JOHNSON, VERMONT
LOCAL HAZARD MITIGATION PLAN
2017 – 2022

FEMA Approval Pending Adoption:
August 28, 2017

Town Selectboard Adopted:
September 18, 2017

Village Board of Trustees Adopted:
September 11, 2017

FEMA Formal Approval:
September 29, 2017

Plan expires:
September 29, 2022
1.1. Introduction

The impact of expected, but unpredictable, natural and human-caused events can be reduced through community planning. The goal of this multi-jurisdictional Local Hazard Mitigation Plan for the Town and Village of Johnson, Vermont (Plan, or LHMP) is to provide an all-hazards local mitigation strategy that makes the community of Johnson more disaster resistant.

Hazard mitigation is any sustained action that reduces or eliminates long-term risk to people and property from natural and human caused hazards and their effects. Based on the results of previous recovery efforts nationwide, FEMA and State agencies have come to recognize that it is less expensive to prevent disasters than to repeatedly repair damage after a disaster has struck. This Plan recognizes that communities have opportunities to identify mitigation strategies and measures during all of the other phases of emergency management: preparedness, response, and recovery. Hazards cannot be eliminated, but it is possible to determine what the hazards are, where the hazards are most severe, and identify local actions that can be taken to reduce the severity of the hazard.

Hazard Mitigation Strategies and Measures alter the hazard by eliminating or reducing the frequency of occurrence, avert the hazard by redirecting the impact by means of a structure or land treatment, adapt to the hazard by modifying structures or standards, or avoid the hazard by stopping or limiting development and could include projects such as:

- Flood-proofing structures
- Tying down propane/fuel tanks in flood-prone areas
- Elevating furnaces and water heaters
- Ensuring adequate and safe water supply
- Elevating structures or utilities above flood levels
- Identifying and upgrading undersized culverts
- Proactive land use planning for floodplains and other flood-prone areas
- Road maintenance and construction to current best practices and standards
- Ensuring critical facilities are safely located
- Buyout and relocation of structures in harm’s way
- Establish and enforce appropriate building codes
- Inform and educate the public

1.2. Purpose

The purpose of this Local Hazard Mitigation Plan is to assist the Town and Village of Johnson (Johnson) in recognizing natural hazards facing their community and identifying strategies to begin reducing risks from acknowledged hazards.

Johnson strives to be in accordance with the strategies, goals, and objectives of the Vermont State Hazard Mitigation Plan, including an emphasis on proactive pre-disaster flood mitigation for public infrastructure, good floodplain and river management practices, and fluvial erosion risk assessment initiatives.

Previous Johnson Hazard Mitigation Plans were developed as an annex to the Lamoille County Multi-Jurisdictional All-Hazards Mitigation Plan. This plan is intended to be a “unified” multi-jurisdictional plan
for the Town and Village of Johnson. While the Village is a political entity with a legislative body located within the Town of Johnson, due to shared resources, responsibilities, and geographic boundaries, there is a clear advantage for the Village and the Town of Johnson to share a multi-jurisdictional Hazard Mitigation Plan.

1.3. Community Profile
Johnson is centrally located in Lamoille County, at the confluence of the Gihon and Lamoille Rivers. The Town abuts Cambridge and Waterville to the west, Morristown to the south and east, Hyde Park and Wolcott to the east, and Belvidere and Eden to the north. It is located approximately 45 miles from the City of Burlington and approximately 40 miles from the state capital of Montpelier – two of Vermont’s largest job centers. Within the Town of Johnson exists the incorporated Village of Johnson.

According to the U.S. Census Bureau, between 2000 and 2010 Town and Village of Johnson’s combined population increased from 3,274 to 3,446 residents. Population and housing growth primarily occurred in Town where the population grew by 8% (159 residents) and the number of housing units increased by 12% (95 units). In the Village, the population grew by 1% (13 residents) and the number of housing units decreased by 3% (13 units).

