

Berlin, Vermont
2026 Local Hazard Mitigation Plan



Former Cedar Drive Trailer Park-July 10, 2023

FEMA Approval Pending Adoption Date:

Municipal Adoption Date:

FEMA Formal Approval Date:

*Prepared by the Berlin Hazard Mitigation Planning
Team*

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Technical Assistance by the Central Vermont Regional Planning Commission



1 INTRODUCTION

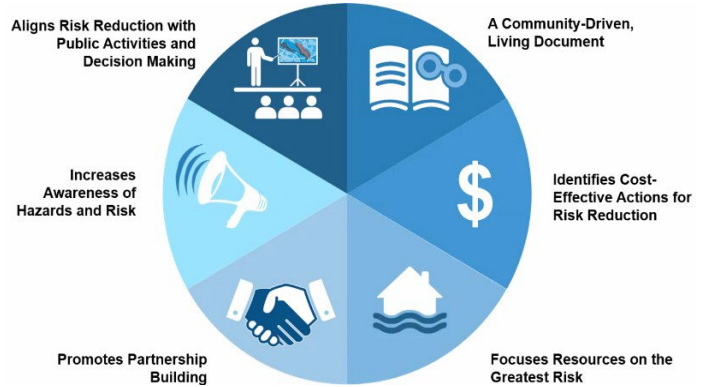
Mitigation planning provides an opportunity for local government to lessen the impact of the next natural disaster. The goal of this plan is to prioritize mitigation investments and plan to reduce risks posed by natural hazards and to increase the Town of Berlin’s resilience to damages from natural hazard impacts.

Hazard Mitigation is any sustained policy or action that reduces or eliminates long-term risk to people and property from the effects of natural hazards. FEMA and state agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This plan recognizes that opportunities exist for communities to identify mitigation strategies and measures during all the other phases of Emergency Management - Preparedness, Response and Recovery. While the hazards can never be completely eliminated, it is possible to identify what the hazards are, where their impacts are most severe, and identify local actions and policies that can be implemented to reduce or eliminate the severity of the impacts.

2 PURPOSE

The purpose of this plan is to assist the town in identifying all-natural hazards facing the community, ranking them according to local vulnerabilities, and developing strategies to reduce risks from those hazards. Once adopted, this plan is not legally binding; instead, it outlines goals and actions to prevent future loss of life and property. The intention is to create a multi-year pathway to mitigating hazards within the community.

The benefits of mitigation planning include:



Source: FEMA LHMP Skill Share Workshop 2021

Furthermore, the Town seeks to be in accordance with the strategies, goals, and objectives of the 2023 State Hazard Mitigation Plan.

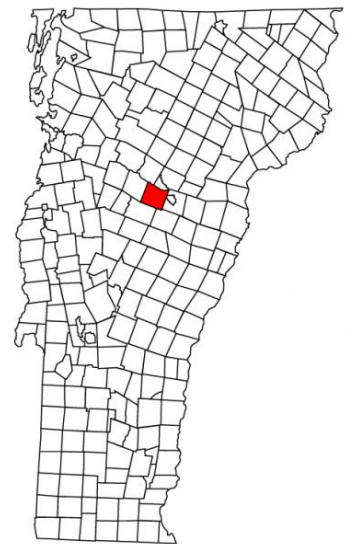
3 COMMUNITY PROFILE

Land Use and Development Patterns

The Town of Berlin is a small, rural, residential community located in the middle of Washington County. It is bordered by Montpelier, East Montpelier, and Middlesex to the north, by Moretown to the west, by Barre Town to the south, and Marshfield and Plainfield to the east.

The town charter was granted in 1763. The first white settlers arrived in 1785.

In 1968 the Central Vermont Medical Center (CVMC) opened in Berlin. This area has continued to grow and is one of the fastest growing areas within the region. Due to the lower risk of flooding, this area appears to be



ideal for long term development without increasing risk to the region.

There is a New Town Center designation in the current mall complex area with adjoining parcels having the Neighborhood Development Area designation, and two designated villages; Riverton and Berlin Corners.

Outside of the New Town Center area and the US-302 corridor, residential development in Berlin still maintains a rural character. Much of the town still has active agricultural lands and there are a diverse array of business dispersed throughout the town.

Land Features

Berlin’s landscape is defined by forested mountains, with the Winooski and Dog Rivers passing thru the community along with the Steven’s Branch and many of their tributaries. This topography varies from river bottom farm fields to steep slopes of the Northfield Range. The town lies at the base of the eastern slopes of the Northfield Mountain Range with Elevations ranging from 498 feet at its lowest elevation to 2126 at Irish Hill on the town’s south eastern edge.

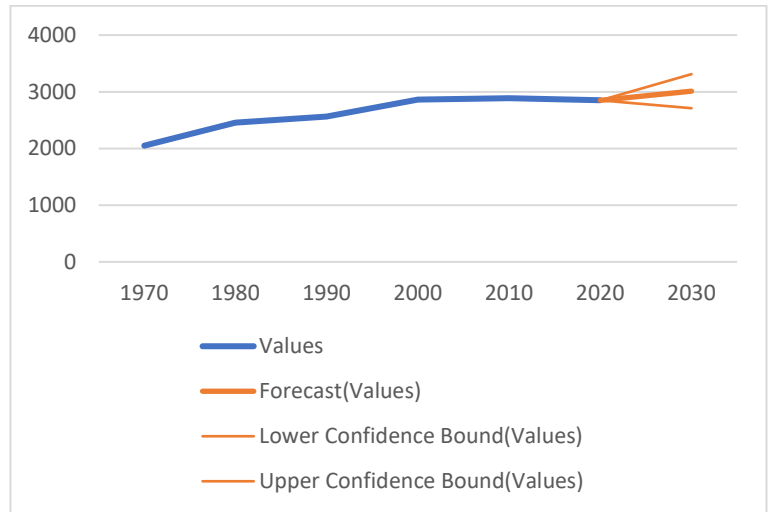
Several extensive land areas are owned by the town, the State of Vermont, and the City of Montpelier. These being the Berlin Pond shoreline and watershed by the City of Montpelier. The state owns the Boyer State Forest. The town forest includes the Irish Hill and part of Paine Mountain.

Demographics and Growth Potential

The 2020 Decennial Census prepared by the U.S. Census Bureau shows an estimated population of 2,849 and 1,261 housing units (from the 2020 census). Over the last 50 years of growth the trend within Berlin is expected to continue especially with Berlin having more development potential away from flood effected areas, than most surrounding communities.

Break down of population by age and percent.

Age	Population	Percent
0-19	546	19.165
20-34	406	14.251
35-49	506	17.761
50-64	632	22.183
65 and older	759	26.641
Total	2849	



Source: Census data with excel projection of expected growth

Between 2010 and 2020, the median age of Berlin has increased by 2.3 years; 49 is the median age, higher than the Vermont median age of 43.2. The portion of the population over 65 is 26.6%, compared to 21.6% in Vermont and 16% in the country. The population density of the town is 79.7 people per square mile compared to an overall state density of 68.

This population data does show a trend that the population of Berlin is aging. Being a small rural community this has direct implications on services and volunteerism. Since the town is served by both volunteer fire and ems services this may become harder to fill these roles as the population continues to age. This also increases the overall risk to the community of any hazards especially those that contribute to power outages with older residents having a higher likelihood of needing medical assistance devices. Older residents also can be more adversely impacted with evacuations during natural disasters. Hopefully this will be addressed as the town continues to grow and provides an increase in

housing. Specifically housing that is affordable for families and first time home owners allowing for a long term thriving community.

Berlin's has very few constraints on it's growth potential. The town is actively planning to increase it's development and has been planning accordingly for the necessary utility infrastructure. Most of the plans for new development are in the new town center area which is ideally located away from most natural hazard risks.

Of Berlin's three designated growth areas, Berlin Corners Village, Riverton Village, and the designated new town center. The Berlin new town center and neighborhood development area has the most potential for new residential development due to having municipal water and wastewater. The town is currently attempting to create a loop system for the water supply to allow maintenance without loss of service this will allow for increased development due to the increased resiliency of the entire water supply system. The rural countryside lacks access to public water and wastewater utilities, due to this the density of development is limited, due to requirements for suitable septic installations. This requires land owners and developers to address this with any building projects, in many of the locations outside of the designated areas. The town has been aligning themselves with the State's guidance for development in villages and town centers for walkability. Also addressing climate change by attempting to limit vehicle miles travelled by increasing density and walkability as a town goal. The town has submitted applications for construction of a walkable path around the new Town Center and neighborhood area but have yet to secure funding for this project.

Climate change is anticipated to increase the frequency of hazards and the intensity, resulting in greater impacts to the community assets identified in the hazard profiles, including people. Land use changes can either increase or decrease the impacts of hazards. Berlin in the wake of recent floods and in implementation of the Community Rating

System (CRS) rules, a part of the National Flood Insurance Program has been making wise decisions on rebuilding and permitting in the Floodway/Floodplain. This has required that no new structures be permitted in the FEMA designated Floodway area. The CRS has allowed residents and businesses to receive discounts on their flood insurance due to making planning and permitting decisions that align with NFIP rules. Berlin is actively engaged in updating their Town Plan as the guiding document for the community. As the population of the community ages, as discussed earlier, overall vulnerability to all hazards may increase due to challenges in communication, preparing for or responding to hazards, mobility challenges, and greater susceptibility to hazards.

It is important as a community that we utilize appropriate preplanning for development to minimize future risk. This can be through bylaws, zoning, and ordinances to create pathways for smart development. With the real world impacts of climate change upon us making sure we address the increased risks of flooding, heavy snow, ice, high winds, and wildfire. As well as more invasive species migration directly impacting our communities. All these besides the greatest risk in Vermont as recognized in the State Hazard Mitigation Plan, fluvial erosion (flash flooding), requires us to make best efforts that we have smart development, away from flood and erosional susceptible areas as paramount to a resilient future.

Precipitation and Water Features

Average annual precipitation is 43 inches; with July being the wettest month. Average annual snowfall is 93 inches; with January and December being the snowiest months.

The Winooski River, Dog River and the Stevens Branch and their many tributaries (Jones Brook, Pond Brook, Cox Brook, and Chase Brook) are the major water features in Berlin.

Drinking Water and Sanitary Sewer

The Public drinking water in Berlin is supplied by City of Montpelier and the Berlin Water Company (privately owned). This system provides water to 111 connections 98 hydrants including dry hydrants and river drafting points for fire protection. All other structures and residences are served either by private wells or springs.

There is municipal sanitary sewer service in some parts of Berlin. By connections to the municipal sewage that is connected and operated by agreement by Montpelier. Sewage though for most residents is handled by on site individual septic systems.

Transportation

Berlin is ±32.9 square miles in size with primary access via Interstate 89, a north-south Principal Arterial-Interstate.

Federal Highway Administration Roads (FHWA) US Route 2- Principal Arterial

Vermont Route 12-Major Collector

Paine Turnpike-Major Collector

US-302- Principal Arterial

Vermont 62 and 63- Principal Arterials

Along with multiple smaller roads or sections. [ArcGIS - Vermont Functional Class and Federal Aid](#)

[Highways](#) for more information. These roads utilize the FHWA disaster response. These areas if damaged during a disaster work with VTrans to develop and report projects/reimbursements through the FHWA process rather than FEMA.

The 2024 VTrans Town Highway data indicates that Berlin has 76.5 municipal road miles: no miles of Class 1; 13.76 miles of Class 2; 36.94 miles of Class 3; 7.41 miles of Class 4 (or functionally Class 4). Of the total municipal road miles, ±48% are paved and 52% are gravel. In addition, there are 16.63 miles of State highway and 9.17 miles of Interstate in Berlin, for a total of ±76.5 miles of traveled highways, including Class 4 roads.

According to the Town's 2025 road erosion inventory, 47% of Berlin's Road mileage is hydrologically connected - meaning it is within 100-feet of a water resource (i.e., stream, wetland, lake, or pond). Proximity to water resources can

make these sections of road more vulnerable to flooding and fluvial erosion. These sections must be up to the standards created for the Municipal Roads General Permit program with a requirement of 7.5% of non-compliant segments being upgraded per year.

According to the Town's 2024 bridge inventory, Berlin has a total of 9 municipal bridges - 1 short structures (6'-20' length) and 8 long structures (>20' length). The town's 8 long structures are inspected every two years by VTrans through the Town Highway Bridge Program. The short structure is reviewed by the Central Vermont Regional Planning Commission while surveying the culverts in the town.

Berlin has a total of 522 culverts in the municipal road right-of-way; all were inventoried in 2024 by the Central Vermont Regional Planning Commission. 7 culverts were listed in critical/urgent and 59 in poor condition and ideally will be considered for replacement and/or upgrade in accordance with Town Road and Bridge Standards. The local road network is maintained by the municipal highway department, whose garage is located on Shed Road.

Electric Utility Distribution System

Electric service to approximately 1481 accounts is provided by the Green Mountain Power, Washington Electric Cooperative, and Northfield.

Public Safety

Fire protection is provided by the Berlin Volunteer Fire Department (BVFD), an all-volunteer organization with FAST squad capabilities. The Fire Department is a member of the Capital Fire Mutual Aid Association. Law enforcement is provided by the Berlin Police department, with support from Vermont State Police and the Washington County Sheriff's department. The nearest hospital is the Central Vermont Medical Center which is located in the center of town. Ambulance services are provided by Barre Town EMS with a station at the BVFD and Northfield ambulance. Continuing this model as the town grows and experiences demographic changes may present issues as far

demographic changes may present issues as far as long-term sustainability. Especially based on overall trends nationwide of securing volunteers.

Emergency Management

Per the Town's Local Emergency Management Plan (LEMP), currently the Emergency Management Director (EMD) is the police chief and is assisted by the town Emergency Management Coordinator an appointed position. They work with others in town to keep the LEMP up to date and coordinate with nearby towns and regional emergency planning efforts.

Vulnerable Populations

Berlin has multiple vulnerable communities within the town's boundaries. Residents who have medical needs and are residing in their homes can choose to be listed in the CARES (citizen assistance registration for emergencies) program. The town Emergency Management director can access this list from the Vermont Emergency Management Watch officer. Most critically is the Central Vermont Medical Center and associated offices. Other locations are Berlin Health and Rehab. There is a Senior living facilities at Chestnut Place and Woodridge Nursing Home. The town also has the Berlin Elementary and Central Vermont Academy. Also Good Samaritan Haven has a transitional housing facility within the town. Finally, there are multiple mobile home parks and cooperatives listed, as well as apartment complexes listed in the LEMP due to their density of residents. Many of these communities are all called out and addressed in the town Local Emergency Management Plan.

4 PLANNING PROCESS

Plan Developers

The Town assembled a Hazard Mitigation Planning Team to participate in updating the Plan. Team members included: Selectboard members, Emergency Management Coordinator, and .

The Central Vermont Regional Planning Commission (CVRPC) assisted the Town with this Plan update. FEMA Building Resilient Infrastructure and Communities (BRIC) funds supported this process.

Plan Development Process

The 2026 Local Hazard Mitigation Plan is an update to the 2020 single jurisdiction mitigation plan. A summary of the process taken to develop the 2026 updated is provided in Table 2.

Table 2: Plan Development Process

Dec 12, 2024: Kick-off meeting. Discussed what an LHMP is; benefits of hazard mitigation planning; current plan status; planning process; outreach strategy; and plan sections. Planning Team working meetings were open to the public. Section 4. Discussed outreach plan and plan for holding public forums. Reviewed possible locations for public forum and next steps.

Jan 8, 2025: Hazard review meeting. Town staff came together to review hazards profile for the town. Discussed previous mitigation actions and requirements of plan. Discussed purpose and developing community profile Sections 2 and 3.

Mar 2025: To notify the Whole Community* of the plan update, the Town posted physical and online notices. Physical notices were posted at the Town Office and Fire Station. Online notices were posted on the Town website (News — Town of Berlin and Front Porch Forum. Posters with a link to the survey were also posted for town meeting day to gather additional input.

*Whole Community stakeholders include: 1) local and regional agencies involved in hazard mitigation; 2) entities with authority to regulate development; 3) neighboring towns; 4) representatives of business, schools/academia, and other private organizations that sustain community lifelines; and 5) representatives of nonprofit organizations that work directly with or provide support to vulnerable populations.

CVRPC posted online notices on the CVRPC website (centralvtplanning.org). CVRPC also direct emailed notice to 1) officials (Selectboard and Planning Commission chairs, Town Managers and Clerks, Emergency Management Directors) in neighboring towns of Northfield, Barre City, Montpelier, Moretown, Barre Town, Williamstown, and Middlesex.

2) Key Partners Friends of the Winooski, Winooski Natural Resources Conservation District, U-32 Unified School District, Central Vermont CWSP, VDH Regional Emergency Preparedness Specialist, VTrans District 6 Projects Manager, Central VT Floodplain Manager). Notice included CVRPC contact

for information on planning process and opportunities for public input – see **Appendix C**.

March 2025: To solicit input from the Whole Community, the Town utilized a survey (see **Appendix D**) and hosted an in-person Community Workshop on 3/13/25 with 8 town members in attendance. Comments were accepted and incorporated. Specifically mud season conditions and limited access to residents due to these conditions. The participants requested that Wildfire probability score be increased. The Town provided notice of the survey and workshop by posting physical notices at the Physical notices were posted at the Town Office, Waitsfield Post Office, Mehuron's Market, and the Joslin memorial library. Online notices were posted on the Town website ([Town of Berlin](#)), and Front Porch Forum.

CVRPC posted online notices on the CVRPC website of the opportunity to provide input on where each hazard might impact the Town; assets most likely to be affected; and preferred types of mitigation actions (Sections 5 and 6). CVRPC also direct emailed notice of the survey and February Workshop to local officials in neighboring towns and Key Partners – see **Appendix C**.

July 9, 2025 Planning Team meeting with Highway Superintendent to discuss locations within the communities transportation network at risk.

August 11, 2025: Planning Team working meeting discussing mitigation actions with public works. (Section 6). Discussion of process moving forward.

August 27, 2025: Met with Planning team to review mitigation actions and score for prioritization and cost benefits to the community and to review at public meeting (Section 6). Discussion of process moving forward.

December 23, 2025: Draft plan posted to town website to gather public comments.

January 19, 2026: Presented mitigation actions to Selectboard along with draft plan for public comment.

February 2, 2026: Discussed draft and board chose to address comments from residents before adoption.

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

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

2025 Zoning Map and associated zoning areas. Referenced to develop Community Capabilities, Integrating into Existing Plans and Procedures, Mitigation Strategy Updates – Changes Since 2020 Plan in Section 6.

2020 US Census Data Used to develop the Demographics and Growth Potential information in Section 3.

2023 State of Vermont Hazard Mitigation Plan Primarily referenced to develop the risk assessment and profiles in Section 5.

2017 FEMA Region 1 Mitigation Ideas for Natural Hazards Used to develop mitigation actions to address impacts from severe winter storms, high wind, and floods. Section 6

2024 Road Erosion Inventory Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

2018 Stormwater Master Plan for the town of Berlin, VT Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

National Oceanic and Atmospheric (NOAA) National Climatic Data Center's Storm Events Database Referenced to develop the risk profile and hazard history in Section 5.

FEMA Disaster Declarations for Vermont Referenced to develop the risk profile and hazard history in Section 5.

Vermont Department of Health Referenced to develop the risk profile in Section 5.

Vermont Department of Conservation Stream Geomorphic Assessments-Structures Used to identify bridges and culverts that are undersized and prone to failure mitigation actions to address floods in Section 6.

Vermont Agency of Natural Resources Natural Resources Atlas Referenced to develop the risk profile in Section 5.

2021 Vermont Climate Assessment Referenced to develop the flood risk profile in Section 5.

2024 Local Emergency Management Plan Primarily used to identify local organizations that support vulnerable populations to ensure these organizations are invited to participate in the plan update.

2024 Structures Inventory (culverts and short structures) Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

2024 FEMA NFIP Insurance Reports Used to determine how many structures are insured, number of repetitive loss properties, and describe NFIP compliance in Section 6.

Mitigation Assistance Program Policy Guide Used to ensure plan meets the Federal mitigation planning requirements, including those for addressing climate change.

Vermont Dam Inventory (VDI) Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

2022 Berlin Town Plan Referenced to develop Community Capabilities, Integrating into Existing Plans and Procedures, Mitigation Strategy Updates – Changes Since 2019 Plan in Section 6.

VTrans Transportation Resilience Planning Tool Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

2023 FEMA Local Mitigation Planning Handbook Used to ensure plan meets the Federal mitigation planning requirements, including those for addressing climate change.

2013 FEMA Mitigation Ideas Resource for Reducing Risk to Natural Hazards Used to develop mitigation actions to address impacts from severe winter storms, high wind, and floods. Section 6

VTrans Town Highway Bridge Inspection Reports Referenced to develop the risk profile in Section 5 and mitigation actions to address floods in Section 6.

