DRAFT LONG TERM RECOVERY AND RESILIENCE PLAN

Northern Vermont Economic Development District

A long-term economic recovery and resilience plan in the NVEDD Region. Flood impacts, risks, and challenges experienced by communities along the Lamoille River and key tributaries are outlined based on ongoing community engagement. Strategies and actions are recommended based on identified risks and challenges after recent flood disasters.

November 2025 DRAFT

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Introduction & Background

Northern Vermont Economic Development District and Regional Influences

The Northern Vermont Economic Development District (NVEDD) is a partnership between Regional Planning Commissions and Economic Development Corporations of Northern Vermont. The organization helps provide opportunities for region-wide development efforts for economic prosperity, sustainability, and resilience. Efforts are often focused on region-specific economic areas, including agriculture, tourism, local and value-added food production, biotechnology, and pharmaceuticals. NVEDD work is made possible through public and private partnerships, and funding is provided through the Economic Development Administration.

Development in the region is influenced by several factors, including natural resources and historic settlement patterns. One of the major natural influences in the Northern Vermont Region is the Lamoille River. It is the state's third longest river, crossing the region from east to west on its way to Lake Champlain. The Lamoille River Watershed covers approximately 706 square miles, and accounts for 7.5 percent of Vermont's land area. The basin occupies a major part of Lamoille County and lesser parts of Franklin, Chittenden, Orleans, Washington, and Caledonia Counties.

The generally steep slopes, rough topography, and narrow river valleys of the Northern Green Mountains and Lamoille River Valley have shaped human settlement patterns and the economy of the region. Traditionally, regional villages and downtown areas were located at key routes along rivers, roads, and railroads. Most of the agricultural activities in the Region occur in the Lamoille River Valley and its primary tributary basins -- where the land is level, tillable, and productive. Today, many of the region's downtown and village centers are still located along rivers, in floodplains, and are exposed to the negative impacts that come with rivers handling increasingly frequent and substantial rainfall.

Communities & Core Economic Hubs

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The NVEDD is comprised of the six counties along the northernmost border of Vermont: Grand Isle, Franklin, Lamoille, Orleans, Caledonia and Essex. Many economic hubs, commercial properties, and residences in regional downtowns and village centers are in the mapped FEMA floodplain or are vulnerable to inundation and erosion. Some centers are strategically located near municipal water and wastewater systems that can support commercial uses and rural development. Businesses and housing are often developed where the infrastructure is available to support them. However, these strategic locations influenced by historic development patterns leaves these areas vulnerable to increasingly frequent and devastating natural disasters.

Please see Appendix A for maps of target communities and commercial properties vulnerable to flooding. [1]

Mitigating impacts on these properties with nature-based solutions and supporting existing or planned foundational infrastructure will be critical to long term economic recovery and resilience in the region. Supporting this infrastructure should involve assessing risks and identifying alternatives to mitigate those risks. This process can unfold using publicly available, region-specific tools such as the Lamoille River Flood Model.

Please see Section II on "Planning for Recovery and Resilience," for more detail on the Lamoille River Flood Model and assessing alternatives in some of these key vulnerable areas.

Impacts from Flooding and Natural Disasters

Intensifying hydrological cycles and increased extreme precipitation are making inland flooding more severe. Three of the five worst flooding events in the region's recorded history occurred over a 12-month period between 2023 and 2024. County-level data from 2020 show that the average annual flood losses for the NVEDD Region are around $20 million. The average annual exposure to flooding in the entire state of Vermont is also some of the highest in the nation – two percent of the state's population is impacted by flooding every year. New development in floodplains exacerbates this

[1] Please note that maps were created using currently available FEMA data. Land use categories are also included from proposed regional land use maps updates, to help show the overall intended patters of development in mapped communities.

risk. Damages from flooding and other hazards across the region take a significant amount of financial and social resources to recover from and are expected to continue.

By understanding flood risk in regional economic centers, communities can identify where they are most vulnerable and strategize for long term recovery and resilience. During the development of this long-term resilience and recovery plan, ongoing community engagement and technical assistance in targeted communities helped to identify areas of flood risk and where there are opportunities to move forward and adapt. Shifting development patterns and prioritizing flood risk management, coupled with infrastructure and building retrofits in existing areas, are some ideas expressed in target communities that could help lower the risk of loss from flooding in the region.

Target Communities

Thirty-five communities within the Lamoille River Basin are located along the Lamoille River. Many experienced substantial damages because of the federally declared disaster DR-4720 (the "July 2023 floods"). Other substantial impacts were also experienced in subsequent disasters: DR-4744 (August 2023 floods), DR-4762 (December 2023 floods), and DR-4810 (July 2024 floods). Some of the hardest hit communities and businesses were in the central stretch of the Lamoille River: Hardwick, Wolcott, Johnson, Jeffersonville, and Cambridge Village, Fairfax, and Georgia. Other heavily impacted communities along the Main Stem and tributaries include Morrisville, Hyde Park, and Stowe.

Below are some tables and figures outlining the community profiles and impacts to municipalities and businesses because of these federally declared disasters.

Table 1a. Target community profiles including demographic information from the U.S. Census.

Community	Population*	Median Household Income (MHI)*	%Poverty	%Unemployment	% w/o vehicle
Town of Hardwick	2,950	Median: 83,052 Mean:91,363	9.4%	1.8%	63 HH 4.8%

Town of Wolcott	1,531	Median:62,118 Mean:78,446	9.2%	2.2%	170 HH 8.5%
Town of Johnson	3,467	Median:54,453 Mean:75,877	11.5%	6.9%	14HH 5.1%
Town of Cambridge	3,783	Median:77,212 Mean:101,482	8.5%	1.3%	79HH 5.4%
Town of Fairfax	5,138	Median:119,063 Mean:116,674	3.5%	1.6%	64HH 9.7%
Town of Georgia	4,876	Median:102,008 Mean: 112,502	5.4%	2.7%	52 HH 2.9%
Lamoille (2020 Census)	25,945	Median: 69,897 Mean: 104,443	8.1%	12.8%	548HH 4.8%
Caledonia					
Franklin					
State (2020 Census)	643,077	Median 81,211	9.7%	15.4%	16901HH 6.3%

* Data from the 2023 American Community Survey.

*Table 1b. Target community profile including demographic data from Census Designated Places (CDP).**

Census Designated Place (CDP)	Median Household Income (MHI)°	% Low-to-Moderate Income (LMI)**	# LMI Persons**
Hardwick	$41,667	74%	745
Wolcott	$39,904	75%	135
Johnson Village	$48,355	70%	835
Jeffersonville	$57,083	52%	665
Cambridge Village	$50,595	44%	240
Fairfax	$56,667	48%	1145
Georgia	N/a	N/a	N/a

**Census Designated Places correspond more closely with the geography of flood impacts experienced in target communities.*
***Source: Low-to-Moderate Income Data, Map Application, based on the 2016-2020 American Community Survey*
°*Source: U.S. Census*

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Table 2. Reported impacts from federally declared disasters in Lamoille County communities and statewide.

Date of Incident (FEMA DR, if declared)	Type of Event	Statewide Damage Assessment	Countywide Damage Assessment	Cambridge	Jeffersonville	Johnson	Wolcott	Hyde Park	Morristown
July 7 – July 21, 2023 (DR-4720-VT)	Severe Storms, Flooding, Landslides, and Mudslides	$61,192,542 (PA)* $26,199,865 (IA)	$9,971,691 (to date) (PA) $5,644,881 (Household Recovery) $2,837,465.92 (IA)	$462,722 (PA) $884,535 (IA)	$ 58,305 (PA) $ 332,870 (IA)	$3,116,237 (PA Village)** $621,856 (PA Town)	$1,934,693 (PA)	$570,525 (PA)	$126,616 (PA Town) $1,987,676 (PA Village)
Dec 18 – Dec 19, 2023 (DR-4762-VT)	Severe Storms & Flooding	$1,929,481 (PA)	$140,622 (PA)*	$1,131,395 (PA)	N/A		$0		
July 9 – July 11, 2024 (DR-4810-VT)	Severe Storm, Flooding, Landslides, & Mudslides	$7,996,409 (PA)* $10,795,241 (IA)	$474,534 (PA)* $313,179 (IA)	$0 (PA) $4,911 (IA)	N/A		$0 (PA)		
Aug 22-24, 2024 (DR-4816)	Severe Storms & Flooding	$1,304,756 (PA)*	$1,212,669 (PA)	$0 (PA)	N/A		$0		

*Preliminary Damage Assessment, not final funding obligation.

**Please note: this figure does not include damages incurred at the wastewater treatment facility.

PA = Public Assistance

IA = Individual Assistance

Source: FEMA Disaster Declarations

Table 2. Reported impacts from federally declared disasters in the target community of Hardwick.

Date of Incident **(FEMA DR, if declared)**	**Type of Event**	**Statewide Damage Assessment**	**Hardwick**
July 7 – July 21, 2023 (DR-4720-VT)	Severe Storms, Flooding, Landslides, and Mudslides	$61,192,542 (PA)* $26,199,865 (IA)	$6,475,520 (PA) $737, 301 (IA; also includes E Hardwick)
July 9 – July 11, 2024 (DR-4810-VT)	Severe Storm, Flooding, Landslides, & Mudslides	$7,996,409 (PA)* $10,795,241 (IA)	$225,468 (PA) $43,401 (IA)

Table 3. Reported impacts from federally declared disasters in the target community of Fairfax.

Date of Incident **(FEMA DR, if declared)**	**Type of Event**	**Countywide Damage Assessment**	**Fairfax**
July 7 – July 21, 2023 (DR-4720-VT)	Severe Storms, Flooding, Landslides, and Mudslides		$8,000.76

For many of the communities around the NVEDD, the July flooding of 2023 and 2024 are some of the most extreme flooding events in recent decades. DR-4720 resulted in well over $15,000,000 in relief funds from FEMA in the forms of individual, business and public assistance.

Below are some snapshots of flood damage and impacts documented in Local Hazard Mitigation Plans and through ongoing targeted community engagement with flood-impacted communities. Communities are listed in the order in which they are located along the Lamoille River (upstream to downstream).

Hardwick

According to the Town of Hardwick Local Hazard Mitigation Plan (LHMP), the town has seven properties in the FEMA/State of Vermont buy-out process because of DR-4720. In addition, there are four mobile homes that were substantially damaged. The July 2023 flood severely impacted Hardwick and has taken its place as the worst in town history. From the wastewater treatment facility, and the Fire Station, to multiple roads, culverts, homes, the Hardwick Bridge, a town vehicle, and segments of the recently completed Lamoille Valley Rail Trail, the complete damage portrait amounts to about $6.4 million in reported damages to public infrastructure. This figure is a low estimate that does not include losses to insured structures, including the wastewater treatment facility and the Fire Station. Both critical facilities were substantially damaged and inundated in the July 2023 and 2024 floods.

