

Adopted by the Town of Peacham Selectboard on 10/2/2019

Town of Peacham, Vermont

All-Hazards Mitigation Plan

**79 Church Street
Peacham, Vermont 05862
Public Assistance Applicant #: 005-54400-00**

Prepared by:

Town of Peacham, Vermont

CERTIFICATE OF LOCAL ADOPTION

Town of Peacham, Vermont

A Resolution Adopting the All-Hazards Mitigation Plan

WHEREAS, the Town of Peacham has worked with its residents and stakeholders to identify its hazards and vulnerabilities, analyze past and potential future losses due to natural and human-caused hazards, and identify strategies for mitigating future losses; and ...

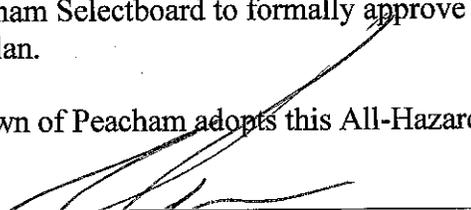
WHEREAS, the Town of Peacham All-Hazards Mitigation Plan contains recommendations, potential actions and future projects to mitigate damage from disasters in Peacham; and

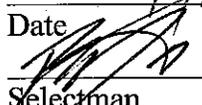
WHEREAS, the Town of Peacham and the respective officials will pursue implementation of the strategy and follow the maintenance process described in this plan to assure that the plan stays up to date and compliant; and...

WHEREAS, a meeting was held by the Town of Peacham Selectboard to formally approve and adopt the Town of Peacham All Hazards Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the Town of Peacham adopts this All-Hazards Mitigation Plan for the town.

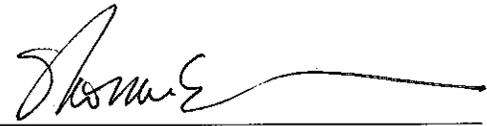
10/2/19
Date


Selectboard Chair


Selectman

Selectman

Selectman


Attested to by Town Clerk

Executive Summary

In 2016, the Town of Peacham began to develop the Town of Peacham’s Local All-Hazard Mitigation Plan. The results of this work are contained herein and represent the collaborative efforts of the Town of Peacham Hazard Mitigation Planning Team and associated residents, towns and agencies that contributed to the development of this plan. As hazard mitigation is a sustained effort to permanently reduce or eliminate long-term risks to people and property from the effects of reasonably predictable hazards, the town has communicated its efforts related to developing this plan to its residents and surrounding municipalities, providing a formal opportunity to provide input and review relevant sections of the plan. Along these lines, the town has documented the planning process so that future updates can follow an efficient pattern in addition to capturing this important component as means of establishing institutional memory. In realization that eligibility to receive federal hazard mitigation grants and optimize state-level reimburse or “match” dollars during a federally declared disaster is dependent on a federally approved plan, the town remains committed to sustaining its mitigation efforts and by developing this plan, will have a guide for action that will foster enhanced emphasis on mitigation in the years to come. The town realizes the importance of mitigation inherent to its own resilience as well as means to establishing strong partnerships with regional support agencies and associations, state government and FEMA. As the town moves towards formally adopting this Local All-Hazards Mitigation Plan, the purpose of this plan is to:

- Identify specific natural, technological and societal hazards that impact the Town of Peacham
- Prioritize hazards for mitigation planning
- Recommend town-level goals and strategies to reduce losses from those hazards
- Establish a coordinated process to implement goals and their associated strategies by taking advantage of available resources and creating achievable action steps

This plan is organized into 5 Sections:

Section 1: Introduction and Purpose explains the purpose, benefits, implications and goals of this plan. This section also describes demographics and characteristics specific to Peacham and describes the planning process used to develop this plan.

Section 2: Hazard Identification expands on the hazard identification in the Peacham Town Plan (2012) with specific municipal-level details on selected hazards.

Section 3: Risk Assessment discusses identified hazard areas in the town and reviews previous federally-declared disasters to identify what risks are likely in the future. This section presents a hazard risk assessment for the municipality, identifying the most significant and most likely hazards which merit mitigation activity. The most significant hazards for Peacham have been profiled and are introduced in the grid below:

Severe winter/Ice storm	High Winds	Flooding
Extreme Cold		

Section 4: Vulnerability Assessment discusses buildings, critical facilities and infrastructure in designated hazard areas and estimates potential losses.

Section 5: Mitigation Strategies begins with an overview of goals and policies in the most recent Town Plan that support hazard mitigation and utilizes a current road inventory to formulate a work plan around major infrastructure projects. An analysis of existing municipal actions that support hazard mitigation, such as planning, emergency services and actions of the highway department are also included. The following all-hazards mitigation goals are summarized below: Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst the town’s residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.
- 5) Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
- 6) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
- 7) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan particularly the recommended mitigation actions, into the municipal/town operating and capital plans & programs as they relate to public facilities and infrastructure. With the development of the road erosion site inventory, the town will begin a process that incorporates the budgetary requirements of the defined mitigation strategies into its formal budgeting paradigm. The Planning Commission will review the LHMP and use language/actions from it to inform the integration and update process. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budget.

Section 5 also identifies and provides a detailed discussion on the following mitigation actions:

- Action #1: Reduce flood-related impacts through infrastructure upgrades, improvement projects and floodplain management activities.
- Action #2: Improve resilience to severe winter storms
- Action #3: Reduce impact of extreme cold durations
- Action #4: Raise public awareness of hazards and hazard mitigation actions
- Action #5: Reduce impact of high wind events

Action #6: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified risk

In conclusion, Section 5 provides an Implementation Matrix to aid the municipality in implementing the outlined mitigation actions with an annual evaluation process to be coordinated and administered by the Peacham Planning Commission.

Table of Contents

SECTION 1: INTRODUCTION AND PURPOSE	1
1.1 Purpose and Scope of this Plan	1
1.2 Hazard Mitigation	1
1.3 Hazard Mitigation Planning Required by the Disaster Mitigation Act of 2000	1
1.4 Benefits	2
1.5 All-Hazards Mitigation Plan Goals.....	2
1.6 Town of Peacham Population and Characteristics.....	3
1.6.1 Population:.....	3
Table 1-1 Town of Peacham, selected population characteristics, 2010 Census.....	3
1.6.2. Housing:.....	4
1.6.3. Income and Employment:.....	4
1.6.4. Town Locations:	4
1.7 Summary of Planning Process	4
SECTION 2: HAZARD IDENTIFICATION.....	7
2.1 Disaster History	7
<i>Table 2-1: Summary of Vermont Emergency Declarations</i>	8
<i>Table 2-2: Summary of Vermont Major Disaster Declarations since 1998 (Caledonia County in Bold with events that resulted in PA funding for the town with an “(*)”)</i>	8
<i>Table 2-2.1. Summary of Peacham Declared Disaster where PA was Received</i>	9
2.1.1. Profiled Hazards:	9
<i>An Introduction to Climate Change:.....</i>	9
High Winds	10
Table 2-3: Beaufort Scale and Peacham Windspeed vs. U.S. Average.....	11
Severe Winter Storm	11
<i>Table 2-4: NOAA’s Regional Snowfall Index (RSI) and PEACHAM Snowfall vs. U.S. Average</i>	12
<i>Peacham Snowfall vs. U.S. Average</i>	13
Ice Storm	14
Extreme Temperatures	14
Flooding	15
<i>Table 2-7: Peacham Precipitation vs. U.S. Average</i>	18
Inundation and Floodplains	18
Fluvial Erosion	19

<i>Ice Jams</i>	21
SECTION 3: RISK ASSESSMENT	21
3.1 Designated Hazard Areas.....	21
3.1.1. <i>Flood Hazard Areas</i>	21
3.1.2. <i>Fluvial Erosion Hazard Areas</i>	22
3.2 Non-designated Hazard Areas	22
3.2.1. Ice Storm Damage.....	22
3.2.2. High Winds and Lightning.....	22
3.3 Previous FEMA-Declared Natural Disasters and Non-Declared Disasters.....	23
<i>Table 3-1: KEY:</i>	23
<i>Table 3-2: Town of Peacham, FEMA-declared disasters and snow emergencies, 2004-Current:</i>	23
3.3 Hazard Assessment and Risk Analysis	27
3.3.1. Natural Hazards	27
<i>Table 3-2 Natural hazards risk estimation matrix</i>	28
3.4 Hazard Summary	29
SECTION 4: VULNERABILITY ASSESSMENT.....	29
4.1 Critical Facilities.....	33
4.2 Infrastructure.....	33
4.2.1 Town Highways.....	33
4.2.2 Bridges, Culverts, and Dams	34
<i>Table 4-4 Inventoried bridges in the Town of Peacham with identified importance</i>	34
4.2.3 Water, Wastewater and Natural Gas Service Areas.....	36
4.2.4 Electric Power Transmission Lines and Telecommunications Land Lines	36
4.3 Estimating Potential Losses in Designated Hazard Areas	37
4.4 Land Use and Development Trends Related to Mitigation	37
4.4.1. <i>Proposed Land Use</i>	38
4.4.2. <i>Land Use Goals</i>	38
4.4.3. <i>Land Use Strategies</i>	38
4.4.4 <i>Future Development and Housing</i>	38
SECTION 5: MITIGATION STRATEGIES	39
5.1 Town Goals and Policies that support Hazard Mitigation.....	39
5.1.1. <i>Community Goals</i>	39

5.1.2. Capital Improvement Goals	39
5.1.3. Public Participation Goals	40
5.1.4. Regulatory Devices Goals.....	40
5.1.5. Land Use	40
5.1.6 Natural Resources.....	40
5.1.7. Policies.....	42
5.1.8. Transportation Plan.....	42
5.1.9. Utilities and Facilities Goals	43
5.1.9.1. Educational Goals	43
5.2 Existing Town of Peacham Actions that Support Hazard Mitigation.....	43
5.2.1. Flood Resilience Goals:.....	45
5.2.2. Flood Resilience Strategies:	45
5.3 Town of Peacham All-Hazards Mitigation Goals.....	46
5.4 Mitigation Actions	46
5.4.1. Current Capabilities and Need for Mitigation Actions	47
5.4.2. Specific Mitigation Actions	47
5.4.3. Prioritization of Mitigation Strategies	54
5.5 Implementation and Monitoring of Mitigation Strategies	56
5.5.1. Public Involvement Following Plan Approval.....	56
5.5.2. Project Lead and Monitoring Process	57
5.5.4. Plan Update Process.....	57
5.5.5. Implementation Matrix for Annual Review of Progress	58
APPENDIX F: Community Survey Results	69

SECTION 1: INTRODUCTION AND PURPOSE

1.1 Purpose and Scope of this Plan

The purpose of this Local All-Hazards Mitigation Plan is to assist this municipality in identifying all hazards facing their community and in identifying strategies to begin to reduce the impacts of those hazards. The plan also seeks to better integrate and consolidate efforts of the municipality with those outlined in the Town Plan as well as efforts of NVDA, Vermont State agencies, FEMA and the State Hazard Mitigation Plan. The town is aware that community planning can aid significantly in reducing the impact of expected, but unpredictable natural and human-caused events. This document constitutes an All-Hazards Mitigation Plan for the Town of Peacham. Community planning can aid significantly in reducing the impact of expected, but unpredictable natural and human-caused events. The goal of this plan is to provide hazard mitigation strategies to aid in creating disaster resistant communities throughout Caledonia County.

1.2 Hazard Mitigation

The Vermont State All-Hazards Mitigation Plan of 2013 defines hazard mitigation as:

“Any sustained action that reduces or eliminates long-term risk to people and property from natural and human-caused hazards and their effects. The Federal Emergency Management Agency (FEMA) and state agencies recognize that it is less expensive to prevent disaster or mitigate its effects 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 they are, where they are most severe and to identify actions that can reduce the severity of the hazard.”

Hazard mitigation strategies and measures can reduce or eliminate the frequency of a specific hazard, lessen the impact of a hazard, modify standards and structures to adapt to a hazard, or limit development in identified hazardous areas. This plan aligns and/or benefits from the 5 goals accomplished as a State since 2010 and as referenced in Section 5 of the State’s 2013 Hazard Mitigation Plan and as part of the newly created Emergency Relief Assistance Funding (ERAF) requirements. With enhanced emphasis on community resiliency, many state agencies and local organizations have an increased awareness of the importance of mitigation planning and have produced plans and resources that towns can use to support their planning efforts. This plan will reference, when relevant, pertinent tools and resources that can be used to enhance mitigation strategies.

1.3 Hazard Mitigation Planning Required by the Disaster Mitigation Act of 2000

Hazard mitigation planning is the process that analyzes a community’s risk from natural hazards, coordinates available resources, and implements actions to reduce risks. Per *44 CFR Part 201: Hazard Mitigation Planning*, this planning process establishes criteria for State and local hazard mitigation planning authorized by Section 322 of the Stafford Act as amended by Section 104 of the *Disaster Mitigation Act of 2000*. Effective November 1, 2003, local governments now must have an approved local mitigation plan prior to the approval of a local mitigation project funded through federal Pre-Disaster Mitigation funds. Furthermore, the State of Vermont is required to

adopt a State Pre-Disaster Mitigation Plan for Pre-Disaster Mitigation funds or grants to be released for either a state or local mitigation project after November 1, 2004.

There are several implications if the plan is not adopted:

- After November 1, 2004, Flood Mitigation Assistance Grant Program (FMAGP) funds will be available only to communities that have adopted a local Plan
- For disasters declared after November 1, 2004, a community without a plan is not eligible for HMGP project grants but may apply for planning grants under the 7% of HMGP available for planning
- For the Pre-Disaster Mitigation (PDM) program, a community may apply for PDM funding but must have an approved plan to receive a PDM project grant
- For disasters declared after October 14th, 2014, a community without a plan will be required to meet a greater state match when public assistance is awarded under the ERAF requirements (Emergency Relief Assistance Funding)

1.4 Benefits

Adoption and maintenance of this Hazard Mitigation Plan will:

- Make certain funding sources available to complete the identified mitigation initiatives that would not otherwise be available if the plan was not in place
- Lessen the receipt of post-disaster state and federal funding because the list of mitigation initiatives is already identified
- Support effective pre-and post-disaster decision making efforts
- Lessen each local government's vulnerability to disasters by focusing limited financial resources to specifically identified initiatives whose importance have been ranked
- Connect hazard mitigation planning to community planning where possible

1.5 All-Hazards Mitigation Plan Goals

This All-Hazards Mitigation Plan establishes the following general goals for the town and its residents:

- 1) Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
- 2) Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
- 3) Maintain and increase awareness amongst the town's residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
- 4) Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.

- 5) Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
- 6) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
- 7) Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan particularly the recommended mitigation actions, into the municipal/town operating and capital plans & programs as they relate to public facilities and infrastructure. With the development of the road erosion site inventory, the town will begin a process that incorporates the budgetary requirements of the defined mitigation strategies into its formal budgeting paradigm. The Planning Commission will review the LHMP and use language/actions from it to inform the integration and update process. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budget.

1.6 Town of Peacham Population and Characteristics

Chartered: 1763

Coordinates: 44 degrees 20'N 72 degrees 11'W

Altitude ASL: 1,526'

1.6.1 Population:

The Town of Peacham is a small rural community in north-central Vermont. This Caledonia County community is part of an area known as the Northeast Kingdom that covers 18,232 contiguous acres. Peacham is composed of forestland interspersed by active farmland and residential property. The 2010 U.S. Census reports a total population of 732 residents, 381 females and 351 males, indicating a population density of about 16 people per square mile acres.

Table 1-1 Town of Peacham, selected population characteristics, 2010 Census

Male	351
Female	381
Age 5 and older	697
Under Age 18	158
Age 24 and Under	197
Age 65 and older	127
Median Age	48.5

1.6.2. Housing:

Per the 2010 Census, there are 542 housing units in Peacham. Peacham has 299 households, of which, 263 are family households. The average household size is 2.45, and the average family size is 2.9. Of the occupied housing units, 263 are owner-occupied. The remaining 36 housing units were renter occupied.

1.6.3. Income and Employment:

Peacham is considered a bedroom community, indicating that much of the town's population in the work force is employed outside of the community. Per the most current American Community Survey (ACS) 5-Year averages (2009-2013), about 37% of Caledonia County residents travel at least 30 minutes to work, which is higher than the state average (29%). Compared to the rest of the Northeast Kingdom, Caledonia County has a higher percentage of jobs in services and retail trade, which tend to have lower average wages. The median household income is \$55,563, compared to the county median (\$41,953), and slightly higher than the statewide median (\$54,267). About 11.6% in Caledonia County families had incomes that fell below the poverty line within the past 12 months. People employed in Peacham tend to make their living close to the land, with small businesses connected to farming and agriculture, forestry and logging, agri-tourism, retail of farm and maple sugar products, auto repair, and real estate. All enterprises, commercial or non-profit, are on a smaller scale appropriate to the town. The town encourages business appropriate to the culture of farming and agriculture to ensure the rural quality of the community.

Source: Peacham Town Plan, 2012

1.6.4. Town Locations:

Hospitals and medical centers near Peacham:

- Northeastern Vermont Regional Hospital: Critical Access Hospital
- St. Johnsbury, VT Health and Rehab
- FMC OF ST. Johnsbury Dialysis
- Caledonia Home Health Care
- Pines Rehab and Health Center
- North Country Home Health and Hospice Agency (Littleton, NH)
- Lafayette Center, Genesis Healthcare (Franconia, NH)

1.7 Summary of Planning Process

The planning team was established in December of 2016 with coordinated efforts between Bruce Melendy of NVDA and town officials. The team represented the community as best as possible, including the school, long-standing residents, town staff, planners and community-based organizations. The kick-off meeting was held on June 13th, 2017. The planning team discussed the planning process, facts related to the town (e.g. disaster history, FEMA PA funding, vulnerable areas of town) and planning process steps. Additionally, a survey was drafted asking

for community input and made available through the town’s standard public notification process and via online survey platform Survey Monkey. The survey introduced the importance and informational needs of a LHMP and asked for more town-specific concerns the residents and/or business owner had. The survey and final planning team roster were approved by the Selectboard in August 2017. From August 2017 to March 2018, there was consistent email correspondence with the planning team. This correspondence was used to communicate with the planning team and collect information and comments on planning sections. Beginning in September 2017, planning updates were sent to the planning team lead (Emergency Management Director Neil Monteith) prior to the selectboard meeting and he would update the selectboard on progress. These monthly updates included the quantitative risk assessment (February 2017), identified hazards (November/March, 2017/2018), vulnerability assessment (January, 2018) and mitigation strategies (March, 2018) were included in each Selectboard meeting as well during plan development. The planning team was asked to comment and provide information on each section of the draft as it was developed. Information collected was then added to the plan and included in the next review. Individual meetings and correspondence with road foreman, town clerk and emergency management coordinator were crucial in understanding prior damage from flooding events, flooding vulnerability and political/residential barriers to mitigation. Following FEMA guidance in Local Mitigation Plan Review Tool Regulation Checklist and FEMA informational resources, the plan was written using data sources that included:

- Surveys and warned, public meetings collecting public comment (issues raised were addressed in plan and the public meeting)
- 2012 PEACHAM Town Plan (provided town data, current goals and regulations supporting mitigation, recent capital expenditures and infrastructure value helped to drive vulnerability assessment)
- 2016 PEACHAM Zoning Regulations Draft (Used for current flood hazard regulations and land use planning)
- 2013 Vermont State Hazard Mitigation Plan (provided key guidance language and definitions throughout the plan).
- Vermont Agency of Natural Resources (ANR) and Transportation (VTrans) (Provided key policy recommendations on environmental conservation, high accident locations, climate change and fluvial erosion data).
- Vermont Departments of Health (VDH) and Environmental Conservation (DEC) (provided information related with public health services that could be impacted during a disaster and state support functions designated to both VDH and DEC. DEC also provided river corridor data for mapping purposes.
- FEMA Open Source (data.gov) Data for Disaster History and PA funding (provided comprehensive declared disaster by year and type as well as project descriptions and cost per event).
- FEMA NFIP “Bureau.Net” database (provided detailed information on repetitive loss properties and associated flood insurance claims).