There are approximately 74.12 miles of roadways in town: 11.4 miles are state highway, 13.13 are Class 2, 36.41 are Class 3 and there are 13.19 miles of Class 4 that are not maintained for year-round travel. Vermont Route 15 is the region’s primary east-west transportation corridor. Data from the Vermont Agency of Transportation (AOT) indicate daily traffic volumes of 9,300 vehicles along Route 15 through the Village of Johnson. A second state highway, Route 100c, runs northeast from the Village of Johnson, connecting to Route 100 in the village of North Hyde Park. Traffic volumes along Route 100C, as measured between Sinclair Road and Hyde Park town line, are 2,600 vehicles per day.

The Town and Village share a Johnson Municipal Office on Route 15. The Town is governed by the Selectboard and the Village of Johnson is governed by the Board of Trustees. Both the Town and Village of Johnson share a jointly appointed Planning Commission.

All roads are funded and maintained through the Town’s Public Works Department, with one Road Foreman. The Village has no authority over roads. The Village has full authority over the Village of Johnson Water and Light department (VOJW&L) which manages the local electric, water and wastewater systems, General and Fire Departments.

There is one Emergency Management Director (EMD) and one Emergency Management Coordinator (acting as an assistant to the EMD). The EMD and EMC are appointed by both the Selectboard. Flood hazard regulations include all structures in Johnson (whether “Town” or “Village”).

There are four electric utilities that provide service to the town: the Village of Johnson Water and Light Department (VOJW&L), Village of Hyde Park Water and Light, Vermont Electric Cooperative (VEC), and Morrisville Water & Light. Morrisville Water & Light and VOJW&L are co-owners of a 34.5 kV transmission system which provides primary transmission service to VOJW&L through a direct interconnect to the VELCO 115 kV substation in Stowe. Green Mountain Power, formerly Central Vermont Public Service Corporation (CVPS), provides back up sub-transmission services to the VOJW&L through its 34.5kV transmission line and substation. The Village of Johnson provides electric service to approximately 950 metered customers, including Johnson State College and encompassing an area approximately two miles in any direction from the center of the village. VEC provides electric service to a
large portion of the rest of the town. The Hyde Park Electric Department and Morrisville Water & Light have small service territories in outlying areas of town. The town has a mapped sewer service area district within which connections to the existing sewer lines are permitted by application and 25,000 gallons per day sewage discharge capacity is allotted under an agreement between the Town and Village of Johnson.

Locally, fire coverage is provided by the volunteer Village of Johnson Fire Department, which also serves the towns of Johnson, Waterville and Belvidere under contract. The fire station is located at 251 Lower Main Street, next to the Municipal Offices. The Johnson Fire Department participates in the Lamoille Mutual Aid Association, which functions as a mutual aid response network among all eight Lamoille County fire departments. Under statute, fire departments are required to provide mutual aid assistance if they have training and resources are available. The Village Fire Department also provides water rescue services statewide through a contract with Vermont Emergency Management.

There are two levels of law enforcement in Johnson: the Lamoille County Sheriff’s Department (LCSD) and the Vermont State Police. The town relies on the LCSD for law enforcement services, through participation in a three town contract, along with Hyde Park and Wolcott. The LCSD dispatch is located on Main Street in Hyde Park Village. Additional law enforcement support is provided by the Vermont State Police. The town’s appointed Constables are authorized to enforce limited local ordinances, but do not have law enforcement powers and duties.

Rescue services in Johnson are provided by the Northern Emergency Medical Services Division of Newport Ambulance Service, Inc. (NEMS), a private non-profit ambulance service that provides immediate response emergency medical care, backup emergency response services (to volunteer rescue squads) and medical transfer services. NEMS provides these services under contract to a five town consortium, which includes Hyde Park, Waterville, Belvidere and Eden. The ambulance is dispatched either through 911 calls received at the sheriff’s department or through direct calls to the service itself. The ambulance service is a private, non-profit organization that is supported, in part, with municipal funds under the above reference contract.

Medical care is provided locally by one local family physician while Copley Hospital in Morrisville provides additional medical support. Copley is a 25-bed treatment center servicing the community for acute, outpatient and long-term care. More specialized services are available in Burlington, Berlin and Hanover, New Hampshire.