Mitigation Strategy Update - Changes Since 2020

The 2020 local hazard mitigation planning effort analyzed natural hazards and the risk they posed to the Town of Berlin. The risk assessment resulted in the categorization of High, Medium and Low risk level hazards. Floods, extreme cold, and winter storms were ranked the highest risk threats in 2020. Fluvial erosion, and high winds were ranked as moderate. With all others receiving a rank of low risk. Actions proposed in 2020 focused on mitigating risks from flooding due to their frequency and severe nature.

As the Town has sought to implement the 2020 mitigation strategy, they have looked for opportunities to incorporate information and recommendations from the 2018 Plan into other plans, programs, and procedures. They were successful in doing so in recent Town Plan and Zoning Ordinance updates.

The Berlin Town Plan, amended in 2022, serves as the Town's framework and guide for reaching community goals, including those for how future growth and development should proceed.

It includes flood resilience and land use policies and actions to support the goal of mitigating risks to public safety, critical infrastructure, historic structures, and municipal investments posed by flooding and fluvial erosion.

The Town Plan is the basis for local land use controls such as those in the Berlin Zoning Bylaws, amended in 2022 and currently undergoing another amendment update. Berlin Zoning Bylaws includes Flood Hazard Area Districts to ensure the selection, design, creation, and use of development in these hazard areas is reasonably safe and accomplished in a manner that is consistent with public wellbeing, does not impair stream equilibrium, flood plain services, or the stream corridor as well as are in compliance with National Flood Insurance Requirements.

In addition, Berlin made significant progress in completing other mitigation actions identified in the 2019 Plan – see Appendix A.

They have much to be proud of and noteworthy mitigation accomplishments are highlighted below.

Improvements to the town roads especially in culvert upsizing in the response to Flooding from DRs(4720 and 4810) have made the town safer. These mitigation investments have 1) strengthened the community's Transportation lifeline; 2) reduced risk to infrastructure; and 3) supported Town efforts to comply with the Municipal Roads General Stormwater Discharge Permit and protect water quality by controlling erosion and stormwater runoff from municipal roads. The town's implementation of National Flood Insurance Rules in permitting have also made residents safer by not allowing the rebuilding of two mobile home parks that were within the identified floodway. These were not allowed to be permitted for rebuilding as having too great a risk to the community, first responders, and residents and would have been a violation of NFIP and CRS requirements.

Generators have been installed at the Water utility pump stations. These mitigation investments have 1) strengthened the community's Energy; Communications; and Food, Water, Shelter lifelines; 2) reduced risk to people during power outages and 3) provide continuity of emergency and vital town services during power outages.

Actions taken by Berlin since 2020 have made the community more prepared and less vulnerable to future natural hazard impacts. The town has been attempting to concentrate development in the new town center designated area around the Berlin Mall area. Which is on the Berlin plateau and has minimal risk of flooding.

As described in the Community Profile above, Berlin's population has been steady and growth potential is believed to be limited by a lack of housing. The town has been actively developing in

the new town center designation area. It is expected that the town population will grow with this increase in housing. This area is ideal for development due to the low risk of natural hazards in this area.

Changes in population and development since 2020 have not made Berlin more vulnerable to natural hazards. Rather changing weather conditions have most influenced the Town's current mitigation strategy.

Climate change is increasing the frequency, duration, and intensity of storms, floods, fires, and extreme temperatures across the nation. Local communities are feeling the impacts of climate change now, and these multi-hazard trends are expected to continue to increase in severity over the next century¹.

As a result, Berlin considered the effects of future conditions, like climate change, on the type, location, and range of intensities of identified hazards when they conducted the risk assessment in 2024. The highest risk hazard impacts that the Town believes they are most vulnerable to, remained essentially the same as those from 2019:

Floods associated with thunder and/or winter storms and ice jams.-These continued as the main threat to the community and Vermont in general with the 3 floods between July 2023 -July 2024. With inundation flooding receiving the highest score and fluvial erosion/flash flooding listed as number 2.

In addition to the traditional natural hazards assessed in 2025, the Town also considered infectious disease to align with the hazards identified in the 2023 State Hazard Mitigation Plan. This was ranked as the 3rd greatest threat to the community. Which is definitely influenced by the Covid outbreak of 2020.

The primary mitigation goal in the 2025 Plan is to increase the Town's resilience to natural hazards by advancing mitigation investment to reduce or avoid long-term risk to people, homes, neighborhoods, the

¹ FEMA Hazard Mitigation Assistance Program and Policy Guide, March 23, 2023.

local economy, cultural and historic resources, ecosystems, and Community Lifelines.

When evaluating mitigation actions, the Town selected actions that support the mitigation goal and are acceptable and practical for the community to implement.

5 HAZARD IDENTIFICATION AND RISK ASSESSMENT

Local Vulnerabilities and Risk Assessment

One of the most significant changes from the 2020 Plan is the way hazards are assessed. To be consistent with the approach to hazard assessment in the 2023 State Hazard Mitigation Plan, the Hazard Mitigation Planning Team conducted an initial analysis of known natural hazard events* to determine their probability of occurring in the future (high probability events are **orange** in Table 4).

The Team then ranked the impacts associated with the natural hazard events based on 1) probability of occurrence and 2) potential impact to people, infrastructure, the environment, and local economy.

This assessment considered the effects of future conditions, like climate change, on the type, location, and range of intensities of identified hazards.

The ranking results are presented in Table 4 and reflect the following **Primary Hazard Risks** that the Town believes they are most vulnerable to:

- **Floods both Fluvial and Inundation:** associated with thunder and/or winter storms and ice jams.
- **Infectious Disease Outbreak**

Each of the **hazard risks** are profiled in this section. Lower risk hazards impacts do justify mitigation but to a lesser extent due to a low probability of occurrence and/or low impact. See the State Hazard Mitigation Plan if you are

interested in more information on the lower risk hazards. [State Hazard Mitigation Plan | Vermont Emergency Management](#)

Hail and Earthquakes were decided by the planning team to be outside of the realm of justification within our region for mitigation actions. Hail being that the historic record of damage being primarily minimal and to vehicles. Earthquakes even though historically small in Vermont do occur but were deemed to be of minimal threat and with no building codes basically impossible for a town to develop effective mitigation strategies.

*This plan defines a natural hazard as a source of harm or difficulty created by a meteorological, environmental, or geological event.

FEMA Local Mitigation Planning Handbook, May 2023

Table 4: Community Hazard Risk Assessment

2025 Hazard Mitigation Plan - Hazard Assessment							
Hazard Impacts	Probability	Potential Impact					Score*:
		Infrastructure	Life	Economy	Environment	Average:	
Fluvial Erosion	3	2	1	3	3	2.25	6.75
Inundation Flooding	3	3	1	4	4	3	9
Ice	2	1.5	2	2	2	1.875	3.75
Snow	3	1	2	1	2	1.5	4.5
Wind	2.5	1	1	1	1	1	2.5
Heat	2	1	2	1	1	1.25	2.5
Cold	3	1	2	1	1	1.25	3.75
Drought	2	1	1	2	1	1.25	2.5
Landslides	1	1	1	3	3	2	2
Wildfire	2	1	1	1.5	2	1.375	2.75
Earthquake	1	1	1	1	1	1	1
Invasive Species	2	1	1	2	2	1.5	3
Infectious Disease Outbreak	3	1	3	4	1	2.25	6.75
Hail	1	1	1	2	1	1.25	1.25
*Score = Probability x Average Potential Impact							

*Score = Probability x Average Potential Impact

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

IMPACT DEFINITIONS

INFRASTRUCTURE IMPACTS: (Effects on Roads, Bridges, Structures, Homes)

- 1 – Minor: Localized/Isolated impacts to Infrastructure (Temporary loss of use)
- 2 – Moderate: Neighborhood level impacts (1-2-day loss of use)
- 3 – Severe: Community-wide impacts (2-5-day Loss of use)
- 4 – Disastrous: Regional losses of roads, bridges, homes (Extensive replacement/rebuild)

LIFE SAFETY ISSUES: (Health and Welfare of Population)

- 1 – Minor scrapes/injuries
- 2 – Occasional Hospitalization required due to injuries
- 3 – Multiple hospitalizations required and/or fatality
- 4 – Community-wide hospitalizations and/or fatalities

ECONOMIC IMPACTS: (Direct recovery costs to municipality and residents)

- 1 – < \$10,000 in damages (Can generally be handled within budget or via insurance)
- 2 – \$10,000-\$100,000 (May require assistance for the uninsured or large impact on local budget)
- 3 – \$100,000-\$1,000,000 (Requests of assistance/FEMA eligible)
- 4 – > \$1,000,000- (All resources used, Possible National Guard use)

ENVIRONMENTAL IMPACTS: (Effects to municipal operations and environment)

- 1 - Negligible: Short term impacts, low clean-up costs for spills
- 2 - Minor: Moderate clean-up costs, temporary redirection of municipal resources
- 3 - Moderate: Extended redirection of local resources/ impacts to normal operations, high clean-up costs
- 4 - Major: Long-term recovery efforts (could take years for full recovery or permanent loss of use)

Highest Risk Hazard Profiles



Floods (fluvial erosion, inundation, dam failure) can damage or destroy property; disable utilities; destroy or make roads and bridges impassable;

destroy crops and agricultural lands; cause disruption to emergency services; and result in fatalities.

People may be stranded in their homes for a time without power, heat, or communication or they may be unable to reach their homes. Long-term collateral dangers include the outbreak of disease, loss of livestock, broken sewer lines or wash out of septic and wastewater systems causing water supply pollution, downed power lines, loss of fuel storage tanks, fires, and release of hazardous materials.

As noted in the 2023 State Hazard Mitigation Plan and 2021 Vermont Climate Assessment, the most common recurring hazard event impacting Vermont communities is flooding. There are two types of flooding: inundation and flash flooding. Inundation is when water rises onto low lying land. Flash flooding is a sudden, violent flood which often entails stream bank erosion (fluvial erosion).

Inundation flooding of land adjoining the normal course of a stream or river is a natural occurrence. If these floodplain areas are in their natural state, floods likely would not cause significant damage. However, most business districts within Vermont are built within this floodplain due to the historical significance of water power.

While inundation-related flood loss can be a significant component of flood disasters, the more common mode of damage in Vermont is fluvial

erosion, often associated with physical adjustment of stream channel dimensions and location during flood events. These dynamic and often catastrophic adjustments are due to bed and bank erosion of naturally occurring unstable stream banks, debris and ice jams, or structural failure of or flow diversion by human-made structures.

Damage from high flows is the single most costly type of disaster in Vermont, primarily due to the erosive power of water. Many roads and culverts conflict with the room needed by streams and rivers.”
2021 Vermont Climate Assessment

Several major flooding events have affected the state in recent years, resulting in multiple Presidential Disaster Declarations. From 2003 to 2019, Washington County experienced roughly \$88.82 million in municipal property damage due to flood events. With the total from DR-4720 the July 10th 2023 flood being 352.7 million in County wide damages. The totals from the most recent July 2024 flood event are still being totaled at the time of this writing.

The worst flooding events in recent years to strike the town of Berlin came in July 10 of 2023 (DR4720), which dropped up to 5-7+ inches of rain in some areas of Washington County. Followed by July 10, 2024 (DR-4810) which dropped 3”-6” of rain and caused severe fluvial erosion of many water and road ways.

The town is concerned with the increased temperatures in winter seasons brought on by climate change. The increase in temperature fluctuations and associated precipitation is worrisome of rain on snow events impacting the region and specifically the town of Berlin due to its location and associated mountains. The snowpack can become hazardous due to the rapid melting from rain on snow and sudden warming, fueling extreme and rapid runoff.



Flood of 2023

Berlin is vulnerable to inundation flooding primarily along the Winooski River, the Dog River and the Steven’s Branch. A wide range of assets are at risk from inundation flooding in these areas. There are 136 buildings in the FEMA identified Special Flood Hazard Area (SFHA) and State identified River Corridor; as well as roads, culverts, bridges, and water wells listed on the Vermont ANR map viewer.

With inundation flooding, there are cascading impacts involving infectious disease as floodwater can contain numerous types of infectious agents and hosts insects that transmit disease. Mosquitos, for example, breed in standing water and when their population increases, so does the risk of diseases they transmit – such as West Nile Virus.

Flash flooding can occur any time the area has heavy rain. It can impact areas that are located outside of designated floodplains, including

along streams confined by narrow valleys (also known as River Corridors). Again, a wide range of assets are at risk from flash flooding. (outside of designated floodplains); including roads, culverts, bridges, homes and businesses and dams.

The most common type of flash flood damage is road washouts. When runoff volumes exceed the capacity of the stormwater collection system (ditching and culverts), washouts can occur.

The town's structures and road erosion inventories as well as VTrans highway flood vulnerability and risk tools were used to help identify locations and assets at risk from flash flooding.

Sections of several roads have a history of flash flooding – Route 12 in multiple locations, US 2, US-302, Junction Road, Comstock Road, West Hill Road and Dog River Road. The locations all show as at risk of inundation or fluvial erosion in the Vermont Transportation Resiliency Planning Tool.

Culvert failures and road washouts can have a significant negative impact on the Town. Especially if they occur on roads considered locally important routes for through-traffic, short-cuts, detours, and/or access to critical facilities – such as VT Route 12, US 2, and Rt 302, Vt 63 and VT 62.

When roads are impacted by flooding, the Town coordinates with the fire department, town road crew and State dispatch to close roads and set up detours. Road closures can create longer commute times and longer emergency service response times.



Route 12 damage 2023

In addition to stormwater runoff from roads, ice jams and dam failures can result in flash flooding in Berlin. Ice jams on the Dog and Winooski Rivers and Steven's Branch are possible, with impacts to the roads, infrastructure and housing primarily found within the FEMA identified SFHA.

Dams

There are Nine dams in Berlin listed in the Vermont Dam Inventory (a database managed by the VT Dam Safety Program containing spatial, structural, historic, and regulatory information on dams in the state). Three are classified as minimal hazard potential and one is a breached dam. None of the dams are owned by the town and there are no high hazard potential dams in Berlin. There are three low hazard potential dams one is the Montpelier # 4 dam which is owned and maintained by the Winooski Hydroelectric Company, the Montpelier Reservoir (Lower) part of the Montpelier Water system and the Berlin Pond Dickey Dam which is being studied for replacement. Finally there is one significant hazard potential dam the Newbrough Upper which has a 3 acre surface pool and a poor condition rating but who's failure would most likely be limited to impacting Muzzy Road unless its failure happened during an already occurring flooding event. The Montpelier #4 hydroelectric

dam is also currently permitted and inspected by the Federal Energy Regulatory Commission, all others are permitted and inspected by the VT ANR.

Upstream of the town on the Winooski River is a high hazard potential dam. The Marshfield #6 dam that is owned by Green Mountain Power (GMP). The town is included in the Emergency Action Plan (EAP) for notification in case of release. In the event of a release the impact would be primarily in the State designated river corridor area. Depending on the timing of a release if during a already occurring flood event this could drastically impact transportation infrastructure. Forwarning of any impending release would be vital to remove residents and motorists from the impact zone of a release. The town should take every opportunity to work with GMP on both the EAP and exercises that are coordinated by them.

High hazard potential dams upstream of the Town on the Steven's Branch are the East Barre Dam which is a flood control dam owned by the State of Vermont's Department of Conservation and regulated by the US Army Corps of Engineers on the Jail Branch. The East Barre Dam only impounds water during high flow events. It is an earthen dam that is 1,632 feet long and 60 feet high with a maximum storage capacity of 23,550 acre-feet. It allows water passage through a culvert that when exceeded the overall capacity causes the impoundment to fill. The second-high hazard dam is the Thurman Dix Reservoir Dam with a poor condition rating. This dam is an earthen dam that holds the water supply for and is owned by Barre City. Its normal storage pool is 1,070 acre-feet and maximum capacity is 2,280 acre-feet. The City is currently working with an engineer to assess the needs for the dam to improve its condition. The Thurman Dix dam failure extent would most likely be entirely within the Town of Orange since the inundation area would lie behind the East Barre dam.

Finally there is a high hazard potential dam on the North Branch. The Wrightsville Dam, located on the North Branch of the Winooski River in the northeast part of Middlesex, is a flood control and hydroelectric dam owned by the State of Vermont's Department of Environmental Conservation (DEC) and regulated by the DEC. The extent of flooding from dam failures is outlined in the Appendix E.

Community survey respondents ranked damages to roads and bridges as particularly important (18 out of 22) to protect against future severe weather impacts.

Flash flooding often entails stream bank or fluvial erosion. Several existing studies were used to help identify locations and assets at risk from fluvial erosion, specifically, a 2009 Dog River Corridor Plan which performed SGA methods and the Central Vermont Stormwater Master Plan completed in 2019.

Stream Geomorphic Assessments (SGAs) provide information about the physical condition of streams and factors that influence their stability. The 2009 Dog River Corridor Plan SGA identifies priority locations for river corridor protection, planting stream buffers, stabilizing stream banks, removing berms, and removing/replacing human-placed structures (i.e., dams, bridges, culverts).

Stormwater Master Planning (SWMP) involves identifying stormwater, sediment, nutrient, and septic inputs to waterways and designing projects to mitigate those inputs; either eliminating them at the source through green stormwater infrastructure, septic system improvements, back road projects or improving floodplain access within the stream network to increase sediment attenuation.

The 2019 Central Vermont SWMP (Berlin) recommended 20 projects to reduce environmental impacts of nutrient and sediment loading to the Winooski River, as well as mitigate flood vulnerability to municipal or state road and drainage infrastructure.

As demonstrated in the above referenced studies, environmental impacts from flooding can be significant, especially to the water quality in the Dog River, the Stevens Branch and the Winooski River. This can in turn have an adverse impact on local tourism and recreation. Flood events with associated road closures can also have a short-term impact on the local economy due to fewer shopping trips and commuter delays and a long term impact to the entire community due to costs of rebuilding and financing debt while waiting on Federal and State reimbursements.

Extent of risk to the town is found in the special flood hazard area for inundation flooding. Fluvial erosion is much more diverse and found near any stream channel either perennial or ephemeral/intermittent and damages can start to road infrastructure with as little as .5"/hour and increases with longer durations.

183 buildings are in the Special Flood Hazard Area (15% of community structures); mostly single family dwellings and businesses.

According to FEMA, 14% of these properties have flood insurance. In total, these 26 policies cover \$9,488,000 in value.

There are 4 repetitive loss properties.

Floods Hazard History

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

7/10/2024: DR-4810 5-7" rain: \$ Still being determined

12/18-19/23: 2" of rain on snow event

7/11/2023: DR4720 5-9" rain: ~\$352.7 million in county damages.

7/20/2021: Heavy rain: \$50,000 county damages

7/14/2020: 3-4" rain: \$5,000 town damages

11/1/2019: 2-4" rain: \$250,000 county damages

6/20/2019: Heavy rain: \$25,000 county damages

5/20/2019: Heavy rain: \$25,000 county damages

4/15/2019: DR4445 1" rain with significant snow melt:

7/1/2017: DR4330 3-4" rain the previous 3-4 days with flash flooding on 7/1/17: \$240,000 county damages

7/19/2015: Heavy rain: \$1,000,000 county damages

4/15-18/2014: DR 4178 heavy rain on snow event \$250,000 county damages

6/25-7/10/2013: DR4140 1-3" of heavy rain over a half hour: \$625,000 county damages

8/28/2011: DR4022 Tropical Storm Irene with 3-7+" rain: \$75,000,000 Public county damages

5/26-27/2011: DR4001 3-5+" rain on snow event: \$5,500,000 county damages

5/20/2011: DR4043: Heavy rain: \$400,000 county damages

4/23-5/9/2011: DR4043 rain on snow event: \$1,000,000 county damages

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



Landslides: A landslide is the sliding of a large mass of rock, earth, or debris, down a sloped section of land. Landslides can be caused by rainstorms, fires, alternate freezing or thawing and/or by the steepening of slopes by erosion or human modification. In Berlin, landslides tend to occur or are exacerbated by fluvial erosion as most of the landslides occur on or near a stream bank, or during extreme wet conditions in areas of clay substrate.

Landslides have three major causes: geology, morphology, and human activity. Geology refers to characteristics of the material itself. The earth or rock might be weak or fractured, or different layers may have different strengths and stiffness. Morphology refers to the structure of the land. For example, slopes that lose their vegetation to fire or drought are more vulnerable to landslides. Vegetation holds soil in place, and without the root systems of trees, bushes, and other plants, the land is more likely to slide away.

Human activity, such as agriculture and construction, can increase the risk of a landslide. Irrigation, deforestation, excavation, and water leakage are some of the common activities that can help destabilize, or weaken, a slope.

The Town of Berlin has 10 landslide locations within the town as listed on the Vermont Agency of Natural Resources Landslide map that was last updated in 2020.

Total damages for landslides are not tracked well within the State of Vermont since often landslides are in association with Fluvial Erosion the damages are often lumped together there. With the increase in precipitation trends due to climate change the risk from landslides is increasing. This can be addressed through land use regulations and mitigation of surface runoff from human actions and development. Historically landslides in Berlin have been small at ~0.1 of an acre or less and are generally related to gully erosion.

