

Town of Manchester Hazard Mitigation Plan



Adopted **MONTH XX, 2025**
Town of Manchester
40 Jeff Williams Way
Manchester Center, VT 05255

Table of Contents

I. Introduction 7

Purpose 7

II. Town Profile..... 8

 Location and Geography 8

 Demographics 9

 Housing 9

 Land Use and Development 9

 Critical Facilities and Infrastructure 10

 Community Development and Development Trends 14

 Historic, Natural/Environmental, and Cultural Resources 14

 Significant events since the last plan update (major disasters, major developments, conditions affecting risk in the community) 15

III. Planning Process 17

 Overview and Background..... 17

 Building Support: Community Involvement, Roles and Responsibilities 17

 Documenting the Plan Update Process 17

IV. Risk Assessment 19

 Understanding the Community’s Risks 19

 Risk Assessment Process 20

 Hazards 22

 Flooding and Fluvial Erosion 23

 Winter Storm 34

 High Wind Event 40

 Extreme Cold 43

 Infectious Disease Outbreak 47

 Invasive Species 53

 Extreme Heat 58

 Hazardous Material Spill 63

 Vulnerability Summary..... 70

V. Capability Assessment..... 71

 Community Capability..... 71

Planning and Regulatory.....	71
Administrative and Technical	73
Financial.....	74
Outreach and Education	74
National Flood Insurance Program.....	75
State Incentives for Flood Mitigation	75
VI. Mitigation Strategy.....	76
Mitigation Goals	76
Mitigation Actions.....	76
Methodology	76
Mitigation Action Evaluation	78
Mitigation Action Plan.....	83
Bringing the Plan to Life: Implementation and Maintenance.....	86
Implementation.....	86
Annual Monitoring and Plan Evaluation	87
Updating the Plan.....	87
References.....	89
Appendix I.....	91
Appendix II.....	99

List of Maps

Map 1. Location of Town of Manchester.	8
Map 2. Critical Facilities and Infrastructure in Manchester, VT.	12
Map 3. Structures in the Special Flood Hazard Area and River Corridor	33
Map 4. Manchester, VT Roads by Type Source: BCRC, 2024.....	39
Map 5. Land Cover in Manchester, Vermont.....	52
Map 6. Map of towns within the State of Vermont that have infestations of Emerald Ash Borer.	57
Map 7. Bennington County Cooling Sites.....	62
Map 8. Location of Vehicle Crashed 2010- 2024.	64

List of Charts

Chart 1. Population of Manchester, VT by Age. 9

Chart 2. Number of flood events by type and year for Bennington County..... 29

Chart 3. Bennington County - Total Precipitation historically and projected 32

Chart 4. Annual snowfall amounts for Peru, VT. 34

Chart 5. Number of winter storm events by type and year for Bennington County. 37

Chart 6. Average Winter Temperature: Western, VT. 38

Chart 7. NOAA and NWS Wind Chill Chart. 44

Chart 8. Cumulative COVID-19 Deaths as of November 9, 2024..... 49

Chart 9. Reportable Diseases and Conditions in Bennington County 50

Chart 10. The weekly percentage of emergency department visits for tick-related issues.
..... 51

List of Figures

Figure 1. Risk is the overlap of community assets and the effects of hazards. 20

Figure 2. Typical Floodplain 25

Figure 3. River Corridors 25

Figure 4. Winter Storm Severity Index..... 36

Figure 5. Blacklegged tick. 48

Figure 6. Image of an Emerald Ash Borer..... 56

List of Tables

Table 1. Number of buildings by type in Manchester, VT 10

Table 2. Critical Facilities 11

Table 3. Town Highway Mileage 13

Table 4. FEMA Designated Disasters since 2016..... 15

Table 5. Dates of Hazard Mitigation Planning Meetings..... 17

Table 6. Existing Plans, Studies, Reports & Technical Information..... 19

Table 7. Town of Manchester Hazard Risk Assessment..... 21

Table 8. Hazard Assessment Ranking Criteria..... 22

Table 9. Crosswalk of hazards 22

Table 10. Dam Hazard Classification.	26
Table 11. Significant flood events impacting Bennington County.	29
Table 12. Structures within river corridors and flood hazard zones in Manchester, VT.	31
Table 13. Summary of wind events in Bennington County since 1996.	41
Table 14. Sunderland Normal Temperatures and Precipitation.	44
Table 15. Extreme Cold events in Bennington County.	45
Table 16. Designated Class B noxious weeds in Vermont.	54
Table 17. Aquatic invasive species in Vermont.	55
Table 18. Top five terrestrial invasive pests in Vermont.	55
Table 19. Temperature extremes from 2010 to 2024 at Peru Cooperative Weather Station.	58
Table 20. Extreme Heat events affecting Bennington County.	60
Table 21. Hazardous material spills in Manchester from 2010 to 2024.	65
Table 22. High hazard/vulnerable sites.	70
Table 23. Types of Mitigation Actions.	77
Table 24. Mitigation Action Evaluation.	78
Table 25. Mitigation Action Plan.	83
Table 26. 2016 Mitigation Actions.	91



I. Introduction

This single jurisdiction Hazard Mitigation Plan is an UPDATE to a plan approved by the Federal Emergency Management Agency (FEMA) adopted September 27, 2016 and expired October 14, 2021. This Hazard Mitigation Plan is funded by a FEMA Hazard Mitigation Assistance grant.

Purpose

This plan is intended to identify, describe, and prioritize potential natural hazards that could affect the Town of Manchester and develop measures to reduce or avoid those impacts.

Hazard mitigation is defined as “any sustained action taken to reduce or eliminate long-term risk to life and property from hazards.” (FEMA 2023) Hazard mitigation plans are created through a community-driven process that identifies the hazards that could impact the town and the actions and projects that a jurisdiction can undertake to reduce risks and damages from natural hazards. The Federal Emergency Management Agency, within the U.S. Department of Homeland Security and the Department of Vermont Emergency Management both advocate the implementation of hazard mitigation measures to save lives and property and reduce the financial and human costs of disasters.

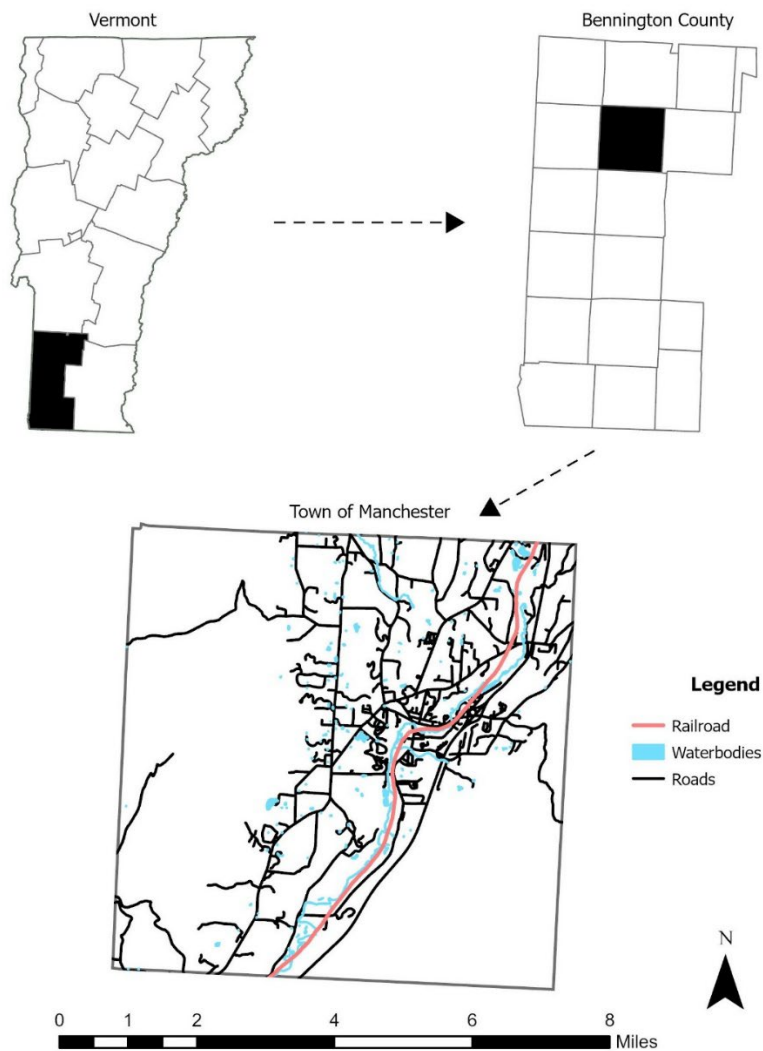
In 2016, Manchester adopted a single jurisdiction hazard mitigation plan. This plan is an update of the 2016 plan to include updated demographics, recent events, changes in the planning and risk assessment process, mitigation actions that have already been completed, and changes in the town’s priorities for mitigation strategies.

This plan is created to align with the [2023 State of Vermont Hazard Mitigation Plan](#).

II. Town Profile

Location and Geography

The Town of Manchester is located in Bennington County, Vermont, in the southwest portion of the state. The Town is surrounded by the towns of Arlington, Dorset, Rupert, Sandgate, Sunderland, Stratton, and Winhall (Map 1). Manchester is approximately 42.08 square miles in the Batten Kill Valley nestled between the Taconic and Green Mountains. Taking up most of the western part of Manchester is Equinox Mountain rising 3,848 feet above sea level, making it the highest peak of the Taconic Range. A railroad from New York through North Bennington, Arlington, and Sunderland also passes through Manchester on the way to Rutland.



Map 1. Location of Town of Manchester. Source: BCRC, August 2024.

Demographics

As of the 2020 Census, Manchester's total year-round population was 4,484 (U.S. Census Bureau) of which 825 live in the Village of Manchester. For the 30 years prior to 2020, the rate of growth in Manchester has mimicked the declining growth rate of the state. According to ESRI Data from the 2020 Census, residents that are 65 years of age and older make up over a quarter of the population of Manchester (Chart 1) with the largest age group being 60 – 69-year-olds followed by 50 – 59-year-olds. This indicates many elderly citizens and retirees who may currently and, in the future, need additional assistance during a disaster.

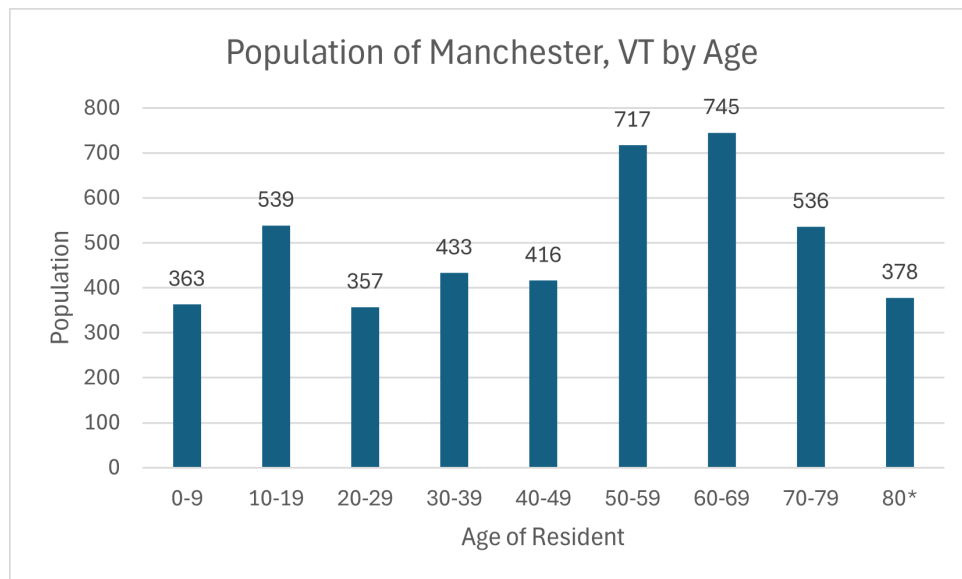


Chart 1. Population of Manchester, VT by Age. Source: ESRI Data from 2020 Census.

Housing

According to the 2020 Census, there are a total of 2,823 housing units in Manchester. 1,392 (49%) of these units are owner occupied, 574 (20%) are renter occupied, and 575 (20%) are seasonal. The town does not regulate short-term rentals (STRs) so may be unaware of the location or the vacancy status of these units.

Land Use and Development

The main settled areas of the Town of Manchester are within the Batten Kill valley which also represents the main transportation corridors for US 7 and Route 7A. To the west is Mt. Equinox, which is primarily forested, and to the east are the Green Mountains, also forested. There are some agricultural lands primarily to the north of the village and the higher density areas of Manchester. A summary of structure types in Manchester can be seen in Table 1. The concentration of development within the valley areas allows for large areas, primarily those in higher elevations and on steeper slopes, to remain

forested. At the same time, the costs of maintenance of major roads, water and sewer, and other services are reduced.

Table 1. Number of buildings by type in Manchester, VT

Number of buildings by type in Manchester, VT <i>Source: VCGIS 2024 E911 data</i>	
Type of Building	Number of Buildings
Residential	2189
Mobile home	124
Commercial with Residence	23
Commercial/Commercial Farm/Other Commercial	370
Industry	15
Utilities	21
Lodging	72
Seasonal Dwelling	14
Municipal/Government	14
Medical	16
Education	20
House of Worship	9
Recreation	58
Other	120
Total	3065

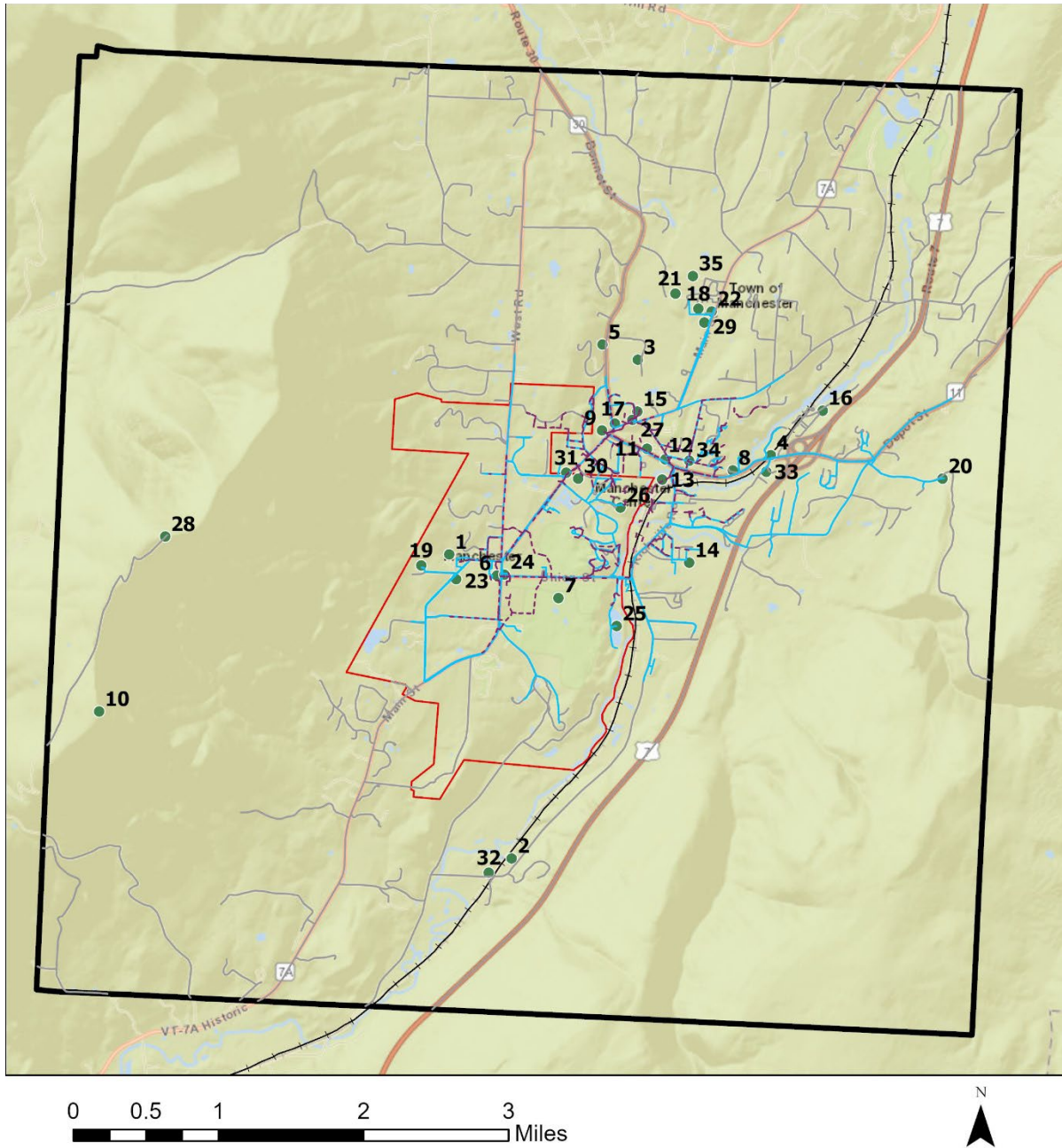
The Manchester, Vermont Town Plan from 2017 indicates that there are 5 land use categories for Manchester including forest, conservation, and recreation lands, rural residential and agricultural lands, neighborhood residential lands, mixed use and commercial lands, and office and industrial lands. Manchester Village comprises approximately one sixth of the land area in the town and has its own municipal plan and zoning ordinances. Manchester Village’s land use designations include rural residential and forest, business, village residential, and multi-family residential lands as well as The Equinox Hotel which has its own designation.

Critical Facilities and Infrastructure

The critical facilities within the Town of Manchester include town-owned facilities, utility substations, schools, and sites with hazardous substances. These are labeled and shown on Map 2 and included in Table 2 below.

Table 2. Critical Facilities

Manchester, VT – Critical Facilities Source: Vermont Center for Geographic Information and Manchester Planning Team		
Label	Name	Description
1	Burr and Burton Academy	Education Facility
2	Bushee Auto Body	Hazardous Materials Storage Facility
3	Dana L. Thompson Memorial Park	Public Attraction or Landmark Building
4	Dorr Oil Co./Inergy Propane	Hazardous Materials Storage Facility Oil/Gas Pumping Station
5	Dorr Oil Company	Hazardous Materials Storage Facility
6	Equinox Hotel	Public Attraction or Landmark Building
7	Equinox Golf Course	Public Attraction or Landmark Building Hazardous Materials Storage Facility
8	Green Mountain Veterinary Hospital	Veterinary Hospital / Clinic
9	Langway Chevrolet	Hazardous Materials Storage Facility
10	Little Equinox Tower	Telecommunications Tower
11	Mac's Manchester	Hazardous Materials Storage Facility
12	Manchester #1	Substation
13	Manchester #2	Substation
14	Manchester #3	Substation
15	Manchester Elementary School	Education Facility Emergency Shelter Hazardous Materials Storage Facility
16	Manchester Highway Garage	Hazardous Materials Storage Facility City/ Town Garage
17	Manchester Medical Center	Outpatient Emergency Clinic
18	Manchester Public Safety Facility	Fire Station EMS Station Law Enforcement Emergency Operations Center Hazardous Materials Storage Facility
19	Manchester Tank #1	Water Tank
20	Manchester Tank #2	Water Tank
21	Manchester Tower	Telecommunications Tower
22	Manchester Town Office	City /Town Office Hazardous Materials Storage Facility
23	Manchester Village Highway Garage	City / Town garage
24	Manchester Village Office	City / Town office
25	Manchester Water and Sewer Department	Wastewater Treatment Plant Hazardous Materials Storage Facility
26	Maple Street School	Education Facility
27	Maplefields @ Manchester	Hazardous Materials Storage Facility
28	Mount Equinox Summit Tower	Telecommunications Tower
29	Northshire Medical Center	Outpatient Clinic
30	Shaw's	Community Point of Distribution
31	Stewart's Shop # 197	Hazardous Materials Storage Facility
32	Ultramar	Oil / Gas Pumping Station Hazardous Materials Storage Facility
33	Verizon Wireless	Hazardous Materials Storage Facility
34	WEQX Radio Station	Radio Station
35	William E. Dailey Inc.	Hazardous Materials Storage Facility



Manchester, VT Critical Facilities

Legend

- - - Sewermain Lines
- Watermain Lines
- Manchester Roads
- Railroad
- Manchester Village Boundary
- Manchester, VT Town Boundary
- Critical Facilities

Label	Name	Description
1	Burr and Burton Academy	Education Facility
2	Bushee Auto Body	Hazardous Materials Storage Facility
3	Dana L. Thompson Memorial Park	Public Attraction or Landmark Building
4	Dorr Oil Co./Energy Propane	Hazardous Materials Storage Facility
5	Dorr Oil Company	Hazardous Materials Storage Facility
6	Equinox Hotel	Public Attraction or Landmark Building
7	Equinox Golf Course	Public Attraction or Landmark Building
8	Green Mountain Veterinary Hospital	Veterinary Hospital / Clinic
9	Langway Chevrolet	Hazardous Materials Storage Facility
10	Little Equinox Tower	Telecommunications Tower
11	Mac's Manchester	Hazardous Materials Storage Facility
12	Manchester #1	Substation
13	Manchester #2	Substation
14	Manchester #3	Substation
15	Manchester Elementary School	Education Facility
16	Manchester Highway Garage	Hazardous Materials Storage Facility
17	Manchester Medical Center	Outpatient Emergency Clinic
18	Manchester Public Safety Facility	Fire Station
		EMS Station
		Law Enforcement
		Emergency Operations Center
		Hazardous Materials Storage Facility
19	Manchester Tank #1	Water Tank
20	Manchester Tank #2	Water Tank
21	Manchester Tower	Telecommunications Tower
22	Manchester Town Office	City / Town Office
		Hazardous Materials Storage Facility
23	Manchester Village Highway Garage	City / Town garage
24	Manchester Village Office	City / Town office
25	Manchester Water and Sewer Department	Wastewater Treatment Plant
		Hazardous Materials Storage Facility
26	Maple Street School	Education Facility
27	Maplefields @ Manchester	Hazardous Materials Storage Facility
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35	William E. Dailey Inc.	Hazardous Materials Storage Facility

Map 2. Critical Facilities and Infrastructure in Manchester, VT.

The transportation system within Manchester also represents a set of critical facilities (Table 3). Manchester contains a total of 60.81 miles of town-maintained roads. This includes Class 1- 4 roads. Vermont Route 7A, Vermont Route 11, and Vermont Route 30 make up 7.34 miles of state highway and US-7 and the on and off ramps make up 9.04 miles. Private roads make up 46.03 miles for a total of 123.21 miles of roads within the town boundaries. (Map 4)

Table 3. Town Highway Mileage

Manchester, VT - Town Highway Mileage <i>Source: Vermont Open Geoportal Data, September 2024</i>	
Highway Type	Miles
Town Highway – Class 1	6.84
Town Highway – Class 2	18.77
Town Highway – Class 3	28.81
Town Highway – Class 4	6.39
Private Road	46.03
State Highway	7.34
US Highway including on/off ramp	9.04
Total	123.21

The electric infrastructure is provided throughout the town by Green Mountain Power (GMP). In 2023, GMP served 2,511 residential customers and 911 commercial customers. Telephone services are provided by Consolidated Communications. Internet service was brought in by the Southern Vermont Communication Union District and almost all of Manchester is now served by Fidium. Cell phone coverage in Manchester has areas of limited connectivity. A lack of ability to communicate during a disaster is a concern to the town and there have been multiple attempts to add a cell tower to an area along Route 7A just north of the town offices but it has not been successful yet.

The town has its own public water supply and wastewater disposal facility. The public water system contains approximately 1,500 connections to watermains and serves around 3,500 customers. Outside of this area property owners are served by on-site wells and septic systems.

Emergency services are primarily provided by the Northshire Rescue Squad and the Manchester Fire Department. However, other surrounding towns with fire departments may also respond to calls depending on the severity of the nature of the call. Law enforcement services are provided by the Manchester Police Department with the Bennington County Sheriff's Department (BCSD) and Vermont State Police providing services on an as needed basis.

The Town has a Local Emergency Management Plan (LEMP) that is updated annually. The current Emergency Management Director (EMD) is also the Town Manager. Manchester has also appointed an Emergency Management Coordinator who is the Chief of Police. The EMD and EMC coordinate with the Town to update the LEMP and

work with surrounding municipalities and service agencies in larger regional planning efforts.

Community Development and Development Trends

Since 2016, Manchester has had a shift in development from commercial use to residential development in mixed use areas. Many buildings that were previously for commercial use only have been converted into residential spaces in the town core. Zoning bylaws have changed in the past several years to allow for greater residential density in this area. Some smaller housing complexes are being developed within the town core as well. Permitting has been put in place for new businesses or for commercial properties to be turned into housing but in many instances, work has yet to begin.

Hildene added onto its properties a section of land along River Road which runs parallel to the Batten Kill. This property includes agricultural land with barns and other building, including a satellite classroom for BBA students some of which are within the Special Flood Hazard Area (SFHA).

In 2022 and 2023, the town water and sewer lines have been extended from where they previously stopped at Cemetery Avenue. They now run an extra 4,969 feet along Route 7A and ending at Homer Road. Plans have been made to expand the water and sewer lines to encompass the Manchester Mobile Home Park just north of the Town Offices, however work has not begun on that project.

Historic, Natural/Environmental, and Cultural Resources

The Town of Manchester was chartered in 1761. Manchester contains 5 historic districts: Manchester Village Historic District, Manchester Center Historic District, Bonnet Street Historic District, North Manchester Historic District, and Manchester Depot Historic District. According to data from the American Community Survey, 2020, 22% of the homes in Manchester were built prior to 1939 and may be at a greater risk of damage or loss due to hazards.

The Equinox Resort owns the Equinox Preserve which protects and conserves 914 acres on the slopes of Mt. Equinox which rises in the western part of the Town. Covered largely in northern hardwood forests, this area also contains many rare and unusual plants and a variety of mammals, birds, and reptile and amphibian species. In the southeast portion of the Town, a large section of land is part of the Green Mountain National Forest, specifically the Lye Brook Wilderness, which offers permanent protection from conversion of the land and maintains it for recreational use and the protection of plant and animal species.

The Batten Kill is an important part of Manchester historically and currently. The West Branch of the river runs through the center of the town and in the early days of the town, helped power mills and factories causing development to occur largely along its banks. Currently the floodplain of the Batten Kill and its tributaries include multiple commercial buildings, a manufactured home park, a school, and many residential homes. More information on possible flood hazards can be found in the [Flooding and Fluvial Erosion](#) section.

The Town of Manchester also includes a highly frequented recreation park located on the east side of Route 30. The Manchester Community Library was finished in its current location in 2014 and serves as an important community hub and gathering place. The Factory Point Town Green is a community gathering place for music and the annual Christmas tree lighting. The Town also has numerous houses of worship, schools (both public and private), childcare centers, and commercial buildings.

Significant events since the last plan update (major disasters, major developments, conditions affecting risk in the community)

Since 2016, Bennington County has experienced five FEMA designated disasters as indicated in Table 4. Four of the five events were flooding events, and the fifth event was the Covid-19 pandemic that had impacts not only on Manchester but also worldwide. Further discussion of these events can be found within the appropriate hazard section.

Table 4. FEMA Designated Disasters since 2016.