- EPA’s Incident Action Checklist for cold weather resilience of water systems (provides a guidance tool for public works to cross-reference actions on the system).
- 2013 ACCD Mobile Home Resilience Plan (served as resource for future mitigation actions)

Based on the information obtained, input from town and state officials, the planning team, state and federal databases, local associations and NVDA, the plan was created. The Planning Team was made up of the following individuals:

Martha Cavannaugh, resident
 Mike Heath, Selectboard Member
 Tim Scott, Selectboard Chair
 Dave Jacobs, community member
 Jeremy Withers, Road Foreman
 Jeff Berwick, Fire Chief
 Brian Barney, 911 Coordinator
 John Sheehan, Constables
 Joshua Kantrowitz, Health Officer
 Thomas Galinat, Town Clerk and Treasurer
 Rebecca Washington, Asst. Town Clerk
 Neil Monteith, Emergency Management Coordinator, Fire Warden
 Jonathan Kaplan, Fire District/ Village Water Representative
 Annette Lorraine, former Selectboard Chair
 Bruce Melendy, NVDA Emergency Preparedness Coordinator
 Geoffrey Sewake, former Planning Board Chair
 Marilyn Magnus, Planning Commission
 Nick Comerci, Planning Commission
 Jerri Kohl, webmaster

While many small communities in Vermont face similar circumstances (e.g. flooding, winter storms and remote residents), each one has unique considerations and opportunities. There was a point made to capture the subtle characteristics of the town, its history and its residents. From this, the specific risks, vulnerabilities and mitigation strategies were developed.

NVDA’s role in assisting the entire region with all facets of planning provided crucial information and NVDA’s Emergency Management Planning representative attended planning team meetings and provided guidance. While the LEPC provides the best platform to engage representatives from various towns and agencies, all bordering towns to Peacham (Groton, Marshfield, Cabot, Danville, Ryegate, Plainfield) were contacted with planning objectives and asked to provide input in addition to receiving a draft plan with an invitation to comment via email through the town clerk. Of note was Plainfield’s input regarding concern over Peacham Pond and the town’s dam safety hazards which, logistically, must include the Peacham Pond Dam as well as Molly’s Falls Reservoir. During DR 4001, nearby Marshfield has a very close call for a major dam breach at a location managed by Green Mountain Power. Vermont’s Department of Emergency Management and Homeland Security (VEM) also provided

information during the development of the plan. VEM also has representation at the LEPC meetings and will continue to provide input and guidance as the town moves forward with their mitigation strategies.

On March 21st, 2018, the town held a warned public meeting to review the identified hazards and associated mitigation strategies. The draft plan was then revised based on input and presented to the town. Much of input from residents (e.g. survey results) focused on road infrastructure washouts, extended power failure, lack of cell service and emergency notification. The revised draft was made available for review at the town office and residents were informed via meeting minutes and the town bulletin board of the ability to review the draft and additional opportunity for formal comment and suggestions. All neighboring town offices (via town clerk) were sent the draft for review and comment. With each email notification, the neighboring town was asked to share the information with their selectboards and given instructions how to respond with questions, comments or concerns (via email to the Peacham Town Clerk). Minor edits were made to the plan following state recommendations and the final draft was resubmitted to VEM and then to FEMA for formal review and approval pending municipal adoption. A resolution of adoption is anticipated following final FEMA approval.

SECTION 2: HAZARD IDENTIFICATION

The planning team looked at natural hazards most common to the state and region, assuring synchronicity with the state hazard mitigation plan's identified hazards and for each, considered prior history, current trends and available data to select a set of profiled hazards that are most likely to impact the Town. Because this plan represents the first of its kind for the town and is intended to provide a comprehensive resource for understanding the relationship between hazards, vulnerabilities and subsequent mitigation efforts, the profiled hazards will form the basis of mitigation actions for the next five-year planning cycle. The following represents the profiled hazards in Peacham. The definitions of each hazard, along with historical occurrence and impact, will be described in this section.

- **Natural Hazards:** weather / climate hazards (drought, hurricane/tornado, high winds, severe winter storm, extreme temperatures, climate change, lightning, hail), flooding, geological hazards (landslide / erosion, earthquake, naturally-occurring radiation), and fire hazards.

Profiled Natural Hazards: High Winds, Severe Winter Storm, Flooding, Extreme Cold Temperature

2.1 Disaster History

The number of natural disasters in Caledonia County since 1998 (12) is at the US average (12). There have been 12 major disasters (Presidential) declared and 3 Emergencies declared. The causes of natural disasters have been; Floods: 9; Storms: 7; Winds: 2; Heavy Rain; 1 Landslide: 1; Snowstorm: 1; Tropical Storm: 1 (Note: Some incidents may be assigned to more than one category). The following discussion on natural hazards is based upon information from

several sources. General descriptions are based upon the *2013 Vermont State Hazard Mitigation Plan*. Due to rural nature of Northeast Kingdom, there is little historical data available for presentation related to all hazards but when available, relevant data is included.

The highest risk hazards (High Winds, Severe Winter/Ice Storm, Flooding, Extreme Cold Temperature) have been profiled to provide the basis of future mitigation strategies. It should be noted here that the town has only received disaster funding for flood-related events. However, lower risk natural hazards (drought, tornado, hurricanes/tropical storms, high winds, extreme heat, hail, landslide, earthquake, naturally-occurring radiation and fire hazards) are omitted from full profiling because they do not pose enough risk to substantiate mitigation efforts at this time. The risk caused by hurricanes/tropical storms is flooding in Peacham and profiled within the flooding section.

Table 2-1: Summary of Vermont Emergency Declarations

Number	Year	Type
3338	2011	Hurricane Irene
3167	2001	Snowstorm
3053	1977	Drought

Source: FEMA

- *Table 2-2: Summary of Vermont Major Disaster Declarations since 1998 (Caledonia County: Bold and “*” denotes Town PA received).*

Table 2-2: Summary of Vermont Major Disaster Declarations since 1998 (Caledonia County in Bold with events that resulted in PA funding for the town with an “()”)*

4207	2015	Severe Winter Storm
4178*	2014	Severe Storms and Flooding
4232	2015	Severe Storms and Flooding
4163	2014	Severe Winter Storm
4140	2013	Severe Storms and Flooding
4120	2013	Severe Storms and Flooding
4066	2012	Severe Storms, Tornado and Flooding
4043	2011	Severe Storms and Flooding
4022*	2011	Tropical Storm Irene
4001*	2011	Severe Storms and Flooding
1995	2011	Severe Storms and Flooding
1951	2010	Severe Storm
1816	2009	Severe Winter Storm
1790*	2008	Severe Storms and Flooding
1784	2008	Severe Storms, Tornado and Flooding
1778	2008	Severe Storms and Flooding
1715	2007	Severe Storm, Tornado and Flooding
1698	2007	Severe Storms and Flooding
1559*	2004	Severe Storms and Flooding
1488	2003	Severe Storms and Flooding

1428	2002	Severe Storms and Flooding
1358	2001	Severe Winter Storm
1336	2000	Severe Storms and Flooding
1307	1999	Tropical Storm Floyd
1228	1999	Severe Storms and Flooding
1201	1998	Ice Storm

Source: FEMA

Table 2-2.1. Summary of Peacham Declared Disaster where PA was Received

Disaster Number	Date	Category	Town	Projects	Total Amount
1559	09/23/2004	Severe Storm(s)	PEACHAM (TOWN OF)	8	\$28,489.46
1790	09/12/2008	Severe Storm(s)	PEACHAM (TOWN OF)	8	\$210,082.72
4001	07/08/2011	Severe Storm(s)	PEACHAM (TOWN OF)	36	\$382,344.10
4022	09/01/2011	Hurricane	PEACHAM (TOWN OF)	10	\$44,127.64
4178	06/11/2014	Flood	PEACHAM (TOWN OF)	1	\$3,202.75

2.1.1. Profiled Hazards:

An Introduction to Climate Change:

From 1962 to 2006, each five-year period resulted in 0-6 Major Disaster Declarations in Vermont. From 2007-2011, there were 11. It is commonly accepted that weather extremes are becoming more commonplace in Vermont. Since 2011, record setting snow, rain and cold have been experienced in the state. In recent years, it has become evident that human activities, mostly associated with the combustion of fuel, have added to the natural concentration of greenhouse gases in the atmosphere and are contributing to rapid climate change on a global scale. While projections of the effects of climate change vary, it is generally predicted that Vermont will have warmer temperatures year-round, with wetter winters and drier summers. An increase in the size and frequency of storms is also predicted. Thus, climate change in the next century will likely increase the chance of weather-related hazards occurring. An increase in precipitation may also result in increased flooding and fluvial erosion. Drier summers may increase the chance of drought and wildfire. A warmer climate may also result in the influx of diseases and pests that cold winters previously prevented. The severity of climate change is also difficult to predict, though the effects may be mitigated somewhat if greenhouse gas emissions are reduced soon. In 2011, Governor Shumlin formed the *Vermont Climate Cabinet*. The Cabinet, chaired by the Secretary of Natural Resources, is a multidisciplinary approach to enhance collaboration between

various state Agencies. Its primary objectives include providing the Governor with advisory information and facilitating climate change policy adoption and implementation. In 2013, the Vermont Agency of Natural Resources (ANR) released the Climate Change Adaptation Framework which addresses climate change exposures, vulnerability-specific elements within each of the natural resource sectors, and ongoing and proposed actions that can be or have been taken to prepare for the expected changes. In line and in conjunction with the ANR report, the primary goal of a VTrans climate change adaptation policy is to minimize long-term societal and economic costs stemming from climate change impacts on transportation infrastructure.

High Winds

High wind events do occasionally cause damage for the town, normally measured in downed power lines. The last recorded high wind event as tracked by the National Weather Service was recorded on 17-18 January 2012. An 81-mph wind gust was measured atop Vermont's highest peak Mount Mansfield. During this event, Caledonia County had wind speeds of 30-40 mph. Specific data for the town was not available but town officials recall the 2012 event as being the most severe in memory and the town expects high wind events that may reach category 2 speeds, but it is unlikely, based on previous events, that a category 3 event will occur in the region. The duration of power supply disruption in Peacham for any hazard is 3 hours according to Washington Electric Cooperative. That outage was caused by a problem associated with Green Mountain Power electrical supply infrastructure. Additional high wind as recording by the NOAA Climatic data center include, specific damage and associated costs are unknown specific to the town:

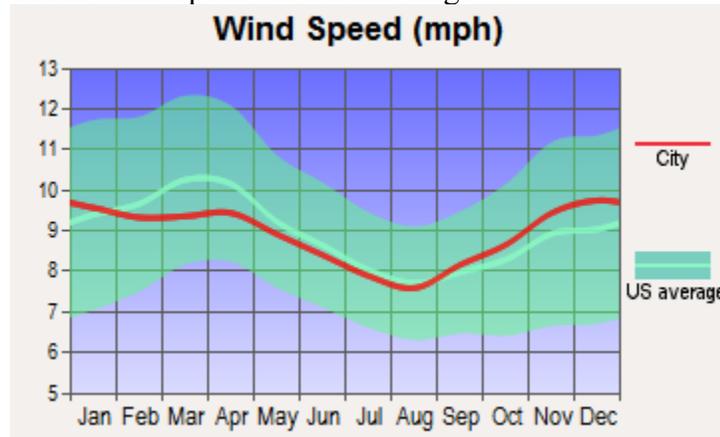
CALEDONIA (ZONE)	VT	02/29/2016	22:00	Strong Wind	35 kts. EG	5.00K
CALEDONIA (ZONE)	VT	05/05/2017	16:15	Strong Wind	43 kts. EG	10.00K
CALEDONIA (ZONE)	VT	10/30/2017	00:00	Strong Wind	40 kts. MG	100.00K

The following table describes the Beaufort Scale for non-hurricane winds.

Table 2-3: Beaufort Scale and Peacham Windspeed vs. U.S. Average

Beaufort*	Avg Miles per Hour	Knots	Surroundings
0 calm		0-1	Smoke rises vertically and the sea is mirror smooth
1 light air	1.2 - 3.0	1 - 3	Smoke moves slightly with breeze and shows direction of wind
2 light breeze	3.7 - 7.5	4 - 6	You can feel the breeze on your face and hear the leaves start to rustle
3 gentle breeze	8.0 - 12.5	7 - 10	Smoke will move horizontally and small branches start to sway. Wind extends a light flag
4 moderate	13.0 - 18.6	11 - 16	Loose dust or sand on the ground will move and larger branches will sway, loose paper blows
5 fresh breeze	19.3 - 25.0	17 - 21	Surface waves form of water and small trees sway
6 strong breeze	25.5 - 31.0	22 - 27	Trees begin to bend with the force of the wind and causes whistling in telephone wires. Some spray on the sea surface
7 moderate gale	32.0 - 38.0	28 - 33	Large trees sway. Moderate sea spray
8 fresh gale	39.0 - 46.0	34 - 40	Twigs break from trees, and long streaks of foam appear on the ocean
9 strong gale	47.0 - 55.0	41 - 47	Branches break from trees
10 whole gale	56.0 - 64.0	48 - 55	Trees are uprooted and the sea takes on a white appearance
11 storm	65.0 - 74.0	56 - 63	Widespread damage
12 hurricane	75+	64 +	Structural damage on land, and storm waves at sea

Town Wind Speed vs. U.S. Average



Severe Winter Storm

Winter storm frequency and distribution varies from year to year depending on the climatological patterns. Because such storms are expected during a Vermont winter, the town is well-equipped to deal with snow removal and traffic incidents. The most damaging types of snowstorms are ice-storms caused by heavy wet snow or rain followed by freezing temperatures.

This leads to widespread and numerous power and telephone outages as lines either collapse due to the ice weight or are brought down by falling trees and branches. According to the *2013 Vermont State All-Hazards Mitigation Plan*:

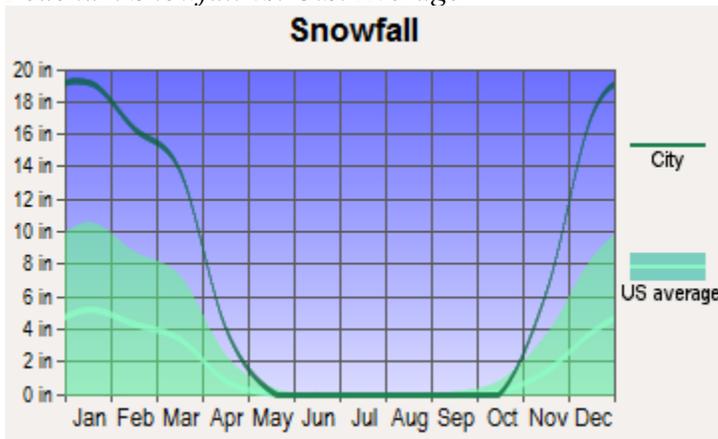
“A winter storm can range from moderate snow to blizzard conditions. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period. A blizzard is a snowstorm with sustained winds of 40 miles per hour or more with heavy falling or blowing snow and temperatures of ten degrees Fahrenheit or colder. An ice storm involves rain, which freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires, and similar objects and to produce widespread power outages.”

The winters of 1969-72 produced record snowfalls for nearby St. Johnsbury, and greater than normal precipitation was recorded in 8 of the 11 years during 1969-79. The closest available data was collected in nearby Waterford where the max 24-hour snowfall occurred February 24-25, 1969 at 34” with an additional 2.12” of rain during the period. The winter of 2010-2011 was the third-snowiest on record with a total of 124.3 inches for the county. The record for the county was 145.4 inches set in 1970-1971. The potential for a major snowstorm that exceeds the capabilities of town exists every year but with the recent increase in snow fall totals and cold temperature duration, the town realizes the further consideration are required. NOAA's National Centers for Environmental Information is now producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5, similar to the Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. NCEI has analyzed and assigned RSI values to over 500 storms going as far back as 1900. New storms are added operationally. As such, RSI puts the regional impacts of snowstorms into a century-scale historical perspective. The index is useful for the media, emergency managers, the public and others who wish to compare regional impacts between different snowstorms. The RSI and Societal Impacts Section allows one to see the regional RSI values for particular storms as well as the area and population of snowfall for those storms. The area and population are cumulative values above regional specific thresholds. For example, the thresholds for the Southeast are 2", 5", 10", and 15" of snowfall while the thresholds for the Northeast are 4", 10", 20", and 30" of snowfall. 2010, 2012 and 2015 have some of the highest rankings for notable storms. These rankings are based, in part on the severity of the storm using the following system. Since 2000, there has only been one event that reached a category 4 in the Northeast, five reached Category 3, eight were “significant” and all others were notable. Despite having considerably more snow than the U.S. average, Peacham has had no major PA funding related to damage from snow events.

Table 2-4: NOAA’s Regional Snowfall Index (RSI) and PEACHAM Snowfall vs. U.S. Average

CATEGORY	RSI VALUE	DESCRIPTION
1	1–3	Notable
2	3–6	Significant
3	6–10	Major
4	10–18	Crippling
5	18.0+	Extreme

Peacham Snowfall vs. U.S. Average



The winter of 2010-2011 was the third-snowiest on record with a total of 124.3 inches. In any Vermont community, this potential exists every winter for a snow or ice storm that exceeds normal operational response capabilities. In January of 2015, Peacham received approximately 28” of snow compared to only 11.3” in 2014. Historic January snowfall totals fell in 1987 (47.5”), 1978 and 1979 (46.5”, 45.8”). Total average snowfall for the county in December is 26.2”, January is 22.6”, February averages are slightly less at 16.9” and March is 18.3”. February 14th-15th, 2007 saw the greatest 24-hour max snowfall total at 23.5”. The snowfall totals are annual averages based on weather data collected from 1981 to 2010 for the NOAA National Climatic Data Center. While declared snow storm disaster have been declared for the county, Peacham has not received PA funding for these events. Because such storms are expected during a Vermont winter, the town is well-equipped to deal with snow removal and traffic incidents. The most damaging types of snowstorms are ice-storms caused by heavy wet snow or rain followed by freezing temperatures. This leads to widespread and numerous power and telephone outages as lines either collapse due to the ice weight or are brought down by falling trees and branches.