Extreme Cold, Snow, and Ice Hazard History

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

1/11-14/2022: 10-40 below zero with winds: no reported damages
 12/18/2021: 5-7" snow \$10,000 county damages
 1/16/2021: 3-6" wet snow: \$50,000 county damages
 3/23/2020: 7-10" snow: \$5,000 county damages
 2/7/2020: 10-16"; ¼" ice: \$20,000 county damages
1/16/2020: DR 4474 6-10" snow: \$10,000 county damages
 3/22/2019: 9" snow: \$25,000 county damages
 2/12/2019: 7-15" snow: \$10,000 county damages
 1/29/2019: 6-10" snow: \$10,000 county damages
 1/19/2019: 10-18" snow: \$25,000 county damages
 1/8/2019: 8-20+" snow: \$25,000 county damages
 11/26/2018: 6-14" heavy snow: \$125,000 county damages
 3/13/2018: 12-30" snow: \$20,000 county damages
 3/7/2018: 7-13" snow: \$10,000 county damages
 1/7/2015: 0-10 degrees with wind of 15-30 mph creating wind chills colder than 20-30 below zero: no reported local damage
12/9/2014: DR4207 10-20" snow: \$250,000 county damages



Severe Storms with Snow and Ice events typically occur between the months of December and March in the Central Vermont Region. They can include

snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Events can also be associated with strong wind or floods, increasing the potential hazard.

Ice storms are characterized by ice accretion from freezing rain, which can weigh down trees and power lines, causing outages and potentially occurring in conjunction with flooding in rain on snow events. Ice storms can occur alone or in conjunction with snow storms, blizzards, and extreme cold. Significant accumulations of ice can cause hazardous conditions for travel, weigh down trees and power lines, and cause power outages.

Freezing rain can also be combined with mixed precipitation and snowfall, hiding ice accumulation and further hindering travel. Ice accumulation on waterways is associated with the potential for ice jams and flooding.

The NOAA breakdown based off of light winds, under 10 mph for ice accumulation:

- .25 inch, isolated power outages
- .50 inch, widespread outages
- .75 inch, major damage
- 1.0 inch, devastating damage

Severe winter storms bring the threat of heavy accumulations of snow, cold/wind chills, strong winds, and power outages that result in high rates of damage and even higher rates of expenditures. A heavy accumulation of snow, especially when accompanied by high winds, causes drifting snow and very low visibility. Sidewalks, streets, and highways can become extremely hazardous for pedestrians and motorists. Severe winter storms develop through the combination of multiple meteorological factors. In Vermont and the northeastern United States, these factors include the moisture content of the air, direction of airflow, collision of warm air masses coming up from the Gulf Coast, and cold air moving southward from the Arctic.

The costs of these storms come in the form of power outages due to heavy snow or ice, damaged trees, school closings, and traffic accidents. From 2014 to 2022, Washington County experienced \$585,000 in property and crop damage from winter storms.

There have been two winter storm-related federally declared disasters in the county (the ice storm of January 2020 – DR 4474; and December 2014 DR 4207.

Extreme cold can have impacts on public health and safety, especially if extreme temperatures coincide with power outages, which can cut off

heat and communication services. Severe winter storm impacts can put vulnerable populations (e.g., older adults, children, sick individuals, pets) at even greater risk.

See the strong wind profile below for more information about the town’s vulnerability to power outages.

Snow accumulation typically does not result in loss of road accessibility. The town’s fleet of snowplows ensures all roads are accessible, even in major accumulation events. Roads adjacent to critical facilities are well maintained and along with connector routes, are prioritized in winter storm events.

Environmental impacts are predominantly tree damage. Extreme snow and ice events typically have a short-term impact on the local economy – fewer shopping trips and commuter delays.

In the last 50 years the largest historical event was in 2014 DR4207 with up to 24” of wet snow that caused widespread power outages and vehicle accidents. Extent of Ice is harder to track but 0.5” of ice can add 500 lbs. of extra weight to power lines. Ice can cause a 30% increase the weight of tree branches. Anything greater than a 0.25” of ice will start to cause power outages and greater than 0.50” causes widespread tree and power line damage with dangerous and impassable roads.

WSSI Descriptor	General Description of Expected Storm Severity Impacts
None	No snow or ice forecast. No potential for ground blizzard conditions.
Limited	Small accumulations of snow or ice forecast. Minimal impacts, if any, expected. In general, society goes about their normal routine.
Minor	Roughly equates to NWS Advisory Level criteria. Minor disruptions, primarily to those who were not prepared. None to minimal recovery time needed.
Moderate	Roughly equates to NWS Warning Level criteria. Definite impacts to those with little preparation. Perhaps a day or two of recovery time for snow and/or ice accumulation events.
Major	Significant impacts, even with preparation. Typically several days recovery time for snow and/or ice accumulation events.
Extreme	Historic. Widespread severe impacts. Many days to at least a week of recovery needed for snow and/or ice accumulation events.



Strong wind can occur alone, such as during straight-line wind events, or it can accompany other natural hazards,

including severe thunder and/or winter storms.

High winds pose a threat to the safety of Berlin's citizens and property. The National Weather Service (NWS) issues a wind advisory when winds are sustained at 31 to 39 mph for at least one hour or any gusts 46 to 57 mph. Sustained winds of 40 to 73 mph or gusts of 58 mph or higher cause the NWS to issue a High Wind Warning.

FEMA's National Risk Index defines strong wind as damaging winds that exceed 58 mph. Strong wind poses a threat to lives, property, and vital utilities primarily because of flying debris or downed trees and power lines.

From 1996 to 2022, wind events caused more than \$1.270 million in property damage in Washington County, with \$450,000 due to one event in December 2022.

Strong wind is possible here; Berlin is susceptible to high directional winds town wide. Many storms with high winds result in downed trees as well as damaged phone and power lines, buildings, and other property.

Downed trees within the road right-of-way are the root cause of many power outages. Roads that pass through dense wooded areas are prone to downed trees, which often can lead to fallen power lines.

Power outages are the main reason for disrupting communications, which are crucial in times of crisis. For example, the loss of phone service is of particular concern for Berlin's vulnerable populations and residents. Landline phones that have been converted from copper wire to fiber rely on an in-home battery back-up. The battery life is typically less than eight hours, whether the phone is used or not. Though many residents use cell phones, longer power outages and damage from high winds further complicating the

problem of contacting emergency services during power outages. Limitations with cell phones during prolonged power outages is that most cell towers have only 12 hours of backup power available.

Telecommunications are also needed for warning systems before a disaster, as well as for response during and recovery after. During a disaster, municipal response is managed by the local Emergency Operations Center (EOC) as designated in the town LEMP.

To mitigate the impacts of power outages, the following public buildings/critical facilities have been equipped with backup power or generator hookup: Water supply pump stations, fire station, town hall and Highway Garage, and Berlin elementary school (as the emergency shelter).

The public buildings lacking backup power is the Riverton fire station.














In addition to power outages, downed trees during strong wind (and heavy snow/ice) events can damage buildings and other property and in rare cases result in fatality. The most common type of damage that survey respondents reported seeing was downed trees. Seventy-one percent (81%) of community survey respondents reported having experienced damage during a past severe weather event.

Environmental impacts are predominantly tree and roof damages. Strong wind events with associated power outages can have a short-term impact on the local economy due to business closures. Downed power lines also can increase the risk of wildfire when conditions are present.

Vermont's Emerald Ash Borer infestation was first detected in 2018 in northern Orange County. The potential risk to public and private structures and impacts on the local economy have not been

quantified. But the impact of invasive pests has a real economic effect on landowners and utilities in dealing with dead trees and their potential to cause damages.

Beaufort Scale

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



Droughts in the Northeast. We frequently experience what are referred to as “flash” droughts, defined as rapid onset of intense dry periods that can follow periods of normal or above normal precipitation. These may last from 2-6 months, and can have profound impacts within the region, on agricultural losses, shortages of water supply and very low stream flows. This pendulum often swings from a dry year to a wet year.

The Town’s risk of droughts is mainly addressed through the Ordinances for the Town water supply. Most residents of the Town are on private wells and bear the costs and risks of mitigation themselves. The Town’s Water Ordinance has the appropriate language for conserving water and limiting non-essential usage during a drought emergency.

There have been 4 instances of D3 level droughts in Washington County Vt since 2000. One longer event in 2016,2018, 2020, and the current drought of 2025 that a disaster declaration has been submitted for.

Strong Wind Hazard History

These are the most up to date significant events impacting Berlin. Federal declarations are depicted in **bold**. Damages are to Washington County.

- 12/23/2022:** 50-60+ wind gusts: \$450,000
- 10/30/2017: 40 mph wind: \$250,000
- 2/26/2010: 55 mph wind: \$15,000
- 2/17/2006: 37 mph wind: \$10,000
- 9/29/2005: 35 mph wind: \$50,000
- 11/13/2003: 35 mph wind: \$10,000
- 10/15/2003: 50 mph wind: \$10,000
- 3/10/2002: strong wind: \$5,000
- 12/12/2000: strong wind: \$5,000
- 3/28/2000: strong wind: \$5,000
- 9/17/1999: strong wind: \$75,000
- 11/23/1998: strong wind: \$10,000
- 2/22/1997: 50 mph wind: \$15,000



Wildfires are not often much of a concern within our region, although the spring and fall can be times when dry hazardous conditions exist. Opportunity for wildfires occurs due to the lack of foliage in these seasons, before spring green up or in the fall after foliage has died back when combined with dry conditions. Historically, Vermont has seen the most wildland fires between March and June. These are generally times when dry conditions exist for an extended period causing drought conditions. Ignition of wildfires is predominantly caused by human activity and mainly from debris fires that are not contained or not supervised. Thus, messaging when conditions exist is very important to convince individuals not to make

mistakes in relation to ignition sources. This messaging is handled by the town fire warden in association with the fire department.

There have only been small isolated wildfires within the last 50 years within Washington county. But due to the shifting weather patterns due to climate change this should be planned for due to spring and fall risk with flash droughts. The largest wildfire/brush fire in Berlin records is ~10 acres.



Invasive Species The National Invasive Species Council defines an invasive species as one that is non-native to the ecosystem under consideration and

whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can overwhelm native species and their habitats, forcing the native species out. They are considered to pose the second greatest threat to biodiversity globally. Invasive plants in Vermont, such as Japanese knotweed, common reed (Phragmites), purple loosestrife, and garlic mustard can change soil composition, change water tables, and disrupt insect cycles. They often lack food value upon which wildlife depends. Some invasive animals prey heavily upon native species while others, such as the alewife and zebra mussel, out-compete native species for food and nutrients with significant impacts reverberating up and down food chains.

Invasive pests such as Emerald Ash Borer (EAB), first found in Vermont in 2018, have serious financial implications for forest landowners and municipalities alike. EAB feeds on ash trees in Vermont, deeply damaging each tree and hindering its ability to move carbohydrates and water resources as necessary. Infected trees will die between three and five years after the introduction of EAB. Productive timber is destroyed by EAB and trees along roads become hazards as they die and disrupt powerlines. Preventative measures can slow the further spread of these insects and protect native ash populations. Additionally, invasive

species can directly or indirectly cause harm to human health. Giant hogweed, wild parsnip and wild chervil are three invasive plant species in Vermont that have phytophototoxic properties, meaning direct contact of their sap with human skin can cause a chemical reaction that makes skin hypersensitive to ultraviolet light. Vermonters have received serious skin burns from the toxicity of the sap of these plants combined with exposure to sunlight. Another example is that of Japanese barberry, which has been proven to increase the incidence of Lyme disease by providing sheltered habitat that increases the abundance of small rodents, which act as hosts to the ticks that carry Lyme disease pathogens.

The risk of invasive species is higher in more disturbed soils and developed areas. But the extent is varied, Emerald Ash Borer is more likely to be found in the heavily wooded upland slopes with Japanese knot weed along the river and stream banks. The Town generally will follow the State of Vermont guidance from the Agency of Natural Resources on how to deal with invasives and work with partners to mitigate their damages.

The town currently has been implementing a right of way (ROW) removal plan for impacted ash trees on town property.



Infectious Disease The Vermont Department of Health defines an infectious disease as one that is caused by micro-organisms, such as bacteria,

viruses or parasites. A vector-borne disease is an infectious disease that is transmitted to humans by blood-feeding arthropods (including ticks), mosquitoes and fleas, or in some cases by mammals (e.g. rabies). Climate change is increasing the likelihood of viral and bacterial pathways through warmer temperatures and in association with floods. Due to the climatic associated shifts due to the warming climate the seasons that vector borne organisms can survive in has increased by 7 days over the last 2 decades. The town is particularly concerned with the threat of

infectious disease as this directly impacted the town during the COVID epidemic (DR-4532). That event showed that outbreaks can drastically impact towns in loss of tax revenue and with the regional hospital being located in the town.

According to the Vermont Department of Health, infectious disease dynamics depend on a range of factors, including: land use, human behavior, climate, efficacy of healthcare services, population dynamics of vectors, population dynamics of intermediate hosts and the evolution of the pathogens themselves. Many of these diseases require continuous monitoring, as they present seasonal threats to the general population. An epidemic emerges when an infectious disease occurs suddenly in numbers that are in excess of normal expectancy. Infectious disease outbreaks put a strain on the healthcare system, can cause continuity of operations challenges for local businesses, impact the economy, and interrupt daily life for everyone within a community. These outbreak incidents are a danger to emergency responders, healthcare providers, schools, and the public. Examples include Coronavirus 19 (Covid-19) which was a federally declared disaster DR-4532, influenza (e.g. H1N1), pertussis, West Nile virus, and many other diseases.

Upon consideration of five climate and health reviews, The Vermont Department of Health has separated vector-borne and other infectious diseases into five threat categories (Table 27). More details on this classification system and the diseases can be found in the 2016 Vermont Climate Health Report.

There is no scale or metric for prioritizing infectious disease at the Town level. The easiest method would be to track hospitalizations by day increase above the average. Or in a pandemic scenario record of days with closed businesses due to risk of infection.

The primary vulnerability would be to those who are immune compromised, elderly and young

populations and are most susceptible to respiratory viruses.

Readers should look to the Vermont Department of Health for more information on significant infectious disease outbreaks, such as epidemics and pandemics. The Town will monitor these for up to date threat information and follow the appropriate protocols developed by these agencies as necessary.

Table 27: Threat Categories of Vector-Borne and Other Infectious Disease

Threat Classification	Disease
Diseases already present in Vermont that may be exacerbated by climate change	West Nile Virus
	Eastern Equine Encephalitis
	Lyme Disease
	Anaplasmosis
	Babesiosis
	Tularemia
Diseases that may spread to Vermont even without contribution of climate change, whose spread to and transmission of Vermont could be exacerbated by climate change	Powassan
	St. Louis Encephalitis
	Western Equine Encephalitis
	La Crosse Encephalitis
	Ehrlichiosis
Diseases with vectors that may spread to Vermont by the end of the century under a higher emission scenario	Rocky Mountain Spotted Fever
	Dengue
Disease that have competent vectors or may in the future have competent vectors in Vermont, but are unlikely to become established in Vermont despite a vector presence	Chikungunya
	Yellow Fever
	Malaria
	Chagas Disease
	Rift Valley Fever
Diseases that may be present in Vermont or may spread to Vermont in the future but whose link with climate changes expected in Vermont is tenuous	Bartonellosis
	Rabies
	Hanta Virus
	Leptospirosis
	Plague
	Valley Fever
	Anthrax
Q Fever	

Source: Vermont Department of Health



Extreme heat and cold Heat warnings are becoming increasingly more prevalent due to our shifting climate. Vermont has been seeing an

Increase in 90+ degree temperature days. This trend is expected to continue. Most of our housing stock and individuals are well adapted to dealing with cold temperature, but the quick swings to higher temperatures do not allow for acclimation, and many of our structures are designed to retain, rather than shed, heat.

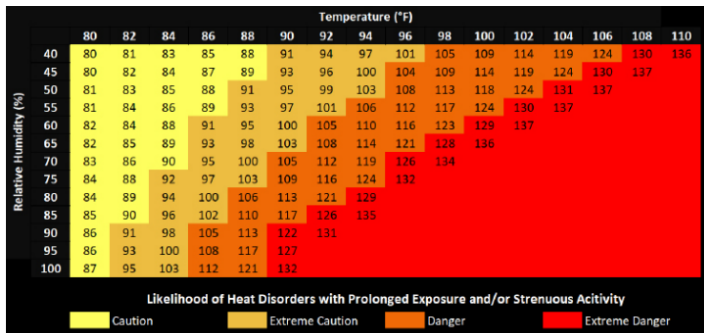
Epidemiological analyses completed by the Vermont Department of Health indicate that Vermonters are five times as likely to visit the emergency department for heat-related illnesses when the heat index reaches the 80s, 10 times as likely when the heat index reaches the low 90s, and over 20 times as likely when the heat index reaches the upper 90s or hotter. These risks are greatly modified by how acclimated a person is to hot weather – the risk for heat-related health impacts is higher early in the heat season, and lower if it has been consistently hot over the past week or more. Consecutive days of hot weather with warm overnight temperatures further increase the risk of experiencing severe heat-related health impacts. Risk also depends on the “normal” level of heat experienced in an area – places that are relatively cooler will typically experience health impacts at lower heat index values than a place that is relatively warmer. June of 2024 saw forecasted heat index of 102. Below are the 4 heat related listing from the SHMP of 2023.

- WASHINGTON (ZONE) 8/1/2006 Heat
- WASHINGTON (ZONE) 8/2/2006 Heat
- WASHINGTON (ZONE) 7/21/2011 Heat
- WASHINGTON (ZONE) 7/1/2018 Heat

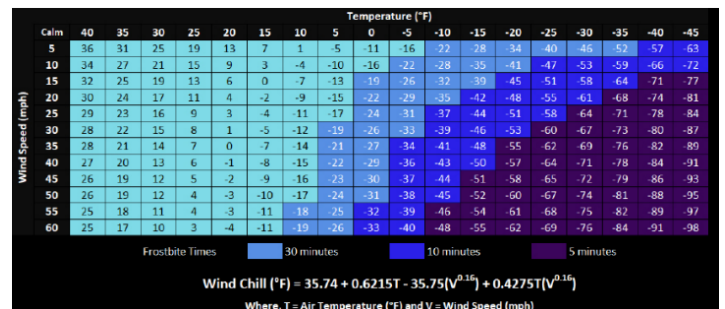
welcomed at cooling centers, sleep in hot tents, and carry heavy loads of their possessions in the heat. There is an increasing risk to multiday heat events in Berlin with a greater increase in heat warning. With there being at least 1 multiday heat advisory on average per year.

In the region, extreme cold can still be an issue. If it is a long-lasting cold without snow cover, frost can migrate deep into the ground freezing pipes and heaving roadways. Most of this would be dealt with by the town either through their utility contracts or by the town road crew in keeping the transportation infrastructure in usable condition. Loss of power during one of these cold snaps may require use of the town shelter and is planned for in the town Local Emergency Management Plan.

What constitutes “extreme cold” can vary across different areas of the country based on what the population is accustomed to in their respective climates. Vermont is adapted to cold conditions; however very cold temperatures remain a threat despite their commonality during Vermont winters. For cold weather events the Town uses the Elementary School as a shelter if in association with a power outage or the school not being in session..

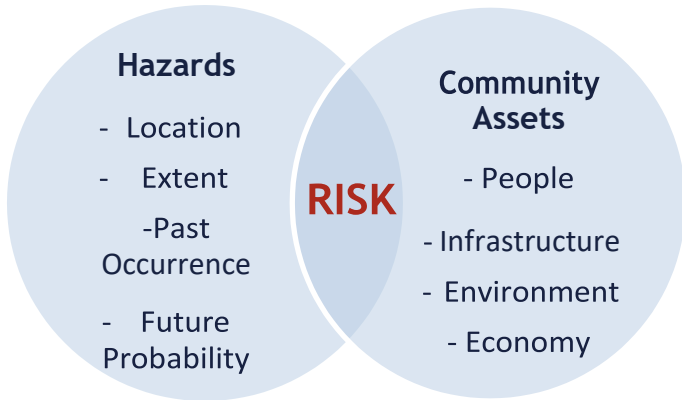


-Hot weather temperature scale



-cold weather temperature scale w/ wind chill

Older adults, people with chronic health conditions, and people with disabilities are at particularly high risk, especially if they live in housing without air conditioning or are unhoused and cannot access cooling facilities and other support resources. The unhoused may not be or feel



have solid plans of mitigating future disasters proactively to minimize risk.

