

Brandon, Vermont  
2022 Local Hazard Mitigation Plan



January 2019 Flooding on Newton Road

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Western Vermont Floodplain Manager

Vermont Department of Health

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## 1 INTRODUCTION

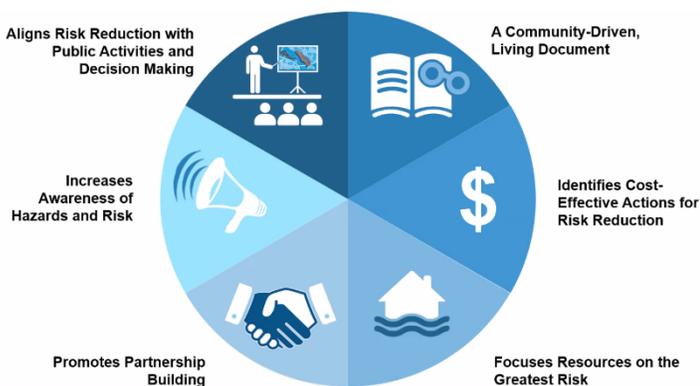
The impact of expected, but unpredictable natural events can be reduced through community planning and action. The goal of this Plan is to provide a natural hazards local mitigation strategy that makes Brandon (the Town) more disaster resistant and more resilient after a disaster.

Hazard Mitigation is any sustained policy or action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. FEMA and state agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This Plan recognizes that communities have opportunities to identify mitigation strategies and measures during all the other phases of Emergency Management – Preparedness, Response and Recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe, and identify local actions and policies that can be implemented to reduce the severity of the hazard.

## 2 PURPOSE

The purpose of this Plan is to assist the Town in identifying all natural hazards facing the community, ranking them according to local vulnerabilities, and developing strategies to reduce risks from those hazards. Once adopted, this Plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property.

The benefits of mitigation planning include:



Source: FEMA LHMP Skill Share Workshop 2021

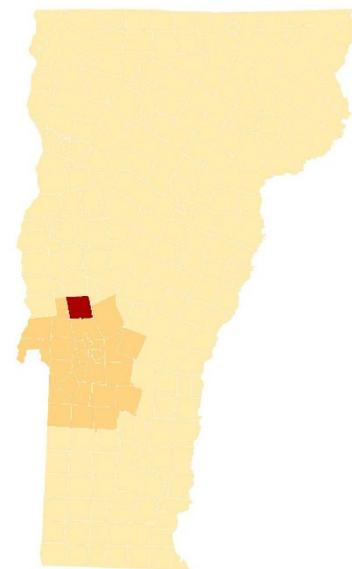
**Furthermore, the Town seeks to be in accordance with the strategies, goals, and objectives of the 2018 State Hazard Mitigation Plan.**

## 3 COMMUNITY PROFILE

### Land Use and Development Patterns

Brandon is located at the north-central border of Rutland County. It is considered a “sub-regional center” between Middlebury to the north and Rutland City to the south.

Brandon contains a distinct, historic downtown or ‘village’ area that straddles the Neshobe River. In or adjacent to the Designated Downtown, there are four greens, four churches, municipal buildings, a variety of stores, offices, restaurants, and several inns.



Another long-standing cluster of development exists northeast of downtown in Forest Dale. There, businesses, the town’s elementary school, two churches, the Senior Citizen’s Center, a golf course, and two general stores are interspersed with residential development, much of which is historic.

Northwest of the downtown is Park Village, a campus of mixed business and residential uses. It is adjacent to the Industrial Park.

These clusters of development are surrounded by generally open, rural, and forested land with residential and non-residential uses.

### Land Features

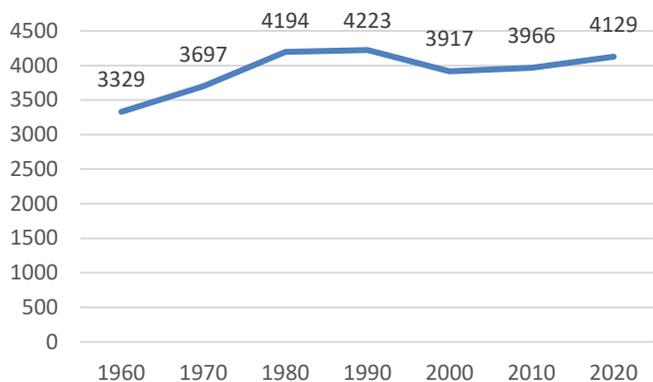
Brandon’s landscape is one of extremes. Elevations range from 357 feet at the downstream extent of Otter Creek in the northwest part of town to a 2,345 feet peak in the Green Mountains – the most dominant land feature along the town’s eastern border.

The northeast corner of Brandon is characterized by the distinct Brandon Gap along Route 73, which provides the only paved access from Brandon to Goshen and Rochester.

The south-central and western portions of town are within the Champlain Lowland and dominated by the Otter Creek Valley.

### Demographics and Growth Potential

The 2020 American Community Survey Five-Year Estimates prepared by the U.S. Census Bureau shows an estimated population of 4,129 and 1,914 housing units. Brandon has had a relatively stable population since 1980.



Between 2010 and 2020, the median age of Brandon residents increased from 41.9 to 49.7; higher than the Vermont median age of 42.8. The portion of the population over 65 is 21%, compared to 19% in Vermont and 16% in the country. The population density of the Town is 100 people per square mile compared to an overall state density of 68.

### ***On the heels of significant infrastructure improvements, the Town of Brandon is positioned to experience intentional and sustainable growth.***

Improvements to the municipal water supply have helped ensure water quality and capacity for potential residents and businesses. Proactive actions to mitigate climate change impacts related to flooding, such as improvements to stormwater systems and upgrades to the wastewater treatment system, contribute to the Town's potential for growth.

In addition to infrastructure improvements, Brandon's state Downtown Designation, uncomplicated tax stabilization policy, and relatively development-friendly zoning regulations and land use ordinances make it a desirable choice for developers.

As described above (Land Use and Development Patterns), there are four (4) main areas for development – Forest Dale, Park Village, Downtown, and surrounding rural areas.

**Forest Dale:** The largest potential for housing exists adjacent to the last large development – Forestbrook. The pending merger of Brandon Fire District #2 with Brandon Fire District #1 only serves to strengthen potential for more housing along the Route 53 corridor to the Leicester line.

**Park Village:** The site of the shuttered Brandon Training School has become a mixed-used area with residential housing, commercial, and municipal spaces. There is an opportunity for rehabilitation of existing buildings in this complex as several are currently underutilized. In addition, there is potential for expansion at the Brandon Industrial lots on Robert Wood Drive in Deneke Park. Existing three-phase power, water and wastewater services could be extended to future expansions.

**Downtown:** Since Tropical Storm Irene, downtown Brandon has experienced significant change. The Town has aggressively followed the recommendations in the 2015 Vermont Economic Resiliency Initiative report, including FEMA buyouts and development of an overflow structure to divert floodwaters from inundating downtown buildings and US Route 7. Immediate residential housing potential exists in rehabilitation/repurposing of buildings like the former Brandon High School and Brandon Lumber along with a handful of single-family units awaiting landowner investment to bring back online. There are new construction residential opportunities adjacent to the Neshobe House development and on Mill Lane. Expanding out to the greater downtown area (from Nickerson Road to Steinberg) there are a few lots that have potential for residential development.

Downtown commercial space is at a premium. Currently four (4) commercial buildings are for sale. New commercial development would be infill.

**Rural:** Most development potential in the surrounding rural areas is along US Route 7. There are 72 acres for sale on the east side of Route 7 near Otter Valley Union High School that could be used for either commercial or residential purposes. In addition, there is one (1) existing commercial property for sale and redevelopment on Route 7 north and a few properties are for sale on Route 7 south.

### Precipitation and Water Features

Average annual precipitation is 41 inches of rain; with June being the wettest month. Average annual snowfall is 71 inches; with February being the snowiest month.

The Otter Creek, its many tributaries (Arnold Brook, Jones Brook, Breese Mill Brook), and broad floodplain west of US Route 7 is a dominant water feature. As is the Neshobe River and its tributaries (Leicester Hollow Brook), which flows through Brandon's historic downtown. Sugar Hollow Brook lies east of US Route 7.

Several small ponds are sprinkled throughout Brandon – Sugar Hollow Pond, Burnell Pond, Jones Mill Pond, Spring Pond.

Approximately 22% of Brandon's land area (or 5,500 acres) is Class II wetlands, including the 278-acre Brandon Swamp Wildlife Management Area. These play an important function in water absorption and holding capacity that thereby reduces the hazards of flooding and replenishes groundwater supplies.

### Drinking Water and Sanitary Sewer

Municipal drinking water service and fire protection is provided by two Fire Districts. Fire District #1 serves approximately 1,180 service connections in the villages of Forest Dale and Brandon. The gravity-fed system has three (3) wells, three (3) storage tanks, approximately 27 miles of distribution piping, and 192 fire hydrants. There are seven (7) water main river crossings in the system and portions are in FEMA-mapped floodplain, including Well #1 on Newton Road.

Brandon Fire District #2 is a loop system serving 59 residents in the Forestbrook housing development. Brandon residents not served by the municipal water systems rely on individual drilled wells, springs, or private water systems.

Sanitary sewer service in Brandon is provided by the Town. This system serves 915 customers in and around the villages of Forest Dale and Brandon. The system has 22 miles of sewer line and 7 pump stations. The main treatment plant is located at 500 Union Street. There are 12 sewer main river crossings in the system and the treatment plant and two of the pump stations (Newton Road and Champlain Street) lie within FEMA-mapped floodplain. Brandon residents not served by the municipal system dispose of sewage in on-site systems.

### Transportation

Brandon is 41 square miles in size with primary access via US Route 7, a principal north-south arterial highway, and VT Route 73, a major east-west collector. Average Annual Daily Traffic count on Route 7, especially in the urban compact, is 10,000+ compared to 1,300-4,000 on VT Route 73.

The 2020 VTrans Town Highway data indicates that Brandon has a total of 66.8 municipal road miles: 2.2 miles of Class 1; 16.01 miles of Class 2; 40.24 miles of Class 3; 8.3 miles of Class 4 (or functionally Class 4). Of the total municipal road miles, 10.8 miles are in the urban compact and 82% of these are paved. Fifty-six (56) municipal road miles are outside of the urban compact and only 40% of these are paved.

According to the Town's 2017 road erosion inventory, 89% of Brandon's road mileage is hydrologically connected - meaning it is within 100-feet of a water resource (i.e., stream, wetland, lake, or pond). Proximity to water resources can make these sections of road more vulnerable to flooding and fluvial erosion.

According to the Town's bridge inventory, Brandon has a total of 23 municipal bridges – 10 short structures (6'-20' length) and 13 long structures (>20' length). The town's 13 long structures are inspected every two years by VTrans through the Town Highway Bridge Program.

Brandon has a total of 829 culverts within the municipal road right-of-way, all of which were inventoried in 2022 by the Rutland Regional Planning Commission. Several culverts are listed in critical condition and should be considered for replacement and/or upgrade in accordance with Town Road and Bridge Standards. The local road network is maintained by the municipal highway department, whose garage is located on Champlain Street and lies within FEMA-mapped floodplain.

### Electric Utility Distribution System

Electric service to approximately 2,190 accounts is provided by Green Mountain Power via several circuits. Average annual outage statistics between 2017 and 2021 are summarized in **Table 1**.

**Table 1: Power Outage Summary**

<b>Average Annual (2017-2021)</b>	
Avg # of times a customer was without power in a year	0.76
Avg length of each outage in hours	1.63
# of hours the typical customer was without power	1.24
<b>2021 only</b>	
Avg # of times a customer was without power in a year	1.86
Avg length of each outage in hours	1.60
# of hours the typical customer was without power	2.98

The longest power outage affecting the greatest number of accounts between 2017 and 2021 was 4.3 hours and impacted 652 accounts. An outage lasting 11.8 hours occurred in 2021 that affected only 1 account.

### Public Safety

Fire protection is provided by the Brandon Fire Department, an all-volunteer organization. The Fire Department is a member of both Rutland County and Addison County mutual aid programs. Law enforcement is provided by the Brandon municipal police department, with support from Vermont State Police. The nearest hospital is the Rutland Regional Medical Center. Ambulance service is provided by the Brandon Area Rescue Squad.

### Emergency Management

Brandon's Town Manager serves as the Emergency Management Director (EMD). They work with others in town to keep the Local Emergency Plan up to date as well as to coordinate with nearby towns and regional emergency planning efforts.

## 4 PLANNING PROCESS

### Plan Developers

Steffanie Bourque, an Emergency Management Planner at the Rutland Regional Planning Commission (RRPC), assisted the Town with updating its Local Hazard Mitigation Plan. Pre-Disaster Mitigation Program funds from FEMA supported this process.

The Hazard Mitigation Planning Team members who assisted with the update include the Town Manager/EMD, Road Foreman, Wastewater System Operator, Water Superintendent, and Town Health Officer.

### Plan Development Process

The 2022 Brandon Local Hazard Mitigation Plan is an update to the 2017 single jurisdiction mitigation plan. A summary of the process taken to develop the 2022 update is provided in **Table 2**.

### Table 2: Plan Development Process

**June 28, 2022:** Kick-off meeting. Discussed what an LHMP is; benefits of hazard mitigation planning; current plan status; planning process; outreach strategy; and plan sections. Planning Team meetings were not open to the public.