The Town adopted a Local Emergency Operations Plan (LEOP) in May 2016. The municipal office and the Fire Station are designated as Emergency Operations Centers, and Johnson State College and Johnson Elementary School are certified Red Cross Emergency Shelters.

2.1. Planning Process Overview
In 2011, much of Vermont was hit hard by Tropical Storm Irene, resulting in the largest, most damaging and costly flood to Vermont since 1927. Several months prior to Tropical Storm Irene, in April 2011, another severe flood event occurred, which resulted in severe damages to Johnson’s shopping plaza that housed the Grand Union grocery and the Post Office. The back to back storms of 2011 changed the way our communities and the State of Vermont view natural disasters, handle the recovery aftermath, and plan for future disasters.
FEMA in 2013, under a new “National Mitigation Framework”, has also issued updated guidance for local hazard mitigation planning. Vermont’s ongoing recovery efforts and FEMA’s new mitigation framework both focus on strengthening community “resilience” – to not only understand and reduce risks of future events, but to also empower communities to recover more quickly and effectively when disasters occur.

The State of Vermont recently enacted new Emergency Relief and Assistance Fund (ERAF) rules, effective October 2014, that provide additional matching funds for federal disaster relief under FEMA’s Public Assistance Program. To qualify, municipalities must adopt updated bridge and culvert standards, participate in the National Flood Insurance Program, adopt a local emergency operation plan, and adopt a local hazard mitigation plan approved by FEMA.

Vermont’s Department of Emergency Management and Homeland Security (DEMHS) released the State’s Hazard Mitigation Plan in November 2013. The State’s HMP Plan serves as a source of information and guidance for local jurisdictions in completing their own Hazard Mitigation Plans, identifying all hazards facing their community, and establishing strategies to begin reducing risk from identified hazards. The State plan and available guidance from FEMA provide the framework for this update.

2.2. Planning Process and Public Participation
The previous Johnson Hazard Mitigation Plan was adopted by the Town of Johnson on March 15, 2015 as an “annex” to the multi-jurisdictional All-Hazards Pre-Disaster Mitigation Plan adopted by the Lamoille County Planning Commission in 2012. The Johnson Annex received FEMA final approval in June 2015.

In developing this Plan, LCPC initiated conversations with the local Emergency Management Director, Emergency Management Coordinator, Town Administrator, Village Manager, joint Town and Village Johnson Planning Commission, LEPC 11, and public at large. Based on these conversations as well as a review of the most recently adopted Hazard Mitigation Plan, LCPC prepared a draft of the 2017-2021 Johnson Hazard Mitigation Plan. Following is the schedule of activities that made up the plan’s development:

- Throughout May, LCPC reviewed the 2015 annex and marked sections of the plan recommended for a revision.
- On May 27, 2016, LCPC sent the marked up version of the 2015 plan to Johnson Planning Commission (joint commission for town and village), Town Administrator, Village Manager, Emergency Management Director (joint for town and village) and Emergency Management Coordinator (joint for town and village) for their review.
- On June 7, LCPC invited the EMD, EMC, Town Administrator and Village Manager to a meeting to review the 2015 plan and discuss proposed changes. Discussion focused on reviewing Johnson’s recent growth patterns and impacts that recent growth may have on Johnson’s approach to hazard mitigation. Johnson officials expressed that recent population and housing growth does not negatively impact community vulnerability to natural hazards. With respect to flooding it was noted that residential growth occurred in places that are not located in flood hazard areas. Johnson officials also reviewed the 2015 Hazard Identification/Risk Assessment table and confirmed that three consistently significant hazards for Johnson are flooding/fluvial erosion, severe wind storms, and winter storms. Finally, LCPC staff and Johnson officials reviewed the
status of hazard mitigation actions from the 2015 plan and developed a draft list of actions for this plan.