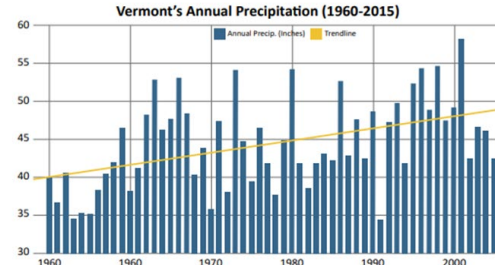
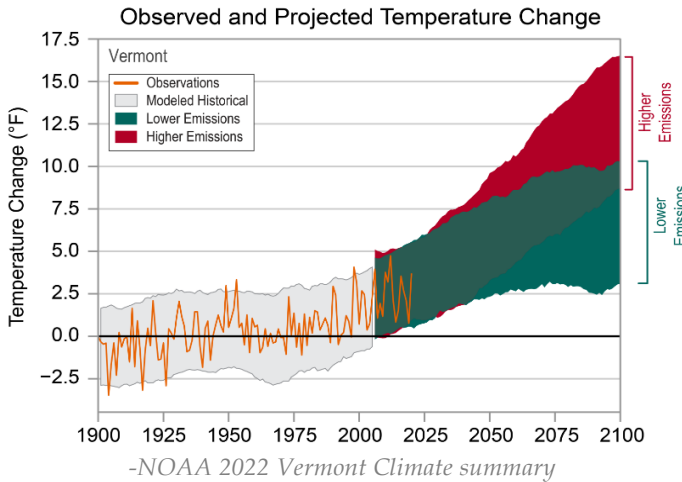


Figure 26: Vermont's annual precipitation (1960-2015)
Source: climatechange.vermont.gov

-precipitation data showing increased precipitation trends from VT state climate action plan

Climate change



The Hazard Identification and Risk Assessment is the foundation for the Mitigation Strategy to reduce future risk.

With the increasing risks of events from our changing climate, all weather-related natural events are expected to have an increase in both frequency and in intensity. Vermont is predicted to experience increases in heat waves, downpours and flooding. This also can lead to flash droughts and cold snaps without the time for acclimation.

The Northeastern United States has already seen an increase of seventy one percent precipitation totals increase since 1950 and an increase in extreme weather events. It is imperative that we

The increase in Atlantic Ocean temperatures as well as the overall climate will create drastic increases in storm potential. This will increase the storm severity indeterminate of the time of year. There should be a realization that due to higher windspeeds and greater moisture capacity many previous records will be exceeded. This has been document by the surpassing of the 400 ppm CO2 tipping point and will continue as permafrost melts and releases more naturally occurring green house gases.

6 HAZARD MITIGATION STRATEGY

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

Mitigation Goals

The Hazard Mitigation Planning Team identified the following as the community's primary mitigation goal:

Increase the Town of Berlin's resilience to natural hazards by planning mitigation investments to reduce or avoid risk to people, homes, the local economy, cultural and historic resources, ecosystems, and community lifelines such as transportation, energy, and communications.

Community Capabilities

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

Administrative & Technical This capability refers to the Town's staff and their skills and tools that can be used for mitigation planning and to implement actions. In addition to the Emergency Management staff described in Section 3, municipal staff that can be used for mitigation planning and to implement specific mitigation actions include: Town Administrator, Town Treasurer, Town Clerk, Assistant Town Clerk, Zoning Administrator, Highway Superintendent, Public Works Supervisor, Police Chief and Road Crew.

In addition to paid staff, there is a 5-member Selectboard, 5-member Planning Commission, Fire Warden, Town Health Officer, and Conservation Commission.

To augment local resources, the Town has formal mutual aid agreements for emergency response – fire and EMS. Technical support is available through the CVRPC in the areas of land use

planning, emergency management, transportation, GIS mapping, and grant writing. Technical support is also available through the State ANR for floodplain bylaw administration and VTrans Districts for hydraulic analyses.

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

Town Plan: December 2022

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

Relationship to Natural Hazard Mitigation Planning:

Includes goals and policies related to flood resilience and land use.

Zoning Ordinance with Flood Hazard Overlay

District Requirements: March 2019 Description:

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

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

Road and Bridge Standards: July 2019

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

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

Road Erosion Inventory Report: 2020

Description: Prioritizes those infrastructure projects necessary to improve transportation network resiliency and water quality. Relationship to Natural Hazard Mitigation Planning: Improvements are designed to minimize or eliminate flood impacts on hydrologically connected road segments.

Local Emergency Management Plan: May 2025

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

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

Water Ordinance: November 2018

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

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

Stormwater Master Plan for the Town of Berlin, VT: 2018

Description: Identify river best management practices and develop prioritized projects to mitigate stormwater water quality problems.

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

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

Berlin's 2024 town budget is \$5,611,301.00, with \$1,587,918 to fund the Highway Department. In

addition to property tax revenues, the Town collects separate fees for water services.

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

- Berlin Volunteer Fire Department, Berlin Elementary School, Berlin Conservation Committee, Friends of the Winooski River,
- Town website, Front Porch Forum, Times-Argus

National Flood Insurance Program Compliance

The Town joined the National Flood Insurance Program (NFIP) in 1984. The effective date of the current Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) is March 19, 2013. The Zoning Administrator enforces NFIP compliance through permit review requirements in its Flood Hazard Area regulations. Berlin's regulations outline detailed minimum standards for development in flood hazard areas defined as FEMA Special Flood Hazard Areas and Floodway Areas. The regulations also require administering Substantial Improvement and Substantial Damage (SI/SD) requirements in accordance with FEMA P-758 SI/SD Desk Reference, May 2010.

Nonconformities. Applicants must obtain conditional use approval from the Development Review before the Zoning Administrator may issue a permit to substantially improve, repair after substantial damage, relocate, replace or enlarge a nonconforming structure within the special flood hazard area as follows:

(1) The proposed development must conform to the applicable development standards in Subsection 2202.H.

(2) If a nonconforming structure is substantially damaged or destroyed, the applicant:

(a) Must not substantially improve the structure if it is located within the floodway unless it is a water-dependent structure.

(b) May reconstruct the structure in its original location outside the floodway only when the structure cannot reasonably be relocated to a less hazardous location on the property.

(3) The applicant must rebuild a nonconforming structure that is substantially damaged or destroyed above the base flood elevation and must otherwise comply with all requirements of the National Flood Insurance Program.

The town is currently awaiting the new flood insurance maps that are being compiled by FEMA and will be reviewed and accepted to maintain the town's NFIP status once the process has been completed.

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

- 1) Prepare, distribute, or make available NFIP insurance explanatory pamphlets or booklets.
- 2) Participate in NFIP training offered by the State and/or FEMA.

State Incentives for Flood Mitigation Vermont's Emergency Relief Assistance Funding (ERAF) provides state funding to match FEMA Public Assistance after federally declared disasters. Eligible public costs are generally reimbursed by FEMA at 75% with a 7.5% State match. The State will increase its match to 12.5% or 17.5% if communities take steps to reduce flood risk as described below. 12.5% funding for communities that have adopted four (4) mitigation measures:

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

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

ANR model regulations.

Berlin's current ERAF rate is 7.5%. Upon adoption of the 2026 Local Hazard Mitigation Plan, their ERAF rate will increase to 17.5% because the Town has joined the NFIP Community Rating System program which requires additional work to receive discounts on flood insurance. .

Mitigation Action Identification

The Hazard Mitigation Planning Team discussed the mitigation strategy, reviewed projects from the 2020 Plan, and identified possible new actions from the following categories for each of the highest risk natural hazards identified in Section 5.



Local Plans & Regulations These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.



Structure & Infrastructure Projects These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This applies to public or private structures as well as critical facilities.



Natural Systems Protection These actions minimize damage and losses and preserve or restore the functions of natural systems.



Outreach & Education Programs These actions inform and educate the public about hazards and potential ways to mitigate them. Although this type of action reduces risk less directly than structure projects or regulation, it is an important foundation. Greater awareness is more likely to lead to

community support for direct actions.

Local Plans & Regulations Examples

Integrate Mitigation into Capital Improvement

Programs: Incorporate risk assessment and hazard mitigation principles into capital planning.

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

Develop a Road Right-of-Way Vegetation Management Plan:

Identify community priorities and plan of action for site-specific tree and roadside forest management to increase roadside resilience.

Improve Flood Resilience with a Flood Study: The aim of a flood study is to define existing flood behavior for a particular catchment, river, or creek. The study helps inform building, land use planning, community awareness and disaster management.

Improve Stormwater Management Planning:

Rain and snowmelt can cause flooding and erosion in developed areas. A community-wide stormwater management plan can address stormwater runoff-related flooding.

Manage Development in Erosion Hazard Areas:

The intent of River Corridor Bylaws is to allow for wise use of property within river corridors that minimizes potential damage to existing structures and development from flood-related erosion.

Community Lifelines

Community Lifelines enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security. The goal of the lifeline concept is to focus response efforts on stabilizing or re-establishing these most fundamental services during and after a disaster. Mitigating lifelines should reduce cascading impacts across government and business functions and lessen system-wide damage.

Community Lifelines are organized into seven categories:

- 1. Law Enforcement
- 2. Fire Service
- 3. Search & Rescue
- 4. Government Service
- 5. Community Safety



- 1. Food
- 2. Water
- 3. Shelter
- 4. Agriculture



- 1. Medical Care
- 2. Public Health
- 3. Patient Movement
- 4. Medical Supply Chain
- 5. Fatality Management



- 1. Power Grid
- 2. Fuel



- 1. Infrastructure
- 2. Responder Communications
- 3. Alerts, Warnings, & Messages
- 4. Finance
- 5. 911 & Dispatch



- 1. Highway/Road/Motor Vehicle
- 2. Mass Transit
- 3. Railway
- 4. Aviation
- 5. Maritime



- 1. Facilities HAZMAT, Pollutants, Contaminants



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

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

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

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

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

Natural Systems Protection Examples

Protect and Restore Natural Flood Mitigation Features: Natural conditions can provide floodplain protection, riparian buffers, groundwater infiltration, and other ecosystem

services that mitigate flooding. Preserving such functionality is important. Examples include 1) adding riparian buffers; 2) stabilizing stream banks; 3) removing berms; 4) minimizing impervious area development; 5) restore floodplain; and 6) restore incision areas.

Outreach & Education Program Examples

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

Assist Vulnerable Populations: Measures can be taken to protect vulnerable populations from natural hazards, such as

- 1) organizing outreach and
- 2) establishing and promoting accessible heating or cooling centers in the community.

Mitigation Action Evaluation

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

See Community Survey results in **Appendix C** for which category of mitigation actions survey respondents wanted the Town to prioritize.

Mitigation Action Plan for Implementation

After careful evaluation, the Planning Team agreed on a list of actions that support the Mitigation Goals of this Plan and are acceptable and practical for the community to implement.

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

benefits were also not selected.

For the selected actions, the Planning Team then 1) assigned a responsible party to lead the completion of each action; 2) identified potential grant funding; defined a timeframe for implementation; and ranked each action's priority (high, medium, low).

Natural hazards pose a unique threat to the Town's vulnerable populations. Data has shown that underserved and marginalized populations tend to live in at-risk hazard-prone areas or in homes with substandard construction. The data also suggests that this segment of the community is less likely to fully recover after a disaster. When ranking an action's priority, those that directly benefit a vulnerable population were ranked high.

The action plan is presented in **Table 6**

Table 5: Mitigation Action Evaluation and Prioritization

Berlin	Need	Support	Feasibility	Project Benefit	Other Obj	Benefit Score	Est Cost	C/B	Mitigation type
Mitigation Actions									
Fluvial Erosion									Mitigation type
Establish Vegetative Buffers in Riparian Areas	1	0	0	0	0	1	1	N	Natural Systems
Restore Incision Areas when threatening structures/ Stream bank armoring	1	1	1	1	0	4	3	Y	Natural Systems
Upsize culverts by conditions status and Ayers Road (54-2)	1	1	1	1	0	4	3	Y	Structures and infrastructure
Study roads for resiliency (culverts) and 5 year plan for dealing with mud season conditions	1	1	1	1	0	4	1	Y	Local Plans and Regulations
Implement projects from the Functioning Floodplain Initiative explorer tool	0	1	0	0	1	2	2	N	Natural Systems
Support Winooski H & H model for regional flood model.	1	1	1	1	0	4	2	Y	Local Plans and Regulations
Education program about rain gardens and what individuals can do to lessen runoff	-1	0	0	0	0	-1	1	Y	Outreach and Education
Inundation Flooding									
Utilize buyouts were appropriate to mitigate flood damages in low lying areas	1	1	1	1	1	5	3	Y	Structures and infrastructure
Elevate structures to Base Flood Elevation	1	0	0	0	0	1	3	N	Structures and infrastructure
Implement flood mitigation project on former Cedar Run and River Run mobile home parks properties	1	1	1	1	1	5	2	Y	Natural Systems
Increasing drainage or absorption capacities with detention and retention basins	0	0	1	0	0	1	2	N	Natural Systems
Support Winooski H & H model for regional flood model.	1	1	1	1	0	4	2	Y	Local Plans and Regulations
Plan for registering flood recovery groups for post incident response and process for them working in the community	0	0	-1	0	0	-1	1	N	Local Plans and Regulations
Education campaign on banning fill along streams, river and how it leads to increased flooding	0	0	0	0	0	0	1	N	Outreach and Education

Burn Bans and outreach for fire danger	1	1	1	1	0	4	1	Y	Local Plans and Regulations
Educating homeowners of risk and defensible space around home for wildfire prevention.	1	1	1	1	0	4	1	Y	Outreach and Education
Public education campaign on fire permits and possible handout.	1	1	1	1	0	4	1	Y	Outreach and Education
Landslides									
Defining steep slope/high-risk areas in land use and comprehensive plans and creating guidelines or restricting new development in those areas	1	1	1	1	0	4	1	Y	Local Plans and Regulations
Implementing monitoring mechanisms/procedures (i.e.,visual inspection)	1	1	1	1	0	4	1	Y	Local Plans and Regulations
Infectious Disease Outbreak									
Educate the Public About the Risks of Infectious Disease and vectors such as lyme disease, West Nile Virus	0	0	1	0	0	1	1	N	Outreach and Education
Train with VDH emergency Specialist staff for outbreak response	1	1	1	1	0	4	2	Y	Local Plans and Regulations
Invasive Species									
Outreach on programs for managing and care of aging and diseased trees by Tree Warden to prevent power outages and road debris	-1	1	0	0	0	0	1	N	Outreach and Education
Outreach and education program on invasive pests and risks of ticks	1	1	1	1	0	4	1	Y	Outreach and Education
Tree Removal in town ROW of infected trees	1	1	1	1	0	4	1	Y	Local Plans and Regulations
Outreach/education program on native plants and invasive plant removal	0	-1	0	0	0	-1	1	N	Outreach and Education
Heat									
Outreach during severe cold or heat of risks to exposure	1	1	1	1	0	4	1	Y	Outreach and Education
Hot and Cold Weather Planning	1	0	1	0	0	2	1	Y	Local Plans and Regulations
Cold									
Hot and Cold Weather Planning	1	0	1	0	0	2	1	Y	Local Plans and Regulations

Outreach during severe cold or heat of risks to exposure	1	1	1	1	0	4	1	Y	Outreach and Education
Drought									
Outreach program on water efficiency opportunities	0	0	1	0	0	1	1	Y	Outreach and Education
						0			
All Hazards									
Develop debris removal plan for post disaster use	-1	0	0	0	0	-1	1	N	Local Plans and Regulations
Integrate Mitigation into Capital Improvement Programs and Planning	0	0	0	0	0	0	1	N	Local Plans and Regulations
Plan for Road Right-of-Way Vegetation Management	0	0	0	0	0	0	1	N	Local Plans and Regulations
Adopt public works mutual aid agreement with other municipalities within Central Vermont Regional Emergency Management Committee area.	0	1	1	0	0	2	1	N	Local Plans and Regulations
Develop 10 yr. strategic or capital plan	0	0	0	0	0	0	2	N	Local Plans and Regulations
Review if contingency fund can be utilized to roll over for funding emergency management needs or mitigation projects	0	0	0	0	0	0	3	N	Local Plans and Regulations

Table 5 Evaluation Criteria:

Life Safety – Will the action be effective at protecting lives and preventing injuries?

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

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

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

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

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

Rank each of the above criteria in Table 5 with a 0, 1, or 2 using the following table:

2 = Highly effective or feasible

1 = Neutral

0 = Ineffective or not feasible

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

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

Final review was conducted culverts for replacement were prioritized by location and secondary access to the town if route 100 is out of service.

Table 6: Mitigation Action Plan

Berlin	Mitigation type	Who	Funding	When
Mitigation Actions				
Fluvial Erosion	Mitigation type			
Restore Incision Areas when threatening structures/ Stream bank armoring	Natural Systems	Town Road Crew or USDA NRCS program,	CWSP, NRCS	as needed
Upsize culverts by conditions status and Ayers Road (54-2)	Structures and infrastructure	Road Crew	Vtrans/Town	2027-2029
Study roads for resiliency (culverts) and 5 year plan for dealing with mud season conditions	Local Plans and Regulations	Planning commission	MPG	2027
Support Winooski H & H model for regional flood model.	Local Plans and Regulations	Planning Commission/CVRPC	CDBG-DR	2026
Inundation Flooding				
Utilize buyouts were appropriate to mitigate flood damages in low lying areas	Structures and infrastructure	Town Selectboard	HMGP/NRCS/Swiftwater	as needed
Implement flood mitigation project on former Cedar Run and River Run mobile home parks properties	Natural Systems	Watershed groups/Town	FMA, HMGP	2027-2029
Support Winooski H & H model for regional flood model.	Local Plans and Regulations	Region/Town	VEM	2026
Floodplain reconnection on District 6 garage site on Rt 302.	Local Plans and Regulations	Town	FMA, HMGP	2028
Dry flood proofing non-residential structures by strengthening walls, sealing openings, or using waterproof compounds or plastic sheeting on walls to keep water out.	Structures and infrastructure	Business owners/selectboard	FMA, HMGP	2027
Implement stormwater management projects from Stormwater Master Plan	Natural Systems	Conservation commission	CWSP	2026-2029
Snow				
Bury Power Lines	Structures and infrastructure	Utility(WEC, GMP)	DOE, HMGP	2026-2029
Install generators on critical locations	Structures and infrastructure	Town	DOE, HMGP	2026
Ice				
Protect Power Lines and Roads by Inspecting and Removing Hazardous Trees in Road ROW	Structures and infrastructure	Town/Road Crew/Tree Warden	Vtrans HSIP, VT Urban Forestry	2025-2029
Education on Carbon Monoxide Poisoning	Outreach and Education	Town/Fire Dept.	AFG	2026

Install generators on critical locations	Structures and infrastructure	Town	DOE, HMGP	2026
High Winds				
Bury Power Lines	Structures and infrastructure	Utility(WEC, GMP)	DOE, HMGP	2026-2029
Update Zoning Ordinance to Require New Subdivision Development to Bury Power Lines	Local Plans and Regulations	Town	MPG	2027
Protect Power Lines and Roads by Inspecting and Removing Hazardous Trees in Road ROW	Structures and infrastructure	Town/Road Crew/Tree Warden	Vtrans HSIP, VT Urban Forestry	2025-2029
Install generators/backup power at critical locations	Structures and infrastructure	Town	DOE, HMGP	2026
Wildfires				
Burn Bans and outreach for fire danger	Local Plans and Regulations	Fire Warden/Fire Dept	Town	as needed
Educating homeowners of risk and defensible space around home for wildfire prevention.	Outreach and Education	Fire Warden/Fire Dept./Town	Town	yearly
Public education campaign on fire permits and possible handout.	Outreach and Education	Town/Fire dept.	Town	yearly
Landslides				
Defining steep slope/high-risk areas in land use and comprehensive plans and creating guidelines or restricting new development in those areas	Local Plans and Regulations	Planning commission	MPG	2028
Implementing monitoring mechanisms/procedures (i.e., visual inspection)	Local Plans and Regulations	Town Road Crew	Town	weekly
Infectious Disease Outbreak				
Train with VDH emergency Specialist staff for outbreak response	Local Plans and Regulations	Health Officer/Fire Dept.	Town	Every other year
Invasive Species				
Outreach and education program on invasive pests and risks of ticks	Outreach and Education	Health Officer/Town/uvm extension/VDH	Town/UVM	2026
Tree Removal in town ROW of infected trees	Local Plans and Regulations	Tree Warden/Road Crew/ Contractor	Vtrans HSIP, VT Urban Forestry	2025-2029
Heat				
Outreach during severe cold or heat of risks to exposure	Outreach and Education	Town EMD/Emergency preparedness committee	Town	as needed
Cold				

Outreach during severe cold or heat of risks to exposure	Outreach and Education	Town EMD/Emergency preparedness committee	Town	as needed
Drought				
Outreach program on water efficiency opportunities	Outreach and Education	Town/Efficiency Vermont	Town	2025-2029

Integrating into Existing Plans and Procedures

For Berlin to succeed in reducing long-term risk, information from this Plan should be integrated throughout government operations. When activities are connected, they can not only reduce risk and increase resilience, but also accomplish other objectives such as environmental protection, economic development, financial stability, and land use planning.