Sources: www.ncdc.noaa.gov www.nws.noaa.gov

Ice Storm

Major Ice Storms occurred in January 1998 and again in December 2013. The North American Ice Storm of 1998 was produced by a series of surface low pressure systems between January 5 and January 10, 1998. For more than 80 hours, steady freezing rain and drizzle fell over an area of several thousand square miles of the Northeast, causing ice accumulation upwards of 2'' in some areas but Peacham was not affected nearly as much as other areas of the state. On December 13th, 2013, another ice storm hit portions of Caledonia County, including Peacham but the extent of this storm is unknown but town officials estimate .5'' maximum of accumulation but this was not widespread. While there is evidence that supports an increase in weather and precipitation severity, the incidence of ice storms remains fairly spaced out. The town expects to have another ice storm but unlike rain and snow events, the occurrence of a major ice storm is not expected every year. Source: www.wrh.noaa.gov/map/?wfo=sto

Extreme Temperatures

While there is no historical evidence to support a concern over the consequences of extremely hot temperatures on human health and safety in Peacham, high temperatures can help to create severe storms as the one evidenced on September 11th, 2013, where record heat (90F) helped to produce damaging hail and winds in parts of the NEK and other areas of Vermont and NY. Recent extremes in cold temperatures is a concern. 2015 tied the coldest winter (January to March) on record (1923) for Vermont as a whole according to the NOAA's National Climatic Data Center whose dataset dates to 1895. 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 20 below to 30 below zero in Caledonia county, including 31 degrees below zero in Sutton and Sheffield, 27 below zero Walden, 25 below in Lyndonville and St. Johnsbury and 23 below zero in Peacham.

An arctic cold front pushed across Vermont during the afternoon hours of January 7th with plummeting temperatures and brisk, strong winds (15 to 30+ mph) causing dangerously cold wind chills of 25 to 40 degrees below zero during the evening of January 7th into the morning hours of January 8th. These dangerously cold wind chills lead to delayed school openings of 2 hours or cancelled classes on the morning of January 8th. Actual minimum ambient temperatures on the morning of January 8th were 15 to 30 below zero across northern New York. Observed wind chills in the mountains ranged from 40 to 70 below zero.

Cold temperatures are expected in the Northeast but they can pose a serious threat to health and safety, especially as the severity and duration increases in conjunction with other technological (e.g. power outage, fuel oil delivery disruption) and societal (ability to purchase heating fuel) factors. Maintaining a safe living environment for livestock during extreme temperatures, especially cold extremes, is a concern for the region and Peacham. Peacham's winter of 2015 was the coldest anyone could remember with a mean temperature of 7.8 degrees Fahrenheit and a

max-low of -26 degrees Fahrenheit in February. However, the January of 1970 had a mean temperature of 6.6 degrees Fahrenheit which is the coldest mean temperature for the county and January is the statistically coldest month in all of Vermont. Since 1900, January produced temperatures in the negative 20's and 30's consistently for Caledonia County with record cold temperatures occurring in 1914 (-38). There is no evidence to support concern over increases in high temperatures for the town as it relates to health and human safety at this time.

Flooding

Flooding is the most common recurring hazard event in the state of Vermont. June, 2015 broke records across the state for the wettest on record. Peacham received nearly 6 inches of rain in June, 2015 but flooding did not result. This amount is high but not highest for the region. 9.65'' fell in 1973 in Saint Johnsbury and the greatest 24-hour rainfall records for the area occurred in May 30th, 2011 at 6.47''. Recent history, including the flooding events of 2011 and the records set in 2015 suggest that increases in total rain fall and severity are to be expected along the lines seen with the records set across the state recently. There are three sources of historical precipitation data for Vermont. The data are reported at the county level: 1) recurrence time intervals for 24-hour rainfall storm depth, 2) annualized daily frequency of rainfall, and 3) rainfall-intensity frequencies. The first source of data is the recurrence time intervals for 24-hour rainfall storm depth. The recurrence depth data describes the expected intensity of major rainfall events with respect to both rainfall depth and frequency of occurrence.

Table 2-8: 24-Hour Rainfall Depths (inches) for Common Recurrence Intervals (ANR, 2002)

County: Caledonia
1-yr, 24-hr Rainfall Depth: 2.1''
2-yr, 24-hr Rainfall Depth: 2.2''
10-yr, 24-hr Rainfall Depth: 3.1''
100-yr, 24-hr Rainfall Depth: 5.0''

The second source of data are the annualized daily frequencies of rainfall, which were obtained from the National Climatic Data Center (NCDC), Climate Normals program for 1981 – 2010. The data provides the average number of days per year with measurable precipitation (greater than 0.01 inches) on a county by county basis. This data allows for the conversion of the annual probabilities derived from the recurrence time intervals to daily probabilities. The annualized estimated daily frequency of measureable rainfall for Caledonia County is 174 days (highest in the state) with 119 days of rain and 55 days of snow. The final source of data are rainfall-intensity frequencies. Hourly precipitation totals throughout the state of Vermont were obtained from the NCDC's Cooperative Observer Program (COOP). Hourly rainfall data were available for 26 COOP locations between 1962 through 2012. Each station is associated with the specific county in which it was located, and the hourly precipitation totals for each station are aggregated by county to yield a frequency distribution of hourly rainfall intensities.

Table: 2-9: Caledonia County Rainfall-Intensity Range (in. /hr.)

County: Caledonia
$x \leq 0.01$: 22.5%
$0.01 < x \leq 0.05$: 25.6%
$0.05 < x \leq 0.10$: 38%
$0.10 < x \leq 0.15$: 3.2%
$0.15 < x \leq 0.20$: 5.9%
$0.2 < x \leq 0.25$: .8%
$0.25 < x$: 4.7%

There are three main types of flooding that occur in Vermont: flooding from rain or snow melt, flash flooding and urban flooding. Flooding has also been known to occur as a result of ice jams in rivers adjoining developed towns and cities. These events may result in widespread damage in major river floodplains or localized flash flooding caused by unusually large rainstorms over a small area. The effects of all types of events can be worsened by ice or debris dams and the failure of infrastructure (especially culverts), private and/or beaver dams. Rain storms are the cause of most flooding in Peacham. Winter and spring thaws, occasionally exacerbated by ice jams, are another significant source of flooding, especially when coupled with high rain levels. Much of this flooding is flash flooding, occurring within hours of a rainstorm or other event. Flash flooding, as opposed to flooding with a gradual onset, causes the largest amount of damage to property and infrastructure. Floods cause two major types of damage: water damage from inundation and erosion damage to property and infrastructure. The *2013 Vermont State All-Hazards Mitigation Plan* discusses flooding extensively. While that plan is concerned with all of Vermont, the information on flooding is all relevant to Peacham in that:

“Recent studies have shown that most flooding in Vermont occurs in upland streams and road drainage systems that fail to handle the amount of water they receive. Due to steep gradients, flooding may inundate these areas severely, but only briefly. Flooding in these areas generally has enough force to cause erosion capable of destroying roads and collapsing buildings. These areas are often not mapped as being flood prone and property owners in these areas typically do not have flood insurance (DHCA, 1998). Furthermore, precipitation trend analysis suggests that intense local storms are occurring more frequently. Additionally, irresponsible land use and development will exacerbate the preexisting vulnerability. Urban flooding usually occurs when drainage systems are overwhelmed and damages homes and businesses. This flooding happens in all urban areas, but specifically in Burlington where the downtown area is located at the bottom of a gradient, which adds to the intensity of this localized flooding....

...Over the past two decades, flood damage costs have risen dramatically in Vermont due to increasing occurrences of flooding and increases in vulnerability associated with unwise land use development in flood plains or within stream corridors. The geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Heavy rains with previous ground saturation, which causes runoff, are a significant part of the flooding formula in Vermont. Steep topography and narrow, inhabited, stream and river valleys further increase the dangerous nature of this hazard. Furthermore, precipitation trend analysis suggests that intense, localized storms that can cause flash flooding are occurring with greater

frequency. While flooding will continue, planning and other mitigation measures can help minimize damages.

All of Vermont’s major rivers have inhabited flood plains. While residents in mountain valleys are at risk, they may not be aware of the danger or may choose to ignore it. There are many reasons property owners are reluctant to relocate to less flood prone ground, not the least of which is the lack of personal experience of flooding. In addition, many communities originated beside rivers and streams; some of the most attractive property is located in vulnerable areas. Lakeshore property in Vermont is vulnerable to flooding from high water levels, either by surface water erosion or flooding. Occasionally, water-saturated ground and high water tables cause flooding to basements and other low lying areas. Lakeshore property is highly desirable and valuable, making the development of lakeshore areas very likely, even with the high potential for flooding. Restrictions on lakeshore property development have significant negative economic and tax revenue impacts that must be carefully weighed against the gains in personal safety and protection of property.”

Vermont experienced major floods long before Federal disaster assistance became available. The most destructive recorded event was in November of 1927. In the month before the flood, rains in excess of 150% of normal precipitation fell after the ground had frozen. The flood itself was precipitated by 10 inches of rain falling over the course of a few days. The flood inundated parts of many towns and damaged or destroyed numerous bridges in the county. As the history of the flooding cited above bears out, the geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Numerous floods have resulted in Presidentially-declared disasters and an influx of Federal disaster assistance. Of these disasters, 1973 flood inflicted widespread damage across the state and the residual rains of Hurricane Belle in 1976 resulted in substantial federal disaster assistance in Vermont. The following chart provides the history of recent PA funding related to flooding events in Peacham. While this does not reflect the total impact of flooding on the town, PA funding history does provide a reference for vulnerable areas in the town and those areas will be addressed.

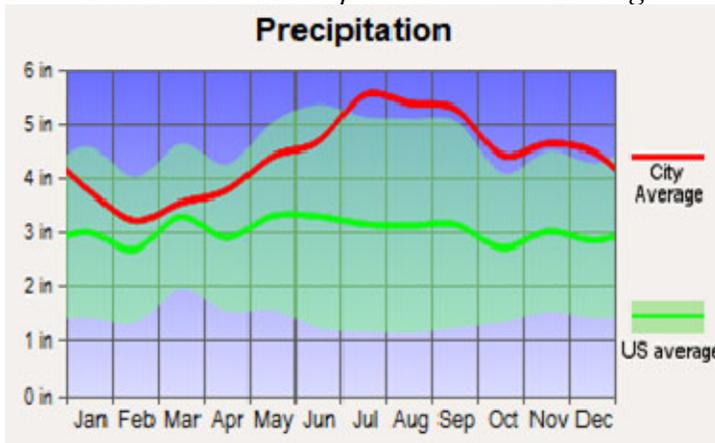
Table 2-5: Bulk PA Funding as a Result of Flooding in Peacham since 2004

Disaster Number	Date	Category	Town	Projects	Total Amount
1559	09/23/2004	Severe Storm(s)	PEACHAM (TOWN OF)	8	\$28,489.46
1790	09/12/2008	Severe Storm(s)	PEACHAM (TOWN OF)	8	\$210,082.72
4001	07/08/2011	Severe Storm(s)	PEACHAM (TOWN OF)	36	\$382,344.10
4022	09/01/2011	Hurricane	PEACHAM (TOWN OF)	10	\$44,127.64
4178	06/11/2014	Flood	PEACHAM (TOWN OF)	1	\$3,202.75

Source: FEMA

Previous experiences have proven to the town that flooding is the greatest risk and another flood event is probable by the time this plan requires an update. With this conviction, the need to complete viable mitigation actions to town infrastructure becomes incredibly important and the town remains aware of this. The estimated Capacity-Disruption Levels Given a Measured Rainfall Event can be interpreted as the conditional probability that a particular roadway capacity disruption occurs, given that a rainfall event occurs. For Caledonia County, the probability that the intensity of a rain event will result in approximately a 2%, 7.5%, or 13.5% roadway capacity reduction are 28.2%, 69.2%, or 2.6%, respectively (*Source: A Risk-Based Flood-Planning Strategy for Vermont's Roadway Network, 2015*).

Table 2-7: Peacham Precipitation vs. U.S. Average



Inundation and Floodplains

Peacham contains over 1,150 acres of wetlands. Peacham has, partially or wholly within its borders, eight lakes and ponds. (1) Peacham Pond (341 acres) borders on Groton State Forest with extensive cottage development on about a third of its shoreline. (2) Martin’s Pond (73 acres) has extensive cottage development on half of its shoreline, with the remaining undeveloped area residing in Groton State Forest. (3) Osmore Pond (51 acres) is completely within Groton State Forest, and has only a picnic area developed along its shore. (4) Kettle Pond is in Groton State Forest with 800 feet of shoreline in Peacham. (5) Foster Pond (56 acres), (6) Ewell Pond (40 acres), and (7) Keiser Pond (34 acres, most of which lies in Danville) have little development. (8) Mud Pond (31 acres), which is largely marsh land, is owned by the Vermont Department of Fish and Wildlife. Public fishing access is available on Peacham, Martins, Foster, Ewell, and Keiser Ponds. The two notable bogs in Peacham are owned by the State. The Town of Peacham has more undeveloped shore land than any other community in the Northeast Kingdom with over 72% (46,150 feet) currently undeveloped (2012 Town Plan). This not provides exceptional recreational opportunities but also helps reduce potential for flood-related property damage.

Regarding flood inundation issues, the 2013 Vermont State All-Hazards Mitigation Plan states:

“While inundation-related flood loss is a significant component of flood disasters, the predominant mode of damage is associated with the dynamic, and often times catastrophic, physical adjustment of stream channel dimensions and location during storm events due to bed and bank erosion, debris and ice jams, structural failures, flow diversion, or flow modification by man-made structures. Channel adjustments with devastating consequences have frequently been documented wherein such adjustments are linked to historic channel management activities, flood plain encroachments, adjacent land use practices and/or changes in watershed hydrology associated with conversion of land cover and drainage activities. The 100-year, or “base” floodplain is the national standard for floodplain management. The area is shown on City Flood Insurance Rate Maps (FIRMs) as issued by FEMA. The 100-year floodplain has one chance in a hundred of being flooded in any given year. The probability that a 100-year flood will occur is a statistical determination based on past flooding in an area. This is not to say that a flood of such magnitude cannot occur two years in a row or twice in the same year. The term only means that in any given year, the odds are 1% that the area will be flooded. The same logic holds true for defining a 500- year flood. In this case, a flood of the 500-year magnitude has a 0.2% chance of occurring in a year. Much flood damage in Vermont occurs along upland streams, damaging private property and infrastructure such as bridges, roads, and culverts. The failure of beaver dams, private ponds and public and private culvert crossings contributes to flood surges and often dramatically increased damage downstream. Homes and other private investments along these streams are generally not recognized as a flood area on FEMA maps of flood hazard zones and, thus, are not typically identified as being vulnerable to flooding or erosion. Town plans and zoning regulations have generally not identified these stream corridors as areas needing protective setbacks for development or zoning.”

In general, floods in the area are caused by heavy rains. Springtime rains are often associated with snowmelt. A winter thaw, accompanied by rain often leads to ice jams which also cause riverine flooding. Hurricanes traveling up the east coast of the country produce occasional flooding situations. The most frequent flooding occurs in early spring as a result of snowmelt and heavy rains, but flooding has historically occurred in every season. Notable floods in this area have occurred in the last several years. Steep slopes, culvert failure and inadequate ditching have resulted in the bulk of damage and subsequent repairs.

Fluvial Erosion

Erosion occurs on a consistent, but small-scale, basis within the riparian corridor of the town’s streams and rivers. This is a part of normal natural processes and as such is necessary for the proper functioning of the ecosystem of these waterways. However, fluvial erosion on a large scale can damage stream banks and undercut infrastructure such as roads, bridges and culverts as well as agricultural land and structures, causing severe damage. Fluvial erosion on a large scale can cause stream bank collapses, which are generally classified as landslides. Most flood damage is associated with fluvial erosion rather than inundation. The May 2011 storm produced the most significant fluvial erosion damage for the town. Several residents had 4-5 foot swaths of soil undercut from the storm but specific data is unavailable. The 2013 *Vermont State All-Hazards Mitigation Plan* contains the following discussion of fluvial erosion:

“Vermont’s landscape has historically contributed greatly to the widespread practice of the channelization of rivers and streams in order to maximize agricultural land uses and facilitate

the development of transportation infrastructure. Channelization, in combination with widespread flood plain encroachment, has contributed significantly to the disconnection of as much as 70% of Vermont's streams from their flood plains. In this unsustainable condition and when energized by flood events, catastrophic adjustments of the channel frequently occur, usually with consequent fluvial erosion damage to adjacent or nearby human investments. All areas of the state suffer equally from fluvial erosion hazards. Some areas have suffered more than others simply because of the location of storm tracks. Transportation infrastructure and agricultural property are the most frequently endangered types of human investment affected by fluvial erosion hazards. Residential, commercial and other municipal properties are also frequently endangered. Changes in watershed hydrology that significantly influence fluvial stability are commonly associated with urbanization or with silvicultural practices. However, watershed scale hydrologic changes have been observed in Vermont as a localized phenomenon either in small, highly urbanized watersheds or in small, rural sub watersheds where clear cutting of a large percentage of the watershed land area has recently occurred. Stream geomorphic assessments and a fluvial geomorphic database maintained by the Agency of Natural Resources have identified main stem rivers typically channelized from 60-95% of their lengths. When human investments and land use expectations include all the land in the valley up to the river banks, there results extreme public interest in maintaining this unsustainable morphological condition despite its great cost and resultant hazard to public safety.”

The Vermont Agency of Transportation (VTrans) applies the term “scour critical” to stream crossing structures especially vulnerable to streambed scour—the undermining of bridge supports by water action and erosion. A spreadsheet database is maintained by VTrans and continually updated by the Bridge Inspection Program. Structures inspected are only those of 20 ft. or longer owned by a municipality or the state. The scour critical rating is based on the structure itself, and does not consider debris jams, outflanking, channel change, or other issues commonly associated with fluvial erosion. Water supply source and distribution systems are also endangered by fluvial erosion. Many water distribution systems involve buried pipes that cross streams, which are vulnerable to fluvial erosion. In December 2014 the Vermont Department of Environmental Conservation (DEC) released the “Flood Hazard Area and River Corridor Protection Procedures” guide, outlining specific actions and considerations. While fluvial erosion potential has not been addressed yet, new data is constantly becoming available, such as the recently released River Corridors Base Map by the Agency of Natural Resources. While Peacham’s exposure is limited by the length and character of the rivers within the town, the potential for significant property damage under unique circumstances is a concern. Therefore, new river corridor data will be evaluated as it becomes available to identify any potential problem areas and any measures that will minimize or eliminate the impact of fluvial erosion shall be implemented. The FEH map is based on 2011 Stream Geomorphic Assessment (SGA) field work and the best available data to date. The River Corridor layer is based primarily on desktop analysis, but the SGA field data will be incorporated into the River Corridor layer and shown on the Atlas soon (next summer/fall?). The FEH map shows only the meander belt of the river, meaning the minimum lateral area needed by the river to form the natural meander pattern appropriate for the stream type and valley slope, with valley shape taken into consideration. The

River Corridor includes the meander belt + 50 feet on either side to allow room for stable bank conditions/vegetation when the river flows against the edge of the meander belt. The FEH map only covers Peacham Hollow Brook and South Peacham Brook. The River Corridor covers all streams draining greater than 2 square miles. For streams draining 0.5 to 2 square miles, a 50-foot setback from top of bank is recommended on either side of the stream.