FEMA Designated Disasters since 2016 and their descriptions. Source: FEMA and NCEI, 2024			
Date	FEMA Declaration Number	Title	Description
June 29, 2017- July 1, 2017	DR-4330-VT	Severe Storms and Flooding	Torrential rainfall throughout portions of Southern Vermont with 3.47 inches in four hours recorded. This caused flooding in the Walloomsac River at Paper Mill Village in Bennington. A microburst in Bennington County also caused estimated wind speeds of 100 mph.
April 15, 2019	DR-4445-VT	Severe Storms and Flooding	Some reports of flooding were made including some washed out dirt roads and a major disaster was declared in Bennington County to assist in repairing the damaged roads.
January 20, 2020 – May 11, 2023	DR-4532-VT	VT Covid-19 Pandemic	Worldwide pandemic of the SARS-CoV-2 virus that infected over 22 million Americans and required those infected to quarantine.

FEMA Designated Disasters since 2016 and their descriptions. Source: FEMA and NCEI, 2024			
Date	FEMA Declaration Number	Title	Description
July 29, 2021 – July 30, 2021	DR-4621-VT	Severe Storms and Flooding	The Town of Manchester suffered major impacts from flash flooding. Two roads were destroyed and others damaged. Flooding was also observed on Richville Road at Union Street to Carlen Street. The Batten Kill spilled over its banks turning fields and pastures into lakes. Damage also occurred to some railroads and residential buildings in the area.
July 7, 2023- July 21, 2023	DR-4720-VT	Severe Storms, Flooding, Landslides, and Mudslides	The combination of heavy rainfall and the Batten Kill overflowing its banks resulted in some areas of flooding in the Town of Manchester. A water rescue was conducted on Natural Form Way as workers were surrounded by about two feet of water. A business, multiple houses, and roads were flooded.

Due to the multiple flood events in the last several years, the Town of Manchester has done multiple improvement projects including upsizing culverts, elevating roads, digging new or larger ditches, and multiple riparian plantings along the Green River and Hopper Brook. These efforts are probably what made the impacts of the 2023 flood event far less destructive than the 2021 flood event.

III. Planning Process

Overview and Background

The Hazard Mitigation Planning process began in July of 2024 when the Town of Manchester and the Bennington County Regional Commission signed a contract to begin work on the update to the 2016 plan. A FEMA Hazard Mitigation Planning Grant was utilized to support this planning process.

Building Support: Community Involvement, Roles and Responsibilities

The planning team was made up of the Town Manager who is also the EMD, the Director of Public Works, the Zoning Administrator, the assistant Zoning Administrator, the Chief Operator of the Water & Sewer Department, The Chief of Police, and the Chief of Northshire Rescue Squad. The Chief of the Rescue Squad represented the older and underserved populations in Manchester. Stakeholders were also encouraged to participate, and a survey was disseminated throughout the town via paper copies with a virtual option as well. 8 responses were received from the paper copies and 9 responses were received online for a total of 17 responses. An effort was made to reach out to the utilities that serve the town, including Green Mountain Power and Consolidated Communications.

Documenting the Plan Update Process

A kick-off planning meeting was held on June 18, 2024 during their publicly warned Selectboard meeting. During this meeting, the hazard mitigation plan update process and the development of the planning team was discussed. Several meetings where the progress of the plan update was discussed, and public input requested, were publicly warned according to the Vermont Open Meetings Law. Dates are listed in Table 5.

Table 5. Dates of Hazard Mitigation Planning Meetings.

Dates of Hazard Mitigation Planning Meetings		
Meeting	Date	Notes
Kick-off meeting	June 18, 2024	Held in conjunction with a regularly scheduled selectboard meeting, the hazard mitigation plan update process discussed. Town residents were present but gave no comment.
Planning Committee Meeting #1	July 10, 2024	Stakeholders identified and an engagement plan created
Community Survey Disseminated	August 1 – September 1, 2024	Community survey shared online and via paper copies at the town office. Fliers posted and information posted on the Manchester Town website, at the Post Office, Discount Beverage, Manchester Police Department, Manchester Library, and at the Town Hall.

Dates of Hazard Mitigation Planning Meetings		
Meeting	Date	Notes
Planning Committee Meeting #2	September 6, 2024	BCRC presented the survey results and led the risk evaluation process as outlined in Section IV .
Planning Committee Meeting #3	November 7, 2024	Working meeting to review mitigation actions from prior plan.
Planning Committee Meeting #4	November 22, 2024	Working meeting to evaluate areas of vulnerability within the town.
Planning Committee Meeting #5	December 19, 2024	Working meeting to continue to review the Town's capabilities.
Planning Committee Meeting #5	February 14, 2025	Working meeting to continue to review the mitigation actions and perform the evaluation and prioritization of each action.
Public Meeting	March 18, 2025	Participated in a Selectboard Meeting to review the final mitigation actions and share the status of the plan with the Selectboard and the community. No comments from the community members that were present.
First Draft of the Plan Published		The first draft was made available for public and municipal review by the planning team on Manchester's website and via email to surround town leaders and stakeholders.
Submission to Vermont Emergency Management for Review		First draft submitted to VEM for review and feedback
Selectboard adoption pending approval of the Hazard Mitigation Plan		Plan was presented to the Selectboard for Adoption pending approval from FEMA.

The plan was posted on The Town of Manchester website, where town information is posted, and on the Bennington County Regional Commission website. The plan was sent to the Selectboard Chairs of the surrounding towns of Arlington, Sandgate, Rupert, Dorset, Peru, Winhall, Stratton Town, and Sunderland for comments. Each were asked to share the plan with appropriate staff and officials. The plan was also sent to community agencies that work with populations that may need additional assistance during a hazardous situation such as the food pantry, United Counseling Services, childcare centers and assisted living facilities. Comments were requested by email to Dara Zink at the Bennington County Regional Commission at dzink@bcrvvt.org by _____. Once the comment period ended, and comments were incorporated, the plan was sent to Vermont Emergency Management for review. Following the review by Vermont Emergency Management, the Selectboard adopted the plan, dated _____, at their _____ meeting.

IV. Risk Assessment

Understanding the Community's Risks

To understand the community's risks, the previous hazard mitigation plan was reviewed, as well as multiple other studies, reports and technical information. Table 6 lists all the plans that were reviewed and how they were used within this plan update.

Table 6. Existing Plans, Studies, Reports & Technical Information

Existing Plans, Studies, Reports & Technical Information	
Title	Use
2023 FEMA Local Mitigation Planning Handbook.	Referenced to ensure that this plan meets FEMA mitigation planning requirements.
Bennington Regional Plan Policies and Actions (adopted March 19, 2015)	Referenced in Section V for the Capability Assessment.
FEMA National Risk Index Map	This information was used to update the risk assessments in Section IV.
FEMA Disaster Declarations for Vermont	Referenced in Section II to build the town profile and referenced in Section IV for each hazard's history.
FEMA 2015 Flood Insurance Rate Maps (FIRM) for Manchester	Referenced in Section II. Flooding and Fluvial Erosion and Section V. National Flood Insurance Program.
FEMA Flood Insurance Study Bennington County, Vermont (All Jurisdictions) Study Number 50003CV000A	Referenced in Section V. National Flood Insurance Program.
Knowledge from residents and stakeholders of the town	This information was used to develop the risk assessment in Section IV.
Local Emergency Management Plan, 2024	Referenced in Section V for the Capability Assessment.
Municipal Climate Change Vulnerability Indicators Tool	Referenced to develop the risk profiles in Section IV.
National Flood Insurance Program	This information was used in Section IV to develop the risk assessment and referenced in Section V. in the Capability Assessment.
Manchester Land Use & Development Ordinance Adopted May 29, 2018	Referenced in Section V for the Capability Assessment.
Manchester Town Plan, 2017	Used to help build the community profile and referenced in Section V for the Capability Assessment.
Manchester, Vermont Annual Report 2023 Fiscal Year	Budget information referenced in Community Capability Section in Section V. Fire warden report and Conservation Commission report referenced in Section IV to create hazard history.
Stormwater Master Plan, Town of Manchester, Vermont (Adopted 2023)	Referenced in Section V for the Capability Assessment.
The Manchester Journal	Local newspaper in Vermont. This was referenced to help build the risk assessment in Section IV.
The National Centers for Environmental Information (NCEI) Storm Events Database	Used to update the hazard history and risk assessment in Section IV.

Existing Plans, Studies, Reports & Technical Information	
Title	Use
The National Weather Service	Data used to build the risk assessment and hazard history in Section IV.
The State of Vermont Hazard Mitigation Plan 2023	Referenced to develop the risk profiles in Section IV.
The Vermont Department of Forest, Parks, and Recreation Data on Wildfire	Referenced to develop the risk profiles in Section IV.
Town of Manchester Hazard Mitigation Plan 2016	This is the previous hazard mitigation plan for the Town of Manchester.
Town of Manchester's FEMA Flood Insurance Rate Map, effective 12/2/2015	Used to create Map 3 and referenced in Section V for the Capability Assessment.
Town Road and Bridge Standards	Referenced in Section V for the Capability Assessment.
VTDigger	Newspaper in Vermont. This was referenced to help build the risk assessment in Section IV.
VTrans Public Crash Data Query Tool	Used to build hazard history and risk assessment in Section IV.

With respect to NCEI data, there have been numerous changes to that database in just the last few years. While NCEI data goes back to 1950, there was a dramatic change in 1996 in the way data were collected. The number of events recorded in the years prior to 1996 is far less than from 1996 onward. Therefore, for the most reliable data, we used only data from 1996 onwards.

Risk Assessment Process

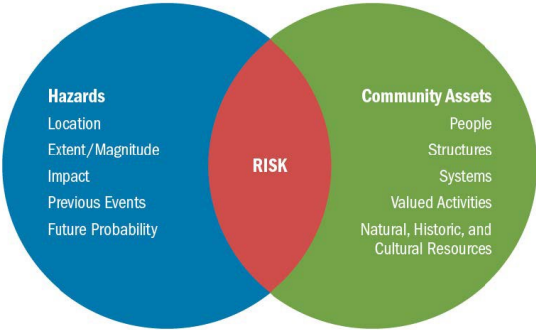


Figure 1. Risk is the overlap of community assets and the effects of hazards.

Risk is defined by FEMA in the Local Mitigation Planning Handbook 2023 as “the potential for damage or loss when natural hazards interact with people or assets.” Where hazards and community assets overlap, you will find risk. The greater the overlap, the greater the risk to people, natural environment, built environment, and other community assets (Figure 1).

The planning committee came together to conduct a risk assessment (Table 7) for each hazard and then choose which hazards would be profiled in this hazard mitigation plan. Since the 2016 plan, there have been significant changes in how hazards are

evaluated. Following the methodology of 2023 Vermont State Hazard Mitigation Plan, the probability of each hazard was ranked on a scale of 1 to 4 by its frequency of occurrence. Each hazard was then evaluated for its potential impact also on a scale of 1 to 4. A description of the ranking for frequency of occurrence and potential impact can be found in Table 8. The potential impact was then averaged, and the final score obtained by multiplying the probability score by the average of the potential impact. The results are then factored into the plan. The planning committee chose not to profile or mitigate any hazards with an overall score of 4.5 or less due to a low probability of occurrence and/or low impact. The State Hazard Mitigation Plan can be reviewed for more information on hail, severe heat, and earthquakes.

Table 7. Town of Manchester Hazard Risk Assessment.

2025 Town of Manchester Hazard Risk Assessment							
Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Flooding and Fluvial Erosion	4	4	4	2	4	3.5	14
Winter Storm	4	2.5	3	3	2	2.625	10.5
High Wind Event	4	3.5	2	3	2	2.625	10.5
Extreme Cold	4	3	3	2	2	2.5	10
Infectious Disease Outbreak	4	1	3	3.5	1	2.125	8.5
Invasive Species	4	1	1	1	3	1.5	6
Extreme Heat	3	1	3	1.5	2	1.875	5.625
Hazardous Material Spill	2	2	2	2.5	3	2.375	4.75
Wildfire**	3	2	1	1	2	1.5	4.5
Landslide and Debris Flow**	3	1.5	1	1	2.5	1.5	4.5
Hail**	4	1	1	1	1	1	4
Drought**	2	1	1	1	2	1.25	2.5
Earthquake**	2	1	1	1	1.5	1.125	2.25
*Score = Probability x Average Potential Impact **Hazards not profiled or mitigated for in this plan.							

Table 8. Hazard Assessment Ranking Criteria

Hazard Assessment Ranking Criteria		
	Frequency of Occurrence: Probability of a plausibly significant event impacting the community or regional scale based on previous occurrences and climate change projections.	Potential Impact: Severity and extent of damage and disruption to population, property, environment, and the economy
1	Unlikely: <1% probability of occurrence per year	Negligible: isolated occurrences of minor built or natural environmental damage, potential for minor injuries, health, or well-being impacts, or minimal economic disruption.
2	Occasionally: 1–10% probability of occurrence per year, or at least one chance in next 100 years	Minor: isolated occurrences of moderate to severe built or natural environmental damage, potential for injuries or health or well-being impacts, minor economic disruption.
3	Likely: >10% but <75% probability per year, at least 1 chance in next 10 years	Moderate: severe built or natural environmental damage on a community scale, injuries, fatalities or impacts to individual and community well-being, short-term economic impact.
4	Highly Likely: >75% probability in a year	Major: severe built or natural environmental damage on a community or regional scale, multiple injuries or fatalities or severe long-term impacts to individual and community well-being, significant long-term economic impact.

Hazards

The planning committee decided to focus on the same hazards as the 2016 plan in the community survey and in the initial planning conversation. No additional hazards were included at that time (Table 9). The 2023 State Hazard Mitigation plan addresses the hazards as listed in the second column. The table crosswalks the hazards in the 2016 plan to the state’s hazards and the last column indicates which hazards will be addressed in this plan and how the plan refers to them. In this plan, flooding and fluvial erosion will include flash floods. Temperature extremes will be addressed separately as Extreme Heat and Extreme Cold.

Table 9. Crosswalk of hazards

Crosswalk of hazards from 2016 Hazard Mitigation Plan to the 2023 Vermont State Hazard Mitigation Plan and then to the 2024 Town of Manchester Hazard Mitigation Plan.		
2016 Town of Manchester Hazard Mitigation Plan Hazard List	2023 Vermont State Hazard Mitigation Plan Hazard List	2025 Town of Manchester Hazard Mitigation Plan Hazard List
Floods and Fluvial Erosion	Fluvial Erosion	Flooding and Fluvial Erosion
	Inundation Flooding	
Winter Storm	Snow	Winter Storm
	Ice	
High Wind Event	Wind	High Wind Event
Hail	Hail	Hail*
Temperature Extremes	Extreme Heat	Extreme Heat
	Extreme Cold	Extreme Cold

Crosswalk of hazards from 2016 Hazard Mitigation Plan to the 2023 Vermont State Hazard Mitigation Plan and then to the 2024 Town of Manchester Hazard Mitigation Plan.		
2016 Town of Manchester Hazard Mitigation Plan Hazard List	2023 Vermont State Hazard Mitigation Plan Hazard List	2025 Town of Manchester Hazard Mitigation Plan Hazard List
Drought	Drought	Drought*
Landslides and Debris Flow	Landslides	Landslides and Debris Flow*
Wildfire	Wildfire	Wildfire*
Earthquake	Earthquake	Earthquake*
Hazardous Materials Spill	Not addressed	Hazardous Materials Spill
Invasive Species	Invasive Species	Invasive Species
Infectious Disease Outbreak	Infectious Disease Outbreak	Infectious Disease Outbreak

*These hazards were addressed in the previous plan but will not be addressed in this plan.

Each hazard chosen to be addressed in this plan will be profiled using the following information based on FEMA requirements:

- Location – the geographic area within the planning area that is affected by the hazard
- Extent – the expected range of intensity for each hazard
- Previous occurrences – the history of any historical events caused by that hazard
- Vulnerability – the probability of the hazard occurring and where the Town is likely to experience negative impacts from the hazardous event

Flooding and Fluvial Erosion

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Flooding and Fluvial Erosion	4	4	4	2	4	3.5	14

Description

According to the 2023 Vermont State Hazard Mitigation Plan, flooding and fluvial erosion were the top two significant hazards in the state. It was also the top ranked hazard in the risk assessment conducted by the planning committee.

A. Flooding

There are two types of flooding that impact Vermont and the Manchester region: inundation flooding and flash floods. The National Weather Service defines a flood as “Any high flow, overflow, or inundation by water which causes or threatens damage.” A flash flood is “a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However,

the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters.” (NOAA’s *National Weather Service - Glossary*) Flash floods can also occur after a dam failure or after a sudden release of water by an ice jam. Inundation flooding is a longer-term event than flash flooding and may last days or weeks and spread over large areas. A floodplain is the land area covered by floodwater.

Runoff from snowmelt in the spring, summer thunderstorms, and tropical storms and hurricanes can all result in flooding in Manchester. Ice jam flooding can occur in Vermont rivers when substantial ice forms followed by several days of warmth, snowmelt and any rainfall leading to the breakup of ice. As the ice breaks up on the rivers, chunks of ice form jams which can cause localized flooding on main stem and tributary rivers. Ice jams are most prevalent during the January thaw in late January and in March and April as spring approaches.

B. Fluvial Erosion

According to the USGS (2020), fluvial erosion “includes bed erosion, meaning lowering of the bed of a stream, as well as bank erosion, which refers to the retreat of stream banks that occurs as a stream widens or migrates laterally.” Rivers that have been straightened, whose riverbeds have been dredged (removal of sediment from the stream bed) or have a lack of riparian buffers (woody vegetation) along their banks are more susceptible to fluvial erosion. Rivers that are constricted by bridges and other structures or by rip rap also tend to have water that moves at a higher velocity that results in both bed and bank erosion. This type of erosion can also cause the failure of dams and channels which can then harm farmland, residences, and roads. The movement of the sediment from the point of erosion can then cause a build up of sediment in reservoirs and even dam streams further downstream.

Location

Flooding and fluvial erosion occurs along the many streams and rivers that flow through Manchester. Headwaters of the Batten Kill tributaries that run through the town can be very flashy, and while some flood losses are the result of inundation, more often flood losses are caused by fluvial erosion.

Digital flood maps have been created by FEMA and became effective for the town on December 2, 2015. Map 3 shows the location of the flood hazard areas and river corridors as determined by this type of mapping.

Special Flood Hazard Areas (SFHA): these are areas mapped by FEMA and using the LIDAR derived zones currently under review. Table 12 shows the number of structures, by type, in the special flood hazard and river corridors and both areas are shown in Map 3. Figure 2 shows the parts of a typical floodplain.

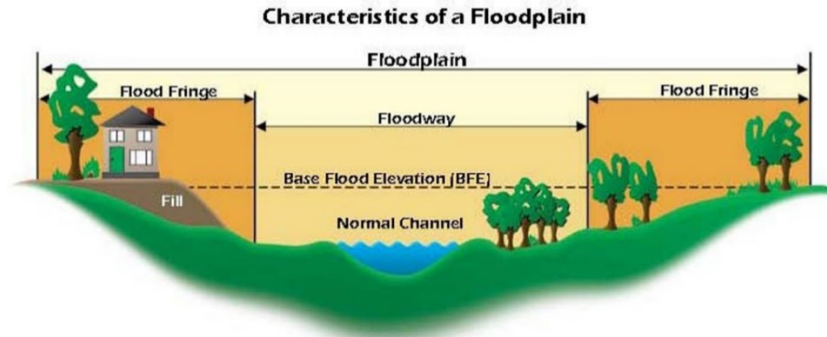


Figure 2. Typical Floodplain

River Corridors: River corridors (Figure 3) have been mapped by the Vermont Agency of Natural Resources using geospatial data and modified by VT ANR river scientists using available field data. The data were used to calculate the “meander belt width” or area within which a river would move across the valley. As rivers shift their location both vertically and horizontally, erosion of adjacent lands can occur and threaten properties that may be outside of special flood hazard areas (Vermont River Management Program 2010).

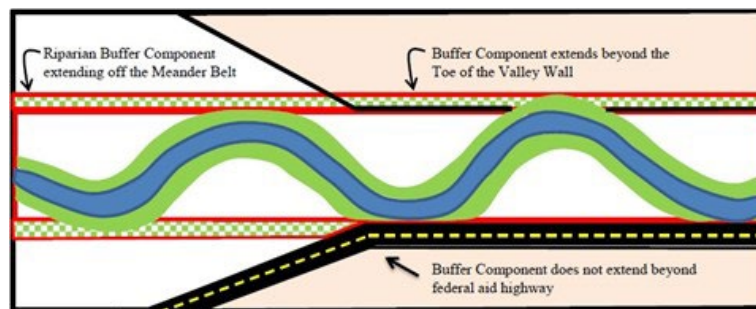


Figure 3. River Corridors

The Agency of Natural Resources (ANR) lists 7 dams within Manchester. One, the dam at Equinox Pond, is categorized as having significant hazard potential however, this dam is located within the Village of Manchester and may be addressed in their Hazard Mitigation Plan. The other dams all are ranked as low to minimal hazard potential. The Dufresne Pond Dam was removed in 2012 in order to restore the river and is not included in Map 3.

Extent

The primary damage from past events has been from inundation flooding and fluvial erosion with secondary damage from wind.

A. Flooding

The National Weather Service uses the following impact categories to describe flooding:

- **Minor Flooding:** Minimal or no property damage, but possibly some public threat (e.g., inundation of roads).

- **Moderate Flooding:** Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations.
- **Major Flooding:** Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- **Record Flooding:** Flooding which equals or exceeds the highest stage or discharge observed at a given site during the period of record. The highest stage on record is not necessarily above the other three flood categories – it may be within any of them or even less than the lowest, particularly if the period of record is short (e.g., a few years).

B. Fluvial Erosion

The extent of fluvial erosion is difficult to track. No local records have been maintained that include this information. However, it can be witnessed by viewing the damage that has occurred along riverbanks and to essential roads within the town after an event.

C. Dams

The Department of Environmental Conservation (DEC) within ANR maintains an inspection program for dams within Vermont. Per the DEC website, this program classifies dams by their “condition and need for improved operation, maintenance, study and analyses, repairs, rehabilitation, or removal.” Dam hazard potential is shown in Table 10. Dams that have a higher hazard classification are subject to more frequent inspections.

Table 10. Dam Hazard Classification.

Dam Hazard Classification <i>Source: Department of Conservation, 2024</i>					
Class	Direct Loss of Life	Property Losses	Lifeline Losses	Environmental Losses	Inspection Frequency
High	Probable or Certain (one or more) (extensive downstream residential, commercial, or industrial development)	Not considered for this classification	Not considered for this classification	Not considered for this classification	2 years
Significant	None expected	Major or extensive public and private facilities	Disruption of essential or critical facilities and access	Major or extensive mitigation required or impossible to mitigate	5 years

Low	None Expected	Private agricultural lands, equipment and isolated non-occupied buildings, non-major roads	No disruption of services – repairs are cosmetic or rapidly repairable damage	Minimal incremental damage	10 years
Minimal	Same as LOW Hazard				None

There are no USGS stream gauges in Manchester along any of the tributaries or the Batten Kill itself. The closest stream gages are located on the West River in Jamaica, Vermont and on the Walloomsac River near North Bennington.

Previous Occurrence, Disasters

There have been numerous storm events that have affected Vermont since settlement, but the local impacts of these are difficult to trace. The 1927 flood was the largest recorded disaster in the history of the state. The state received over six inches of rain, with some areas receiving 8-9 inches. Following a rainy October, this storm occurred from November 2nd through the 4th causing extensive flooding. Two storms occurred in March of 1936. Heavy rains and snowmelt caused significant flooding. Two years later, the 1938 hurricane caused both flooding and extensive wind damage. The remnants of Hurricane Belle (August 9-10, 1976; DR-518) caused flooding damage in portions of Vermont.

Hurricanes and tropical storms that form in tropical waters have historically affected New England but are relatively infrequent. Besides the 1938 hurricane previously mentioned, Tropical Storm Belle brought significant rains to Vermont in 1976 and Hurricane Gloria brought rain and wind damage in 1985. Manchester has been subjected to two major tropical storms in the past twenty years. Hurricane Floyd was a Category 4 storm before hitting North Carolina on September 16, 1999, and then was reduced to a tropical storm when it reached southern New England.

In August of 2011, Tropical Storm Irene hit New England (DR-4022-VT). One of the largest events in recent history, this storm was the remnant of Hurricane Irene, which was a Category 1 hurricane. A Category 1 storm has winds of 74-95 miles per hour and could damage roofs, down shallow-rooted trees and damage power lines. Rainfall amounts averaged 4 to 8 inches and fell within a twelve-hour period. A Cooperative Weather Observer recorded 4.70 inches of rain in Pownal and Bennington Morse State Airport reported 4.23 inches of rain from August 27 to 28. In Bennington County, widespread flash flooding and associated damage was reported countywide, with many roads closed due to flooding and downed trees and power lines. Strong winds also occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The combination of strong winds and extremely saturated soil led to widespread long duration power outages. In Bennington

County, approximately 5,000 customers were affected by power outages. According to the Manchester Journal article published in 2013, Manchester largely recovered from the storm within days. The hardest hit areas were Richville Road, Rootville Road, and many waterlines were broken causing the town to issue boil water notices. This storm was also the beginning of multiple rounds of flooding within Green Mountain Road.

Even more recently, on July 29th and 30th 2021, a fast-moving storm hit southern Vermont bringing 6 inches of rain to some areas. Manchester felt the impacts of flash flooding that caused damage to Rootville Road making it impassable. Richville Road was also once again flooded and had to be closed, and Green Mountain Road and its neighborhood was covered in sediment as the waters receded. The Hillvale neighborhood was also impacted by a stream that diverted through it and stormwaters accumulated throughout the downtown, flooding multiple businesses and causing hazardous road conditions. Bennington and Windham County were both declared eligible for Public Assistance (PA) under the federal disaster declaration DR-4621. Together, these counties were awarded \$7,248,345.00.

The most recent flood occurred at the end of July 2023. After a wet early July left water tables high, widespread amounts of showers and thunderstorms hit the region from July 9th through 11th causing flooding across the county. While most of the immediate area was spared the worst of the damage, the Bourne Brook breached its banks in the Green Mountain Road neighborhood once again flooding homes and damaging the road. Most of the damage remained to the northeast of Manchester however, with Londonderry and Weston bearing the brunt of the damage locally and East Dorset also dealing with damaged roads and homes. Two fatalities were recorded in connection with the flooding in the state. Rainfall totals of 2.5 to 5 inches fell across the southern Green Mountains and Bennington County was once again part of a federal disaster declaration (DR-4720-VT). Together, these counties were awarded \$7,248,345.00.

Chart 2 shows a total of 50 flood events in Bennington County from 1996 to 2023, using National Center for Environmental Information data. These have been primarily minor and affected either specific streams, such as the Walloomsac and Batten Kill, or a specific town or towns.