**June/July 2022:** Notice posted on RRPC and Town websites/social media and bulletin boards at Junction Store in Forest Dale and Town Office in downtown Brandon that Town is updating the LHMP. Emailed notice to officials (Selectboard and Planning Commission chairs, Town Managers and Clerks, Emergency Management Directors) in neighboring towns of Chittenden, Pittsford, Hubbardton, Sudbury, Goshen, Leicester, Whiting, and Key Partners (Rutland Natural Resources Conservation District, Western VT Floodplain Manager, Dept of Health Regional Emergency Preparedness Specialist, VTrans District 3 Projects Manager). Notice included RRPC contact for information on planning process and opportunities for public input – see **Appendix D**.

**July 12, 2022:** Planning Team meeting – confirmed plan purpose and continued work on community profile. Began work on community hazard risk assessment, storm history, and identifying assets vulnerable to highest risk natural hazards.

**August 2, 2022:** Planning Team meeting – completed work on community profile and hazard identification and risk assessment. This is a critical milestone in the plan development process and the draft plan was readied for the public meeting.

**August 22, 2022:** Draft LHMP presented at joint meeting of Brandon Selectboard and Planning Commission to encourage public input from local government and public that could affect plan’s conclusions and better integrate with Town initiatives. This meeting was recorded and aired on PEGTV. Draft shared with Key Partners for input on vulnerable locations and assets. Draft posted for public comment period with instructions to email comments to Town Manager, David Atherton. Comments were accepted until September 12, 2022 – see **Appendix D**.

**September 12, 2022:** Draft LHMP discussed at Brandon Selectboard meeting with opportunity to share public comments. This meeting was recorded and aired on PEGTV.

**September 15, 2022:** Planning Team meeting – discussed comments received on August draft; completed work on hazard identification and risk assessment. Began work on hazard mitigation strategy – confirmed mitigation goals, discussed community capabilities, and updating status of 2017 actions.

**October 18, 2022:** Planning Team meeting – continued work on hazard mitigation strategy – completed community capabilities; updated status of 2017 mitigation actions; and evaluated range of possible mitigation actions.

**November 1, 2022:** Planning Team meeting – completed work on hazard mitigation strategy; plan maintenance; and changes since 2017 plan. Draft LHMP finalized for presentation to local officials and public at joint meeting of Brandon Selectboard and Planning Commission on November 28, 2022.

**December 6, 2022:** Final draft LHMP presented at joint special meeting of Brandon Selectboard and Planning Commission. Plan emailed to neighboring towns and Key Partners. Draft posted for public comment period with instructions to email comments to Town Manager, David Atherton. Comments were accepted until December 19, 2022 – see **Appendix D**.

**December 19, 2022:** Draft LHMP discussed at Selectboard meeting with an opportunity to share public comments. The meeting was recorded and aired on Brandon YouTube Channel.

**December 20, 2022:** Final draft LHMP submitted to Vermont Emergency Management for Approval Pending Adoption.

In addition to the local knowledge of Planning Team members and other relevant parties, several existing plans, studies, reports, and technical information were utilized in the preparation of this Plan. A summary of these is provided in **Table 3**.

### **Table 3: Existing Plans, Studies, Reports & Technical Information**

2022 Local Emergency Management Plan

2021 FEMA NFIP Insurance Reports

2021-2017 Green Mountain Power Outage Data

2021 Brandon Fire District #1 Source Protection Plan

2021 Brandon Fire District #1 Emergency Response Plan

2020 Land Use Ordinance

2020 American Community Survey Five-Year Estimate

2020 Stormwater Infrastructure Mapping Project

2019 Brandon Town Plan

2018 State of Vermont Hazard Mitigation Plan

2017 Road Erosion Inventory

2017 Brandon Stormwater Master Plan

2015 Vermont Economic Resiliency Initiative

1992 Brandon Sewer Ordinance

VTrans Town Highway Bridge Inspection Reports

Vermont Statewide Highway Flood Vulnerability and Risk Map

RRPC Local Liaison Reports of Storm Damage

National Oceanic and Atmospheric (NOAA) National Climatic Data Center’s Storm Events Database

FEMA Disaster Declarations for Vermont

OpenFEMA Dataset: Public Assistance Funded Project Summaries for Vermont

## Changes Since the 2017 Plan

The Brandon Town Plan, adopted in 2016 and amended in 2019, serves as the Town's primary, if not definitive, statement of the Town's values, especially **how** [emphasis added] future growth and development should proceed to promote the health, safety, and welfare of its citizens. It is intended to be the foundation for community programs, policy setting, and decision making. The findings and recommendations influence the Town's budget and capital expenditures, community development efforts, and natural resource protection initiatives.

There is a Flood Resilience section in the Town Plan with specific policies and action steps to support the goal of mitigating and eliminating risks to public safety, critical infrastructure, historic structures, and municipal investments posed by flooding and fluvial erosion.

The Town Plan is the basis for the local land use controls such as those in the Brandon Land Use Ordinance, adopted in July 2020. Brandon's Land Use Ordinance includes Flood Hazard Area and River Corridor Overlay Districts to ensure that the selection, design, creation, and use of development in these hazard areas is reasonably safe and accomplished in a manner that is consistent with public wellbeing, does not impair stream equilibrium, flood plain services, or the stream corridor.

Brandon is one of only 31 municipalities in the State of Vermont that had adopted bylaws regulating development in the river corridor. This is a significant accomplishment to mitigate the impacts of flooding in the community.

As described in the Community Profile section of this Plan, the Town is in demand and positioned to experience intentional and sustainable growth. Delayed or postponed construction is now in progress. Commercial vacancies are very low and existing businesses are reinvesting in renovation or expansion.

Average existing residential property for sale is currently going to sale in approximately three months.

There are still several approved vacant building parcels available for immediate sale and the Brandon sewer and water infrastructure has considerable capacity for future expansion.

According to Brandon Zoning Administrator, the past five years has involved a unique mix of Town development. The US Route 7 re-construction of the Downtown infrastructure initially proved to be a challenge to local business until its completion in 2021. This then included a pandemic precedent; followed by a perceptible resurgence of public interest in local businesses and housing.

Zoning permits issued over the past five years document the following commercial, residential, and subdivision activity.

New major commercial investment was focused more on growth of existing business or municipal infrastructure updates and expansion. Upon the completion of US Route 7 road construction, business interest in the Central Business District increased significantly. Thirty-four (34) commercial permits were approved during this period. Approvals included upgrades to Town transfer station and sewer facilities, a self-storage, and Cannabis related permits.

From a high of 14 new/replacement Single Family Residence (SFR) permits in 2018, another 25 new SFRs were permitted during the past five years. This average of eight new or upgraded SFR's is high for Rutland County in this same period.

However, a recent trend to convert existing multi-family rental housing to condominium ownership of the Dwelling Units might be noted. Another reverse of new housing construction plans included a Developer's decision to abandon an 85 dwelling Planned Unit Development (initially approved by Town in early 2020's); presumably due to project capital investment costs required today. This project was re-permitted to a nine lot sub-division, which was re-purchased quickly.

Fourteen (14) subdivision permits were issued. The recent approval was for five new parcels, in contrast to the common request for a two-three lot request.

***A combination of the Town Plan and local land use controls guide development in Brandon. As a result, changes in land use and development since 2017 have not made the community more vulnerable to natural hazards.***

Like the 2017 Local Hazard Mitigation Plan, the 2022 update focused exclusively on natural hazards defined as atmospheric, hydrologic, geologic, and wildfire phenomena. Hazards not necessarily related to the physical environment, such as infectious disease, were excluded from consideration by the Planning Team.

The Town's mitigation priorities remained essentially the same. In 2017, Brandon's highest risk natural hazards were Floods and Fluvial Erosion, Thunder and Windstorms, and Snow and Ice Storms.

The Town again ranked storms with associated high winds; flooding (inundation, flash, and fluvial erosion); and extreme cold, snow, ice as the community's highest risk natural hazards.

In 2022, the Town did not formally assess the risks associated with invasive species; however, they did discuss the potential hazards and risks associated with the Emerald Ash Borer (EAB) given the confirmed detection in Rutland County in October 2020. Invasive species were not included in the 2017 Plan.

Brandon has made significant progress completing the mitigation actions identified in the 2017 Plan – see **Appendix C**. They have much to be proud of. Noteworthy mitigation projects completed since 2017 are highlighted below.

The installation of an overflow culvert beneath Center Street (US Route 7) to divert high flows of the Neshobe River during storm events has been instrumental in protecting Downtown Brandon from flooding. Since its completion in 2017, the overflow has taken water eight (8) times and performed as designed.

Newton Road, along the Neshobe River, is one of the most vulnerable locations in Brandon to inundation flooding. Property buyouts have been an effective mitigation measure to address repeat flood impacts to structures on this road. To date, the Town has completed seven (7) buyouts with funding from FEMA and has two (2) more with closure pending. Three (3) additional buyouts are in the pipeline with anticipated closure in 2024. Upon removal of these structures, the previously developed area has been restored to floodplain.

The Brandon Planning Commission, with assistance from the Rutland Regional Planning Commission, was able to garner public support to include river corridor protections in the municipal zoning regulations. Updated regulations were adopted in 2020. Brandon is one of four (4) towns in Rutland County to have adopted river corridor protections.

Brandon worked with Watershed Consulting Services in 2017 to complete a Stormwater Master Plan. To date, the Town has completed three mitigation projects identified in the Plan: 1) nine bioswales along both sides of Park Street; 2) a swale and sediment retention area between the Center Street parking lot and Neshobe River; and 3) two bioswales on Pearl Street that were prone to standing water during storm and thaw events. The Town is currently working on a fourth project on North Street with anticipated completion by 2024.

***Actions taken by Brandon since 2017 have made the community more prepared and less vulnerable to future natural hazard impacts.***

Nonetheless, due to an increase in the frequency and intensity of weather events, the Town remains vulnerable to high wind events, flooding, severe winter storms, and invasive species (particularly the Emerald Ash Borer).

As a result, the Town has identified a range of mitigation actions to address impacts from high winds, flooding (inundation, flash, and fluvial erosion), extreme cold/snow/ice, and the Emerald Ash Borer – see **Table 6**.

## 5 HAZARD IDENTIFICATION AND RISK ASSESSMENT

After engaging in discussions, the Town identified the following “highest risk hazards” that they believe their community is most vulnerable to:

### Local Vulnerabilities and Risk Assessment

One of the most significant changes from the 2017 Plan is the way hazards are assessed. To be consistent with the approach to hazard assessment in the 2018 State Hazard Mitigation Plan, the Hazard Mitigation Planning Team conducted an initial analysis of known natural hazard events<sup>1</sup> to determine their probability of occurring in the future (high probability events are **orange** in Table 4).

The Planning Team then ranked the hazard impacts associated with the known natural hazard events based on the probability of occurrence and potential impact to life, the economy, infrastructure, and the environment. The ranking results are presented in Table 4.

- **High winds associated with thunder, tropical, and winter storms**
- **Inundation, flash flooding, and fluvial erosion associated with thunder, tropical, and winter storms**
- **Extreme cold, snow, and ice associated with winter storms**

Each of these “highest risk hazards” (**orange** in Table 4) are further discussed in this section and depicted in the Local Natural Hazards and Vulnerabilities Map in Appendix B.

The “lower risk hazards” that are considered to have a low probability of occurrence and low potential impact are not discussed. For information on these hazards, consult the State Hazard Mitigation Plan.

**Table 4: Community Hazard Risk Assessment**

Hazard Event	Hazard Impacts	Probability	Potential Impact					Score
			Life	Economy	Infrastructure	Environment	Average	
<b>Thunderstorm</b>	<b>Flash Flood/Fluvial Erosion</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>2.75</b>	<b>11.00</b>
<b>Ice Jam</b>	<b>Inundation</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3.00</b>	<b>12.00</b>
<b>Tropical Storm/Hurricane</b>	<b>Flood</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>3.25</b>	<b>13.00</b>
Tornado	Hail	3	1	2	3	3	2.25	6.75
<b>Landslide</b>	Landslide	2	1	1	1	2	1.25	2.50
<b>Winter Storm</b>	<b>Cold/Snow/Ice</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>3.50</b>	<b>10.50</b>
<b>Drought</b>	Heat	3	2	1	1	3	1.75	5.25
	Drought	2	1	2	2	3	2.00	4.00
Wildfire	Wildfire	2	3	3	2	2	2.50	5.00
Earthquake	Earthquake	1	3	3	2	2	2.50	2.50

\*Score = Probability x Average Potential Impact

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

<sup>1</sup> This Plan defines natural hazards as atmospheric, hydrologic, geologic, and wildfire phenomena. Hazards not necessarily related to the physical environment, such as infectious disease, were excluded from consideration by the Planning Team.

## Invasive Species

The Planning Team did not formally assess the risk associated with invasive species; however, they did discuss the potential hazards and risks associated with the Emerald Ash Borer (EAB) specifically.

Vermont's EAB infestation was first detected in 2018 in northern Orange County. In October 2020, a new detection of EAB in West Rutland was confirmed making Brandon a town in the High Risk Area. This is the first confirmed detection in Rutland County. An inventory of trees within the road right-of-way is needed to determine how many Ash trees are at risk. The potential risk to public and private woodlots and impacts on the local economy have not been quantified.