In response, ongoing priority projects for the community include mitigating impacts to the wastewater treatment facility, which is foundational to the Village and local economy. Others include relocation of the Fire Department building and floodplain restoration projects to mitigate the impacts to the historic district and Village Center. For more information on priority projects, please see the “Municipally Led Projects” table in Section III. of this plan.

Wolcott

According to the Wolcott Local Hazard Mitigation Plan, Wolcott Village must be temporarily evacuated as the Lamoille River rises during severe rain events. The Town’s municipal garage, fire station, and emergency shelter are also located in the Village, so flood response is complicated by this geography. Relocating these critical facilities and services will be crucial for resiliency and long-term recovery in Wolcott. There is also limited cell coverage in the area, which further complicates response. Evacuation is often noticed by a Lamoille County Sherriff patrol car. Typical damage covers a wide range from flooded structures, road washing out, bridge and culvert damage.

The July 2023 flood imposed significant damage on Wolcott’s designated Village Center, including inundating the fire department, town garage, and individual septic systems and leach fields. The construction of the new community wastewater system in the Village involves designs to help improve flood resilience, by locating a community leach field outside of the floodplain, ballasting tanks, and other mitigation measures. Transportation infrastructure was also heavily impacted, including damage to a critical town culvert under School Street, the primary inroad into the Village core. Flat Iron Road (the only other route out of the Village when School Street is inundated), was completely eroded down to bedrock and needed to be rebuilt and riprapped. Flood impacts on the steeper slopes of North Wolcott Road along the Wild Branch resulted in erosion, loss of property, and slope failures along this major trucking route. The Lamoille Valley Rail Trail (LVRT) also experienced significant damage in the Wolcott sections of the trail, including major washouts and debris built up around the historic truss bridge.

Furthermore, the Town of Wolcott approved eight (8) residential property buyouts because of DR-4720. The loss of this revenue on the Grand List is amplified with additional debt taken on to respond to and recover from flood damages – the Town took on a $1,000,000 loan to repair damaged local infrastructure. Public reuse of buyout properties is of interest locally. The Town will explore options for renewed economic activity on site that would spark new community connections, such as a "Riverside Park," hosting food trucks, and improved amenities for LVRT travelers.

For more information on priority projects for economic recovery and resiliency, please see the "Municipally Led Projects" table in Section III of this plan.

Johnson

Like Hardwick, Johnson Village homes, businesses, and critical infrastructure were severely impacted in the DR-4720 flood event. The event resulted in $3,738,093 to date in public assistance for the community. This figure is a low estimate that does not include losses and damage to the wastewater treatment facility, which was under several feet of water and remains in a vulnerable condition. As of this writing, the Village is exploring options including mitigating the facility in place or relocating to property outside of the floodplain. This infrastructure remains a key component to local economic development and recovery as there is a significant amount of capacity available to support new housing, businesses, and services in safer locations. Other foundational local utilities such as the water system and electric utility have components that would benefit from mitigation in advance of future flood disasters, such as access roads and utility poles in the mapped floodplain.

As of this writing, a combination of seventeen (17) commercial and residential properties (with a total of 27 dwelling units) are pursuing FEMA buyouts in Johnson. A cluster of buyout properties at the confluence of the Lamoille with the Gihon River are a topic of conversation locally. There is a strong interest in spurring new flood-resident economic development opportunities and revitalizing the Village Core - activities including a new farmers market for improved local food access or improved connections and parking for the Lamoille Valley Rail Trail.

For more information on priority projects for economic recovery and resiliency, please see the “Municipally-Led Projects” table in Section III. of this plan.

Cambridge & Jeffersonville
As a result of increasingly frequent and severe flood events, the Town and Village of Cambridge are placing increased focus on hazard mitigation and flood resiliency. Given the shortened recurrence intervals of these extreme events, mitigating the impact of future floods is viewed as essential to the health, safety and wellbeing of the community, residents, visitors, and economy.

In July 2023, the village cores were fully inundated. During this event, forty-six (46) private structures including senior housing, residences, businesses, and religious institutions sustained significant flood damage with many requiring evacuations. 8 residential structures totaling 14 dwelling units in the Vllage of Cambridge are in the buyout process. Furthermore, access and use of critical facilities was negatively impacted – a pump station for the municipal wastewater system was damaged in the flooding and another remains at risk. The current connecting infrastructure and springs serving the Jeffersonville water system are located along a stream and also remain at risk. Elevating infrastructure that can’t be moved as well as developing a new water source and connecting infrastructure will be critical to the ability of this community to recover long term and relocate businesses and facilities out of harm’s way.

Fairfax
The Town of Fairfax was affected by the July 2023 floods at a smaller scale than communities upstream experienced. Within the village, the Lamoille River rose to nearly overtopping Bridge 9 on VT104. There was minor flooding northeast

of the bridge affecting one commercial site. Several residents on Maple Street reported flooded basements. Outside of the village, flooding occurred along two sections of Goose Pond Road that caused the road to be temporarily closed. Several residents were isolated, however the town staged equipment nearby in the event of an evacuation. Residents were also affected by flooding near the mouth of Stones Brook and the Shepardson Hollow area. Approximately seven residents reported water in their basements. Further downstream, the Lamoille River overtopped portions of Hunt Street which remained open and some reported having water in their basements. The Town's expenses were eligible for Category B reimbursement for transporting and pre-positioning equipment and other resources along Goose Pond Road.

Georgia

The Town of Georgia was spared from flood damages during July 2023. The greatest impact was at Arrowhead Mountain Lake on the Lamoille River. In neighboring Milton, Green Mountain Power operates the Clark Falls Dam which controls the water levels of Arrowhead Mountain Lake. GMP was able to control the unprecedented flow of flood waters greatly limiting damages in both communities. Route 7 in Milton was temporarily closed but remained open in Georgia. VT104A which runs between Fairfax and Milton also remained open during peak flows.

The largest impact in Georgia was Georgia Industrial Park's water intake at Arrowhead Mountain Lake and water treatment plant located in the Georgia Industrial Park. The facility historically served a business specializing in the development of infant nutrition and foods and serves as a major employer in the area, however the business is relocating. Over 90% of the facility's capacity will be available for a new business to move into. The water treatment facility filters are capable of treating 175 gallons per minute (gpm). The state recognizes that the facility could achieve up to 350 gpm. However, sedimentation from flood events negatively impacts business and operations of the treatment intake by clogging pipes, requiring routine maintenance to unclog the pipes. In addition, during the July 2023 flood event, the sediment collected at the settling ponds had to be routinely transported off site for several days. Assessing and mitigating the impacts of sedimentation from the river will be critical to the long-term resilience and economic vitality of this area of the watershed, in terms of decreasing the on-site physical impacts from sedimentation as well as related water quality impacts downstream to the communities of Milton, Colchester, and Lake Champlain.

Other Regional Impacted Communities

In addition to the above listed target communities, other communities along the Lamoille River, tributaries, and throughout the region experienced damages from flooding and natural disasters since the July 2023 floods. For example, the Village of Morrisville, located between the target communities Wolcott and Johnson along the Lamoille River, faced over $1.5 million in damage to the municipal wells and water supply. One well and connecting infrastructure was completely washed out and another must be relocated to a less vulnerable location. This water system supplies the only major hospital in the Lamoille region and many residences and businesses in Designated Village Center. Mitigating impacts to this foundational infrastructure will be key to the region's long-term resilience and recovery.

Impacts were also felt by other communities but may not be as well-documented or understood. Flood impacts, risks, and challenges are specific to a community's geography and context. Supporting place-based resiliency measures will be important to address the needs of every community in the NVEDD region, using key strategies and tools outlined in Section III of this plan.

Impacts on Key Regional Economic Sectors

Agriculture

Agriculture is one defining characteristic of the NVEDD region. According to the Comprehensive Economic Development Strategy, innovative programs are being implemented to strengthen the ties between communities and local farms and food. This is an important element of planning for long-term resilience. For example, the Healthy Roots Collaborative (HRC) is a regional food system in Franklin and Grand Isle Counties that provides programs and services for consumers and producers - from gleaning vegetables to redistribute to charitable food sites, to strengthening farm education with Farm to School programs. The "Yellow Barn" in Hardwick combines historic structures with a new business accelerator campus for a farm-and-food based economy. It's also next door to the Vermont Food Venture Center, a shared-use food hub and business incubator.

Due to historic development patterns and proximity of arable land to rivers, many working lands and farms are located along the Lamoille Main Stem. Farms along the river sustained damage from fluvial erosion and inundation. Upstream from farms in the floodplain, other operations such as maple sugaring on steep mountain slopes also sustained damage.

Below is a table of damages reported to the Vermont Agency of Agriculture, Food, and Markets (VAAFM) for the July 2024 floods. Although the survey data was collected in response to the 2024 flood events, the 2024 storm and damages came "on the heels of severe weather last season [in 2023] that caused significant damage and economic harm to farms and food producers across the state."[2] It is worth nothing that this data is self-reported, which often understates the magnitude of damages sustained in this sector. For example, damages were sustained on farms in Johnson, but were not reported and captured in the VAAFM data set.

Table 2. Agriculture Damage Assessments - Lamoille and Franklin Counties (2023).

County/Town	Responses	Ag Business Type	$ Value Loss
Lamoille/Cambridge	1	Dairy	~$100,000
Lamoille/Stowe	1	Dairy	~$20,000
Lamoille/Stowe	1	Maple	~$100,000
Lamoille/Hyde Park	1	Produce/Horticulture	~$20,000
Lamoille/Morristown	1	Dairy	~$20,000
Lamoille/Elmore	1	Produce/Horticulture	~$50,000
Franklin/Fairfax	2	Produce/Horticulture	~$70,000
Franklin/Fairfield	1	Dairy	~$20,000
Franklin/Montgomery	1	Hay/Feed Crops	~$420,000

Source: Vermont Agency of Agriculture, Food & Markets (VAAFM), Flood Loss and Damage Survey FY 2024

[2] https://agriculture.vermont.gov/severe-weather-and-flooding-agricultural-impacts-survey-2024