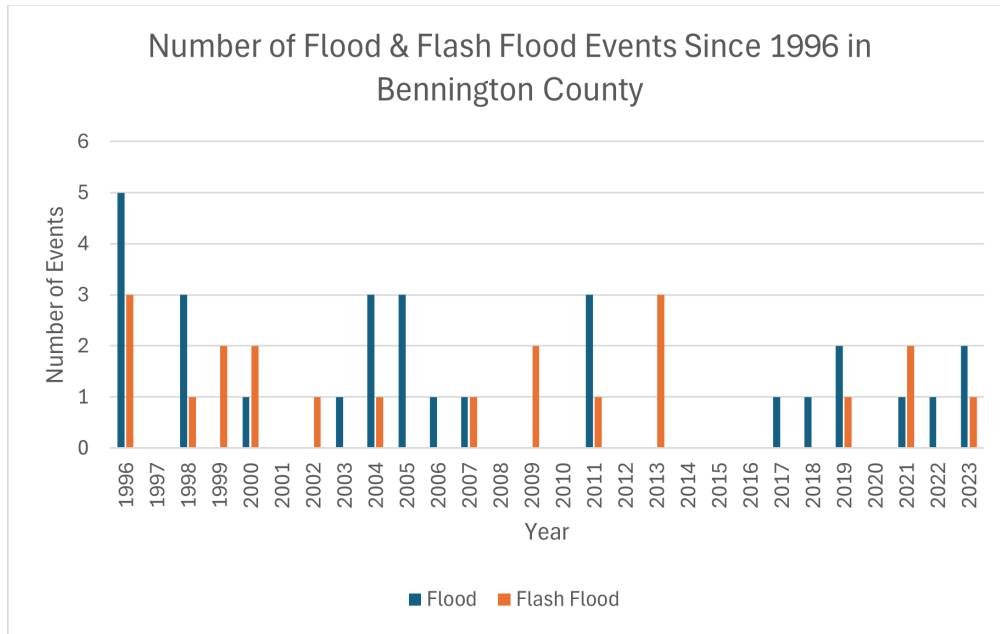


Chart 2. Number of flood events by type and year for Bennington County. Source NCEI, 2024

Table 11 describes significant flood events that have occurred since 1996 which impacted Bennington County and likely affected Manchester. These events were described in the National Center for Environmental Information records (2024). It should be noted that only the January 1996 event and the December 2023 events occurred in the winter, with all other events in the spring, summer or fall. Ice jam flooding does occur in the winter, however no major instances have included this type.

Table 11. Significant flood events impacting Bennington County.

Significant flood events impacting Bennington County. Source: National Center for Environmental Information records (NCEI, 2024)			
Dates	Type	Description	FEMA
19-20 Jan 1996	Flood	An intense area of low produced unseasonably warm temperatures, high dew points and strong winds resulting in rapid melting of one to three feet of snow. One to three inches of rain fell as the system moved northeast along the coast. This resulted in numerous road washouts and the flooding of several homes across the county. A Cooperative Weather Observer recorded 0.94" of rain in Sunderland. One death was reported in Vermont.	DR-1101 1/19 to 2/2 1996
16-17 Sept 1999	Flood	The remnants of Hurricane Floyd brought high winds and heavy rainfall (3-6 inches) to southern Vermont. Many smaller tributaries reached or exceeded bank full. Estimated wind gusts exceeded 60 mph, especially over hill towns. Power outages occurred across southern Vermont. A Cooperative Weather Observer recorded 4.94" of rain in Sunderland.	DR-1307 9/16-21 1999
14-17 Jul 2000	Flash Flood	Thunderstorms caused torrential rainfall with flash flooding washing out sections of roadways in northeast Bennington County and southern Bennington County. Routes 7 and 67 were closed. A Cooperative Weather Observer recorded 3.39" of rain in Sunderland.	DR-1336 7/14-18 2000

Significant flood events impacting Bennington County. Source: National Center for Environmental Information records (NCEI, 2024)			
Dates	Type	Description	FEMA
17 Dec 2000	Flood	Unseasonably warm and moist air brought a record-breaking rainstorm to southern Vermont. Rainfall averaged 2-3 inches. The heavy rain, combined with snowmelt and frozen ground, lead to a significant runoff and flooding. A Cooperative Weather Observer recorded 3.38" of precipitation in Sunderland.	DR-1358 12/16-18 2000 (Severe Winter Storm)
21 July to 18 Aug 2003		Severe storms and flooding affected Vermont including Bennington County. (Note: this event does not appear in the NCDC data.) A Cooperative Weather Observer recorded sporadic and sometimes large amounts of precipitation during that period in Sunderland.	DR-1488 7/21-8/18 2003
16-17 Apr 2007	Flood	An intense coastal storm spread heavy precipitation across southern Vermont, starting as a mixture snow, sleet and rain which changed to all rain. Liquid equivalent precipitation totals ranged from three to six inches leading to minor flooding across portions of southern Vermont. A Cooperative Weather Observer recorded 3.54 of rain in Sunderland.	DR-1698 4/15-21 2000
28-29 Aug 2011	Flood/ Flash Flood	Tropical Storm Irene produced widespread flooding, and damaging winds across the region. Rainfall amounts averaged four to eight inches and fell within a twelve-hour period. A Cooperative Weather Observer recorded 5.16" of rain in Sunderland. In Bennington County, widespread flash flooding and associated damage was reported countywide, with many roads closed due to flooding and downed trees and power lines. Strong winds also occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The combination of strong winds and extremely saturated soil led to widespread long duration power outages.	DR-4022 8/27-2 2011
29 June-1 July, 2017	Flood	Thunderstorms across the region resulted in torrential rainfall in portions of Southern Vermont. The airport at Bennington recorded 3.47 inches of rain in four hours during the evening. This rainfall resulted in river flooding along the Walloomsac. A storm also produced a microburst in Bennington County with maximum wind speeds of 100 mph estimated.	DR-4330
15 April, 2019	Flood	Heavy rain fell throughout the region during the morning hours of Monday, April 15th, 2019. This resulted in a few reports of flooding with some dirt roads washed out. A major disaster was declared by the President of the United States in Bennington County to assist in repairing the damaged roads.	DR-4445
29-30 July, 2021	Flood	Between 2 and 5 inches of rain fell across most areas which resulted in several reports of flash flooding. This rainfall ended a very wet month of July in which most areas picked up between 12 and 18 inches of rain.	DR-4621
7-21 July, 2023	Flood	Rain fell on already saturated soils and resulted in areas of areal and flash flooding throughout the county.	DR-4720

Vulnerability

A moderate or major flood event, with the occurrence of fluvial erosion, in or near Manchester any given year is highly likely, with a > 75% probability in a year.

Table 12 tallies the number of structures by type within the special flood hazard area and river corridor. This count includes any structure whose footprint falls within either the Special Flood Hazard Area (SFHA) or within the river corridor. As shown, there are 70 structures within the special hazard area and 120 within the river corridor. The locations of these structures are shown in Map 3.

Table 12. Structures within river corridors and flood hazard zones in Manchester, VT.

Structures by type in river corridors flood hazard zones in Manchester, VT. <i>Source: Vermont Open Geodata Portal</i>		
Type of Structure	Number in SFHA	River Corridor
Residential	25	44
Mobile home	6	13
Commercial with Residence	4	9
Commercial/Commercial Farm/Other Commercial	24	38
Industry	2	1
Utilities	5	2
Lodging	0	0
Seasonal Dwelling	0	0
Municipal/Government	0	1
Medical	0	0
Education	0	0
House of Worship	0	0
Recreation	3	6
Other	1	6
Total	70	120

Manchester has seen repeated flood damage along Richville Road and Rootville Road. Homes located on Green Mountain Road which is adjacent to Bourne Brook have been flooded multiple times. Most services recover in less than seven days due to the rapid response of the Department of Public Works however specific property owners may be impacted longer. The planning team indicates that the Town and its services can effectively manage and safely sustain rainfall amounts of 4-6 inches in a single event.

Water infrastructure has suffered damage due to flooding and roads become impassable even after heavy rains. The planning team reviewed these impacts and ranked flooding and fluvial erosion as having major impacts on the community by causing long-term impacts to homes, infrastructure, and the natural environment. In the

past, the Town's economy was able to recover relatively quickly after a flood event causing only minor economic disruption.

FEMA's National Risk Index for the Manchester region, which includes Census Tract 50003970401 and 50003970402, shows Manchester's current expected annual loss due to riverine flooding as relatively low compared to the rest of the nation. Manchester's social vulnerability is also ranked as relatively low and its community resilience is considered relatively moderate. It is important to keep in mind that the National Risk Index bases its ratings on historical data and should not be used to predict future outcomes.

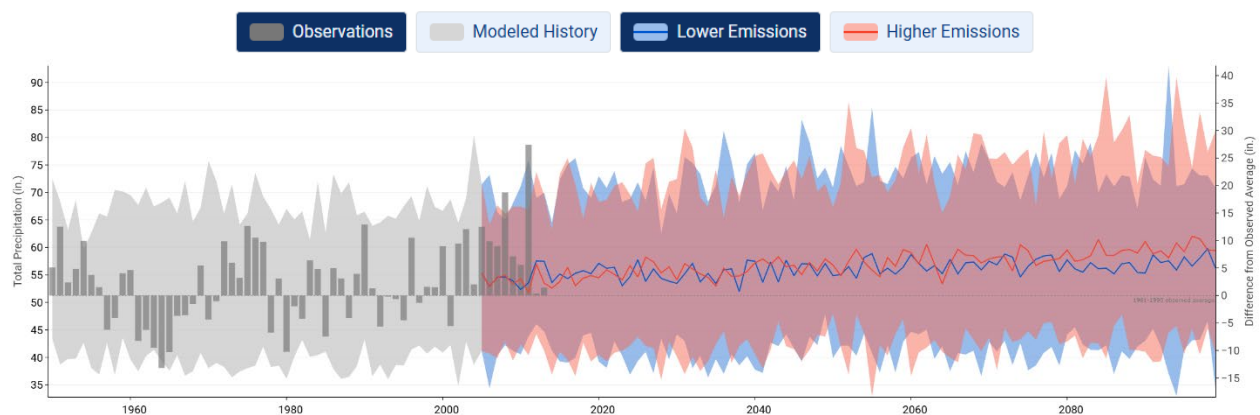
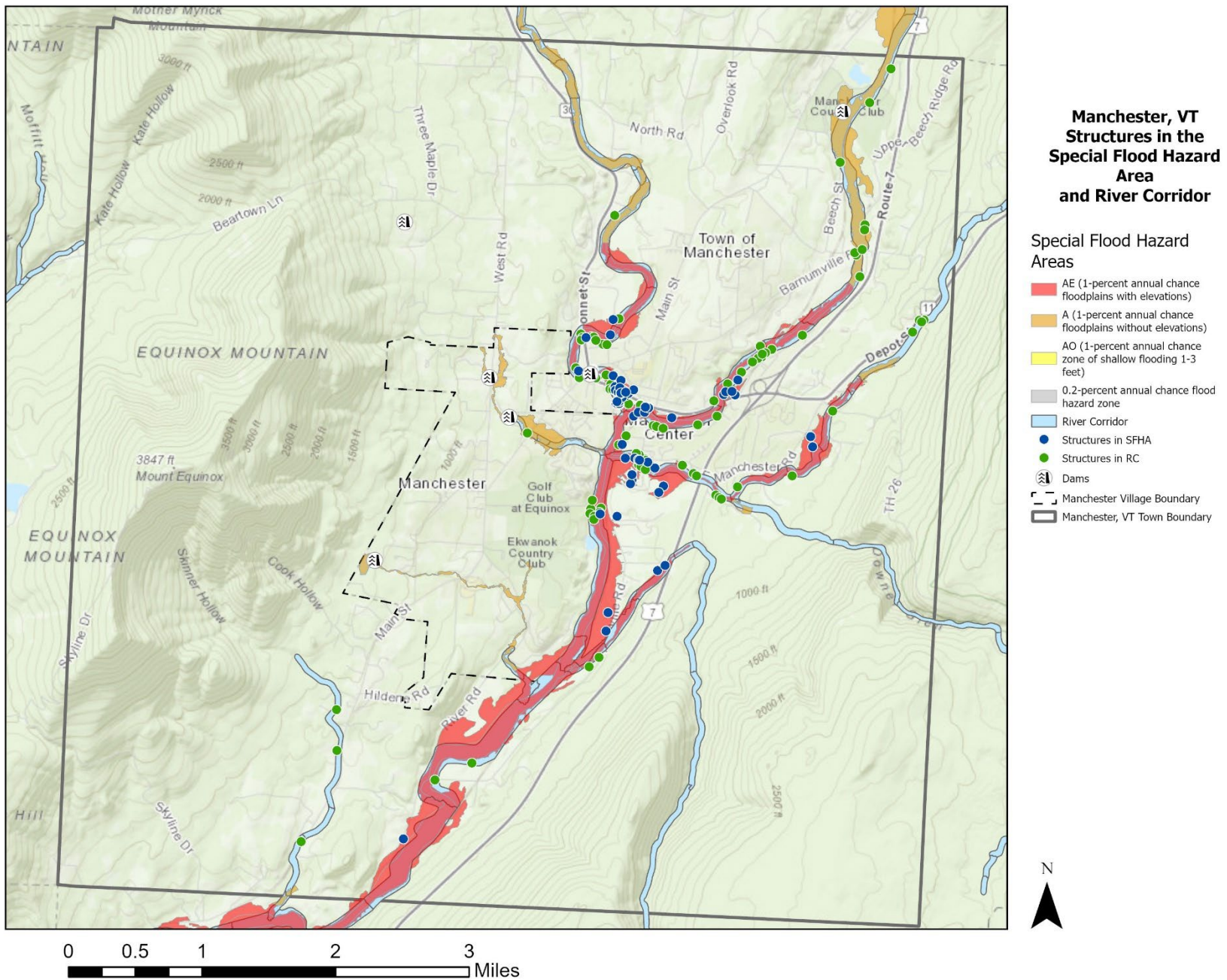


Chart 3. Bennington County - Total Precipitation historically and projected through 2090 Source: The Climate Explorer

The U.S. Climate Resilience Toolkit Climate Explorer is a tool that is created to look at potential future outcomes. This tool indicates that the Bennington County area is expected to have higher annual precipitation under both lower emission (RCP4.5) and higher emissions modeling (RCP8.5). According to these models (Chart 3), the average annual precipitation between 1960 and 1990 was 51.26 inches. The lower emission model shows a potential increase of 4.81 inches of precipitation annually and the higher emissions model shows an increase of 5.68 inches per year by 2040. This increase in annual precipitation due to climate change may cause an increase in flooding events impacting life and safety, the built environment, and the natural environment. The economy may also see impacts if the flooding is extensive enough to limit tourism, which the town is heavily reliant upon. If development were to remain stagnant in Manchester the impact of the increased precipitation may continue to cause damage to infrastructure and residences. The focus on infill housing by the state and municipalities may increase the density in Manchester near waterways and may increase the risk to human life as well.



Map 3. Structures in the Special Flood Hazard Area and River Corridor in Manchester, VT. Source: BCRC, 2025

Winter Storm

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Winter Storm	4	2.5	3	3	2	2.625	10.5

Description

Winter storms are a frequent occurrence in Vermont and may consist of heavy snow, mixed precipitation, or ice storms. All may be accompanied by strong winds (see [High Wind Event](#)) which may cause drifting snow and low visibility. In addition to snow, ice storms occur when the lower levels of the atmosphere and/or ground are at or below freezing, and rain is falling through warmer air aloft. The precipitation freezes upon contact with the ground, objects on the ground, trees and power lines. Winter storms may also be accompanied by extreme cold temperatures (see [Extreme Cold](#)).

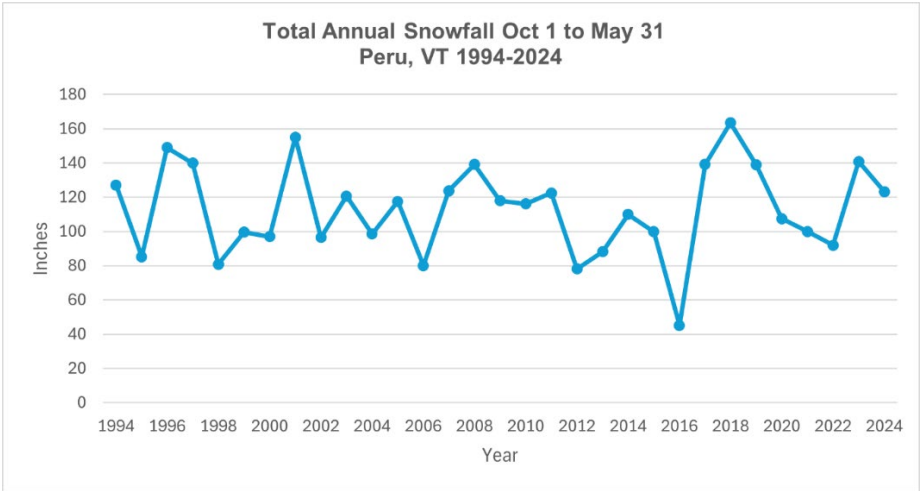


Chart 4. Annual snowfall amounts for Peru, VT. Source: NOAA Regional Climate Centers, 2024

The average annual snowfall in Bennington County is 73.9 inches, with December, January, February, and March as the primary months for snowfall according to the Midwestern Regional Climate Center. Between 1991 and 2020, this region has an average of 42.1 days per year that experience snow fall. Chart 4 (above) shows that annual snowfall amounts as measured at the Peru, VT Cooperative Observer Station between 1994 and 2024 as reported by NOAA Regional Climate Centers. There are few Cooperative Observers in Bennington County and many do not keep consistent records. Peru, VT is the closest observer but it is important to point out that it does lie at approximately 1,700 feet of elevation as opposed to Manchester’s 977 feet so may reflect higher snowfall amounts.

Location

Significant snowstorms and ice storms would affect the entire town of Manchester and likely most or all of Bennington County and surrounding counties and states. Within

Manchester, unpaved roads are more difficult to maintain during winter storms, and residents along those roads would be most likely to be delayed by such storms. Most roads in Manchester are paved, however. The skill of road crews in Vermont means that only the heaviest snowstorms (>12 inches) or ice storms affect the populations. Map 4 indicated the types of roads located in Manchester.

Extent

Winter storms can be measured in many ways and storms that have similar amounts of snowfall may be very different from each other. The National Weather Service Weather Prediction Center uses the Winter Storm Severity Index (WSSI) as a forecasting tool to relay potential impacts of a potential storm and where those impacts will be located (Figure 4). WSSI bases its ranking on 6 components:

- **Snow amount index** – depicts which areas (i.e., transportation) could be affected by either the total amount of snowfall or the rate of snowfall. Also taken into consideration is climatology. Snowfall in one area of the country has more or less of an impact depending on their preparedness.
- **Snow load index** – takes into consideration how the weight of the snow can impact trees and powerlines.
- **Blowing snow index** – reflects where transportation problems may be an issue due to blowing or drifting snow.
- **Ground blizzard index** – depicts the severity of ground blizzards to transportation.
- **Flash freeze index** – the severity of events caused by temperatures rapidly falling below freezing.
- **Ice accumulation index** – accounts for the combined effects of ice accumulation and wind that can produce tree damage, utility interruptions, and transportation shutdowns.

Potential Winter Storm Impacts	
	Winter Weather Area Expect Winter Weather. <ul style="list-style-type: none"> • Winter driving conditions. Drive carefully.
	Minor Impacts Expect a few inconveniences to daily life. <ul style="list-style-type: none"> • Winter driving conditions. Use caution while driving.
	Moderate Impacts Expect disruptions to daily life. <ul style="list-style-type: none"> • Hazardous driving conditions. Use extra caution while driving. • Closures and disruptions to infrastructure may occur.
	Major Impacts Expect considerable disruptions to daily life. <ul style="list-style-type: none"> • Dangerous or impossible driving conditions. Avoid travel if possible. • Widespread closures and disruptions to infrastructure may occur.
	Extreme Impacts Expect substantial disruptions to daily life. <ul style="list-style-type: none"> • Extremely dangerous or impossible driving conditions. Travel is not advised. • Extensive and widespread closures and disruptions to infrastructure may occur. • Life-saving actions may be needed.

Figure 4. Winter Storm Severity Index. Source: The National Weather Service

Previous Occurrence, Disasters

On October 4, 1987, a winter storm stranded travelers in the area and knocked out power for several days. This storm happened early in the season during fall foliage and caught the road crew unprepared. The increased number of visitors to the area during this time made it difficult to clear the roads efficiently, making this one of the most difficult to handle according to the planning team. The "Blizzard of '93," one of the worst storms this century, virtually shut down Vermont on the weekend of March 13-14, forcing the closure of roads and airports. This was one of the most powerful snowstorms on record. Snowfall amounts ranged from 10 to 28 inches across the state. However, neither of these events merited federal disaster declarations.

An emergency declaration was issued for Bennington County and multiple other counties throughout the state, for a snowstorm that occurred from March 5 – March 7, 2001. The biggest nor'easter of the season hit southern Vermont starting early Monday morning and buried the area in approximately two feet of snow, making this the biggest general snowfall since the Blizzard of '93.

In 2008, the State of Vermont was issued a federal disaster declaration (DR-1816) in Bennington and Windham counties for a severe winter ice storm that occurred between December 11th and December 18th. Snow and sleet amounts of 4 to 8 inches fell across the higher elevations of Bennington County. Ice accretions of up to three quarters of an inch formed which led to numerous downed trees, limbs, and power lines. Woodford reported 7 inches of mixed precipitation. An estimated 15,000 customers lost power due

to this event causing schools to shut down for multiple days. Some roads became impassable from fallen debris. Frigid cold followed this storm which compounded the effects of the power outages, and many warming shelters were setup to assist those without power and heat.

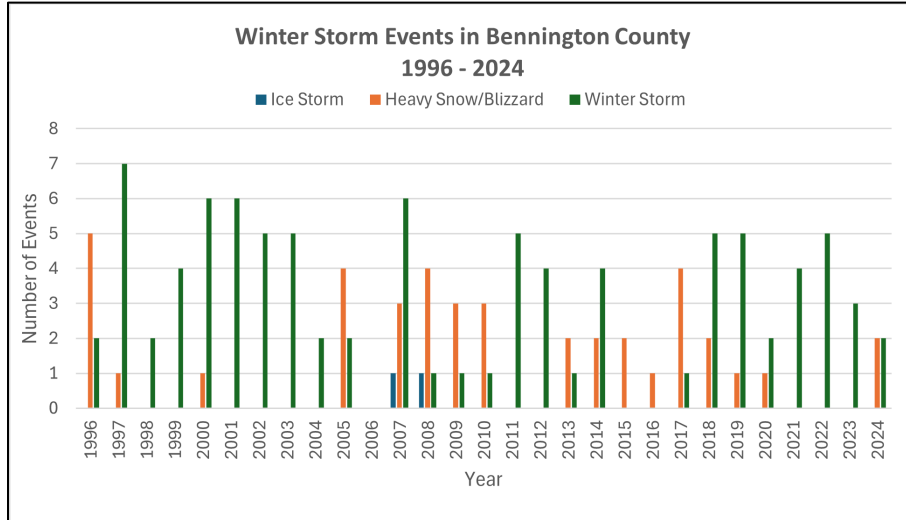


Chart 5. Number of winter storm events by type and year for Bennington County. Source National Center for Environmental Information, 2024.

Chart 5 summarizes the 134 winter storm events that have occurred in Bennington County since 1996. As can be seen, a high number of events occurred in 1997 and 2007 with ice storms as well as heavy snow and blizzards becoming less frequent in later years.

Vulnerability

There is a 100% probability of a moderate or greater snowstorm affecting Bennington County, including Manchester, in any given year. The largest impact would be on life safety. These can be large-scale events, though local impacts may vary greatly. Roads and power lines are most vulnerable, with traffic accidents most likely to create injuries. Power outages could be short-term or last seven or more days. Some roads may remain impassable for long periods as well. Heavy snow can impact the built environment by damaging buildings due to collapsed roofs. Snow laden trees and limbs may fall and damage buildings, utility lines, and cause blockages along roads. Manchester’s skilled road crew are well adapted to handling winter weather and only the heaviest snowstorms (>12 inches) or ice storms affect transportation. Any future changes to development would be minimally impacted by winter storms. However, the population of Manchester is aging per the census data indicated in the Town Profile section. This population has greater vulnerability to heart attacks, strokes, or other injuries while clearing snow or while walking on ice after a winter storm.

Vulnerable populations that do not have access to generators may struggle during power outages and remote areas may be cut off from supplies due to blocked roads.

Those who do have generators may be at an increased risk for carbon monoxide poisoning if the generators are not properly ventilated. Winter storms that cause power outages may also cause vulnerable populations to be disconnected from necessary services due to the inability to travel or communication disruption. Those who may have medical equipment that requires power may also be unable to use it during a power outage. Individuals with underlying or pre-existing health issues may also suffer an increase in heart attacks while trying to remove snow manually.

Storms that cause long-term power outages and road closures can negatively impact the economy causing store closures and burst pipes. The natural environment would have the least impact due to the resiliency of the natural wildlife and plants that grow in this area.

The National Risk Index currently gives Manchester a relatively low risk index rating for both ice storms and winter weather events, indicating that there is a low expected loss value, relatively low social vulnerability, and community resilience is ranked as relatively moderate.