Downed trees within the road right-of-way are the root cause of many power outages. There are many roads that pass through dense wooded areas that are prone to downed trees, which can lead to fallen power lines. Areas of particular concern include Birch Hill Road, North Birch Hill Road, Van Cortland Road, Basin Road, High Pond Road, Lover's Lane, Wheeler Road, Town Farm Road, and the Forestbrook development.

When a power outage occurs, communication systems become compromised. Landline phone service that has been converted from copper wire to fiber relies on an in-home battery back-up. The battery life is typically less than eight hours, whether the phone is used or not. Though most residents use cell phones, service in Brandon is spotty, further complicating the problem of contacting emergency services during power outages.

## Highest Risk Hazard Profiles

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### High Wind

Severe thunderstorms can produce high winds, lightning, flooding, rain, large hail, and even tornadoes. Thunderstorm winds are generally short in duration, involving straight-line winds and/or gusts more than 50 mph. Thunderstorm winds can cause power and communication outages, transportation and economic disruptions, significant property damage, and pose a high risk of injuries and loss of life.

From 2004 to 2010, for thunderstorms that caused more than \$200,000 in damage, Rutland County experienced nearly \$2 million in property damage. From 2011 to 2020, thunderstorms resulted in just under \$2.4 million in property damage in Rutland County, with \$525,000 due to a high wind event in May 2017.

***Violent windstorms are possible here; Brandon is susceptible to high directional winds town wide. Many storms with high winds result in downed trees, damaged phone and power lines, buildings, and other property. Brandon is vulnerable to power outages, and they present a potentially significant risk to many residents.***

To mitigate the impacts of power outages, the following public buildings/critical facilities have been equipped with back-up power or generator hook-up: Police Station; Town Garage; Neshobe School (primary local shelter); wastewater treatment plant; two main wastewater pump stations (Champlain Street and Newton Road); Fire District #1 office; Well #2; and Well #3.

The Town Office, which lacks back-up power, serves as the local Emergency Operations Center (EOC). During a disaster, municipal response is managed by the EOC, this would include all communications – from phone calls to internet browsing and 2-way radio.

Connectivity is crucial in times of crisis. Telecommunications are needed for warning systems before disaster, as well as for response during and recovery after. Power outages are the main reason for stopping communications, leaving the EOC significantly compromised.

In addition to the Town Office, other critical facilities without back-up power include the alternate local shelter – the American Legion – and the Fire District #1 storage tank controls. The battery back-up for the control system provides power for up to 6 hours. After which operations shift from automated to manual.

## High Wind Hazard History

These are the most up to date significant events impacting Brandon. Federal declarations are depicted in **bold**.

6/30/2021: 50 mph wind: \$2,000 local damage  
 3/1/2021: 39 mph wind: \$20,000 regional damage  
 8/4/2020: 45 mph wind: \$35,000 regional damage  
 2/24/2019: 48 mph wind: \$25,000 regional damage  
 4/1/2018: 63 mph wind: \$50,000 regional damage  
 10/30/2017: 40 mph wind: \$100,000 regional damage  
 5/5/2017: 64 mph wind: \$500,000 regional damage  
 7/23/2016: 60 mph wind: \$25,000 local damage  
 5/27/2015: 50 mph wind: \$5,000 local damage  
 7/8/2014: 55 mph wind: \$10,000 local damage  
 5/27/2014: 55 mph wind: \$5,000 local damage  
 12/21/2012: 61 mph wind: \$50,000 regional damage  
 12/1/2010: 52 mph wind: \$100,000 regional damage  
 6/27/2008: 50 mph wind: \$10,000 local damage  
 8/16/2007: 60 mph wind: \$75,000 local damage  
 6/27/2007: 55 mph wind: \$10,000 local damage  
 2/17/2006: 37 mph wind: \$75,000 regional damage  
 9/29/2005: 35 mph wind: \$50,000 regional damage

## Inundation/Flash Flooding/Fluvial Erosion

Floods can damage or destroy property; disable utilities; destroy or make impassable roads and bridges; destroy crops and agricultural lands; cause disruption to emergency services; and result in fatalities. People may be stranded in their homes for a time without power, heat, or communication or they may be unable to reach their homes. Long-term collateral dangers include the outbreak of disease, loss of livestock, broken sewer lines or wash out of septic systems causing water supply pollution, downed power lines, loss of fuel storage tanks, fires, and release of hazardous materials.

As noted in the State Hazard Mitigation Plan, “Flooding is the most common recurring hazard event in Vermont” (2018: 55). There are two types of flooding that impact Vermont communities: inundation and flash flooding. Inundation is when water rises onto low lying land. Flash flooding is a sudden, violent flood which often entails fluvial erosion (stream bank erosion).

Inundation flooding of land adjoining the normal course of a stream or river is a natural occurrence. If these floodplain areas are in their natural state, floods likely would not cause significant damage.

While inundation-related flood loss can be a significant component of flood disasters, the more common mode of damage in Vermont is associated with fluvial erosion, often associated with physical adjustment of stream channel dimensions and location during flood events. These dynamic and oftentimes catastrophic adjustments are due to bed and bank erosion of naturally occurring unstable stream banks, debris and ice jams, or structural failure of or flow diversion by human-made structures. An ice jam occurs when the ice layer on top of a river breaks into large chunks which float downstream and cause obstructions (State HMP 2018). Brandon is vulnerable to ice jams on Newton Road, Wheeler Road, and downtown.

Several major flooding events have affected the state in recent years, resulting in multiple Presidential Disaster Declarations. From 2003 to 2010, Rutland County experienced roughly \$2.6 million in property damage due to flood events.

The worst flooding event in recent years came in August of 2011 from Tropical Storm Irene (DR4022), which dropped up to 10-11 inches of rain in some areas of Rutland County. Irene caused 2 deaths and \$55,000,000 in reported property damage and \$2.5 million in crop damage in Rutland County.

Although the storm was technically a tropical storm, the effects of the storms are profiled in this flooding section, since the storm brought only large rainfall and flooding to the Town, not the high winds typically associated with tropical storms. This caused most streams and rivers to flood in addition to widespread and severe fluvial erosion. Brandon experienced \$1.4 million in local damages during Irene - \$116,510 Individual Assistance; \$817,430 Public Assistance; \$122,000 Hazard Mitigation; and \$370,180 National Flood Insurance.

From 2012 to 2020, Rutland County experienced approximately \$3.5 million in property damage; with \$1.9 million due to a flash flood event in July 2017 (DR4330) and \$1 million due to a flash flood event in April 2019 (DR4445).

***In Brandon, flooding is a risk. Damages from Tropical Storm Irene were significant, resulting in approximately \$1.4 million in impacts. A wide range of assets are vulnerable to flooding.***

**Sixty-six structures are in the Special Flood Hazard Area (4% of community structures); including residential dwellings, commercial properties, public water supply well, municipal wastewater treatment plant, and municipal garage.**

**According to FEMA, 14% of these properties have flood insurance. In total, these 13 policies cover \$1,867,300 in value.**

***There are 2 repetitive loss properties.***

Like many other Vermont towns, Brandon was built very close to a river. As described in Section 3, the Neshobe River travels west out of Goshen and meanders throughout the Town. It is the biggest contributor to inundation flooding in many parts of Brandon.

As shown on the Local Natural Hazards and Vulnerabilities Map in **Appendix B**, Brandon is vulnerable to inundation flooding on Newton Road, Stone Mill Dam Road, Wheeler Road, Forestdale Road, Pearl Street, Union Street, and lower Carver Street. The Neshobe Golf Club is also vulnerable to inundation flooding.



July 2017 Flood Event on Newton Road

A wide range of assets are at risk from inundation flooding, including roads, culverts, bridges, homes, commercial property, agricultural lands, water mains/service lines/hydrants, sanitary sewer mains/laterals/pump stations, as well as the access roads to Well #1 on Newton Road and the wastewater treatment plant on Union Street.

Flash flooding can occur any time the area has heavy rain. It can impact areas that are located outside of designated floodplains, including along streams confined by narrow valleys. Sections of several roads are periodically washed out – Grove, Old Brandon, North, Wagner, Basin, Van Cortland, North Birch, Richmond, Town Farm, Lover's Lane, Wheeler, Hollow, Short Swamp, Hack Saw Mill, and Marshall Phillips. All these roads, except for Grove and North streets, are gravel. Impacts to municipal roads and driveways can be exacerbated by undersized culverts and inadequate ditching.

Culvert failures and road washouts can have a significant negative impact on the Town. Especially if they occur on roads considered locally important routes for through-traffic, short-cuts, detours, and/or access to critical facilities – such as Forestdale Road (access to the Brandon Police Department), Wheeler Road, and Carver Street.

When roads are impacted by flooding, the Town coordinates with the Fire Department and State Dispatch to close the roads and set up detours. The road closures create longer commute times for residents and longer emergency service response times.

The inventory of hydrologically connected roads completed in 2017 for the Municipal Road General Stormwater Discharge Permit also identified areas vulnerable to flash flooding and included recommended corrective actions to make these areas more resilient.

Stream Geomorphic Assessments (SGAs) provide information about the physical condition of streams and factors that influence their stability. Phase 1 and 2 SGAs exist for the Neshobe River. SGA data was used to identify and prioritize river corridor protection and restoration projects within the Neshobe River watershed, primarily in the Town of Brandon.

The Neshobe River Corridor Plan was completed in September 2011. A list of 13 potential restoration and conservation projects was developed. Types of projects include river corridor and wetland protection through easements and conservation efforts, improving riparian buffers, reducing farm field runoff, evaluation of berm removal, mass failure remediation, bridge replacement, and dam removal.

Assets vulnerable to fluvial erosion on the Neshobe River include a bridge on North Street (B8), bridge on Town Farm Road (B24), bridge on Wheeler Road (B1), buildings on north side of Park Street in the downtown, Mill Lane, a bridge on Union Street (B5), as well as various water and sanitary sewer main river crossings, and the wastewater treatment plant.

Assets vulnerable to fluvial erosion on the Otter Creek include a bridge on Pearl Street (B12) and water main river crossing.

***As weather patterns shift and we see larger storms and more frequent freeze-thaw cycles, the Town will monitor for signs that rivers that have historically been stable becoming less stable, with increased erosion, widening, trees falling in from its banks, etc.***

### **Flooding Hazard History**

These are the most up to date significant events impacting Brandon. Federal declarations are depicted in **bold**.

8/24/2020: 2-3” rain: no reported local damage

**4/15/2019: DR4445** 1-2” rain with significant snow melt: no reported local damage; \$1,000,000 regional damage

**7/1/2017: DR4330** 3-4” rain the previous 3-4 days with flash flooding on 7/1/17: \$395,180 local damage; \$700,000 regional damage

**6/25-7/11/2013: DR4140** heavy rain over multiple days: \$13,645 local damage; \$420,000 regional damage

**8/28/2011: DR4022** Tropical Storm Irene with ±5” rain: \$1.4 million local damage (\$116,510 Individual / \$817,430 Public / \$122,000 HMGP / \$370,180 NFIP)

8/6/2008: 3-5” rain: \$100,000 local damage

7/24/2003: heavy rain: \$25,000 local damage

**12/16/2000: DR1358** 2-4” rain: no reported local damage

### **Extreme Cold/Snow/Ice**

In the Rutland Region, most winter weather events occur between the months of December and March. Throughout the season, winter weather events can include snowstorms, mixed precipitation events of sleet and freezing rain, blizzards, glaze, extreme cold, the occasional ice storm, or a combination of any of the above. Events can also be associated with high winds or flooding, increasing the potential hazard.

The costs of these storms come in the form of power outages due to heavy snow or ice accumulations, damaged trees, school closings and traffic accidents.

From 2001 to 2010, Rutland County experienced \$2.7 million in property and crop damage from winter storms. 2011 to 2020 experienced \$1.58 million in property damage, with \$300,000 due to a 10” - 20” heavy, wet snowfall across the county on December 9, 2014.

There have been four winter storm-related federally declared Disasters in the county (the ice storm of January 1998 – DR 1201; severe winter storms in December 2000 and 2014 – DR 1358 and DR 4207, respectively; and severe storm and flooding in April 2007 – DR 1698).

***Typically, towns’ vulnerability to snow and ice storms are loss of road accessibility and power outages. The Town is prepared for a power outage during a severe winter storm, except for the local emergency operations center.***

Snow accumulation typically has not made the Town vulnerable to loss of road accessibility. The Town’s fleet of snowplows ensures all roads are accessible, even in major accumulation events. Roads adjacent to critical facilities are well maintained.

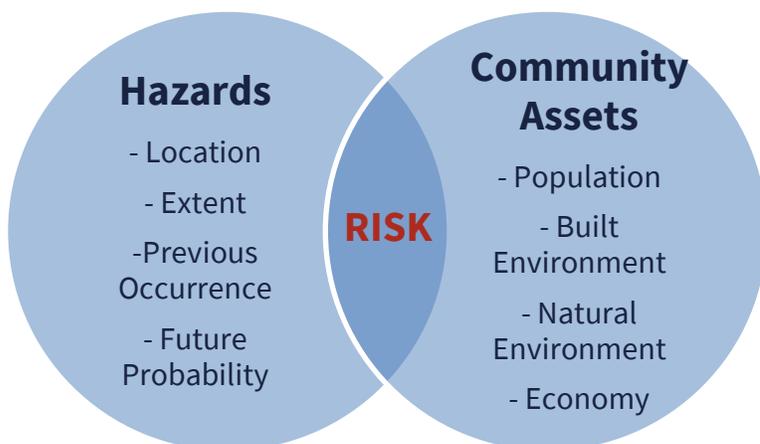
The change of winter storm events from mostly snow to rain and ice has increased the Town’s risk with downed trees and resulting power outages, which are previously discussed in the High Wind hazard profile.