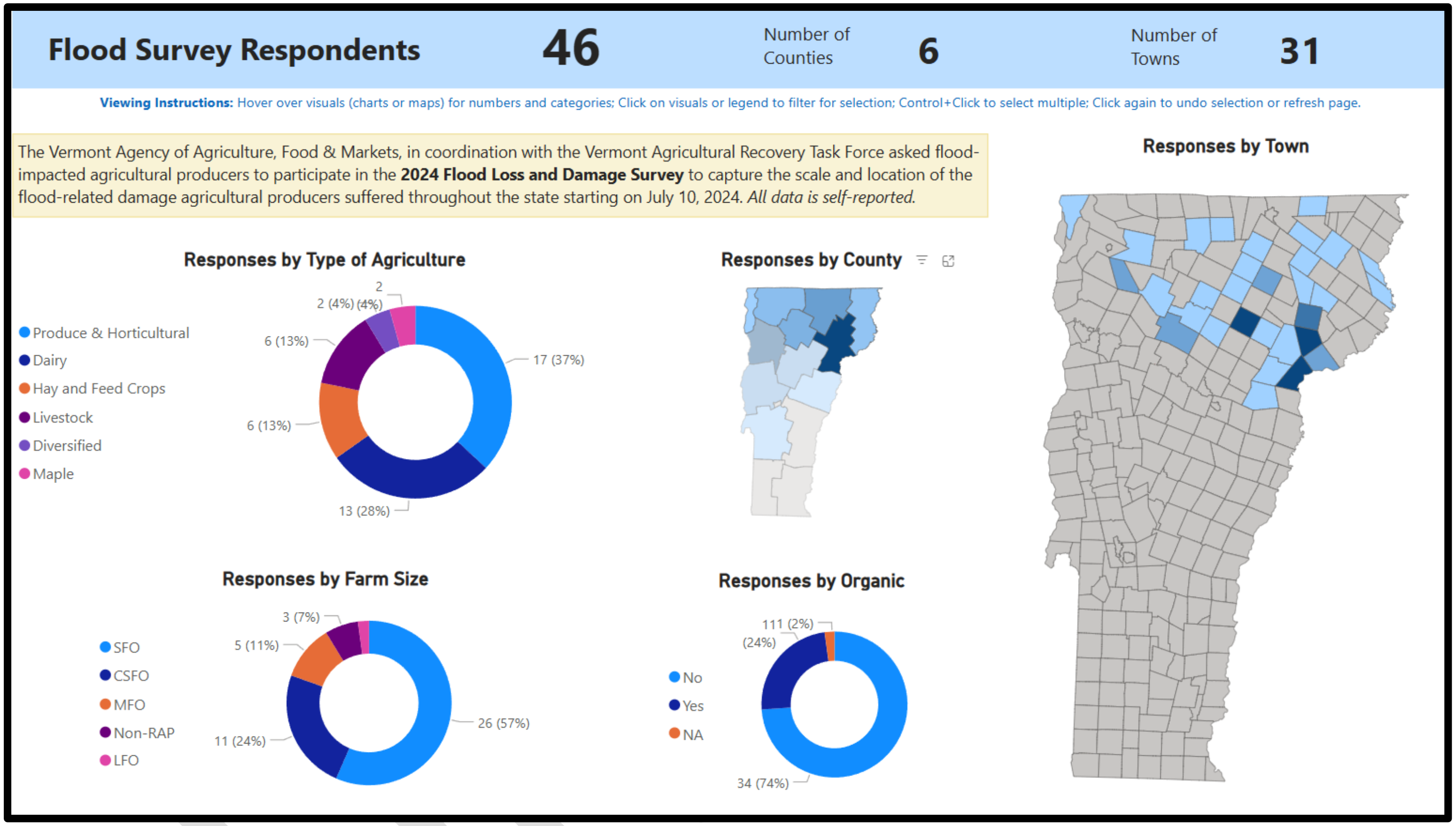

Figure 1. 2024 Agricultural Flood Loss and Damage Survey results for the NVEDD Region. Flood impacted agricultural producers in the region reported damages suffered in 2024 flood events. Responses collected by the Vermont Agricultural Recovery Task Force in coordination with the Vermont Agency of Agriculture.

The figure above is also from the VAAFM flood damage and loss survey, representing responses collected across the NVEDD Region. Of the 46 responses collected in the 2024 survey, an estimated $2.1 million in income loss was reported across 1,100 acres of agricultural land. About $1.4 million in income loss was reported in Caledonia and Orleans Counties alone. Most impacts were reported by small farming operations focused on produce and horticulture or dairy operations. The areas that reported the most damage also generally coincide with the Lamoille River Watershed.

Outdoor Recreation

The NVEDD has a strong focus on building the outdoor recreation economy, leveraging local outdoor recreational assets to increase visitor traffic, create new jobs, promote healthier communities, and strengthen stewardship of natural resources that serve as the foundation for the outdoor recreation economy.

Outdoor recreation is increasingly recognized as a key economic driver around the country. The same holds true in Vermont, including the Northern region. The outdoor recreation sector contributes over $2 billion annually or 4.8% of Vermont's economy to the state's economy.[3] In recent years, growth has been measured in accommodation and food services, manufacturing of outdoor goods, retail sales, and workforce in the outdoor recreation sector.[4] The NVEDD would benefit from a dedicated analysis of how outdoor recreation impacts the regional economy. For example, one study conducted for Caledonia County summarized projected trail visitation and economic impact along the Lamoille Valley Rail Trail between St. Johnsbury and Hardwick. Visitor spending was estimated to contribute up to $4.7 million in annual sales activity at restaurants, lodging, retail operations, gas stations, and other local businesses and establishments. This could provide new local jobs and opportunities for rural entrepreneurs. Being prepared for disasters would also contribute to the long-term resilience of these businesses catering to the outdoor recreation sector.

One major regional employer is Smugglers' Notch Resort. The four-season resort employs 1,000 employees seasonally and approximately 300 year-round staff to support lodging, dining, skiing, biking, disc golf, and other recreational activities. The resort also serves as an informal emergency shelter for Jeffersonville when the Village floods. The resort's location up VT Route 108 means it also has steep roads and is vulnerable to flooding and erosion during high rainfall events. Assessing and mitigating impacts to the access road is a priority for this outdoor recreation employer, another is assessing resiliency measures for the water reservoir that serves as a water source for resort operations.

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[3] https://www.bea.gov/news/2024/outdoor-recreation-satellite-account-us-and-states-2023

[4] https://www.nvda.net/lvrt.php

According to the State Comprehensive Outdoor Recreation Plan (SCORP), the outdoor recreation economy generally encompasses: individuals, organizations, and businesses working to make outdoor recreation possible (service providers, producers of goods, and professionals and volunteers who design, build, manage, and communicate about outdoor recreation); places where people go, stop along the way, and the means used to get there; and, community and economic development benefits, including improved quality of life, retaining youth and students, and attracting a skilled workforce. Resilient, healthy, and vibrant communities stem from public outdoor recreation spaces like parks, trails, and waterways.

The Lamoille Valley Rail Trail

One critical regional recreational asset is the approximately 94-mile Lamoille Valley Rail Trail (LVRT). The LVRT is a four-season, multi-purpose, ADA accessible recreation and transportation corridor for walking, hiking, cycling, horseback riding, cross-country skiing, dogsledding, snowmobiling, and more. Some folks also leverage the LVRT to commute to work. The LVRT is the longest rail trail in New England and connects 18 towns in the Northern Vermont Region, from St. Johnsbury to Swanton. The trail has great potential to help maintain and grow a resilient regional economy. According to an economic impact analysis conducted for Caledonia and Essex Counties, the economic impact potential of the LVRT for towns in this region could result in estimated upwards of $650,000 in tax revenues and 60-75 new FTE jobs. Historically, the rail was also an economic driver in a different sector, as a regional railroad transporting goods and resources manufactured by local mills and mines.

The LVRT closely follows the Lamoille Main Stem across the region. Portions of the LVRT between Hardwick and Cambridge experienced significant damages in the July 2023 floods, which delayed the "grand opening" of the end-to-end trail. Subsequent floods also damaged this section of trail, as well as sections of trail along "steeper sections" of the watershed around Danville and St. Johnsbury. Over 130 sites along the trail were damaged due to fluvial erosion, bank failures, debris build up, and washouts of undersized infrastructure (bridges and culverts). An estimated $12 million in repairs was required in response to this flooding event. Protecting this valuable recreational, transportation, and economic resource will be an effort that could have rippling effects on maintaining the regional outdoor recreation economy.

Planning for Recovery & Resilience

One of the first steps in planning for recovery and resilience is risk assessment. A primary goal in this context is to identify vulnerabilities, make flood-prone areas more resilient to the risks where possible, and enable development in safer, less flood-prone areas. The following sections outline tools available to assess risks and analyze vulnerabilities, flood impacts, risks, and challenges identified by communities and lived experience, and opportunities to mitigate and adapt to risks identified by regional communities, partners, and the Lamoille River Flood Model.

Lamoille River Flood Model

One of the early steps in planning for resilience is identifying vulnerable areas and assessing measures that could help mitigate the impacts of future flood events. Publicly available tools such as FEMA maps can be used for this, but the maps often understate the risk of flooding in the region. The Lamoille River Flood Model is one regional tool available to communities to perform this analysis, with more discrete and local data incorporated into the maps.

The model can be used to examine elements such as:

- water surface elevation,
- floodplain mapping,
- flow characteristics (e.g., velocity, depth),
- channel and water profiles, and
- dam, bridge, and culvert impacts (e.g., backwatering, overtopping, scour).

Types of flood mitigation alternatives that can be considered include:

- constrictions (from bridges, culverts, buildings, naturally narrow spots)
- floodplain reconnection, and/or
- areas with prior damage.

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Initially developed by expert consultants SLR International Corporation with the Lamoille County Planning Commission, the Lamoille Hydraulic model was expanded in coordination with target communities and regional partners in 2025. It was expanded to cover the Main Stem of the Lamoille River from Hardwick down through Lake Arrowhead in Georgia. Key tributaries that feed into the Lamoille River Main Stem were also included, Cooper Brook, Stevens Book (Hardwick), Gihon River (Johnson), Seymour River (Cambridge Village), Stones Brook, and Mill Brook (Fairfax).

Below is a map that shows the extent of this update to the Lamoille River Hydraulic Flood Model:

