist Street and Chelsea Road were severely damaged and the not passable. The damage to these areas was in excess of \$480,000.

The most recent damaging floods were in May and August (TS Irene) of 2011. Williamstown suffered the most damage in the May flood event when 3-5" of rain fell over the area and caused severe flash flooding. The following roads were damaged (repair costs included):

Falls Bridge Road - \$23064.20	Rood Pond Road - \$6,082.08
South Hill Road - \$11,304.78	Baptist Street - \$2,265.29
Gilbert Road - \$6,287.78	Stone Road - \$2,1321.25
Winchester Hill Road - \$4,122.20	Brush Hill Road - \$2,214.32

Flint Road - \$35,954.56  
 Robar Road - \$7,997.82

Brockway Hill Road - \$24,988.19  
 McGlynn Road - \$8,199.91

The total damages from the May flood event cost about \$150,000. During Tropical Storm Irene, Williamstown did not suffer as much damage as the May floods. Flooding and damage occurred on Flint Road – (\$6,733.09) and Stone Road (\$1,890.69).

As a result of these past events, the Town is interested in updating flood hazard bylaws and applying for HMGP funds to repair culverts on Flint Road, Gilbert Road and Winchester Road.

The following matrix provides an overview of the hazard:

Hazard	Location	Vulnerability	Extent	Impact	Probability
Flood/ Flash Flood/ Fluvial Erosion	See lists above	Infrastructure, roads, private property	5-7" of rain during Irene, 3-5" during May 2011 event Data gap for localized flooding levels	\$640, 000 + public infrastructure damages Floodplain properties - \$9,930,300	Medium

**Hurricane/Severe Storms/Tropical Storms**

Recent History of Occurrences (presidential declarations and NCDC query search information. The closest flood gauge is located in Montpelier, approximately 15 miles downstream):

Date	Event	Location	Extent
8/28/2011	TS Irene	Williamstown, Statewide	~6" rain, Montpelier flood gauge at 19.05 feet (flood stage is at 15 feet) DR 4022
5/27/2011	Severe Storm, flash flooding	Williamstown, County Wide	1" hail, 3-5" of rain, 50 knot winds, DR 4001, Montpelier gauge at 17.59 feet
7/21/2008	Severe storms, flooding	Williamstown, County Wide	3-5" of rain
8/25/2007	Severe Storms	Williamstown, County Wide	55 knot wind gusts, 1" hail
7/9/2007	Severe Storms, hail, flooding	Williamstown, County Wide	1"-2.75" hail, DR 1715
6/19/2006	Severe storms	Williamstown, County Wide	50 knot winds, downed trees and power lines














8/1/2005	Severe Storm	Williamstown, County Wide	1" hail, 55 knot winds
9/16/1999	Tropical Storm Floyd	Williamstown, Statewide	Tropical Storm , DR 1307, Montpelier flood gauge at 9.30 feet
6/27/1998	Severe Storms	Williamstown, County Wide	3-6" rain across county, DR 1228, not a historical crest in Montpelier
5/29/1998	Severe Storms	Williamstown, County Wide	50 knot winds, heavy rains, downed trees and power lines
2/2/1998	Severe Ice Storm	Williamstown County Wide	Destructive Ice Storm Damage
7/15/1997	Severe Storms	Williamstown, County Wide	\$500k in damages, 3-5" of rain
6/7/1982	Severe Storms	New England	14" of rain, \$276 M damages
8/1976	Hurricane Belle	Williamstown, Statewide	Gale force winds, 2 deaths
7/3/1964	Hail	Williamstown, County Wide	1.5" hail
9/22/1938	Hurricane	Williamstown, Statewide	Category 1 force winds

Hurricanes and tropical storms are violent rain storms with strong winds that have large amounts of rainfall and can reach speeds up to 200 mph. Hurricane season is between the months of June and November. These types of storms originate in the warm waters of the Caribbean and move up the Eastern seaboard where they lose speed in the cooler waters of the North Atlantic. A severe thunderstorm is a thunderstorm that contains any one or more of the following three weather conditions: hail that is 3/4 of an inch or greater in diameter, winds 58 miles per hour or greater, and/or tornadoes. Severe storm events can occur late spring and early summer as temperatures increase in the summer season. The frequency and intensity of hurricanes, tropical storms, and severe storms is expected to increase with climate change.

Similar to flooding, the extent of severe storms is not well documented in the Williamstown. The impact of storms is usually flood related. See extent for flooding in the above flood section. Wind impacts are Town wide. Wind extent from storms is not well documented as there is no monitoring station in Williamstown. Estimates for wind are gathered from county wide data off the NCDC website. An estimate of the worst anticipated wind extent in Williamstown based on past occurrences would be Category 1 force hurricane winds and H8 hail according to the Hail/Torro scale. At a Beaufort number of 8-9 and Hail sized H4/5, Williamstown may start to experience high wind and hail impacts and damages. In the future, Williamstown could consider installing a monitoring station to better gather data for wind events. Wind events can

be recorded using the Beaufort, Saffir Simpson. Hail events can be recorded using the Torro/Hailstorm Scale.