- Based on the officials’ feedback, LCPC began updating the 2015 plan and developed a draft plan focused on incorporating the officials’ ideas for new mitigation actions.
- On June 9, 2016, the draft plan was posted on the town and village web site. Public was notified that on June 14, 2016, Johnson Planning Commission will hold a meeting to review draft plan and accept public input.
- On June 10, 2016, LCPC posted a message on Front Porch Forum inviting Johnson residents to take part at the Planning Commission meeting. Johnson municipal staff distributed an invitation to the meeting via the Friends of Johnson newsletter.
- On June 14, 2016, Johnson Planning Commission held the publicly warned meeting to discuss the draft plan. Johnson Planning Commission is a joint planning commission for the Town and Village of Johnson and composed of residents from both jurisdictions. The meeting was attended by six Johnson Planning Commission members and three additional community members residing in the Village of Johnson. The summary of input and how it was incorporated into the plan is below.

<table>
<thead>
<tr>
<th>Comment</th>
<th>How Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability rating should be higher than it is for severe wind storms, winter storms, and failure of the Green River Reservoir dam and other dams upstream from us.</td>
<td>Probability rating was adjusted to medium for severe wind storms and winter storms. Probability rating for dam failure remains described as low.</td>
</tr>
<tr>
<td>Who put up the riprap on the sewage treatment plan side of the Gihon, resulting in water eroding lawn on the other side of the river and why?</td>
<td>Eric Osgood, Emergency Management Director and Selectboard Chair recalls that property owner placed rip rap along the river to protect his property from erosion at the location where the sewer plant and the property owner’s land intercept. This work was done by the owner many years ago.</td>
</tr>
<tr>
<td>Village Resident with a house on Railroad Street talked about his basement flooding due to various neighborhood issues, most recently due to a new neighbor’s driveway that is sloped in a way that exacerbates flooding in the Resident’s basement.</td>
<td>Not addressed in this plan.</td>
</tr>
<tr>
<td>It would be helpful to know what consequences are predicted in Johnson if a dam were to fail. She thinks agriculture should be included under severe wind. Under hazmat spills she thinks water quality should have been included.</td>
<td>Included in Hazard Identification/Risk Assessment table.</td>
</tr>
<tr>
<td>It was suggested that the village revolving loan funds could be opened to private owners who want to do flood proofing.</td>
<td>Included as action item in this plan.</td>
</tr>
</tbody>
</table>
Throughout July and August 2016, LCPC worked to incorporate public comments into the plan and finalize the plan draft. After the Selectboard’s review of the plan, the plan was sent to FEMA for their review on September 19, 2016.

In February, 2017, Johnson received a notification from DEMHS that FEMA requests revisions to the draft plan.

Between February and May 2017, LCPC worked with the Village Manager, Town Administrator, Emergency Management Director, Johnson Selectboard and Village Board of Trustees to incorporate to the plan revisions required by FEMA.

2.3. Planning Process and Neighboring Communities

Neighboring communities have been encouraged to provide input into the development of this plan and review the draft plan. On June 9, 2016 this Plan was posted on the LCPC’s web site and at the LCPC’s Facebook page. On June 21, 2016, the plan was distributed to Local Emergency Planning Committee #11 members. The LEPC is composed of emergency management professionals and volunteers from Lamoille County and includes representatives from all of Johnson’s neighboring communities, i.e. Belvidere, Cambridge, Eden, Hyde Park, Morristown and Waterville. The LEPC members were instructed to provide feedback to Lea Kilvadyova, Lamoille County Regional Planner via email or phone.

2.4. Existing Plans, Studies, Reports, and Technical Information

To develop this plan and to provide Johnson with relevant information necessary to develop hazard mitigation strategies, the following resources were utilized and referenced throughout this plan:

- 2013 State of Vermont Hazard Mitigation Plan
- 2016-2024 Johnson Town and Village Municipal Development Plan
- 2016 Johnson Local Emergency Operations Plan
- Vermont Division of Emergency Management and Homeland Security
- Vermont Agency of Transportation
- Vermont Center for Geographic Information
- Emergency Response Guidebook
- National Flood Insurance Program
- Flood Insurance Rate Maps
- U.S. Census, 2010
- American Community Survey, 2010 – 2015
- FEMA [https://www.fema.gov/disaster](https://www.fema.gov/disaster)