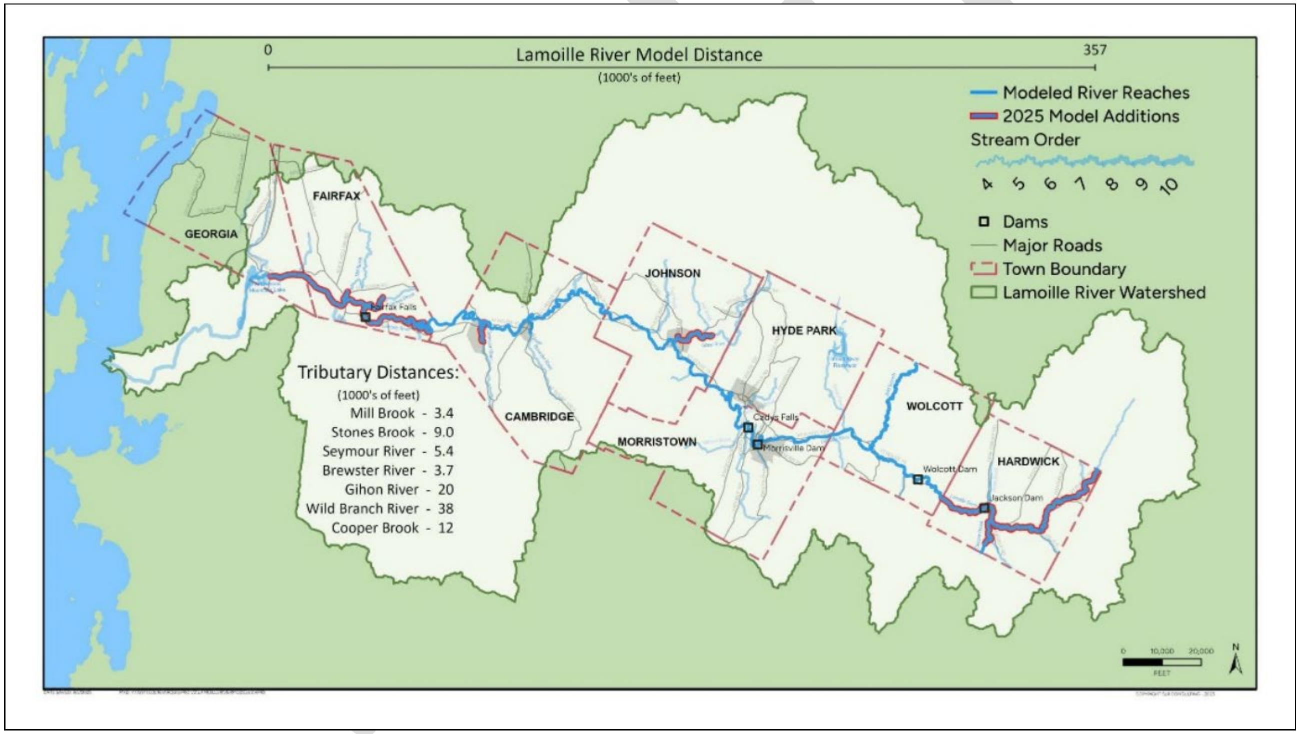

Figure 2. Extent of Lamoille River Flood Model, including Town boundaries, river reaches, key tributaries, and major roads. River reaches encompassed in 2025 update are blue and outlined in a solid red line. Visual and modelling created by SLR International.

Using data inputted about water flows and existing infrastructure around the river, the model can be used to identify areas of flood risk, determine potential impact at various flood frequencies are,[5] and impacts may occur and analyze the potential benefits of flood mitigation strategies.[6] Strategies can be analyzed to understand potential effects on water surface elevations, velocities, and other co-benefits prior to the significant investments required for implementation. This tool can ultimately help communities prioritize projects and justify investments, showing real and measurable outcomes from mitigation projects.

The model was used to assess potential alternative projects in target communities along the Main Stem of the Lamoille River. Some alternatives that may result in significant flood reduction benefits and improve the long term resilience of regional economies. For example, one alternative assessed under the model included floodplain restoration project at Wescom Road, along the Gihon River in Johnson near the confluence of the Lamoille River. Implementing a floodplain restoration project at this location with an average cut depth of three feet could result in reductions of water surface elevations up to six inches in the Village Center during a 100-year flood. A significant number of individual households and businesses would not be impacted and help folks maintain access to driveways and critical transportation networks in this area. When combined with other alternatives assessed in the model, flood impacts and risks experienced in this community could be reduced by a significant margin – protecting critical infrastructure, households, businesses, and the local economy.

The following sections outline the commonly reported flood risks, impacts, challenges, and opportunities identified through engagement with target communities after the July 2023 flood events (DR-4720). The updated Lamoille River Flood Model was used to assess alternative measures to help mitigate some of these community-identified risks and are incorporated in Section III project tables of this plan.

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[5] Are you planning for a 2-year, 5-year, 10-year, 25-year, 50-year, 100-year, 500-year flood?

[6] The update to the model also incorporated the most recent available data from FEMA, which increased the likelihood of peak discharges during the 100-year flood event from 19,000 CFS to 21,000 CFS. The 100-year flood has a 1% annual probability of occurring. With the updated data, there may be a higher likelihood of increased discharges during this this type of flood event.

Public Infrastructure

Flood Risks, Impacts, and Challenges

1. **Critical facilities and infrastructure located in floodplain.**
   This includes: water, wastewater, electricity, and communication infrastructure, transportation infrastructure, electric utility infrastructure, wastewater treatment facilities, public water supply facilities, fire department facilities, highway department facilities, emergency operation centers and shelters, and municipal offices. As of April 2025, in Lamoille County, forty-one critical facilities are in the flood hazard area. In Franklin County, there are thirty residential structures, one commercial facility, and one industrial site in the flood hazard area (Green Mountain Power Hydro Facility). Infrastructure located in the floodplain leaves communities and economies vulnerable to inundation, erosion, and other flood hazards, resulting in property damage and loss. As mentioned in the introduction, the state of Vermont experienced over $100,000,000 in reported damage for FEMA public and individual assistance in 2023, with a substantial portion incurred in the Northern Vermont region. This also comes with significant time, resources, and personnel dedicated to documenting, tracking and managing damage and repairs, and financial hardship to make immediate and necessary repairs. The location of infrastructure and facilities in the floodplain often hinders the capacity of emergency personnel to respond to the disaster event. Mitigating impacts to these facilities and infrastructure will need continued assessments to help with long term recovery. Additionally, supporting relocation efforts into safer areas where possible will help with long term resilience.

   Near the headwaters of the Lamoille River, the Hardwick Wastewater Treatment Facility is a foundational piece of infrastructure in the mapped floodplain. This facility has been repeatedly damaged by floods including DR-4720. The Hardwick Fire Station, also within the floodplain, has experienced repeated flood damage resulting in equipment loss and service disruptions. The municipality is currently exploring relocation of both facilities to sustain 1) critical water supply and wastewater disposal operations and 2) emergency response operations and access to necessary emergency equipment during and post flood event. Relocation of the Wolcott Fire Station and

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Highway Garage, located in the floodplain immediately downstream of Hardwick, is also a priority for this community. When Wolcott Village floods, this facility is rendered inaccessible and takes on flood waters, and, as with Hardwick, the town must relocate vehicles and equipment to higher ground if they can get there in time. Further downstream and located within the floodplain is the Morrisville public water system, serving the only regional hospital in Lamoille County. During the July 2023 floods, one of the two wells serving the system was submerged and suffered structural, fluvial erosion and debris damage; the other well budling was inundated resulting in a multi-day “do not drink” order. Other facilities and foundational infrastructure in downstream communities that are also in the mapped floodplain include: Johnson Wastewater Treatment Plant, Johnson Water and Light Department electric utility infrastructure, Jeffersonville Wastewater System Pump Station, and Georgia Industrial Park Water System intake pipe. The Georgia Industrial Park Water System is located near “Lake Arrowhead” on the Lamoille River. The water system intake pipe stems from Lake Arrowhead and after treatment, has the capacity to serve usages between 200-250,000 gallons per day. Sedimentation from floods clog the intake pipe and must be routinely cleaned out in order adequately source and treat water through the system. The Treatment Plant currently serves Perrigo Nutritional in the manufacturing of baby formula. Future tenants and uses from this facility are under discussion as of this writing.

2. **Housing Stock is located within flood prone areas.** Much of this housing if affordable and/or work force housing. Loss of this housing stick due to flood damage and/or buyouts has compounded the housing crisis in northern Vermont. As of April 2025, in Lamoille County, 354 residential structures in the flood hazard area. In Lamoille County the July 2023 flood event alone resulted in 32 residential properties entering the FEMA buyout process which would result in the loss of 52 dwelling units county-wide. The development or redevelopment of diverse residential housing opportunities and units outside of flood prone areas, and in close proximately to existing village centers is a priority of the region. In order to accomplish this goal communities will need to pursue public water and sewer extensions, municipal, private, and nonprofit partnerships, funding opportunities, and creative solutions.

3. **Transportation infrastructure is undersized, aging and prone to flood damage/loss**. Transportation networks are used for evacuation, emergency response, resource and supply distribution, and commerce. Transportation

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networks are also critical for emergency response personnel to reach stranded populations. Bridges and culverts across the NVEDD region are reported by communities to be aging and undersized, often constricting the flow of water and shifting or intensifying impacts to properties nearby and downstream. As a result, evacuation routes get cut off in high waters and limit response or increase response times for emergency personnel. They also limit access to emergency shelters and recovery resources. Several bridges and culverts along the state and local highways that runs through downtowns and villages require measures to mitigate risks and improve resilience, including the “Wrong Way” bridge and Lower Pleasant Vally bridge in Cambridge Village, Johnson Village bridge over the Gihon confluence with the Lamoille River, VT Route 104 Bridge 9 in Fairfax Village and VT Route 104A Bridge 1 and Bridge 10 “High Bridge” in Georgia.

Slope failures and landslides on steep roadways also threaten large trucks and travel routes in higher elevations. For example, North Wolcott Road is a major trucking route down to Route 15, with slope failures being monitored and studied by the Town. The access road leading up to the Smugglers’ Notch Resort provides access to an informal but integral emergency shelter and critical resources for Jeffersonville. Vulnerabilities on this steep roadway threaten safe access to resources when the Lamoille river floods.

4. **Limited local budgets, personnel turnover, and challenging federal standards.** Emergency repairs and routine infrastructure upgrades are expensive. Target communities often rely on grant funding to implement projects. Funding requirements that come with federal grants can be unclear and inconsistent, especially to new local staff that are unfamiliar with the rules or don’t have experience to rely on. The Federal Emergency Management Agency (FEMA) also requires returning damaged infrastructure to the condition it was in before it was damaged to be reimbursed for repairs after a declared disaster, rather than upsizing or redeveloping to be more resilient for future events. Federal standards also change across administrations, and do not always match on-the-ground experience included in more localized or regional datasets, including the Lamoille River Flood Model.

Opportunities for resilient long-term recovery and resilience.

1. **Capital Planning and Continuity of Operations Plans.** A Capital Plan can help communities stay abreast of their capital infrastructure needs and connect what communities need with revenues they have available. Reserving funds helps to prioritize projects, including infrastructure improvements or equipment purchases, and help communities save for future investments for routine maintenance or emergency repairs. Capital plans can help buffer impacts from loss due to decrease in availability of state and federal funding streams.

   Continuity of Operations Plans (COOPs) can also support response and recovery efforts at critical facilities. This type of planning can help make sure essential personnel know who to contact, where things are, and how they can get there in an emergency. Continuity of Operations Plans can help document a plan can be followed in the event of an emergency, ideally reducing chaos and confusion. Municipal water and wastewater systems are foundational infrastructure that support businesses, housing, and job opportunities across the region. Developing clear communication channels and COOPs will be important to supporting flood response and recovery efforts.

2. **Rebuild with and invest in flood resilient infrastructure**. Whether it is a routine upgrade or emergency repair, based on lived-experience, communities suggested upsizing ditches, culverts, and bridges to the 500-year flood event, or as prioritized through processes such as local hazard mitigation plan updates or analysis through the Lamoille River Flood Model. Other opportunities to protect critical facilities in the floodplain include elevating ground-level floors of buildings and utilities and providing vents for flood waters to enter and leave above-grade crawl spaces.