## Beaufort Scale

Beaufort number	Wind Speed (mph)	Seaman's term		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

### Saffir-Simpson Scale for Hurricane Classification

Strength	Wind Speed (Kts)	Wind Speed (MPH)	Pressure (Millibars)	Pressure
Category 1	64-82 kts	74-95 mph	>980 mb	28.94 "Hg
Category 2	83-95 kts	96-110 mph	965-979 mb	28.50-28.91 "Hg
Category 3	96-113 kts	111-130 mph	945-964 mb	27.91-28.47 "Hg
Category 4	114-135 kts	131-155 mph	920-944 mb	27.17-27.88 "Hg
Category 5	>135 kts	>155 mph	919 mb	27.16 "Hg

### Tropical Cyclone Classification

Tropical Depression	20-34kts
Tropical Storm	35-63kts
Hurricane	64+kts or 74+mph



### Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The impacts associated with hurricanes and severe storms are mainly associated with flooding impacts. Damage locations from TS Irene and the May 28, 2011 storm events are outlined in the Flood/Flash Flood/Fluvial Erosion hazard section. There were no high wind impacts associated with the 2011 events.

In 1999, Tropical Storm Floyd passed through Vermont. The primary impact from Floyd was downed trees and power lines due to high winds. Approximately 3,000 people were without

power in the Central Vermont Region. About 7" of rain fell over Williamstown; however, flood impacts were offset by drought conditions from earlier in the year.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Hurricane / Tropical/ Severe Storms	Town Wide for Wind impacts, See flood/flash flood /fluvial erosion hazard analysis section	Large trees, power lines, culverts/ bridges	6" rain Tropical Storm Irene in 24 hrs (8/28/2011), 5-7" rain Tropical Storm Floyd in 24 hrs (9/16/1999), Cat. 1 Hurricane 1938	\$150,000 from Spring 2011 events	Medium

### 5.3 Moderate Threat Hazards

#### Avalanche

An avalanche is the sliding of a large mass of snow down the side of a mountain or cliff. Avalanches can be caused by rainstorms, alternate freezing or thawing and/or by the steepening of slopes by erosion or human modification.

The extent of avalanches can be measured using the European avalanche table. The worst avalanche Williamstown could experience would be rated a 3 (medium) on the scale. Williamstown could experience damages from avalanches rated a 2.

Size	Run out	Potential Damage	Physical Size
1 - Slough	Small snow slide that cannot bury a person, though there is a danger of falling.	Relatively harmless to people	length <50 m volume <100 m <sup>3</sup>
2 - Small	Stops within the slope.	Could bury, injure or kill a person.	length <100 m volume <1,000 m <sup>3</sup>
3 - Medium	Runs to the bottom of the slope.	Could bury and destroy a car, damage a truck, destroy small buildings or break trees.	length <1,000 m volume <10,000 m <sup>3</sup>
4 - Large	Runs over flat areas (significantly less than 30°) of at least 50 m in length, may reach the valley bottom.	Could bury and destroy large trucks and trains, large buildings and forested areas.	length >1,000 m volume >10,000

Williamstown is primarily concerned with avalanches in the gulf along route 14. Avalanches occur in this area after large snow storms annually during the winter. This stretch of road has known to be closed after large storms until snow plows are able to clear the road. There is no formal documentation of an avalanche; however, the road foreman and town clerk recall an incident in the winter of 1992 where an avalanche covered Route 14 with 20 feet of snow. There was concern of people being trapped under the snow, but no one was found. The Town is concerned an avalanche will hit a motor vehicle. In the future, Williamstown can better document the occurrences and extent of avalanches in the Route 14 gorge using photographs and reports.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Avalanche	The "gulf" – Route 14	Roads, trees above, motor vehicles	3 on the scale, snow 20 feet deep in the Rte 14 gorge	\$50,000 in road plowing costs	Medium

### High Wind

High wind is defined as an event with sustained wind speeds of 40 m.p.h. or greater lasting for 1 hour or longer or an event with winds of 58 m.p.h. or greater for any duration. Thunderstorms can generate high winds and down hundreds of large trees within a few minutes. The State can also experience tornadoes, which are capable of damaging or destroying structures, downing trees and power lines and creating injuries and death from collapsing buildings and flying objects.

A tornado is a mobile, destructive vortex of violently rotating winds having the appearance of a funnel-shaped cloud and advancing beneath a large storm system. The extent of tornados can be measured using the Enhanced Fujitas scale. An estimate of the worst tornado extent anticipated by Williamstown is an EF0. Williamstown may start to experience damage from wind at wind rated an 8 on the Beaufort Scale (see hurricane/severe storms/tropical storm section).

Enhanced Fujita (EF) Scale		
Enhanced Fujita Category	Wind Speed (mph)	Potential Damage
EF0	65-85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.

EF2	111-135	<b>Considerable damage.</b> Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	<b>Severe damage.</b> Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	<b>Devastating damage.</b> Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
	>200	<b>Incredible damage.</b> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur.

source: [http://en.wikipedia.org/wiki/Enhanced\\_Fujita\\_Scale](http://en.wikipedia.org/wiki/Enhanced_Fujita_Scale)

Tornadoes are less common than hail storms and high winds, but have occurred throughout Vermont. Across the State, however, 34 tornadoes have been recorded between 1950 and 1999, injuring 10 people and causing over \$8.4 million dollars in estimated property damage. Nearly all of these incidents occurred from May through August with most of occurring in the afternoon. Occurrences include:

Date	Event	Location	Extent
5/27/2011	Hail/Winds	Williamstown/County Wide	50 knot winds and hail
7/17/2009	Tornado	Williamstown	EF0 tornado
8/25/2007	Thunderstorm Winds	Williamstown	61 knot winds
6/02/2007	Thunderstorm Winds	Williamstown/East Barre	55 knot winds
8/02/2006	Thunderstorm Winds	Williamstown	60 knot winds
8/03/2004	Thunderstorm Winds	Williamstown	52 knot winds
7/21/2003	High Wind	Williamstown	60 knot winds

On July 17, 2009 an EF0 tornado touched down in Williamstown. The tornado took the roof off a barn and tore down trees and power lines.