2.5. Plan Maintenance Process

Town Administrator and Village Manager will collaboratively evaluate Johnson’s LHMP annually by reviewing the status of mitigation actions and assessing their effectiveness in meeting the hazard mitigation goals. Any significant disaster event may prompt a review of this plan by municipal staff, Emergency Management Director and elected Boards. One year prior to the expiration of the Plan, Town Administrator and Village Manager will initiate and lead the process of the Plan update-with possible assistance of the Lamoille County Planning Commission. To involve the public, we will implement the process that will mirror the process used during the update of this plan and described in detail in section 2.1 of the plan. The Selectboard and the Board of Village Trustees are the authorities to vote on the plan approval.
by reviewing the status of mitigation actions and assessing their effectiveness in meeting the hazard mitigation goals

**3.1. Hazard Identification and Risk Assessment (HI/RA):**

A risk assessment measures the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural disasters. During the preparation of this plan, the community identified six major and eight low hazards. These hazards, presented in Table 1 below, were ranked based upon the likelihood of the event and the community’s vulnerability to the event. Vulnerability is rated as high, moderate, or low, based on the community’s susceptibility to the hazard and disruption of daily functions in the community. Probability is rated in terms of the likelihood the hazard will occur in any given year: high (80-100%); medium (30-80%); low (0-30%).

**Table 1: Johnson Town and Village Hazard Identification and Risk Assessment**

<table>
<thead>
<tr>
<th>Natural Hazards</th>
<th>Town and Village Vulnerability</th>
<th>Probability</th>
<th>At Risk from Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood inundation, flash flood, fluvial erosion and ice jams</td>
<td>High</td>
<td>Medium</td>
<td>Utility Infrastructure, Transportation network, Structure/Property, Water quality, Agriculture</td>
</tr>
<tr>
<td>Severe wind storms (thunderstorms, hurricanes and tropical storms)</td>
<td>Medium</td>
<td>Medium</td>
<td>Utility Infrastructure, Transportation network, Structure/Property, Water quality, Agriculture</td>
</tr>
<tr>
<td>Major winter storms and ice storms</td>
<td>Medium</td>
<td>Medium</td>
<td>Utility Infrastructure, Transportation network, Structure/Property</td>
</tr>
<tr>
<td>Landslide</td>
<td>Low</td>
<td>Low</td>
<td>Utility Infrastructure, Transportation network, Structure/Property</td>
</tr>
<tr>
<td>Drought</td>
<td>Low</td>
<td>Low</td>
<td>Agriculture, Public Health, Economy, Water Quality</td>
</tr>
<tr>
<td>Wildfire/forest fire</td>
<td>Low</td>
<td>Low</td>
<td>Silviculture, Structures/Property, Public Health, Economy, Agriculture, Water Quality</td>
</tr>
<tr>
<td>Hailstorm</td>
<td>Low</td>
<td>Low</td>
<td>Utility Infrastructure, Structure/Property, Water quality, Public Health, Economy, Agriculture</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Low</td>
<td>Low</td>
<td>Utilities, Transportation network, Structure/Property, Water quality, Public Health, Economy</td>
</tr>
<tr>
<td>Tornado</td>
<td>Low</td>
<td>Low</td>
<td>Utilities, Transportation network, Structure/Property, Water quality</td>
</tr>
<tr>
<td>Extreme temperatures</td>
<td>Low</td>
<td>Low</td>
<td>Damage to agricultural crop, infrastructure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technological Hazards</th>
<th>Town and Village Vulnerability</th>
<th>Probability</th>
<th>At Risk from Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam failure</td>
<td>Medium</td>
<td>Low</td>
<td>Utility Infrastructure, Transportation network, Structure/Property, Water quality, Public Health, Economy, Agriculture</td>
</tr>
<tr>
<td>Major highway accidents</td>
<td>Medium</td>
<td>Low</td>
<td>Utility Infrastructure, Transportation network, Structure/Property, Water quality, Public Health, Economy</td>
</tr>
<tr>
<td>Major structure fire</td>
<td>Medium</td>
<td>Low</td>
<td>Utility Infrastructure, Transportation network, Structure/Property, Water quality, Public</td>
</tr>
</tbody>
</table>
The next section of the plan will address, in detail, three natural hazards with high or medium community vulnerability and medium probability. These include Flood inundations/flash floods/fluvial erosion/ice jams; Severe wind storms (thunderstorms/hurricanes/tropical storms); and Major winter storms/ice storms. Natural hazards and technological hazards with low or medium vulnerability, and low probability are not addressed.