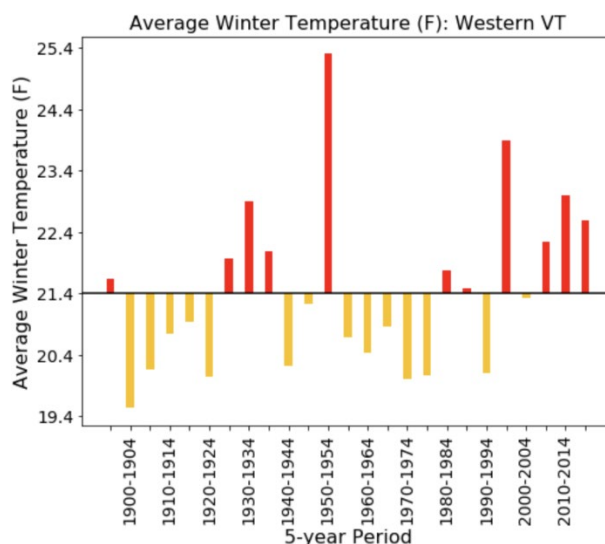
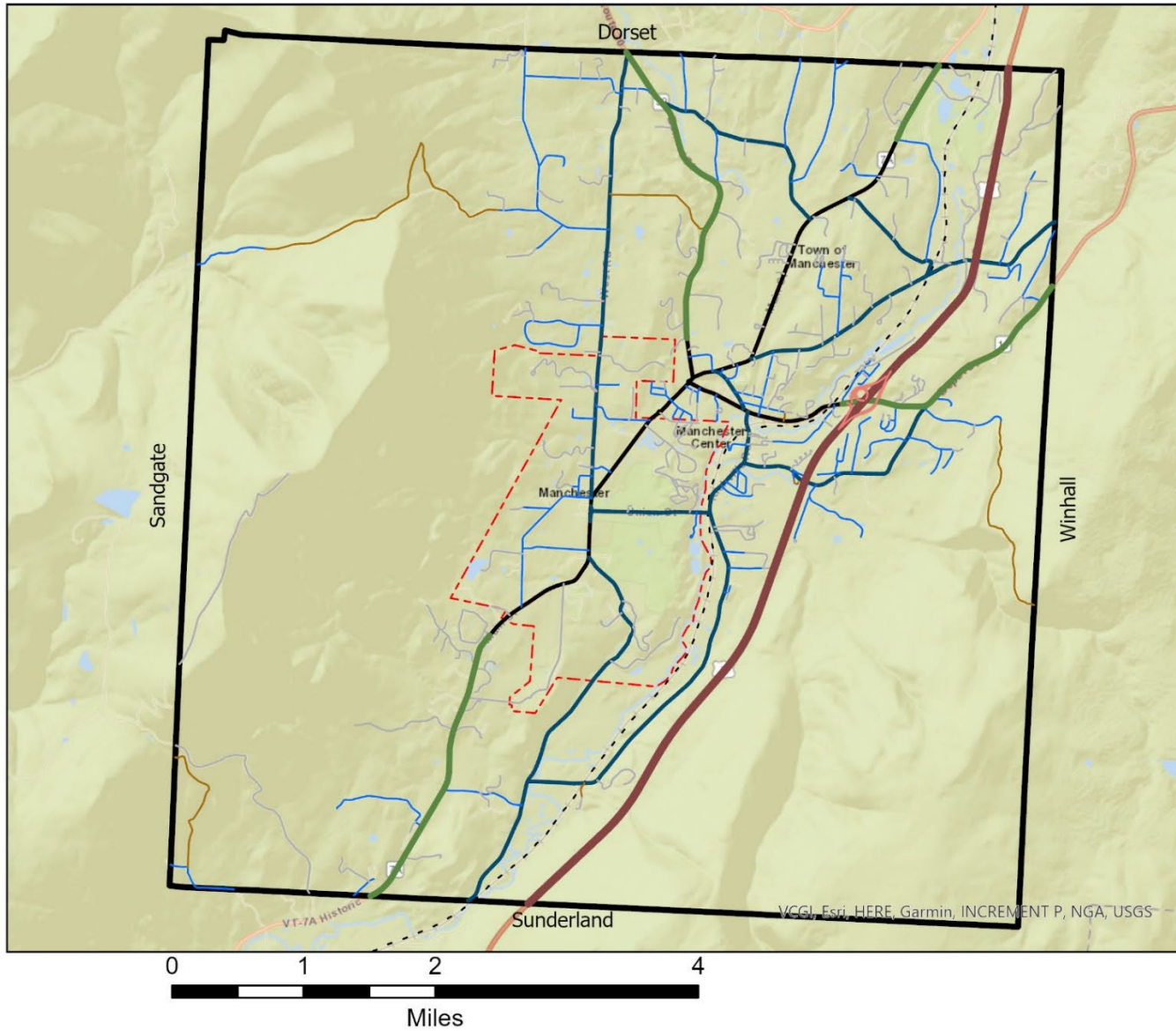


Chart 6. Average Winter Temperature: Western, VT. Source: Vermont Climate Assessment, 2021

According to the Vermont Climate Assessment, 2021, the average winter temperatures have risen since the early 1900s by roughly 3.3 degrees Fahrenheit (Chart 6). Snowfall amounts have generally decreased as the temperatures have risen. However, annual snowfall remains highly variable year over year indicating that vulnerability will vary annually as well. This may create a negative economic impact on the town as it is heavily reliant upon the nearby ski mountains and winter recreation as a large part of its tourism industry, per the Manchester Town Plan, 2017. The Vermont Climate Assessment estimates a decrease in the ski season by up to one month when considering high emission scenarios by 2080. Low emission scenarios still predict a loss of up to two weeks by 2080.



**Manchester, VT
Roads by Type**

Legend

Manchester Roads
AOTCLASS

- Town Highway Class 1
- Town Highway Class 2
- Town Highway Class 3
- Town Highway Class 4
- Private Road
- State Highway
- U.S. Highway
- U.S. Highway on/off ramp
- - - Railroad
- - - Manchester Village Boundary
- ▭ Manchester

Map 4. Manchester, VT Roads by Type Source: BCRC, 2024

High Wind Event

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
High Wind	4	3.5	2	3	2	2.625	10.5

Description

High wind events in Manchester can be the result of windstorms, hurricanes/tropical storms, thunderstorms, and tornados. Winter storms can also bring high wind events. Large portions of Manchester are forested so the risk of downed trees and power lines is great. These types of events are frequent occurrences in this area with NCEI listing a total of 166 wind events in Bennington County since 1996, an average of almost 6 events per year. Thunderstorm winds are the most common and occur largely in the spring and summer months. Wind events can occur at any time throughout the year and often occur in tandem with other hazards such as flooding and fluvial erosion or winter storms which bring strong winds, heavy snow, and ice.

Location

High wind events can strike anywhere. Where storms are funneled up valleys, damage can be significant. Roads that run through densely wooded areas are susceptible to downed trees and fallen power lines. Homes that are surrounded by trees may also be at risk of damage due to trees falling.

Power outages can occur due to downed power lines. This could impact small areas of Manchester or the entire area depending on the scale of the event. Telephone service may be affected as well. Cell service is not consistent throughout Manchester and without landlines, communication may be limited. With a combination of downed trees blocking roads and the inability to communicate due to loss of power, emergency services may not be able to reach areas of the town during an emergency.

Extent

The National Weather Service (NWS) and the National Oceanic and Atmospheric Administration (NOAA) classifies the wind events addressed in this plan as follows:

- *Windstorm* – Straight-line winds that are sustained at speeds of 31 to 39 mph for at least an hour or gusts of 46 to 57 mph occur. High wind advisories are issued by the NWS for sustained winds of 40 to 73 mph or for gusts of 58 mph or higher. This includes both high winds and strong winds as reported by NOAA in Table 13 below.
- *Thunderstorm* – The NWS issues thunderstorm warnings when winders are 58 mph or higher and/or hail of 1 inch or longer is expected. Thunderstorms cause microbursts or macrobursts that can reach speeds up to 80 mph.

- *Tropical Storm* – The NWS classifies a tropical storm as a tropical cyclone that has maximum sustained wind speeds of 39 to 73 mph. May bring heavy rains causing flooding and fluvial erosion.
- *Hurricane* – A hurricane is a tropical cyclone with maximum wind speeds of 74 mph and greater. May bring heavy rains causing flooding and fluvial erosion.
- *Tornado* – NOAA defines a tornado as “a narrow, violently rotating column of air that extends from a thunderstorm to the ground.” These occur typically between March and August.
- *Funnel Cloud* – Similar to a tornado but the funnel is not in contact with the ground.

Previous Occurrence, Disasters

NOAA lists several types of wind events in their database: high wind, strong wind, thunderstorm wind, tornado, and tropical storm. A summary is listed below in Table 13.

Table 13. Summary of wind events in Bennington County since 1996. Source: National Centers for Environmental Information, 2024

Summary of wind events in Bennington County since 1996. Source: National Centers for Environmental Information, 2024								
Year	High Wind	Strong Wind	Thunderstorm Wind	Tropical Storm	Hurricane	Tornado	Funnel Cloud	Total
1996	5							5
1997	2	2	4					8
1998	1		4			1		6
1999	2		3					5
2000	1		1					2
2001			2					2
2002	1		3			1		5
2003	1					1		2
2004								0
2005	1		3					4
2006	5		4					9
2007	3		4					7
2008		3	3					6
2009	1		1					2
2010	5		3				1	9
2011	1		5	1				7
2012	2		3					5
2013			4					4
2014			2					2
2015			2					2
2016		1	4					5
2017	4	3	4					11

Summary of wind events in Bennington County since 1996. <i>Source: National Centers for Environmental Information, 2024</i>								
Year	High Wind	Strong Wind	Thunderstorm Wind	Tropical Storm	Hurricane	Tornado	Funnel Cloud	Total
2018	2	5	2					9
2019	1	9	3					13
2020		3	2					5
2021	1	3	8					12
2022	2	4	4					10
2023		3	1					4
2024	2	3						5
Totals	43	39	79	1		3	1	166

The following events have resulted in federal disaster declarations:

- DR – 1101: January 19, 1996- High Wind Strong southerly winds resulted in reports of downed trees, limbs, and power lines throughout the region. These winds were part of a larger storm event that resulted in road washouts and the flooding of several homes within Bennington County.
- DR – 1307: September 16, 1999- Tropical Storm Floyd This storm brought high winds and heavy rainfall to Southern Vermont. Winds gusted over 60 mph and a combination of the wind and saturated grounds caused trees to fall and power lines. Up to 2,000 people lost power in southern Vermont.
- DR – 1488: July 21, 2003- Tornado A tornado originating in Pownal cut a swath longer than 25 miles and 150 yards wide. It then moved northeast into Bennington and then moved into the Green Mountain State Forest in western Windham County. It caused some damages to structures within Bennington and Pownal but most damage was to trees. 2,000 customers lost power in extreme southern Vermont.
- DR – 1698: April 16, 2007- High Wind Funneling of winds in portions of southern Vermont caused approximately 175 large trees (8-12 inches in diameter) to fall in Dorset.
- DR – 4022: August 28, 2011- Tropical Storm Irene The wind from this large event knocked down trees and powerlines throughout Bennington County. Roads closed due to the downed trees and power outages occurred throughout the area.
- DR – 4330: July 1, 2017- Thunderstorm Winds Peak winds caused a 100-mph microburst. Trees snapped and were uprooted within the path of the microburst.
- DR – 4720: July 13, 2023- Thunderstorm Winds Part of the larger flooding event, thunderstorm winds caused downed trees and power lines in Bennington County.

Vulnerability

Future probability of wind events happening in Manchester is almost guaranteed with a greater than 75% chance of occurrence. Manchester is vulnerable to wind events due to its proximity to large, forested areas. The built environment is at the greatest risk of damage due not only to falling trees but also to winds that can rip shingles from roofs or tornados that can cause severe structural damage. According to the Municipal Climate Change Vulnerability Indicators Tool, 37% of Manchester's housing was built prior to 1959. Older homes and modular buildings are more at risk of damage due to wind. The road crew is quick to respond to remove trees but when first responders have an extended response time, the risk to human life or injury increases. Many residents of Manchester rely on the power grid and access to the internet to work remotely. These individuals may be cut off from service for an extended time and be unable to work. For those who do not work remotely, there may be a delay or even the inability to commute to work due to road closures caused by downed trees and powerlines.

FEMA's National Risk Index places Manchester at relatively low risk for strong wind events, hurricanes, and very low risk for tornadoes. Manchester's expected annual loss (EAL) is also relatively low for these types of events with social vulnerability also being relatively low and community resilience as relatively moderate. However, with storms increasing in frequency and intensity due to climate change, Manchester may see an increase in the negative impacts of these wind events. For future development within the town building to design and construction standards that take high winds into consideration should be considered. Burying utility lines to new development in the future may also be considered as a long-term mitigation action.

Extreme Cold

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Extreme Cold	4	3	3	2	2	2.5	10

Description

Extreme cold is not well defined as the combination of temperature, wind chill, and time of exposure can make a difference to the imposed risk. For those involved in outdoor activities, extreme cold, accompanied by wind, is when exposed skin would be subject to frostbite. Frostbite occurs when the body subjected to cold temperatures attempts to keep its vital organs functioning by cutting the circulation to extremities leaving them to freeze. Extreme cold can also cause hypothermia in individuals whose body temperature drops below 95° Fahrenheit and it can't create heat as fast as it loses it. For periods of power outages that might accompany winter storms, when temperatures fall below freezing that would not only affect personal health and the health of household animals, but could result in pipes freezing, and the loss of water supplies and perishables.

Bennington County has one active cooperative weather observer but none in Manchester. The closest one is in Sunderland which is no longer active however, records there were kept long enough for the station to have monthly temperature normal collected but the NCEI (Table 14).

Table 14. Sunderland Normal Temperatures and Precipitation.

Sunderland normal temperatures and precipitation for 1991-2020. Source: NCEI: https://www.ncei.noaa.gov			
Month	High Temp (°F)	Low Temp (°F)	Average Temp (°F)
January	32	11.2	21.6
February	35	12.2	23.6
March	42.8	20.1	31.5
April	56.7	31.2	44
May	68.7	41.7	55.2
June	77.2	50.6	63.9
July	80.9	55.2	68
August	79.3	53.5	66.4
September	73	45.7	59.4
October	59.8	35.9	47.8
November	48.4	27.6	38
December	37.4	18.8	28.1

Location

Cold weather would impact Manchester where there is human life due to the risk of hypothermia and frost bite. The built environment is at risk due to potential damage due to freezing pipes and the subsequent water damage.

Extent

The National Weather Service (NWS) utilizes the Wind Chill Temperature (WCT) index to calculate wind chill and indicates how long it would take for frostbite to occur. (Chart 7).

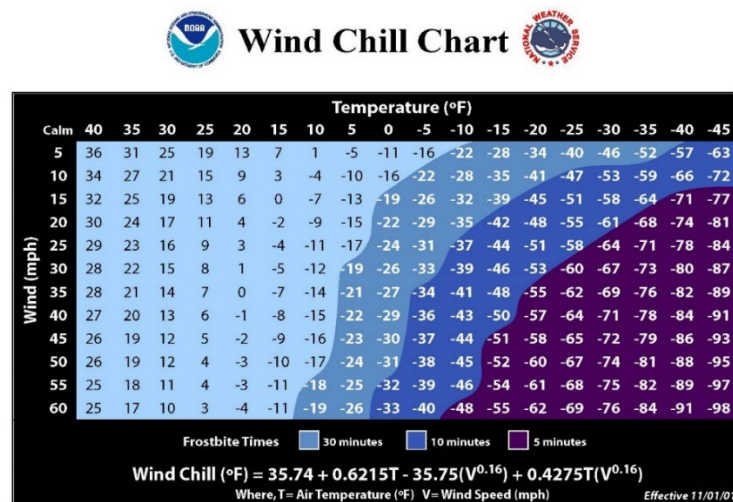


Chart 7. NOAA and NWS Wind Chill Chart. Source: Weather.gov

The NWS will also issue watches, warning and advisories when the weather gets cold. These are intended to inform the public about dangerous conditions to human life and also inform the agricultural industry to negative conditions for plant growth. These include:

- **Wind chill warning** – Issued when wind chill values are expected or occurring.
- **Wind chill watch** – Issued when dangerously cold wind chill values are possible.
- **Wind chill advisory** – Issued when seasonably cold wind chill values are expected but not extreme cold.
- **Hard freeze warning** – Issued when temperatures are expected to drop below 28 degrees for an extended period of time and may cause crop damage.
- **Freeze warning** – Issued when temperatures are expected to drop below 32 degrees for a prolonged period of time and may negatively impact crops and other plants.
- **Freeze watch** – Issued when there are significant and widespread freezing temperatures within the next 24 to 36 hours.
- **Frost advisory** – Areas of frost are expected and may pose a threat to vegetation.

Previous Occurrence, Disasters

The National Center for Environmental Information lists 14 extreme cold events for Bennington County. They are included below in Table 15.

Table 15. Extreme Cold events in Bennington County.

Extreme Cold events in Bennington County. Source: NCEI, 2024	
Date	Description
1/17/2000	A northwest wind of 15 to 30 miles per hour blew across southern Vermont. Temperatures his lows between zero and ten below and the combination of cold temperatures and wind created wind chill values of 50 to 60 degrees below zero.
1/23 – 1/24/2011	Southern Vermont had low temperatures of 10 to 25 degrees below zero with brisk westerly winds. Wind chill reading of 25 to 35 degrees below zero were experienced.
1/7 – 1/8/2015	Overnight lows were between -9 and -19 degrees with strong northwesterly winds leading to wind chill values as low as 15 to 35 degrees below zero. This caused many school districts in the region to have delayed starts.
2/15 – 2/16/2015	Low temperatures were as low as 20 degrees below zero and coupled with wind gusts up to 30 miles per hour, wind chill values were 20 to 45 degrees below zero. Many towns and cities in the area opened warming shelters and reports of burst pipes and water mains occurred due to the cold temperatures penetrating deep into the ground.
2/13 – 2/14/2016	Dropping temperatures reached lows of 12 to 28 degrees below zero and winds gusted 20 to 40 miles per hour. These conditions led to wind chill factors of 25 to 45 degrees below zero.
12/27 – 12/29/2017	Gusty winds and temperatures as low as 5 to 14 degrees below zero resulted in wind chill values of 37 degrees below zero.

Extreme Cold events in Bennington County. Source: NCEI, 2024	
Date	Description
12/31/2017	Temperatures in Bennington were as low as 18 below zero in Bennington County. These cold temperatures resulted in dangerous wind chills ranging from 11 below to 31 degrees below zero.
1/1/2018	A frigid airmass combined with northwesterly winds up to 15 miles per hour resulted in dangerously cold wind chills. Wind chills fell as low as 15 to 35 below zero in many locations across the region.
1/5 – 1/7/2018	This was an extended period of extremely cold conditions following a winter storm. The coldest wind chills occurred when winds gusting to 30 to 40 mph resulted in widespread wind chills as low as 20 to 40 degrees below zero. Many warming shelters were opened across the state as a result of the cold weather.
1/8 – 1/9/2021*	A 35-year-old man died from hypothermia within minutes after crashing his truck on Route 279 in Bennington and fleeing into the woods. Temperatures were in the low 20s at the time of the accident, falling into the mid-teens overnight.
1/20 – 1/22/2019	After a winter storm, frigid temperatures with wind chills falling to -20 to -40F occurred. The cold weather prompted the closing of schools and the opening of warming shelters across the region.
1/30 – 1/31/2019	Wind chills the morning of the 31st fell to 15 to 35 degrees below zero. The wind chills prompted many schools to close or delay opening.
1/28 – 1/29/2021	Dangerously cold wind chills across southern Vermont with low temperatures ranging from 11 degrees below zero up to 5 degrees above zero. Wind chill values ranged from 31 degrees below zero up to 3 degrees below zero.
1/14 – 1/15/2022	Wind chills fell to -15 to -35 degrees over most areas.
2/3 – 2/4/2023	Temperatures fell with readings of 15 to 30 degrees below zero followed by strong winds with peak wind gusts between 35 and 50 mph. A few power outages occurred as a result. The combination of very cold air and strong winds resulted in wind chill values much lower than the air temperature. The lowest wind chills ranged from 25 to 50 degrees below zero. Warming centers opened to aid to those needing to shelter from the cold. In addition, some area schools closed because of the cold weather.
*This event was classified as cold/wind chill but was to include in this report due to its serious nature.	

Vulnerability

Extreme cold is a frequent occurrence in Vermont and the Manchester area. Taking into consideration climate change, the planning committee felt that this hazard is highly likely to happen, and the greatest impact will be to the built environment and to the life and safety of members of the community.

Extreme cold typically has less of an impact on this population unless it is accompanied by high winds or a power outage. Many in the state are familiar with the cold and have homes with adequate heat and have the proper attire and gear to deal with extreme cold. However, there is a risk of hypothermia and frostbite for those that venture outside during extreme cold, and heart attacks when shoveling snow or other vigorous activities. Other vulnerable populations such as the elderly or the very young may be more susceptible to cold-related illnesses. Manchester’s aging population will be at higher risk of extreme cold. According to the [2023 Vermont State Hazard Mitigation Plan](#), these groups also find it more difficult to maintain their body temperatures and may have a higher risk of hypothermia. Those experiencing homelessness are also at a greater risk of developing hypothermia and frostbite during extreme cold. Manchester can use the

Town Hall, the Public Safety Facility, and the Park House at Dana Thompson Memorial Park can all be used as potential warming shelters. However, warming shelters are usually not opened unless there is a long-term power outage or other issue affecting the community during an extreme cold weather event.

The built environment can be impacted by extreme cold if buildings are not properly insulated. Water pipes can freeze and then burst causing water damage to homes. In seasonal homes, this may be a larger problem especially if they are not routinely maintained when the homeowners are not in residence. Other built environment impacts are frost heaves on roads and the creation of large potholes. Frost heaves can also cause damage to building foundations negatively impacting the structural integrity of the buildings.

The National Risk Index indicates that Manchester’s Risk Index rating is relatively low. Climate change may be bringing a shift to warmer days, but it may also decrease the amount of snowfall on the ground leaving the built environment increasingly susceptible to freeze-thaw cycles. While development is not changing immensely, there may be greater impacts to those older structures that are already in place due to the freeze-thaw cycles.

Infectious Disease Outbreak

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Infectious Disease Outbreak	4	1	3	3.5	1	2.125	8.5

Description

Infectious diseases are caused by bacterial infections, viruses, fungi, and other organisms that can spread through the human population. Two of the most well-known infectious diseases currently occurring are COVID-19 and Lyme disease. Until COVID-19, Lyme disease had been the most prevalent infectious disease in Bennington County. Lyme Disease is very common in this region, as well as other tick-born illnesses.



Figure 5. Blacklegged tick. Source: Vermont Department of Health, 2024

Lyme disease, anaplasmosis, and babesiosis are all caused by blacklegged ticks (*Ixodes scapularis*) (Figure 5). These ticks are found throughout Vermont but live primarily in wooded areas and fields with tall grass and brush. They are most active in May and June and then again in October and November, however, they can be encountered at any time of the year when temperatures are above freezing.

Lyme disease has various symptoms due to the various body parts that can be impacted including skin, heart, nerves, and joints. Symptoms may begin as fatigue, chills, muscle pain, and a bull's eye rash called an erythema migrans. If not treated by antibiotics early, Lyme disease can spread throughout the body leading to numbness or pain in the arms and legs and/or paralysis on one side of the face. Untreated, chronic nervous system issues may develop over months and years and this disease may impact every organ system.

Diseases that are spread by mosquitos are also an area of concern such as the West Nile and Zika viruses. Most recently, there have been cases of Eastern Equine Encephalitis (EEE) in the state. This mosquito transmitted virus can cause fevers or neurologic disease such as meningitis or may not cause any symptoms. Mosquitos carry the virus from infected birds and while horses, deer, and humans are able to be infected, they cannot transmit (EEE). In 2024, the Vermont Department of Health (VDH) reported two human cases of EEE in Chittenden County which are the first since 2012. 2024 also had two cases of horses being infected in Addison and Orleans County. In 2011, EEE caused two deaths in nearby Rutland County. Bennington County has remained free of EEE cases, however VDH does warn that since it has recently been found in the surrounding states of New Hampshire and Massachusetts it is a possibility that it could be found in the Bennington County area. Those individuals that work and recreate outdoors are at higher risks of infection and during the summer months mosquito bites should be prevented.

Location

Infectious diseases can be encountered in many places. Bacterial infections and viruses like COVID-19 can be encountered almost anywhere in day-to-day life, primarily when people congregate.

Ticks that carry Lyme disease and other illnesses are found in wooded areas and fields. Lyme disease is reported more commonly in the southern and western halves of the state due to a slightly warmer climate which makes for a longer period of tick activity.

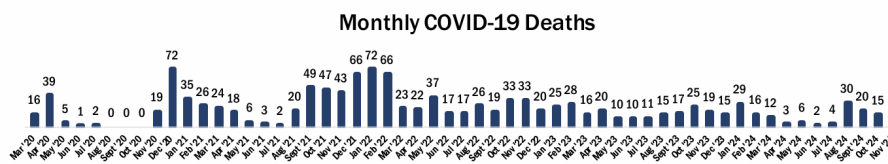
EEE carrying mosquitoes tend to cluster near acidic, hardwood wood swamps, typically in areas of Northern Vermont. They may circulate throughout the state, however.

Extent

The Vermont Department of Health (VDH) tracks and monitors cases of infectious diseases. Currently, VDH issues a weekly report summarizing COVID-19 cases that include statewide hospitalization cases, emergency visits, and deaths due to COVID-19 (Chart 8). VDH also collects information on Vermont emergency room and urgent care visits for human-tick encounters. A tick encounter is any visit that involves a tick-related issue which may include anything from a bite or assistance in removing a tick.

Cumulative COVID-19 Deaths as of November 9, 2024

Total	Age group								
	Under 10	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
1227	2	0	2	11	20	78	123	274	717



Note: Deaths are from registered death certificates and represent preliminary data. A change in death count may represent new deaths, corrections, or other updates.

Data Source: Vermont Department of Health Vital Statistics System.

Chart 8. Cumulative COVID-19 Deaths as of November 9, 2024. Source: Vermont Department of Health Vital Statistics System.

Previous Occurrence, Disasters

COVID-19 pandemic began in early 2020 and it is currently still an active virus within the town and the world. In the beginning, when there was little known about COVID-19, people were required to wear face masks and physically distance themselves from others to reduce transmission. As a result, businesses were disrupted with some closing, schools were closed for prolonged periods with students learning remotely, and many workers switched to working remotely. The United States and Vermont went through several case surges where transmission in communities was increased.

Several vaccines have now been developed and distributed. Currently in the United States, anyone age 6 months and over can receive a COVID vaccine. COVID-19 and the vaccination progress is ongoing.

Lyme disease is widespread in Vermont and New England and perhaps due to better tracking by physicians and other environmental factors, the number of cases is gradually increasing.

Chart 9 shows the diseases and conditions tracked by the Vermont Department of Health. These numbers indicate the total number of cases from 2006-2022. However, tracking numbers for certain diseases and conditions were low in 2021. This may be due to the increased tracking of COVID-19 causing a disruption in the tracking of other diseases. It is important to note that Lyme disease and Anaplasmosis are the two highest ranked reportable diseases in the State of Vermont.

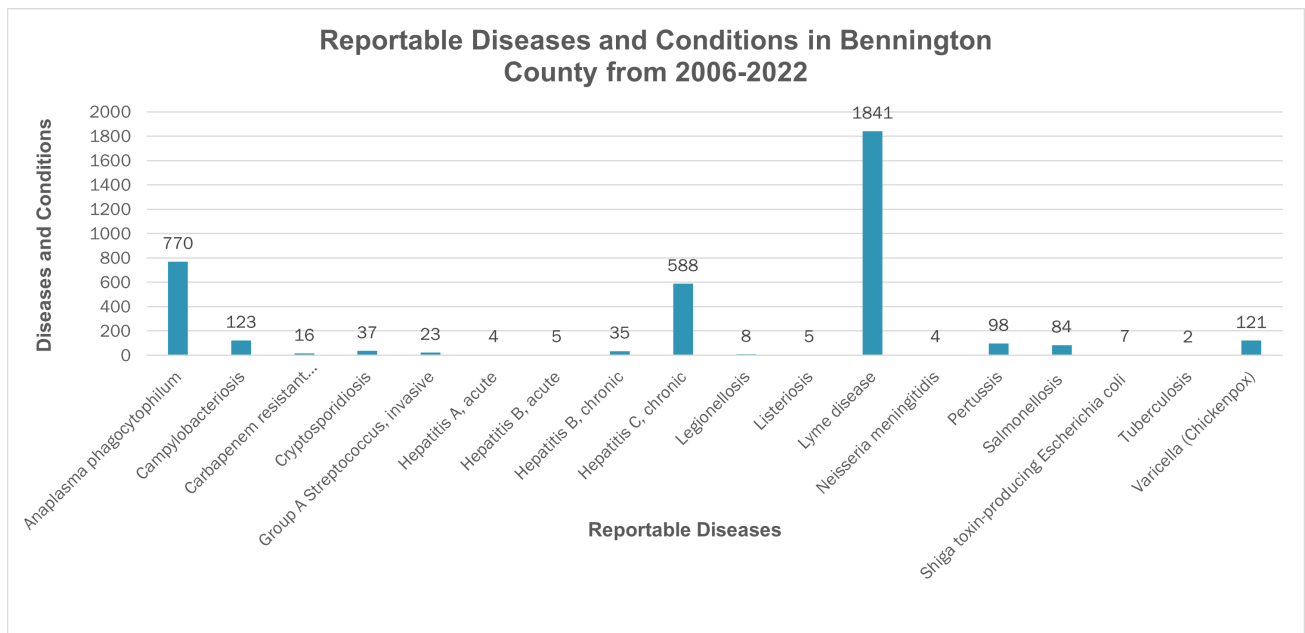


Chart 9. Reportable Diseases and Conditions in Bennington County from 2006 to 2023 (Source: VT Department of Health)

Vulnerability

The probability levels for infectious disease ranges. While tick-borne illnesses are frequent for the area, large pandemics that affect large parts of the population are rare. The planning team ranked it as highly likely as there is still a high probability of continued and isolated occurrences.