Hazard	Location	Vulnerability	Extent	Impact	Probability
High Winds	Town Wide	Power lines, trees, structures	EFO on 7/17/2009	\$100,000	Medium

**Extreme Cold/Winter Storm/Ice Storm**

History of Occurrences (from NCDC website):

Snow and/or ice events occur on a regular basis during the winter months. Recent significant events have included:

Date	Event	Location	Extent
3/6/2011	Winter storm	Williamstown, County wide	12-18" of snow, 10,000 customers lost power statewide
2/23/2010	Winter Storm	Williamstown, County wide	20" of snow and 50,000 customers lost power statewide
2/22/2009	Winter Storm	Williamstown, County Wide	16" of snow, 30 mph wind gusts
2/1/2008	Winter storm	Williamstown, County wide	3-7" of snow and ice ¼-1/2" thick, 50 mph wind gusts
2/14/2007	Winter storm	Williamstown, County wide	22" of snow
2/14/2006	Winter storm	Williamstown, County Wide	30" of snow
1/4/2003	Winter storm	Williamstown, County wide	19" of snow
3/5/2001	Winter storm	Williamstown, County wide	15-30" of snow
12/31/2000	Winter storm	County wide	10" of snow
1/15/1998	Winter storm	Williamstown, County wide	10-12" snow (not a DR in Washington County)
12/29/1997	Winter storm	Williamstown, County wide	21" of snow
12/7/1996	Winter Storm	Williamstown, County wide	12" of snow
3/21/1994	Winter storm	Williamstown, County Wide	5-11" of snow
11/1/1993	Winter storm	Williamstown, County wide	15" of snow
1/3/1993	Freezing Rain	Williamstown, Statewide	¼-1/2" freezing rain

A winter storm is defined as a storm that generates sufficient quantities of snow, ice or sleet to result in hazardous conditions and/or property damage. Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is similar to hail only smaller and can be easily identified as frozen rain drops (ice pellets) that bounce when hitting the ground or other objects. Sleet does not stick to wires or trees, but in sufficient depth, can cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surfaces coating the ground, trees, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. Periods of extreme cold tend to occur with these events.

The physical impacts of winter storms are city wide due to the expansive nature of winter storms. For the next plan update, Williamstown will more closely monitor winter storms to determine the worst impacts possible on the City. Based on past occurrences, the worst anticipated winter weather Williamstown could experience would be 2-3' in 24 hrs of snow with more at higher elevations and several days of power outages. Using the wind chill scale and historical information, the estimate for extreme cold and windchill is  $-60^{\circ}$  Fahrenheit. The worst recent storm was in Feb. 2006 and after that the Blizzard of 1888. Scales to measure the extent of winter storms are below.

**Heavy snowfall** – Williamstown is significantly affected when they experience an accumulation of 7 inches or more of snow in a 12-hour period or 13 inches or more in a 24-hour period.

**Blizzard** – Williamstown is significantly affected when they experience sustained wind speeds in excess of 40 mph accompanied by heavy snowfall or large amounts of blowing or drifting snow.

**Ice storm** – Williamstown is significantly affected when they experience ice accumulations of  $\frac{1}{4}$ " or greater.

#### Wind Chill Extent Scale

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# NWS Windchill Chart



		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times:  30 minutes  10 minutes  5 minutes

**Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)**  
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

One of the major problems associated with ice storms is the loss of electrical power. Major electric utility companies have active, ongoing programs to improve system reliability and protect facilities from damage by ice, severe winds and other hazards. Typically, these programs focus on trimming trees to prevent encroachment of overhead lines, strengthening vulnerable system components, protecting equipment from lightning strikes and placing new distribution lines underground.

Other major problems include closed roads and restricted transportation.

By observing winter storm watches and warnings, adequate preparations can usually be made to lessen the impact of snow, ice and sleet, and below freezing temperature conditions on the Town of Williamstown. Providing for the mass care and sheltering of residents left without heat or electricity for an extended time and mobilizing sufficient resources to clear broken tree limbs from roads, are the primary challenges facing community officials. Williamstown should plan and prepare for these emergencies. That planning and preparedness effort should include the identification of mass care facilities and necessary resources such as cots, blankets, food supplies and generators, as well as debris removal equipment and services. Williamstown High School, Elementary School and Fire Department are the town shelters. Additional large shelters are located in the neighboring town of Williamstown.

Hazard	Location	Vulnerability	Extent	Impact	Likelihood
Winter Storm/Ice Storm	Town Wide	Utilities, trees, roads, old/under insulated structures	12+” of snow on March 2011 event; 22+” on Feb. 2006 event in 24 hrs	additional sheltering/ plowing/ emergency services costs for town - \$15,000	High

### Structure Fire

A quarter of the calls received in 2010 by Williamstown Fire Department were fire related incidents – chimney, stove pipe and oven fires. Although many structures in Williamstown are less than 100 years old, many residents heat their homes with wood or pellet burning stoves. The remoteness and distance from fire and emergency services of many homes also increases the likelihood of a home being completely, opposed to partially, destroyed by a fire. Fire hydrants are available within the Village area. The Town is also concerned about the plastics plant in the industrial park adjacent to the senior housing complex. To date there have been no large structure fires.