During prolonged cold events, Fire Districts #1 and #2 infrastructure is vulnerable to freezing – the above ground storage tank at 131 New Road; concrete encased utility mains crossing the Neshobe River; and service lines. January and February 2015 were record cold months in the Rutland Region. Brandon reported temperatures of 12 degrees below zero. Forty-seven water service lines froze resulting in significant disruption in water supply and budget impacts. Several residents were without water for four (4) days.

### Extreme Cold/Snow/Ice Hazard History

These are the most up to date significant events impacting Brandon. Federal declarations are depicted in **bold**.

- 2/3/2022: 8-12” snow mixed with freezing rain: \$50,000 regional damage
- 1/16/2021: 3-6” wet snow: \$50,000 regional damage
- 2/7/2020: 8-12” snow; ¼” ice: \$15,000 regional damage
- 1/19/2019: 16” snow: \$10,000 regional damage
- 11/26/2018: 4-8” heavy snow: \$25,000 regional damage
- 2/7/2018: 10” snow: \$10,000 regional damage
- 12/12/2017: 12” snow: \$10,000 regional damage
- 3/14/2017: 12-22” snow: \$25,000 regional damage
- 2/1-2/2015: Record cold month with 15-20+ days below zero and 10” snow: \$10,000 regional damage
- 1/7/2015: 0-10 degrees with wind of 15-30 mph creating wind chills colder than 20-30 below zero: 12 below zero reported in Brandon: \$28,585 local damages
- 12/9/2014: DR4207** 10-20” snow: \$200,000 regional damage
- 2/23/2010: 6-30” snow: \$100,000 regional damage
- 12/11/2008: 5-9” snow/glaze ice: \$50,000 regional damage
- 4/15-16/2007: DR1698** “Nor’icane” 3” snow and rain, 60-80 mph wind: \$34,040 local / \$1 mil regional damage
- 3/5/2001: EM3167** 2-18” snow: \$4,800 local damage



### Vulnerability Summary

#### High Wind

**Location<sup>1</sup>:** Town-wide

**Vulnerable Assets<sup>1</sup>:** Roads, buildings, trees, power lines, telecommunication systems, signalized traffic lights

**Extent:** up to 64 mph winds

**Impact:** \$75,000 local damage / \$500,000 regional damage

**Probability:** >75% chance in a year

#### Inundation/Flash Flooding/Fluvial Erosion

**Location<sup>1</sup>:** *Inundation Flooding:* Newton Rd, Stone Mill Dam Rd, Wheeler Rd, Forestdale Rd, Pearl St, Union St, lower Carver St, downtown, Neshobe Golf Club

*Flash Flooding:* Grove St, Old Brandon Rd, North St, Wagner Rd, Basin Rd, Van Cortland Rd, North Birch Hill, Richmond Rd, Town Farm Rd, Lover’s Ln, Wheeler Rd, Hollow Rd, Short Swamp Rd, Hack Saw Mill Rd, Marshall Phillips Rd

*Fluvial Erosion:* Neshobe River – North St, Town Farm Rd, Wheeler Rd, Park St (downtown), Mill Ln, Union St, utility river crossings; Otter Creek – Pearl St, utility river crossings

**Vulnerable Assets<sup>1</sup>:** Roads, culverts, bridges, homes, driveways, commercial property, agricultural lands, water mains/service lines/hydrants, sanitary sewer mains/laterals/pump stations, access road to Well #1, access road to wastewater treatment plant, wastewater treatment plant

**Extent:** ±5” rain; extent data for fluvial erosion is unavailable

**Impact:** \$1.4 million local damage

**Probability:** >75% chance in a year (all flooding types)

#### Extreme Cold/Snow/Ice

**Location<sup>1</sup>:** Town-wide

**Vulnerable Assets<sup>1</sup>:** Roads, culverts, bridges, trees, power lines, telecommunication systems, signalized traffic lights

**Extent:** up to 30” snow; ¼” ice; 80 mph winds; 15-20+ days below zero

**Impact:** \$28,585 local damage / \$1 mil regional damage

**Probability:** >10% but <75% probability per year

<sup>1</sup> See **Appendix B:** Local Natural Hazards and Vulnerabilities Map

***The Hazard Identification and Risk Assessment is the foundation for the mitigation strategy to reduce future losses.***

## 6 HAZARD MITIGATION STRATEGY

The highest risk natural hazards and vulnerabilities identified in the previous section of this Plan directly inform the hazard mitigation strategy outlined below, which the community will strive to accomplish over the coming years. The mitigation strategy chosen by the Town includes the most appropriate activities to lessen vulnerabilities from potential hazards.

### Mitigation Goals

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The Hazard Mitigation Planning Team discussed mitigation goals and identified the following as the community's main mitigation goals:

- Reduce or avoid long-term vulnerabilities to identified hazards.
- Reduce the loss of life and injury resulting from these hazards.
- Mitigate financial losses incurred by municipal, residential, industrial, agricultural, and commercial establishments due to disasters.
- Reduce the damage to public infrastructure resulting from these hazards.
- Encourage hazard mitigation planning as a part of the municipal planning process.
- Encourage continued implementation of existing mitigation regulatory capabilities, such as Flood Hazard Area and River Corridor land use bylaws.
- Recognize the connections between land use, stormwater management, road design, maintenance, and the effects from disasters.
- Ensure that mitigation measures are sympathetic to the natural features of community rivers, streams, and other surface waters; historic resources; character of neighborhoods; existing land use and the capacity of the community to implement them.

### Community Capabilities

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Each community has a unique set of capabilities, including authorities, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. Brandon's mitigation capabilities that reduce hazard impacts or that could be used to implement hazard mitigation activities are listed below.

### Administrative and Technical

In addition to the Emergency Management staff described in Section 3, municipal staff that can be used for mitigation planning and to implement specific mitigation actions include: Administrative Assistant, Bookkeeper, Town Clerk/Treasurer, Assistant Town Clerk/Treasurer, 5-member Highway Department, 2-member Wastewater Department, 5-member Police Department, Economic Development Director, Town Health Officer, Deputy Health Officer, part-time Zoning Administrator.

In addition to paid staff, there is a 5-member Selectboard, 5-member Planning Commission, Tree Warden, Fire Warden, Downtown Business Alliance, Historic Preservation Commission, and Chamber of Commerce.

Brandon Fire District #1 staff includes the volunteer fire department and 2-member Water Department.

To augment local resources, the Town has formal mutual aid agreements for emergency response – fire and public works. Technical support is available through the RRPC in the areas of land use planning, emergency management, transportation, GIS mapping, and grant writing. Technical support is also available through the State ANR for floodplain administration and VTrans Districts for hydraulic analyses.

**Strengths:** staff are trained on hazards and mitigation ● coordination between departments is effective ● excellent record keeping systems ● past success in securing grants for public infrastructure improvements ● strong working relationships with neighboring communities to augment local resources

**Areas for Improvement:** periodic tabletop and field exercises to test and strengthen operational coordination ● few staff perform multiple functions, this lack of redundancy makes Town's administrative and technical capabilities vulnerable ● Highway Department staff could benefit from training in online mapping and asset management resources – ANR Atlas, VTCulverts, MRGP REI Portal

## Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Examples of planning capabilities that can either enable or inhibit mitigation include land use plans, capital improvement programs, transportation plans, stormwater management plans, disaster recovery and reconstruction plans, and emergency preparedness and response plans. Examples of regulatory capabilities include the enforcement of zoning ordinances, subdivision regulations, and building codes that regulate how and where land is developed, and structures are built.

**Municipal Plan:** Adopted Feb 2016, Amended Oct 2019

**Description:** A framework and guide for how future growth and development should proceed.

**Relationship to Natural Hazard Mitigation Planning:** Includes goals, policies, and action steps related to flood resilience.

**Land Use Ordinance with Flood Hazard Area and River Corridor Overlay District Requirements:** Adopted Jul 2020

**Description:** Provides for orderly community growth promoting the health, safety, and general welfare of the community.

**Relationship to Natural Hazard Mitigation Planning:** Establish site plan review requirements and zoning districts, including Flood Hazard and River Corridor Overlay Districts, with specific standards for proposed development. Requirements are designed to prevent overdevelopment; to mitigate negative impacts to the natural and human environment; minimize effects to the historical and aesthetic character of the community; and ensure design and construction of development in flood and other hazard areas are accomplished in a manner that minimizes or eliminates the potential for flood loss or damage to life and property.

**Road and Bridge Standards:** Adopted Sept 2019

**Description:** Provide minimum codes and standards for construction, repair, maintenance of town roads and bridges.

**Relationship to Natural Hazard Mitigation Planning:** Standards include management practices and are designed to ensure safety of the traveling public, minimize damage to road infrastructure during flood events, and enhance water quality protections.

**Road Erosion Inventory Report:** Dec 2018

**Description:** Prioritizes those infrastructure projects necessary to improve transportation network resiliency and water quality.

**Relationship to Natural Hazard Mitigation Planning:** Improvements are designed to minimize or eliminate flood impacts on hydrologically connected road segments.

**Local Emergency Management Plan:** Adopted Mar 2022

**Description:** Establishes lines of responsibility and procedures to be implemented during a disaster and identifies high risk populations, hazard sites, and available resources.

**Relationship to Natural Hazard Mitigation Planning:** Includes actions for tracking events and response actions including damage reports to facilitate funding requests during recovery. This type of information can be essential to preparing hazard mitigation project applications for FEMA funding.

**Fire Department ISO Rating:** Issued in Sept 2014

**Description:** The Brandon Fire Department's ISO rating is 06/6Y. This rating is a score from 1 to 10 that indicates how well-protected the community is by the local fire department.

**Relationship to Natural Hazard Mitigation Planning:** Everyone wants to keep family, home, and business safe from fires. The ISO rating is a measure of the effectiveness of a community's fire services.

**Water Ordinance:** Adopted Apr 2007

**Description:** Establish minimum standards for design, construction, installation, control, operation of public drinking water system.

**Relationship to Natural Hazard Mitigation Planning:** Adopted standards that reduce risk, make the system more resilient, and conserve water.

**Source Protection Plan:** Adopted May 2002

**Description:** Defines the area of land that likely recharges a public drinking water source and addresses actions a public water system will perform to minimize the contaminant risks to the source(s).

**Relationship to Natural Hazard Mitigation Planning:** Source water protection can complement a broad sweep of community objectives, including protection of water quality, open space, natural systems, and disaster resilience.

**Sewer Ordinance:** Adopted May 1992

**Description:** Establish minimum standards for design, construction, installation, control, operation of public sewage and sewage disposal systems.

**Relationship to Natural Hazard Mitigation Planning:** Adopted standards that reduce risk and make the system more resilient.

**Stormwater Master Plan:** Adopted Oct 2017

**Description:** Identify current stormwater inputs and develop prioritized projects to mitigate stormwater water quality problems.

**Relationship to Natural Hazard Mitigation Planning:** Many projects accomplish multiple goals-water quality and mitigation.

**Strengths:** land use ordinances with flood hazard and river corridor overlay districts are effective at reducing hazard impacts and are adequately administered and enforced ● elements of hazard mitigation included in other local plans ● stormwater master planning ● capital planning ● Continuity of Operations Planning

**Areas for Improvement:** none identified at this time

### Financial

Financial capabilities are the resources that a community has access to or is eligible to use to fund mitigation actions.

Brandon's current annual town budget is \$3,230,130, with \$896,350 to fund the Highway Department. In addition to property tax revenues, the Town collects fees for sanitary sewer services. The Town bonded for the stormwater overflow culvert in the downtown area. This project was completed in 2017. All other past mitigation projects have been grant funded, most of which have been property buyouts that have been 100% funded.

Both Fire Districts collect fees for the provision of fire protection and drinking water. Annual budgets for Brandon Fire District #1 and #2 are \$895,886 and \$22,830, respectively.

**Strengths:** 1% Local Option Tax that generates approximately \$230,000 annually that can only be used for capital projects ● maximize grant opportunities, including FEMA buy-out program ● capital improvement planning and budgeting for reserve funds

**Areas for Improvement:** include more funding in annual budget for emergency planning

### Education and Outreach

Brandon has several education and outreach opportunities that could be used to implement mitigation activities and communicate hazard-related information:

- Town website
- Front Porch Forum
- Brandon VT Buzz Facebook Page
- Brandon Reporter (local newspaper)
- Brandon Free Library
- Brandon Artists Guild
- Brandon Area Chamber of Commerce

**Strengths:** multiple programs/organizations already exist in the community ● strong online presence

**Areas for Improvement:** more accessible information to reach vulnerable populations ● more coordination and consistent messaging across multiple organizations

### National Flood Insurance Program Compliance

The Town joined the National Flood Insurance Program (NFIP) in 1978. The effective date of the current Flood Insurance Rate Map (FIRM) is August 28, 2008. The Zoning Administrator enforces NFIP compliance through permit review requirements in its Flood Hazard Area regulations. Brandon's regulations outline detailed minimum standards for development in flood hazard areas defined as FEMA Special Flood Hazard Areas and Floodway Areas.