There are several ways the Town can achieve integration into existing plans and procedures to support risk-informed community planning. They can include the community’s primary mitigation goal as stated on page 18, information from the risk assessment, and mitigation actions as follows:

- The mitigation goal and risk assessment information can be considered when prioritizing capital improvements. Mitigation actions listed in this Plan can be included in the annual budgeting process.
- Funding for mitigation actions can be prioritized in the annual budget process.

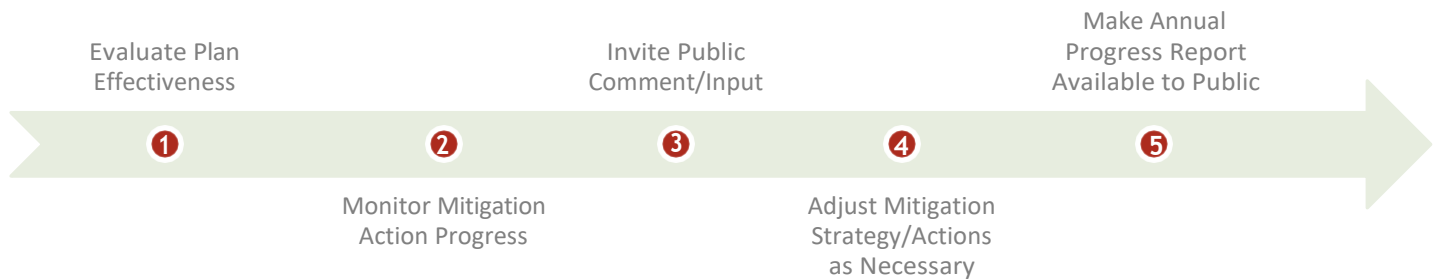
- The mitigation goal and risk assessment information can be incorporated into the next Town Plan update (Land Use and Flood Resilience chapters in particular) to help steer growth and redevelopment away from high-risk locations.
- The mitigation goal and risk assessment information can be incorporated into future zoning ordinance updates. Ideally incorporating this while doing zoning updates for the acceptance of new flood maps.
- The mitigation goal and risk assessment information can be incorporated into any plans to expand public water and sewer utilities to ensure they are not expanded into high-hazard areas.
- Several flood-related mitigation actions for increasing road resiliency can be implemented under the existing Municipal Road General Permit (8054-9040) for controlling stormwater discharges from town roads.
- Several flood-related mitigation actions for increasing road resiliency can be implemented under the existing Municipal Road General Permit (8054-9040) for controlling stormwater discharges from town roads.

7 PLAN MAINTENANCE

This Plan is dynamic. To ensure it remains current and relevant, it should be annually evaluated and monitored and updated every five years, in accordance with FEMA guidelines in effect at the time. The town will utilize a process for collecting input to the town Emergency Management Director and Emergency Management Coordinator. This will be publicly announced utilizing Front Porch Forum that the yearly review is upcoming to garner community input and comments. This will be incorporated into the yearly review by the Selectboard. This will also allow for the inclusion of any new mitigation projects that the town may want to undertake during the timeframe of the current plan.

Annual Evaluation and Monitoring

Within 12 months of FEMA Final Approval, the Plan will be annually evaluated and monitored as follows:



1 The Selectboard will evaluate the effectiveness of the Plan in meeting the stated goals. Things to consider during this evaluation:

- What disasters has the town (or region) experienced?
- Should the list of highest risk natural hazard impacts be modified?
- Are new data sources, maps, plans, or reports available? If so, what have they revealed, and should the information be incorporated into this plan?
- Has development in the region occurred and could it create or reduce risk?
- Has the town adopted new policies or regulations that could be incorporated into this plan?
- Have elements of this plan been incorporated into new plans, reports, policies, or regulations?
- Are there different or additional community capabilities available for mitigation implementation?

2 Next, the Selectboard will monitor mitigation action progress. Things to consider:

- Is the mitigation strategy being implemented as anticipated?
- Were the cost and timeline estimates accurate?
- Should new mitigation actions be added?
- Should proposed actions be revised or removed?
- Are there new funding sources to consider?

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

3 The Selectboard will seek public comment from the Whole Community on plan implementation. Things to consider:

- Are there any new stakeholders to include?
- What public outreach activities have occurred?
- How can public involvement be improved?

- 4 Based on input received, the mitigation strategy and/or actions will be modified, if needed.
- 5 A report (or record in the form of meeting minutes) of the annual evaluation and monitoring will be made available to the public.

Table 7: Mitigation Action Status

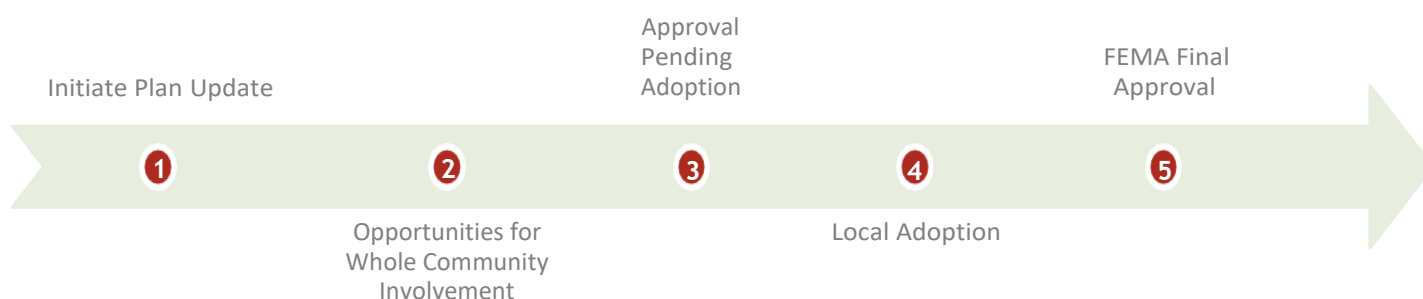
Berlin	Who	Funding	When	Status
Mitigation Actions				
Fluvial Erosion				
Restore Incision Areas when threatening structures/ Stream bank armoring	Town Road Crew or USDA NRCS program,	CWSP, NRCS	as needed	
Upsize culverts by conditions status and Ayers Road (54-2)	Road Crew	Vtrans/Town	2027-2029	
Study roads for resiliency (culverts) and 5 year plan for dealing with mud season conditions	Planning commission	MPG	2027	
Support Winooski H & H model for regional flood model.	Planning Commission/CVRPC	CDBG-DR	2026	
Inundation Flooding				
Utilize buyouts were appropriate to mitigate flood damages in low lying areas	Town Selectboard	HMGP/NRCS/Swiftwater	as needed	
Implement flood mitigation project on former Cedar Run and River Run mobile home parks properties	Watershed groups/Town	FMA, HMGP	2027-2029	
Support Winooski H & H model for regional flood model.	Region/Town	VEM	2026	
Floodplain reconnection on District 6 garage site on Rt 302.	Town	FMA, HMGP	2028	
Dry flood proofing non-residential structures by strengthening walls, sealing openings, or using waterproof compounds or plastic sheeting on walls to keep water out.	Business owners/selectboard	FMA, HMGP	2027	
Implement stormwater management projects from Stormwater Master Plan	Conservation commission	CWSP	2026-2029	
Snow				
Bury Power Lines	Utility(WEC, GMP)	DOE, HMGP	2026-2029	
Install generators on critical locations	Town	DOE, HMGP	2026	
Ice				
Protect Power Lines and Roads by Inspectingand Removing Hazardous Trees in Road ROW	Town/Road Crew/Tree Warden	Vtrans HSIP, VT Urban Forestry	2025-2029	
Education on Carbon Monoxide Poisoning	Town/Fire Dept.	AFG	2026	

Install generators on critical locations	Town	DOE, HMGP	2026	
High Winds				
Bury Power Lines	Utility(WEC, GMP)	DOE, HMGP	2026-2029	
Update Zoning Ordinance to Require New Subdivision Development to Bury Power Lines	Town	MPG	2027	
Protect Power Lines and Roads by Inspecting and Removing Hazardous Trees in Road ROW	Town/Road Crew/Tree Warden	Vtrans HSIP, VT Urban Forestry	2025-2029	
Install generators/backup power at critical locations	Town	DOE, HMGP	2026	
Wildfires				
Burn Bans and outreach for fire danger	Fire Warden/Fire Dept	Town	as needed	
Educating homeowners of risk and defensible space around home for wildfire prevention.	Fire Warden/Fire Dept./Town	Town	yearly	
Public education campaign on fire permits and possible handout.	Town/Fire dept.	Town	yearly	
Landslides				
Defining steep slope/high-risk areas in land use and comprehensive plans and creating guidelines or restricting new development in those areas	Planning commission	MPG	2028	
Implementing monitoring mechanisms/procedures (i.e., visual inspection)	Town Road Crew	Town	weekly	
Infectious Disease Outbreak				
Train with VDH emergency Specialist staff for outbreak response	Health Officer/Fire Dept.	Town	Every other year	
Invasive Species				
Outreach and education program on invasive pests and risks of ticks	Health Officer/Town/uvms extension/VDH	Town/UVM	2026	
Tree Removal in town ROW of infected trees	Tree Warden/Road Crew/ Contractor	Vtrans HSIP, VT Urban Forestry	2025-2029	
Heat				
Outreach during severe cold or heat of risks to exposure	Town EMD/Emergency preparedness committee	Town	as needed	
Cold				

Outreach during severe cold or heat of risks to exposure	Town EMD/Emergency preparedness committee	Town	as needed	
Drought				
Outreach program on water efficiency opportunities	Town/Efficiency Vermont	Town	2025-2029	

5-Year Updates

This Plan will be updated at a minimum every five (5) years as follows:



- 1 Currently, funding to assist municipalities in paying for planning services to update the Local Hazard Mitigation Plan is undetermined as new federal priorities are determined it will be imperative for the town to discuss options with Vermont Emergency Management (VEM) to determine what funding is available.

Once funding is secured and the grant agreement between the Town and State is in place, the Town Manager can issue a request for proposals (RFP) to procure planning services in accordance with the grant agreement. The RFP should be issued approximately 14 months before the Plan expires.

Once a consultant is procured, the Plan update can begin with a kick-off meeting including the consultant and local hazard mitigation planning team. The kick-off meeting should be scheduled approximately 12 months before the Plan expires. The Town should allot approximately 8 months for the Plan update process.

- 2 Opportunities for Whole Community involvement throughout the Plan update process need to be factored into the schedule. These opportunities may include a community survey, planning workshop, and public meetings at critical milestones agreed to at the project kick-off meeting.
- 3 Once the local hazard mitigation planning team has prepared a final draft, they can seek authorization from the Selectboard to submit the Plan for VEM/FEMA approval. Plan approval is accomplished in two steps - the first is Approval Pending Adoption. The Town should submit for Approval Pending Adoption approximately 4 months before the Plan expires to allow for time to respond to any review comments received from VEM/FEMA.
- 4 Once the Town receives Approval Pending Adoption, the Selectboard should adopt the Plan as soon as their next regular meeting.
- 5 Once adopted, the Town can submit the Plan for VEM/FEMA Final Approval. The Town should submit for Final Approval approximately 1 month before the Plan expires to ensure there is no gap in coverage between updates. The FEMA Final Approval date starts the clock on the effective dates of the 5-year Plan.

CERTIFICATE OF ADOPTION
Town of Berlin, Vermont Selectboard
A Resolution Adopting the Berlin, Vermont 2026 Local Hazard Mitigation Plan

WHEREAS the Berlin Selectboard recognizes the threat that natural hazards pose to people and property within the Town of Berlin; and

WHEREAS the Berlin Selectboard has prepared a natural hazard mitigation plan, hereby known as the Berlin, Vermont 2026 Local Hazard Mitigation Plan 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 Berlin, Vermont 2026 Local Hazard Mitigation Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Town of Berlin from the impacts of future hazards and disasters; and

WHEREAS adoption by the Berlin Selectboard demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Berlin, Vermont 2026 Local Hazard Mitigation Plan.

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF BERLIN, VERMONT, THAT:

Section 1. In accordance with 24 VSA §872, the Berlin Selectboard adopts the Berlin, Vermont 2026 Local Hazard Mitigation Plan. While content related to the Town of Berlin may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the Town of Berlin 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 3 in favor and 0 against, and ___ abstaining, this 16 day of FEB, 2026.

By: John J. STARRIS (print name)
Selectboard Chair

ATTEST: By: Vince Conti (print name)

MITIGATION ACTIONS FROM 2017 PLAN

			Annual Progress: 2020	
Timeline	Task	Brief Description	Progress	2025 Update
Spring 2020- Fall 2022	Fluvial Geomorphic Assessments and assessment-based mapping/action	Continue Phase I and Phase II fluvial geomorphic assessments on streams and waterways in Berlin.	DEC has a comprehensive and interactive database for the Winooski River Watershed Basin. REI Scheduled for completion in 2020	DEC has a comprehensive and interactive database for the Winooski River Watershed Basin. REI completed in 2019-2020
Fall 2020- Fall 2022	Fluvial Erosion Hazard Mapping	Rate the fluvial erosion hazard for each assessed reach and develop a fluvial erosion hazard map for the waterway using SGAT. Create map of all assessed reaches. Submit to VT ANR for QA/QC.	Mapping completed for floodplain and river corridor	Mapping completed for floodplain and river corridor
Fall 2020- Fall 2022	River Corridor Management Plans	Where Phase I and II assessments are complete, develop a River Corridor Management Plan.	NFIP Participant	Corridor management plans have been completed for Upper Winooski, Dog River, and the Stevens Branch.
Fall 2020- Fall 2022	Fluvial Erosion Hazard Mitigation Implementation	Develop strategies to mitigate losses from identified fluvial erosion hazards.	Major infrastructure enhancement has occurred as result of flooding with FEH-specific projects planning in current planning cycle	Improvements made in the wake of DR-4720 and DR4810 as well as normal maintenance.
Spring 2020- Spring 2021	Flood Insurance Rating Map Updates	Review draft FIRM data. Update floodplain regulations/zoning.	There have been 16 LOMCS according to FEMA database	The town has joined the NFIP CRS program.
Fall 2019- Fall 2020	Infrastructure Assessment for Storm Water Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts and storm water infrastructure.	Town has identified projects with problem, priority and estimated budget. With great institutional memory of town infrastructure, the highway department is well- equipped to assess, monitor and prioritize needs.	Have utilized State TRPT tool and in flood response.
Fall 2019- Fall 2022	Infrastructure Assessment for Fluvial Erosion Vulnerability	Assess the vulnerability and operational capability of municipal roads, culverts, bridges and systems infrastructure to fluvial erosion.	Road and Bridge Standards adopted and meet or exceed 2013 standards.	Adopted 2019 bridge and road standards

Timeline	Task	Brief Description	Progress	2025 Update
Spring 2019- Fall 2024	Culvert Upsizing	Upsize culverts and ditching along roads to mitigate against repeated damages from storm water or spring snowmelt.	VTCULVERTS.ORG Culvert and Bridge Inventory has been populated.	2024 bridge and culvert inventory was updated
Spring 2019	Continued Monitoring of Vulnerable Infrastructure	Inventory bridges to document future damage from flooding. A constantly updated inventory will allow Berlin to keep track of frequently damaged infrastructure and will guide planning to avoid future infrastructure damage.	Bridge replacement scheduled for 2019	CVRPC completed a new bridge and culvert survey in 2024. This included all short structures or those >20'.
Fall 2019- Fall 2024	Road Improvements	Within political and financial restraints, consider re-engineering certain sections of roads to lower overall maintenance costs, improving snow plowing speeds and improve overall capability of roads to handle current and projected traffic volumes.	Projects named and scoped. Each annual update will list accomplished projects here:	Completed Fisher Road reconnection.
Fall 2020- Spring 2021	Develop SOP for emergency events based on any identified need and political/financial restraints. ICS training for municipal staff	Building on current Emergency Operations Plans for the Highway Department and Road Commission, and SOP can help clearly define expectations, roles and responsibilities. Develop understanding of eligibility criteria for HMGP projects.	Communication between Highway Department and Road Commission is ongoing. ICS required for LEOP approval.	Completed SOP and ICS training for municipal staff.
Fall 2020- Winter 2022	Increase Awareness of Funding Opportunities	Increase understanding of FEMA's HMGP program so that this potential funding source can be utilized.	New	Have reviewed outreach for the state and attended VEM HMGP informational meeting and trainings.
Summer 2020- Fall 2020	Documenting	Develop a methodology that serves to efficiently capture work and expenditures on sites and keep this information at the town office as time and financial constraints allow	Improve current system could enhance efficiency of proving prior damage	Have made progress but could still use some improvement. In progress.

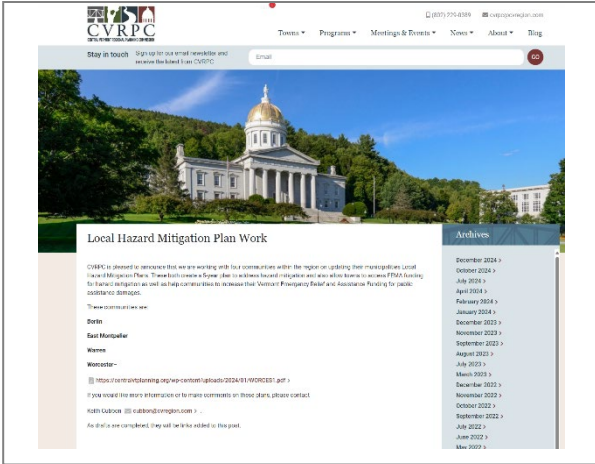
Timeline	Task	Brief Description	Progress	2025 Update
Fall 2020- Winter 2021	Improve Existing Shelter Capability/ Investigate Alternate Shelters	Maintain and improve on capabilities of existing emergency shelter capability, including emergency generator functionality. Investigate capabilities of other buildings sufficient to serve as smaller shelters.	All shelters have a generator. Explore additional shelter and secure funding for emergency power if required.	Could still use work,. Trainings for shelter staff, increase number of volunteers.
Fall 2020- Winter 2023	Reduce risk of power failure due to ice storms:	Enhance collaboration between town and private electric company as means of increasing efficiency of mitigation efforts and restoration when systems are down. Maintain function of generators.	Current communication and operations are working well but room for improvement possible within financial and political restraints.	ROW clearing in municipal ROW. Done on a yearly basis as possible.
Fall 2020- Winter 2020	Notification	Develop a notification/communication plan that conveys essential sheltering information using school phone system and back-up methodology (email, text, etc.)	New	Not currently pursuing. Town is utilizing VTAlert for messaging.
Fall 2020- Winter 2020	Residential Programs	Provide guidance and communication to residents on the structural and mechanical actions that can occur to reduce risk to severe winter storms (e.g. weather- proofing, anchoring alternative heating sources, tree trimming, financial programs, etc.)	FEMA, VEM and other state agencies publish annual materials that can be obtained and distributed	Efficiency Vermont is handling residential programs.
Winter 2020- Winter 2024	Monitor roads for safe and effective plowing	Efficient snow removal is the foundation to winter storm (snow) events, assuring roads are plowable before winter remains an important facet of highway department functions. Increase communication with rail as deemed necessary to assure safe train travel during heavy snow/ice events.	Ongoing	Ongoing as needed.
Winter 2020- Winter 2024	Increase awareness of ICS structure and recommended practice	The town can mitigate the effects of a severe winter by understanding how a large-scale storm is managed when the State EOC is operational. Additional awareness of local-level roles and responsibilities during statewide event is a mitigation action	ICS required but enhanced understand may benefit	Town participation in VEM exercises for this need.

Timeline	Task	Brief Description	Progress	
Winter 2020-2	Economic Resilience	<p>Within political and financial restraints, establish program for assistance in paying heating bills during crisis situations, if not already required by state law.</p> <p>Develop and sustain a program that serves to connect resource organizations with residents in need of support services</p>	New	LIHEAP outreach for this in coordination with Capstone.
Fall 2020- Winter 2024	Maintain Existing Shelter Capability	<p>Maintain and improve capabilities of existing shelters. Notification procedures and shelter staffing is a priority for the city and intends to move forward on planning and public involvement. More formalized training is required, and the ARC's "Shelter Initiative Program" can be used at no cost to the town to enhance both shelter management knowledge and sheltering supply cache.</p>	Ongoing with improvements planned	Ongoing, taking trainings as available by ARC.
Winter 2020- Winter 2022	Assess Vulnerable Population	<p>Develop an awareness of the most at-risk community members during an evacuation and/or sheltering event. Focusing on those that lack resources or capability to reach facilities when in need and create plans, including outreach protocol on how to address this potential hurdle.</p>	New	Outreach and awareness of encampments by town police.
Winter 2020- Winter 2022	Notification and Education	<p>Investigate and develop a notification/communication plan that conveys essential sheltering information. Educating citizens regarding the dangers of extreme cold and the steps they can take to protect themselves when extreme temperatures occur by sustaining a process that serves to disseminate educational resources for homeowners and builders on how to protect pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls. Inform homeowners that letting a faucet drip during extreme cold weather can prevent the buildup of excessive pressure in the pipeline and – avoid bursting through a yearly public service campaign.</p>	New	Provide information on town website for educational materials and utilizing VTAlert for notification.
Spring 2020- Winter 2025	Establish standards for all utilities regarding tree pruning around line	<p>Incorporate inspection and management of hazardous trees into the drainage system maintenance process. Support and suggest the testing of power line poles to determine if they are rotting. Support the inspection of utility poles to ensure they meet specifications and are wind resistant. When feasible,</p>	New	Power poles assessed by utility and CVfiber, town supports burying lines when feasible.