Hazard	Location	Vulnerability	Extent	Impact	Probability
Structure Fire	Town wide	Wood structures especially older than 100 yrs, homes that use wood burning stoves for heat	Data Gap	\$150, 000 per home based on median grand list value	Medium

## 6. Mitigation

### 6.1 Williamstown Town Plan (2011) Polices that Support Local Hazard Mitigation

- Ensure that the Town and villages are safe and highly accessible to all our citizens and visitors. (Community Facilities and Service Goal)
- To protect environmental quality by minimizing impact from human activity and planning and maintaining natural areas that contribute to health, scenic area, and quality of life of the community and people in Williamstown. (Natural Resources and Features Goal)



- To manage the quality and quantity of storm-water runoff in order to avoid property damage and negative impacts on surface and groundwater. (Natural Resources and Features Goal)
- To protect the safety and privacy of residents (Portrait of the Williamstown People Goal)
- To protect the quality, quantity, pressure, and source of water for the safety of its residents and environment (Community Utilities and Infrastructure Plan Goal)
- To increase the safety and perception of safety and choices in transportation including non-motorized users, walkers, horses, that share the use our streets. (Transportation Goals)

The goal of this hazard mitigation plan is:

- To take actions to reduce or eliminate the long-term risk to human life and property from dam failure, flash flood/flood/fluvial erosion, and hurricane/severe storm/tropical storms.

Specific hazard mitigation strategies related to goals of the Plan include:

- Ensure existing and future drainage systems are adequate and functioning properly
- Preserve and prevent development in areas where natural hazard potential is high
- Ensure that all residents and business owners are aware of the hazards that exist within Williamstown and ways they can protect themselves and insure their property
- Ensure that emergency response services and critical facilities functions are not interrupted by natural hazards

## 6.2 Identified Hazard Mitigation Programs, Projects & Activities

Hazard mitigation programs, projects and activities that were identified for implementation at the Williamstown Local Hazard Mitigation meeting:

Hazards	Action	Local Leadership	Prioritization (High, Med)	Possible Resources	Time Frame
Dam Failure	Improve communications with State regarding Rouleau Pond Dam	Select Board, ANR	Med	Town Funds	2-3 years
Dam Failure	Develop inundation models for Rood Pond in coordination with the State	Select Board, ANR, CVRPC	Med	Town Funds, MPG	3-4 years

Dam Failure, Flooding, NFIP Compliance	Improve, amend and update flood hazard bylaws to limit development in inundation areas	SB, ANR, CVRPC	High	Town Funds	2 years
Flooding, Severe Storms	Upgrade and expand damaged culverts on Upper & Lower Flint Rd	Select Board, Road Foreman	High	HMGP	1-2 years
Flooding, Severe Storms	Upgrade and expand damaged culverts on Winchester Rd	Select Board, Road Foreman	High	HMGP	1-2 years
Flooding, Severe Storms	Upgrade and expand damaged culverts on Gilbert Rd	Select Board, Road Foreman	High	HMGP	1-2 years
Flooding, Severe Storms	Upgrade and expand damaged culvert on Rte 14/Chelsea Road	Select Board, Road Foreman	High	HMGP, Town, VTrans	2years
Flooding, Severe Storms	Upgrade and expand box culvert on McGlynn Rd	Select Board, Road Foreman	Med	HMGP, Town, VTrans	2-3 years
Flooding, Severe Storms	Upgrade and expand bridge on Brush Hill Road	Select Board, Road Foreman	Med	HMGP, Town, VTrans	2-3 years
Flooding, Severe Storms	Project # 1, 4 and 7 from the Stevens Branch Corridor Plan (see attachments)	SB, Town Manager, Town Engineer, ANR	Med	Town funds, USDA, EPA	4 years
Winter Storms/ Extreme Cold/ Ice Storms	Provide training to residents and sensitive populations on how to insulate homes (pipes, attics) for extreme cold spells	SB, PC, Fire Dept	Med	EMGP	2 years
Winter storms/ extreme cold/ice storms, hurricane/ tropical storms/	Provide looped distribution service or other redundancies in the electrical service to critical facilities	Fire Dept, SB	Med	General Funds, EMGP, DPIG	3-4 years

severe storms, high wind/ tornadoes					
NFIP Compliance	Work with elected officials, the State and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training and education	Planning Commission, ANR, Select Board, Road Foremen	Med	Town, USDA	2-3 years
NFIP Compliance, flooding	Identify and become knowledgeable of non-compliant structures in the community.	Select Board, ANR, Planning Commission	Med	Town	2-3 years
Emergency Preparedness	Update Rapid Response/Emergency Operations plan	Fire Department, Select Board	High	Town Funds	2 years

VEM also emphasizes a collaborative approach to achieving mitigation on the local level, by partnering with ANR, VTrans, ACCD, Regional Planning Commissions, FEMA Region 1 and other agencies, all working together to provide assistance and resources to towns interested in pursuing mitigation projects and planning initiatives.