The Town discussed the following as possible actions to continue NFIP compliance:

- 1) Prepare, distribute, or make available NFIP insurance explanatory pamphlets or booklets.
- 2) Participate in NFIP training offered by the State and/or FEMA.
- 3) Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm.

### State Incentives for Flood Mitigation

Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match FEMA Public Assistance after federally declared disasters. Eligible public costs are generally reimbursed by FEMA at 75% with the State matching 7.5%. The State will increase its match to 12.5% or 17.5% of the total cost if communities take steps to reduce flood risk as described below.

12.5% funding for eligible communities that have adopted four (4) mitigation measures:

- 1) NFIP participation
- 2) Town Road and Bridge Standards
- 3) Local Emergency Plan
- 4) Local Hazard Mitigation Plan

17.5% funding for eligible communities that also participate in FEMA's Community Rating System OR adopt Fluvial Erosion Hazard or other river corridor protection bylaw that meets or exceeds the Vermont ANR model regulations.

***Brandon's current ERAF rate is 17.5% because they adopted all four mitigation measures and have river corridor protections in their zoning bylaws.***

### Mitigation Action Identification

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The Hazard Mitigation Planning Team discussed the mitigation strategy, reviewed projects from the 2017 Plan, and identified possible new actions from the following categories for each of the highest risk natural hazards identified in Section 5.

- 1) **Local Plans and Regulations:** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- 2) **Structure and Infrastructure Projects:** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This applies to public or private structures as well as critical facilities. These projects may be eligible for funding through FEMA's Hazard Mitigation Assistance Program.
- 3) **Natural Systems Protection:** These actions minimize damage and losses and preserve or restore the functions of natural systems.
- 4) **Education and Awareness Programs:** These actions inform and educate the public about hazards and potential ways to mitigate them. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. Greater understanding and awareness are more likely to lead to community support for direct actions.

### **Local Plans and Regulations**

**Integrate Mitigation into Capital Improvement Programs:** Risk assessment and hazard mitigation principles can be incorporated into capital planning.

**Manage Development in Erosion Hazard Areas:** The intent of River Corridor Bylaws is to allow for wise use of property within river corridors that minimizes potential damage to existing structures and development from flood-related erosion.

**Improve Stormwater Management Planning:** Rain and snowmelt can cause flooding and erosion in developed areas. A community-wide stormwater management plan can address stormwater runoff.

**Reduce Impacts to Roadways:** The leading cause of death and injury during winter storms is automobile accidents, so it is important to plan for and maintain adequate road and debris clearing capabilities.

**Develop a Road Right-of-Way Vegetation Management Plan:** Identify community priorities and plan of action for site-specific tree and roadside forest management to increase roadside resilience.

### **Structure and Infrastructure Projects**

**Remove Existing Structures from Flood Hazard Areas:** FEMA policy encourages the removal of structures from flood-prone areas to minimize future flood losses and preserve lands subject to repetitive flooding.

**Improve Stormwater Drainage Capacity:** Minimize flooding and fluvial erosion by 1) increasing drainage/absorption capacities with green stormwater management practices; 2) increasing dimensions of undersized drainage culverts in flood-prone areas; 3) stabilizing outfalls with riprap and other slope stabilization techniques; and 4) re-establishing roadside ditches.

**Conduct Regular Maintenance for Drainage Systems:** Help drainage systems and flood control structures function properly with 1) routine cleaning and repair; 2) cleaning debris from support bracing underneath low-lying bridges; and 3) inspecting bridges and identifying if any repairs are needed to maintain integrity or prevent scour.

**Protect Infrastructure and Critical Facilities:**

Minimize infrastructure losses and protect critical facilities from flooding by 1) elevating roads above base flood elevation to maintain dry access; 2) armoring streambanks near roadways to prevent washouts; 3) rerouting a stream away from a vulnerable roadway; and 4) floodproofing facilities.

**Protect Power Lines:** Protect power lines by 1) inspecting and maintaining hazardous trees in the road right-of-way and 2) burying power lines.

**Protect Critical Roadways:** Use snow fences or living snow fences (e.g., rows of trees) to limit blowing and drifting of snow.

**Retrofit Critical Facilities:** Critical facilities can be protected from the impacts of high winds and winter storms by 1) retrofitting them to strengthen structural frames to withstand wind and snow loads; 2) anchoring roof-mounted mechanical equipment; and 3) installing back-up generators or quick connect wiring for a portable generator.

**Natural Systems Protection****Protect and Restore Natural Flood Mitigation Features:**

Natural conditions often provide floodplain protection, riparian buffers, groundwater infiltration, and other ecosystem services that mitigate flooding. It is important to preserve such functionality. Examples include 1) adding vegetative buffers in riparian areas; 2) stabilizing stream banks; 3) removing berms; 4) minimizing impervious area development; and 5) restore incision areas.

**Education and Awareness Programs****Educate Residents about Extreme Winter Weather:**

Winter storms create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Educational outreach can help minimize these risks.

**Assist Vulnerable Populations:** Measures could be taken to ensure vulnerable populations are adequately protected from the impacts of natural hazards, such as 1) organizing outreach and 2) establishing and promoting accessible heating or cooling centers in the community.

**Mitigation Action Evaluation and Prioritization**

For each mitigation action identified, the Hazard Mitigation Planning Team evaluated its potential benefits and/or likelihood of successful implementation. Each action was evaluated against a broad range of criteria, including a planning level assessment of whether the costs are reasonable compared to the probable benefits. Results of this evaluation are presented in **Table 5**.

**Mitigation Action Implementation**

After careful evaluation and prioritization, the Planning Team agreed on a list of actions that are acceptable and practical for the community to implement.

***Actions without overall public support/political will were not selected for implementation. Actions whose costs were not reasonable compared to probable benefits were also not selected.***

For the selected actions, the Planning Team then 1) assigned a responsible party to lead the implementation of each action; 2) identified potential funding; and 3) developed a timeframe for implementation. This action plan is presented in **Table 6**.

**Note that the Town will make every effort to maximize use of future Public Assistance Section 406 Mitigation opportunities when available during federally declared disasters.**

**Table 5: Mitigation Action Evaluation and Prioritization**

Mitigation Action	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
<b>Local Plans and Regulations</b>									
<b>Recommended for Implementation</b>									
Plan for and Maintain Adequate Road and Debris Clearing Capabilities	1	1	1	1	1	1	6	1	Yes
Update Road Erosion and Culvert Inventories	1	1	1	1	1	1	6	1	Yes
Plan for Road Right-of-Way Vegetation Management	1	1	1	1	1	1	6	1	Yes
Integrate Mitigation into Capital Improvement Programs	1	1	1	0	1	1	5	1	Yes
Review VTrans Bridge Inspection Reports <sup>1</sup> and Plan for Identified Repairs to Prevent Scour	1	1	1	0	1	1	5	1	Yes
<b>Not Recommended for Implementation</b>									
Manage Development in Erosion Hazard Areas with River Corridor Bylaws	Planning Team did not evaluate this action because the Town's 2020 Land Use Ordinance includes river corridor protections.								
Improve Stormwater Management Planning by Completing a Stormwater Master Plan	Planning Team did not evaluate this action because the Town has a Stormwater Master Plan, completed in 2017.								
<b>Structure and Infrastructure Projects</b>									
<b>Recommended for Implementation</b>									
Routinely Clean and Repair Stormwater Infrastructure	1	1	1	1	1	1	6	1	Yes
Increase Drainage/Absorption Capacities with Green Stormwater Management Practices	1	1	1	1	1	1	6	1	Yes
Stabilize Outfalls	1	1	1	1	1	1	6	1	Yes
Protect Power Lines and Roadway by Inspecting and Removing Hazardous Trees in Road ROW	1	1	1	1	1	1	6	1	Yes
Increase Dimension of Drainage Culverts in Flood-Prone Areas	1	1	1	1	1	1	6	1-2	Yes
Install/Re-establish Roadside Ditches	1	1	1	1	1	1	6	1-2	Yes
Install Back-up Generators or Quick Connect Wiring at Critical Facilities	1	1	1	1	1	1	6	2	Yes
Elevate Roads Above Base Flood Elevation to Maintain Dry Access	1	1	1	1	1	1	6	3	Yes
Floodproof Critical Facilities	0	1	1	1	1	0	4	3	Yes
<b>Not Recommended for Implementation</b>									
Remove Existing Structures from Flood-Prone Areas	1	1	1	1	1	1	6	3	Yes
	Since Tropical Storm Irene, Brandon has been successful at removing structures from flood-prone areas to minimize future flood losses. They have acquired and demolished many structures from voluntary property owners and preserved the land subject to repetitive flooding. Brandon is currently working on four residential buyouts – three on Newton Rd and one on Marble St. Once these buyout projects are complete, there are no additional properties the Town has targeted for this action. Therefore, the Planning Team did not recommend this action for future implementation. Should circumstances change, the Town will consider additional buyout projects.								
Bury Power Lines	1	1	1	-1	1	1	4	3	No
Routinely Clear Debris from Support Bracing Underneath Low-Lying Bridges	Planning Team did not evaluate this action because there are no municipal low-lying bridges with support bracing.								

<sup>1</sup> VTrans inspects all town-owned bridges in the State's Town Highway Bridge Program every two years. Bridge inspection reports are available on the VTrans website.

Mitigation Action	Life Safety	Prop Protect	Tech	Political	Admin	Other Obj	Benefit Score	Est Cost	C/B
Use Snow Fence on Critical Roadways	Planning Team did not evaluate this action because there are no critical roadways vulnerable to drifting.								
Retrofit Critical Facilities to Strengthen Structural Frames to Withstand Wind and Snow Loads	Planning Team did not evaluate this action as there are no critical facilities in need of structural retrofits.								
Anchor Roof-Mounted Mechanical Equipment on Critical Facilities	Planning Team did not evaluate this action as there are no critical facilities with roof-mounted mechanical equipment.								

### Natural Systems Protection

#### Recommended for Implementation

Stabilize Stream Banks	1	1	1	1	1	1	6	1-2	Yes
Remove Berms and/or Accumulated Debris from Stream to Restore Flood Capacity	1	1	1	1	1	1	6	2-3	Yes

#### Not Recommended for Implementation

Establish Vegetative Buffers in Riparian Areas	1	1	1	1	1	1	6	1	Yes
	Planning Team did not recommend this action for implementation as there are no known project locations; however, the Town will collaborate with the Natural Resources Conservation District to identify and implement projects that meet the goals of this Plan.								
Restore Incision Areas	Planning Team did not evaluate this action as there are no known waterways experiencing stream channel incision.								

### Education and Awareness Programs

#### Recommended for Implementation

Educate Residents About Highest Risk Natural Hazards	1	1	1	1	1	1	6	1	Yes
Keep the Ditches Clean Campaign	1	1	1	1	1	1	6	1	Yes

#### Not Recommended for Implementation

Assist Vulnerable Populations	Planning Team did not evaluate this action because the Town already has a system in place to identify and monitor the needs of vulnerable populations – see current Local Emergency Management Plan (LEMP).								
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### Table 5 Evaluation Criteria:

**Life Safety** – How effective will the action be at protecting lives and preventing injuries?

**Property Protection** – How effective will the action be at eliminating or reducing damage to structures and infrastructure?

**Technical** – Is the mitigation action a long-term, technically feasible solution?

**Political** – Is there overall public support/political will for the action?

**Administrative** – Does the community have the administrative capacity to implement the action?

**Other Community Objectives** – Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation?

**Rank each of the above criteria in Table 5 with a -1, 0, or 1 using the following table:**

1= Highly effective or feasible

0 = Neutral

-1 = Ineffective or not feasible

**Estimated Cost** – 1 = less than \$50,000; 2 = \$50,000 to \$100,000; 3 = more than \$100,000

**C/B** – Are the costs reasonable compared to the probable benefits? Yes or No

**Table 6 Community Lifelines Description:** A Community Lifeline enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security. The primary objective of lifelines is to ensure the delivery of critical services that alleviate immediate threats to life and property when communities are impacted by disasters. These critical services are organized into one of seven lifelines:

 <b>Safety and Security</b>	 <b>Food, Water, Shelter</b>	 <b>Health and Medical</b>	 <b>Energy (Power &amp; Fuel)</b>	 <b>Communications</b>	 <b>Transportation</b>	 <b>Hazardous Materials</b>
<ol style="list-style-type: none"> <li>1. Law Enforcement</li> <li>2. Fire Service</li> <li>3. Search &amp; Rescue</li> <li>4. Government Service</li> <li>5. Community Safety</li> </ol>	<ol style="list-style-type: none"> <li>1. Food</li> <li>2. Water</li> <li>3. Shelter</li> <li>4. Agriculture</li> </ol>	<ol style="list-style-type: none"> <li>1. Medical Care</li> <li>2. Public Health</li> <li>3. Patient Movement</li> <li>4. Medical Supply Chain</li> <li>5. Fatality Management</li> </ol>	<ol style="list-style-type: none"> <li>1. Power Grid</li> <li>2. Fuel</li> </ol>	<ol style="list-style-type: none"> <li>1. Infrastructure Responder</li> <li>2. Communications</li> <li>3. Alerts, Warnings, &amp; Messages</li> <li>4. Finance</li> <li>5. 911 &amp; Dispatch</li> </ol>	<ol style="list-style-type: none"> <li>1. Highway/Road/Motor Vehicle</li> <li>2. Mass Transit</li> <li>3. Railway</li> <li>4. Aviation</li> <li>5. Maritime</li> </ol>	<ol style="list-style-type: none"> <li>1. Facilities HAZMAT, Pollutants, Contaminants</li> </ol>

**Table 6: Mitigation Action Implementation**

**Plan for and Maintain Adequate Road and Debris Clearing Capabilities:** A leading cause of death and injury during winter storms is from auto accidents so it is important to plan for and maintain adequate road and debris clearing capabilities. This includes capital planning and annual funding to support the facilities (garage and equipment) and an appropriate number of staff needed to maintain the transportation network in Brandon. Capital planning for a new town garage has begun with a target of 2025 for construction completion.