Impacts on people and the economy are the primary concern for the planning team. The potential impact on people was ranked as moderate. Those individuals in the town’s vulnerable populations such as the elderly, the young, and those who are immunocompromised are at increased risk from infectious diseases. The aging population will increase this risk in the future. In the case of another pandemic, there are disruptions to daily life which can lead to mental health crises.

Regarding Lyme disease, Manchester contains highly forested areas as shown on Map 5. Future land use changes are not expected to increase vulnerability to infectious disease but many residents recreate or work outdoors throughout the year and while there aren't any tracking numbers specifically for tick-borne illnesses for residents of Manchester, Chart 10 shows emergency room and urgent care visits within Vermont. There is a clear spike in visits in spring and fall when residents, workers, and visitors to the area are active outdoors. The long-term impacts of Lyme disease on an individual may vary but include disruption to daily life and mental health issues. Work may become difficult, making it hard to provide for themselves or their family.

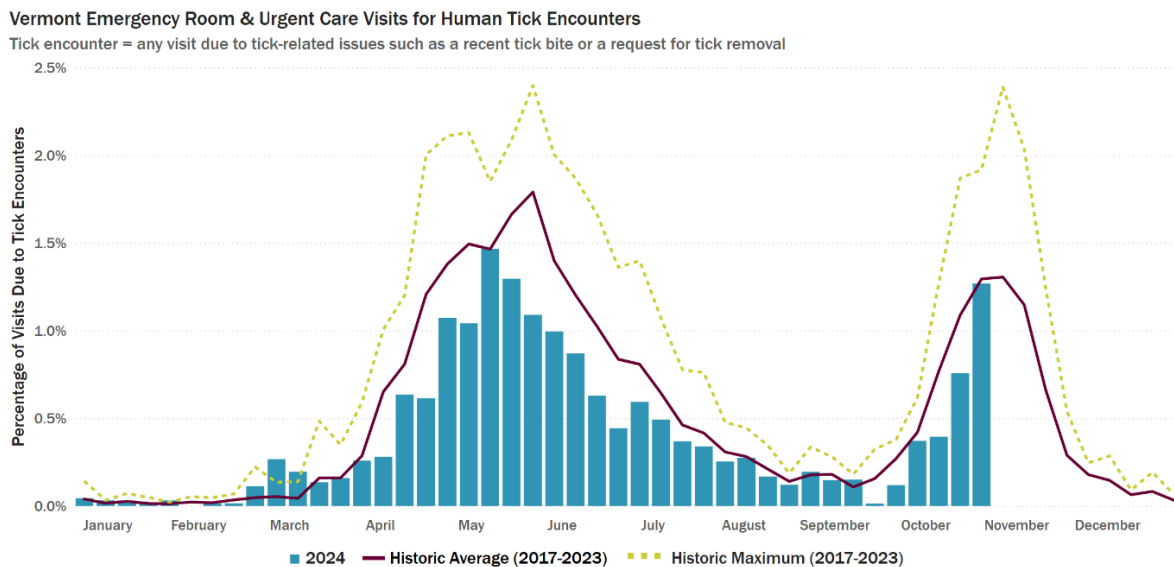
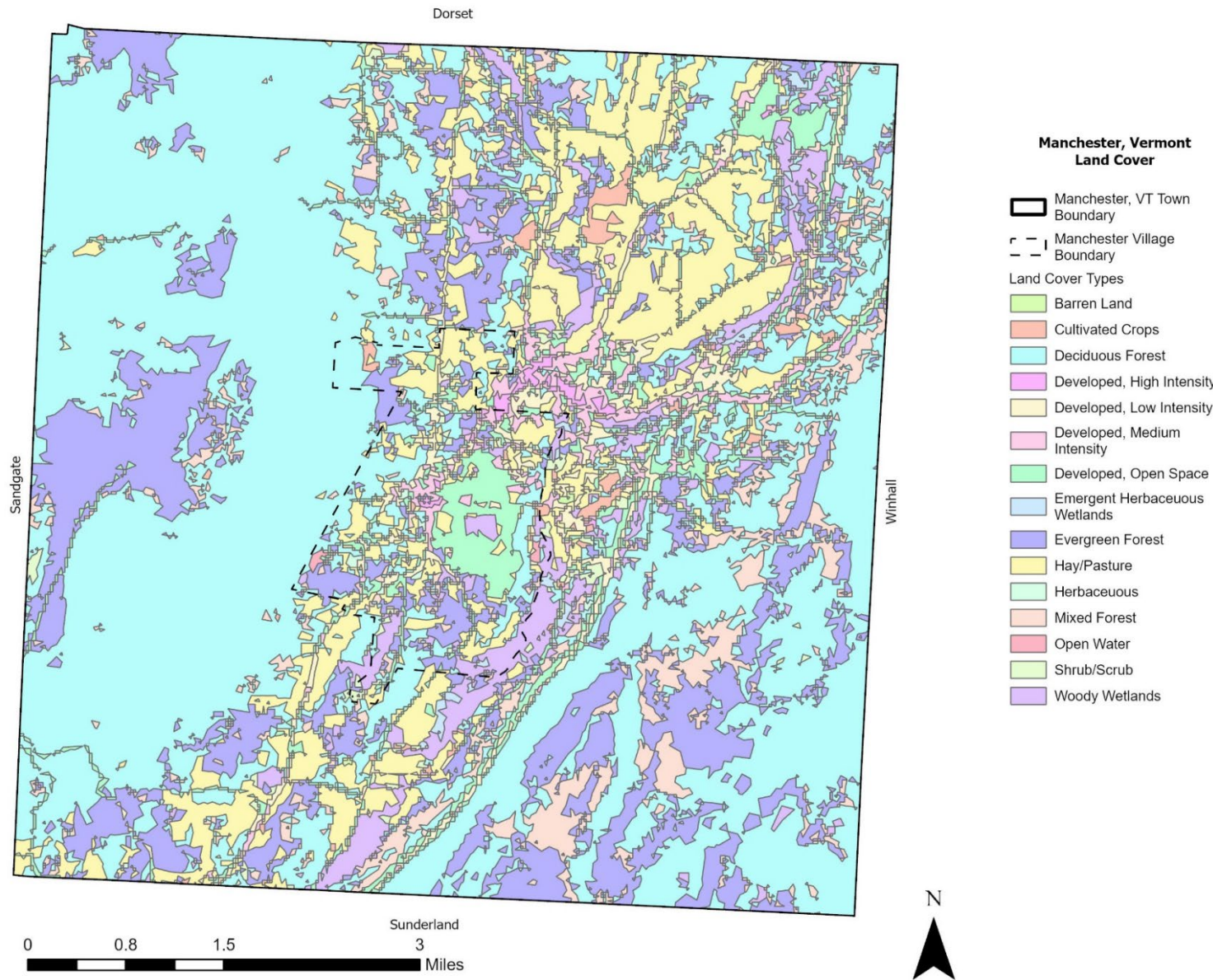


Chart 10. The weekly percentage of emergency department visits for tick-related issues. Source: Vermont Department of Health, November 11, 2024

The planning team ranked the impacts on the economy by infectious diseases as moderate to high. The economy could be greatly impacted by another pandemic. The town relies largely on tourism and a pandemic which causes stay-at-home orders or otherwise limits the movement of individuals can cause a loss of visitors and the financial benefits that they bring to the area. Previously, shopping and dining were curtailed and the economy suffered during the COVID-19 shut down.

According to the Vermont Climate and Health Profile Report issued by the VDH in 2016, the effects of climate change are uncertain. Climate change may bring a warmer climate and shorter winters, and this coupled with the reforestation that Vermont has been experiencing and the rise in the deer population (a common carrier of the black-legged tick), leads researchers to believe that the tick population will continue to grow and tick-borne illnesses will become even more common. Mosquito-borne diseases may also increase as warmer weather may bring other mosquito species to the Manchester area that were not present previously.



Map 5. Land Cover in Manchester, Vermont. Source: Bennington County Regional Commission, 2024

Invasive Species

Hazard	Probability	Potential Impact				Average:	Score*:
		Built Environment	People	Economy	Natural Environment		
Invasive Species	4	1	3	3.5	1	2.125	8.5

Description

Invasive species are organisms that are not native to a geographic area and which can or do cause economic or environmental harm. Invasive species are characterized by organisms that spread rapidly, can displace native species, and have few or no predators to keep their populations in check. At the same time, they have characteristics that may reduce the value and use of natural resources. For example, bush honeysuckle can become a dominant shrub in some forests reducing the potential for tree regeneration. Japanese knotweed colonizes stream banks and does not hold soil well which leads to increased streambank erosion. (Vermont Invasives, 2024)

Invasive species are typically spread by human activity. Vermont experiences both terrestrial and aquatic organisms. For the purposes of this plan, we will consider two groups: aquatic invasives and land invasives. Aquatic invasives are found in lakes, ponds, and rivers. Land invasives are further split into forest pests and terrestrial plants. Forest pests are those that cause negative impacts on tree health in biodiversity. Terrestrial plants are non-native plants that cause negative effects to the environment.

Vermont has two invasive species plant lists: Class A species are on the Federal Noxious Weed List but are not known to occur in Vermont. These are listed in 7 C.F.R. 360.200, a section of the Code of Federal Regulations. Class B species are known to occur in the state and are considered a threat (Table 16). The table also indicates species observed in Manchester.

The bush honeysuckles (*Lonicera* spp.) have been observed along roadsides. Buckthorn (*Rhamnus cathartica*) and Japanese barberry (*Berberis thunbergii*) have invaded forests and wetland edges. Japanese knotweed (*Fallopia japonica*) has invaded stream banks and other disturbed areas.

Table 16. Designated Class B noxious weeds in Vermont.

Designated Class B noxious weeds in Vermont. Source: Vermont Agency of Agriculture, Food and Markets: http://agriculture.vermont.gov/plant_pest/plant_weed/invasive_noxious_weeds/noxious_weeds_list Those with a * have been identified in Bennington County. Source: Early Detection and Mapping System: http://www.eddmaps.org/tools/query/ . Those marked with ** have been identified within the Town of Manchester. Sources: Mary Beth Deller,-USFS provided data; Michael S. Batchter observations, Early Detection and Mapping System: http://www.eddmaps.org/tools/query/ .	
Scientific Name	Common Name
Terrestrial	
<i>Acer ginnala</i> *	Amur maple
<i>Acer platanoides</i> * **	Norway maple
<i>Aegopodium podagraria</i> * **	Bishop's goutweed/goutweed/snow-on-the-mountain
<i>Ailanthus altissima</i>	Tree of heaven
<i>Alliaria petiolata</i> * **	Garlic mustard
<i>Berberis thunbergii</i> * **	Japanese barberry
<i>Berberis vulgaris</i> * **	Common barberry
<i>Butomus umbellatus</i>	Flowering rush
<i>Celastrus orbiculatus</i> * **	Oriental bittersweet
<i>Euonymus alatus</i> * **	Burning bush
<i>Fallopia japonica</i> * **	Japanese knotweed
<i>Hydrocharis morsus-ranae</i>	Frogbit
<i>Iris pseudacorus</i> * **	Yellow flag iris
<i>Lonicera japonica</i> *	Japanese honeysuckle
<i>Lonicera maackii</i> * **	Amur honeysuckle
<i>Lonicera morrowii</i> * **	Morrow honeysuckle
<i>Lonicera tatarica</i> *	Tatarian honeysuckle
<i>Lonicera x bella</i>	Bell honeysuckle
<i>Rhamnus cathartica</i> *	Common buckthorn
<i>Rhamnus frangula</i>	Glossy buckthorn
<i>Vincetoxicum nigrum</i>	Black swallow-wort
Aquatic	
<i>Lythrum salicaria</i> *	Purple Loosestrife
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil
<i>Najas minor</i>	European or Brittle Naiad
<i>Nymphoides peltata</i>	Yellow floating-heart
<i>Phragmites australis</i> ssp. <i>Australis</i> *	Common Reed
<i>Potamogeton crispus</i>	Curly-leaf Pondweed
<i>Trapa natans</i>	Water Chestnut

While not listed on the Class B Noxious Weeds list, wild (poison) parsnip is a watch list species due to the negative impacts it can have upon those who encounter it. The phototoxic sap that this plant contains can cause burns, blistering, and skin discoloration which makes it difficult to manage. (VTInvasives.org) This plant is found along roadsides, pastures, and in abandoned fields. Its seeds can lay dormant for up to four years so managing it takes repeated attempts and should be completed as part of a larger management plan with multiple methodologies.

Table 17 shows aquatic invasive species listed by the Vermont Agency of Natural Resources.

Table 17. Aquatic invasive species in Vermont.

Aquatic invasive species in Vermont. Source: Watershed Management Division, Department of Environmental Conservation: https://dec.vermont.gov/watershed/lakes-ponds/aquatic-invasives	
Scientific Name	Common Name
<i>Dreissena polymorpha</i>	Zebra mussel
<i>Alosa pseudoharengus</i>	Alewife
<i>Orconectes rusticus</i>	Rusty crayfish
<i>Didymosphenia geminata</i>	Didymo**
** Didymo is no longer considered an invasive species. Instead, it is classified as a nuisance plant.	

Table 18 shows the top 5 terrestrial invasive pests as listed by the Agency of Agriculture Food and Markets.

Table 18. Top five terrestrial invasive pests in Vermont.

Top five terrestrial invasive pests in Vermont. Source: Agency of Agriculture Food and Markets, State of Vermont: https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/plant-health-and-pest-management/vermont	
Scientific Name	Common Name
<i>Anoplophora glabripennis</i>	Asian Longhorn Beetle
<i>Agrilus planipennis</i>	Emerald Ash Borer
<i>Pheretimosids</i>	Jumping Worm
<i>Lymantria dispar</i>	Spongy Moth
<i>Lycorma delicatula</i>	Spotted Lanternfly

The Emerald Ash Borer has become the focus recently of many towns in the Bennington County region. This insect's larva feeds on all types of ash trees causing most to die within three to five years. Since this insect is non-native, it does not have any predators which leads to overpopulation and the devastation of ash trees. According to VTInvasives.org, approximately 5% of Vermont's trees are species of ash.



Figure 6. Image of an Emerald Ash Borer.
Source: VTInvasives.org

Location

Invasive species can affect the town in multiple places depending on the environment the organism inhabits. Forested areas are subjected to the Emerald Ash Borer (Figure 6) and the Asian Long-horned Beetle (ALB). Terrestrial plants can impact open field, forested areas, and even the banks along water ways such as the Japanese knotweed which colonizes stream banks, and does not hold soil well, leading to increased streambank erosion. Aquatic invasives can affect the multiple waterways throughout the town as well as the multiple small lakes and ponds. It is important to note that there has not been any record of aquatic invasives in Manchester yet. However, the Batten Kill has experienced didymo (a nuisance plant) growth previously.

Extent

The full extent of invasive plants in Manchester and in Bennington County has not been mapped. Some mapping of invasive species observation has been conducted and compiled within the EDDMapS database. VT Invasives maps for the likeliness of EAB in locations around the state and indicated that in 2024, there is an infestation of EAB in the town. (Map 6)

The Asian Long-horned beetle (ALB) has not been found in Manchester, however there is an active infestation in Worcester County, Massachusetts. Monitoring this outbreak should be considered as its relative proximity may be concerning.

Previous Occurrence, Disasters

Invasive species are present and represent a continuous hazard that will vary with their abundance and their impacts on human life, the natural environment, and by extension, the economy.

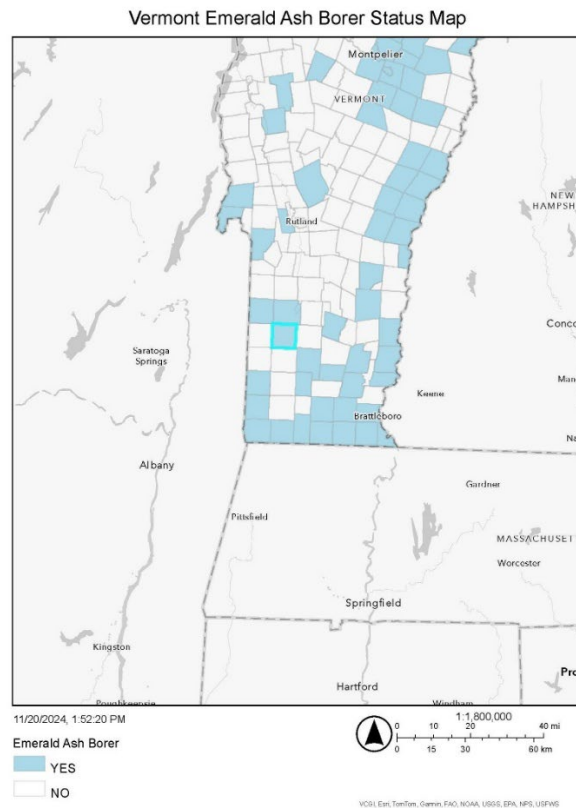
Vulnerability

The planning team indicated that the likelihood of an increased abundance of invasive species is highly likely with a greater than 75% chance of occurring. Potential impact to

the natural environment are moderate. Invasive insects that can cause tree death, particularly the Emerald Ash Borer, could result in road closures, power outages, and property damages. Should the Asian long-horned beetle move north from Massachusetts, maple trees could be strongly negatively affected. Plants such as the poison parsnip can cause injury to human life due to phototoxic sap that can cause burns, blistering, and skin discoloration. Growth of this plant can limit outdoor recreation as it grows along roadsides and in pastures and abandoned fields. The risk of transmission of aquatic invasives is high and therefore promoting prevention techniques such as draining, cleaning, and drying equipment will be especially important.

An increase in the invasive insect population brought on by climate change, particularly the emerald ash borer, can cause an increase in tree death and could result in an increase in road closures, power outages and property damage due to dead and falling trees. Even as the human population and development is expected to remain relatively the same, invasive species may increase due to visitors or second homeowners potentially introducing these plants and animals to the Manchester area.

Future anticipated changes in land use and development are not expected to have an impact on invasive species.



Map 6. Map of towns within the State of Vermont that have infestations of Emerald Ash Borer. Source: VTInvasives.org

Extreme Heat

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	Average:	
Severe Heat	3	1	3	1.5	2	1875	5.625

Description

Extreme heat as defined by FEMA is a “prolonged period of excessively hot weather, with temperatures about the average high temperature for a particular region for that time of the year, often combines with high humidity.” (Extreme Heat | fema.gov)

According to the Vermont Department of Health, a “hot day” is one in which the temperature is 87° or hotter. This is also the thresholds in which hospitals in the State of Vermont see a rise in heat related emergency room visits. (Extreme Heat Events in Vermont (healthvermont.gov))

Extreme heat is recorded at other times of the year but does not have the health consequences of summer periods. The heat index, which factors in the high relative humidity levels of summer, is also a factor. However, relative humidity is not recorded at area weather stations, so the history of heat index can’t be calculated.

The National Weather Service tracks temperature extremes via cooperative weather observers throughout the state. The most recent and closest data is from Peru, VT even though it is at a higher elevation. Table 19 shows the maximum and minimum temperatures for each month since 2010. “M” indicated missing data. In this case, no data was submitted for this location in 2010 until July and most of 2019 data is missing. June of 2024 held the highest temperature for that month and 2023 held the highest minimum temperature for the month of October. This may indicate a trend for higher temperatures earlier and later into the spring and winter seasons.

Table 19. Temperature extremes from 2010 to 2024 at Peru Cooperative Weather Station.

Temperature Extremes from 2010 to 2024 at the Peru Cooperative Weather Station. Source: NOAA Regional Climate Centers, November 2024													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2010	M	M	M	M	M	M	85	86	88	68	60	48	88
2011	52	52	57	60	79	83	86	81	82	77	64	51	86
2012	44	45	77	82	84	85	84	84	78	67	60	49	85
2013	37	41	48	70	78	83	84	79	75	73	60	51	84
2014	45	42	48	73	80	78	84	78	80	76	60	50	84
2015	42	31	50	65	84	73	85	82	83	71	70	64	85
2016	42	54	65	71	83	83	82	84	77	66	61	47	84
2017	48	59	59	73	84	84	80	82	85	75	61	48	85
2018	49	65	52	66	79	84	89	84	81	74	56	48	89

Temperature Extremes from 2010 to 2024 at the Peru Cooperative Weather Station. Source: NOAA Reginal Climate Centers, November 2024													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	45	M	M	M	M	M	M	M	M	M	M	M	47
2020	58	52	59	59	87	84	85	83	80	73	70	54	87
2021	39	43	64	72	82	85	82	84	79	75	62	57	85
2022	40	54	62	62	84	83	84	85	79	74	73	54	85
2023	46	52	51	79	80	85	85	75	83	83	64	55	85
2024	43	54	58	74	82	87	84	79	77	77	67	M	87
Mean	44	50	58	67	82	83	84	82	81	74	63	52	76
Max	58	65	77	82	87	87	89	86	88	83	73	64	89
Year	2020	2018	2012	2012	2020	2024	2018	2010	2010	2023	2022	2015	2018
Min	23	31	48	34	78	73	80	75	75	66	56	47	23
Year	2000	2015	2014	1979	2013	2015	2017	2023	2013	2016	2018	2019	2000

Location

Extreme heat is a widespread occurrence that will have greater impacts in those areas of Manchester that have heat islands where paved surfaces, sidewalks, and buildings are concentrated. Manchester has maintained natural landscapes within the downtown area which will assist in keeping the area cool and provide shade and moisture.

Extent

The National Weather Service issues heat index warnings for Vermont based on the following thresholds:

Excessive Heat Warning – The maximum heat temperature is expected to be 105°F or higher for at least 2 days and nighttime temperatures will not dry below 75°F.

Excessive Heat Watch – Conditions are favorable for an excessive heat event in the next 24 to 72 hours.

Heat Advisory – Issued within 12 hours of the onset of extremely dangerous heat conditions which is when the maximum heat index temperature is 95°F - 104°F or higher for at least 2 days and nighttime temperatures will not drop below 75°F.

Excessive Heat Outlook – issued when there is the potential for an excessive heat event within the next 3-7 days.

Previous Occurrence, Disasters

There were only two Extreme Heat events documented by the National Center for Environmental Information (NCEI) for Excessive Heat. Table 20 lists these events and the description from NCEI.

Table 20. Extreme Heat events affecting Bennington County.

Excessive Heat events affecting Bennington County. Source: National Center for Environmental Information records (NCEI, 2024)		
Dates	Type	Description
8 March 2000	Excessive Heat	No additional information provided.
1 – 5 July 2018	Excessive Heat	A hot and humid airmass brought excessively high heat indices to southern Vermont during the beginning of July through the Independence Day holiday. Temperatures soared as high as the mid-90s on July 1st, the hottest day of the stretch. Combined with dewpoints in the mid-70s, heat indices reached nearly 105° in the warmest areas. July 5th marked the fifth consecutive day with a high temperature in the 90s at Bennington. In addition to the hot daytime temperatures, overnight low temperatures only falling into the 70s was common, which exacerbated heat-related problems. The extensive heat prompted the opening of many cooling centers across the region.

Vulnerability

The planning team rated extreme heat affecting Manchester in any given year as likely, with a >10% to <75% probability per year taking into consideration potential changes due to climate change. Excessive heat occurs approximately less than one day per year. Even though it is less frequent than extreme cold, severe heat can be more challenging, as many homes don't have air conditioning and an increase in humidity during the summer can make it difficult to cool down. The Vermont Department of Health's (VDH) data reflects that Vermont residents are more likely to experience heat-related illnesses at temperatures that are lower than other parts of the country due to the infrequency of higher temperatures in the state.

Farmers, outdoor workers, and those experiencing homelessness are at an increased risk of heat illness, as are infants, young children, older adults, and those with underlying health conditions. According to VDH, heat kills more people in the U.S. each year than any other extreme weather event. Heat-related deaths are also preventable. Climate change is increasing the number of days per year with extreme heat which may bring an increase in heat-related illnesses and hospitalizations, especially for the aging population who may be more susceptible to heat-related illnesses especially if taking certain medications.

Heat becomes more dangerous the longer it lingers. A multiple day event with warm nights can make it difficult for homes to cool down, making it difficult for people to cool

down. During these events, it is important to check on friends, family, neighbors, and vulnerable populations. Residents should know where to follow weather forecasts and alerts, such as the National Weather Service and Vermont Alert, and recognize the signs of heat stroke and heat exhaustion. It is also important to stay hydrated and refrain from vigorous activity during the hottest parts of the day. If possible, people should stay in air-conditioned areas during extreme heat events, as it is a major protective factor against heat-related illness (Vermont Department of Health, 2022).

To help Vermont prepare for excessive heat, the [VDH Cooling Site Map](#) (Map 7) was created to show areas where people could cool off during periods of extreme heat. Bennington County has 18 cooling sites in total with two listed in the Manchester area: The Manchester Community Library and the Dana Thompson Recreation Area. This map (linked above) is updated regularly and should be referred to for the most recent cooling site information.