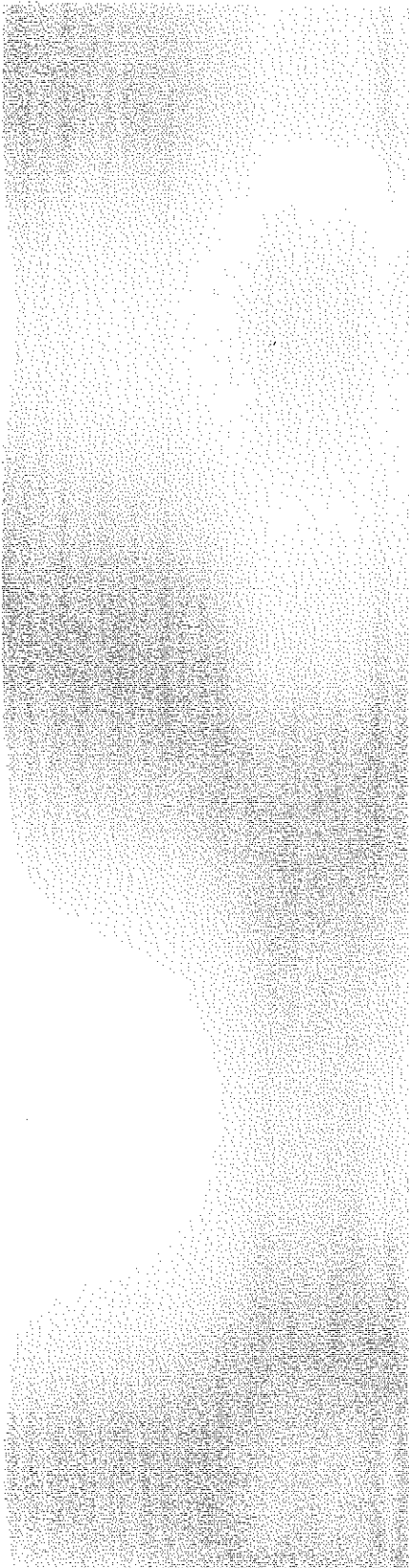
The mitigation activities are listed in regards to local leadership, possible resources, implementation tools, and prioritization. Prioritization was based upon the economic impact of the action, the Community's need to address the issue, the action's cost, and the availability of potential funding. The action's cost was evaluated in relation to its benefit as outlined in the STAPLEE guidelines.

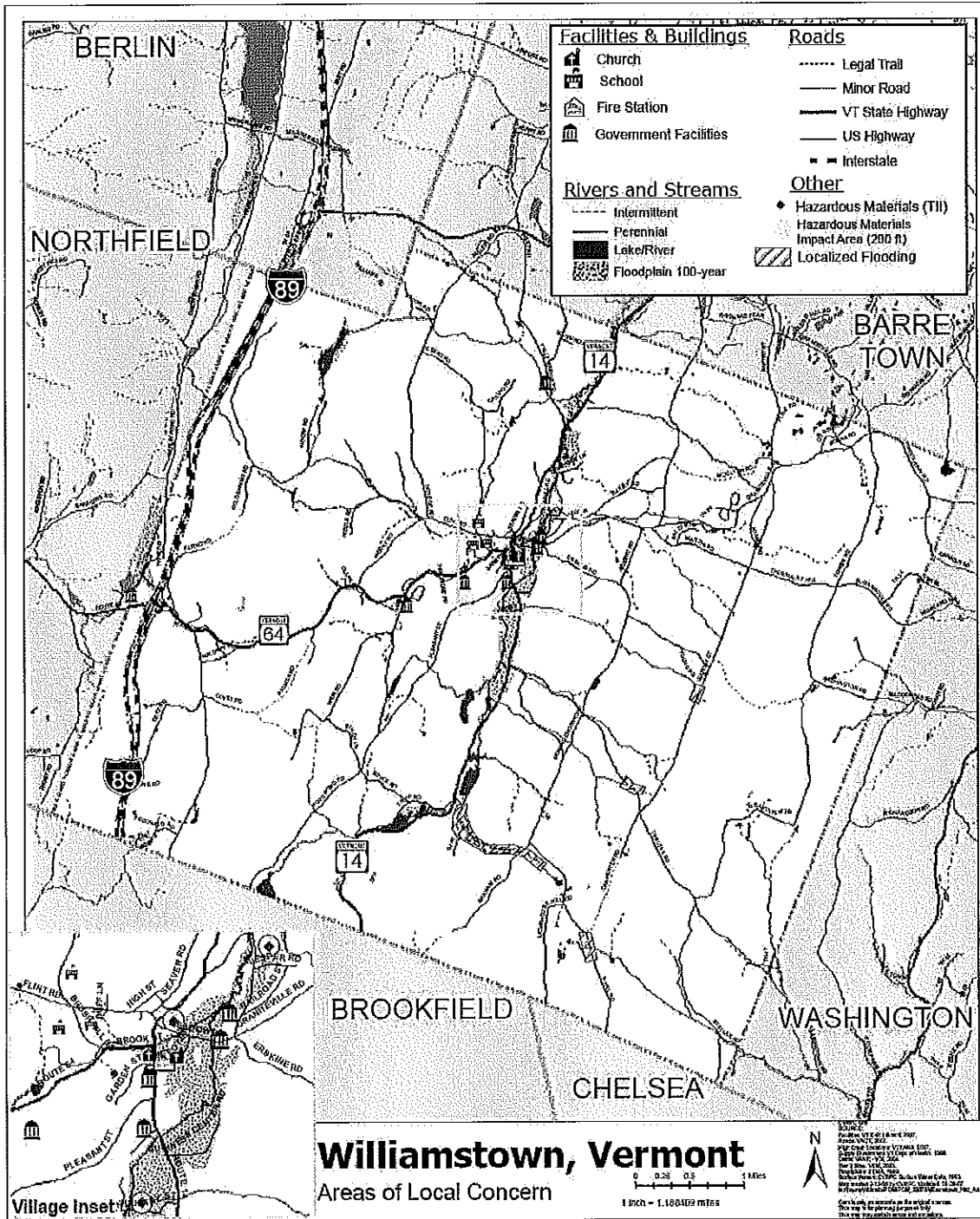
Williamstown understands that in order to apply for FEMA funding for mitigation projects that a project must meet FEMA benefit cost criteria. The Town must also have a FEMA approved Hazard Mitigation Plan as well.