		<p>support burying power lines to provide uninterrupted power after severe winds.</p> <p>Avoid use of aerial extensions to water, sewer, and gas lines when possible. Support use of designed-failure mode for power line design to allow lines to fall or fail in small sections rather than as a complete system to enable faster restoration.</p>		
Spring 2020-Spring 2025	Public Outreach	<p>Ensure that school and hospital officials are aware of the best area of refuge in buildings and that their plans are viable in high wind mitigation events. Instruct property owners on how to properly install temporary window coverings before a storm. Support education to design professionals to include wind mitigation during building design/modification to an extent deemed necessary.</p> <p>Coordinate with airport to assure communication plans support notification procedures to protect health and safety</p>	New	No longer priority. No funding to support.
Fall 2020-Fall 2024	Residential Programs	<p>Develop and maintain education materials to inform property owners on how to protect their homes and businesses through accepted hazard resilience actions (e.g. securing their structures from high winds, elevating their electrical equipment/furnaces in basements, protecting from lightning strikes by grounding electrical outlets, etc.).</p>	New	Provide information on town website for educational materials.
Fall 2020-Fall 2024	Family Programs	<p>Continue family programs, such as car safety seat and bike safety programs, to raise family awareness of hazards, safety, preparedness and prevention.</p>	Ongoing	Ongoing as needed
Fall 2020-Fall 2024	Fire Prevention Programs	<p>Continue National Fire Prevention Week and other programs to raise public awareness of fire hazards, safety, preparedness and prevention.</p>	Ongoing	Ongoing, yearly
Fall 2020-Fall 2024	Other hazard awareness programs	<p>Develop public awareness programs, based on all- hazards needs.</p>	Ongoing	Provide information on town website for educational materials

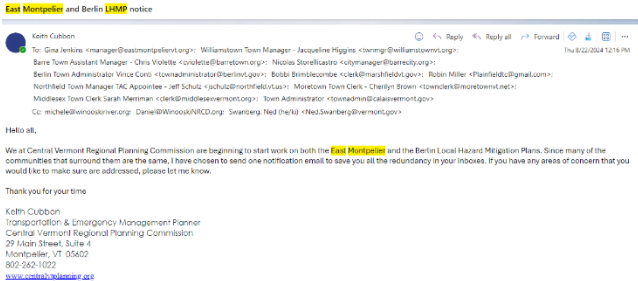
SUMMARY OF PUBLIC COMMENTS ON DRAFT PLAN

Public comments received throughout the plan development process are summarized here. For detailed information about how the Whole Community was invited to participate reference **Table 2**.

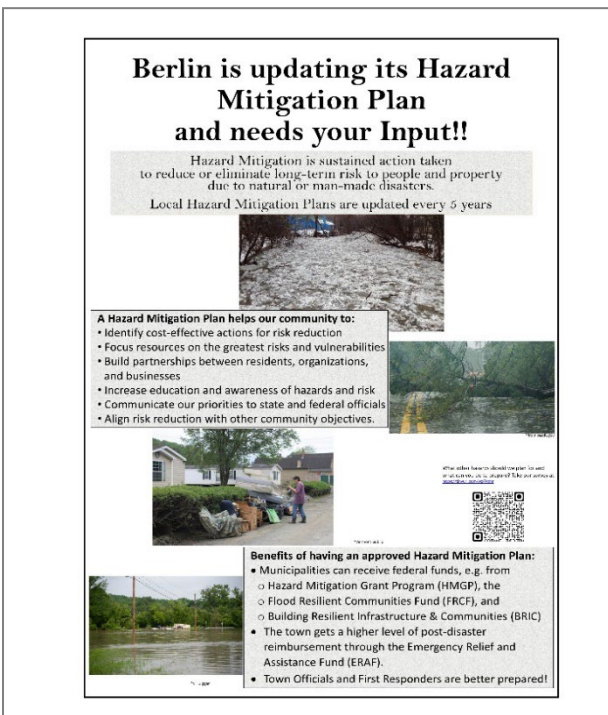


Example Plan update kick-off public notice from Central Vermont Regional Planning Commission website.

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



Example email to Key Partners announcing Plan update dated August 22, 2024.

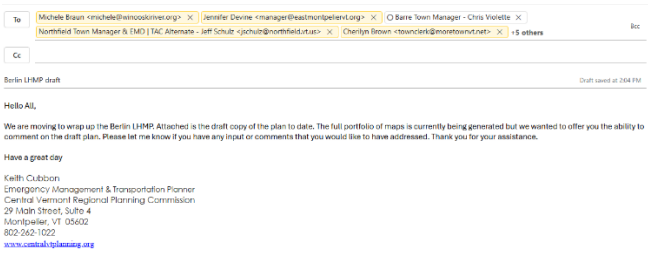


Example Local Hazard Mitigation Planning Community Survey poster used in town, on town Facebook and Front Porch Forum, posted on March 1, 2025.

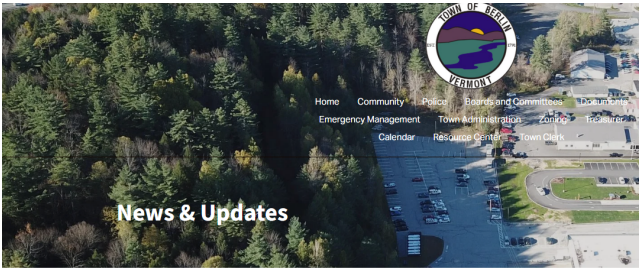
See **Appendix B** for copy of survey and results.



Berlin Hazard Mitigation Planning Workshop advertisement posted at locations throughout town.



Email to Key Partners and local officials in neighboring towns seeking comments on draft plan as draft was completed in plan development process – dated October 17, 2025



Town Government Updates ✓

Public Notices/Press Release ^

[Local Hazard Mitigation Plan - 2025](#)

[Local Options Tax Proceeds](#)

[Open Meeting Law](#)

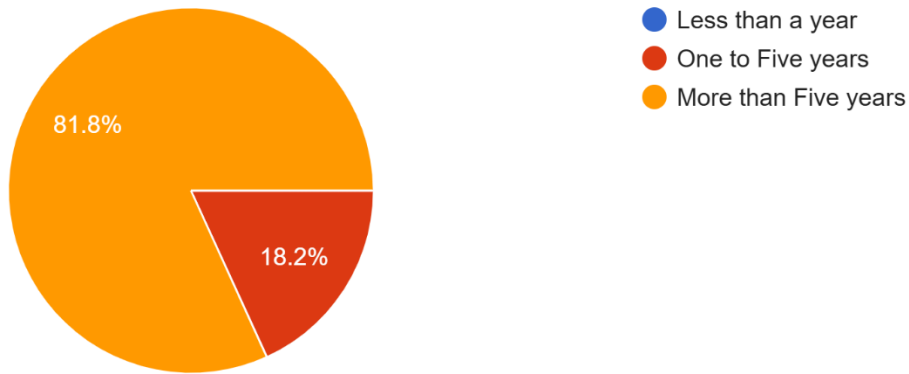
Town posted draft of plan to website on 12/23/25 to begin public comments to draft. Presented draft plan to selectboard at 1/19/26. Preliminary adoption of draft at 2/2/26 meeting.

COMMUNITY SURVEY RESULTS

The Town of Berlin utilized a survey to solicit public input on 1) potential natural hazard impacts and 2) mitigation strategies to reduce these impacts in the future. The survey was made available online as well as hard copy over the course of 8 weeks between November 2024-February 2025. The Town received 22 responses and a summary of the input received is provided below, followed by a copy of the actual survey.

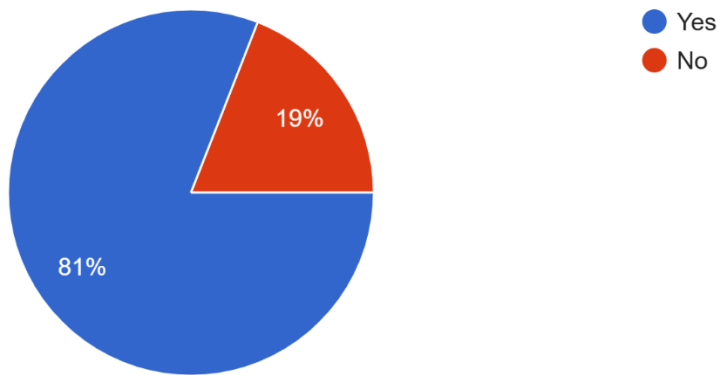
1) How long have you lived in or owned a business or property in Berlin?

22 responses



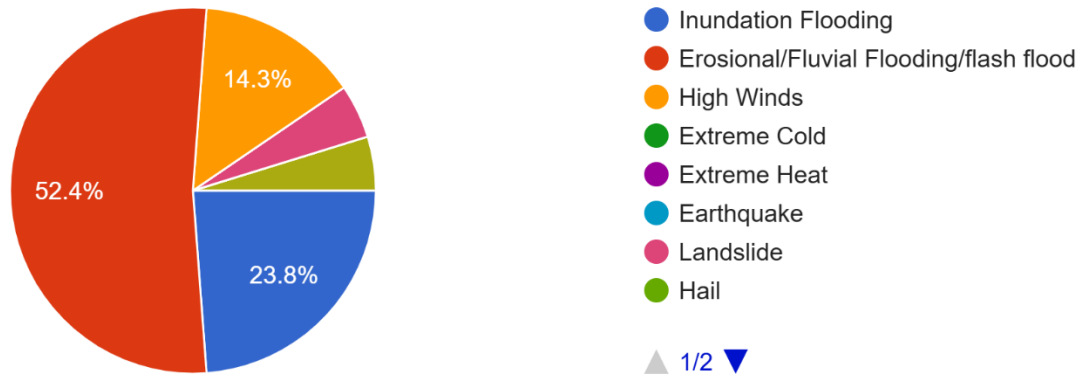
2) Have you or your property be directly impacted by a natural disaster?

21 responses



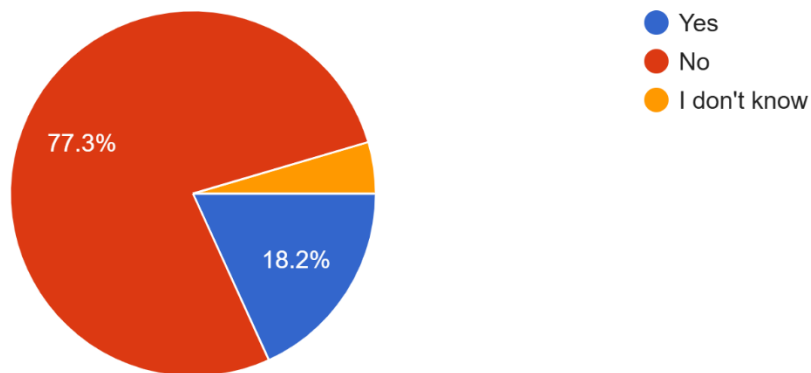
3) Which natural hazard are you most concerned about?

21 responses



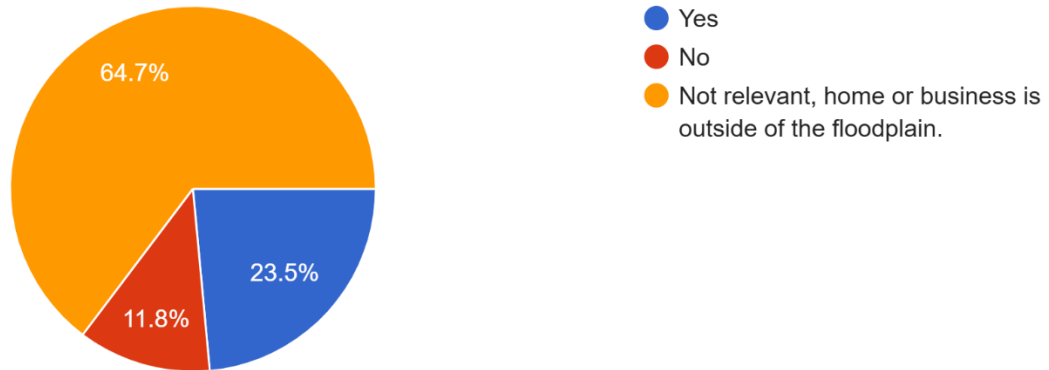
4) Is your home or business property located in a FEMA designated floodplain?

22 responses



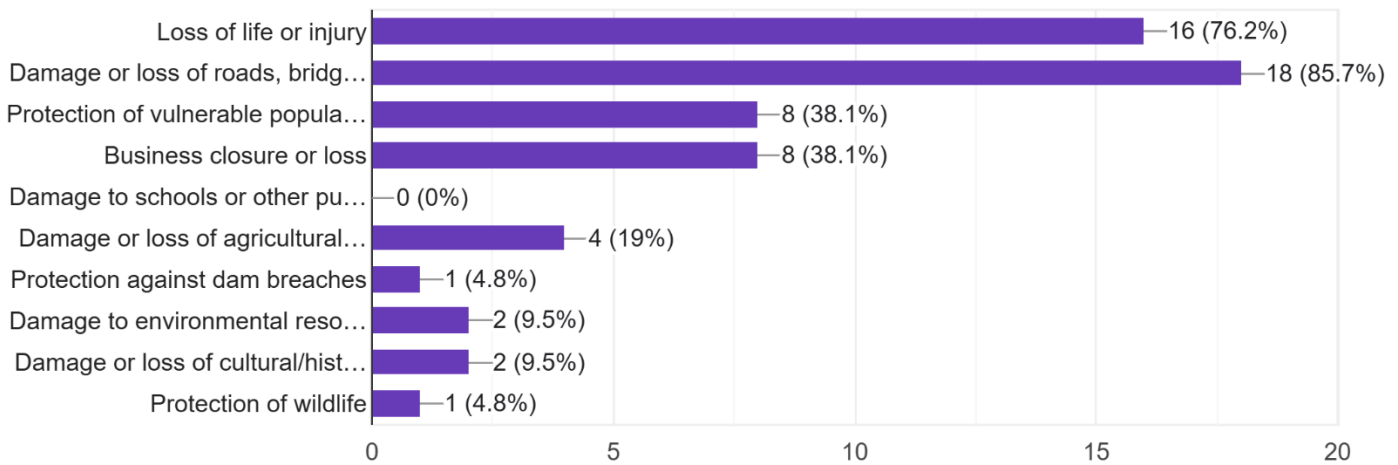
5) If yes to question 4, do you have insurance through the National Flood Insurance Program (NFIP)?

17 responses



6) In your opinion, which of the following are most important to protect against potential future severe weather impacts in Berlin? Please check up to 3 boxes.

21 responses



7) In this context, hazard mitigation is a sustained measure that reduces or eliminates long-term risk to people and property from the effects of natural hazards (defined as severe weather events). What types of hazard mitigation measures would you like to see the community prioritize?

17 responses

Flood plain development, appropriately sized culverts.

Fix bridges and sink holes

Cleaning out waterways to increase volume and flow. We put it in and never take any out.

While it's more a response than mitigation, long-term, major improvements and expansion to our emergency services is needed.

Flood risk mitigation: culvert maintenance and upsizing, runoff absorption, etc.

Improved stormwater management alongside/adjacent to roads, construction of affordable housing up out of the floodplain, closure,

Up-sizing road culverts or replacing with bridges, proper care/closure of Class 4 roads, insuring use of good quality gravel bases and/or fabrics when repairing or improving road surfaces, and making sure materials used do not further spread invasive plants

As a part of hazard mitigation, attention should be paid to the securing of objects that are prone to float away such as propane tanks, large containers, and other items in the floodways. These should be secured to prevent damage. Populations in areas prone to flooding should be targeted with emergency prep and evacuation information and reminded annually.

Make permanent fixes to infrastructure (roads, culverts, etc.) to withstand future flooding. Help owners of businesses who are in the floodplain to find common sense, well-engineered solutions to future flooding. What kinds of mitigation can we do to prevent future flooding in low-lying places like the former BigLots/Pomerleau building. Is there an opportunity to do some engineering to either build up river banks or find some other solution?

Improve undersize culverts

Stream Bank Stabilization

Flood mitigation projects to avoid damage and minimize downtime

Management of Winooski and Dog Rivers including dredging and riverbank management to protect properties located along these waterways

Minimizing development in flood plains, mitigating river flooding

Cleaning rivers

Increased allowable density and development in areas outside of the FEMA mapped floodplain that incentivizes sustainable growth of Berlin that is climate resilient.

We would like to have the town put hazard mitigations in place for immediate response as well as long term prevention. Imperative.

8) Anything else you would like to provide for consideration and incorporation into the Berlin Local Hazard Mitigation Plan?

8 responses

Dredge the rivers and put back large rocks

Re engineering hillside drainage to disperse water over a greater area , not just downhill.

While roads may be an important factor to me, all of the items listed should be in the plan with measures to inform and communicate with the public about them and encourage community action, including volunteers to address those that are appropriate.

I am temporarily separated from Berlin. I was located in BMHP, which was mostly destroyed. I (and many others) strongly believe that the BMHP at Cedar drive should not be permitted to reopen as a residential area. Berlin and FEMA should strongly consider a buyout of this area and perhaps making it a recreational area for the community. Having lived there for many years, it is clear that Cedar drive is prone to repeated flooding events. There were door-to-door emergency alerts or evacuation advisories almost annually at that park. This indicates a clear threat which is unlikely to be mitigated to a point of residential safety. Future plans should aim to convert this park, and any other similar residential areas that cannot be reasonably protected, in to safe, non-residential spaces.

Berlin Planning Commission would be happy to work with CVRPC

Properties that abutt the rivers should be allowed to increase the height of their banks (berming) to protect their homes and businesses. The Town should facilitate this type of preventative measure and work with the State to permit such action.

On the pond, especially, we should not be simply putting the ineffective drainage pipes baci in place- we need to prioritize much larger pipes to contain and control flood waters.

Question 2, "Have you or your property be directly impacted ", someone needs to proof read before you send out. . . "Been Impacted". Question 5, should begin, "If yes to question 3". In your email, you refer to the "Four Corners Fire Station". . . when did we start calling it that? (1), it's not located at the four corners, that's at the Nye property and (2) it's the Berlin Fire Department (BFD). And finally, why has it been almost 2 years and Paine Turnpike has yet to be repaired from the flood? If you can't even fix this road, how can we take anything you say regarding a Local Hazard Mitigation Plan?

Berlin LHMP community survey

B *I* U ↻ ✕

This is an opportunity for the residents of Berlin to have their voices heard for prioritizing hazard mitigation projects for the town and strategies for the next 5 years.

1) How long have you lived in or owned a business or property in Berlin?

- Less than a year
 - One to Five years
 - More than Five years
-

2) Have you or your property been directly impacted by a natural disaster?

- Yes
 - No
-

3) Which natural hazard are you most concerned about?

- Inundation Flooding
- Erosional/Fluvial Flooding/flash flood
- High Winds
- Extreme Cold
- Extreme Heat
- Earthquake
- Landslide
- Hail
- Invasive Species
- Infectious Disease
- Ice
- Snow
- Drought

4) Is your home or business property located in a FEMA designated floodplain?

- Yes
 - No
 - I don't know
-

5) If yes to question 4, do you have insurance through the National Flood Insurance Program (NFIP)?

- Yes
 - No
 - Not relevant, home or business is outside of the floodplain.
-

6) In your opinion, which of the following are most important to protect against potential future severe weather impacts in Berlin? Please check up to 3 boxes.

- Loss of life or injury
 - Damage or loss of roads, bridges, utility infrastructure
 - Protection of vulnerable populations
 - Business closure or loss
 - Damage to schools or other public property (e.g., parks, buildings)
 - Damage or loss of agricultural operations
 - Protection against dam breaches
 - Damage to environmental resources (e.g., wetlands, ponds, rivers, forests)
 - Damage or loss of cultural/historic properties
 - Protection of wildlife
-

7) In this context, hazard mitigation is a sustained measure that reduces or eliminates long-term risk to people and property from the effects of natural hazards (defined as severe weather events). What types of hazard mitigation measures would you like to see the community prioritize?

Long answer text

8) Anything else you would like to provide for consideration and incorporation into the Berlin Local Hazard Mitigation Plan?