The FEH version is currently regulated under Peacham Zoning. From a hazard mitigation planning standpoint, it is wise to consider both the FEH and the River Corridor information for the additional streams.

Ice Jams

Ice jams, which can cause rapid and catastrophic flooding, are considered increasingly hazardous in parts of Vermont. In addition to the inundation damage they cause, ice jams can block infrastructure such as roads and culverts. Ice jams are not as much of a concern in Peacham as elsewhere in Vermont. This is most likely due to the relationship between ice jams and the dam, the Moore Reservoir freezes over but the river is normally open. Water is drained in the reservoir for power generation and floating ice gets stuck behind the dam and in spring the water is generally low. Ice on the river below Moore Dam would back up at Comerford Dam. A list of historic ice jams, including municipalities and streams, is maintained by VEM and the Vermont Agency of Natural Resources (ANR). The US Army Corps of Engineers Cold Regions Research and Engineering Laboratory maintains a more specific database of ice jams, which includes over 903 events in Vermont with the latest occurring in 2013. Despite Peacham not having any recorded events, nearby Passumpsic had 19 (10th highest in the state) and St. Johnsbury had 38 (5th highest in the state) with the Connecticut River being number one in the state with 84 recorded ice jams and the Passumpsic River with only one. There are several small dams in Peacham, none of which are considered high risk. The largest being on Peacham Pond with a height of 26 feet. The others are on Goslant and Martins Pond, Ewell Pond (breached), Foster Pond, Mud Pond (possibly breached), and at least 2 private ponds with dams that are considerable size. Even these very small private ponds, if breached would effect sections of town road.

(Source: http://rsgisias.crrel.usace.army.mil/apex/f?p=524:39:10954063060296::NO::P39_STATE:VT)

SECTION 3: RISK ASSESSMENT

3.1 Designated Hazard Areas

3.1.1. Flood Hazard Areas

Peacham is in both the Connecticut and Winooski River watershed. Peacham is located in the “Upland” drainage region and while this limits the amount of rich soils found in areas along the Connecticut River, it helps to protect the town from major riverine flooding. Areas along Peacham Hollow Brook and South Peacham Brook do flood periodically but the areas are both farmland and no structures are at risk. The town has no properties in the SFHA (A or V zones).

source: *NFIP Insurance Report: Vermont*

3.1.2. Fluvial Erosion Hazard Areas

About two-thirds of Vermont’s flood-related losses occur outside of mapped floodplains, and this reveals the fundamental limitations of the FEMA FIRMs. A mapped floodplain makes the dangerous assumption that the river channel is static, that the river bends will never shift up or down valley, that the river channel will never move laterally, or that river beds will never scour down or build up. River channels are constantly undergoing some physical adjustment process. This might be gradual, resulting in gradual stream bank erosion or sediment deposit – or it might be sudden and dramatic, resulting a stream bank collapse. In fact, this type of flood-related damage occurs frequently in Vermont, due in part to the state’s mountainous terrain. Land near stream banks are particularly vulnerable to erosion damage by flash flooding, bank collapse, and stream channel dynamics. The Vermont Department of Environmental Conservation, Agency of Natural Resources, has identified river corridors, which consist of the minimum area adjacent to a river that is required to accommodate the dimensions, slope, planform, and buffer of the naturally stable channel and that is necessary for the natural maintenance or natural restoration of a dynamic equilibrium condition. In other words, the river corridor provides “wiggle room” for a stream as its channel changes over time. Keeping development out of the river corridors therefore reduces vulnerability to erosion. Development is prohibited in Special Flood Hazard Area and Fluvial Erosion Hazard Zones and is specifically defined in the Town’s Zoning Regulations (Section 505.3).

Repetitive Loss Properties

The town has no repetitive loss properties (buildings or homes).

source: FEMA Repetitive Loss/BCX Claims provided with packet. NOTE: BCX claims are ones located out of the SFHA.

3.2 Non-designated Hazard Areas

3.2.1. Ice Storm Damage

Historic impacts of ice storms in Peacham were minimal in comparison to other areas of the state.

1998 data: <https://www.fema.gov/disaster/1201>

3.2.2. High Winds and Lightning

Ridgeline and hilltop homes as well as homes located in the midst of mature forests are the most vulnerable to damage from falling trees and tree limbs. The Vermont Agency of Transportation works to keep limbs trimmed. As with many Vermont communities characterized by natural terrain, the issue of downed trees creating power loss and property damage is more common compared to urban areas. Historically, these instances are short in duration and have not posed a serious risk for the town or its residents.

3.3 Previous FEMA-Declared Natural Disasters and Non-Declared Disasters

While the Town of Peacham has had a history of flooding, losses to public infrastructure have intensified in recent years. The summers of 1996, 1998 and 2002 saw moderate road damage throughout the town and in the village areas. Damage was largely contained to local back roads (unpaved) due to washouts. The town has been fortunate that its buildings and residential property has remained unaffected by recent disasters. Peacham has received public assistance funding from FEMA for the following natural disasters:

Table 3-1: KEY:

DR	Date	Type
1559	09/23/2004	Severe Storm(s)
1790	09/12/2008	Severe Storm(s)
4001	07/08/2011	Severe Storm(s)
4178	06/11/2014	Flood
4022	09/01/2011	Hurricane

Table 2-2: Town of Peacham, FEMA-declared disasters and snow emergencies, 2004-Current:

Disaster Number	PW Number	Application Title	Damage Category Code	Project Amount	Federal Share Obligated	Total Obligated
1559	116	GRAVEL ROAD REPAIR	C - Roads & Bridges	\$8,872.42	\$6,654.32	\$7,058.90
1559	117	GRAVEL ROAD AND DITCH REPAIR	C - Roads & Bridges	\$4,222.08	\$3,166.56	\$3,359.09
1559	118	GRAVEL ROAD AND DITCH REPAIR	C - Roads & Bridges	\$3,396.42	\$2,547.32	\$2,702.20
1559	119	GRAVEL ROAD REPAIR	C - Roads & Bridges	\$9,748.56	\$7,311.42	\$7,755.94
1559	120	GRAVEL ROAD AND DITCH REPAIR	C - Roads & Bridges	\$2,175.09	\$1,631.32	\$1,730.51
1559	121	GRAVEL ROAD REPAIR	C - Roads & Bridges	\$4,173.22	\$3,129.92	\$3,320.22
1559	122	GRAVEL ROAD REPAIR	C - Roads & Bridges	\$3,329.08	\$2,496.81	\$2,648.62
1559	123	GRAVEL ROAD REPAIR	C - Roads & Bridges	\$2,069.05	\$1,551.79	\$1,630.00

1790	209	Peacham VT - Gov Mattocks Rd. TH #53 - County Rd TH#6	C - Roads & Bridges	\$52,489.55	\$39,367.16	\$39,367.16
1790	221	1790 - East Peacham Road - TH-2	C - Roads & Bridges	\$24,228.48	\$18,171.36	\$18,171.36
1790	232	1790 - Green Bay Road TH-6	C - Roads & Bridges	\$15,856.03	\$11,892.02	\$11,892.02
1790	234	Peacham VT - Penny Rd. --TH #31	C - Roads & Bridges	\$48,940.62	\$36,705.47	\$36,705.47
1790	235	1790 - Old Cemetery Road TH-20	C - Roads & Bridges	\$5,656.32	\$4,242.24	\$4,242.24
1790	258	1790 - Thaddeus Stevens Road	C - Roads & Bridges	\$5,297.44	\$3,973.08	\$3,973.08
1790	267	Peacham VT -- Hapenny Rd -- TH41	C - Roads & Bridges	\$23,615.65	\$17,711.74	\$17,711.74
1790	271	Peacham VT - Mack's Mountain Road - TH-5	C - Roads & Bridges	\$104,026.20	\$78,019.65	\$78,019.65
4001	83	TIM Peacham Farrow	C - Roads & Bridges	\$5,247.39	\$3,935.54	\$3,935.54
4001	84	TIM Peacham Cow Hill	C - Roads & Bridges	\$5,692.94	\$4,269.71	\$4,269.71
4001	85	TIM Peacham Thaddeus	C - Roads & Bridges	\$10,461.82	\$7,846.37	\$7,846.37
4001	108	TIM Peacham Kieser	C - Roads & Bridges	\$3,957.29	\$2,967.97	\$2,967.97
4001	109	TIM Peacham Somers	C - Roads & Bridges	\$17,886.43	\$13,414.82	\$13,414.82
4001	114	TIM Peacham Young	C - Roads & Bridges	\$10,827.51	\$8,120.63	\$8,120.63
4001	115	TIM Peacham Aiken	C - Roads & Bridges	\$7,410.15	\$5,557.61	\$5,557.61
4001	117	TIM Peacham Blanchard	C - Roads & Bridges	\$11,659.70	\$8,744.78	\$8,744.78
4001	118	TIM Peacham Way	C - Roads & Bridges	\$3,984.84	\$2,988.63	\$2,988.63
4001	124	TIM Peacham Nunn	C - Roads & Bridges	\$1,188.13	\$891.10	\$891.10

4001	125	TIM Peacham Bayley	C - Roads & Bridges	\$32,996.24	\$24,747.18	\$24,747.18
4001	126	TIM Peacham Field	C - Roads & Bridges	\$1,741.87	\$1,306.40	\$1,306.40
4001	127	TIM Peacham Taylor	C - Roads & Bridges	\$2,262.10	\$1,696.58	\$1,696.58
4001	130	TIM Peacham Old County	C - Roads & Bridges	\$18,972.58	\$14,229.44	\$14,229.44
4001	131	TIM Peacham Worchester	C - Roads & Bridges	\$3,112.74	\$2,334.56	\$2,334.56
4001	132	TIM Peacham Foster	C - Roads & Bridges	\$6,826.24	\$5,119.68	\$5,119.68
4001	133	TIM Peacham Maple	C - Roads & Bridges	\$17,943.43	\$13,457.57	\$13,457.57
4001	139	TIM Peacham East Peacham	C - Roads & Bridges	\$1,633.42	\$1,225.07	\$1,225.07
4001	141	TIM Peacham Stevenson	C - Roads & Bridges	\$2,215.60	\$1,661.70	\$1,661.70
4001	142	TIM Peacham Hookerville	C - Roads & Bridges	\$2,872.97	\$2,154.73	\$2,154.73
4001	143	TIM Peacham Willow Brook	C - Roads & Bridges	\$19,660.21	\$14,745.16	\$14,745.16
4001	144	TIM Peacham Hollow Woods	C - Roads & Bridges	\$5,941.57	\$4,456.18	\$4,456.18
4001	146	TIM Peacham Varnum	C - Roads & Bridges	\$21,351.12	\$16,013.34	\$16,013.34
4001	147	TIM Peacham Elwell	C - Roads & Bridges	\$2,725.76	\$2,044.32	\$2,044.32
4001	148	TIM Peacham Macks Mountain	C - Roads & Bridges	\$42,703.72	\$32,027.79	\$32,027.79
4001	149	TIM Peacham Green Bay	C - Roads & Bridges	\$77,944.21	\$58,458.16	\$58,458.16
4001	151	TIM Peacham Old Cemetery	C - Roads & Bridges	\$49,176.64	\$36,882.48	\$36,882.48
4001	155	TIM Peacham County	C - Roads & Bridges	\$33,985.77	\$25,489.33	\$25,489.33
4001	161	TIM Peacham Penny	C - Roads & Bridges	\$21,847.17	\$16,385.38	\$16,385.38
4001	162	TIM Peacham Slack	C - Roads & Bridges	\$33,009.49	\$24,757.12	\$24,757.12
4001	169	TIM Peacham Gov Wentworth	C - Roads & Bridges	\$1,559.09	\$1,169.32	\$1,169.32
4001	170	TIM Peacham Peacham Pond	C - Roads & Bridges	\$2,572.78	\$1,929.59	\$1,929.59
4001	216	TIM Peacham	C - Roads	\$16,378.51	\$12,283.88	\$12,283.88

		Gov Mattock	& Bridges			
4001	219	TIM Peacham Emergency Protective Measures	B - Protective Measures	\$5,573.56	\$4,180.17	\$4,180.17
4001	220	TIM Peacham Emergency Protective Measures Donated	B - Protective Measures	\$642.93	\$482.20	\$482.20
4001	229	TIM Peacham Great	C - Roads & Bridges	\$5,826.15	\$4,369.61	\$4,369.61
4022	189	MOPEC1 TH- 58	C - Roads & Bridges	\$21,781.81	\$19,603.63	\$19,603.63
4022	190	MOPEC2 TH- 14	C - Roads & Bridges	\$5,060.76	\$4,554.68	\$4,554.68
4022	191	MOPEC3 TH- 56	C - Roads & Bridges	\$3,235.51	\$2,911.96	\$2,911.96
4022	192	MOPEC4 TH- 53	C - Roads & Bridges	\$2,721.40	\$2,449.26	\$2,449.26
4022	193	MOPEC5 TH-5	C - Roads & Bridges	\$2,826.55	\$2,543.89	\$2,543.89
4022	194	MOPEC6 TH- 59	C - Roads & Bridges	\$2,478.54	\$2,230.69	\$2,230.69
4022	195	MOPEC7 TH-4, TH-7	C - Roads & Bridges	\$4,665.39	\$4,198.85	\$4,198.85
4022	196	MOPEC8 TH- 61	C - Roads & Bridges	\$2,114.48	\$1,903.03	\$1,903.03
4022	197	MOPEE1	F - Public Utilities	\$1,500.00	\$1,350.00	\$1,350.00
4022	260	MOPEB1	B - Protective Measures	\$2,646.28	\$2,381.65	\$2,381.65
4178	9	Peacham PEACC01 TH 56	C - Roads & Bridges	\$4,270.33	\$3,202.75	\$3,202.75

Sources: FEMA and the 2015Peacham Town Plan

Non-declared disasters (e.g. snow and rain storms) have not resulted in damage above and beyond normal maintenance. Extreme, long-lasting cold temperatures during winter months do pose a concern for the town as in many communities where the price of heating fuel often exceeds resident's ability to pay. Coupled with high unemployment, there is an increased risk for the town's residents to not meet the financial requirements for adequate heat, especially during long periods of extremely cold temperatures. Without adequate provisions, 48 hours of extremely cold temperatures could create a serious health hazard.

3.3 Hazard Assessment and Risk Analysis

Although estimating the risk of future events is far from an exact science, the Planning Team used best available data and best professional judgment to conduct an updated Hazards Risk Estimate analysis, which was subsequently reviewed and revised by town officials in March, 2018. This analysis assigns numerical values to a hazard's affected area, expected consequences, and probability and supports the inclusion of all profiled hazards in this plan. This quantification allows direct comparison of very different kinds of hazards and their effect on the town and serves as a method of identifying which hazards hold the greatest risk based on prior experience and best available data. The following scoring system was used in this assessment:

Area Impacted: scored from 0-4, rates how much of the municipality's developed area would be impacted.

Consequences: consists of the sum of estimated damages or severity for four items, each of which are scored on a scale of 0-3:

- Health and Safety Consequences
- Property Damage
- Environmental Damage
- Economic Disruption

Probability of Occurrence: (scored 1-5) estimates an anticipated frequency of occurrence based on prior experience and current information.

To arrive at the Overall Risk Value, the sum of the Area and Consequence ratings was multiplied by the Probability rating. The highest possible risk score is 80.

3.3.1. Natural Hazards

According to the updated Hazard and Risk Estimation for Peacham, the following natural hazards received the highest risk ratings out of a possible high score of 80:

- Severe Winter Storm (30)
- Flooding (50)
- Extreme Cold (40)
- High Winds (16)

Flood-related disasters have had the greatest financial impact on the town. While no deaths or injuries have been recorded for declared or non-declared disasters, the potential for health and safety risk during a severe winter storm and/or extreme cold are considered higher than that posed by a flooding event. Lighting and high winds further the risk for power loss and high winds can occur any time of year (and normally occur in unison with rain or snow events).

Table 3-2 Natural hazards risk estimation matrix

Peacham, VT Hazard & Risk Analysis: NATURAL HAZARDS with Hazardous Material Incident		Drought	Flooding	High Winds	Fluvial Erosion	Landslide	Lightning	Multi-Structure Urban Fire	Hazardous Materials Incident	Winter Storm	Extreme Cold
		Area Impacted									
Key: 0 = No developed area impacted											
1 = Less than 25% of developed area impacted											
2 = Less than 50% of developed area impacted											
3 = Less than 75% of developed area impacted											
4 = Over 75% of developed area impacted		2	3	4	1	1	1	1	4	4	
Consequences											
<i>Health & Safety Consequences</i>											
Key: 0 = No health and safety impact											
1 = Few injuries or illnesses											
2 = Few fatalities or illnesses											
3 = Numerous fatalities		0	1	1	0	0	1	2	1	1	1
<i>Property Damage</i>											
Key: 0 = No property damage											
1 = Few properties destroyed or damaged											
2 = Few destroyed but many damaged											
3 = Few damaged but many destroyed											
4 = Many properties destroyed and damaged		0	1	1	1	1	1	2	1	2	1
<i>Environmental Damage</i>											
Key: 0 = Little or no environmental damage											
1 = Resources damaged with short-term recovery											
2 = Resources damaged with long-term recovery											
3 = Resource damaged beyond recovery		2	2	1	1	1	1	1	2	0	2
<i>Economic Disruption</i>											
Key: 0 = No economic impact											
1 = Low direct and/or indirect costs											
2 = High direct and low indirect costs											
2 = Low direct and high indirect costs											
3 = High direct and high indirect costs		1	3	1	1	1	1	3	1	3	2
Sum of Area & Consequence Scores		5	10	8	4	4	5	9	6	10	10
Probability of Occurrence											
Key: 1 = Unknown but rare occurrence											
2 = Unknown but anticipate an occurrence											
3 = 100 years or less occurrence											
4 = 25 years or less occurrence											
5 = Once a year or more occurrence		1	5	2	2	1	2	1	2	3	4
TOTAL RISK RATING											
Total Risk Rating =											
Sum of Area & Consequence Scores		5	50	16	8	4	10	9	12	30	40
x Probability of Occurrence											

The town is vulnerable to power loss and in colder months, this could place the residents of the town in harm's way. While the history of major power loss over extended periods of time is minimal, there have been repetitive short-term outages, the greatest lasting 3 hours. This duration poses a health and safety risk to residents as well as limiting response capabilities of town staff. With a designated high accident location and a town-wide 50mph speed limit and village-wide 30mph limit, the concern for a hazardous substance spill resulting from a transportation accident is a concern but a moderate to low one. With the recent severity of cold temperatures lasting for longer durations, accessibility of heating fuel is a concern and this accessibility is defined by transportation issues resulting from a major storm where roads are impassable and from resident's ability to pay for the fuel. As with many disaster scenarios, the hazards categories are related to one another. Natural hazards can cause a technological problem which can then cause a societal problem.