3.2. Major Natural Hazards

3.2.1. Flood Inundation/Flash Flood/Fluvial Erosion and Ice Jams

Hazard Definition: Flooding is the overflowing of rivers, streams, drains, and lakes due to excessive rain, rapid snow melt, or ice. Flash flooding is a rapidly occurring flood event usually from excessive rain. Fluvial erosion is the removal of sediment from stream channel banks by the channel flow. This process occurs naturally over time as a stream channel makes adjustments. However, fluvial erosion can occur more quickly and severely during flood events and can pose a significant risk to infrastructure and buildings within the river corridor. Ice jams occur when warm temperatures and heavy rain cause snow to melt rapidly. Snowmelt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of the river. The ice layer often breaks into large chunks, which float downstream and often pile up near narrow passages or other obstructions, such as bridges and dams.

Extent: Johnson vulnerability to a flood is high and the probability of flood occurrence is medium. The information provided by the National Weather Service identifies flood stage on Lamoille River in Johnson as the river height of 13 feet. The most significant historical event has been document in August 1995 when Lamoille crested at 19.88 feet. More recently, in a devastating spring flood of April 2011, Lamoille crested at 16.97 feet. For ice jams, extent and historical occurrence data is not available.

Location: Flooding, flash flooding and fluvial erosion are Johnson’s most commonly recurring hazards. Parts of community most at risk are generally the ones located in the floodplain and along river corridors. These areas are shown on the attached Flood Hazard Map. In the Village, most of the past damages occurred to properties along Main and Railroad Streets and impacted homes, municipal waste water plant, municipal library and the post office shopping plaza. In Town, primary impacts have been to town roads located along the Lamoille and Gihon Rivers and associated culverts and bridges. Ice jams can occur anywhere along the Lamoille and Gihon rivers.

There are 131 structures in Johnson located within a FEMA special flood hazard area. Of these structures, 54 are located in the Town (areas of Johnson outside the Village) and 77 in the Village. Johnson also has structures that are susceptible to fluvial erosion and as such these structures have been identified by the State of Vermont as being located with a river corridor area. Often, special flood hazard and river corridor areas overlap however, river corridors also exist in places (e.g. along smaller streams) where flood hazard areas do not.
A history of major flood events that resulted in federal disaster declarations, starting in 1995, is listed below. The list includes dates, public assistance funding received and descriptions of disasters.