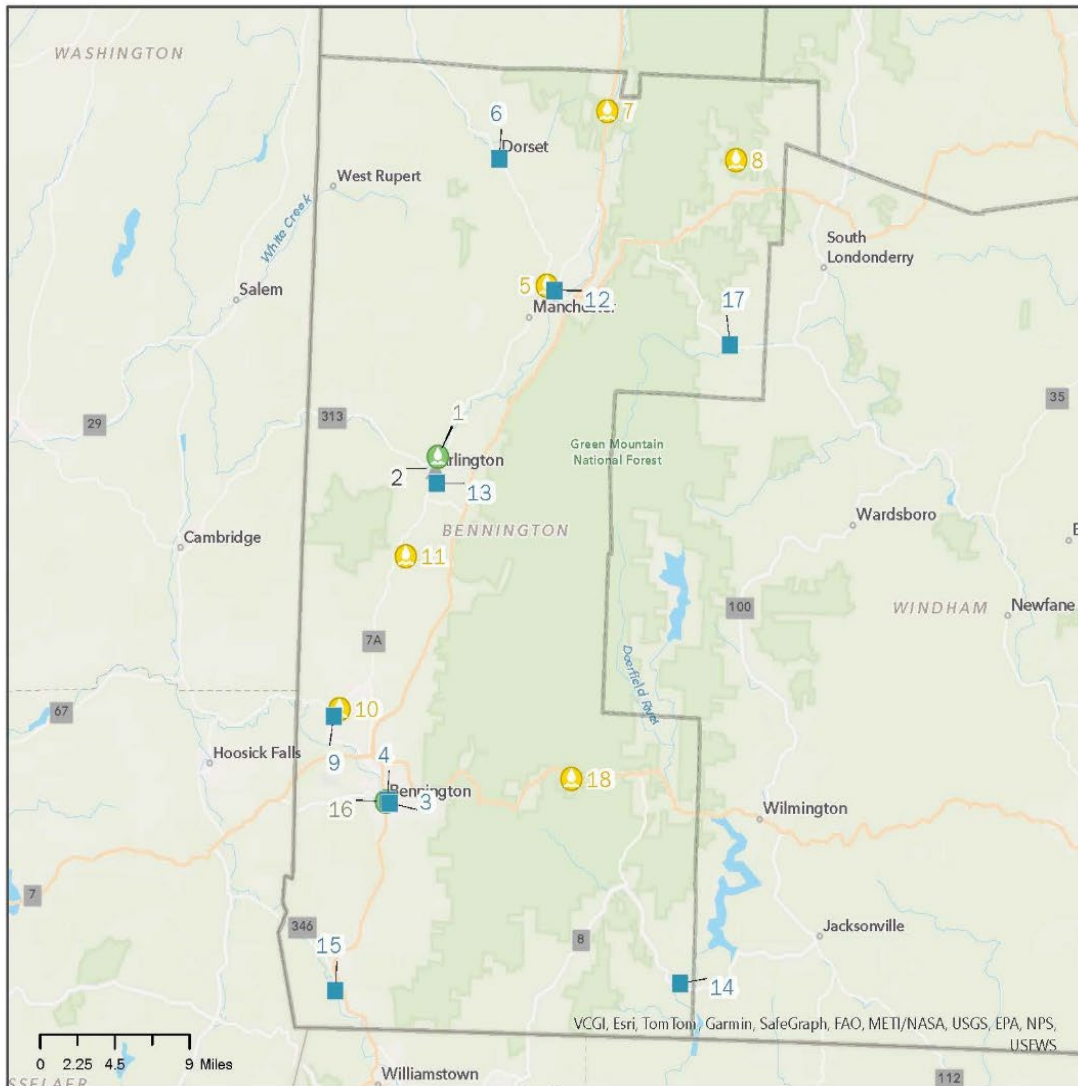
Other than its impact on people, heat can impact the built infrastructure and the natural environment as well. Most Vermont buildings were built with the primary goal of keeping residents warm in winter so many do not have built in air conditioning. Many homes rely on window units that rely on electricity to operate and in the case of a power outage, many homes will not have access to cooling systems thereby increasing the risk of health-related issues. Buildings are not the only infrastructure impacted by heat. The materials used in bridges and on roads can be negatively impacted by prolonged heat and damage may also occur. Heat causes damage to the natural environment by upsetting ecosystem balances and can increase the chance of drought which can in turn lead to an increase in wildfires.

Bennington County Cooling Sites

Find somewhere to take a break in air conditioning or splash in cool water. Please call the site before you go to confirm open hours and if there are entry fees. If you need more help finding or getting to a cooling site, please call 2-1-1.

Cooling Site Type

- Indoor cooling site - open during normal hours
- ▲ Indoor site that is occasionally open for cooling - please call the facility to check
- Free beaches, pools, splash pads, or swimming holes
- Beaches, pools, or splash pads that usually charge an entry fee



Key Site Name	Address	City	Phone
1 Arlington Recreation Park	Recreation Park Rd	Arlington	802-375-2332
2 Arlington Town Office	3828 VT-7A	Arlington	802-379-9916
3 Bennington Free Library	101 Silver St	Bennington	802-442-9051
4 Bennington Senior Center	124 Pleasant St	Bennington	802-442-1052
5 Dana Thompson Recreation Area	340 Recreation Park Rd	Manchester	802-362-1439
6 Dorset Village Library	3331 VT-30	Dorset	802-867-5774
7 Emerald Lake State Park	65 Emerald Lake Ln	East Dorset	802-362-1655
8 Hapgood Pond Day Use Area	Hapgood Pond Rd	Peru	802-362-2307
9 John G. McCullough Free Library	2 Main St	North Bennington	802-447-7121
10 Lake Paran	269 Houghton St	North Bennington	802-422-8457
11 Lake Shaftsbury State Park	262 Shaftsbury State Park Rd	Shaftsbury	802-375-9978
12 Manchester Community Library	138 Cemetery Ave	Manchester Center	802-362-2607
13 Martha Canfield Memorial Free Library	528 East Arlington Rd	Arlington	802-375-6153
14 Readsboro Community Library	301 Phelps Ln	Readsboro	802-423-5460
15 Solomon Wright Public Library	97 Main St	Pownal	802-823-5400
16 Splash Pad	109 North St	Bennington	802-442-1037
17 Winhall Memorial Library	2 Lower Taylor Hill Rd	Bondville	802-297-9741
18 Woodford State Park	142 State Park Rd	Bennington	802-447-7169

Scan to go to www.HealthVermont.gov/hot-weather for more information



Map 7. Bennington County Cooling Sites. Source: Vermont Department of Health, 2024

Hazardous Material Spill

Hazard	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	<u>Average:</u>	
Hazardous Material Spill	2	2	2	2.5	3	2.375	4.75

Description

Hazardous waste is any material that is flammable, corrosive, toxic, or labeled with warning or caution labels. These materials are used in industry, in the home, or on farms and are transported regularly.

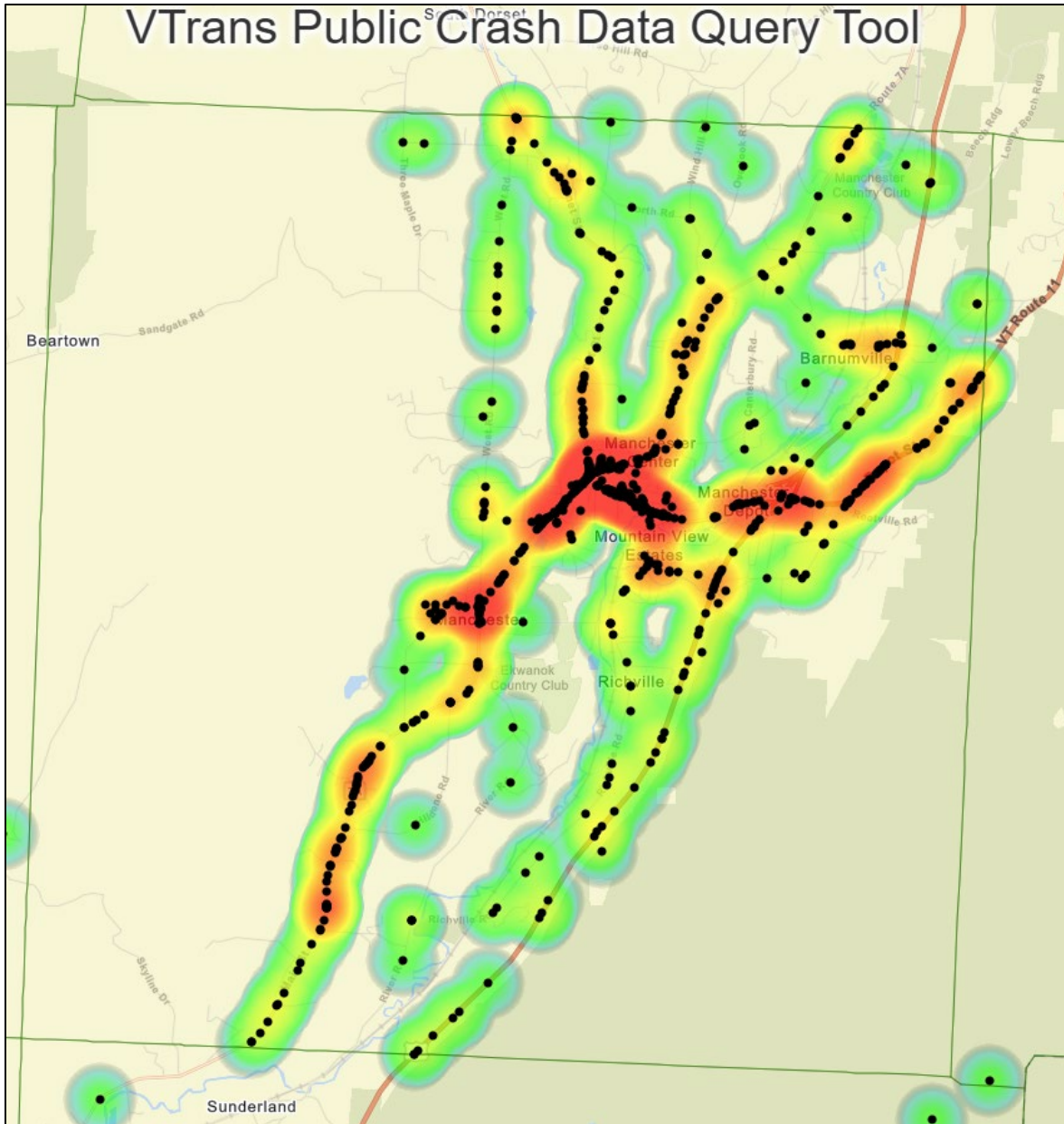
Of particular concern in any hazardous material spill would be the impact on water resources as the hazardous material could quickly flow downstream and impact the natural environment over larger areas. Many of Manchester's roads follow waterways and many of the crashes have occurred along the Batten Kill.

Location

Hazardous material spills can occur anywhere where there are hazardous materials. Roads have the potential to be spill areas as vehicular accidents involving trucks carrying hazardous materials can cause a spill. Roads with average grades greater than 10% present hazards, particularly when wet or during winter storms. Map 8 shows the locations of vehicle crashes in Manchester from 2010 to November 2024. Excluding the State Highway 7, most crashes are found along Route 7A and Routes 11 & 30 as they pass through the town and serve as major thoroughfares.

Extent

Hazardous material spills can occur anywhere where there are hazardous materials either being stored or carried by motor vehicles: including homes, businesses, along roadways and railways. Roads have the potential to be spill areas as vehicular accidents involving trucks carrying hazardous materials can cause a spill.



Map 8. Location of Vehicle Crashed 2010- 2024. Source: VTrans Public Crash Data Query Tool, 2025

Previous Occurrence, Disasters

Vermont Agency of Resources maintains a hazardous materials spills list. Reviewing the list indicates that there were 71 spills in Manchester from 2010 to 2024 (Table 21). Most of these spills affected small areas.

Table 21. Hazardous material spills in Manchester from 2010 to 2024

Hazardous Materials Spill in Manchester 2010 – August 2024. Source: Vermont Environmental Tool Spills List (Spills (vt.gov))							
Spill#	Year	Facility Name	Nature of Incident	Product Contaminants	Quantity	Responsible Party	Date Reported
2010WM D121	2010	Chec Residence	AST leak to basement	#2 Fuel Oil	5 Gallons	Resident	3/9/2010
2010WM D272	2010	residence	hydraulic line burst	hydraulic oil	<1 Gallons	CVPS	6/1/2010
2010WM D556	2010	gravel pit	hose failure	hydraulic oil	3 Gallons	CVPS	11/17/2010
2010WM D611	2010	Northbound Lane	hydraulic leak during plowing	hydraulic oil	5 Gallons	VTrans	12/14/2010
2011WM D071	2011	roadside	downed transformer	MODF non-PCB	<1 Gallons	CVPS	2/14/2011
2011WM D295	2011	Power Pole	Capacitor and Transformer	transformer oil	10 Gallons	CVPS	5/27/2011
2012WM D340	2012	roadside pp line 4011 pad mount #8	Non PCB MODF leaking out of transformer	MODF (mineral oil dielectric fluid)	1 Gallons	GMP	6/29/2011
2011WM D584	2011	transformer	Capacitor and Transformer -- TSIRENE	MODF	--	CVPS	9/1/2011
2012WM D222	2012	Dorr Oil Company	Hose fitting or hose failed during delivery.	Gasoline	20 Gallons	Door Oil	5/3/2012
2012WM D395	2012	Hand Chevrolet	PCS discovered during boring for bridge work	Unknown/unspecified Petroleum	--	Hand Chevrolet	8/3/2012
2012WM D424	2012	Roadside	camper dumped septage	Sewage/Septage	50 Gallons	VTrans	8/21/2012
2013WM D061	2013	roadside	Hydraulic Equipment Failure	Hydraulic Oil	7 Gallons	VTrans	2/11/2013
2013WM D088	2013	Ultramar Bulk Delivery Station	bad hose connection to transfer pump from truck	Diesel	2 Gallons	Abenaqui Carriers	2/27/2013
2013WM D214	2013	Skinner Library	PCS and heavy sheen on water in excavation for foundation	#2 Fuel Oil	--		5/10/2013
2013WM D239	2013	Route 7A AOT Spill	Hydraulic line failure resulted in release of hydraulic oil on paved area.	Hydraulic Oil	4 Gallons	VTrans	5/28/2013
2013WM D319	2013	parking lot - former Sirloin Saloon lot	Hydraulic Equipment Failure	Hydraulic Oil	3 Gallons	Casella Waste Management, Inc.	7/11/2013
2013WM D423	2013	roadway/roadside	Hydraulic Equipment Failure	Hydraulic Oil	3 Gallons	VTrans	9/12/2013

Hazardous Materials Spill in Manchester 2010 – August 2024. Source: Vermont Environmental Tool Spills List (Spills (vt.gov))							
Spill#	Year	Facility Name	Nature of Incident	Product Contaminants	Quantity	Responsible Party	Date Reported
2013WM D439	2013	Roadside / Streamside	Excavator working near banks of Battenkill River lost 1/2 gallon of diesel	Diesel	<1 Gallons	SumCo Eco Contracting	9/19/2013
2014WM D092	2014	Manchester Journal	Suspected release - approximately 200 gallons of fuel oil unaccounted for	#2 Fuel Oil	200 Gallons	Manchester Journal	2/24/2014
2014WM D172	2014	former Heaslip Fuels	UST removed from ground, sludge leaked from tank during salvage operation	#2 Fuel Oil	25 Gallons	Resident	4/17/2014
2015WM D051	2015	Thomas Residence	Release from hose near fill port	#2 Fuel Oil	<1 Gallons	Irving Energy	2/5/2015
2015WM D198	2015	Jones Property	Leaking UST	#2 Fuel Oil	--	Peoples United Bank	4/27/2015
2015WM D213	2015	Above All Vermont	Drums dumped at property	#2 Fuel Oil, Diesel	2 Drums	Unknown	5/5/2015
2015WM D296	2015	Shchemelev Property	1,000-gal & 500-gal USTs	#2 Fuel Oil	unk --	Tecom Group	6/23/2015
2015WM D546	2015	Maplefields at Manchester	Fuel Station; failed shut off	Gasoline	4 Gallons	R L Vallee/Maplefields	10/29/2015
2016WM D288	2016	Roadside	Blown transformer	MODF (mineral oil dielectric fluid)	6 Gallons	GMP	6/26/2016
2016WM D408	2016	Roadside	Transformer oil spill	MODF (mineral oil dielectric fluid)	<1 Gallons	GMP	9/2/2016
2017WM D047	2017	Residence	AST Overfill	#2 Fuel Oil	1 Gallons	Irving Energy	1/26/2017
2017WM D081	2017	Roadway	Snow plow hydraulic leak	Hydraulic Oil	8 Gallons	VTrans	2/16/2017
2017WM D089	2017	Dorr Oil	Above Ground Tank overfill	Diesel	5100 Gallons	Dorr Oil	2/24/2017
2017WM D111	2017	Comer Residence	Small spill on patio during fueling	#2 Fuel Oil	2 Gallons	Miles Fuels Arlington	3/10/2017
2017WM D137	2017	Hunter Park	Release from pad transformer	MODF (mineral oil dielectric fluid)	<1 Gallons	GMP	3/31/2017
2017WM D146	2017	Kimball Property	oil entering sump from historic release	#2 Fuel Oil	--	Resident	4/4/2017
2017WM D150	2017	Roadside	Dump truck driving with body up hit phone wire and flipped over	Diesel, Hydraulic Oil	5-10 Gallons	Lawrence Grant Excavating	4/7/2017
2017WM D209	2017	Lot across from Dorr Oil	water seeping from roadbed has sheens	#2 Fuel Oil	unk Gallons	Dorr Oil? not certain	5/8/2017

Hazardous Materials Spill in Manchester 2010 – August 2024. Source: Vermont Environmental Tool Spills List (Spills (vt.gov))							
Spill#	Year	Facility Name	Nature of Incident	Product Contaminants	Quantity	Responsible Party	Date Reported
2017WM D335	2017	Family Footwear	Heating Oil UST leak	#2 Fuel Oil	UKN --	L&S Realty LLC	7/7/2017
2017WM D343	2017	Maplefields at Manchester	Customer inattention	Gasoline	2 Gallons	R L Vallee/Maplefields	7/11/2017
2017WM D622	2017	Manchester Jolly	PCS found during tank removal	Gasoline	--	S.B. Collins, Inc./Jolley/Smart Stop	11/30/2017
2018WM D216	2018	Manchester Tenney Brook	Petroleum vapors in onsite retail store	Gasoline	unknown --	Midway Oil	1/6/2018
2018WM D081	2018	GMP Line 1112 Pole 5	Truck hydraulic line blew, spill oil on pavement	Hydraulic Oil	1 Gallons	GMP	2/22/2018
2018WM D137	2018	Ryan Rental	Failed septic	Sewage/Septage	--	Unknown	4/7/2018
2018WM D224	2018	Stewarts Shops #197	Fuel disp. release; vehicle drove off w/hose attached	Gasoline	3 Gallons	Stewarts Shops	5/23/2018
2018WM D280	2018	CCC	Dripping fuel return line after installation	#2 Fuel Oil	10 Gallons	Irving Oil	6/30/2018
2018WM D447	2018	Dorr Oil Facility	Truck backed into dispenser	Gasoline	530 Gallons	SRN Trucking	10/15/2018
2019WM D158	2019	GMP Substation	Hydraulic Equipment Failure	Hydraulic Oil	<1 Gallons	GMP	4/16/2019
2019WM D199	2019	GMP Line 161, Pole 49	Bucket Truck blew hydraulic line	Hydraulic Oil	<1 Gallons	GMP	5/9/2019
2019WM D282	2019	residence	Hose on truck failed	Hydraulic Oil	2 Gallons	Casella Waste Management, Inc.	6/24/2019
2019WM D422	2019	Knight Residence	550-gal HO LUST removed	#2 Fuel Oil	--	Resident	9/25/2019
2019WM D429	2019	Roadside	Hydraulic Equipment Failure	Hydraulic Oil	20 Gallons	Casella Waste Management, Inc.	10/1/2019
2019WM D470	2019	GMP Line 6321, Pole 6-10	Transformer down during spill	MODF (mineral oil dielectric fluid)	1 Gallons	GMP	10/18/2019
2019WM D468	2019	roadside	downed pole mounted transformer	MODF (mineral oil dielectric fluid)	~10 Gallons	GMP	10/18/2019
2020WM D097	2020	Manchester Community Library	Elevator failure	Hydraulic Oil	27 Gallons	Manchester Community Library	3/11/2020
2020WM D256	2020	Roadside	Transformer shorted and vented flaming oil	MODF (mineral oil dielectric fluid)	<1 Gallons	GMP	6/18/2020

Hazardous Materials Spill in Manchester 2010 – August 2024. Source: Vermont Environmental Tool Spills List (Spills (vt.gov))							
Spill#	Year	Facility Name	Nature of Incident	Product Contaminants	Quantity	Responsible Party	Date Reported
2020WM D409	2020	Mac's Manchester	Motor Fuel; UST release	Gasoline	UNK --	Sherman V. Allen/Mac's	9/14/2020
2020WM D531	2020	Roadside	Downed tree hit transformer	MODF (mineral oil dielectric fluid)	1 Gallons	GMP	12/3/2020
2021WM D071	2021	Roadway	Release from Snow Plow	Hydraulic Oil	20 Gallons	VTrans	2/19/2021
2021WM D251	2021	Holzhauser Residence	Leaking UST discovered upon closure	#2 Fuel Oil	--	Resident	6/29/2021
2022WM D394	2022	Zaretzky Residence	Leaking AST in basement	#2 Fuel Oil	Up to 150 Gallons	Resident	10/3/2022
2023WM D027	2023	Maplefields at Manchester	Appears to be from area of dispenser - cause currently unk	Gasoline	5 Gallons	R L Vallee/Maplefields	1/17/2023
2023WM D036	2023	Corbett Residence	Release from furnace	#2 Fuel Oil	15 Gallons	Resident	1/21/2023
2023WM D112	2023	Roadside	Transformer oil spill.	MODF (mineral oil dielectric fluid)	<1 Gallons	GMP	3/14/2023
2023NAS 906	2023	McCormick Farm Property	Found vintage fire suppression & "grenades" in barn	carbon tetrachloride	9 Containers/Cylinders	--	6/30/2023
2023WM D749	2023	Forti Residence	Above Ground Tank leak or failure	#2 Fuel Oil	10 Gallons	Resident	11/2/2023
2023WM D753	2023	Wilburn Residence	Above Ground Tank overfill	#2 Fuel Oil	5 Gallons	Irving Energy	11/6/2023
2024WM D031	2024	Power Pole	Transformer/Capacitor Release	MODF (mineral oil dielectric fluid)	10 Gallons	GMP	1/11/2024
2024WM D036	2024	power pole	Transformer/Capacitor release	Lube/Gear/Transmission Oil	--	GMP	1/13/2024
2024WM D047	2024	Roadway	Snowplow hydraulic line blew	Hydraulic Oil	15 Gallons	VTrans	1/16/2024
2024WM D050	2024	VTrans	Hydraulic Equipment Failure	Hydraulic Oil	15 Gallons	VTrans	1/16/2024
2024WM D236	2024	Roadside	Hydraulic line leak	Hydraulic Oil	<1 Gallons	GMP	4/30/2024
2024WM D405	2024	Residence	Transformer/Capacitor release	MODF (mineral oil dielectric fluid)	3 Gallons	GMP	7/15/2024
2024WM D480	2024	Roadway	Motor Oil Release	Motor Oil	1 Gallons	GMP	8/9/2024

Vulnerability

The Town of Manchester's vulnerability to hazardous material spills is ranked moderate overall. The planning team ranked it as an occasional occurrence with a 1-10% chance of occurrence per year with impacts to very small areas. Many areas are vulnerable due to the proximity of surface and groundwater resources to roads and railway. The trains that travel through town and vehicles on the local roads may carry materials that could spill and harm aquatic resources as well as individual wells. In most cases the impact on the built environment, people, and the economy is minor. Injuries, except in the case of direct injuries from a traffic accident, are likely to be low. The natural environment would experience moderate impacts if aquatic resources and/or water supplies were affected. The National Risk Index does not address risk from hazardous material spills.

The Manchester Fire Department has the ability to respond to small hazardous materials spills. The State Hazardous Materials Response Team is called to assist with larger incidents.

Climate change may not have a direct impact on the risk of hazardous materials spills. However, an increase in strong storm events may cause disruptions in normal traffic routes due to road washouts or other blockages. Vehicles carrying hazardous materials may have to travel routes that are not built to support increased levels of traffic and there may be an increase in traffic accidents and potentially hazardous material spills.

Vulnerability Summary

The planning team reviewed all the data from the Risk and Hazard Assessments and then discussed areas within the town that are most vulnerable to the hazards outlined in this plan. These areas are indicated on Map 9 and detailed on Table 22 below.

Table 22. High hazard/vulnerable sites.

High hazard/vulnerable sites as identified by the planning team.			
Hazard	Site	Site Location	Vulnerability
Flooding	Green Mountain Road, Richville Road,	Along East Manchester Road, Green Mountain Road, Richville Road	Multiple historical flooding events which have impacted homes and businesses along East Manchester Rd., Richville Rd., Green Mountain Rd., and Natural Form Way.
Flooding	Bourn Brook/Glen Rd Culvert	Glen Road undersized culvert	This undersized culvert could cause flooding in the area.
Flooding	Union St and Richville Road Intersection	Located along the Batten Kill	Multiple historical flooding events leading to issues accessing homes along Richville Road.
Flooding	River Road	Located near the Manchester Sunderland border.	Multiple historical flooding events have led to flooded and impassable roads and even stranded travelers.
Flooding	Richville Road	Just south of Cass Terrace	Multiple historical flooding events have flooded this section of the road and in conjunction with flooding across the road both north and south of this, there have been residents cut off from access in and out of their homes and evacuations have been needed.
Flooding	Hillvale Subdivision culvert	Located Northwest of Route 7A prior to the center of Manchester, south of the Factory Point Green circle. Culvert and pipe system flows under 7A to Cottage Street and Riverside Heights	If this undersized culvert and pipe system fails, water would flow to Cottage Street and under Riverside Heights causing flooding in the area and potentially impacting multiple manufactured homes and other homes and buildings.
Flooding	Watermain & Sewer Pumping Station	Green Mountain Rd/Bourn Brook	Newly acquired watermains and sewer pumping station are at risk of flooding by Bourn Brook
Flooding	Wastewater Treatment Plant	138/140 Battenkill Lane	At risk of flooding due to Batten Kill
Flooding	Main Sewerage Pumping Station	177 Lincoln Avenue, Manchester Center/Depot Street	Multiple historical flooding events by the Bourn Brook. Flooding has increased dramatically since Irene.
Flooding	Water Transmission Main	100 to 590 Richville Road	When the stream jumps the banks at the upper culvert

			crossing, it washes out the road. Updated to box culvert in 2023.
High Wind Event	Manufactured Homes	Multiple sites in town	This type of home may be more susceptible to damage from high winds.
Winter Storm	Roads with steep slopes and higher elevations	Tollgate Rd, New Ireland Rd, 3 Maple Drive, Bentley Hill Rd, and Powderhorn Rd.	These roads have steep slope and are at higher elevations. Keeping the roads clear during a snowstorm can be difficult and may be difficult for emergency vehicles to access.

V. Capability Assessment

Community Capability

Each municipality has tools and resources available to them that enable them to increase their resilience. FEMA considers these tools and resources to be the municipality’s capabilities and categorizes them into four groups: planning and regulatory, administrative and technical, financial, and education and outreach.

Planning and Regulatory

The planning and regulatory capability includes plans, codes, and ordinances that can mitigate hazards or may create additional vulnerabilities within the area. Manchester’s planning and regulatory capabilities include the plans detailed below.

It is important to note that Manchester does not have any local building codes. Instead, the State of Vermont has adopted the [2015 Vermont Fire & Building Safety Code](#).

Manchester Town Plan

The [Manchester Town Plan](#) was adopted in 2017. The Town Plan is part of Manchester’s ongoing process to develop a tool as a “guide for strengthening and protecting” the quality of life for its residents. The Town Plan identifies the goals which support hazard mitigation planning in flood resilience, land use, transportation, recreation, public facilities and services, and natural resources. The town plan also reviews the hazard mitigation planning process and encourages regular updating of this type of plan. It should be noted that the 2017 Town Plan is currently being updated at the same time the update for the hazard mitigation plan. At that time, it will include an update to the Energy Plan which is currently a standalone plan adopted in 2020 and described in more detail below.