Long answer text

Capabilities to Implement Mitigation Actions

EXISTING AUTHORITIES, POLICIES, PROGRAMS AND RESOURCES

Plans and Studies

Capability	Description	Improvement Opportunity
<i>Town Plan</i>	Long term plan to guide development and growth in the town.	Prioritize growth in safe areas for development.
<i>Local Hazard Mitigation Plan (LHMP)</i>	Long term plan for mitigating risk to natural hazards	Develop new list of priorities for communities and planned mitigations.
<i>Stormwater Plan</i>	Studies watershed for projects	Implement projects from plan list
<i>Local Emergency Management Plan (LEMP)</i>	Town emergency response plan for disasters and updated annually	Continue process for updating annually. Possibly add annexes for heat emergencies.
<i>Capital Improvement Plan</i>	5- or 10-year plan for budgeting community projects	Add in disaster contingency/mitigation grant fund
<i>Culvert Inventory</i>	Inventory of all town owned culverts and short bridges	Recently completed in 2024 Scheduled to Update in 2029

Administrative Capacity and Capability

Capability	Description	Improvement Opportunity
<i>Emergency Management Director</i>	Person in charge of coordinating town response to natural disaster	None at this time
<i>Planning Commission</i>	Plans for future growth in town	Promote taking ICS training
<i>Zoning Administrator</i>	Verifies that growth aligns with town zoning rules and permits	Utilize NFIP training opportunities
<i>Tree Warden</i>	Maintains trees in town forest, public land and town right of ways	None at this time
<i>Selectboard</i>	Town elected board	Promote selectboard to take ICS 402 training

<i>Mutual Aid Agreements</i>	Currently have mutual aid agreement for fire service.	Sign on to regional public works mutual aid agreement.
<i>VEM Training</i>	ICS training	Promote town committees and staff receiving training.
<i>Road Department</i>	Road Maintenance	Promote taking ICS 100 or 402 training
<i>Town Clerk/Administrator/Administrative Assistant</i>	Town administrator day to day management of town government.	Trained in FEMA ICS structure

Financial Resources

Capability	Description	Improvement Opportunity
<i>Town Budget</i>	Blueprint for funding town government	None at this time
<i>Capital Improvement Plan</i>	Long term plan for funding community projects	Have disaster set aside or contingency fund
<i>Municipal Bonds</i>	Funding for larger projects	None at this time

Zoning and Regulations

Capability	Description	Improvement Opportunity
<i>National Flood Insurance Program (NFIP) CRS</i>	Flood Insurance-town has performed actions to receive a CRS score of 7.	Update flood maps as necessary
<i>SFHA bylaws</i>	Are up to date and have addition of adopted river corridor bylaws	Update to new FEMA flood maps and bylaw requirements if necessary
<i>Zoning / Land Use Regulations</i>	Land use guidance for development	Update after town plan update if necessary
<i>Road Standards</i>	2019 VT Bridge and Road Standards	Will wait for VTrans next update
<i>River Corridor bylaws</i>	Adopted	Adopt River Corridor Bylaws

Outreach and Education

Capability	Description	Improvement Opportunity
<i>Front Porch Forum</i>	Outreach potential	Have notices/reminders of risk for wildfires and outreach for programs that lower risk to hazards
<i>Town Website</i>	Town postings and communication	None at this time, already utilizing for disaster support services
<i>Water Bill</i>	<i>Inserting announcements with town water bills ensures communication to a broad audience. Drought information.</i>	<i>Create long term plan for coordinating announcements and prepare templates to use for communication with water bills.</i>

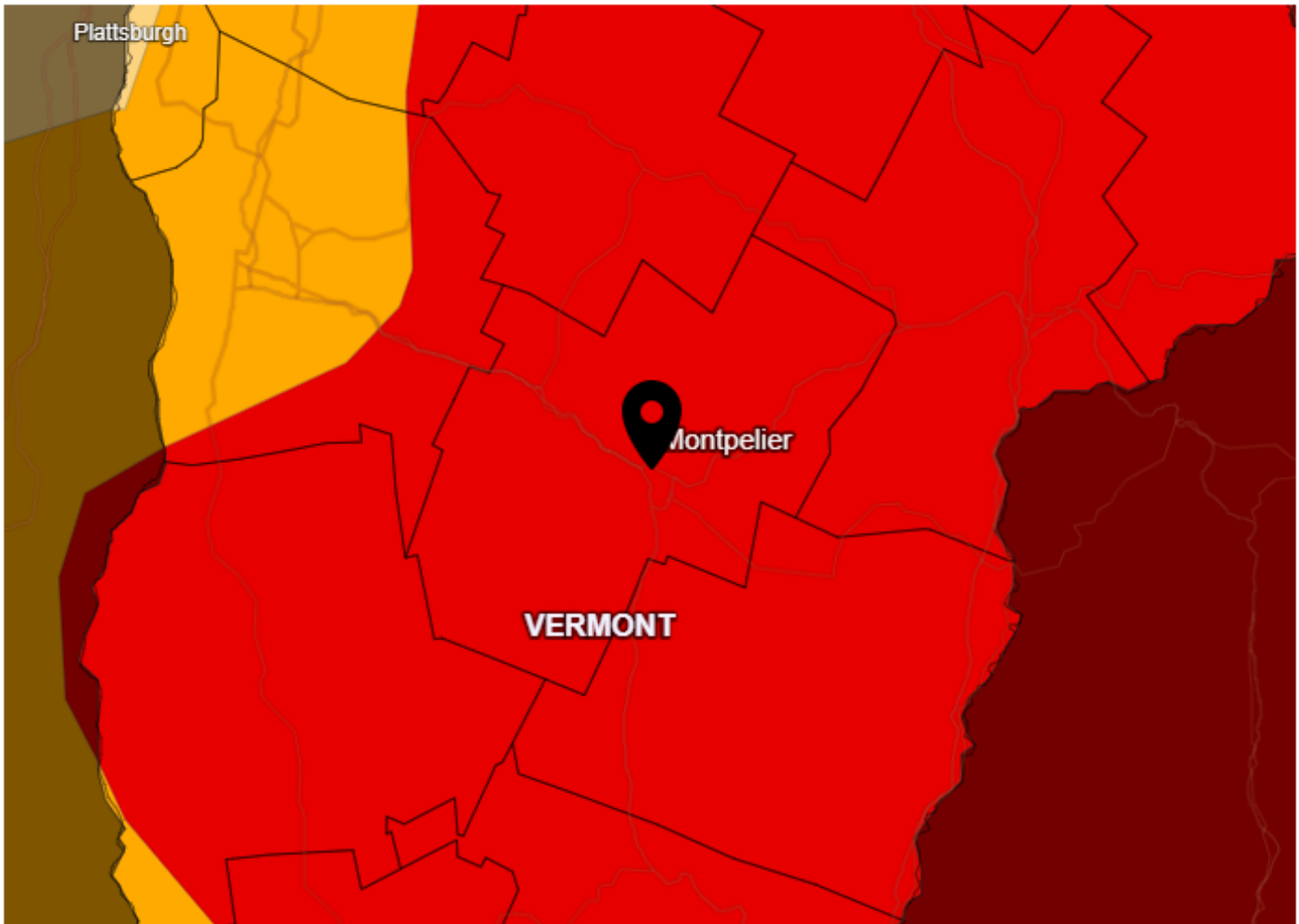
Partnerships

Berlin is served by Friends of the Winooski, Vermont River Conservancy, Winooski Natural Resource District Agency of Natural Resources, and Vermont Department of Environmental Conservation.

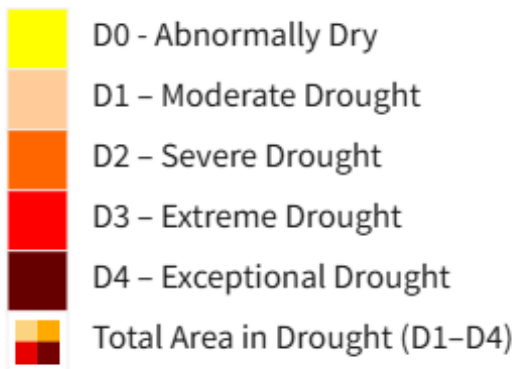
The community will continue to build a stronger relationship with our natural resource partners to design and implement natural systems protection mitigation actions through natural and nature-based infrastructure solutions. Natural and nature-based infrastructure, both existing and constructed, will provide multiple benefits to the community including erosion control, stormwater retention, water purification, cooling effects, wind abatement, mental health and recreation enhancements, increased real estate values, native species habitat, and educational opportunities.

Extent of Risk for BERLIN	Risk	Area/Type of risk	~ \$ of damages possible	Disasters
Fluvial Erosion	anything greater than 1"/ hr for more than 2 hours	Special Flood Hazard Area and within 50' of stream channels or stormwater inlets/Structures, People, Transportation	\$1,306,300	See Table Section 5
Inundation Flooding	4-6" of rain in 24hrs	Special Flood Hazard Area and within 50' of stream channels or stormwater inlets/ Structures, People	\$ 2,616,302	See Table Section 5
Snow	up to 30"	town wide/Structures, Utilities, Transportation	Undetermined	See Table Section 5
Ice	1/4" or greater	town wide/ Structures,Utilities, Transportation	Undetermined	See Table Section 5
High Winds	45 mph	town wide, but more prominent on higher slopes/Structures, Utilities	Undetermined	See Table Section 5
Wildfires	6 acres	town wide, Structures, environment	minimal	None
Landslides	0.1 of an acre	Steep sloped areas of unstable soils. Often undercut by stream or waterway. /Structures, Transportation	Undetermined / currently just timber loss.	No disaster records but 9 documented landslides within the town boundaries.
Infectious Disease Outbreak	206 cases of COVID/weekly avg./ at CVMC for region.	town wide, people	Undetermined	DR-4532
Invasive Species	Unknown/ determinate by type (plant, insect, fungus)	town wide/ environment, agriculture	Undetermined	None
Heat	90 degrees	town wide/People	Undetermined	None
Cold	-20 degrees/ -30 to-60 degrees with windchill	town wide/People	Undetermined	See Table Section 5
Drought	D3	town wide/People, Agriculture	Undetermined	None

U.S. Drought Monitor



Drought & Dryness Categories



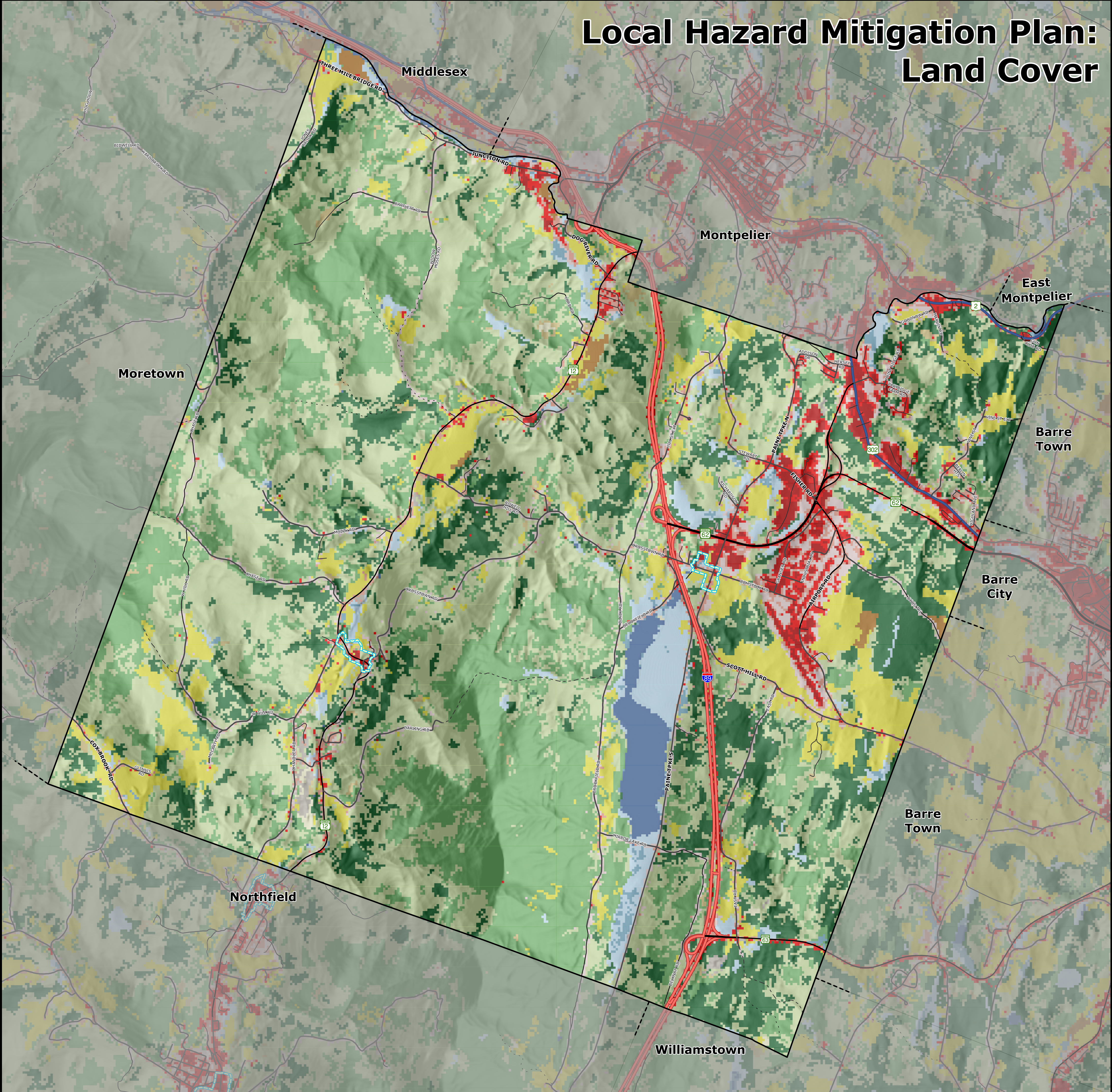
% of Washington County

D0 - Abnormally Dry	0%
D1 - Moderate Drought	0%
D2 - Severe Drought	0%
D3 - Extreme Drought	100.00%
D4 - Exceptional Drought	0%
Total Area in Drought (D1-D4)	100.00%

Source(s): NDMC, NOAA, USDA
Data Valid: 10/16/25

Drought.gov

Local Hazard Mitigation Plan: Land Cover



Data Resources
 Parcels: Berlin Parcel Boundaries (2025, VCGI)
 State Village Center Designation: Village Center Boundary (2025, ACCD)
 Roads: Vermont Agency of Transportation - Road Centerlines (2025, VCGI)
 National Land Cover Dataset - (2021, Multi-Resolution Land Cover Consortium)

Map Notes
 Date: 22 December 2025
 File: \GIS\Towns\Berlin\Berlin.aprx
 Contact: gis@cvregion.com

Disclaimer
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Legend

National Land Cover Dataset (2021)

Open Water	Barren Land (Rock/Sand/Clay)	Grassland/Herbaceous
Developed, Open Space	Deciduous Forest	Pasture/Hay
Developed, Low Intensity	Evergreen Forest	Cultivated Crops
Developed, Medium Intensity	Mixed Forest	Woody Wetlands
Developed High Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands

Roads

Class I, II & III Town Highways	Interstate Highway
Class IV & Forest Highways	US Route
Legal Trail	VT Route
Private Road	Discontinued Road

Boundaries

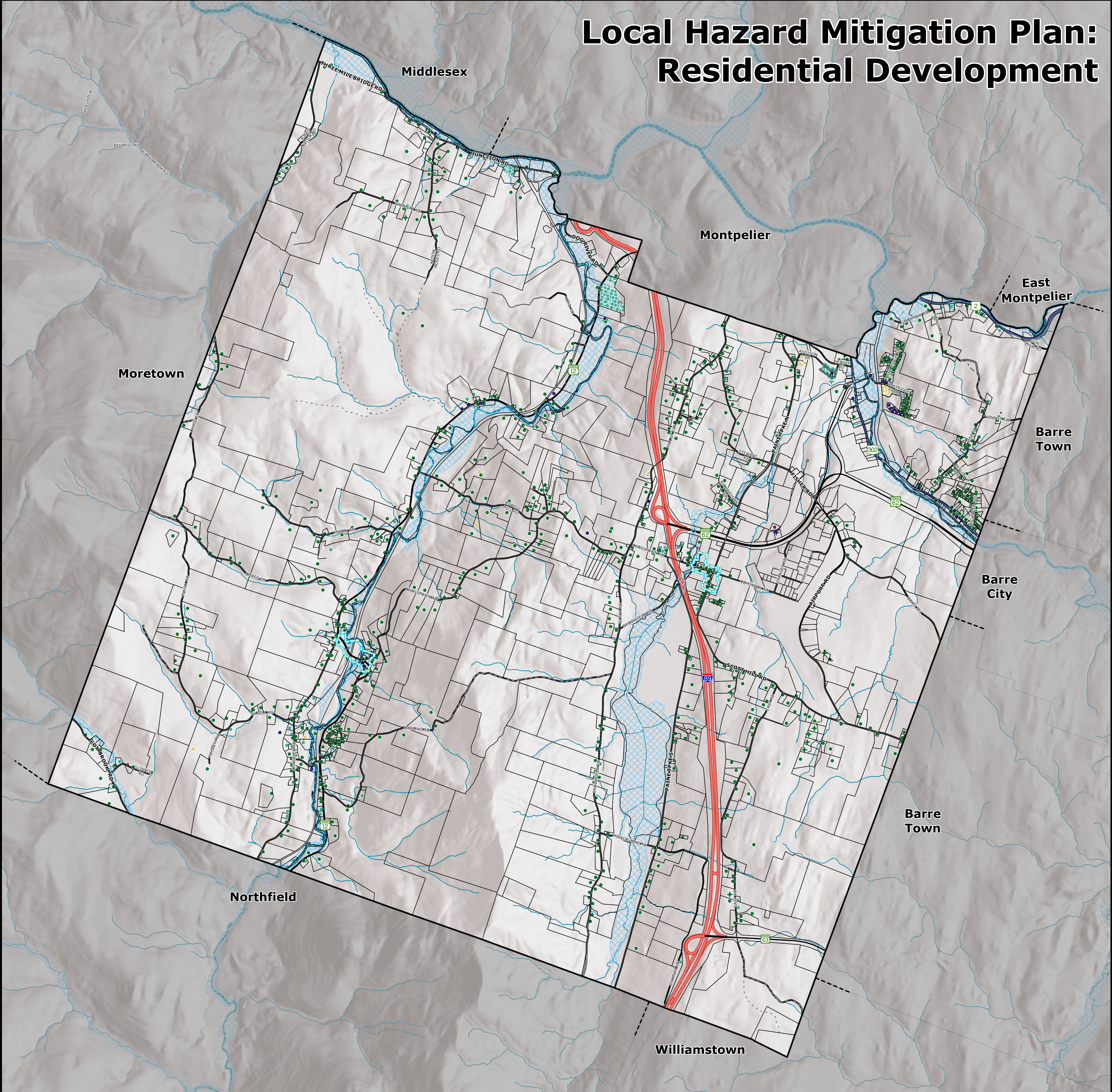
Town Boundary
Designated Village Center

Scale: 0 to 2 miles / 0 to 3 kilometers

Location Map

The Location Map displays the Central Vermont Regional Planning Commission (green) and the Town of Berlin (yellow) within the State of Vermont.