3. **Extend critical infrastructure and relocate facilities outside of the floodplain**, as infrastructure and available land allows. Expand infrastructure service areas to help transition housing and businesses towards safer areas out of the floodplain. Target communities identified new long-term housing as an important aspect to planning and supporting regional economic resilience and growth. For example, the new Wolcott Community Wastewater system will serve properties in the FEMA mapped floodplain. Extending the service area to other areas outside of the floodplain will help support new and safe development. Long-term housing options for low- and moderate-income households will help support regional industries, and communities in recovery and resilience. Extending existing

water and wastewater systems will continue to provide foundation infrastructure to local economies while helping support new development in safer areas, such as Hyde Park, Cambridge/Jeffersonville, and Stowe.

Downtowns/Village Centers & Employment Areas; Local/Regional Economy

Flood Risks, Impacts, Challenges

1. **NVEDD Comprehensive Economic Development Strategy – key sectors**
    a. **Agriculture** – due to the location of much of the region's arable land in floodplains, proximity to the Lamoille and other rivers, agricultural operations experience loss of crops, arable land, and equipment from flood inundation, fluvial erosion, and other hazards. According to the 2024 VAAFM Flood Damage and Loss Survey, the most detrimental type of damage and loss reported include damage to soils or loss of land, damage to farm access roads and structures, and loss of crops meant for wholesale of retail markets, and livestock feed. Other natural disasters and hazards that remain risks to farm operations also include frosts, drought, pests and disease.

    b. **Recreation and tourism** – inundation and erosion are significant threat to operations and maintenance of regional trail networks. Multi-use trails such as the Cambridge Greenway are located along the Lamoille River and have faced repeated damage from flood events. Other trails on steep slopes without properly maintained or adequately sized infrastructure, if any, wash out in rain events and erode from rainfall in addition to heavy recreational use.

    The Lamoille Valley Rail Trail (LVRT) is also a significant recreational, transportation, and economic resource in the region, which follows the Lamoille Main Stem from St. Johnsbury through Cambridge and ends in Swanton. The trail also intersects with other regional multi-use trail networks including the Cambridge Greenway and the Missisquoi Valley Rail Trail north of Cambridge, through Fletcher, Fairfield, and Sheldon Junction. In addition to erosion, inundation and deposition pose significant risks for the trail in Franklin County and parts of Lamoille County. Furthermore, lack of historical maintenance for assets such as culverts and bridges (to an extent) has also contributed to flood impacts. Historic culverts in Caledonia County present a greater risk with existing infrastructure like culverts, since the rail line was elevated on former trestle. In some cases, abutting property owners negatively impacts the trail and physically alter it, contributing to flood impacts and challenges.

Communities and businesses that leverage this trail network can become disconnected from the trail after flooding and erosion and need to implement short term solutions such as shuttles through detours. Damages to roadways also impact tourism by rendering travel routes unsafe or unpassable, and damages to buildings results in closures and lost revenue for businesses.

2. **Downtown and Village Centers are in flood hazard areas.** Based on historic settlement patterns and locations along rivers and streams, infrastructure that supports businesses and employment has been built out in the floodplain for many communities across the region. Hospitality and retail businesses in downtowns and village centers supporting key economic sectors are at risk from inundation due to location of buildings, facilities, and equipment in the floodplain or along steep slopes (i.e., mountain roads to ski resorts). Flood events damage buildings, inventory, and result in closures, thus loss of revenue for businesses and income for employees.

Opportunities & Strategies

1. **Continuity of Operations Planning.** A business continuity plan, aka continuity of operations plan (COOP), is a written document on how an organization will respond and recover from a disaster. Having a plan in place that can be put into immediate action will help businesses recover and open more quickly to reduce loss in revenue and employment. The plan should include contact lists, maps of vital equipment and utilities, procedures to protect property, and a back up location to conduct business. Templates are available through the US Small Business Administration and FEMA. Mutual aid agreements with other local businesses could help businesses access equipment for emergency responses and repairs to recover more quickly. A fillable example is also linked as an attachment in the Appendix of this plan.

2. **Relocate/transition businesses out of floodplain to safer areas.** This will help protect business owners and their assets as well as allow job opportunities to remain stable when disaster strikes. Relocation requires that there is

infrastructure available to support this. Foundational infrastructure such as water and sewer lines will need to be extended into safer areas so that businesses, downtowns, and village centers can transition into safer locations. Water and wastewater are needed to support new or planned food-based businesses, high-use industries, childcare facilities, and health care centers such as hospitals. Relocation could involve a property buyout, which allows communities to re-envision public uses in the hearts of downtowns and villages, maintaining vibrancy and economic viability.

3. **Support outdoor recreation and tourism industries.** Outdoor recreation and tourism are valuable economic drivers in the state and the region. Target communities expressed support growing recreation and tourism-based economies. Regional assets such as the Lamoille Valley Rail Trail, rivers, ponds, and lakes for paddling and water-based recreation, or large ski resorts attract national and international visitors, with associated benefits from dollars spent in regional communities. Employment opportunities in associated businesses such as retail and hospitality support and improve user experiences. Continuing to build and maintain a regional economic base with employment opportunities in other industries is also important to buffer impacts from any potential losses from tourism and recreation after flood events. For example, Smugglers' Notch Resort is one regional location that employs about 300 full time employees and nearly 1000 seasonal employees annually. According to the 2024 Vermont Agency of Transportation Average Annual Daily Traffic (AADT) Report, the AADT for this route 7026 vehicles. Employees and visitors travelling this route must use the only steep road available to access this scenic and recreational area and employment hub. Analyzing risks from damages and erosion along the steep slopes of this access road will be one critical project to support a resilient economy in this area long-term.

4. **Elevate and mitigate impacts to structures, assets, and inventory.** Where relocation is not an option, elevate buildings to the 500-year flood event, including ground-level floors of buildings and utilities. Provide vents for flood waters to enter and leave above-grade crawl spaces. Plans can also be made through COOPs to prioritize and protect business assets and inventory when adequate warnings and notices are provided. For outdoor recreational businesses and amenities, communities should design and reinforce trail networks to reduce damage and loss of use and visitation. Green infrastructure and floodplain restoration projects can also be around structures and

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across economic centers, including floodplain restoration projects and streambank buffers. These types of projects can allow flood waters to fan out, slow down, reduce water surface elevations and velocities that all contribute to damages from inundation and erosion.

The agricultural sector in particular faces many challenges given the varied nature and ongoing risk associated with cultivation and raising livestock. Flood risks are one of many faced by agricultural operations. Responses provided to the 2024 Flood Loss and Damages Survey to the VAAFM include types of recovery needs and potential changes. Primary needs identified by survey respondents and farmers are financial assistance, rebuilding farm roads and culverts, and streambank restoration. Streambank and floodplain restoration projects can help mitigate impacts to and protect equipment, crops, livestock, and other essential inventory. Please visit the Appendix of this plan for additional financial and technical assistance resources available to farming operations.

Municipal and Social Services

Flood Risks, Impacts, and Challenges

1. **Confusing or unclear communication channels.** Communications at all levels – local, regional, state and federal – needs improvement. Clear concise communication plans with various communication methods and technologies are vital to address all hazards and challenges. Plans and lines of communication need to be revisited frequently and tested. Furthermore, an overabundance of digital resources is overwhelming, and inaccessible when the power goes out. Individuals and households are left in a vulnerable situation without a clear way towards reaching assistance or meeting their immediate needs and path to recovery. This can also lead to significant direct costs (e.g., equipment damage, litigation) and other indirect or social costs (e.g., loss of public confidence, damage to reputation). Lastly, while the move towards fiber installation has improved access to high-speed internet, the decommissioning of copper phone service in many areas that lack cellphone service is of immediate concern as emergency personnel, individuals, and households will be cut off from emergency communications if they lack a backup power source.

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2. **Inaccessible emergency shelters and resources.** Individuals and households are unable to reach their local or regional shelter and/or resource due to damaged or inundated transportation networks. Furthermore, there is no regional method of providing road closure information to the public during events. Cross jurisdictional coordination and centrally located resources will be necessary to ensure all individuals and households have real time evacuation route information, have access to shelter facilities, have access to immediate, short term and long-term resources regardless of municipal boundaries.

3. **Lack of training and human capacity.** Municipal official and staff turnover results in a loss of institutional knowledge on how to respond during a flood or emergency. To ensure long-term sustainability and capability of emergency operations, there must be written emergency operation plans, a level of professional knowledge redundancy in personnel, regular training and regular exercises to keep everyone up to speed. Furthermore, many communities rely on volunteers to fill vital emergency operations, response, and recovery roles. These individuals require the same training and resources as municipal officials and staff. Many communities that rely on volunteers are also finding it increasingly difficult to recruit individuals. Communities will need to devise ways of recruiting, training, retaining, organizing and deploying volunteers. Doing so will help quell burn out and "flood fatigue" which has been witnessed in recent years caused by reliance on limited staff and volunteers.

   Where staff are available and trained to support emergency operations and response, they may lack the necessary skills and experience to perform their jobs effectively in a high-stress, chaotic environment. This leads to mistakes and delays in critical tasks like providing aid, assessment damage, or conducting rescue operations.[7] Loss of experienced staff creates significant skill gaps, especially in leadership roles.

   Opportunities & Strategies

1. **Mutual aid agreements and joint trainings.** Municipalities should have FEMA-approved mutual aid agreements in place with neighboring towns or local businesses to help decrease response times and increase access to resources. Target communities also suggest staging equipment in advance of a known flood event where possible.

[7] https://www.gao.gov/products/gao-20-503

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Updating mutual aid agreements annually can help ensure they are in place and time does not need to be spent agreeing and signing during a disaster.

In addition, target communities and partners suggest coordinating regional training and sharing resources with neighboring communities. Connecting emergency personnel with experts, group trainings, regional gaps and needs discussions, and knowledge sharing could be facilitated in watershed or regional meetings between regional planning commissions, regional development corporations, regional emergency management committees, conservation districts, local governments, and volunteers.

2. **Community-wide and neighborhood gatherings.** Regular, informal meetings between community members and neighbors are important to building and maintaining relationships. Target communities identified a “sense of community” as a top strength to living in the Northern Vermont Region, and as one of the best strategies for supporting recovery after a flood event. Social connection helps strengthen emergency response and recovery efforts. After disaster strikes, meeting basic needs important for recovery – including food access, mental health, social services. Neighbors and strong communities with plans in place help folks access these services faster. Maintaining access to these resources at emergency shelters or other designated areas will help folks recover long term.

3. **Relocate and strengthen network of emergency shelters out of floodplain**. Map regional shelters including in neighboring towns to understand distribution and access to shelters. Stockpile resources in shelters when possible. Support American Red Cross shelter training opportunities for volunteers across the region.

Natural Resources

Flood Risks, Impacts, and Challenges

1. **Increased tension between conservation and development in safer areas.** Conserving land upstream of village centers and downtowns can act as a buffer by slowing and filtering flood waters. However, this also decreases

available, developable land and narrows opportunities for residential, municipal, and commercial facilities to locate out of the floodplain. Development pressures are already faced by upload forests and areas but may be exacerbated with increasing frequency of long-term flood recovery and resiliency efforts. Development pressures have historically been mitigated by encouraging development in Center Areas where possible, but as communities plan for long term resilience and transition into safer areas, development pressures on upland areas may increase.