3.4 Hazard Summary

According to the risk estimation analysis, the highest rated hazards for Peacham are:

1. Flooding
2. Severe Winter/Ice Storm
3. Extreme Cold
4. High Winds

Flooding is the highest rated hazard for Peacham due to previous damage events and subsequent costs to repair. With 36 locations needing repair to the combined cost of just over \$380,000 following DR4001, the potential for significant, town-wide damage is possible with a severe rain event. Within each of the highest rated hazards, there exists the potential for the secondary, but no less important, consequence of increased financial demand on residents as a result of an event. While winters in Vermont are characterized by cold weather, recent increases in the duration of extremely cold temperatures increase the costs of heating energy and this is a challenge that the state and local communities are being forced to address.

SECTION 4: VULNERABILITY ASSESSMENT

Vulnerability refers to the potential impact of a specific loss related to an identified risk. Peacham is a small town with very few buildings aside from residential. While the loss of any one facility would cause a disruption in town services and operations, the overall vulnerability is low. There are roads, bridges and culverts vulnerable to flooding and those are identified below. Loss of equipment function for the highway department is a vulnerability for the town but the risk is not due or predicted to be a result of a disaster, merely, the required maintenance expected of highway-related machinery.

For this section of the plan, the planning team looked at prior history and worst-case scenarios. Additional considerations include seasonal patterns, areas likely to be most affected, probable duration of the hazard, and speed of onset. A combination of the risk ranking, disaster history expenditures and frequency of the hazard was used to classify the community vulnerability as HIGH (25 years or less-low end), MODERATE (unknown but anticipate occurrence or 25 years or less-high end) or LOW (100 years or less). For example, a flood event is highly likely in many communities, but the degree of impact varies. A highly likely flood with critical or catastrophic impact rates the community vulnerability as HIGH. Another community with a highly likely or likely flood with a limited impact would receive a vulnerability rating of MODERATE. The vulnerability of a community having the occurrence of an event as possible or unlikely with limited or negligible impact would be classified as LOW.

Vulnerability Narrative for Profiled Hazards:

Severe winter storm: 25 Years or Less

Summary: While all structures are vulnerable to major snow loads, there is little evidence to support concern over structure failure due to snow loads on roofs, ice on gutters, etc. Town snow removal equipment is vulnerable to damage with greater use, especially during emergency situations as well as road damage from plowing. Populations caught outdoors, commuting or working outside during a severe winter storm are more vulnerable to cold-related injury and/or snow related accidents but winter comes every year and residents and the town are accustomed to making intelligent decisions regarding safety and protection of infrastructure. Special populations (e.g. aging, disabled, etc.) are more vulnerable in terms of mitigating structure loads, hazardous travel and relocating to safety.

Flooding: 25 Years or Less

Flooding is the most common recurring hazard event in the state of Vermont. There are three main types of flooding that occur in Vermont: flooding from rain or snow melt, flash flooding and urban flooding. Flooding has also been known to occur as a result of ice jams in rivers adjoining developed towns and cities. These events may result in widespread damage in major river floodplains or localized flash flooding caused by unusually large rainstorms over a small area. The effects of all types of events can be worsened by ice or debris dams and the failure of infrastructure (especially culverts), private and/or beaver dams. Rain storms are the cause of most flooding in Peacham. Winter and spring thaws, occasionally exacerbated by ice jams, are another significant source of flooding, especially when coupled with high rain levels. Much of this flooding is flash flooding, occurring within hours of a rainstorm or other event. Flash flooding, as opposed to flooding with a gradual onset, causes the largest amount of damage to property and infrastructure. Floods cause two major types of damage: water damage from inundation and erosion damage to property and infrastructure. The *2013 Vermont State All-Hazards Mitigation Plan* discusses flooding extensively. While that plan is concerned with all of Vermont, the information on flooding is all relevant to Peacham in that:

“Recent studies have shown that most flooding in Vermont occurs in upland streams and road

drainage systems that fail to handle the amount of water they receive. Due to steep gradients, flooding may inundate these areas severely, but only briefly. Flooding in these areas generally has enough force to cause erosion capable of destroying roads and collapsing buildings. These areas are often not mapped as being flood prone and property owners in these areas typically do not have flood insurance (DHCA, 1998). Furthermore, precipitation trend analysis suggests that intense local storms are occurring more frequently. Additionally, irresponsible land use and development will exacerbate the preexisting vulnerability. Urban flooding usually occurs when drainage systems are overwhelmed and damages homes and businesses. This flooding happens in all urban areas, but specifically in Burlington where the downtown area is located at the bottom of a gradient, which adds to the intensity of this localized flooding....

...Over the past two decades, flood damage costs have risen dramatically in Vermont due to increasing occurrences of flooding and increases in vulnerability associated with unwise land use development in flood plains or within stream corridors. The geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Heavy rains with previous ground saturation, which causes runoff, are a significant part of the flooding formula in Vermont. Steep topography and narrow, inhabited, stream and river valleys further increase the dangerous nature of this hazard. Furthermore, precipitation trend analysis suggests that intense, localized storms that can cause flash flooding are occurring with greater frequency. While flooding will continue, planning and other mitigation measures can help minimize damages.

All of Vermont's major rivers have inhabited flood plains. While residents in mountain valleys are at risk, they may not be aware of the danger or may choose to ignore it. There are many reasons property owners are reluctant to relocate to less flood prone ground, not the least of which is the lack of personal experience of flooding. In addition, many communities originated beside rivers and streams; some of the most attractive property is located in vulnerable areas. Lakeshore property in Vermont is vulnerable to flooding from high water levels, either by surface water erosion or flooding. Occasionally, water-saturated ground and high-water tables cause flooding to basements and other low-lying areas. Lakeshore property is highly desirable and valuable, making the development of lakeshore areas very likely, even with the high potential for flooding. Restrictions on lakeshore property development have significant negative economic and tax revenue impacts that must be carefully weighed against the gains in personal safety and protection of property."

Vermont experienced major floods long before Federal disaster assistance became available. The most destructive recorded event was in November of 1927. In the month before the flood, rains in excess of 150% of normal precipitation fell after the ground had frozen. The flood itself was precipitated by 10 inches of rain falling over the course of a few days. The flood inundated parts of many towns and damaged or destroyed numerous bridges in the county. As the history of the flooding cited above bears out, the geography and topography are right for a significant localized storm with extreme damage at almost any location in Vermont. Numerous floods have resulted in Presidentially-declared disasters and an influx of Federal disaster assistance. Of these disasters, 1973 flood inflicted widespread damage across the state and the residual rains of Hurricane Belle in 1976 resulted in substantial federal disaster assistance in Vermont. The following chart provides the history of recent PA funding related to flooding events in Peacham. While this does not reflect the total impact of flooding on the town, PA funding history does provide a reference for vulnerable areas in the town and those areas will be addressed.

Previous experiences have proven to the town that flooding is the greatest risk and another flood event is probable by the time this plan requires an update. With this conviction, the need to complete viable mitigation actions to town infrastructure becomes incredibly important and the town remains aware of this. The estimated Capacity-Disruption Levels Given a Measured Rainfall Event can be interpreted as the conditional probability that a particular roadway capacity disruption occurs, given that a rainfall event occurs. For Caledonia County, the probability that the intensity of a rain event will result in approximately a 2%, 7.5%, or 13.5% roadway capacity reduction are 28.2%, 69.2%, or 2.6%, respectively (*Source: A Risk-Based Flood-Planning Strategy for Vermont's Roadway Network, 2015*).

Extreme Cold: 25 Years or Less

Summary: Recent evidence shows that greater extremes in temperature and overall weather fluctuation are occurring with increased frequency. A long-duration cold snap can cause significant damage to structures due to bursting pipes and the residential health and safety considerations include factors related to financial resources, fuel supply, sheltering, provisions and employment.

Table 4-2: Vulnerability Summary Table

Hazard	Vulnerability	Extent (Storm Data from most severe event)	Impact (economic/health and safety consequence)	Probability
Flood	Culverts, bridges, road infrastructure,	The greatest 24-hour rainfall record for immediate region occurred in late August 2011 at 4.01". The greatest level of precipitation in any month occurred in August 2011 at 11.12". No detailed data was available for fluvial erosion damage in town in terms of numbers of acres lost during each event.	DR 4011 (7/2011) resulted in greatest financial impact and damage to roads and bridges with about \$380,000 in FEMA funding for 36 projects.	25 years or less

<p>Extreme Cold/ Snow/Ice Storm</p>	<p>The entire Town is vulnerable, including road infrastructure, town and privately-owned buildings, utility infrastructure</p>	<p>Snowfall has varied, from a few inches to over a foot or more. Heavy snow and wind may down trees and power lines. Snow/ice contributes to hazardous driving conditions. The winter of 2010-2011 was the third-snowiest on record with a total of 124.3 inches for the county. The record for the county was 145.4 inches set in 1970-1971. Ice data for the town was unavailable but storm of 12/13/13 produced a max accumulation of .5”.</p>	<p>For roof collapse: monetary damages will depend on each structure but, collapse of barn roof is often a total loss. This does not include the loss of livestock. Collapse of a house roof may be at a 50% loss. For car crashes due to poor driving conditions: minimal damage to vehicle to totaled vehicle and operator injury. Health impacts could vary significantly. Loss of energy or communication capabilities may occur and impede recovery.</p>	<p>25 years or less</p>
---	---	--	---	-------------------------

4.1 Critical Facilities

The Center for Disaster Management and Humanitarian Assistance defines critical facilities as: “Those structures critical to the operation of a community and the key installations of the economic sector.” Table 4-1 identifies critical facilities in Peacham. As mentioned in the summaries above, some critical facilities have increased vulnerability during specific hazard events. However, there is no evidence to suggest that any critical facility is highly vulnerable during any hazard event. All critical facilities in the town are outside the designated flood hazard areas and have no history of damage due to a disaster. In this regard, the town is resilient to critical facility damage during a natural disaster most likely to affect the region.

4.2 Infrastructure

Flooding is the highest risk profiled hazard and town infrastructure has high vulnerability to damage during major flood events. The information presented below summarizes town infrastructure and high vulnerability areas.

4.2.1 Town Highways

The road network consists of:

- *Class I Town highways - 1.6 miles:* Class I town highways are those town highways that form the extension of a state highway route. The Agency of Transportation shall determine which highways are Class I highways. The only Class I highway in Peacham is the 1.6 miles of the Groton-Marshfield highway - Route 232.
- *Class II Town highways -10.0 miles:* These are the most important highways in each town. As far as practicable, they shall be selected with the purpose of securing main lines of improved highways from town to town and to places which by their nature have more than the normal amount of traffic. They are designated by the Select Board and approved by the Vermont State Highway Board.
- *Class III Town highways -51.6 miles:* These are all traveled highways other than Class I or II. The Select Board, after conferencing with a representative of the State Agency of Transportation, shall determine Class III highways. The minimum standards for Class III highways are that they be negotiable under normal conditions all seasons of the year. This would include, but not be limited to, sufficient surface and base, adequate drainage, and sufficient width to permit winter maintenance.
- *Class IV Town highways -7.9 miles:* Class IV town highways include all other town highways as designated by the Select Board. These roads are typically 3 rods wide (unless otherwise recorded), are not eligible for state aid funds and are not maintained for winter use. These highways are maintained for summer service only; persons erecting dwellings served by these roads cannot expect winter service. There has been little change in the classification of roads in the past ten years, and there is no anticipated change during the current planning period.

Table 4-2 Town highway mileage by class, Town of Peacham

Class 1	Class 2	Class 3	Class 4	State Hwy	Fed Hwy	Interstate	Total 1, 2, 3, State Hwy
1.6	10	51.6	7.9	0	0	0	71.1 Miles

Source: data derived from VTrans TransRDS GIS data/Peacham Town Plan

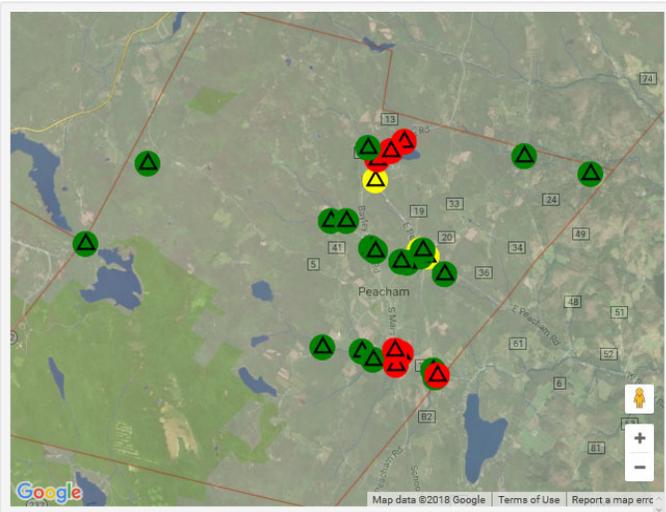
4.2.2 Bridges, Culverts, and Dams

Bridges:

There are a variety of bridges, culverts and dams located in the town. The following bridges are contained in an inventory maintained by VCGI, VTrans and the NVDA and represent those of greatest concern for the town. This analysis does not take into account the fluvial geomorphology or the elevation of the bridge above the floodplain.

Table 4-4 Inventoried bridges in the Town of Peacham with identified importance

The entire Bridge Inventory with maps for the town can be found on the state site: <https://vtculverts.org/bridges#list>



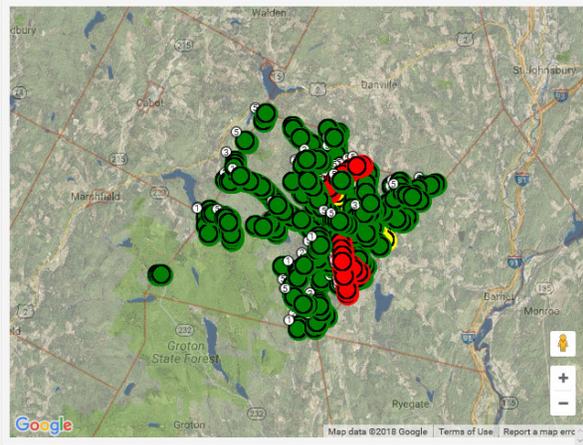
According to the risk ranking system developed and displayed on the site: vtculvert.org, the following Peacham bridge locations are considered high importance (*note: bridge conditions are unknown*):

- PEACHAM BARNET RD
- PEACHAM BARNET RD
- PEACHAM DANVILLE RD
- PEACHAM DANVILLE RD
- PEACHAM DANVILLE RD
- PEACHAM GROTON RD
- S MAIN ST

Culverts:

There are currently 646 culverts in the town and are classified in the VTCulverts.org system. The majority of the culverts are in GOOD condition (271), 24 are rated as EXCELLENT. The remainder are FAIR (235) or POOR (116) and UNKNOWN (24). This inventory is updated by the Town. VTCULVERTS.ORG also ranks culverts with an interactive map, the following roads contain culverts that are rated high risk (denoted with Red on the map):

Table 2-4: Vulnerability Ranking Map for Peacham Culverts



Source: <https://www.vtculverts.org/structures>

Dams:

Goslant Pond, Ewell Pond (breached), Foster Pond, Mud Pond (possibly breached), and at least 2 private ponds with dams that are considerable size. Even these very small private ponds, if breached would effect sections of town road. The largest being on Peacham Pond with a height of 26 feet but a breech would have little effect on the Town. Just a very short section of Kellogg Mill Road (class IV).

4.2.3 Water, Wastewater and Natural Gas Service Areas

The Town currently has a village water supply. The Peacham Fire District #1 supplies water to all homes, apartments, businesses and public buildings in Peacham Corner (as defined in 1927). This service is managed and paid for by those to whom water is provided in Peacham Corner. Peacham has two small community sewage disposal systems: one private and one town-owned. Statewide, many private systems have annual periods of failure, causing pollution of the ground surface, the surface waters, and the atmosphere. Failure usually results from the system's being located in soils that are naturally saturated during wet periods, inadequate capacity of the system in relation to the volume of sewage and the soil's ability to absorb the effluent, and/or faulty installation. While a survey of systems in Peacham has not been undertaken, recent statewide research has discovered that up to one-third of septic systems constructed in an average year are installed to replace systems which have failed.

4.2.4 Electric Power Transmission Lines and Telecommunications Land Lines

High-tension electric transmission lines run through the Town of Peacham and service is provided by Washington Electric and Green Mountain. Landline phone service is widely available; however, cell phone service is limited in town.

4.3 Estimating Potential Losses in Designated Hazard Areas

According to most current American Community Survey 5-Year averages, the median value of an owner-occupied housing unit in Peacham is \$239,687. With no repetitive loss properties, the town does not believe that even during a flooding event similar to those of 2011 that there would be substantial damage to buildings or residential housing that exceeded 1%. However, given the magnitude of damage to town roads, the potential for costs exceeding annual budgeting allotments is possible. However, the repairs and upgraded resilience of these locations associated with these prior expenses greatly reduces the potential for a recurrence.

4.4 Land Use and Development Trends Related to Mitigation

Peacham lies in the geographic region known as the Piedmont. This area is characterized by glacial uplands with hilly terrain and the absence of true mountains. Today, many of the marginal farm areas have reverted back to forest cover; The Town of Peacham contains approximately 30,000 acres of land. The town is primarily made up of six types of land and/or water; forests, agricultural, open non-agricultural, developed residential, ponds, and wetlands. Forests account for 23,365 acres or 78.0% of Peacham's land area. Agricultural accounts for 2,050 acres or 6.8%; Open Non-Agricultural accounts for 2,224 acres or 7.4%; Developed Residential is 627 acres or 2.1 %; Wetlands account for 1,066 acres or 3.6%; and Ponds are 636 acres or 2.1 %. 2,574 acres of the agricultural lands are part of the agricultural overlay (defined later). Topographic elevations range from the peak of Cow Hill at 2,566 feet to a low of 888 feet (above sea level) along the eastern edge in the Peacham Hollow Brook; Peacham has the distinction of containing an important watershed divide.

Peacham is an example of the pattern of development for which Vermont is well known. Historically, development in Peacham has occurred in and around compact villages with surrounding land uses appearing as a patchwork quilt of open farmland, managed wood lots, and large tracts of forested land. The small amount of residential development that has occurred outside of villages has, for the most part, occurred as low-density housing (housing lots of 10 acres or more). Peacham has also benefited from many land owners who have maintained open land even if it is not actively farmed. There is strong public support for maintaining slow growth and the existing pattern of development through the town planning and development review process. The primary and current land use controls available to help maintain the existing pattern of development are listed and summarized in the town plan (Peacham Town Plan). Below are notable zoning regulations for the town:

- *All proposed development must comply with the regulations of the Vermont Shoreland Protection Act and Vermont Wastewater System and Potable Water Supply Rules. Parcels created after July 1, 2014 must be large enough to allow the intended development and construction to comply with the Shoreland Protection Act (see Title 10, Chapt. 49A of the Vermont Statutes.*
- *Alterations and adjustments within the established exterior dimensions of a dwelling located outside of any regulated Flood Hazard Areas which do not change the use of the dwelling will not require a permit. Alterations which change the exterior dimensions of a structure shall require a permit. A destroyed dwelling and/or other structure located outside of any regulated Flood Hazard Areas may be rebuilt without a permit only if it*

conforms to the architectural footprint, height, dimensions, and use of the former structure. The site of a destroyed structure must be cleaned of all debris and any cellar hole capped within one year.