A High prioritization denotes that the action is either critical or potential funding is readily available and should have a timeframe of implementation of less than two years. A Medium prioritization is warranted where the action is less critical or the potential funding is not readily available and has a timeframe for implementation of more than two years but less than four. A Low prioritization indicates that the timeframe for implementation of the action, given the action's cost, availability of funding, and the community's need to address the issue, is more than four years.

**Attachments**

- Areas of Local Concern Map
- Map and Strategies from Stevens/Jail Branch Corridor Plan
- Old Hazard Appendix
- 5 year plan maintenance and review process
- Town Resolution Adopting the Plan





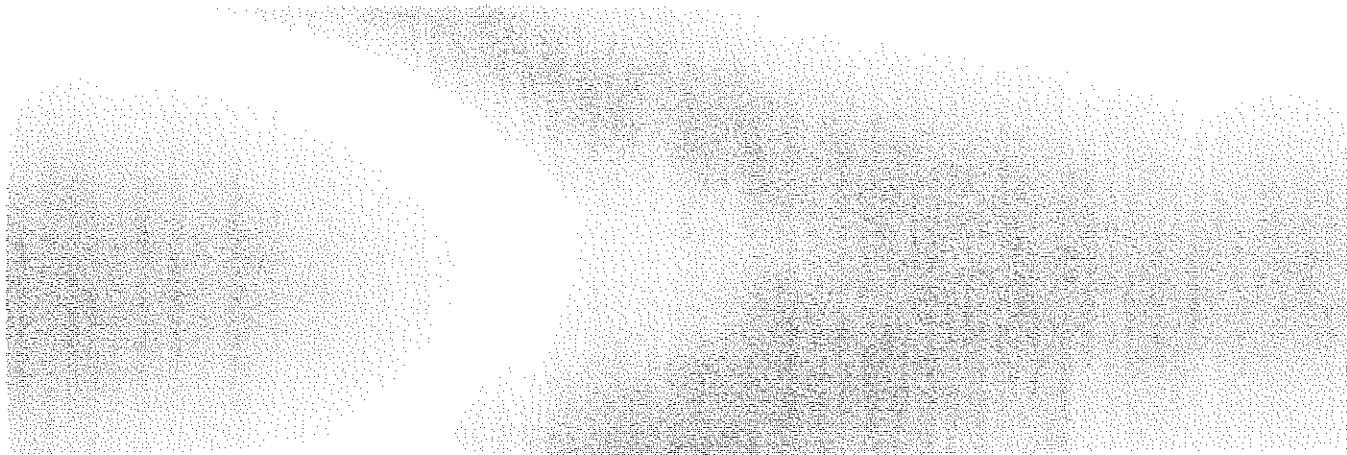


Stevens Branch Watershed 2008 Phase 2 Prioritized Project and Strategy Summary (from Stevens Branch Corridor Plan 3/13/2009)									
Project No.	Reach/ Segment Condition Sensitivity	Site Description Including Stressors and Constraints	Project or Strategy Description	Technical Feasibility & Priority	Other Social Benefits	Costs	Land Use Conversion & Landowner Commitment	Potential Partner Commitments	
1	All of project area	Extensive straightening and frequent loss of floodplain access, escalating erosion conflicts due to increased stream velocity.	FEH and belt-width-based corridor planning, protection of attenuation assets.	Feasible, high priority; delineation process largely developed. Development pressures in watershed likely to continue, upstream impacts affect success of projects	Flood hazard reduction, fisheries protection, prime farmland protection, viewshed preservation, water quality protection, oversight of management activities affecting stream function	Development of FEH corridor, outreach and educational materials; policy development and implementation (Literature Cited report)	Depends on options chosen; see VT ANR Municipal Guide to Fluvial Erosion Hazard Mitigation	Towns of Barre, Barre City, and Williamstown FWR-CVRPCVT ANR-RMP	
2	Numerous reaches High Priority (in order of priority): M1.11-A, M1.11-B, M1.11-C, M1.15-A, M1.10-A, M1.18-B, M1.18-C, M1.19-A	Bank erosion, encroachment leading to bank destabilization and increased flows	Buffer protection and enhancement and corridor easement projects	Feasible, high priority; data available; cheap; easy to promote with landowners; funding available for easement projects	Water quality protection, fisheries protection, flood hazard reduction	Outreach; materials and planting costs; easement development costs	Landowner commitment critical. Potential land use conversion of buffer areas.	Private Landowners; FWR, CVRPC, VT ANR-RMP, CREP	
3	Numerous reaches High Priority (in order of priority): M1.10-B, M1.11-B, T3.01-A, T3.01-B, T3.02B, T3.03-A, T3.04-D, T3.05-A, T3.05-B, T3.05-C, T3.05-D	Increased flow, downstream reaches incised	Collect and assemble stormwater input data for reaches; develop plan for mitigating flow	Feasible, high priority; data available; towns may have model inventories and budgeting/resources ?	Water quality protection, fisheries protection, flood hazard reduction	Data assembling; outreach and education; alteration costs where appropriate	Private landowners are key to success	Towns of Barre, Barre City, and Williamstown Private landowners; FWR-CVRPCVT ANR-RMP	
4	Numerous reaches High Priority (in order of priority): T2S4.01-A, T3.01-A, T3.01-B, T2S4.01-B, T2S4.02-A	Downstream reaches incised, sediment discontinuities reducing movement of larger bedload sediments to help rebuild meanders and floodplain	Collect and assemble geomorphic data for bridges and culverts; develop and disseminate sizing recommendations and/or requirements	Feasible, high priority; data already available; some towns may have model inventories and budgeting	Flood hazard reduction; fisheries protection	Data collection and assembling; replacement costs where appropriate		Towns of Barre, Barre City, and Williamstown FWR; CVRPCVT ANR-RMP	