**ADDRESSED HAZARDS**

 **Winter Storm**  
Primary Hazard

 **High Wind**

**Lead Party**

Town Manager

**Type of Project**

Local Plans and Regulations

**COMMUNITY LIFELINES TARGETED**

 **Safety & Security**

 **Transportation**  
Primary Lifeline

**Area of Impact**

Town-wide; ±67 mile road network

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- Highway Foreman
- Selectboard

**BENEFIT SCORE = 6**

**PROJECT TIMELINE**

To coincide with preparing annual Town budget each Nov

**Update Road Erosion and Culvert Inventories:** These inventories, completed in 2017 and 2022, serve as the basis for asset management and should be kept up-to-date annually, with a full reassessment every 5 years.

**ADDRESSED HAZARDS**

 **Flooding**

**Lead Party**

Town Manager

**Type of Project**

Local Plans and Regulations

**COMMUNITY LIFELINES TARGETED**

 **Safety & Security**

 **Transportation**  
Primary Lifeline

**Area of Impact**

Town-wide; ±61 miles of hydrologically connected roads and ±829 culverts

**FUNDING SOURCES**

- Local funding
- VTrans Grant Programs

**PARTNERSHIPS**

- Rutland RPC
- Highway Foreman

**BENEFIT SCORE = 6**

**PROJECT TIMELINE**

2024 construction season (REI)  
2027 construction season (culvert)

**Develop a Road Right-of-Way (ROW) Vegetation Management Plan:** Hazard trees in the road ROW can contribute to power and communication outages as well as debris in the roadway during high wind events and winter storms. This hazard is exacerbated by the possibility of an Emerald Ash Borer infestation. To increase roadside resilience, Brandon is in the process of developing a plan to identify 1) community priorities and 2) plan of action for site-specific tree and roadside forest management.

**ADDRESSED HAZARDS****Lead Party**

Town Manager

**Type of Project**

Local Plans and Regulations

**COMMUNITY LIFELINES TARGETED****Area of Impact**

Town-wide

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- Vermont Urban & Community Forestry Program (UCF)
- Tree Warden
- Highway Foreman

**BENEFIT SCORE = 6****PROJECT TIMELINE**

Complete Plan by Dec 2025

**Plan for Bridge Repairs:** Several town bridges are vulnerable to flash flooding and/or fluvial erosion – e.g., B8, B6, B17. The Town will implement a **Bridge Inspection Program** to ensure VTrans inspection reports for 13 long structures and municipal inspections of 10 short structures will be reviewed and used to plan for needed flood-related bridge repairs such as scour, as needed.

**ADDRESSED HAZARDS****Lead Party**

Town Manager

**Type of Project**

Local Plans and Regulations

**COMMUNITY LIFELINES TARGETED****Area of Impact**

Long structures: B5, B8, B9, B10, B11, B12, B21, B22, B23, B24, B25, B113A, B114

Short structures: Bch1, BW1, B4, B6, B7, TFR10, B17, B23, B28, B29

**FUNDING SOURCES**

- Local funding
- VTrans Structures Program
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- VTrans
- Highway Foreman

**BENEFIT SCORE = 5****PROJECT TIMELINE**

B8 Scoping Study in process

B17 2022 BRIC Scoping Study funding request (award pending)

Review VTrans Reports Oct 2023

Develop Other Plan(s) Jul 2024

**Routinely Clean and Repair Stormwater Infrastructure:** Regular maintenance is one of the most effective ways to mitigate the impacts of flooding. Routine cleaning and repairs of catch basins, ditches, and culverts will be done according to the Highway Department's maintenance schedule and the Municipal Roads General Permit (MRGP).

**ADDRESSED HAZARDS****Lead Party**

Highway Foreman

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Area of Impact**

Town-wide; ±67 mile road network, ±825 culverts, ±255 drop inlets

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- None

**BENEFIT SCORE = 6****PROJECT TIMELINE**

See Highway Department's Maintenance Schedule and MRGP

**Install Green Stormwater Management Practices:** Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage stormwater runoff and control flooding. The 2017 Brandon Stormwater Master Plan (SWMP) identifies several projects that rely on a mixture of green infrastructure and more traditional end of pipe practices.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Highway Foreman

**Type of Project**

Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

See 2017 SWMP

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- Vermont Youth Conservation Corp (VYCC)
- Rutland NRCDC

**BENEFIT SCORE = 6****PROJECT TIMELINE**

See 2017 SWMP

**Stabilize Culvert Outfalls:** Erosion at culvert outlets is common and can cause structural failure with serious downstream consequences. Properly stabilized outfalls protect channel bank stability and reduce erosion. Brandon has identified the following locations where culvert outlet stabilization is needed.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Highway Foreman

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

- 1) High Pond Rd
- 2) Birch Hill Rd
- 3) Others as required by MRGP

**FUNDING SOURCES**

- Local funding
- VTrans Grant Programs
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- VTrans
- ANR Stream Engineer
- US Army Corps of Engineers

**BENEFIT SCORE = 6****PROJECT TIMELINE**

- 1) 2023 construction season
- 2) 2024 construction season
- 3) See MRGP

**Remove Hazard Trees in Road Right-of-Way (ROW):** Hazard trees in the road ROW can contribute to power and communication outages as well as debris in the roadway during high wind events and winter storms. This hazard is exacerbated by the possibility of an Emerald Ash Borer infestation. Brandon will remove hazard trees within their road ROW and/or request removal by Green Mountain Power if also within the power line ROW in accordance with their Road ROW Vegetation Management Plan.

**ADDRESSED HAZARDS****Winter Storm**  
Primary Hazard**High Wind****Lead Party**

Highway Foreman

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Energy**  
Primary Lifeline**Transportation****Communications****Area of Impact**

Town-wide

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- Tree Warden
- Green Mountain Power

**BENEFIT SCORE = 6****PROJECT TIMELINE**

See Road ROW Vegetation Management Plan

**Adequately Size Drainage and Perennial Stream Culverts in Flood-Prone Areas:** Undersized culverts can lead to road washouts and flooding. Brandon has identified several locations where new or upsized replacement culverts are needed.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Highway Foreman

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

- 1) Richmond Rd/Arnold Rd
- 2) Birch Hill Rd/Short Swamp Rd
- 3) McConnell Rd (box culvert)
- 4) Wheeler Rd (box culvert)
- 5) Stone Mill Dam Rd
- 6) North Birch Rd (box culvert)
- 7) Others as required by MRGP

**FUNDING SOURCES**

- Local funding
- VTrans Grant Programs
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- VTrans
- ANR Stream Engineer
- US Army Corps of Engineers

**BENEFIT SCORE = 6****PROJECT TIMELINE**

- 1) 2023 construction season
- 2) 2024 construction season
- 3) 2024 construction season
- 4) 2025 construction season
- 5) 2025 construction season
- 6) 2026 construction season
- 7) See MRGP

**Install/Re-work Roadside Ditches:** Properly installed and stabilized roadside ditches are critical to protect the integrity of the road. Areas below either need new ditches or have ditches that need to be re-worked to bring them up to current Road Standards.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Highway Foreman

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

- 1) High Pond Rd/Arnold Dist/Wheeler
- 2) Lover's Ln/Birch Hill/McConnell
- 3) Richmond Rd/Town Farm
- 4) Prospect Rd
- 5) Others as required by MRGP

**FUNDING SOURCES**

- Local funding
- VTrans Grant Programs

**PARTNERSHIPS**

- VTrans

**BENEFIT SCORE = 6****PROJECT TIMELINE**

- 1) 2023 construction season
- 2) 2024 construction season
- 3) 2025 construction season
- 4) 2026 construction season
- 5) See MRGP

**Install Back-up Power at Critical Facilities:** Generators (standby or portable) are emergency equipment that provide a secondary source of power to a facility. Brandon has identified three (3) critical facilities in need of back-up power.

**ADDRESSED HAZARDS****All Hazards****Lead Party**

Town Manager

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Energy**  
Primary Lifeline**Food, Water, Shelter****Area of Impact**

- 1) Town Office (local EOC)
- 2) Fire District #1 Tank Controls
- 3) American Legion (local shelter)

**FUNDING SOURCES**

- Local funding
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- American Legion
- Fire District #1

**BENEFIT SCORE = 6****PROJECT TIMELINE**

- 1 & 2) 2023 construction season
- 3) 2025 construction season

**Elevate Roads Above Base Flood Elevation to Maintain Dry Access:** Stone Mill Dam Road and the intersection of Newton Road and Town Farm Road are vulnerable to inundation flooding from the Neshobe River, and Pearl Street is vulnerable to inundation flooding from the Otter Creek. Brandon will investigate alternatives, including elevating the road, to ensure it is accessible during future flood events.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Town Manager

**Type of Project**

Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

- 1) Stone Mill Dam Rd
- 2) Newton/Town Farm intersection
- 3) Pearl St

**FUNDING SOURCES**

- Local funding
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- ANR Wetlands Ecologist

**BENEFIT SCORE = 6****PROJECT TIMELINE**

- 1) 2025 construction season
- 2) 2027 construction season
- 3) 2028 construction season

**Floodproof Critical Facilities:** The municipal wastewater pump station on Newton Road is vulnerable to inundation flooding from the Neshobe River as well as groundwater infiltration during high water events. Floodproofing this critical facility will ensure it remains functional during future flood events.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Town Manager

**Type of Project**

Structure and Infrastructure

**COMMUNITY LIFELINES TARGETED****Safety & Security**  
Primary Lifeline**Food, Water, Shelter****Area of Impact**

Newton Rd wastewater pump station

**FUNDING SOURCES**

- Local funding
- Clean Water State Revolving Loan
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- DEC Wastewater Management Program

**BENEFIT SCORE = 4****PROJECT TIMELINE**

2027 complete Design  
2028 complete Construction

**Stabilize Stream Banks:** An eroding section of stream bank on the Neshobe River is encroaching on several assets – roads, homes, downtown commercial buildings, utility main crossings, and the Neshobe Golf Club. Brandon will work with project partners to explore options to stabilize the stream bank.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Town Manager

**Type of Project**

Natural Systems Protection

**COMMUNITY LIFELINES****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

±3 mile stretch of the Neshobe River

**FUNDING SOURCES**

- Local funding
- VANR Water Quality Grants
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- ANR Stream Engineer
- US Army Corps of Engineers
- Rutland NRC
- Private Property Owners

**BENEFIT SCORE = 6****PROJECT TIMELINE**

Partner outreach by Jul 2024  
Begin project scoping by Dec 2025

**Remove Accumulated Debris to Restore Flood Capacity:** The same stretch of the Neshobe River that is experiencing streambank erosion, has reduced flood capacity due to accumulated debris within the stream channel. This poses a risk during high water events to the same assets listed in the mitigation action above. Brandon will work with project partners to explore holistic options to restore flood capacity and stabilize streambank erosion.

**ADDRESSED HAZARDS****Flooding****Lead Party**

Town Manager

**Type of Project**

Natural Systems Protection

**COMMUNITY LIFELINES TARGETED****Safety & Security**  
Primary Lifeline**Transportation****Area of Impact**

±3 mile stretch of the Neshobe River

**FUNDING SOURCES**

- Local funding
- VANR Water Quality Grants
- FEMA/VEM Mitigation Grant

**PARTNERSHIPS**

- ANR Stream Engineer
- US Army Corps of Engineers
- Rutland NRCDC
- Private Property Owners

**BENEFIT SCORE = 6****PROJECT TIMELINE**

Same as above

**Educate Residents about Hazards Related to High Winds, Flooding, and Severe Winter Storms and Keep the Ditches Clean Campaign:** Brandon will undertake education and awareness efforts by adding flyers to town mailings and publishing information on the Town website and community social media sites on 1) what to do before, during, and after severe weather events and 2) the importance of keeping the municipal ditches free of yard waste and other debris.

**ADDRESSED HAZARDS****All Hazards****Lead Party**

Town Manager

**Type of Project**

Education and Awareness

**COMMUNITY LIFELINES****Safety & Security****Transportation**  
Primary Lifeline**Area of Impact**

Town-wide

**FUNDING SOURCES**

- Local funding

**PARTNERSHIPS**

- Town Health Officer
- Ready.gov

**BENEFIT SCORE = 6****PROJECT TIMELINE**

Coincide with Town Meeting and issuance of tax/utility bills

## Process for Incorporating Plan Requirements into Other Planning Mechanisms

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For Brandon to succeed in reducing long-term risks, the information and recommendations of the Local Hazard Mitigation Plan should be integrated throughout government operations.