<table>
<thead>
<tr>
<th>Date</th>
<th>DR Number</th>
<th>Assistance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 1995</td>
<td>1063</td>
<td>$496,594</td>
<td>Record setting heavy rains caused flooding in six north-central counties. Preliminary damage assessments indicated individual losses greater than damages to public infrastructure. Flood levels exceeded the 500-year event in several areas along the Lamoille River.</td>
</tr>
<tr>
<td>January 1996</td>
<td>1101</td>
<td>$5,290</td>
<td>A mid-winter flood event brought statewide destruction of private and public property with eleven counties included in the declared disaster area. This event left more than 150 communities eligible for public assistance.</td>
</tr>
<tr>
<td>July 1997</td>
<td>1184</td>
<td>$137,334</td>
<td>Excessive rain in several northern Vermont counties caused flash flooding and destruction of public and private property.</td>
</tr>
<tr>
<td>July 1998</td>
<td>1228</td>
<td>$7,262</td>
<td>Eleven of the fourteen Vermont counties experienced severe damage from excessive rainfall. The torrential rains came in much the same pattern as they had in the summer of 1997, but occurred further south than the 1997 floods. The flash flooding left many homes destroyed, roads and bridges damaged, and communities cut off from the rest of the state.</td>
</tr>
<tr>
<td>July 2008</td>
<td>1790</td>
<td>$104,954</td>
<td>Severe storms and flooding caused a federal disaster to be declared in Addison, Caledonia, Essex, Lamoille, Orange, Washington, and Windsor counties on September 12, 2008. More than $104,954 in federal public assistance funds was used to repair flood damaged public infrastructure.</td>
</tr>
<tr>
<td>April/May 2011</td>
<td>1228</td>
<td>$68,985</td>
<td>Excessive rain and severe floods swept across northern Vermont, with a federal disaster declared for Addison, Chittenden, Essex, Franklin, Grand Isle, Lamoille, and Orleans counties. At the height of the storms on April 27, much of the Village of Johnson was inundated with flood waters from the Lamoille River. The Grand Union grocery chain – which served residents of Johnson, Hyde Park, Cambridge, Waterville, and Belvidere– ceased operations following the flood. As part of the recovery effort, Johnson worked extensively to recruit a new store operator. Between the Town and Village there was $91,980 of eligible damage claims submitted to FEMA, of which FEMA reimbursed 75% or $68,985. In addition, the Village had an insurance claim for damages to the wastewater treatment facility (WWTF) in the amount of $112,268. The Village implemented significant measures to mitigate damage from future flood events when replacing equipment covered by insurance.</td>
</tr>
<tr>
<td>August 2011</td>
<td>4022</td>
<td>$19,622</td>
<td>High wind and flooding associated with Tropical Storm Irene devastated southern Vermont, causing localized damage to structures and property in northern parts of the</td>
</tr>
</tbody>
</table>
state. While the impact was far less severe in Lamoille County than elsewhere in the state, Johnson experienced limited road, culvert, and power line damage from rain and high winds. The Town and Village had a combined expense of $21,802, of which FEMA paid a 90% share of $19,622. Numerous thunderstorms with heavy rain, damaging lightning and some isolated large hail and strong winds resulted in flash flooding in Lamoille, Addison and Orleans counties with radar estimated storm total rainfall of 3 to 5 inches. Johnson did not submit a claim for this event.

Heavy rainfall produced flash flooding across Lamoille and Chittenden Counties. Excessive runoff in the steep terrains washed out bridges, culverts and roads. Gradually the flash flooding transitioned to a flood event as larger rivers such as the Lamoille and Browns river responded to the increased flows. Johnson did not submit a claim for this event.

Heavy rainfall and snowmelt caused widespread minor to moderate flooding across Lamoille County, mainly along and west of Route 100. Numerous highways were flooded and there was widespread damage to gravel roadsides and many culverts failed in Johnson, Belvidere, Cambridge and Waterville. In Stowe, the recreation path sustained damage. In Johnson, a washed out culvert stranded six families in the Codding Hollow neighborhood for nearly two days until a temporary bridge could be installed. The Lamoille River in Johnson exceeded its flood stage of 13 feet and crested at 14.16 feet. Total public assistance received to repair damages was $1,844,155. Johnson received $21,000 to repair damages to Rocky Road and was approved for public assistance funding of $348,000 to repair and upgrade the culvert on Codding Hollow Road.

### 3.1.1. National Flood Insurance Program (NFIP)

Both the Town and Village of Johnson participate in the NFIP, with the Village subsumed under the Town’s Flood Hazard Ordinance. Since 1978, there have been 35 losses and a total of $321,953 in claims. As of 2015, there have been four properties identified as repetitive loss structures. All four properties are residential. Three properties are located along Route 15 (Main Street) in the Village and one property is located in Town, on Route 100C. There were 34 individual insurance policies in effect, seven in Town and 27 in the Village. The Town recognizes the importance of having NFIP available and will continue to regulate floodplain development through its floodplain zoning regulations. The floodplain zoning regulations are administered by Flood Zoning Administrator and hearings are held by the Zoning Board of Adjustments (currently designated as Johnson Planning Commission). It should be noted that NFIP does not cover some important potential losses such as utilities located in basements and has a maximum coverage limit of $500,000. That is a very limiting factor for businesses, which have to obtain supplemental insurance at very high rates. NFIP should be encouraged to review and update coverage and limits as well as the Flood Insurance Rate Maps (last updated in April 1987).
3.1.2. Major Winter Storm/Ice Storm

Hazard Definition: Severe winter storms bring the threat of heavy accumulations of snow, cold/wind chills, strong winds, power outages and property damage.