Stevens Branch Watershed 2008 Phase 2 Prioritized Project and Strategy Summary (from Stevens Branch Corridor Plan 3/13/2009)									
Project No.	Reach/ Segment Condition Sensitivity	Site Description Including Stressors and Constraints	Project or Strategy Description	Technical Feasibility & Priority	Other Social Benefits	Costs	Land Use Conversion & Landowner Commitment	Potential Partner Commitments	
5	T2S4.02-B, M1.14-0, M1.15-B, T3.02S4.01S101A, T3.02S4.01S101B, T3.01B	access RB mass failure exacerbated by stormwater outflow.	for private installations and help towns with inventory, prioritization, and capital budgeting Re-location of stormwater input	Feasible, should fit in with City stormwater management priorities.	Protect fisheries and water quality from increased sediment	Landowner outreach and education; relocation of stormwater flow	Land use conversion minimal; landowner will need to commit to project	Landowners, Bare City Engineers, FWR, RMP	
6	M1.10B M1.10D	Extensive tributary erosion and head cut that has moved up to Route 14. Arrest headcutting [move?]	Arrest headcutting at Route 14	Feasible, should fit in with City stormwater management priorities.	Protection of State Highway; improved water quality, protection of fisheries	Replacement of culvert and other structures for arresting headcut	Land use conversion minimal; City road engineer must be on board	Bare City Engineers, VTrans, FWR, RMP	
7	M1.15B	Floodplain not accessed on right bank due to berm presence; recent flooding over left bank into developed area	Remove berm	Feasible, should be further evaluated but is possibly simple solution to problematic flooding	Return area of non-floodplain habitat to floodplain habitat	Landowner outreach and education, equipment for berm removal and site restoration	Some land conversion of flood-protected land to non-flood-protected land; will need landowner commitment	FWR, RMP, CREP, EQP	
8	T3.01B	Mass failure RB; upstream of bridge is threatening house above	Stabilize stream bank; redirect stream flow with rock vein	Feasible; financial responsibility needs to be worked out	Water quality protection	Riprap and vein boulders, installation costs.	Landowner commitment needed, City commitment needed.	Bare City, Landowner at site, FWR, RMP	
9	T3.03A	Gully formation on left valley wall is adding sediment to Jail Branch and is headcutting.	Arrest head cut in tributary gully	Potentially feasible; needs further evaluation to determine source, assess future erosion risk, and consider value of intervention	Landowner education, protection of water quality and fisheries.	Landowner outreach and education, materials and installation costs.	Minimal land use conversion; needs landowner commitment.	Site landowners, Bare Town, FWR, RMP, CREP, EQP	

Stevens Branch Watershed 2008 Phase 2 Prioritized Project and Strategy Summary (from Stevens Branch Corridor Plan 3/13/2009)									
Project No.	Reach/Segment Condition Sensitivity	Site Description Including Stressors and Constraints	Project or Strategy Description	Technical Feasibility & Priority	Other Social Benefits	Costs	Land Use Conversion & Landowner Commitment	Potential Partner Commitments	
10	T3.01B	Lack of flood attenuation in city.	Remove berm	Potentially feasible; needs further evaluation to assess value and issues involved	Landowner education; reduced flood hazard downstream	Landowner outreach and education would be extensive considering potential flooding over school playing fields; cost of removing berm and stabilizing the site.	Land use conversion possibly; landowner and citizen commitment would have to be high	Barre City Government, Barre City citizens, landowners, FWR, RMP.	
11	<del>T3.01A</del>	Possibly unnecessary barrier to attenuation.	Remove berms	Potentially feasible; needs further evaluation to assess value and issues involved	Landowner education; reduced flood and erosion hazard downstream	Landowner outreach and education, materials and installation costs.	Minimal land use conversion; needs landowner commitment.	Site landowners, Williamstown Town, FWR, RMP CREP, EQP	