4.4.1. Proposed Land Use

Peacham joined the NFIP on 11/23/11 under state-provided FEH maps. FIRM maps do not currently exist for the town. Because of this, the town remains in the “Emergency Phase” of NFIP status and will enter Normal Phase whence FIRM maps are completed (expected date unknown). The Zoning Bylaws hold to the recommended practices under the NFIP and all continued compliance and participatory requirements are managed by the Zoning Administrator. The Administrative Officer (AO) enforces the flood hazard regulations, which are integrated with the town's zoning regulations. The AO receives, and reviews permit applications and forwards for board review as appropriate. In accordance with FEMA requirements, the AO maintains records of all permits issued for development in areas of special flood hazard; elevations, in relation to mean sea level, of the lowest floor, including basement, of all new or substantially improved buildings; elevations, in relation to mean sea level, to which buildings have been flood proofed; flood proofing certifications; and all variance actions, including justification for their issuance. There are no repetitive loss properties in the town. There is one policy with \$45,000 in coverage with \$0 paid out since 1978.

Source: <http://bsa.nfipstat.fema.gov/reports/reports.html>

(Source: *Repetitive Losses / BCX Claims Federal Emergency Management Agency: VERMONT*).

4.4.2. Land Use Goals

The town is committed to implementing the goals and objectives of the Town Plan. Furthermore, it is meant to promote the health, safety, and general welfare of the inhabitants of the Town of Peacham. Its purposes are to

- A. Manage all flood hazard areas designated pursuant to 10 V.S.A. Chapter 32 § 753, the municipal hazard mitigation plan and make the Town of Peacham, its citizens, and businesses eligible for enrollment in the National Flood Insurance Program (NFIP) and federal flood insurance, federal disaster recovery funds, and hazard mitigation funds as may be available; and
- B. Implement the goals, policies, and recommendations of the current Town Plan.

4.4.3. Land Use Strategies

The town will continue to encourage stewardship of its natural resources through information and education and promote viability of resources through Current Use, Vermont Land Trust and Local Vermont products. Additionally, the Planning Commission will investigate the feasibility of implementing subdivision regulations to preserve open space, and discourage loss of farmland and, if found appropriate, shall draft such regulations for submission to the Selectboard.

4.4.4 Future Development and Housing

Despite the advantages of attracting new businesses and housing, the town does not foresee major development occurring in the next five-year planning cycle. Other than individual real-estate transactions, there is little anticipated business development projected.

SECTION 5: MITIGATION STRATEGIES

5.1 Town Goals and Policies that support Hazard Mitigation

The Town Zoning Regulations are designed to implement the goals and objectives of the Town Plan. Furthermore, they are meant to promote the health, safety, and general welfare of the inhabitants of the Town of Peacham through two main goals:

- a. Manage all flood hazard areas designated pursuant to 10 V.S.A. Chapter 32 § 753, the municipal hazard mitigation plan and make the Town of Peacham, its citizens, and businesses eligible for enrollment in the National Flood Insurance Program (NFIP) and federal flood insurance, federal disaster recovery funds, and hazard mitigation funds as may be available; and
- b. Implement the goals, policies, and recommendations of the current Town Plan.

5.1.1. *Community Goals*

- a. Continue supporting state standards with local, POS water/sewer sources.
- b. Take advantage of the UVM/ACCD mobile home park preparedness programs to support resiliency of this disproportionately impacted population during disasters if applicable.
- c. Consider implementation of special population tracking within the community where-by residents unable to drive or that have no one to depend on can self-identify for inclusion in a maintained data-base so that rescue personal and emergency managers can account for this demographic.
- d. Work with residents, NVDA, rescue services, Vermont EMS and the LEPC to accomplish community outreach to develop understanding of the scope of practice of EMS in rural Vermont.
- e. The Selectboard and Planning Commission shall pursue grant funding for shelter emergency generators.
- f. Selectboard and Planning Commission shall continue to study the availability of firefighting water supplies, recommend locations and install dry hydrants where needed. The town has pursued grants for dry hydrants through VT Rural Protection Task Force.
- h. The Selectboard and Planning Commission shall pursue grants and program participation for the provision of wireless and broadband communications.

5.1.2. *Capital Improvement Goals*

- a. Provide services and facilities deemed necessary for the orderly and rational development of the Town.

b. Selectboard shall investigate options for the construction of public building or buildings to house Road Department equipment and operations and possibly an animal holding facility for dogs impounded by the Town and propose such facility to the voters.

5.1.3. Public Participation Goals

a. Continue to solicit input regarding planning issues from town residents and from other entities which can help to offer solutions and insight into the problems the Town faces both now and in the future via formal meetings and advertised opportunities for input.

b. Utilize the LEPC and NVDA to increase awareness, enhance planning and engage in exercises that address needs in the community.

5.1.4. Regulatory Devices Goals

a. Continue to use the Zoning Bylaws. The bylaws have been established to conform to, and be in harmony with, the Vermont Municipal and Regional Planning and Development Act. Any conflicts that are identified between the two documents will defer to Title 24 VSA, Chapter 117 as the prevailing authority.

b. Maintain and continue a Capital Expense Budget and Program for the purpose of ensuring that the rate of growth does not outstrip the town's ability to pay for the associated necessary services such as roads, schools, police and fire protection, solid waste, etc.

c. Develop and maintain a "No Adverse Impact" (NAI) approach to flood hazard management by institutionalizing the best practices set forth by the ASFPM.

d. Utilize best practices in flood-plain management for farm-related development in town.

5.1.5. Land Use

a. Work to develop a Flood Hazard Area Overlay District to include all designated flood hazard areas. The purpose of the Flood Hazard Area Overlay District is to (1) protect public health, safety, and welfare by preventing or minimizing hazards to life and property due to flooding, and (2) to ensure that private property owners within designated flood hazard areas are eligible for flood insurance under the National Flood Insurance Program (NFIP).

5.1.6 Natural Resources

a. Ensure that the existing health ordinance is enforced to maintain protection of both surface and groundwater supplies.

b. Ensure that permits issued for development near sensitive areas, such as steep slopes, high elevations, wetlands, scenic vistas and wildlife habitats, contain conditions assuring conformance to the goals set forth by the state of Vermont and when applicable and feasible, those defined as best practices by floodplain management organizations such as the ASFPM as well as those set forth in this plan and the most recent town plan.

c. The town should work with the NVDA and ACCD to continue the process of identifying the Town's land conservation priorities, and to the degree possible, link them to broader regional conservation work.

d. In line with the VTrans mission statement regarding climate change, the town remains committed to:

- Ensure that there are viable alternative routes around vulnerable infrastructure such as bridges and roadways
- Make safety a critical component in the development, implementation, operation and maintenance of the transportation system
- Develop contingency plans for a wide-variety of climate impacts to be implemented as data/information becomes available
- Utilize information technology to inform stakeholders during times of emergency
- Educate of the public and other stakeholders on the threats posed by climate change and fluvial erosion hazards
- Increase inspection of infrastructure if warranted by climate change indicators
- Apply a decision-making framework to incorporate cost-benefit analyses into adaptive plans and policy
- Work to protect essential ecosystem functions that mitigate the risks associated with climate change
- Educate individuals within the agency to use best-practices during recovery periods to avoid ecological damage that may further exacerbate risk
- Recognize the interconnected nature of our built environment with ecological processes
- Protect the state's investment in its transportation system and adapting transportation infrastructure to the future impacts of climate change

e. In line with DEC's best practices regarding fluvial erosion, the town will work to:

- Slowing, Spreading, and Infiltrating Runoff (The State Surface Water Management Strategy is found at <http://www.watershedmanagement.vt.gov/swms.html> and <http://www.watershedmanagement.vt.gov/stormwater.htm>)
- Avoiding and Removing Encroachments. http://www.watershedmanagement.vt.gov/rivers/htm/rv_floodhazard.htm http://www.watershedmanagement.vt.gov/rivers/docs/rv_RiverCorridorEasementGuide.pdf
- River and Riparian Management: DEC has prepared a compendium of *Standard River Management Principles and Practices* to support more effective flood recovery implementation; improve the practice of river management; and codify best river management practices in Vermont. The document compiles the most current river management practices based on the best available science and engineering methods to create consistent practice and language for risk reduction while maintaining river and floodplain function. Best practices are established to address common flood damages, including:

- Erosion of banks adjacent to houses and infrastructure
- Erosion of road embankments
- Channel movement across the river corridor
- River bed down-cutting that destabilizes banks, undermines structure foundations, exposes utility crossings, and vertically disconnects rivers from adjacent floodplains
- Bridge and culvert failure

Source: http://www.watershedmanagement.vt.gov/permits/htm/pm_streamcrossing.htm

5.1.7. Policies

- a. Through both town and state-level management, the town will work to:
 - Encourage and maintain naturally vegetated shorelines, buffers and setbacks for all rivers, ponds and streams
 - Allow higher density or cluster development in existing and designated settlement areas and low-density development in the remaining areas
 - Reduce flood hazard and repetitive road and driveway washout through continued updates and adherence to priorities in road, bridge and culvert improvement projects
 - Identify and manage pollution, flooding and fluvial erosion hazards along rivers and streams as they arise

5.1.8. Transportation Plan

In adjunct to town-specific planning, the town is committed to continually subscribing to all current state standards related to:

- a. Maintaining safe operating conditions on the present system of town roads through design and modification to keep traffic at appropriate speeds and to assure the safest possible driving conditions, including consideration of additional paving (though only on portions of roads prone to damage) should state funding become available.
- b. Protection of existing town roads from flood damage and uncontrolled storm water runoff.
- c. Preserving the capacity of town roads and maintain adequate traffic flows and safety.
- d. Support the road maintenance crew through Town-provided training sessions. This includes ICS training along with the Road Commission (Selectboard).
- e. Support policies and procedures that ensure longevity of essential town-equipment and develop and maintain MOU's with neighboring towns related to equipment use during emergencies.
- f. Continue long term access opportunities to gravel and sand deposits for future road maintenance use.
- g. Consider developing a standard operating procedure (SOP) based on ICS principles for highway department response events were coordination, communication and support are at a heightened level.

5.1.9. Utilities and Facilities Goals

- a. Maintain current relationships with the Vermont State Police and Rescue for police and emergency medical services, respectively.
- b. Develop policies and procedure that ensures equipment longevity to the greatest extent possible.
- c. Develop a retention plan for highway department personnel to help avoid high turnover and preserve institutional memory.
- d. Promote high-speed internet access in the Village to encourage local businesses to reside in Peacham.
- e. Ensure adequate provision of water sources for fire suppression by requiring dry hydrants, fire ponds, water storage, or other measures where appropriate. The Planning Commission will work with developers and property owners on this task.

5.1.9.1. Educational Goals

- a. The School Board should work with the Selectboard, the American Red Cross and Fire Department to ensure that the necessary equipment exists at the school for its use as an emergency shelter.
- b. Increase emergency planning cohesion between school and town EOPs through mutual participation and presentation at scheduled LEPC meetings and town and/or school meetings.
- c. Continue collaboration with the Vermont Chapter of the American Red Cross on their sheltering initiative program to further readiness with training and supplies related to sheltering operations.

5.2 Existing Town of Peacham Actions that Support Hazard Mitigation

The town has done an excellent job at monitoring and addressing transportation issues, engaging in a documented and systematic approach to mitigation actions. The Selectboard has successfully pursued funding to address needs. Exemplified by Better Back Roads, Structures Grants and FEMA funding. The town has been able to enhance its resilience and overall preparedness. The town has addressed its current and future needs and by and large, road improvement projects remain the primary focus for the town and the areas identified were selected based on the condition of culverts and ditches and primarily focused on runoff issues particularly as the incidence of heavy storms has increased. In many cases, culverts properly sized for normal rain events are overwhelmed by the severe ones. The town will seek local, state and federal funds to address the sites identified as priorities. Peacham will earmark the funds necessary to complete one major project each year for the next 5 years and will keep its culvert inventory current to improve its institutional memory. The town has also adopted municipal road and bridge standards that meet or exceed the 2013 standards and has an approved and adopted, annually, Local Emergency Operations Plan and Town Plan.

Table 5.0: Existing Town Actions Supported Hazard Mitigation

Type of Existing Protection	Description /Details/Comments	Issues or Concerns
Emergency Response		
Police Services	Vermont State Police	None at this time
Fire Services	Peacham	Retention and Recruitment
Fire Department Personnel		Need for new volunteers remains
Fire Department Mutual Aid Agreements	Northeast International Mutual Aid (19 participants)	None at this time
EMS Services	Calex	Staffing longevity and community awareness of scope of services
Other Municipal Services		
Highway Services	Town Highway Department	Has completed 5-year scoping of priority mitigation projects and budgets work each fiscal year.
Highway personnel	3 FTE field personnel	MOU's completed with residents to avoid future conflict and liability over culvert and ditching work and other towns to assure equipment availability
Water / Sewer Department	None	None at this time
Planning and Zoning personnel	Town positions filled	None at this time
Residential Building Code / Inspection	No	None at this time
Emergency Plans		
Local Emergency Operations Plan (LEOP)	2018	Assure sheltering plans and contact information is up to date and vulnerable populations are addressed.
School Emergency/Evacuation Plan(s)	2017	Increased collaboration (with town staff, school, LEPC, NVDA), knowledge of roles and drills are next step.
Municipal HAZMAT Plan	None	None at this time
Shelter, Primary	Peacham School	Working with ARC's Shelter Initiative and have obtained certification, training and supplies. Include volunteer staff in planning communication and schedule drills to test efficacy.
Replacement Power,	Acquired	Stay proactive with state and FEMA

backup generator		regarding town interests.
Municipal Plans		
Town / Municipal Comprehensive Plan	2017	None at this time
Town of Peacham Road Erosion Site Inventory	2017	Created with assistance from ANR
Hazard Specific Zoning (slope, wetland, conservation, industrial, etc.)	Utilize most current state regulations	Consider using current best practices to guide actions for achieving a “No Adverse Impact” policy as well as assuring future farm development occurs with defined best practices
Participation in National Flood Insurance Program (NFIP) and Floodplain/Flood Hazard Area Ordinance	Joined 11/23/11 under state-provided FEH maps	Town remains in “Emergency Phase” of NFIP status and will enter Normal Phase whence FIRM maps are completed.
Culvert and bridge Inventory	2017	https://vtculverts.org/map https://vtculverts.org/bridges#list Strive to coordinate lists and keep up to date

5.2.1. *Flood Resilience Goals:*

- Mitigate Peacham’s flood hazards in the most cost-effective manner possible
- Minimize the risk exposure and associated expense to Peacham tax payers
- Ensure the Town and its facilities are prepared to meet the demands of the next flood
- Ensure the Town can receive the maximum outside assistance in the event of the next Federally declared disaster

5.2.2. *Flood Resilience Strategies:*

- Identify and protect Peacham’s natural flood protection assets, including floodplains, river corridors, other lands adjacent to streams, wetlands, and upland forested cover
- Adopt flood hazard regulations that at a minimum, protect property from known risks
- Review and evaluate statewide river corridor information, when it becomes available
- Consider adopting regulations that will protect erosion prone areas for additional Development and encroachment
- Maintain and regularly update the Local Emergency Operations Plan.
- Continue to meet the VTrans Road and Bridge standards. Participate in regional Road Foreman trainings and Transportation Advisory Committee meetings to stay abreast of flood resilience measures for the Town’s roads and bridges
- Continue to update the Town’s transportation infrastructure information in the Vermont Online Bridge and Culvert Inventory Tool

- Upgrade undersized and failing culverts
- Develop and maintain a Local All-Hazard Mitigation Plan
- Equip the town’s emergency shelter (the school) with a generator and/or solar panels

5.3 Town of Peacham All-Hazards Mitigation Goals

The following goals were developed by the planning team, vetted during a warned community meeting and approved by the Town of Peacham during the development of this plan:

1. Reduce at a minimum, and prevent to the maximum extent possible, the loss of life and injury resulting from all hazards.
2. Mitigate financial losses and environmental degradation incurred by municipal, educational, residential, commercial, industrial and agricultural establishments due to various hazards.
3. Maintain and increase awareness amongst the town’s residents and businesses of the damages caused by previous and potential future hazard events as identified specifically in this Local All-Hazards Mitigation Plan.
4. Recognize the linkages between the relative frequency and severity of disaster events and the design, development, use and maintenance of infrastructure such as roads, utilities and storm water management and the planning and development of various land uses.
5. Maintain existing municipal plans, programs and ordinances that directly or indirectly support hazard mitigation.
6. Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan into the municipal comprehensive plan as described in 24 VSA, Section 4403(5). This mechanism will be developed by the Planning Commission, Selectboard and NVDA and integrate the strategies into the existing town plan as annexes until the next formal update occurs, where a section devoted to mitigation planning will be integrated into the plan.
7. Develop a mechanism for formal incorporation of this Local All-Hazards Mitigation Plan particularly the recommended mitigation actions, into the municipal/town operating and capital plans & programs as they relate to public facilities and infrastructure. With the development of the road erosion site inventory, the town will begin a process that incorporates the budgetary requirements of the defined mitigation strategies into its formal budgeting paradigm. The Planning Commission will review the LHMP and use language/actions from it to inform the integration and update process. Town Meeting Day will serve as the formal time that mitigation strategy budgetary considerations will be approved and incorporated into the town budget.

5.4 Mitigation Actions

In following FEMA guidance, the following mitigation action categories form the basis of the town’s future mitigation actions. The planning team decided to adopt this approach for all future mitigation work. For each mitigation action to follow, an indication of group will be given with the abbreviations below:

Mitigation Action Groups:

(P) Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

(PP) Property Protection: Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.

(PEA) Public Education & Awareness: Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

(NRP) Natural Resource Protection: Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

(SP) Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g., culverts), floodwalls, seawalls, retaining walls, and safe rooms

5.4.1. Current Capabilities and Need for Mitigation Actions

The Town Plan's goals and policies that support hazard mitigation and the existing mitigation actions demonstrate the variety of policies and actions forming the foundation of this All Hazards Mitigation Plan. Within the boundaries of both financial and political capabilities, the town will work on the following actions in the next five-year planning cycle.

5.4.2. Specific Mitigation Actions

The following seven actions define the mitigation measures to be taken by the town in the next five years:

Action #1: Reduce flood-related impacts through infrastructure upgrades, improvement projects and floodplain management activities.

Action #2: Improve resilience to severe winter storms

Action #3: Reduce impact of extreme cold durations

Action #4: Raise public awareness of hazards and hazard mitigation actions

Action #5: Reduce impact of high wind events

Action #6: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified risk

Each of the seven actions listed above are explained below in regard to progress, project leads and partner agencies and specific action steps:

Action #1: Reduce flood-related impacts through infrastructure upgrades, improvement projects and floodplain management activities.