The following are specific examples of how information and recommendations from the 2017 Plan update were incorporated into other plans, programs, and procedures:

- Land Use Ordinance with Special Flood Hazard Area and River Corridor District Requirements, adopted in July 2020
- Local Road and Bridge Standards, adopted in September 2019
- Brandon Town Plan, amended in October 2019
- Local Emergency Management Plan, include a Vulnerable Populations Communication Protocol, adopted in March 2022
- Road Erosion Inventory Report, completed in December 2018
- Brandon Fire District #1 Source Protection Plan, updated in 2021
- Brandon Fire District #1 Emergency Response Plan, updated in 2021
- Planning for Wastewater Treatment Facility Capital Improvements (construction began in August 2022 with anticipated completion in November 2024)
- Wastewater System Emergency Power Outage Plan, updated in Aug 2022

The following are specific examples of how the Town will incorporate the 2022 Plan update into other plans, programs, and procedures:

- The Selectboard will incorporate risk assessment and hazard mitigation goals into capital planning efforts and improvement programs, especially those funded by the 1% Local Option Tax.
- The Planning Commission will integrate the hazard mitigation goals for disaster resiliency, including NFIP compliance, into the goals and objectives of the next updates to the Town Plan and Land Use Bylaws.

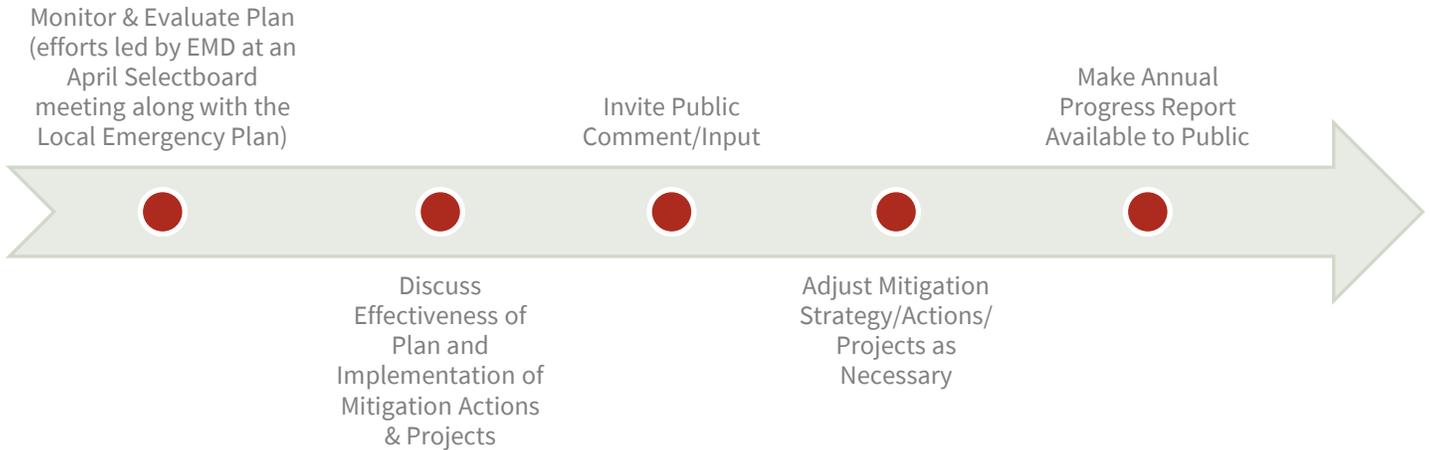
- The Highway Foreman will implement several mitigation infrastructure projects (e.g., upsize perennial and drainage culverts in flood-prone areas, install/re-work roadside ditches, install green stormwater management practices) through existing plans (2017 Road Erosion Inventory and Report for hydrologically-connected road segments, 2017 Stormwater Master Plan, 2022 bridge and culvert inventory).
- The Town Manager (or an appointed committee) will work with the Rutland Natural Resources Conservation District and other partners to identify opportunities to collaborate on implementing natural resources protection projects that meet the goals of this Plan.
- The Town Manager will work with the Town Clerk to provide NFIP information materials at the Town Office and on the Town's website – including promotion of flood insurance, public safety information, and development regulations.
- The Town Manager will encourage the Zoning Administrator to participate in regular NFIP-related training.
- The Wastewater Department will incorporate elements of hazard mitigation and risk reduction into the upcoming updates to the 2023 Spill Prevention Plan and Emergency Response Plan (to be developed following completion of the capital improvements in 2024).
- Fire District #1 will incorporate elements of natural system protection and disaster resilience into future updates to the public drinking water system Source Protection Plan and Emergency Response Plans.

## 7 PLAN MAINTENANCE

This Plan is dynamic. To ensure the Plan remains current and relevant, it is important it be monitored, evaluated, and updated periodically.

### Monitoring and Evaluation

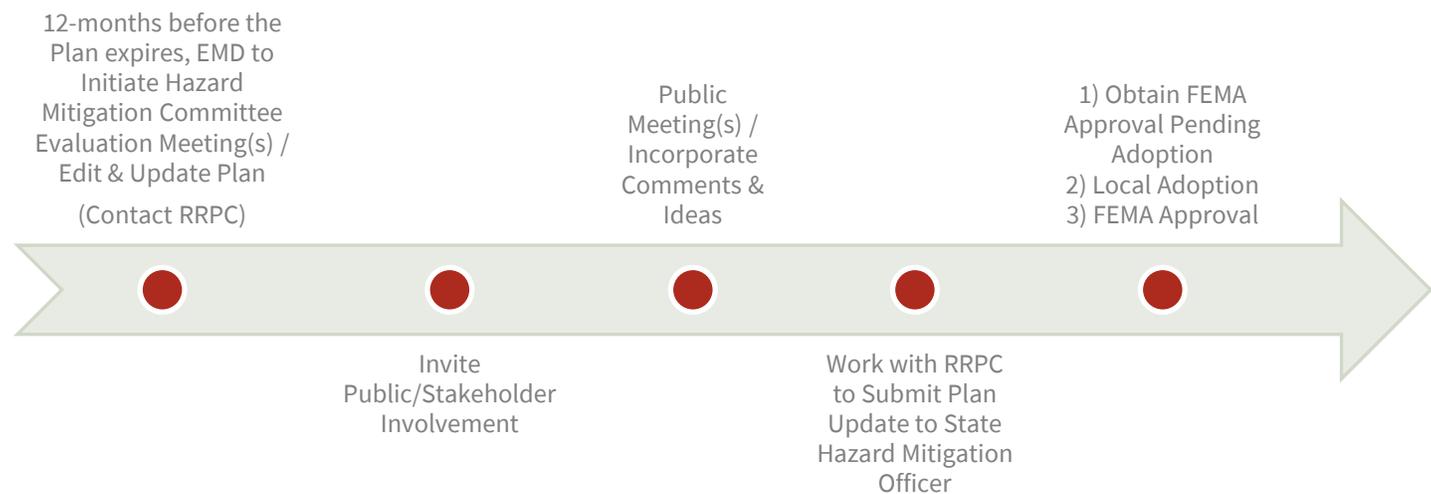
This Plan will be monitored and evaluated annually starting in 2024 in accordance with the following process:



The status (e.g., in progress, complete) of each mitigation action should be recorded in **Table 7**. If the status is “in progress” note whether the action is on schedule. If not, describe any problems, delays, or adverse conditions that will impair the ability to complete the action.

### Updating

This Plan will be updated at a minimum every five (5) years in accordance with the following process:



**Table 7: Mitigation Action Status**

Mitigation Action	2024	2025	2026	2027	2028
<b>Local Plans and Regulations</b>					
Plan for and Maintain Adequate Road and Debris Clearing Capabilities					
Update Road Erosion and Culvert Inventories					
Develop Road Right-of-Way Vegetation Management Plan					
Plan for Bridge Repairs					
<b>Structure and Infrastructure Projects</b>					
Routinely Clean and Repair Stormwater Infrastructure					
Increase Drainage/Absorption Capacities with Green Stormwater Management Practices					
Stabilize Outfalls					
Protect Power Lines and Roadway by Inspecting and Removing Hazardous Trees in Road ROW					
Increase Dimension of Drainage Culverts in Flood-Prone Areas					
Install/Re-establish Roadside Ditches					
Install Back-up Generators or Quick Connect Wiring at Critical Facilities					
Elevate Roads Above Base Flood Elevation to Maintain Dry Access					
Floodproof Critical Facilities					
<b>Natural Systems Protection</b>					
Stabilize Stream Banks					
Remove Berms and/or Accumulated Debris from Stream to Restore Flood Capacity					
<b>Education and Awareness Programs</b>					
Educate Residents About Highest Risk Natural Hazards					
Keep the Ditches Clean Campaign					

**CERTIFICATE OF ADOPTION**  
**TOWN OF Brandon, Vermont Selectboard**  
**A RESOLUTION ADOPTING THE Brandon, Vermont 2022 Local Hazard Mitigation Plan**

WHEREAS, the Town of Brandon has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the **Brandon, Vermont 2022 Local Hazard Mitigation Plan**, which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Brandon has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its **Brandon, Vermont 2022 Local Hazard Mitigation Plan (Plan)** under the requirements of 44 CFR 201.6; and

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

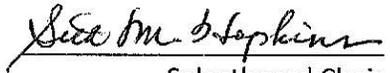
WHEREAS, the **Plan** recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Brandon with the effect of protecting people and property from loss associated with those hazards; and

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

RESOLVED by Town of Brandon Selectboard:

1. The **Brandon, Vermont 2022 Local Hazard Mitigation Plan** is hereby adopted as an official plan of the Town of Brandon;
2. The respective officials identified in the mitigation action plan of the **Plan** are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and **Plan** maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and
4. An annual report on the process of the implementation elements of the Plan will be presented to the Selectboard by the Emergency Management Director or Coordinator.

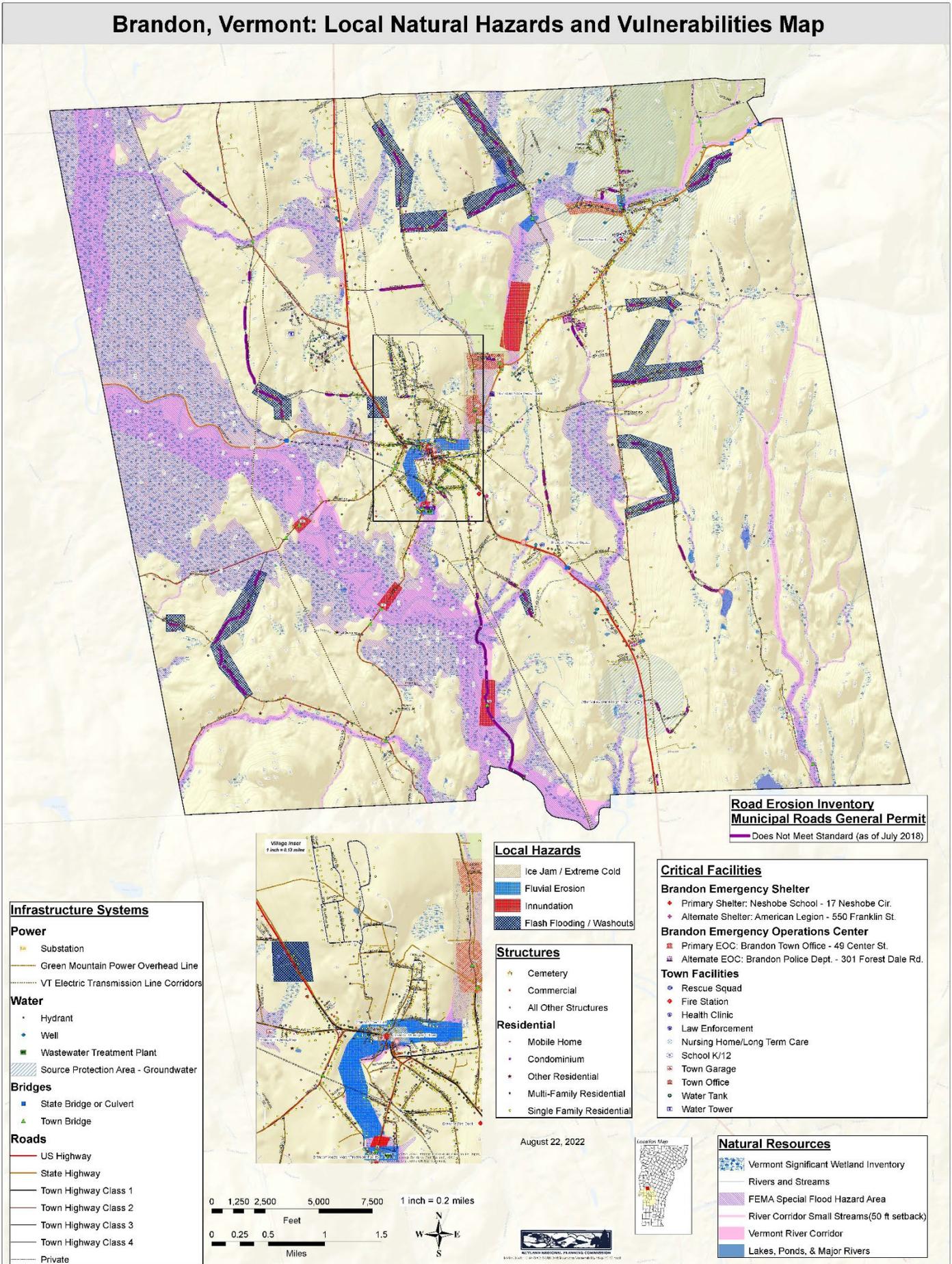
IN WITNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Brandon this 9<sup>th</sup> day of January 2023.