Manchester Land Use & Development Ordinance

The [Manchester Land Use & Development Ordinance](#) revised August 20, 2024, prepared by the Manchester Planning Commission, consists of the combined zoning,

subdivision, flood hazard and river corridor regulations. This bylaw is used to establish flood hazard and river corridor overlay districts within the town and set standards for development within those areas to promote life safety and mitigate future negative impacts due to development and implement the goals of the 2017 Town Plan. Section 12 addresses Flood Hazard and River Corridor Regulations. Section 12.1.2 includes information about referrals to the State National Flood Insurance Program (NFIP) when applications are received for development in the regulated flood hazard area. Substantial improvement (SI) and substantial damage (SD) implementation are not directly addressed within the ordinance. It is recommended that language be added to clarify how and by whom SI and SD determinations are implemented.

Local Emergency Management Plan, 2024

Annually, Manchester updates its Local Emergency Management Plan (LEMP) in accordance with Vermont Emergency Management standards. These plans establish roles and responsibilities, describe procedures, and identify vulnerable populations that may need assistance during a disaster. The local Emergency Management Director works with the Selectboard to complete this document. Information from this plan can be used to help facilitate information gathering and requests for funding after a disaster that will lead to future mitigation actions.

Road and Bridge Standards

Manchester adopted the Town Road and Bridge Standards in 2019. These standards provide minimum codes and standards for the construction, maintenance and repair of existing and future town roads and bridges. These standards promote safety, reduce life cycle costs, and address environmental concerns. These standards are directly linked to hazard mitigation as they require practices that will lead to minimization of road damage due to flooding.

Stormwater Master Plan, Town of Manchester, Vermont (April 21, 2023)

The Stormwater Master Plan was written under contract between the Vermont Department of Environmental Conservation (VT DEC) and Watershed Consulting in the spring of 2023. Stormwater planning is part of flooding mitigation and this plan provides recommendations of “Best Management Practices (BMPs) to address concerns that have been raised for this area.” The plan addressed unmanaged stormwater which can increase flooding within the Town of Manchester. The three sites addresses within this plan include the Manchester Elementary and Middle School, the Manchester Square Shopping Plaza, and the Elm Street Town Parking Lot. This plan also provides a comprehensive list of grant programs that are available for the Town to fund these types of projects.

Bennington Regional Plan Policies and Actions (adopted March 19, 2015)

The [Bennington Regional Plan](#) lists the following policies and actions supporting hazard mitigation:

- Several policy recommendations emphasize protecting natural resources, maintaining village and urban centers and avoiding development on sensitive lands including areas of steep slope and wetlands along with the protection of surface and groundwater resources and forested lands (Sections VIII and IX).
- A climate resilience section (X) as required by Vermont statute that identifies hazards from flooding and fluvial erosion. The section encourages avoiding development in flood hazard areas, reconstruction of bridges and culverts that impede flows, creating and/or maintaining an undisturbed buffer along streams to provide for lateral movement and attenuation of overland flow, participation in the National Flood Insurance Program, updating of flood bylaws, adoption of up-to-date road and bridge standards and participation in the community rating system.

Vermont Hazard Mitigation Plan (2023)

[The Vermont Hazard Mitigation Plan](#) identified a series of hazards along with those we considered in this plan. The Manchester plan follows the state plan except some hazards are combined. Table 9 on page 22 reflects the hazards included in the State’s HMP and how these hazards are reflected in Manchester’s plan.

Administrative and Technical

Administrative and technical capabilities are the municipality’s staff, skill, and tools that can be used to carry out mitigation planning and actions. These are people driven capabilities and may include staff or volunteers.

Manchester employs 35 full-time employees. Those roles that can impact hazard mitigation actions and processes are as follows: a five-person Selectboard, a town manager, a town clerk/treasurer, a five-person planning commission, a zoning administrator (ZA), a five-person development review board (DRB), a director of the Department of Public Works, a director of the Water & Sewer Departments, a fire warden and a fire warden assistant, emergency management director, a police department with a staff of 10, a health officer, a tree committee, and a tree warden. Many of the individuals that fill these positions fill multiple roles within the community.

The Selectboard is the legislative authority and develops the town budget. The Selectboard is responsible for day-to-day management and planning. The Selectboard also appoints the Emergency Management Director and members of the Planning Commission and adopts bylaws and ordinances. Vermont has a town meeting form of government, and the budget is approved by voters on town meeting day.

The Emergency Management Director and/or their appointees participate in the Regional Emergency Management Committee and receive information and training on emergency and disaster management. The Town of Manchester maintains its own police force with agreements from Winhall Police Department for mutual aid. The

Bennington County Sheriff's and Vermont State police may also assist in certain instances. Manchester has its own volunteer fire department, the Manchester Fire Department. Emergency medical services are provided by the Northshire Rescue Squad.

Technical support is provided by Bennington County Regional Commission (BCRC). BCRC provides assistance in planning in land use, emergency management, transportation, GIS mapping, and grant writing. The State Agency of Natural Resources (ANR) aids with floodplain bylaw administration and VTrans can also provide assistance to the town via training and maintenance of state roads. The Town can get support from the Vermont Emergency Management for hazard mitigation needs and emergency response. The Town can also rely on the U.S. Forest Service for maintenance of forest lands, training and other supports. The Town also retains a civil engineer to assist with developing infrastructure projects.

Financial

Financial capabilities are monetary resources that Manchester can access to fund mitigation actions. The General fund funds 35 full-time employees including police officers, the planning and zoning administrator and assistant administrator, positions within the Town Manager's office which supports other departments, and employees within the Department of Public Works.

Manchester also has a small emergency management fund, a bridge and culvert fund, and a sinking fund to maintain the town's highway equipment. Manchester has developed a reserve account to replace or upgrade necessary police equipment. Manchester has also been the recipient of grant funding from Grants in Aid, Better Road Grants, and Structures Grants.

Outreach and Education

Manchester has many opportunities for outreach and education. The town's strengths include a well-run website and a social media presence. The town should consider putting together an Emergency Resource page on their website that will allow the town to share important emergency information and provide resources to residents. Information can also be shared via social media and Front Porch Forum. The Town of Manchester partakes in many events throughout the year and in partnership with Vermont Emergency Management and BCRC, may consider distributing information regarding emergency response and preparation during these events.

National Flood Insurance Program

Vermont municipalities have the authority to regulate development in flood hazard areas under 24 Vermont Statutes Annotated (VSA), Chapter 91. Under 10 VSA, Chapter 32, the Secretary of the Agency of Environmental Conservation has the authority to designate flood hazard areas and to assist the towns with flood hazard regulations. Manchester has participated in the National Flood Insurance Program (NFIP) since April 3, 1978, and as mentioned above, has bylaws in place to implement that program. This program is overseen by the Town Zoning Administrator. According to the FEMA Community Information System (CIS), there are 25 policies in force in Manchester with 17 within the Special Flood Hazard Area.

The Town bylaws reflect the flood insurance rate maps (FIRMs) prepared by FEMA. DFIRMs (digital flood insurance rate maps) have been developed using LIDAR, a technology that can be used to develop highly accurate elevations and, thereby, predict potential flood elevations from different storm events (FEMA 2010). The current DFIRM for Manchester is dated December 2, 2015.

State Incentives for Flood Mitigation

Manchester also has access to [Vermont's Emergency Relief Assistance Funding \(ERAF\)](#). After a federally declared disaster, public costs are reimbursed at 75% by federal funds and the state will contribute an additional 7.5%. The ERAF program offers additional funds, either 12.5% or 17.5%, to those municipalities that take specific steps to proactively reduce flood damage. To be eligible for the 12.5% additional funding, the town needs to do the following:

- Participate in the NFIP
- Adopt Town Road and Bridge Standards
- Annually adopt a Local Emergency Management Plan prior to May 1
- Adopt a Local Hazard Mitigation Plan

The town is eligible for the 17.5% rate if they do all four of the steps above AND they also adopt River Corridor protections and/or participate in the Community Rating System.

Manchester will be eligible for the 17.5% ERAF rate upon adoption of this Local Hazard Mitigation Plan as they will have met the first three of the above requirements and they have also adopted river corridor protections.

VI. Mitigation Strategy

The most important component of every mitigation plan is the mitigation strategy. This strategy is composed of three parts: the mitigation goals, actions, and an action plan that will describe how this strategy will be implemented.

Mitigation Goals

The Town planning committee identified the following mitigation goals in 2016. During the planning process for this updated plan, the same goals were identified by the planning committee. These goals are listed below.

1. Reduce injury and loss of life resulting from natural disasters.
2. Reduce damage to public infrastructure, minimize disruption to the road network and maintain both normal and emergency access.
3. Establish and manage a program to proactively implement mitigation projects for roads, bridges, culverts and other municipal facilities to ensure that community infrastructure is not significantly damaged by natural hazard events.
4. Design and implement mitigation measures so as to minimize impacts to rivers, water bodies and other natural features, historic structures, and neighborhood character.
5. Increase the economic resiliency of Manchester by reducing the economic impacts incurred by municipal, residential, agricultural and commercial establishments due to disasters.
6. Incorporate hazard mitigation planning into other community planning projects, such as Town Plan, Capital Improvement Plan, and Town Local Emergency Operation Plan
7. Ensure that members of the general public continue to be part of the hazard mitigation planning process.

Based on the above goals and the assessment of hazards, Manchester identified and prioritized mitigation actions which are specifically described in Table 25.

Mitigation Actions

Methodology

There are four categories of mitigation actions (Table 23) that need to be identified for the priority hazards selected and shown in [Section 4 Table 9](#).

Table 23. Types of Mitigation Actions

Types of Mitigation Actions		
Mitigation Action Categories	Description of Category	Example of Actions
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	Comprehensive plans, land use ordinances, building codes, capital improvement programs, open space preservation, stormwater management, municipal plans, and master plans.
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 could apply to public or private structures as well as critical facilities and infrastructure.	Acquisitions and elevations of structures in flood prone areas, undergrounding utilities, structural retrofits, floodwalls and retaining walls, detention and retention structures, culvert and bridge upgrades.
Natural Systems Protection	These actions minimize damage and losses and also preserve or restore the functions of natural systems.	Sediment and erosion control, stream corridor restoration, forest and land management, and conservation easements.
Education and Awareness Programs	These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.	Websites with information and maps, trainings and meetings, and information to residents on potential hazards in the community.

The 2016 Hazard Mitigation Plan included 54 mitigation actions ([Appendix I](#)). The planning team reviewed each of these actions and felt that such a large number of actions was too cumbersome to be effectively addressed by this plan and chose to carry over 25 actions and included 11 new actions for a deeper review. The previous actions, the status of each action, and whether the team chose to move forward with that action can be found in [Appendix I](#). Actions for wildfire, landslides and debris flow, hail, drought, and earthquake are not included in this update since those hazards are not addressed in this plan. If an action was not carried to the 2025 plan, the reason is indicated in italics.

Table 24 lists the actions the planning team chose to address in this update and how each was evaluated based on the following criteria:

1. Life safety – Will the action be effective at protecting lives and preventing injuries?
2. Property protection – Will the action be effective at eliminating or reducing damage to structures and infrastructure?
3. Technical – Is the action a long-term, technically feasible solution?
4. Political – Is there overall public support/political will for the action?

5. Administrative – Does the community have the administrative capacity to implement the action?
6. Other community objectives – Does the action advance other community objectives, such as capital improvements, economic development, benefit a vulnerable population, improve environmental quality, or open space preservation?

Each of these criteria were ranked on a scale of -1, 0, or 1 with -1 being ineffective or not feasible, 0 being neutral, and 1 being highly effective. A Benefit Score was then calculated based on the sum of the scores given to each criterion.

Using the Benefit Score, a cost-benefit analysis was also undertaken for each mitigation action. The planning team estimated the cost of each mitigation action. A score of 1 was given for those mitigation actions with an estimated cost of less than \$50,000. A score of 2 was given for those actions with an estimated cost of \$50,000 to \$100,000 and a score of 3 was given for those actions with an estimated cost greater than \$100,000. The cost/benefit is then a comparison between the Benefit Score and the Cost Score and considering whether the costs are reasonable compared to the probable benefits.

Priority was assessed slightly independently of the cost and benefit and was instead based largely on the perceived need of each action and the availability of funding.

Mitigation Action Evaluation

Table 24 outlines the 36 considered actions, the evaluation of each criteria including the cost-benefit analysis. The planning team decided to keep all evaluated actions in the plan after this analysis.

Table 24. Mitigation Action Evaluation

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Hazard Type: All Hazards										
Education and Outreach	Provide a “Be Prepared” section of the Town website with links to hazard mitigation for each hazard addressed in this plan and emergency response information for residents and visitors.	1	1	1	1	1	1	6	1	High/Low

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Local Planning and Regulations	Encourage proper construction techniques and use of appropriate materials to address hazards, particularly flooding, winter storms, wind events.	1	1	1	1	1	1	6	1	High/Low
Local Planning and Regulations	Integrate this hazard mitigation plan into the Town Plan, the Local Emergency Management Plan and budgeting and capital improvements plan.	1	1	1	1	1	1	6	1	High/Low
Education and Awareness	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly extreme cold, extreme heat, and infectious diseases, but also those in need of assistance for evacuation and/or sheltering. Provide information on home weatherization, education on safe generator use, warning signs of heat illness, and cold weather safety. Update as the Town's needs and population's needs change.	1	1	1	1	1	1	6	1	High/Low
Education and Awareness	Encourage businesses and institutions to develop continuity of operations plans.	1	1	1	0	1	1	5	1	High/Low
Local Planning and Regulations	Develop and incorporate the Town's road access requirements for intersections with private driveways to assure emergency access particularly during winter storms and flooding events.	1	1	1	1	1	1	6	1	High/Low
Structure and Infrastructure Projects	Acquire a generator to provide backup power for the town water and sewer systems	0	0	1	1	1	1	4	3	Medium/High
Structure and Infrastructure Projects	Replace water and sewer mains to improve treatment and supply systems and reduce system inefficiencies.	1	1	1	1	1	1	6	3	Medium/High
Structure and Infrastructure Projects	Replace aging headworks at the wastewater plant per State recommendation.	1	0	1	1	1	1	5	3	High/High

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Structure and Infrastructure Projects	Install back up water well in north end of town.	1	0	1	1	1	1	5	3	High/High
Structure and Infrastructure Projects	Consider adding wastewater sewer main heading south on Richville Road from Green Mtn Road to Cass Terrace to reach additional properties to protect the aquifer that feeds the town well. Review the already completed engineering study for viability.	1	1	1	1	1	1	6	3	High/High
Structure and Infrastructure Projects	Consider adding wastewater sewer main heading east on Depot Street to reach additional properties to improve septic systems and assist in possible future development.	1	1	1	1	1	1	6	3	High/High
Hazard Type: Floods and Fluvial Erosion										
Structure and Infrastructure Projects	Reconnect the Bourn Brook to its floodplain by utilizing the analysis finalized in 2023 and utilizing BCRC as grant management for this project.	1	1	1	1	1	1	6	3	High/High
Structure and Infrastructure Projects	Reconnect the Lye Brook to its floodplain by utilizing the analysis finalized in 2023. The Town, in partnership with BCRC, should review future hazard mitigation funding in order to develop a funding stream to pursue this project.	1	1	1	1	1	1	6	3	High/High
Structure and Infrastructure Projects	Consider upsizing the Hillvale Subdivision culvert to alleviate potential flood risk to Route 11 & 30.	1	1	1	1	1	1	6	1	High/Low
Structure and Infrastructure Projects	Evaluate and upgrade the aging Bonnet Street Bridge per AOT suggestions.	1	1	1	1	1	1	6	3	High/High
Structure and Infrastructure Projects	Upgrade the box culvert on Muddy Lane near Starry Drive to a large box culvert or corrugated culvert.	1	1	1	1	1	1	6	3	High/High

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Education and Awareness	Educate owners on the importance of securing propane tanks and other items that could float or blow away in storms	1	1	1	1	1	1	6	1	High/Low
Local Planning and Regulations	Develop a watershed planning team with other towns within the Batten Kill watershed to coordinate planning and other actions to protect the river and promote flood resilience	1	1	1	1	1	1	6	1	High/Low
Local Planning and Regulations	Participate in the Community Rating System to help reduce flood insurance premiums for residents and businesses	0	1	1	1	1	1	5	1	High/Low
Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	1	1	1	1	1	1	6	1	High/Low
Local Planning and Regulations	Update culvert inventory on an ongoing basis	0	1	1	1	1	1	5	1	High/Low
Natural Systems Protection	Complete inventory of road network to assess whether road segments connected to surface waters through ditches, culverts or other drainage structures meet the new stormwater standards currently under development by the DEC Municipal Roads Program	1	1	1	1	1	1	6	1	High/Low
Natural Systems Protection	Develop a long-term plan to bring all sections of connected roads to revised standards as part of the municipal general permit.	1	1	1	1	1	1	6	1	High/Low
Structure and Infrastructure Projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	1	1	1	1	1	1	6	1	High/Low
Structure and Infrastructure Projects	Encourage property owners in flood or fluvial erosion hazard zones to consider selling their properties (buy out) or implementing flood proofing including elevating structures	1	1	1	1	1	1	6	1	High/Low

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Structure and Infrastructure Projects	Continue to implement corridor protection, buffer plantings, structure and berm removal and other projects listed in the Batten Kill- Walloomsac-Hoosic Tactical Basin Plan and, where applicable, in the 2007 Batten Kill corridor plan (Field 2007) and in the	1	1	1	1	1	1	6	3	High/High
Structure and Infrastructure Projects	Identify and replace culverts and bridges that do not meet current Vermont Town Road and Bridge Standards	1	1	1	1	1	1	6	3	High/High
Hazard Type: Winter Storm										
Local Planning and Regulations	Develop written agreements with adjacent towns for sharing of highway equipment and mutual support.	0	0	1	1	1	1	4	1	Medium/Low
Hazard Type: High Wind Event										
Local Planning and Regulation	Encourage protection and planting of wind breaks in new developments	1	1	1	1	1	1	6	1	High/Low
Structure and Infrastructure Projects	Manchester will assess and remove hazard trees within the right-of-way (ROW) and/or partner with Green Mountain Power if it is within the power line ROW.	1	1	1	1	1	1	6	2	High/Medium

Hazard Type: Infectious Disease Outbreak										
Local Planning and Regulations	Monitor disease occurrences and potential outbreaks, partnering with the VT Dept. of Health	1	0	1	1	1	1	5	1	High/Low
Hazard Type: Invasive Species										
Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	0	0	1	0	1	1	3	1	Medium/Low
Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	0	0	1	0	1	1	3	1	Medium/Low

Action Category	Actions	Life Safety	Prop Protec	Tech	Political	Admin	Other Obj	Benefit Score	Est. Cost	C/B
Hazard Type: Hazardous Material Spill										
Structure and Infrastructure Projects	Work with VT AOT to identify and mitigate high accident intersections and road segments	1	1	1	1	1	1	6	1	High/Low
Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	1	1	1	1	1	1	6	2	High/Medium

Mitigation Action Plan

The Mitigation Action Plan (Table 25) provides a summary of each mitigation action recommended for implementation, the parties responsible for carrying out the action, the timeframe to implement, and possible funding sources.

Table 25. Mitigation Action Plan

2025 Mitigation Action Plan							
	Hazard	Action Category	Action	Responsible Party*	Time Frame	Funding Source	Priority
1	All Hazards	Education and Outreach	Provide a "Be Prepared" section of the Town website with links to hazard mitigation and emergency response information for residents and visitors.	Town Manager	2025 to 2026	Town general fund	High
2	All Hazards	Local Planning and Regulations	Encourage proper construction techniques and use of appropriate materials to address hazards, particularly flooding, winter storms, wind events.	Town Planning Commission; Zoning Administrator	2025 to 2026	Town general fund	Medium
3	All Hazards	Local Planning and Regulations	Integrate this hazard mitigation plan into the Town Plan, the Local Emergency Management Plan and budgeting and capital improvements plan	Town Selectboard Town; Planning Commission; Zoning Administrator; Town Manager	On an annual basis or when plans are updated	Town general fund	High

* If there are multiple parties listed, the primary party responsible for the action is listed first.

2025 Mitigation Action Plan							
	Hazard	Action Category	Action	Responsible Party*	Time Frame	Funding Source	Priority
4	All Hazards	Education and Awareness	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly extreme cold, extreme heat, and infectious diseases, but also those in need of assistance for evacuation and/or sheltering. Provide information on home weatherization, education on safe generator use, warning signs of heat illness, and cold weather safety. Update as the Town's needs and population's needs change.	Town Emergency Management Coordinator	2025 and ongoing	Town general fund	High
5	All Hazards	Education and Awareness	Encourage businesses and institutions to develop continuity of operations plans	Town Economic Development	2025 and ongoing	Town general fund	Low
6	All Hazards	Local Planning and Regulations	Develop and incorporate the Town's road access requirements for intersections with private driveways to assure emergency access particularly during winter storms and flooding events.	Town Planning Commission	2025 to 2026	Town general fund	Medium
7	All Hazards	Structure and Infrastructure Projects	Acquire a generator to provide backup power for the town water and sewer systems	Water Board Sewer Board	2026 to 2027	Town general fund FEMA HMGP, PDM, FMA	High
8	All Hazards	Structure and Infrastructure Projects	Replace water and sewer mains to improve treatment and supply systems and reduce system inefficiencies.	Water and Sewer Boards; Town Selectboard	2025 and ongoing	General Fund	High
9	All Hazards	Structure and Infrastructure Projects	Replace aging headworks at the wastewater plant per State recommendation.	Water and Sewer Boards; Town Selectboard	2025 to 2030	General Fund	Medium
10	All Hazards	Structure and Infrastructure Projects	Install back up water well in north end of town.	Water and Sewer Boards; Town Selectboard	2028	General Fund	Low
11	All Hazards	Structure and Infrastructure Projects	Consider adding waste-water sewer main heading south on Richville Road from Green Mtn Road to Cass Terrace to reach additional properties to protect the aquifer that feeds the town well. Review the already completed engineering study for viability.	Water and Sewer Boards; Town Selectboard	2029	General Fund	High
12	All Hazards	Structure and Infrastructure Projects	Consider adding wastewater sewer main heading east on Depot Street to reach additional properties to improve septic systems and assist in possible future development.	Water and Sewer Boards; Town Selectboard	2029	General Fund	High
13	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Reconnect the Bourn Brook to its floodplain by utilizing the analysis finalized in 2023 and utilizing BCRC as grant management for this project.	Town Selectboard BCRC	2025 to 2028	FEMA HMGP, BRIC	High
14	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Reconnect the Lye Brook to its floodplain by utilizing the analysis finalized in 2023. The Town, in partnership with BCRC, should review future hazard mitigation funding in order to develop a funding stream to pursue this project.	Town Selectboard BCRC	2026 to 2029	FEMA HMGP, BRIC	Medium
15	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Consider upsizing the Hillvale Subdivision culvert to alleviate potential flood risk to Route 11 & 30.	Town Selectboard Department of Public Works VTrans	2026	FEMA HMGP, BRIC, VT Better Roads	Medium

2025 Mitigation Action Plan							
	Hazard	Action Category	Action	Responsible Party*	Time Frame	Funding Source	Priority
16	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Evaluate and upgrade the aging Bonnet Street Bridge per AOT suggestions.	Department of Public Works Green Mountain Power	2026	VTrans	High
17	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Upgrade the box culvert on Muddy Lane near Starry Drive to a large box culvert or corrugated culvert.	Department of Public Works	2026 to 2027	General Fund	Medium
18	Floods and Fluvial Erosion	Education and Awareness	Educate owners on importance of securing propane tanks and other items that could float or blow away in storms	Town Zoning Administrator	2025 and ongoing	Town general fund	Low
19	Floods and Fluvial Erosion	Local Planning and Regulations	Develop a watershed planning team with other towns within the Batten Kill watershed to coordinate planning and other actions to protect the river and promote flood resilience	Town Planning Commission BCRC	2027 to 2028	Town general fund Watershed Grant from VT ANR	Low
20	Floods and Fluvial Erosion	Local Planning and Regulations	Participate in the Community Rating System to help reduce flood insurance premiums for residents and businesses	Town Selectboard	2025 and ongoing	Town general fund	High
21	Floods and Fluvial Erosion	Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	Development Review Board Department of Public Works	2025 and ongoing	Town general fund	High
22	Floods and Fluvial Erosion	Local Planning and Regulations	Update culvert inventory on an ongoing basis.	Department of Public Works BCRC	2025 and ongoing	Town General Fund VT Better Roads funding	High
23	Floods and Fluvial Erosion	Natural Systems Protection	Complete inventory of road network to assess whether road segments connected to surface waters through ditches, culverts or other drainage structures meet the new stormwater standards currently under development by the DEC Municipal Roads Program	Department of Public Works; DEC	2026 to 2028	Town General Fund VT Better Roads	Medium
24	Floods and Fluvial Erosion	Natural Systems Protection	Develop a long-term plan to bring all sections of connected roads to revised standards as part of the municipal general permit.	Department of Public Works	2026 to 2028	Town General Fund VT Better Roads	Medium
25	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	Department of Public Works	2025 and ongoing	Town highway fund	High
26	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Encourage property owners in flood or fluvial erosion hazard zones to consider selling their properties (buy out) or implementing flood proofing including elevating structures	Town Selectboard	2025 and ongoing	FEMA HMGP, PDM, FMA	High
27	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Continue to implement corridor protection, buffer plantings, structure and berm removal and other projects listed in the Batten Kill-Walloomsac-Hoosic Tactical Basin Plan and, where applicable, in the 2007 Batten Kill corridor plan (Field 2007) and in the	Town Selectboard; Batten Kill Watershed Alliance Basin Planning Team	2025 and ongoing	FEMA HMGP, FMA, PDM; Vermont Ecosystem Restoration Program, Vermont Watershed Grant	High
28	Floods and Fluvial Erosion	Structure and Infrastructure Projects	Identify and replace culverts and bridges that do not meet current Vermont Town Road and Bridge Standards	Department of Public Works	2025 and ongoing	Town highway fund State of Vermont AOT FEMA HMGP, PDM, FMA	High
29	Winter storms	Local Planning and Regulations	Develop written agreements with adjacent towns for sharing of highway equipment and mutual support.	Town Selectboard; Department of Public Works	2025 to 2026	Town general fund	Medium

2025 Mitigation Action Plan							
	Hazard	Action Category	Action	Responsible Party*	Time Frame	Funding Source	Priority
30	High wind events	Local Planning and Regulation	Encourage protection and planting of wind breaks in new developments	Town Emergency Management Director; Zoning Administrator	2025 and ongoing	Town general fund	Low
31	High wind events	Structure and Infrastructure Projects	Manchester will assess and remove hazard trees within the right-of-way (ROW) and/or partner with Green Mountain Power if it is within the powerline ROW.	Department of Public Works Green Mountain Power	2025 and ongoing	General Fund	High
32	Infectious disease outbreak	Local Planning and Regulations	Monitor disease occurrences and potential outbreaks, partnering with the VT Dept. of Health	Town Health Officer	2025 and ongoing	State of VT Dept. of Health	Low
33	Invasive species	Local Planning and Regulations	Monitor extent of invasive species, particularly forest invasive species such as Emerald Ash Borer	Department of Forests, Parks Recreation Forest health Program; Tree Commission	2025 and ongoing	Town general fund	Low
34	Invasive species	Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	Development Review Board	2025 and ongoing	Town general fund	Low
35	Hazardous materials spill	Structure and Infrastructure Projects	Work with VT AOT to identify and mitigate high accident intersections and road segments	VT AOT	2026 to 2027	State AOT funds	Medium
36	Hazardous materials spill	Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	Vermont Geological Survey	2026 to 2027	VT Geological Survey funds	High

Bringing the Plan to Life: Implementation and Maintenance

Implementation

This hazard mitigation plan will remain available on the Bennington County Regional Commission (BCRC) website under the tab for Manchester. This will make the plan accessible to all officials and the public.