Group: SP, NRP, PP

Risk or Hazard Addressed: Risk to property, residents

Lead Responsible Entity: Town of Peacham Road Foreman and Selectboard

Potential Partner Entities: Vermont Agency of Natural Resources; Vermont Agency of Transportation; NVDA, VEM, FEMA and the Agency of Commerce and Community Development

Timeframe: 2018 – 2023

Funding Requirements and Sources: FEMA or other hazard mitigation grants; FHWA grants; VAOT grants; Municipal Operating and Capital budgets.

Progress: The Road Foreman continually monitors road and storm water management capabilities. All bridges and culverts have been electronically accounted for and the town is diligent in maintaining a comprehensive and newly-formed, Road Erosion Site Inventory Plan that serves to guide action by identifying areas of road erosion, estimated costs of repair and future needs. In 2015, the University of Vermont released Scour research and opportunities for scour sensors.

Specific Identified Tasks:

- 1) Infrastructure Assessment for Storm Water Vulnerability – Funding and staff resources permitting, assess the vulnerability and operational capability of municipal-owned roads, culverts and other storm water management infrastructure to predicted storm water and snowmelt in areas with a documented history of recurring problems. The infrastructure will be evaluated regularly prior to replacement or upsizing of the existing infrastructure.
- 2) Continued Monitoring of Vulnerable Infrastructure - Monitor bridges and culvert locations that have erosion and scouring concerns and track via the Road Erosion Site Inventory.
- 3) Road Improvements - Within political and financial restraints, re-engineer certain sections of roads to lower overall maintenance costs, improving snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes. Specific projects, numbered by priority include:
 1. Aiken Farm Culvert: Currently undersized and needs 14x8 Box Culvert. 180k estimated cost.
 2. Paving need due to repetitive washouts:
 - Village Road: Chronic washouts require road to be paved with paved shoulders.
 - 500ft. on Old Cemetary Road near library needs to be paved
 - 500-800ft. on Church St. by town office needs to be paved

These areas are lined with catch basins that fill and overflow with a hard rain. This occurs 8-10x per season with a price of \$2,000 per event. Investigate drainage options in nearby ponds.

3. Develop communication plan with landowners resistant to allowing mitigation actions because of they don't want their lawn destroyed.
 4. Green Bay Loop: 1500' Section needs to be reshaped and graveled
 5. Governor Madox Road and County Road needs engineering work to prevent S. Peacham Brook (which runs under road and alongside) from crushing road section during high rains.
 6. Macks Mountain Road needs stone ditching work to improve drainage and reduce washouts
 7. Slack St and Penny St.: 2 Brooks join together and travel under Penny St. Road washes out in high rains. Road sections have been armored with large stone and washout risk has been reduced.
- 4) Documenting – Develop a methodology that serves to efficiently capture work and expenditures on sites and keep this information at the town office and/or current “Grater Log” used by Road Foreman
 - 5) Increase Awareness of Funding Opportunities - Increase understanding of FEMA’s HMGP program so that this potential funding source can be utilized through trainings and communication with the State Mitigation Office.
 - 6) ICS Training and Emergency Operations (SOP) Plan Development – Enhance knowledge of the principles of ICS and develop a Standard Operating Procedures that details the relationship, roles and responsibilities of the Highway Department and Road Commission during major events.

Rationale / Cost-Benefit Review: Conducting vulnerability assessments facilitates a targeted and effective approach to road and storm water management infrastructure. This will prove useful in the development and implementation of municipal capital and operating plans as well as the development and implementation of grant-funded mitigation projects. Some areas suffer low-level but consistent damage during heavy rains and snowmelt. Mitigating against these problems would reduce short and long-term maintenance costs and improve the flow of traffic for personal and commercial purposes during flooding events. Tracking road work and understanding the HMGP program can open funding streams into the town and can make the application process much easier when required information is already available. A basis understanding of ICS will serve the town and at little or no cost. As a requirement for an approved LEOP, municipal ICS-awareness is seen as necessary state-wide. During an emergency event when the Highway Department personnel are required to work beyond normal capacity, increased communication and collaboration between the Highway Department and local entities can be enhanced with a basic SOP. An SOP can also serve to increase institutional memory when there are staff changes at every level as well as provide a template from which tabletops and drills can be based off of.

Action #2: Maintain and improve resilience to severe winter storms

Group: SP, PP, PEA

Risk or Hazard Addressed: Risk to property, infrastructure and residents

Primary Responsible Entities: Town of Peacham Selectboard, Planning Commission and Emergency Management director;

Potential Partner Entities: LEPC, Peacham Fire Chief, ARC’s Sheltering Initiative Program

Timeframe: 2018 – 2023

Funding Requirements and Sources: VEM or FEMA hazard mitigation funding; existing programs, contingent on available resources and funding.

Progress: Roads are monitored and altered, when necessary so that plowing can occur without damage to trucks and/or road. The Peacham School has been identified as the primary emergency shelter. The school does not have an emergency generator. The fire department building is the designated EOC and tertiary shelter and it does have a generator in place. Snow clearing equipment is regularly serviced, and the town maintains an adequate supply of salt.

Specific Identified Tasks:

- 1) Maintain Existing Shelter Capability: Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the town and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.
- 2) Reduce risk of power failure due to ice storms: Enhance collaboration between town road foreman and electric company related to down-limbed induced power failure. Maintain function of generators.
- 3) Notification: Develop a notification/communication plan that conveys essential sheltering information using school phone system and back-up methodology (email, text, etc.). Continue to build on and use VT-Alert training for emergencies.
- 4) Residential Programs: Provide guidance and communication to residents on the structural and mechanical actions that can occur to reduce risk to severe winter storms (e.g. weather-proofing, anchoring, alternative heating sources, tree trimming, financial programs, etc.)
- 5) Continue to monitor roads for safe and effective plowing: Efficient snow removal is the foundation to winter storm (snow) events, assuring roads are plowable before winter remains an important facet of highway department functions
- 6) Increase awareness of ICS structure and recommended practices: The town can mitigate the effects of a severe winter by understanding how a large-scale storm is managed when the State EOC is operational. Additional awareness of local-level roles and responsibilities during statewide event is a mitigation action.

Rationale / Cost-Benefit Review:

This mitigation action serves to reduce the economic impact and risk to both human and animal (livestock and pet) health and safety during severe winter storm events by reducing risk and enhancing the mechanisms of winter storm mitigation in the long term. More formalized policy formation in both staffing and notification procedures, especially pertaining to vulnerable populations where transportation and special needs are a concern could potentially significantly reduce the physical, psychological and social impacts of a disaster.

Action #3: Reduce impact of extreme cold durations

Group: PEA, PP, SP

Risk or Hazard Addressed: Risk to infrastructure, livestock and residents

Primary Responsible Entities: Town of Peacham Selectboard and planning commission, EMC, Fire Department, local/regional assistance organizations.

Potential Partner Entities: NVDA, Peacham School Vermont DMEHS, LEPC

Timeframe: 2018-2023

Funding Requirements and Sources: Financial factors may produce barriers to change. Strategic planning and understanding of the total scope of needs and potential for change is logical first-step.

Specific Identified Tasks:

- 1) Economic Resilience: Establish program for assistance in paying heating bills during crisis situations, if not already required by state law. Develop and sustain a program that serves to connect resource organizations with residents in need of support services.
- 2) Maintain Existing Shelter Capability: Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the town and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.
- 3) Assess Vulnerable Population— Develop an awareness of the most at-risk community members during an evacuation and/or sheltering event. Focusing on those that lack resources or capability to reach facilities when in need and create plans, including outreach protocol on how to address this potential hurdle.
- 4) Notification and Education – Investigate and develop a notification/communication plan that conveys essential sheltering information. Educating citizens regarding the dangers of extreme cold and the steps they can take to protect themselves when extreme temperatures occur by sustaining a process that serves to disseminate educational resources for homeowners and builders on how to protect pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls. Inform homeowners that letting a faucet drip during extreme cold weather can prevent the buildup of excessive pressure in the pipeline and avoid bursting through a yearly public service campaign.

Rationale / Cost-Benefit Review:

With an increase in extreme weather, including cold, there is a need to protect property and the population. Given the magnitude of population dependence on social services, indicating economic and other social vulnerabilities, effective outreach, education and collaboration with resources supports this mitigation action category.

Action #4: Raise public awareness of hazards and hazard mitigation actions

Group: PEA

Risk or Hazard Addressed: Risk to property, residents

Lead Responsible Entities: Town of Peacham, Fire Chief, LEPC, NVDA

Potential Partner Entities: Vermont state agencies and regional organizations

Timeframe: 2018-2023

Funding Requirements and Sources: Majority of information is available and both state agencies and organizations can provide materials for outreach

Progress: As mitigation planning continues to integrate into normal, day-to-day operations, the town has an opportunity to engage its residents with information that will serve to mitigate several risks. The LEPC meets regularly and covers a host of topics related to emergency

preparedness and raises awareness in the community about what organizations are doing around emergency response planning and chemical safety. Town meeting day can serve as an annual update and outreach opportunity as well.

Specific Identified Tasks:

- 1) Hazard Resilience for Property Owners- Develop and maintain education materials to inform property owners on how to protect their homes and businesses through accepted hazard resilience actions (e.g. securing their structures from high winds, elevating their electrical equipment/furnaces in basements, protecting from lightning strikes by grounding electrical outlets, etc.).
- 2) HMGP Awareness: Attend informational sessions on the HMGP funding opportunities for acquisition, elevation and flood-proofing projects. Work with NVDA to develop an information brochure for residents.
- 3) School Programs – Assure the school is structurally ready to handle natural hazard risks to the greatest extent possible. Continue school programs to raise student awareness of hazards, safety, preparedness and prevention. Explore establishing the school emergency notification system as the primary methodology for all emergency notification procedures and build in the contact information accordingly.
- 4) Family Programs – Continue family programs, such as car safety seat and bike safety programs, to raise family awareness of hazards, safety, preparedness and prevention.
- 5) Fire Prevention Programs – Continue National Fire Prevention Week and other programs to raise public awareness of fire hazards, safety, preparedness and prevention.
- 6) Other hazard awareness programs – Develop public awareness programs, based on all-hazards needs. Programs to address pandemic hazards, preparedness and mitigation may be appropriate as directed by the state department of health and its jurisdictional offices of local health

Rationale / Cost-Benefit Review: Improved public awareness could potentially significantly reduce the loss of life and property damage through ongoing, formal, ongoing, public information campaigns that address property protection actions (flood proofing, elevation, anchoring mobile homes/propane tanks, electric and water system elevation, electric grounding, etc.) Improved awareness would also build understanding and public support for municipal mitigation actions to reduce potential infrastructure and liability costs.

Action #5: Continue fluvial geomorphology assessments in collaboration with DEC and develop strategies and regulatory actions in response to identified risks

Group: P, NRP, PEA, PP

Risk or Hazard Addressed: Risk to property, residents

Status: Ongoing

Primary Responsible Entities: Department of Environmental Conservation District Representative, NVDA Planners, Agency of Natural Resources (VT ANR) District Representative, Town of Peacham Planning Commission.

Potential Partner Entities: Nonprofits, other Town of Peacham officials, and other appropriate entities.

Timeframe: 2018–2023

Progress: DEC has completed assessments for Basin ID 15 (Passumpsic). NVDA can assist in enhanced mapping of the floodplain within the town and has provided the town with updated River Corridor Maps. The town has adopted flood hazard area zoning regulations and is considering a “no development” policy in the SFHA for the future.

Specific Identified Tasks

- 1) Fluvial Geomorphic Assessments – The town will work with DEC through coordinated meetings, workshops and communication to increase understanding of current findings and develop an applicable framework to help guide decisions related to priority infrastructure work and vulnerability.
- 2) Fluvial Erosion Hazard Mapping – Develop a fluvial erosion hazard map for the waterways, using the GIS extension known as SGAT (or Stream Geomorphic Assessment Tool) for assessed stream reaches. As assessments are completed, a map of all assessed waterways in the town will be created.
- 3) River Corridor Management Plans – Using the River Corridor Maps, the town will develop an outreach strategy to residents/structures in or near the defined corridor. This communication should focus on flood resilience measures and opportunities. With the lack of repetitive loss properties in the town, the likelihood of viable HMGP acquisition projects is low but increasing awareness of this program can serve the town well.
- 4) Fluvial Erosion Hazard Mitigation Implementation - The town will draft strategies to avoid or mitigate losses from the identified fluvial erosion hazards. These strategies may include the adoption and implementation of programs, mechanisms or regulations to prevent endangerment of persons and property in riparian corridor areas from fluvial adjustment processes. Efforts could range from a relatively simple, public information campaign about the map to the adoption of a municipal ordinance or by-law that restricts development in such hazard areas.
- 5) Administrative and Zoning Regulations: Zoning administrator will work with town officials and residents to determine if a “Zero Development” policy in high flood/erosion risk areas is required in the town and progress accordingly.

Rationale / Cost-Benefit Review:

Continuing this project will require a sustained succession of grants, state appropriations and other funding to complete assessments in Peacham. Successful completion will provide municipal and regional benefits. The municipality’s fluvial erosion areas would be adequately and electronically mapped. This will enable the municipality to make residents and businesses aware of fluvial erosion hazards and potentially lead to municipally-directed programs, mechanisms and regulations that further mitigate against this hazard, protecting existing structures and infrastructure. Identifying fluvial erosion hazard areas could also help the municipality restrict future development in hazardous areas, if that should be an advantage to the town in the future. More accurate knowledge of fluvial geomorphology will enable the community to have a better understanding of hazard areas and what mitigation measures might most effectively address those concerns. Flooding is the most common and most significant hazard that can trigger a Federal disaster declaration in Peacham. Along with an update to the flood hazard area maps, identifying the fluvial erosion hazard areas provides improved

opportunities for the community to mitigate potential losses and gauge future development initiatives. With the upcoming advent of an advanced software system (CAI), the town can begin to develop enhanced mapping in-house using currently available data and use this resource as a guide for communication, planning and policy formation.

Action #6: Reduce vulnerability to high wind events with accepted best practices

Group: P, PP

Risk or Hazard Addressed: Risk to property, residents

Lead Responsible Entities: Peacham Planning Commission, HED, Fire Chief, NVDA.

Timeframe: 2018 –2023

Funding Requirements and Sources: GMP and Washington Electric are independent from municipal services but enhanced collaboration can aid in mitigating high wind events. Included below are the tasks that will be assessed on a benefit-cost ratio level in this planning cycle.

Specific Identified Tasks:

1. Developing and maintaining a database to track community vulnerability to severe wind: Use GIS to map areas that are at risk to the wind hazard associated with different non-hurricane conditions and identify concentrations of at-risk structures. Create a severe wind scenario to estimate potential loss of life and injuries, the types of potential damage, and existing vulnerabilities within a community to develop severe wind mitigation priorities.
2. Establish standards for all utilities regarding tree pruning around line: Incorporate inspection and management of hazardous trees into the drainage system maintenance process. Support and suggest the testing of power line holes to determine if they are rotting. Support the inspection of utility poles to ensure they meet specifications and are wind resistant. When feasible, support burying power lines to provide uninterrupted power after severe winds. Avoid use of aerial extensions to water, sewer, and gas lines when possible. Support use of designed-failure mode for power line design to allow lines to fall or fail in small sections rather than as a complete system to enable faster restoration.
3. Public Outreach: Ensure that school and town officials are aware of the best area of refuge in buildings and that their plans are viable in high wind mitigation events. Instruct property owners on how to properly install temporary window coverings before a storm. Support education to design professionals to include wind mitigation during building design/modification to an extent deemed necessary.

Rationale / Cost-Benefit Review:

High winds have impacted the town and do pose a risk for infrastructure, transportation and public safety. Many mitigation actions associated with high wind risk also address and reduce risk associated with other hazards affecting the town and maintaining the functionality of the town is not only important for the town and its residents but for the region as well.

5.4.3. Prioritization of Mitigation Strategies

Because of the difficulties in quantifying benefits and costs, it was necessary to utilize a simple “*Action Evaluation and Prioritization Matrix*” in order to affect a simple prioritization of the mitigation actions identified by the town. This method is in line with FEMA’s STAPLEE method. The following list identifies the questions (criteria) considered in the matrix so as to establish an order of priority. Each of the following criteria was rated according to a numeric score of “1” (indicating poor), “2” (indicating below average or unknown), “3” (indicating good), “4” (indicating above average), or “5” (excellent).

- Does the action respond to a significant (i.e. likely or high risk) hazard?
- What is the likelihood of securing funding for the action?
- Does the action protect threatened infrastructure?
- Can the action be implemented quickly?
- Is the action socially and politically acceptable?
- Is the action technically feasible?
- Is the action administratively realistic given capabilities of responsible parties?
- Does the action offer reasonable benefit compared to its cost of implementation?
- Is the action environmentally sound and/or improve ecological functions?

The ranking of these criteria is largely based on best available information and best judgment of project leads. For example, all road improvement projects were initially identified by Road Foreman and approved for inclusion in this plan by the road commission. It is anticipated that, as the town begins to implement the goals and actions of their Mitigation Strategies, they will undertake their own analysis in order to determine whether or not the benefits justify the cost of the project. Also, most proposed FEMA HMGP mitigation projects will undergo a benefit-cost analysis using a FEMA BCA template and approved methodology.

Table 5-2: Peacham Action Evaluation and Prioritization Matrix

Rank	Mitigation Action	Responds to high hazard	Funding potential	Protection value	Time to implement	Social and Political acceptance	Technical feasibility	Admin feasibility	Benefit to Cost	Environmental advantage	TOTAL
2	Reduce flood-related impacts through infrastructure upgrades, improvement projects and floodplain management activities	5	4	5	2	5	4	4	5	4	38
3	Improve resilience to severe winter storms	2	5	5	4	5	5	4	5	2	37
5	Reduce impact of extreme cold durations	3	2	4	2	3	2	2	3	3	24
4	Reduce impact of high wind events	3	4	5	2	5	3	3	5	1	27
1	Raise public awareness of hazards, hazard mitigation and disaster preparedness	4	5	5	5	5	5	5	5	3	43
6	Continue fluvial geomorphology (in coordination with state recommendations and protocol) assessments and develop strategies in response to any identified risk	3	2	4	2	2	2	2	3	3	23

5.5 Implementation and Monitoring of Mitigation Strategies

5.5.1. Public Involvement Following Plan Approval

After adoption, the town will continue to maintain web-presence of the mitigation plan with an opportunity for community input available on its website. Additionally, the town will hold an annual public meeting after performing the annual progress report for the mitigation plan to discuss achievements and the following year's implementation plan. At town meeting, the town will present mitigation information and provide the public an opportunity to increase understanding and involvement with planning efforts. The LEPC will also host an annual mitigation plan presentation where response/state agencies, neighboring communities and other stakeholders can provide input. The town will also notify its neighboring municipalities of the availability of information for review and any significant risks and/or mitigation actions that have an impact on surrounding towns.