  
Selectboard Chair

ATTEST

  
\_\_\_\_\_  
Town Clerk

# Brandon, Vermont: Local Natural Hazards and Vulnerabilities Map



## MITIGATION ACTIONS FROM 2017 PLAN

### Vulnerability: Flooding of Bridges and Low Lying Areas

- 1) **Replace Rt 53 Bridge.** The Rt 53 bridge over the Neshobe River in Forest Dale is undersized, (it does not accommodate all floods), and should be replaced with a larger span to reduce risk for bridge closure, damage to surrounding property, and impacts to local businesses due to bridge closure. The project will significantly reduce flood and erosion risk affecting two businesses with nine employees, a state highway that is a major connector, and several private residences.

**Who:** Public Works Director. Town Manager **When:** 2018-2019 **How:** HMGP, VT Structures Grant **Priority:** High  
**2022 Status:** Remains a priority - application submitted to FEMA in 2021 for scoping study

- 2) **Replace Wheeler Rd Bridge.** The abutments for the Wheeler Road Bridge over the Neshobe River are in poor condition and the bridge is undersized (it does not accommodate all floods). This project will significantly reduce flood and erosion risks along Wheeler Rd and Vt Route 73, helping ensure this critical throughway is kept open during floods.

**Who:** Public Works Director. Town Manager **When:** 2019-2020 **How:** HMGP, VT Structures Grant **Priority:** High  
**2022 Status:** Remains a priority – working with VEM on scoping study application for submittal in Dec 2022

- 3) **Stabilize or Relocate Wastewater Treatment Facility.** Brandon's businesses are highly dependent on a functioning Wastewater Treatment Facility (WWTF), however flooding and erosion have negatively affected Brandon's WWTF for years. The WWTF is aging and major upgrades will be required in the near future, at which point steps to reduce flood risks should be considered in any proposed upgrades or planning of a new facility. This could include the reconnection of adjacent floodplains to take the pressure off the existing WWTF location, or the planning of a new facility in a different location outside of the flood hazard zones. This will ensure that the WWTF remains up and running after an event, ensuing businesses can remain open for employees and customers as this facility services over 1,000 residential and commercial connections.

**Who:** Select Board. Public Works Director. Town Manager **When:** 2021-2025 **How:** HMGP **Priority:** High  
**2022 Status:** \$5million in upgrades started in August 2022 that will address most of the stabilization.

- 4) **Revise Zoning to require that new development be built to BFE+ 2'.**

**Who:** Select Board. Planning Commission **When:** 2018-2019 **How:** RRPC Assistance **Priority:** Moderate  
**2022 Status:** Complete – July 2022 Zoning Regulations require new development to be built to BFE+1'

- 5) **Revise Zoning to Ensure New Development will not be Vulnerable to Flooding or Erosion.** This includes adopting State River Corridor Protection Language

**Who:** Select Board. Planning Commission **When:** 2018-2019 **How:** Assistance from RRPC **Priority:** Moderate  
**2022 Status:** Complete - River Corridor Bylaws were adopted in July 2020

- 6) **Floodproof Downtown Businesses.** Multiple buildings in downtown Brandon were flooded during Tropical Storm Irene and one was destroyed. Flood risk may be lowered with the completion of the overflow culvert project; however, some risk of flood damage will likely remain during extreme floods. Floodproofing projects (such as sealing off buildings to prevent water infiltration) would protect nine businesses and the town offices, protecting a total of 83 employees.

**Who:** Town Manager **When:** 2019-2020 **How:** HMGP **Priority:** High

**2022 Status:** Complete – stormwater culvert overflow project completed in 2017

- 7) **Remove Berms Downstream of Route 53 in Forest Dale** Historic berms along the south bank of the Neshobe River downstream of VT Route 53 in Forest Dale restrict the river's access to a forested floodplain in an areas of major flood flow and sediment transport. Berm removal would allow the river to access an undeveloped floodplain upstream of an area along Newton Rd, where homes were flooded during Tropical Storm Irene and the July 1, 2017 flooding. This then reduces flooding and erosion risks and protects several homes and one business with five employees.

**Who:** Public Works Director. Town Manager **When:** 2018-2019 **How:** HMGP, VT Structures Grants **Priority:** High

**2022 Status:** Complete – a large berm on Newton Road, adjacent to Route 53, was removed in 2018

- 8) **Home Buyouts Along Newton Rd.** Numerous homes along Newton Rd were flooded during Tropical Storm Irene and the July 1, 2017 flooding. Removing these homes entirely would prevent future repeat damage to these homes and would create more floodplain access.

**Who:** Public Works Director. Town Manager **When:** 2017-2019 **How:** HMGP **Priority:** High

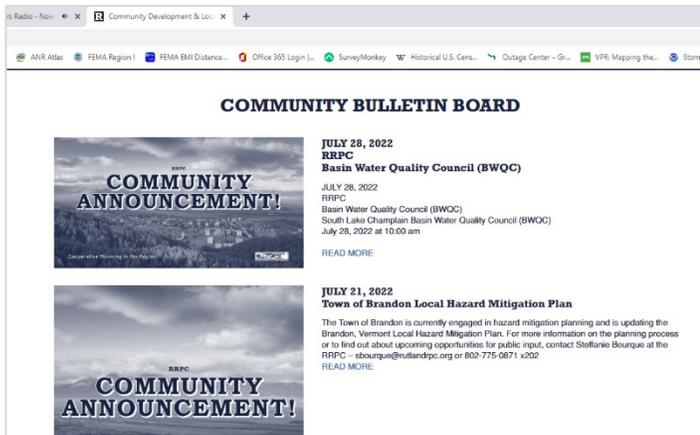
**2022 Status:** Town is working on their 11<sup>th</sup> property buyout on Newton Road

- 9) **Remapping the Downtown Flood Insurance Rate Maps.** The overflow culvert that was constructed in downtown Brandon in May 2017 changed the hydraulic capacity and flow of the Neshobe River, in the area where the river flows through downtown Brandon. This changes the floodplain in the downtown area, thus necessitating remapping.

**Who:** Town Manager **When:** 2020-2021 **How:** HMGP **Priority:** High

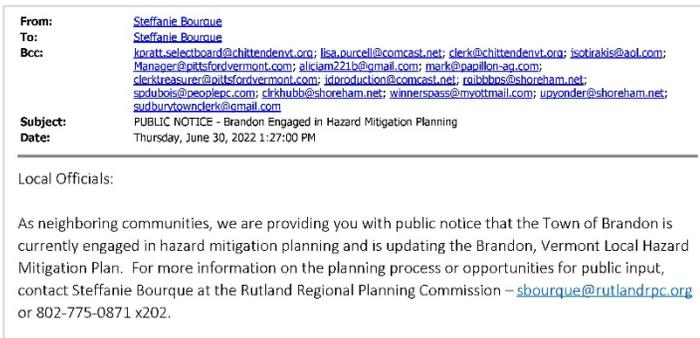
**2022 Status:** FIRM updates by FEMA are in progress

# SUMMARY OF PUBLIC COMMENTS ON DRAFT PLAN



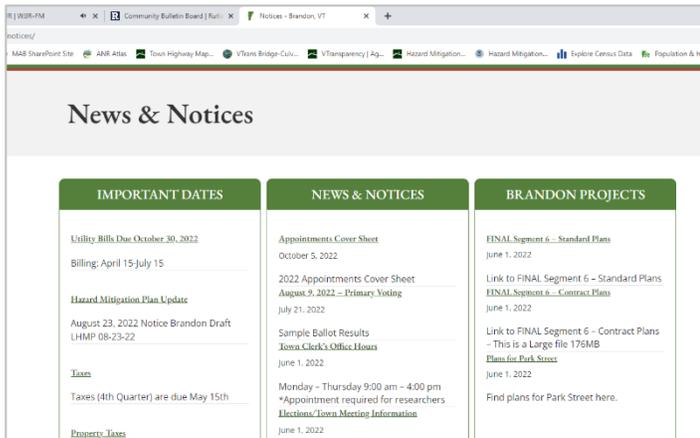
Example plan update kick-off public notice from Rutland Regional Planning Commission website.

No inquiries received in response to the kick-off notice.



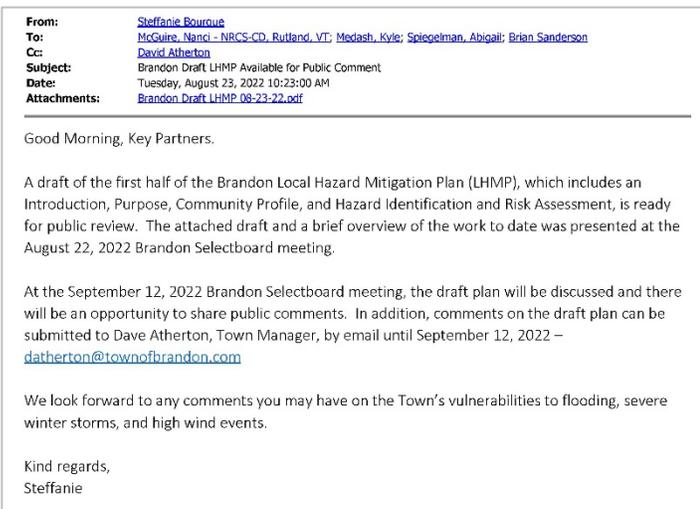
Email to local officials in neighboring communities announcing LHMP update kick-off – dated June 30, 2022. Similar email sent to Key Partners.

No inquiries received from neighboring communities or Key Partners.



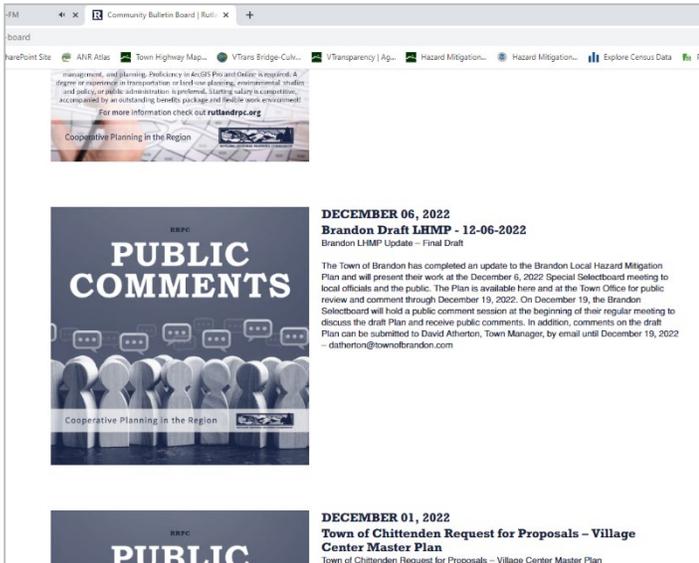
Example notice of draft plan available for public comment from Town of Brandon website, including link to draft plan, posted on August 23, 2022.

No comments received from local officials or the public.



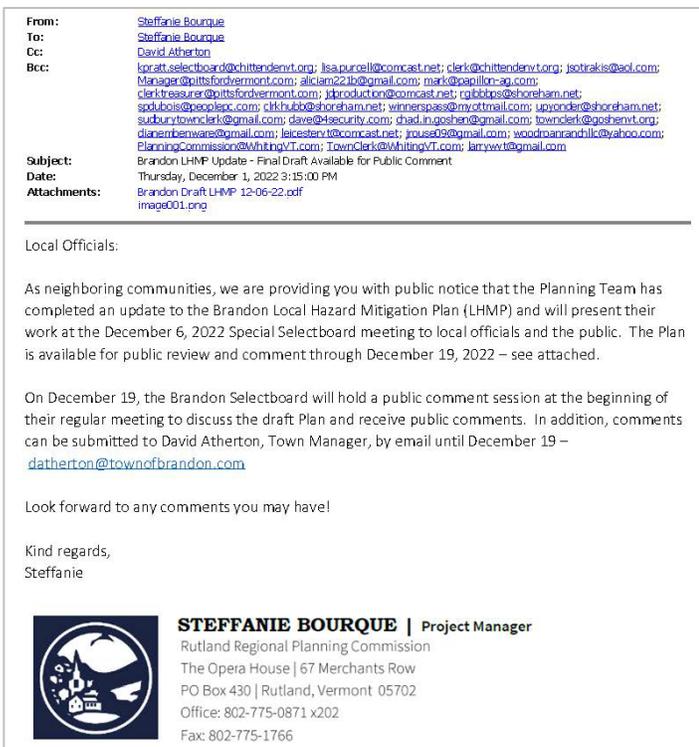
Email to Key Partners seeking comments on draft plan, specifically Town vulnerabilities to highest risk natural hazards presented in Section 5 of the plan – dated August 23, 2022. Similar email sent to local officials in neighboring communities.

No comments received from Key Partners or neighboring communities.



Example notice of final draft plan available for public comment from Rutland Regional Planning Commission website, including link to final draft plan, posted on December 2, 2022.

No comments received from local officials or the public.



Email to local officials in neighboring communities seeking comments on final draft plan – dated December 1, 2022. Similar email sent to Key Partners.

No comments received from neighboring communities or Key Partners.