Local Hazard Mitigation Plan: Residential Development



Data Resources

Parcels: Berlin Parcel Boundaries (2025, VCGI)
 Village Center: Agency of Commerce & Community Development (2025, VCGI)
 Roads: Vermont Agency of Transportation - Road Centerlines (2025, VCGI)
 Surface Water: Vermont Hydrography Dataset (2020, VCGI)
 FEMA Flood Hazard Area: National Flood Hazard Layer (2015, FEMA)
 Structures: E911 Site Location (address points) (2025, VCGI)

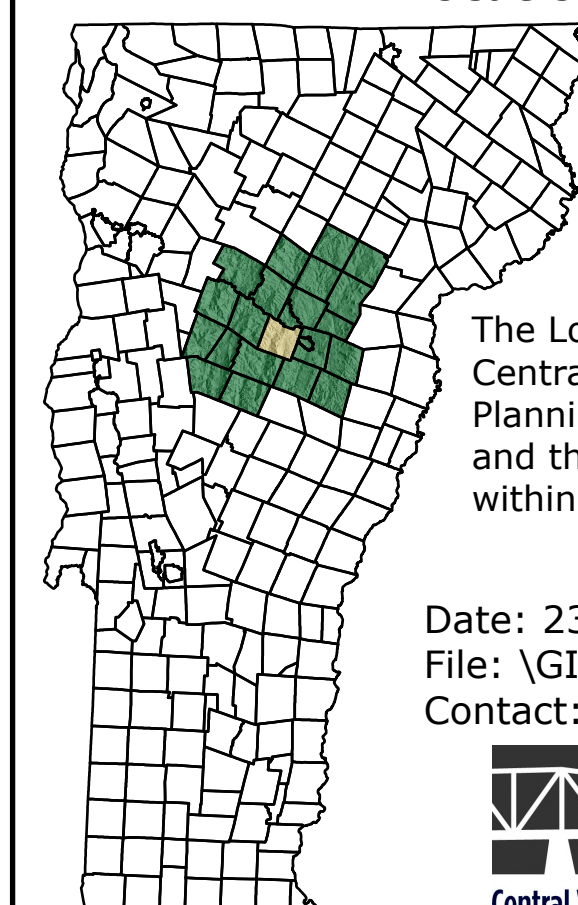
Disclaimer

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Legend

- | | | |
|--|---|---|
| Boundaries
□ Parcel Boundary
□ Town Boundary
☒ Designated Village Center
☒ Special Flood Hazard Area
Surface Water
— Rivers & Streams
■ Lakes & Ponds | Pre-2020
● Mobile Home
● Single Family Dwelling
● Multi-Family Dwelling
● Other Residential
● Congregate Housing
Post-2020
◆ Mobile Home
◆ Single Family Dwelling
◆ Multi-Family Dwelling
◆ Other Residential | Roads
— Class I, II & III Town Highways
— Class IV & Forest Highways
- - - Legal Trail
— Private Road
— Interstate Highway
— US Route
— VT Route
- - - Discontinued Road |
|--|---|---|

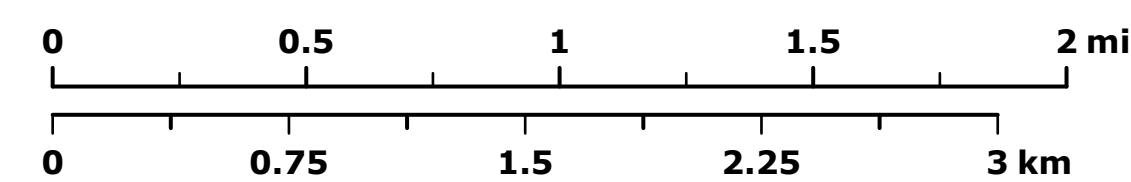
Location Map



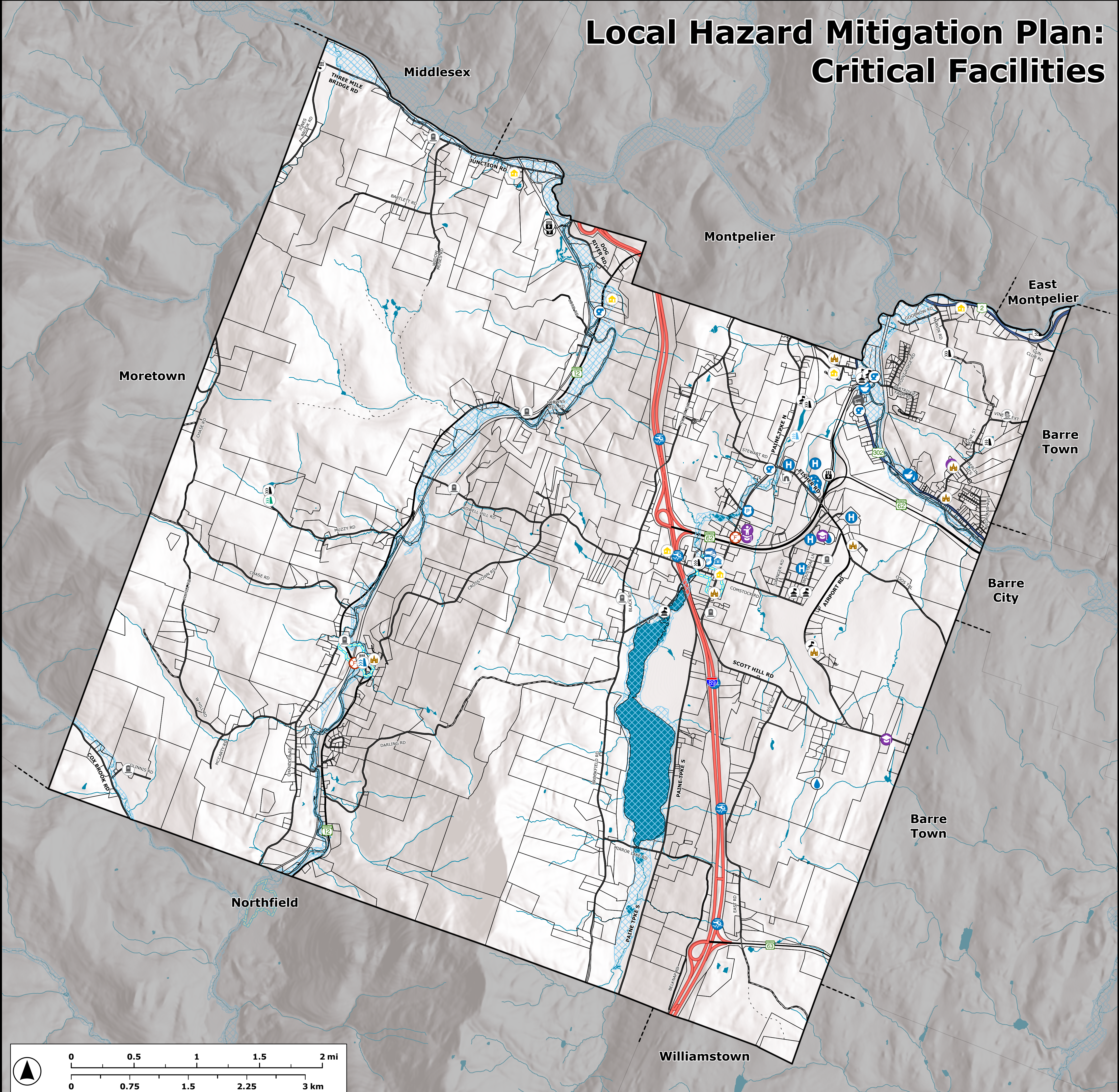
The Location Map displays the Central Vermont Regional Planning Commission (green) and the Town of Berlin (yellow) within the State of Vermont.

Map Notes

Date: 23 December 2025
 File: \\GIS\Towns\Berlin\Berlin.aprx
 Contact: gis@cvregion.com



Local Hazard Mitigation Plan: Critical Facilities



Data Resources

Parcels: Berlin Parcel Boundaries (2025, VCGI)
 Mobile Home: Berlin Mobile Home Parks (2025, CVRPC)
 State Village Center Designation: Village Center Boundary (2025, ACCD)
 Surface Water: Vermont Hydrography Dataset (2020, VCGI)
 Special Flood Hazard Area: National Flood Hazard Layer (2015, FEMA)
 Dam Inventory: DEC Dam Safety and Hydrology (VCGI, 2022)
 Critical Facilities: E911 Site Location (2025, VCGI & Town of Berlin)

Disclaimer

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- Legend**
- | | | | |
|--|---|--|--|
| <p>Boundaries</p> <ul style="list-style-type: none"> Parcel Boundary Designated Village Center Town Boundary Special Flood Hazard Area <p>Surface Water</p> <ul style="list-style-type: none"> Rivers & Streams Lakes & Ponds <p>Educational Facilities</p> <ul style="list-style-type: none"> Daycare / Pre-school School (K - 12) SummerCamp | <p>Cultural Facilities</p> <ul style="list-style-type: none"> House of Worship Cemetery <p>Dams</p> <ul style="list-style-type: none"> Breached Breached (Partial) In Service Removed <p>Government Facility</p> <ul style="list-style-type: none"> Town Office Town Garage State Garage State / Federal National Guard | <p>Public Health</p> <ul style="list-style-type: none"> Health Clinic Pharmacy <p>Utilities</p> <ul style="list-style-type: none"> Public Phone Substation Pump Station Water Tank <p>Emergency Services</p> <ul style="list-style-type: none"> Fire Station Law Enforcement Helipad / Heliport Shelter | <p>Roads</p> <ul style="list-style-type: none"> Class I, II & III Highways Class IV & Forest Highways Legal Trail Private Road Interstate Highway US Route VT Route Discontinued Road <p>High-Density Residential</p> <ul style="list-style-type: none"> Mobile Home Park |
|--|---|--|--|

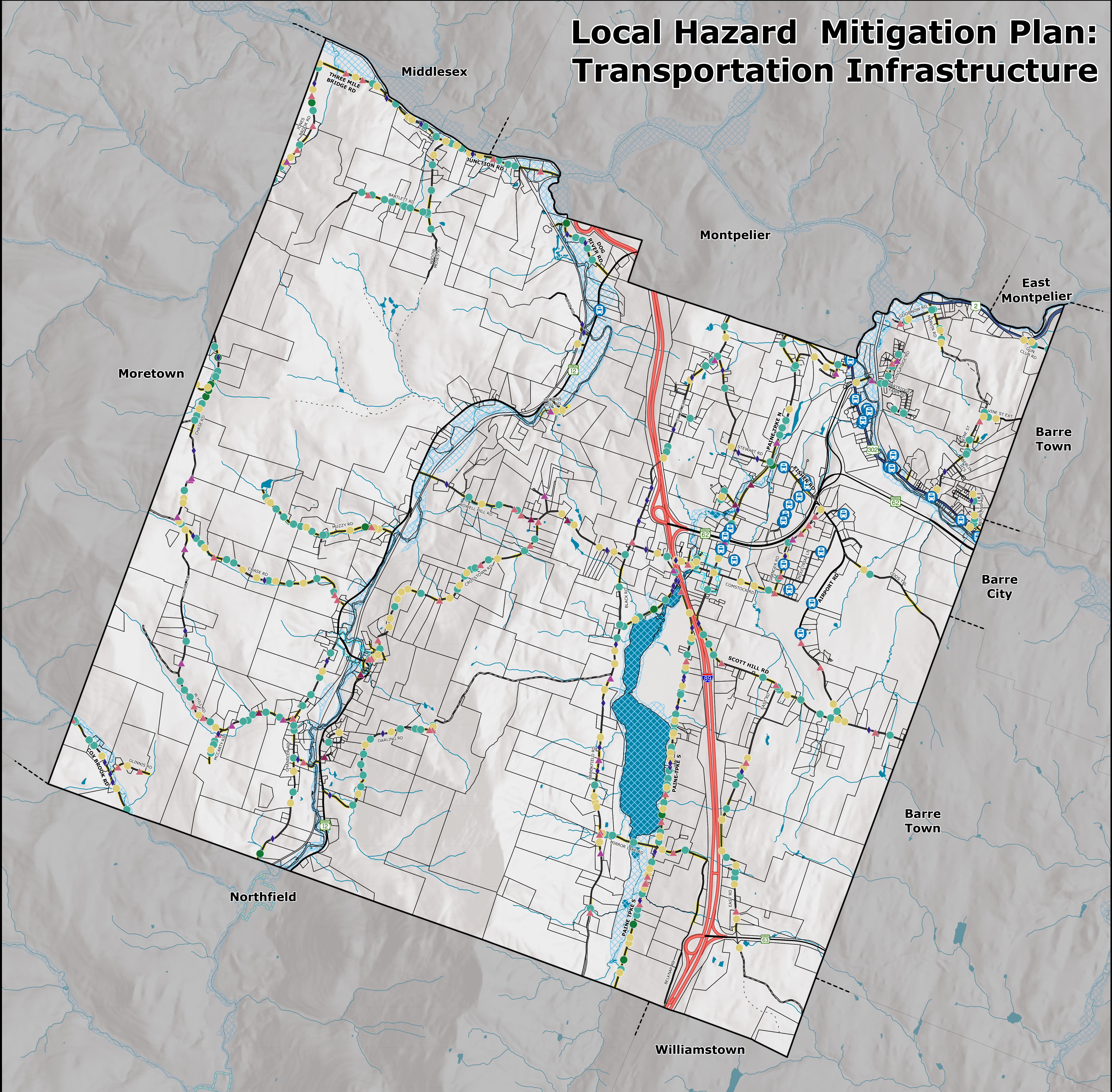
Location Map

The Location Map displays the Central Vermont Regional Planning Commission (green) and the Town of Berlin (yellow) within the State of Vermont.

Map Notes

Date: 16 December 2025
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 Contact: gis@cvregion.com

Local Hazard Mitigation Plan: Transportation Infrastructure



Data Resources

Parcels: Berlin Parcel Boundaries (2025, VCGI)
 State Village Center Designation: Village Center Boundary (2025, ACCD)
 Surface Water: VT Hydrography Dataset (2020, VCGI)
 Special Flood Hazard Area: National Flood Hazard Layer (2015, FEMA)
 Infrastructure Condition: Bridge & Culvert Inventory (2023, CVRPC)
 Roads: Agency of Transportation - Road Centerlines (2025, VCGI)
 Hydrologically Connected Road Segments: Agency of Natural Resources (2019, VCGI)

Disclaimer

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Boundaries

- Parcel Boundary
- Town Boundary
- Designated Village Center
- Special Flood Hazard Area

Surface Water

- Rivers & Streams
- Lakes & Ponds

Public Transit

- Bus Stops

Legend

Culvert Condition

- Excellent
- Good
- Fair
- Poor
- Closed
- Urgent / Critical
- Unknown

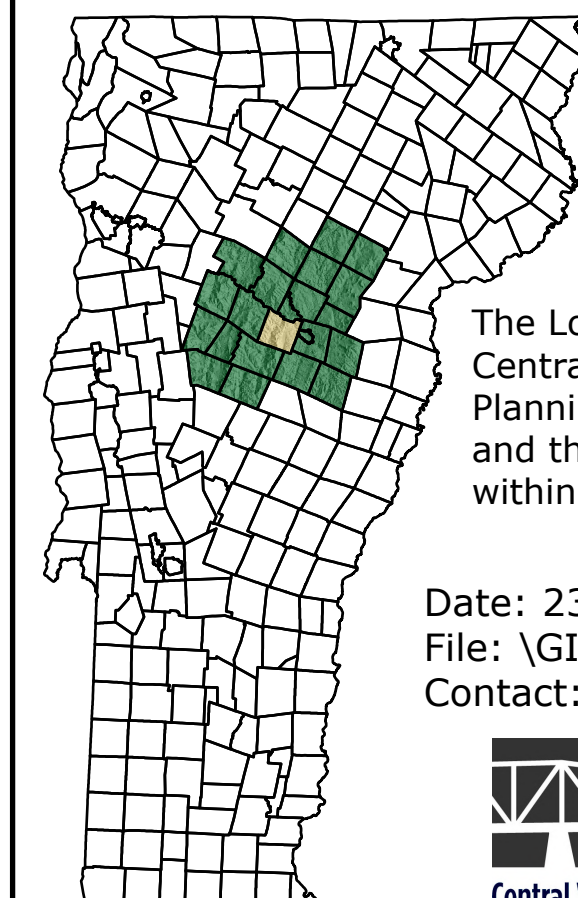
Bridge Condition

- Good

Roads

- Class I, II & III Town Highways
- Class IV & Forest Highways
- Legal Trail
- Private Road
- Interstate Highway
- US Route
- VT Route
- Discontinued Road
- Hydrologically Connected Segment

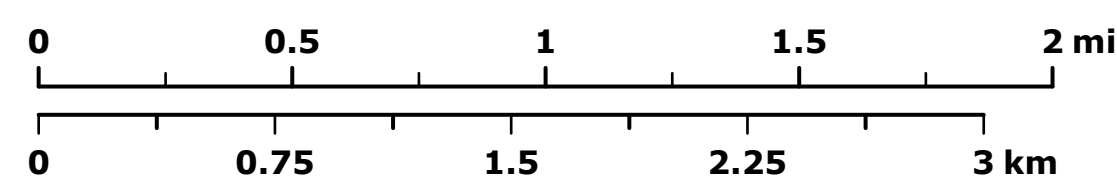
Location Map



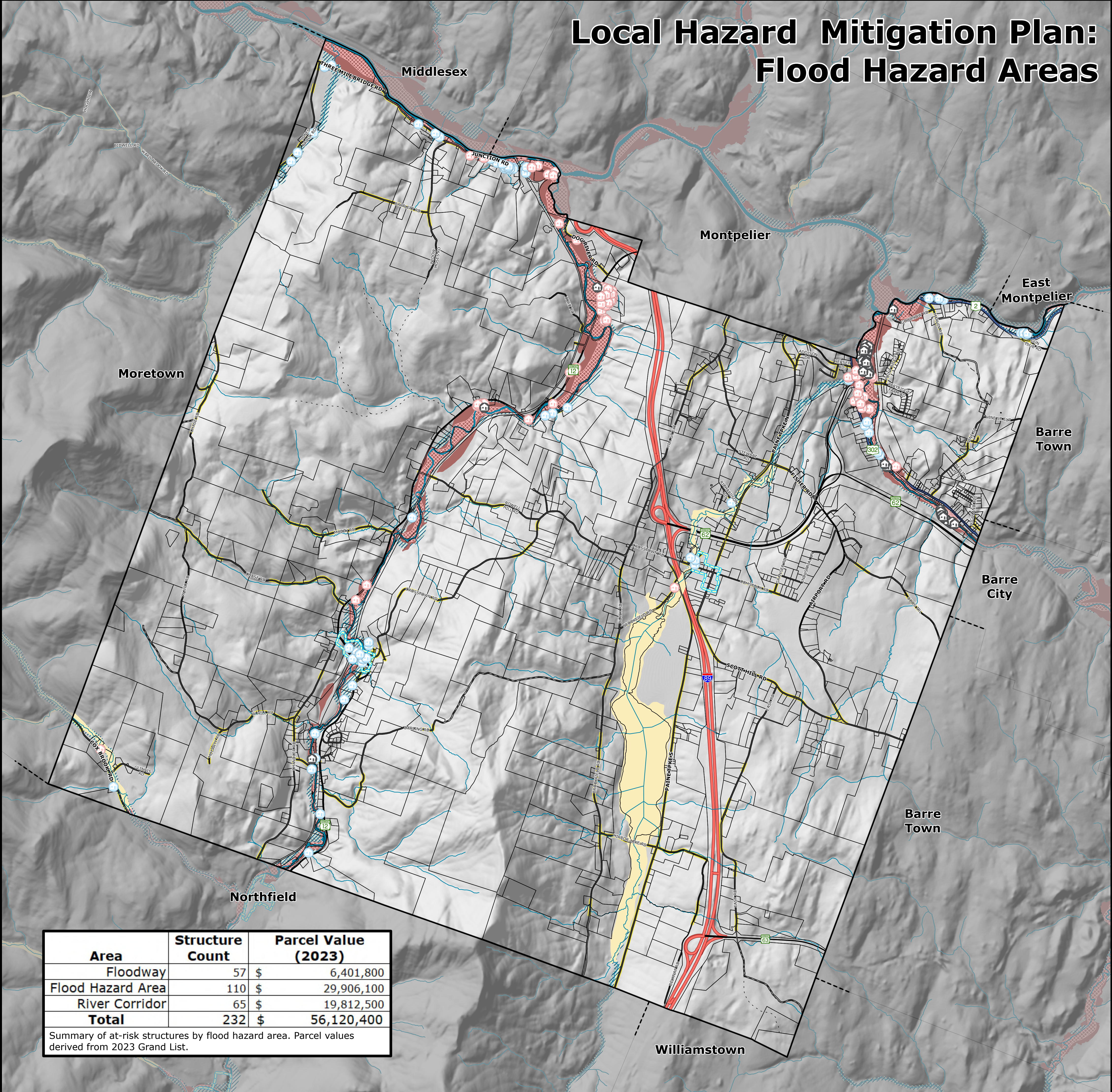
The Location Map displays the Central Vermont Regional Planning Commission (green) and the Town of Berlin (yellow) within the State of Vermont.

Map Notes

Date: 23 December 2025
 File: \GIS\Towns\Berlin\Berlin.aprx
 Contact: gis@cvregion.com



Local Hazard Mitigation Plan: Flood Hazard Areas



Area	Structure Count	Parcel Value (2023)
Floodway	57	\$ 6,401,800
Flood Hazard Area	110	\$ 29,906,100
River Corridor	65	\$ 19,812,500
Total	232	\$ 56,120,400

Summary of at-risk structures by flood hazard area. Parcel values derived from 2023 Grand List.

Data Resources
 Parcels: Berlin Parcel Boundaries (2025, VCGI)
 State Village Center Designation: Village Center Boundary (2025, ACCD)
 Surface Water: Vermont Hydrography Dataset (2020, VCGI)
 At-risk Structures: Derived data (CVRPC, 2025)
 FEMA Flood Hazard Area: National Flood Hazard Layer (2015, FEMA)
 Roads: Vermont Agency of Transportation - Road Centerlines (2025, VCGI)
 Hydrologically Connected Road Segments: Agency of Natural Resources (2019, VCGI)

Disclaimer
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Legend

Boundaries	Roads	Flood Hazard Areas
□ Parcel Boundary	— Class I, II & III Town Highways	■ Zone A
▭ Designated Village Center	— Class IV & Forest Highways	■ Zone AE
▭ Town Boundary	⋯ Legal Trail	▨ Floodway
Surface Water	— Private Road	▨ River Corridor
— Rivers & Streams	— Interstate Highway	At-risk Structures
■ Lakes & Ponds	— US Route	● River Corridor
	— VT Route	● Flood Hazard Area
	⋯ Discontinued Road	● Floodway
	— Hydrologically Connected Road Segment	

Location Map

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Map Notes
 Date: 23 December 2025
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Central Vermont Regional Planning Commission