The town will incorporate the mitigation actions outlined in this plan and future updates into the town plan in the next update process in 2033. The town plan update process will be led by the Planning Commission, who will review this plan and determine those mitigation actions and goals that should be included in the town plan. The proposed mitigation actions will also be included in the town budget in its development for approval by the voters on Town Meeting Day.

The 2016 Hazard Mitigation plan was incorporated into the 2025 Town Plan and was used to inform the town budget in order to complete the necessary upgrades to existing infrastructure in Manchester such as culverts and roads.

Annual Monitoring and Plan Evaluation

The Selectboard Members and the Emergency Management Director (EMD) are responsible for the annual monitoring of this plan. Annual monitoring will take place at a Selectboard meeting in December in preparation for developing the annual budget. It will take place in the following steps:

1. The Selectboard and EMD will review the effectiveness of the Plan in meeting its stated mitigation goals.
2. The Selectboard and EMD will monitor the mitigation action progress by reviewing which actions have been completed, are in progress, are scheduled, or there has been no progress
3. The Selectboard will solicit input from local stakeholders regarding the effectiveness of plan implementation. This may be completed via a public meeting, a survey, or workshops.
4. The Selectboard will then review the collected information and decide whether or not the goals and/or actions with the Plan need to be modified.
5. A report will be generated and shared with the public which outlines the results of the annual monitoring process.

If requested, the Bennington County Regional Commission will provide advice and assistance on the plan evaluation.

Updating the Plan

This hazard mitigation plan is valid for 5 years from the date of approval by FEMA. No later than two and a half years prior to the expiration of this plan, the Town Manager and the Selectboard will work with Vermont Emergency Management to apply for grant funding to update this plan. No later than eighteen months prior to this plan expiring, the Town Manager and the Selectboard or a designated planning team will initiate a review of the plan by:

1. Updating the descriptions and analyses of events using new information since completion of the 2025 draft.
2. Identification of any new buildings or infrastructure or changes in critical facilities.
3. Estimation of potential probability and extent of hazards based on any new information since completion of the 2025 plan.
4. Review of completed hazard mitigation projects.
5. Identification of new projects and actions given the revised hazard evaluation.
6. Review of any changes in priorities since adoption of the 2025 plan.
7. Revision of the assessment of risks and vulnerability from identified hazards.
8. Development and use of criteria to assess the potential benefits and costs of identified actions for use in prioritizing those actions.

9. Integration of the updated plan into the Manchester Town Plan and other plans and programs.

The Town Manager and the Selectboard or designated planning team will update the Hazard Mitigation Plan or hire a consultant to complete the plan update. The planning team will hold open meetings to solicit opinions and to identify issues and concerns from members of the public and stakeholders, collect feedback via a survey sent to residents and other stakeholders, and collect comments during public meetings on the suggested mitigation actions. The draft plan will be made available to the public, sent to the State Hazard Mitigation Officer (SHMO), and sent to neighboring towns and organizations for review and input. The revised plan will be submitted for review by the SHMO a second time. Once all questions and comments have been addressed, the SHMO will send the plan to FEMA. Following approval by FEMA, the Selectboard will adopt the completed plan.

Should a declared disaster occur, Manchester may undertake special review of this plan and the appropriate updates will be made. After Action Reports, reviews, and debriefings should be integrated into the update process. The plan should also be updated to reflect the findings of any other studies completed, such as culvert and bridge studies, river corridor plans, and other such studies.

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Appendix I.

Table 26. 2016 Mitigation Actions

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
All Hazards	Education and Outreach	Provide a “Be Prepared” section of the Town website with links to hazard mitigation and emergency response information for residents and visitors.	Town Manager	2016 to 2017	Town general fund	High	Carried to 2025 plan
All Hazards	Local Planning and Regulations	Encourage proper construction techniques and use of appropriate materials to address hazards, particularly flooding, winter storms, wind events, earthquakes, landslides and wildfire	Town Planning Commission; Zoning Administrator	2016 to 2017	Town general fund	High	Carried to 2025 plan
All Hazards	Local Planning and Regulations	Build economic development capacity as recommended in the Northshire Economic Development Strategy	Town Economic Development	2016 to 2018	Town general fund	Medium to High	Removed
<i>This action falls outside of the scope of this plan.</i>							
All Hazards	Local Planning and Regulations	Integrate this hazard mitigation plan into the Town Plan, the Local Emergency Management Plan and budgeting and capital improvements plan	Town Selectboard Town; Planning Commission; Zoning Administrator; Town Manager	2016 to 2021 (ongoing)	Town general fund	Medium to High	Carried to 2025 plan
All Hazards	Education and Awareness	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly drought, extreme temperatures and infectious diseases, but also those in need of assistance for evacuation and/or sheltering	Town Emergency Management Coordinator	2016 to 2017	Town general fund	High	Carried to 2025 plan
<i>Revised to reflect the hazards included within the 2025 Hazard Mitigation Plan</i>							

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
All Hazards	Education and Awareness	Encourage businesses and institutions to develop continuity of operations plans	Town Economic Development	2016 to 2018	Town general fund	Medium	Carried to 2025 plan
All Hazards	Local Planning and Regulations	Assess need for driveway standards to assure adequate emergency access particularly to assure adequate access in winter storms, floods and for wildfire protection	Town Planning Commission	2016 to 2017	Town general fund	High	Carried to 2025 plan
							<i>This action has been changed to reflect what the town can regulate. See action #6 in 2025 actions.</i>
All Hazards	Structure and Infrastructure Projects	Acquire a generator to provide backup power for the town water and sewer systems	Water Board Sewer Board	2016 to 2017	Town general fund FEMA HMGP, PDM, FMA	High	Carried to 2025 plan
Floods and Flash Floods	Education and Awareness	Educate owners on importance of securing propane tanks and other items that could float or blow away in storms	Town Zoning Administrator	2016 to 2017	Town general fund	Medium	Carried to 2025 plan
Floods and Flash Floods	Local Planning and Regulations	Develop and incorporate flood resiliency section, including sections addressing the protection of surface waters, land adjacent to streams, wetlands and water bodies, upland forests and other lands necessary to provide flood resiliency into the Manchester Town Plan as required by Vermont statutes	Town Planning Commission BCRC	2017 to 2018	Town general fund; Municipal Planning Grant	Medium to High	Completed
							<i>The flood resiliency section has been incorporated into the 2017 Town Plan.</i>
Floods and Flash Floods	Local Planning and Regulations	Develop a watershed planning team with other towns within the Batten Kill watershed to coordinate planning and other actions to protect the river and promote flood resilience	Town Planning Commission BCRC	2017 to 2021	Town general fund Watershed Grant from VT ANR	Medium	Carried to 2025 plan

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
Floods and Flash Floods	Local Planning and Regulations	Adopt and enforce updated flood hazard and river corridor protection zone bylaws	Development Review Board Zoning Administrator	2016 to 2017	Town general fund	High	Completed
			<i>Updated flood hazard and river corridor protection zone bylaws were incorporated into the 2018 Land Use and Development Ordinance.</i>				
Floods and Flash Floods	Local Planning and Regulations	Participate in the Community Rating System to help reduce flood insurance premiums for residents and businesses	Town Selectboard	2016 to 2018	Town general fund	High	Carried to 2025 plan
Floods and Flash Floods	Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	Development Review Board Department of Public Works	2016 to 2020 (ongoing)	Town general fund	High	Carried to 2025 plan
Floods and Flash Floods	Local Planning and Regulations	Adopt the latest Vermont Town Road and Bridge Standards	Town Selectboard	2016 to 2017 and as updated	Town general fund	High	Completed
			<i>Manchester Selectboard adopted the latest Vermont Town Road and Bridge Standards on July 30, 2019.</i>				
Floods and Flash Floods	Local Planning and Regulations	Inventory roads for stormwater mapping as part of the Vermont Stormwater program	Department of Public Works BCRC	2017 to 2020	VT Better Roads; Town General Fund	High	Completed
			<i>This inventory has been completed and a Stormwater Master Plan finalized in April 2023.</i>				
Floods and Flash Floods	Local Planning and Regulations	Complete town-wide stormwater management plan in accordance with the Vermont Stormwater Manual	Department of Public Works	2017 to 2020	VT Better Roads; Town General Fund	High	Completed
			<i>The Stormwater Master Plan was finalized in April 2023.</i>				
Floods and Flash Floods	Local Planning and Regulations	Map stormwater system	Vermont DEC	2016 to 2018	State funding	High	Completed
			<i>This task has been completed.</i>				
Floods and Flash Floods	Local Planning and Regulations	Update culvert inventory	Department of Public Works BCRC	2017 to 2018	Town General Fund VT Better Roads funding	Medium	Carried to 2025 plan

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
Floods and flash floods	Natural Systems Protection	Complete river corridor plan and hydraulic studies of Lye Brook and possibly Bourne Brook and assess needed infrastructure improvements, possible property acquisition, including buy-outs, and other strategies	Department of Public Works BCRC	2016 to 2018	State of Vermont Ecosystem Restoration Program Town general fund	High	Completed
			<i>Completed in December of 2023.</i>				
Floods and flash floods	Natural Systems Protection	Complete assessment and develop measures to reduce erosion on the west bank of the Batten Kill near the water treatment facility, including assessing the Union Street bridge.	Department of Public Works	2018 to 2021	State of Vermont Ecosystem Restoration Program Town General Fund	High	Removed
			<i>This project falls within the Village of Manchester which is outside of the scope of this plan.</i>				
Floods and flash floods	Natural Systems Protection	Identify possible acquisition of wetlands and special flood hazard areas to assure natural systems protection	Town Conservation Commission BCRC	2018 to 2021	Town general fund Municipal Planning Grant	Medium	Removed
			<i>This action is outside of the town's capabilities at this time.</i>				
Floods and flash floods	Natural Systems Protection	Complete inventory of road network to assess whether road segments connected to surface waters through ditches, culverts or other drainage structures meet the new stormwater standards currently under development by the DEC Municipal Roads Program.	Department of Public Works; DEC	2017 to 2018	Town General Fund VT Better Roads	High	Carried to 2025 plan
Floods and flash floods	Natural Systems Protection	Develop a long-term plan to bring all sections of connected roads to revised standards as part of the municipal general permit.	Department of Public Works	2017 to 2019	Town General Fund VT Better Roads	High	Carried to 2025 plan
Floods and Flash Floods	Natural Systems Protection	Implement stormwater management projects identified as part of the Municipal General Permit planning	Department of Public Works Bennington County Conservation District	2018 to 2021 and beyond	Town general fund State funding FEMA HMGP, PDM, FMA	High	Removed

2016 Mitigation Actions								
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status	
			<i>This action is outside of the town's financial capabilities at this time.</i>					
Floods and flash floods	Structure and Infrastructure projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	Department of Public Works	2016 to 2020 (ongoing)	Town highway fund	High	Carried to 2025 plan	
Floods and flash floods	Structure and infrastructure protection	Encourage property owners in flood or fluvial erosion hazard zones to consider selling their properties (buy out) or implementing flood proofing including elevating structures	Town Selectboard	2016 to 2021 (ongoing)	FEMA HMGP, PDM, FMA	High	Completed/Carried to 2025 plan	
Floods and flash floods	Structure and infrastructure protection	Implement corridor protection, buffer plantings, structure and berm removal and other projects listed in the Batten Kill- Walloomsac-Hoosic Tactical Basin Plan and, where applicable, in the 2007 Batten Kill corridor plan (Field 2007) and in the	Town Selectboard; Batten Kill Watershed Alliance Basin Planning Team	2016 to 2021 (ongoing)	FEMA HMGP, FMA, PDM Vermont Ecosystem Restoration Program, Vermont Watershed Grant	Medium to High	Carried to 2025 plan	
Floods and flash floods	Structure and infrastructure projects	Identify and replace culverts and bridges that do not meet current Vermont Town Road and Bridge Standards	Department of Public Works	2016 to 2021 (ongoing)	Town highway fund State of Vermont AOT FEMA HMGP, PDM, FMA	High	Carried to 2025 plan	
Winter storms	Education and Outreach	Provide educational materials on sheltering in place and preparation for winter storms, including long-term power outages	Town Emergency Management Director and Coordinator	2016 to 2017	Town general fund	High	Removed	
			<i>Incorporated into the first mitigation action to create a "Be Prepared" section on the town website.</i>					
Winter storms	Education and Awareness	Provide materials for residents on methods to protect property from wind events	Town Emergency Management Director and Coordinator; Zoning Administrator	2016 to 2018	Town general fund; FEMA HMGP, PDM, FMA	High	Removed	
			<i>Incorporated into the first mitigation action to create a "Be Prepared" section on the town website.</i>					

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
Winter storms	Local Planning and Regulations	Develop agreements with adjacent towns for sharing of highway equipment	Town Selectboard; Department of Public Works	2016 to 2017	Town general fund	High	Carried to 2025 plan
Winter storms	Structure and Infrastructure Projects	Place utilities underground for critical facilities such as town hall or the public safety building.	Town Manager	2016 to 2018	FEMA HMGP, PDM, FMA	Medium	Removed
<i>This action is outside of the town's capabilities at this time.</i>							
High wind events	Education and Outreach	Provide educational materials on sheltering in place and preparation for winter storms, including long-term power outages	Town Emergency Management Director and Coordinator	2016 to 2017	Town general fund	High	Removed
<i>Incorporated into the first mitigation action to create a "Be Prepared" section on the town website.</i>							
High wind events	Local Planning and Regulation	Require boats, propane tanks and other items stored outdoors to be secured	Town Planning Commission; Zoning Administrator	2016 to 2017	Town general fund	High	Removed
<i>Combined with Mitigation Action #9.</i>							
High wind events	Local Planning and Regulation	Encourage appropriate plantings to avoid future damage from downed trees	Town Tree Warden	2016 to 2017	Town general fund	Medium	Carried to 2025 plan
<i>This action is outside of the town's capabilities at this time.</i>							
High wind events	Local Planning and Regulation	Encourage protection and planting of wind breaks in new developments	Town Emergency Management Director; Zoning Administrator	2016 to 2018	Town general fund	Medium	Carried to 2025 plan
High wind events	Structure and Infrastructure Projects	Retrofit existing buildings to withstand high winds including protection of power lines and other utilities	Town Selectboard; Private Owners	2016 to 2021 (ongoing)	FEMA HMGP, PDM	Medium	Removed
<i>This action is outside of the town's capabilities at this time.</i>							
High wind events	Structure and Infrastructure Projects	Place utilities underground for critical facilities such as town hall or the public safety building.	Town Manager; Private Owners	2016 to 2018	FEMA HMGP, PDM	High	Removed
<i>This action is outside of the town's capabilities at this time.</i>							
Hail	Structure and Infrastructure Projects	Retrofit existing buildings to minimize hail damage	Town Selectboard; Private Owners	2017 to 2019	FEMA HMGP, PDM	Low to Medium	Removed

2016 Mitigation Actions								
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status	
			<i>This hazard was not chosen to be addressed in this plan update.</i>					
Drought	Local Planning and Regulation	Monitor drought conditions	Town Emergency Management Director	2016 to 2020 (ongoing)	Town general fund	Medium	Removed	
			<i>This hazard was not chosen to be addressed in this plan update.</i>					
Drought	Education and Awareness	Provide educational materials on dealing with drought	Town Emergency Management Director	2016 to 2018	Town general fund; FEMA HMGP, PDM	Medium	Removed	
			<i>This hazard was not chosen to be addressed in this plan update.</i>					
Drought	Natural System Protection	Develop improved assessment of groundwater sources and amend bylaws to assure their protection	Vermont Geological Survey Town Planning Commission	2017 to 2019	FEMA HMGP, PDM; State of Vermont	Medium	Removed	
			<i>This hazard was not chosen to be addressed in this plan update.</i>					
Drought	Local Planning and Regulation	Incorporate planning for droughts in the local emergency management plan	Town Emergency Management Director	2017 to 2018	Town general fund	Medium	Removed	
			<i>This hazard was not chosen to be addressed in this plan update.</i>					
Hazardous materials spill	Local Planning and Regulation	Update 2012 assessment of hazardous materials and potential accident locations.	LEPC 7	2019 to 2020	State of VT DEC funds	High	Removed	
			<i>The 2012 Assessment was not found within the town's files and the LEPC 7 no longer exists.</i>					
Hazardous materials spill	Structure and Infrastructure Projects	Work with VT AOT to identify and mitigate high accident intersections and road segments	VT AOT	2016 to 2019	State AOT funds	Medium to High	Carried to 2025 plan	
Hazardous materials spill	Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	Vermont Geological Survey	2017 to 2019	VT Geological Survey funds	Medium	Carried to 2025 plan	
Infectious disease outbreak	Local Planning and Regulations	Monitor disease occurrences and potential outbreaks, partnering with the VT Dept. of Health	Town Health Officer	2016 to 2021 (ongoing)	State of VT Dept. of Health	High	Carried to 2025 plan	
Infectious disease outbreak	Education and Outreach	Provide educational materials in printed form and on the town web site on potential infectious diseases	Emergency Management Director and Coordinator	2016 to 2019	Town general fund /State of Vermont Health Department	High	Removed	

2016 Mitigation Actions							
Hazard	Type Action	Action	Responsible Party	Time Frame	Funding Source(s)	Priority	Status
			<i>Incorporated into the first mitigation action to create a "Be Prepared" section on the town website.</i>				
Invasive species	Local Planning and Regulations	Monitor extent of invasive species, particularly forest invasive species such as Emerald Ash Borer	Tree Commission Conservation Commission	2016 to 2020 (ongoing)	Town general fund	Medium	Carried to 2025 plan
Invasive species	Local Planning and Regulations	Complete surveys for ash trees vulnerable to Emerald Ash Borer in town highway ROW	BCRC; Bennington County Conservation Commission	2016 to 2018	FEMA HMGP, PDM VT Department of Forests, Parks and Recreation	Medium	Removed
<i>This action is outside of the town's capabilities at this time.</i>							
Invasive species	Local Planning and Regulations	Survey for invasive species (e.g., Japanese knotweed) along streams to identify potential erosion areas	Batten Kill Watershed Alliance; Conservation Commission	2016 to 2018	State of Vermont Department of Parks, Forestry and Recreation	Medium	Removed
<i>This action is outside of the town's capabilities at this time.</i>							
Invasive species	Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	Development Review Board	2016 to 2021 (ongoing)	Town general fund	Medium	Carried to 2025 plan
Invasive species	Education and Awareness	Provide outreach materials for landowners on using native plants and controlling invasive species	Bennington County Conservation District	2016 to 2017	Town general fund /State of Vermont Department of Parks, Forestry and Recreation	High	Removed
<i>Incorporated into the first mitigation action to create a "Be Prepared" section on the town website.</i>							

Appendix II.

**Certificate of Adoption
Town of Manchester
Select Board**

A Resolution of the Town of Manchester Adopting the Town of Manchester Hazard Mitigation Plan dated MONTH XX, 2025.

WHEREAS the Select Board recognizes the threat that natural hazards pose to people and property within the Town of Manchester; and

WHEREAS the Town of Manchester has prepared a multi-hazard mitigation plan, hereby known as the Town of Manchester Hazard Mitigation plan dated **MONTH XX, 2025** in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS the Town of Manchester Hazard Mitigation plan dated **MONTH XX, 2025** identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Manchester from the impacts of future hazards and disasters; and

WHEREAS adoption by the Town of Manchester demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Town of Manchester Hazard Mitigation plan dated **MONTH XX, 2025**.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF MANCHESTER, VT, THAT:

Section 1. The Manchester Select Board adopts the Town of Manchester Hazard Mitigation Plan dated **MONTH XX, 2025**. While content related to the Town of Manchester may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the Town of Manchester to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of _____, _____.

By: _____
_____ (print name)

ATTEST:

By: _____
_____ (print name)

APPROVED AS TO FORM:

By: _____
_____ (print name)

Appendix III.

Community Stakeholder Survey for Manchester's Local Hazard Mitigation Plan

This survey is on public perceptions and opinions about natural hazards in Manchester. In addition, we would like information about the methods and techniques you prefer for reducing the risks and losses associated with these hazards. The information you provide will be used to help us better prepare for natural disasters. (The survey should take less than 10 minutes to complete.) This survey is accessible online through the Town of Manchester's website @ www.manchester-vt.gov.

1. Your Name and email (optional):

2. Town of Residence (required):

- 16 responded Manchester or Manchester Center
- 1 responded Bennington

3. The previous Hazard Mitigation Plan for Manchester was adopted in 2016. Do you believe that the following goals are still a priority for the Town of Manchester?

1. Reduce injury and loss of life resulting from natural disasters.
 - a. Yes – 100%
 - b. No – 0%
2. Reduce damage to public infrastructure, minimize disruption to the road network and maintain both normal and emergency access.
 - a. Yes – 100%
 - b. No – 0%
3. Establish and manage a program to proactively implement mitigation projects for roads, bridges, culverts and other municipal facilities to ensure that community infrastructure is not significantly damaged by natural hazard events.
 - a. Yes – 100%
 - b. No – 0%
4. Design and implement mitigation measures to minimize impacts to rivers, water bodies and other natural features, historic structures, and neighborhood character.
 - a. Yes – 100%
 - b. No – 0%
5. Increase the economic resiliency of Manchester by reducing the economic impacts incurred by municipal, residential, agricultural and commercial establishments due to disasters.
 - a. Yes – 88%
 - b. No – 12%
6. Incorporate hazard mitigation planning into other community planning projects, Town Plan, Capital Improvement Plan, and Town Local Emergency Management Plan.
 - a. Yes – 100%
 - b. No – 0%

7. Ensure that members of the general public continue to be part of the hazard mitigation planning process.
 - a. Yes – 94%
 - b. No – 6%

4. How concerned are you about the following hazard events?

(1= Not concerned to 5= Very concerned)

	1 (Not Concerned)	2 (Not very Concerned)	3 (Neutral)	4 (Somewhat Concerned)	5 (Very Concerned)
Flood	0%	5.9%	0%	41.2%	52.9%
Winter Storm	5.9%	5.9%	23.5%	35.3%	29.4%
High Wind Event	0%	5.9%	11.8%	47.1%	35.3%
Hail	12.5%	37.5%	18.8%	18.8%	12.5%
Severe Heat	6.3%	25%	25%	25%	18.8%
Severe Cold	0%	25%	43.8%	6.3%	25%
Drought	33.3%	0%	33.3%	33.3%	0%
Wildfire	22.2%	11.1%	44.4%	22.2%	0%
Landslides	22.2%	33.3%	22.2%	22.2%	0%
Earthquake	44.4%	22.2%	22.2%	11.1%	0%
Hazardous Material Spill	6.3%	0%	33.3%	25%	37.5%
Infectious Disease outbreak	0%	12.5%	18.8%	43.8%	25%
Invasive Species	0%	12.5%	18.8%	31.3%	37.5%

5. Where do you turn for information during an emergency?

8	Town Website	8	TV	5	Radio Station
0	Front Porch Forum	7	Social Media	9	VT Alert

6. Next, we would like to know what specific types of community assets are most important to you. Please choose “Not Applicable” if the asset is not found in your community.

(1 = Least important to 5 = Most important)

	1 (Least Important)	2 (Slightly Important)	3 (Somewhat Important)	4 (Very Important)	5 (Most Important)
Elder-care Facilities	0%	12.5%	37.5%	37.5%	12.5%
Schools (K-12)	0%	18.8%	12.5%	43.8%	25%
Medical Center	0%	0%	17.6%	35.3%	47.1%
Major Bridges	0%	0%	31.3%	25%	43.8%
Fire/Police Stations/EMS	0%	0%	6.3%	43.8%	50%
Library/Historic Buildings	6.3%	25%	31.3%	31.3%	6.3%

Major Employers	0%	12.5%	37.5%	43.8%	6.3%
Small Business	0%	6.3%	25%	43.8%	25%
Parks	0%	25%	43.8%	12.5%	18.8%
Environmental Resources (wetland, lakes, ponds, rivers, forests)	0%	0%	56.3%	25%	18.8%
Churches	20%	26.7%	40%	13.3%	0%

7. Which types of mitigation projects do you believe local, state, and federal government agencies should focus on to reduce disruptions of services and to strengthen the community?

Check ALL that apply:

Project Type	Responses
Retrofit and strengthen essential facilities such as the town hall, etc.	5
Replace inadequate or vulnerable bridges and culverts	13
Retrofit infrastructure by, for example, elevating roadways and improving drainage systems	11
Work on improving the damage resistance of utilities (electricity, communications, water/wastewater facilities, etc.)	12
Install or improve protective structures, such as floodwalls, levees or overflow facilities	12
Buyout flood prone properties and maintain as open space	9
Strengthen codes, ordinances and plans to require higher hazard risk management standards	6
Inform property owners of ways they can mitigate damage to their property(s)	8
Improve local emergency shelter facilities	4
Other	0

8. How would you rate the importance of the following actions to protect yourself and your community: (1=Least Important to 5= Most Important)

	1 (Least Important)	2 (Slightly Important)	3 (Somewhat Important)	4 (Very Important)	5 (Most Important)
Strengthening emergency services (police, fire, ambulance)	0%	6.7%	46.7%	26.7%	20%
Protecting private property	0%	26.7%	26.7%	20%	26.7%
Protecting utilities (phone/internet/power/water/wastewater)	0%	0%	25%	43.8%	31.3%
Protecting and reducing damage to utility infrastructure (power/water/wastewater)	0%	0%	18.8%	18.8%	62.5%

Protecting transportation infrastructure (roads/bridges)	0%	0%	6.3%	43.8%	50%
Protecting natural environment	0%	25%	25%	31.3%	18.8%
Protecting historical/cultural landmarks	0%	0%	30.3%	50%	18.8%
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	6.3%	12.5%	18.8%	43.8%	18.8%
Preventing development in hazard areas	0%	0%	37.5%	43.8%	18.8%

General Household Information

Finally, we would appreciate any information you are willing to share with us about your household. This information will remain confidential and is for survey comparison only.

10. How long have you lived in the state?

- Less than 1 year – 6%
- 1-5 years – 12%
- 6-9 years – 0%
- 10-19 years – 6%
- 20 or more years – 76%

11. Do you own or rent your home?

- Own – 100%
- Rent – 0%
- Other – 0%

12. Do you own/rent a:

- Single-family home – 100%
- Duplex – 0%
- Apartment (3-4 units in structure) – 0%
- Apartment (5 or more units in structure) – 0%
- Condominium/townhouse – 0%
- Manufactured home – 0%
- Other – 0%

13. Is your home or business property located in a FEMA designated floodplain?

- I don't know – 19%
- No – 0%
- Yes – 81%
- If yes, do you have insurance through the National Flood Plain Insurance Program (NFIP)? – No responses received