Appendix - 6.2 Hazardous Materials

Of the five hazardous materials (Tier II) sites within the Williamstown town boundary four are located within the village. They are: VT Fire VT Technologies, 154 Industrial Lane, Verizon Williamstown Dial Office, 33 Lathrop Court and Williamstown Wastewater Treatment Facility, 61 Vesper Road. These sites, due to the amount of stored material, are required to report to Vermont Emergency Management and are therefore classified as Tier II sites. According to the EPA website Tier II sites are locations which have a release of a hazardous substance, pollutant, or contaminant that has caused, or is likely to cause, human exposure or contamination of a sensitive environment. These sites typically involve contamination of drinking water, surface water, air, or soils which has either caused, or is likely to cause, exposure to nearby populations, or has contaminated, or is likely to contaminate, sensitive environments (such as wetlands, national parks, and habitats of endangered species, etc.). (See Hazard Analysis Map)

According to the VT Department of Environmental Conservation's (DEC) Solid Waste Management Division *Active Hazardous Sites List 2000* there is 8 active hazardous sites in Williamstown. According to the *Toxics In Vermont: A Town-by-Town Profile* report by the Toxics Action Center a hazardous waste site are areas where a release of hazardous materials has occurred and where it has been determined that further investigation is necessary.

The following list indicates the release of hazardous materials in Williamstown. In the event of a hazardous materials spill local responders are required to report incidents to Vermont Emergency Management. The closest hazmat truck is located 46 miles away at the IBM Facility in Essex Junction. The closest hazmat de-contamination trailer is located 7 miles away at the Barre City Public Safety Building.

History of Occurrences:

Date	Material	Amount	Unit	Location
8/28/2000	Motor Oil	Unknown	n/a	Robert Brown's Junkyard,
1/25/2002	Gasoline	7-8	Gallons	Interstate 89 MM 43.5
4/18/2002	Diesel Fuel	200	Gallons	189 South between Exit 5 & 6
12/29/2005	Sewage	Unknown	n/a	Williamstown WWTF
4/12/2006	#2 Heating Oil	10	Gallons	Construction Hill Road Trailer Park

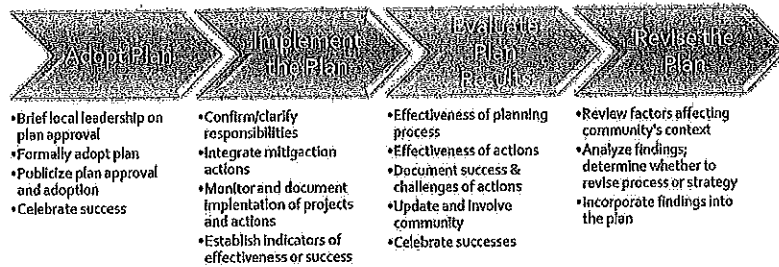
*Information from 2001 - 2005*

*Provided by Hazardous Materials Compliance Officer, Vermont Emergency Management*

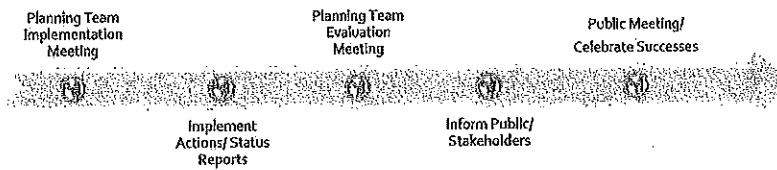
The following matrix provides an overview of the hazard:

Hazard	Location	Vulnerability	Extent	Impact	Probability
Hazardous Materials	Areas within the village/densely populated areas surrounding Industrial Lane, Lathrop Court and Vesper Road.	Roads, Residences and Stream/surface water.	Moderate	Unknown -- no data available regarding past occurrences.	MEDIUM

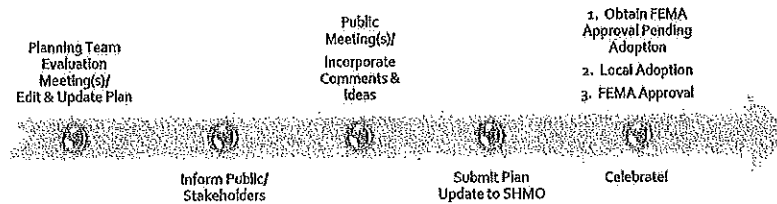
## 5-Year Plan Review/Maintenance



### After Plan Adoption-Annually Implement and Evaluate



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



**Certificate of Adoption**

The Town of Williamstown  
Select Board  
A Resolution Adopting the Local Hazard Mitigation Plan  
January 1, 2013

WHEREAS, the Town of Williamstown has worked with the Central Vermont Regional Planning Commission to identify hazards, analyze past and potential future losses due to natural and manmade-caused disasters, and identify strategies for mitigating future losses; and

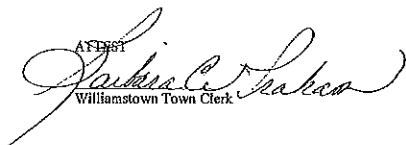
WHEREAS, the Williamstown Local Hazard Mitigation Plan contains several potential projects to mitigate damage from disasters that could occur in the Town of Williamstown; and

WHEREAS, a duly-noticed public meeting was held by the Town of Williamstown Select Board on January 1, 2013 to formally adopt the Williamstown Local Hazard Mitigation Plan;

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

  
Chair of Select Board

  
Member of Select Board

ATTEST  
  
Williamstown Town Clerk