5.5.2. Project Lead and Monitoring Process

The town's Selectboard chair is the project lead and will work in conjunction with the Selectboard, town clerk and NVDA to complete the yearly progress report included in the plan. The town will create a mitigation action collection system that will be used as the source of future updates following the annual evaluation that will occur in conjunction with the progress report using the Plan Implementation Matrix provided below. While mitigation actions are, by default, often addressed at monthly Selectboard meetings, the town will schedule one meeting annually to formally assess the plan and adopt updates following the annual progress report and community meeting regarding the LHMP. Once the plan is approved by FEMA, the calendar will begin for annual review. The town will take the following implementation matrix and add actions to it each year, modifying tasks and/or needs as required so that the next LHMP update will be populated with the specific actions related to each mitigation strategy by year.

5.5.3 Plan Evaluation and Update Process

The town's Selectboard chair will lead the plan evaluation process as part of the annual progress report. Prior to town meeting and in preparation for the annual town report, a mitigation section will be included that provides an executive summary for the public that addresses the following topics:

- Status of recommended mitigation actions for the five-year planning period
- Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk
- Identification of a lead person to take ownership of, and champion the Plan if different from Selectboard Chair
- An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.)
- Discussion of how changing conditions and opportunities could impact community resilience in the long term
- Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience

By engaging in the annual evaluation, the town will have a viable method for capturing the facets of efficacy and areas needing revision and improvement in its mitigation plan. The town is committed to “institutionalizing” mitigation into its normal operating procedures and with approval of this plan, embarks on the formal incorporation of mitigation actions and discussion, maintaining an awareness that involves not only the Selectboard, Town Clerk and Road Foreman but also the community at large, including the organizations represented by the current planning team. Along these lines, the town will maintain a contact list of the current planning team and make revisions as required, including the team on the evaluation process each year. Through this consistent attention resulting from the evaluation process, progress reports and communication in the annual town report, the town will achieve the consistency required to enhance resilience through planning, assessment and actions devoted to mitigation.

5.5.4. Plan Update Process

The Plan update will be led by the Selectboard Chair and Town Clerk. Depending on funding availability, the town may elect to acquire the assistance of NVDA and/or a consultant to update

the plan following a declared disaster and/or the next five-year planning cycle. To assure that the Plan does not expire, the town will begin the update process within no less than six months of the current Plan’s expiration date. Following a disaster and during the recovery phase, the town will use the experience to assess the current Plan’s ability to address the impact of the most recent disaster and edit the plan accordingly. Using the annual progress reports and evaluation narratives as a guide, along with perceived changes in risk or vulnerabilities supported by data and/or observation, strategies will be captured in accordance with FEMA guidelines, which includes reconvening the planning team during the update process. The town will establish a “Mitigation File” that documents all evaluations and progress reports, along with actions, especially related to infrastructure improvement projects. While the progress reports are designed to capture the specific actions the town has accomplished related to implementation, keeping a narrative list with dates on all actions relatable to mitigation (e.g. school drills, LEOP updates, Fire Safety Awareness, meetings, etc.), will provide the town the bulk of information required in the update process.

5.5.5. Implementation Matrix for Annual Review of Progress

The following table is intended to aid municipal officials in implementing the mitigation actions for Peacham and to facilitate the annual monitoring and progress reporting. Progress has been included as a guide to future updates. Each year, the town will reserve a Selectboard meeting to review and update the Implementation Matrix as means to establishing an accurate evaluation of the plan’s efficacy and the information required for the succeeding update to the plan.

Table 5.5.6 Local All-Hazards Mitigation Plan Implementation Matrix (following page)

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Continue fluvial geomorphology assessments and develop strategies in response to identified risk.	VT DEC, TransCanada, NVDA, VT ANR	Spring 2019- Spring 2023	Fluvial Geomorphic Assessments and assessment-based mapping/action	Continue Phase I and Phase II fluvial geomorphic assessments on streams and waterways in Peacham.	DEC has a comprehensive and interactive database for Basin 15 and that the town can build from.
	NVDA, VT ANR	Fall 2018- Fall 2019	Fluvial Erosion Hazard Mapping	Rate the fluvial erosion hazard for each assessed reach and develop a fluvial erosion hazard map for the waterway using SGAT. Create map of all assessed reaches. Submit to VT ANR for QA/QC.	River Corridor maps have been completed by NVDA
	Planning Commission and Selectboard	Spring 2019- Spring 2021	River Corridor Management Plans	Where Phase I and II assessments are complete, develop a River Corridor Management Plan.	River Corridor maps are first step in planning process. Town reviews current zoning regulations for necessary changes annually
	Peacham Planning Commission	Spring 2019- Spring 2021	Fluvial Erosion Hazard Mitigation Implementation	Develop strategies to mitigate losses from identified fluvial erosion hazards.	Problem areas have been identified
	Peacham Planning Commission	Summer 2020	Flood Insurance Rating Map Updates	Review draft FIRM data. Update floodplain regulations/zoning.	See above
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Reduce flood-related impacts through infrastructure upgrades, improvement projects and floodplain management activities.	Road Foreman, Commission	Spring 2018- Winter 2023	Infrastructure Assessment for Storm water Vulnerability	Funding and staff resources permitting, assess the vulnerability and operational capability of municipal-owned roads, culverts and other storm water management infrastructure to predicted storm water and snowmelt in areas with a documented history of recurring problems. The infrastructure will be evaluated regularly prior to replacement or upsizing of the existing infrastructure.	Town has developed a Road Erosion Site Inventory with problem, priority and estimated budget. With great institutional memory of town infrastructure, the highway department is well-equipped to assess, monitor and prioritize needs.

Road Foreman, Commission	Spring 2018-Winter 2023	Continued Monitoring of Vulnerable Infrastructure	Monitor bridges and culvert locations that have erosion and scouring concerns and track via the Road Erosion Site Inventory.	Road and Bridge Standards adopted and meet or exceed 2013 standards.
Road Foreman	Spring 2018-Winter 2023	Road Improvements and Landslide Protection	<p>Within political and financial restraints, re-engineer certain sections of roads to lower overall maintenance costs, improving snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes. Specific projects, numbered by priority include</p> <p>Projects:</p> <p>8. Aiken Farm Culvert: Currently undersized and needs 14x8 Box Culvert. 180k estimated cost.</p> <p>9. Paving need due to repetitive washouts: Village Road: Chronic washouts require road to be paved with paved shoulders.</p> <ul style="list-style-type: none"> • 00ft. on Old Cemetary Road near library needs to be paved • 500-800ft. on Church St. by town office needs to be paved <p>These areas are lined with catch basins that fill and overflow with a hard rain.</p>	VTCULVERTS.ORG Culvert and Bridge Inventory has been populated. Town has developed a Road Erosion Site Inventory with problem, priority and estimated budget.

			<p>This occurs 8-10x per season with a price of \$2,000 per event. Investigate drainage options in nearby ponds.</p> <p>Develop communication plan with landowners resistant to allowing mitigation actions because of they don't want their lawn destroyed.</p> <p>Green Bay Loop: 1500' Section needs to be reshaped and graveled</p> <p>Governor Madox Road and County Road needs engineering work to prevent S. Peacham Brook (which runs under road and alongside) from crushing road section during high rains.</p> <p>Macks Mountain Road needs stone ditching work to improve drainage and reduce washouts</p> <p>Slack St and Penny St.: 2 Brooks join together and travel under Penny St. Road washes out in high rains. Road sections have been armored with large stone and washout risk has been reduced.</p>	
--	--	--	--	--

--	--	--	--	--

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
continued	Selectboard, Road Foreman	Fall 2018- Winter 2019	Documenting	Develop a methodology that serves to efficiently capture work and expenditures on sites and keep this information at the town office and/or current “Grater Log” used by Road Foreman	Communication between Highway Department and Road Commission is ongoing. “Grater Log” used by Road Foreman
	Road Foreman	Fall 2018- Winter 2023	Increase Awareness of Funding Opportunities	Increase understanding of FEMA’s HMGP program so that this potential funding source can be utilized through trainings and communication with the State Mitigation Office.	ongoing
	Road Foreman	Spring 2018- Winter 2023	ICS Training and Emergency Operations (SOP) Plan Development	Enhance knowledge of the principles of ICS and develop a Standard Operating Procedures that details the relationship, roles and responsibilities of the Highway Department and Road Commission during major events.	ongoing
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Maintain and improve resilience to severe winter storms	Emergency Management Director	Spring 2018- Winter 2023	Improve Existing Shelter Capability	Maintain and improve on capabilities of existing emergency shelter capability, including emergency generator functionality	The School has a generator. Explore other sheltering options and secure funding for emergency power/solar panels as required
	Emergency Management	Winter 2018- Winter 2023	Reduce risk of power failure due to ice storms	Enhance collaboration between town road foreman and electric	new

	Director			company related to down-limbed induced power failure. Maintain function of generators	
	Emergency Management Director	Fall 2018	Notification	Develop a notification/communication plan that conveys essential sheltering information using school phone system and back-up methodology (email, text, etc.)	new
	Emergency Management Director	Fall 2018	Residential Programs:	Provide guidance and communication to residents on the structural and mechanical actions that can occur to reduce risk to severe winter storms (e.g. weather-proofing, anchoring, alternative heating sources, tree trimming, financial programs, etc.)	new
	Road Commission	Fall 2018, 2019, 2020, 2021, 2022, 2023	Continue to monitor roads for safe and effective plowing	Efficient snow removal is the foundation to winter storm (snow) events, assuring roads are plowable before winter remains an important facet of highway department functions	Needs assessment required
	Road Commission, Selectboard, EMD	State training calendar dependent	increase awareness of ICS structure and recommended practices:	The town can mitigate the effects of a severe winter by understanding how a large-scale storm is managed when the State EOC is operational. Additional awareness of local-level roles and responsibilities during statewide event is a mitigation action.	new
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Reduce impact of extreme cold durations	Selectboard, EMD	Fall of each planning cycle year	Economic Resilience	Establish program for assistance in paying heating bills during crisis situations, if not already required by state law. Develop and sustain a	new

				program that serves to connect resource organizations with residents in need of support services.	
	Selectboard, EMD	Fall of each planning cycle year	Maintain Existing Shelter Capability	Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the town and intends to move forward on planning and public involvement. More formalized training is required and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.	new
	EMD	Fall 2019- Fall 2020	Assess Vulnerable Population	Develop an awareness of the most at-risk community members during an evacuation and/or sheltering event. Focusing on those that lack resources or capability to reach facilities when in need and create plans, including outreach protocol on how to address this potential hurdle.	new
	Fire Chief, Selectboard, EMD	Fall 2019- Fall 2020	Notification and Education	Investigate and develop a notification/communication plan that conveys essential	new

				<p>sheltering information. Educating citizens regarding the dangers of extreme cold and the steps they can take to protect themselves when extreme temperatures occur by sustaining a process that serves to disseminate educational resources for homeowners and builders on how to protect pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls. Inform homeowners that letting a faucet drip during extreme cold weather can prevent the buildup of excessive pressure in the pipeline and avoid bursting through a yearly public service campaign.</p>	
Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Reduce vulnerability to high wind events with accepted best practices	Selectboard, Fire/EMD	Fall 2019-Fall 2020	Developing and maintaining a database to track community vulnerability to severe wind	Use GIS to map areas that are at risk to the wind hazard associated with different non-hurricane conditions and identify concentrations of at-risk structures. Create a severe wind scenario to estimate potential loss of life and	new

				injuries, vulnerabilities within a community to develop severe wind mitigation priorities the types of potential damage, and existing	
		Fall 2019- Fall 2020	Establish standards for all utilities regarding tree pruning around lines	Incorporate inspection and management of hazardous trees into the drainage system maintenance process. Support and suggest the testing of power line holes to determine if they are rotting. Support the inspection of utility poles to ensure they meet specifications and are wind resistant. When feasible, support burying power lines to provide uninterrupted power after severe winds. Avoid use of aerial extensions to water, sewer, and gas lines when possible. Support use of designed-failure mode for power line design to allow lines to fall or fail in small sections rather than as a complete system to enable faster restoration	new
	Fire, EMD	Spring 2019	Public Outreach	Ensure that school and town officials are aware of the best area of refuge in buildings and	new

				that their plans are viable in high wind mitigation events. Instruct property owners on how to properly install temporary window coverings before a storm. Support education to design professionals to include wind mitigation during building design/modification to an extent deemed necessary	
--	--	--	--	---	--

Action	Primary Responsible Entity	Timeline	Task	Brief Description	Progress
Raise public awareness of hazards, hazard mitigation and disaster preparedness.	Emergency Management Director; Peacham Fire Chief	2017-2022	Residential Programs	Develop and maintain education materials to inform property owners on how to protect their homes and businesses through accepted hazard resilience actions (e.g. securing their structures from high winds, elevating their electrical equipment/furnaces in basements, protecting from lightning strikes by grounding electrical outlets, etc.).	New
	Emergency Management Director; Peacham Fire Chief	2017-2022	Family Programs	Continue family programs, such as car safety seat and bike safety programs, to raise family awareness of	Ongoing

			hazards, safety, preparedness and prevention.	
Emergency Management Director; Peacham Fire Chief	2017-2022	Fire Prevention Programs	Continue National Fire Prevention Week and other programs to raise public awareness of fire hazards, safety, preparedness and prevention.	Ongoing
Emergency Management Director; Peacham Fire Chief	2017-2022	Other hazard awareness programs	Develop public awareness programs, based on all-hazards needs.	Ongoing

APPENDICES

NOTE: Appendices A-D not included with State submission or for FEMA review)

Appendix A: Community Reports: Town of Peacham(Flood Ready Vermont)

Appendix B: Culvert Locator: Town of Peacham(VTrans)

Appendix C: No Adverse Impact Floodplain Management Fact Sheet (ASFPM)

**Appendix D: Farm Structures in Designated Flood Hazard Area Planning Checklist
(VAAF)**

APPENDIX F: Community Survey Results

Peacham Emergency Readiness Survey

#1

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Sunday, October 22, 2017 7:36:05 AM
Last Modified: Sunday, October 22, 2017 7:37:34 AM
Time Spent: 00:01:29
IP Address: 209.105.130.49

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.) **Full-time resident**

Q2 What are your concerns about emergency events in the town?

lack of coordination and notification

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.) **Better cell services/communications, More flood resilience roads**

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.) **Roads blocked**

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town? **Respondent skipped this question**

Q6 Thank you very much for your input. This survey will help the town better prepare us for the next emergency. If we can contact you with any questions, please provide an email or phone number where we may reach you. **Respondent skipped this question**

Peacham Emergency Readiness Survey

#2

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, October 23, 2017 11:34:38 AM
Last Modified: Monday, October 23, 2017 11:54:11 AM
Time Spent: 00:19:33
IP Address: 67.158.176.177

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.) **Full-time resident**

Q2 What are your concerns about emergency events in the town? **Respondent skipped this question**

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.)
Other (please specify):
Definitely *not* more cell services. If we could have buried telephone and/or cable tv cables, we wouldn't lose communications in storms (landlines for all who have them and internet, and thus VOIP, for those who have a cheap UPS or haven't lost power). Same for power. Of course, getting the respective companies to pay to bury lines would be very difficult, but they would save a lot in routine and emergency maintenance.

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.)
Roads blocked
Heat out for extended time,
Power out for extended time

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town? **Respondent skipped this question**

Q6 Thank you very much for your input. This survey will help the town better prepare us for the next emergency. If we can contact you with any questions, please provide an email or phone number where we may reach you.

jerrikohl@gmail.com

Peacham Emergency Readiness Survey

#3

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, October 23, 2017 11:58:43 AM
Last Modified: Monday, October 23, 2017 11:59:16 AM
Time Spent: 00:00:32
IP Address: 75.133.4.30

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.) **Full-time resident**

Q2 What are your concerns about emergency events in the town? **Respondent skipped this question**

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.) **Better cell services/communications**

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.) **Power out for extended time**

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town? **Respondent skipped this question**

Q6 Thank you very much for your input. This survey will help the town better prepare us for the next emergency. If we can contact you with any questions, please provide an email or phone number where we may reach you. **Respondent skipped this question**

Peacham Emergency Readiness Survey

#4

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, October 24, 2017 6:16:46 PM
Last Modified: Tuesday, October 24, 2017 6:33:38 PM
Time Spent: 00:16:52
IP Address: 107.77.253.3

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.)
Full-time resident,
Other (please specify):
FARMER JOHN.....

Q2 What are your concerns about emergency events in the town?
I WANT TO KNOW EVERY THING.....

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.)
Other (please specify):
????????????????????????????????????

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.)
Property damaged by storm,
Roads blocked,
Other (please specify):
MURDER ON SLACK STREET OF. X PRIN. THE STATE CRIME LAB WAS IN MY DRIVE WAY 3479 U.S.RTE 2 WEST THEY TURN INTO MY DRIVE WAY. THEY HAD TO GO TO WOODARD ROAD WHICH IS PAST MY LAND ON U.S RTE 2. MY NEIGBOR SHOT HIM. IN THE HEAD. NEISOM WHITE

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town?
THAT EVERY ONE THAT IS NOW ON THIS PEACHAM SITE AFTER UP AND WORKING ONE YEAR AFTER IT WAS SUPPOSEDWORKINGK BE NOTIFIED INSTANLY UP UP DATED BY THE MIN.....

Peacham Emergency Readiness Survey

#5

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, October 31, 2017 10:25:44 AM
Last Modified: Tuesday, October 31, 2017 10:35:50 AM
Time Spent: 00:10:05
IP Address: 207.136.202.106

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.) **Full-time resident**

Q2 What are your concerns about emergency events in the town?

No cell service in most of Peacham, particularly East Peacham east of Library. How residents will be notified in the event of an emergency situation such as chemical spill, medical contagious event, road outages, gas leaks, hazardous waste or spill, etc. Who coordinates, who calls, who to call, etc.?

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.) **Better cell services/communications, More flood resilience roads**

Other (please specify):
Have a current and annually updated emergency response plan on file and reviewable by public. Include call list and backups.

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.) **Property damaged by storm**

Power out for extended time, Roads blocked, Flooding on my property

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town?

The next time a road in front of my house gets washed out down to bedrock...and I contact a SelectBoard member (could not contact or find anyone from Highway Dept.) that the town hasn't put up a barrier or warning barrels, hopefully the response will not be "if people are stupid enough not to stop then they deserve what happens to them." Totally inappropriate.

Peacham Emergency Readiness Survey

#6

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 02, 2017 5:48:35 PM
Last Modified: Thursday, November 02, 2017 5:56:30 PM
Time Spent: 00:07:55
IP Address: 174.83.96.205

Page 1

Q1 What is your relationship to Peacham? (Check all that apply.) **Full-time resident**

Q2 What are your concerns about emergency events in the town?

Recognize potential events and prepare or mitigate to prevent them or reduce impact.

Q3 What do you think the community should accomplish to be better prepared for the next emergency event? (Check all that apply.) **Better cell services/communications, More flood resilience roads, More/better emergency shelters**
Other (please specify):
More community participation in response to emergencies.

Q4 Have you ever affected by an emergency or event in Peacham? (Check all that apply.) **Heat out for extended time, Power out for extended time**

Q5 What other thoughts, concerns or suggestions do you have about emergencies, hazards and emergency response in the town? **Respondent skipped this question**

Q6 Thank you very much for your input. This survey will help the town better prepare us for the next emergency. If we can contact you with any questions, please provide an email or phone number where we may reach you. **Respondent skipped this question**