2. **Loss of ecological function and land uses.** Whenever there is fluvial erosion, in addition to potential damage to hard infrastructure and existing land uses, there is also loss in ecological function. In places where the natural floodplain has been developed, there is often also conflict between developed infrastructure and the natural course of rivers and streams. Erosion of floodplain and streambanks on steep slopes damages functional ecosystems and creates opportunities for negative feedback loops, including further erosion/streambank instability, invasive species replacing native species, and habitat loss. Loss in ecological function also decreases the amount of natural flood control and storage, pollution management, and other benefits associated with intact and connecting floodplains.

3. **Dams overtopping and failure.** Historically constructed to impound waterways for power or flood control, dam infrastructure is getting older and may pose a risk to downstream communities. Bridges can also function as a dam in some areas and

Opportunities & Strategies

1. **Assess and Implement Projects using the Lamoille River Hydraulic Flood Model.** The Lamoille River Hydraulic model can be used to test the impact a proposal flood mitigation project might have on a community. Where flood reduction benefits are analyzed and expected to occur, communities should scope projects and work towards implementing recommended measures that could result in multiple possible benefits for long term community resiliency.

2. **Develop Easements and Bylaw Updates.** Conserve upstream and upland property to slow the flow of water and mitigate impacts of fluvial erosion and flood inundation downstream. Protecting intact floodplains, river corridors,

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and upstream forests can be a cost-effective way to prevent future flood damage. It will also be important for partners to coordinate with municipalities and property owners to ensure conserved areas align with long-term community development and land use planning. River Corridor, Farmland, and other types of easements could help protect intact natural areas and natural ecological functions that support resiliency and reduce impacts from flooding and storms. Floating property easements are another type of easement that could be explored for regional trail networks, allowing trails along rivers to move to an extent and incorporate revegetation to help stabilize banks and buffer trails from erosion and other damage.

NVEDD partners should also work with municipalities to update bylaws to mitigate flood and erosion by incorporating river corridor bylaws, requiring a minimum of two feet of freeboard, and other protective measures.

3. **Enhance vegetative stream buffers and reduce spread of invasive species.** Communities should revegetate uphill or upstream of center areas and investigate projects to increase flood storage such as floodplain restoration on public lands. Streambank buffers help control fluvial erosion and have added benefits of improving water quality and supporting wildlife habitat. Partners such as local Conservation Commissions, Conservation Districts, Regional Planning Commissions, or the VT Fish and Wildlife can assist in floodplain restoration project planning and funding identification.

4. **Invest in Natural Capital Projects in Capital Planning.** Implementing green infrastructure and flood mitigation projects can help to protect existing infrastructure that can't be relocated and remain in harm's way. Floodplain restoration projects in appropriate areas between and around critical facilities can help reduce water surface elevations and velocities that result in damage to facilities from inundation and fluvial erosion. Budgeting and investing in scoping, designs, and implementation of nature-based projects will help work towards mitigating impacts to critical facilities and village centers. These types of projects can also come with many other co benefits including improving water quality, supporting wildlife habitat, and increasing outdoor educational and recreational opportunities. Communities should also continue to explore opportunities to also upsize culverts and bridges to be more gynomorphically compatible and support aquatic organism passage.

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Actions, Next Steps, and Resiliency & Recovery Projects

Regional Priorities for Resilience & Recovery

This final section outlines key actions and next steps for target communities to become more resilient to future flood events and disasters. Actions and steps listed below can support opportunities and strategies identified through targeted community engagement to address flood impacts and challenges experienced in the July 2023 floods and subsequent declared disasters. Specific projects prioritized through ongoing community engagement and updates to the Lamoille River Flood Model are also listed in the tables at the end of this section. These projects overlap with actions and next steps that communities can take for long term recovery and resilience.

Key Actions and Strategies

- **Assess & invest in resilience strategies to mitigate impacts on critical infrastructure and facilities.**
    - Conduct feasibility studies for flood mitigation projects (i.e., dam removals, flood mitigation, floodplain restoration).
    - Relocate critical facilities and essential services (e.g., fire stations, utilities, emergency shelters) out of flood hazard areas.
    - Elevate and/or floodproof municipal facilities and services where relocation is not feasible.
    - Upsize culverts and bridges where feasible.
    - Utilize the Lamoille Flood Model to identify and assess alternatives for flood mitigation projects.

- **Coordinate and improve communication tools and networks.**
    - Advertise and sign up for VT-Alert.[8]
    - Educate EMDs and local officials on use of river gauge data through the National Weather Service Northeast River Forecast Center, and other tools that are available and widely used.[9]
    - Develop a regional stream gauge and precipitation sensor network.

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[8] https://vem.vermont.gov/vtalert
[9] https://www.weather.gov/nerfc

- Develop a regional coordination and response plan for all hazards.
- Develop a regional real time road closure mapping tool to assist with evacuation, response and post event civilian movement.
- Develop Emergency Management Director (EMD) & Emergency Management Coordinator (EMC) directory for regional emergency response coordination.
- Establish neighborhood-scale response hubs with supplies and communication tools.
    - Determine extent of perceived "neighborhoods" in rural areas.
    - Map neighborhoods & identify community leaders. Overlap with EMD geography.
    - Coordinate using established communication channels
- Develop local and regional emergency preparedness, response, and recovery websites.
- Develop public, municipal, and regional communication plans.
- Acquire satellite communication capabilities.
- Install and implement early warning alarms or sirens where warranted.
- Identify individuals and population requiring additional assistance and/or coordination and develop local systems to assist and/or check in with those individuals and/or populations.
- Develop a protocol for accessing and sharing information down the watershed.

- **Coordinate watershed-wide planning through regional planning commissions.**
    - Establish regional resilience councils to coordinate cross-jurisdictional efforts.
    - Hold regular watershed partner meetings - Quarterly, biannual, or annual, depending on desires of partners and participants. Integrate into standing NVEDD meetings when appropriate.
    - Map out regional emergency resources available to individuals and businesses.
        - Map emergency shelters and develop memorandums of understanding between municipalities to ensure access to individuals and households have access to shelter facilities and resources.
        - Determine a central "warehouse" or location for supplies to be donated and stored for recovery.
        - Centrally locate and maintain an American Red Cross supply trailer in Lamoille County.
    - Develop regional flood mitigation and floodplain restoration projects along the Lamoille River watershed to reduce water surface elevations and velocities.
        - Restore riparian buffers and wetlands along the Lamoille River and tributaries.

        - Conduct feasibility studies for dam removals and flood bench installations.
        - Implement stormwater management upgrades in urban centers like Morrisville, Johnson and St. Johnsbury.
        - Explore and implement upland wetland restoration and water retention opportunities.
    - Partner with Vermont League of Cities and Towns and/or neighboring communities and organizations to develop mutual aid agreements for shared services and equipment to be prepared to respond to future disaster events.
    - Continue offering educational opportunities and coordinate sharing of resources and training in partnership with Vermont Emergency Management and Regional Emergency Management Committees.
        - Host public workshops on flood preparation and insurance.
        - Train local officials in FEMA processes and funding applications.
        - Photograph vulnerable public and private infrastructure and assets as appropriate to have pre-disaster photos on file for FEMA.
    - Collect long term data on implemented projects. Measure changes over time and build portfolio to justify future investments and pursuit of projects.

- **Support Resilient Housing and Community Development**
    - Support new development and transition vulnerable community centers into safer areas.
    - Pursue recommended resiliency actions and strategies from the Comprehensive Economic Development Strategy.
        - Encourage and facilitate development of Local Emergency Management Plans, Hazard Mitigation Plans, and Protective Zoning.
        - Develop Local Emergency Plan addendums that detail specific response actions for various high probability and high impact hazards.
    - Develop land use and development policies and bylaws that discourage development in high-risk areas.
    - Incentivize resilient construction through local zoning and tax credits.
    - Expand workforce housing initiatives.
    - Support mobile home parks in low lying areas through flood mitigation, floodproofing, and infrastructure improvements.

- **Pursue public-private partnerships for community investments.**
    - Explore new opportunities or rekindle old public/private partnerships.[10]
    - Develop sector-specific resilience strategies (e.g., agriculture, tourism, recreation)
        - Elevating or relocating equipment.
        - Implement floodplain and streambank restoration to mitigate impacts on recreational trail networks.
        - Shuttles and detours to connect recreational users to amenities.
    - Create regional business incubators focused on adaptation technologies.
    - Develop regional resilience indicators (e.g., housing recovery rates, infrastructure upgrades).

- **Explore creative funding stacks and strategies for financial investments.**
    - Leverage available federal and state funding (e.g., FEMA HMGP, Flood Resilient Communities Fund).
    - Launch business recovery grants and technical assistance for flood-impacted enterprises.
    - Establish Revolving Loan Funds.
    - Explore new opportunities or rekindle old public/private partnerships.[11]
    - Plan for and secure additional funding or donations to stretch local dollars.
        - Develop capital plans and disaster recovery/mitigation funding reserves.
        - Plan for local investment in critical infrastructure and facilities.
        - Explore creation or leverage non-profits through regional planning commissions or other regional resilience organizations.

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[10] The Montpelier Commission for Recovery and Resilience could be a model for extending partners included in the Lamoille Watershed Working Group. https://www.montpelierstrong.org/

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Target Communities: Municipally Led Projects

The following projects were identified through ongoing community engagement and alternatives analysis using the Lamoille River Hydraulic Flood Model. Communities are listed by region, as they are geographically located along the Lamoille River (upstream to downstream).

Target Community	Project	Estimated Timeline	Action Steps	Potential Resources
NVEDD Region: Caledonia County				
Hardwick	Mill Street Floodplain Restoration & Stabilization	7-10 years	• Assess alternative measures for slope stabilization at former Inn property. • Identify and secure funding • Preliminary & Final Design • Implementation	
	Fire Department Relocation and Flood Mitigation	5-7 years	• Assess alternatives for additional flood storage near Granite Street Historic District. • Secure funding for new facility • Purchase/construct • Transition equipment and operations into new facility • Relocate critical services outside of SFHA. • Assess & identify floodplain restoration measures • Secure funding. • Remove old building and implement flood storage/mitigation project	EDA-DS FRCF FEMA CDBG

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	Town Line Farmland Floodplain Restoration		• Secure easement or purchase farmland. • Assess alternative measures • Coordinate with partners including current property owners, Vermont Land Trust, Vermont River Conservancy, natural resource conservation district. • Identify and secure funding • Preliminary & Final Design • Implementation	CWSP NRCS
	East Hardwick Bridge Replacement / Flood Mitigation		• Assess alternative measures to determine whether bridge should be upsized or other mitigation measures. • Coordinate with partners including adjacent property owners, Agency of Transportation, RPC, natural resource conservation district. • Identify and secure funding • Preliminary & Final Design • Implementation	
	Upper Lamoille Flood Mitigation and Floodplain Restoration		• Scoping study. Assess alternative measures, such as flood benching, based on preliminary designs • Coordinate with partners such as adjacent property owners,	FRCF

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			RPC, business owners, natural resource conservation district. Coordinate with future Sawmill Park project. • Identify and secure funding • Final Designs • Implementation	
NVEDD Region: Lamoille County				
Wolcott	Fire Station and Town Garage Relocation and Flood Mitigation	7-10 years	• Identify new property or location for facilities. • Acquire property or develop agreement if new location is shared. • Feasibility study and design plans for new or reused facility.	EDA-DS CDBG-DR USDA RD MPG
	Riverside Park - Buyout Reuse Planning	3-5 years	• Secure funding for preliminary Design Plans for Park and connecting trails to Town Forest at FEMA buyout property • Coordinate with Rail Trail program • Identify operator/small business owner for potential business opportunities (e.g., primitive campground, food trucks) • Submit reuse plans to FEMA for approval • Secure funding for construction of pavilion, camping platforms, and/or trail development	EDA-DS CDBG-DR EPA VOREC VCF

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			• Draft emergency warning and notice plan for campers	
	Streambank Erosion at Town Hall	7-10 years	• Assess alternatives to mitigate erosion and protect Town Hall • Preliminary & Final Designs Implementation	
	Targeted Wastewater System Extensions into safer areas	7-10 years	• Assess areas for transition outside of floodplain. • Ongoing coordination with local boards/committees, RPC, state agencies, engineer, property owners, legal review, developers, etc. • Identify and secure funding. • Preliminary Engineering and Design for extent, area, materials, etc. • Environmental Review. • Secure necessary permits in state ROW and property easements. • Implementation/construction.	EDA-DS CDBG-DR CHIP CWSRF/DWSRF VBB WISPr NBRC
	Flat Iron Road Floodplain Restoration	3-5 years	• Identify funding sources. • Ongoing coordination with partners including Fish and Wildlife, ANR, VTrans, local planning commission, RPC, etc. • Final Design Plans • Implementation	EDA-DS

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	North Wolcott Road Floodplain Restoration	3-5 years	• Identify funding sources. • Ongoing coordination with partners including Fish and Wildlife, ANR, VTrans, local planning commission, RPC, property owners, conservation district, etc. • Preliminary & Final Design Plans • Implementation	CDBG-DR EDA-DS CWSP
Morrisville	Municipal Well & Water System Resilience Measures	7-10 years	• Final Designs for Water System Wells and Connecting Infrastructure. • Ongoing coordination with local boards/committees, RPC, state agencies, engineer, property owners, legal review, developers, etc. • Environmental Review. • Identify and secure funding. • Implementation/Construction.	EDA-DS NBRC VBB CHIP CWSRF/DWSRF NBRC CDBG DR
Hyde Park	Infrastructure Upgrades to support flood resilient economic development	7-10 years	• Assess areas for transition outside of the floodplain. • Ongoing coordination with Town/Village, local boards/committees, RPC, state agencies, engineer, property owners, legal review, utilities, etc. • Identify and secure funding.	EDA-DS CHIP CWSRF/DWSRF NBRC
Johnson	Targeted Infrastructure	7-10 years	• Assess areas for transition outside of floodplain.	EDA-DS CDBG-DR

	Extensions into safer areas		• Ongoing coordination with Town, local boards/committees, operator(s), RPC, state agencies, engineer, property owners, legal review, utilities, Vermont State University, etc. • Identify and secure funding. • Preliminary Engineering and Design for extent, area, materials, etc. • Environmental Review. • Secure necessary permits in state ROW and property easements. • Implementation/construction.	CHIP CWSRF/DWSRF VBB WISPr NBRC
	Wastewater Treatment Facility Mitigation		• Ongoing coordination with Town, local boards/committees, operator(s), RPC, state agencies, engineer, property owners, legal review, utilities, etc. • Identify and secure funding. • Preliminary Engineering and Design for extent, area, materials, etc. • Environmental Review. • Implementation	FEMA USDA-RD EDA-DS CHIP DWSRF
	Gihon Confluence Floodplain Restoration -	7-10 years	• Assess alternatives based on concepts from Lamoille River Flood Model updates	CDBG-DR EPA CWSP EDA DS

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	Main Street Bridge & Bypass Culverts		• Coordinate with Agency of Transportation, FEMA flood buyout projects and Town, Village, and local commissions/committees	NBRC
	Wescom Road Floodplain Restoration	3-5 years	• Ongoing coordination with neighboring property owners and Town, including Planning & Conservation Commission • Final Design • Implementation	EDA-DS CWSP CDBR DR EDA DS NBRC
	Village Buyouts – Reuse Planning & Implementation	5-7 years	• Assess properties for potential contamination. Corrective Action Planning and clean up, if necessary. • Assess Housing and Economic Development opportunities outside of flood hazard area. Understand where opportunities are to replace housing units and businesses lost to buyouts. • Redevelopment planning for flood mitigation and community reuse. Surveys, meetings with the Village Trustees. • Incorporate bike and pedestrian connectivity through Village (e.g., with LVRT trailhead) • Coordinate with potential partners such as the	EDA-DS CDBG-DR EPA VOREC VCF NBRC

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			Town/Village of Johnson, local boards/committees, Discover Johnson, Lamoille River Paddlers, and the LCPC. • Submit reuse plans to FEMA for review. • Identify funding sources for design and implementation. • Implement ideas from design plans. Can be one element at a time.	
	Utility Pole Relocation and Adaptation	7-10 years	• Assess alternatives for relocating utility poles with Johnson Water & Light Department • Integrate assessment into long term planning for buyout properties at the Lamoille and Gihon River confluence area • Relocate utility poles out of the floodplain.	EDA-DR NBRC
	Municipal Water System Continuity of Operations	0-3 years	• Coordinate site visit(s) with abutting landowners • Map emergency route to access well • Draft and execute agreement/MOU	EDA-DR EMPG
Cambridge	Stormwater Infrastructure Upgrades	7-10 years	-	

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	Housing Needs Assessment and Feasibility Study	0-3 years	• Identify Funding • Hire consultant • Investigate housing opportunities to replace housing units lost to buyouts.	MPG
	Village Buyouts – Reuse Planning & Implementation	5-7 years	• Assess properties for potential contamination. Corrective Action Planning and clean up, if necessary. • Redevelopment planning for community reuse. Surveys, meetings with the Village Trustees. • Incorporate bike and pedestrian connectivity through Village (e.g., with Store, or Park & Ride) • Coordinate with potential partners such as the Town of Cambridge, Lamoille River Paddlers, and the LCPC. • Submit reuse plans to FEMA for review. • Identify funding sources for implementation. • Implement ideas from design plans. Can be one element at a time.	EDA-DS CDBG-DR EPA VOREC VCF
	Village Water System Planning and Mitigation	7-10 years	• Assess aging water system pipes & connecting infrastructure	USDA DWSRF NBRC

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			• Prioritize measures for improvements • Identify funding sources for implementation • Capital Planning • Develop administrative protocols & procedures; COOP	
Jeffersonville	Municipal Water System Resilience Measures	0-3 years	• Assess alternative locations for new well site • Identify measures to protect connecting infrastructure from streambank erosion. • Drill new well • Construct connecting and treatment infrastructure	EDA-DS DWSRF NBRC
	Wastewater System Resilience Measures	0-3 years	• Elevate Church Street Wastewater system pump station and electric panel	
	Targeted Water/Wastewater Infrastructure Extensions into safer areas	7-10 years	• Assess areas for transition outside of floodplain. • Ongoing coordination with Town/Villages, local boards/committees, operator(s), RPC, state agencies, engineer, property owners, legal review, Smugglers' Notch Resort, etc. • Identify and secure funding.	EDA-DS CDBG-DR USDA-RD CHIP CWSRF/DWSRF VBB WISPr

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			• Preliminary Engineering and Design for extent, area, materials, etc. • Environmental Review. • Secure necessary permits in state ROW and property easements. • Implementation/construction.	
	Route 15 Bypass Culvert #2	5-7 years	• Identify funding • Advance design/engineering plans • Ongoing coordination with Town/Villages, local boards/committees, RPC, state agencies, engineer, adbutting property owners, legal reviewetc. • Construct second bypass culvert • Develop maintenance plan	EDA-DS CDBG-DR
Stowe	Infrastructure Upgrades to support flood resilient economic development	7-10 years	• Assess areas for transition outside of the floodplain. • Ongoing coordination with Town/Village of Moscow, local boards/committees, RPC, state agencies, engineer, property owners, legal review, utilities, etc. • Identify and secure funding.	EDA-DS CHIP CWSRF/DWSRF NBRC
NVEDD Region: Franklin County				

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Fairfax	Steeple Market Flood Mitigation	5-7 years	• Install temporary measures in market such as flood gates. • Assess alternative measures for flood mitigation. • Coordinate with partners such as adjacent property owners, Agency of Transportation, Steeple Market, the natural resource conservation district, TAC. • Identify and secure funding. • Preliminary & Final Design • Implementation	
	Stones Brook and Lamoille Confluence – Floodplain Restoration	7-10 years	• Assess alternative measures • Identify and secure funding • Preliminary & Final Design • Implementation	FRCF CWSP
	Goose Pond Road Stabilization	0-3 years	• Assess alternative measures • Identify and secure funding • Preliminary & Final Design • Implementation	BRIC
	Rood Mill Road Bridge Replacement	7-10 years	•	
	Mill Brook Bank Stabilization	5-7 years	• Assess alternative measures. • Coordinate with partners such as adjacent property owners, the natural resource conservation district, TAC. • Identify and secure funding	

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			• Preliminary & Final Design • Implementation	
Georgia	Arrowhead Lake Flood and Ice Jam Mitigation	7-10 years	• Assess alternative measures due to erosion and ice jamming. • Identify and secure funding • Coordinate with partners such as adjacent property owners, Agency of Transportation, the natural resource conservation district, TAC. • Preliminary & Final Design • Implementation	

Target Communities: Partner-Led Projects

Community	Partner	Project	Estimated Timeline	Action Steps	Resources
Cambridge	Smugglers' Notch Resort	Smugglers' Notch Access Road Planning & Implementation	3-5 years	• Assess alternative measures. • Coordinate with partners such as the Agency of Transportation, the natural resource conservation district, etc. • Identify and secure funding	EDA-DS CHIP?

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				• Preliminary & Final Design Implementation	
		Smugglers' Notch Water Reservoir Resilience Assessments & Improvements	0-3 years	• Assess alternative measures. • Coordinate with partners such as the Agency of Natural Resources, the natural resource conservation district, etc. • Identify and secure funding • Preliminary & Final Design Implementation	EDA-DS
Georgia	Georgia Industrial Park	Water Treatment System Extension & Improvements	5-7 years	• Identify new user(s) for facility • Drill new wells for existing users. • Assess and identify locations for targeted extensions • Conduct Feasibility Study for potential extension and connections to	Private funding DWSRF

				Georgia Village Center. • Coordinate with partners including the Town of Georgia, housing developers, state agencies, RPC, RDC, etc. • Preliminary designs for prioritized infrastructure upgrades • Identify funding sources • Construct Extensions	
Regional	Natural Resource Conservation Districts	Flood Mitigation and Restoration Projects	Ongoing	• Assess alternative measures. • Coordinate with partners such as private property owners, the Agency of Natural Resources, RPCs etc. • Identify and secure funding • Preliminary & Final Design	

				Implementation	
Regional	RPCs	Bylaw Updates & Municipal Planning & Implementation	3-5 years	• Flood Hazard Bylaw updates • Land Use & Development Bylaw updates • Local Hazard Mitigation Plans updates Provide expertise and capacity for local and regional flood mitigation projects,	CDBG-DR MPG ACCD CDBG DR
Regional	LCPC & LEDC	Lamoille Outdoor Recreation Economy Inventory & Economic Impact Analysis	0-3 years	• Secure planning funds • Coordinate with regional municipalities, businesses, and partner organizations. • Inventory outdoor recreation amenities and assets • Hire consultant to perform economic impact analysis	

Regional	LCPC, NRPC, CCRPC	Lamoille River Hydraulic Flood Model Update	0-3 years	• Secure funding • Collect bridge data (i.e., span) • Hire consultant to expand flood model from Main Stem to Lake; Missisquoi River. Include other key tributaries and confluence areas. • Update existing extent with new and available data.	

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Appendices and Attachments

Appendix A

Flood Risk Maps

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Appendix B

Recovery and Resilience Checklists, Guides, and Resources

Response & Recovery Resource

Place & Organization	Resource or Example	Brief Description
Federal Emergency Management Agency (FEMA)	Filing an Insurance Claim	For communities in NFIP - Guidance on filing flood insurance claims.
Regional Planning Commissions	Local Liaison Program	Assist state Emergency Operations Center with community situational reports. Assist state and municipalities with disaster recovery activities as needed including supporting MARCs, VOADs, and other recovery organizations.
USDA: Farm Service Agency	Various Disaster Assistance Programs	Provide financial and technical support to help farmers and ranchers recover from losses caused by natural disasters and restore their agricultural operations.
USDA: Natural Resource Conservation Service	Emergency Watershed Protection Program	Assist communities recover from natural disasters by funding measures (i.e. debris removal, banks stabilization, etc.) that reduce threats to life and property in impaired watersheds.
Vermont Agency Of Transportation District Offices	District Office Contacts and Damage Assessment Reporting Rail Trail Damage reporting	Provides technical assistance, including damage assessment for town highways, bridges, and culverts;

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Place & Organization	Resource or Example	Brief Description
		access temporary bridge structures for damaged crossings.
Vermont Small Business Development Center	Disaster Recovery Guide for Businesses	Checklists, lists, and worksheets to help guide disaster preparedness for small busineses.
VT – E911 Board - Citizens Assistance Registry for Emergencies (CARE)	CARE (Citizens Assistance Registry for Emergencies) | Enhanced 911 Board CARE Information for Responders / Dispatch Agencies | Enhanced 911 Board	The CARE program was created to help emergency responders identify Vermonters who might need additional assistance in case of a wide-scale event.
Vermont Agency of Natural Resources	Drinking Water & Groundwater	Provides rapid technical and financial assistance to restore safe, reliable drinking water supplies and protect public health during water-related emergencies. The Drinking Water Emergency Use Fund (administered by ANR) can pay for: water testing, emergency repairs to public water systems, hiring certified operators, and provision of bottled or bulk water in crises.
	Wastewater Not sure about the link to this.	Communities or wastewater treatment facility operators report overflows and discharges via the DEC's online event reporting system, as required under Vermont law.
	ANR's Emergency Stream Permit Program	See comment for links to get narrative.

Place & Organization	Resource or Example	Brief Description
Vermont Department of Environmental Conservation (DEC)	Water/Wastewater Agency Response Network (WARN) | Department of Environmental Conservation	Allow water and wastewater systems to receive rapid mutual aid and assistance from other systems to continue providing services if they are impaired by unforeseen staff absences, materials shortages, or equipment failures.
VT DEC - Rivers Program	River Permit Information	If an activity changes, alters, or modifies the course, current, or cross section of any watercourse within or along the boundaries of VT, that activity may require a permit. The Rivers Program issues permit covering three general areas of activities: construction or excavation of rivers/streams; activities exempt from municipal regulation in flood hazard areas, and activities that involve dam removal or hydroelectric power.
Vermont Department of Health (VDH)	Public Health alerts and guidance, water testing and well safety, environmental health and monitoring. Support for shelters and people with disabilities and functional access needs.	Assists with flooding by protecting public health before, during, and after flood events through guidance, monitoring, and support.
Vermont League of Cities and Towns (VLCT)	Flood: Preparedness, Response & Recovery | Vermont League of Cities and Towns	

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Place & Organization	Resource or Example	Brief Description
Vermont Division of Fire Safety (DFS)	Assists residents with safely returning to their homes and businesses as quickly as possible after a flooding event.	Assists communities with flooding primarily through life-safety support, code guidance, and post-flood building safety assessments.
U.S. Small Business Administration (SBA)	Low-interest disaster loans and mitigation resources.	Provide businesses with information on low-interest disaster loans, mitigation planning resources, and preparedness guidance to reduce potential flood-related losses.

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Preparedness; Resilience

Place & Organization	Resource or Example	Brief Description
American Red Cross (ARC)	Flood Safety Webpage	Flood Safety Checklists and general tips to help prepare for a flood.
Vermont Emergency Management (VEM)	VT-ALERT - Click Here to Register	VT-ALERT is used by the state and local responders to notify the public of emergency situations.
	Community Preparedness Resources	Templates for Local Emergency Plans and related Annexes (i.e Debris Management, Sheltering). Links to other resources such as heating and cooling shelters. State Emergency Training opportunities.
Vermont Department of Environmental Conservation (DEC)	National Flood Insurance Program | Department of Environmental Conservation	Assists communities with compliance with the NFIP which ensures properties are eligible for flood insurance. Assists with adopting and enforcing floodplain management regulations and provides technical assistance and mapping support,
	2017 Vermont Stormwater Management Manual	Guidance for stormwater management, focusing on both water quality and quantity controls. A resource for designers, developers, and homeowners looking to minimize the impact of stormwater runoff.
	Drinking Water Preparedness and Security Resources	Planning Tools and Contact Information for Drinking Water.

Place & Organization	Resource or Example	Brief Description
Vermont Flood Ready website and Atlas	Welcome to Flood Ready Vermont | Flood Ready	Assists communities, businesses, and homeowners prepare for, manage and reduce, flood risks through planning tools, data, and resources that support hazard mitigation. Identify critical facilities, transportation services and buildings in your community that are at risk of damage from flooding.
Regional Development Corporations	Business Emergency Preparedness Workbook	Workbook to outline a plan to prepare for a disaster including a decision tree, contact list, and a matrix to help prioritize what resources to protect. Workbook linked at the end of this plan.
Vermont League of Cities and Towns (VLCT)	Flood: Preparedness, Response & Recovery | Vermont League of Cities and Towns	
Federal Emergency Management Agency (FEMA)	Benefit Cost Analysis Toolkit	Benefit-Cost Analysis is a decision-making tool that FEMA uses to compare the risk reduction benefits of a hazard mitigation project to its costs. Used to assess cost-effectiveness of projects.
	National Hazard Risk Assessment Program and Hand National Risk Index Map for Natural Hazards. Related: Hazus Loss Library	A program focused on providing a multi-hazard view of risk for communities, combining the likelihood and consequences of natural hazards with community risk factors.

Place & Organization	Resource or Example	Brief Description
	Recovery Resource Library	
Vermont Department of Health (VDH)	Public Health alerts and guidance, water testing and well safety, environmental health and monitoring. Support for shelters and people with disabilities and functional access needs.	Assists with flooding by protecting public health before, during, and after flood events through guidance, monitoring, and support.
Regional Planning Commissions	Assist communities with emergency planning related activities	Including Emergency Relief Assistance Fund compliance support, local Hazard Mitigation Planning, organizing and supporting Regional Emergency Management Committees, support emergency management plan updates and serve as

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Appendix C

Business Emergency Planning Workbook

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Appendix D

Resilience & Recovery Principles

The following definitions and principles can guide resilience and recovery planning. Each can be used and tailored to meet the needs of the region.

1. **National Organization of Development Organizations (NADO)**

Economic Resilience is the ability of a community's business and economic development efforts to better withstand, and recover more quickly from, adverse incidents of any kind.

A "three-pronged" approach to resilience:

a. Plan for resilience – identify economic vulnerabilities and develop strategies for long-term durability.
b. Establish information networks – foster collaboration among stakeholders in public, private, education, and non-profit sectors.
c. Create "resilient recovery" – that is stakeholder driven, with resilience-embedded strategies through collaboration with private, nonprofit, local, state, and federal orgs.

Steps to take:

a. Organize - committees, task forces.
b. Assess – perform comprehensive resilience assessment – US Census Resilience Ranking
c. Identify shortcomings – based on assessment.
d. Gain knowledge – through direct and indirect research and advice.
e. Secure resources – funding, expertise, technical assistance.
f. Take Action – create a step-by-step action plan.

2. **Federal Emergency Management Agency (FEMA)**

Resilience: the ability to prepare for threats and hazards, adapting to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions.

Principles:

5. Identify, prepare for, resist, and respond to shocks and stressors.
6. Center resilience goals around well-being of individuals, families, and communities.
7. Pursue solutions that do not exacerbate disparities.
8. Adapt to evolving circumstances and implement innovative ideas.
9. Engage and empower public, private, academic, and non-profit sectors in collective deliberation.
10. Implement solutions that meet current and future needs.
11. Prioritize solutions and investments that address hazards that are the greatest risk, and result in multiple benefits.

3. **Vermont League of Cities and Towns (VLCT)**

Disaster preparedness means preparing before disaster strikes, responding during the event, and positioning community for long term recovery after the disaster.

Principles:

a. Works best when everyone works together – shared efforts and sense of unity in response leads to more shared resources, emotional support, which builds trust and helps move things forward.

Any of these frameworks, or combinations of them, could be used to help communities and businesses across Northern Vermont recover long term from flood disasters. Using the Lamoille River Flood Model and other available tools can help assess alternatives and take additional steps towards mitigating the impacts from flood events. Target communities along the Lamoille Main Stem continue to respond to and recover from the July 2023 and 2024 flood events. The following categories and core themes emerged from regional surveys, public meetings, and ongoing conversations in meetings with businesses, municipal bodies and representatives, community members, and other regional stakeholders. These themes can help assess what areas are critical to focus on for long term recovery, and guide communities towards next steps, including identifying priorities, securing necessary resources, and implementing projects.

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