Location: Winter storms with snow, ice and freezing temperatures in various combinations are fairly commonplace in Johnson. During a snowstorm an entire community is equally at risk.

Extent: The worst winter storm that can be anticipated in Johnson would be comparable to December 2008 ice storm where much of the region was impacted by 3-4” of ice accumulation, causing widespread, multi-day power outages and obstructing roads with downed trees and power lines. These are low probability events. Alternatively, the worst snow storm that can be expected is snowfall of up to 30”, which has occurred multiple times (as shown in Table 2). While large snowfalls often disrupt business for one or more days, Vermont communities are well prepared for snow and such storms are generally less of a hazard than the aforementioned ice storms.

Two winter storms that resulted in FEMA disaster declarations since 2011 occurred in December 2013 (DR 4163) and December 2014 (DR 4207). The storms had a primary impact on utilities serving Lamoille County and caused damages estimated at $390,000 and $230,000, respectively.

Johnson is well geared to handle most winter/ice storms. Due to the region’s mountainous terrain, it is not uncommon for precipitation to range from rain in the valley area, to ice in the middle elevations, with heavy snows in the higher terrain. This poses a challenge to highway maintenance personnel. Johnson maintains snow removal equipment for all town highways, and Vermont Agency of Transportation maintains equipment for state highways. Snowfalls that are within normal snowfall limits are handled effectively; however, during heavy snowfall for extended periods of time, removal of snow becomes problematic. Historically, these events are not frequent and are short in duration. During such events, radio communications is maintained between highway crews and town emergency responders. Local construction equipment in the community has been used during past emergencies to augment community resources. Most residents are accessible during severe weather conditions, although access may be delayed. In the event of a winter emergency, the Highway Department will assist fire and ambulance crews by making private roads passable.

Table 2: Johnson Severe Winter Storm Hazard History 1978-2016

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Extent in Lamoille Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 9-11, 2014</td>
<td>Severe winter storm</td>
<td>6’-18” of snowfall</td>
</tr>
<tr>
<td>Dec 20-23, 2013</td>
<td>Severe winter storm</td>
<td>6-18” of snowfall</td>
</tr>
<tr>
<td>Feb 24-25, 2012</td>
<td>Severe winter storm</td>
<td>13-30+” of snowfall</td>
</tr>
<tr>
<td>March 6, 2011</td>
<td>Severe winter storm</td>
<td>18-30” of snowfall</td>
</tr>
<tr>
<td>Feb. 23, 2010</td>
<td>Severe winter storm</td>
<td>Up to 20” of snowfall</td>
</tr>
<tr>
<td>Dec. 12-13, 2008</td>
<td>Ice/freezing rain storm</td>
<td>Ice accumulations of 3-4”</td>
</tr>
<tr>
<td>February 14, 2007</td>
<td>Severe winter storm</td>
<td>Up to 48” of snowfall</td>
</tr>
<tr>
<td>Oct. 25, 2005</td>
<td>Severe winter storm</td>
<td>Up to 14” of snowfall</td>
</tr>
<tr>
<td>Feb. 10, 2005</td>
<td>Severe winter storm</td>
<td>10-20” of snowfall</td>
</tr>
<tr>
<td>Jan. 4, 2003</td>
<td>Severe winter storm</td>
<td>Up to 20” of snowfall</td>
</tr>
<tr>
<td>April 9, 2000</td>
<td>Severe winter storm</td>
<td>13-25” of snowfall</td>
</tr>
<tr>
<td>Jan 6, 1998</td>
<td>Ice/freezing rain storm</td>
<td>Up to 0.5” of icing between 1500’-2500’ elevations</td>
</tr>
</tbody>
</table>
### 3.1.3. Severe Wind Storms: Thunderstorms, hurricanes and tropical storms

**Hazard Definition:** Severe thunderstorms, hurricanes and tropical storms are compound hazards that are capable of producing precipitation, high winds, flooding, and fluvial erosion. Thunderstorm winds are generally short in duration, involving winds or gusts in excess of 50 mph. A tropical storm has a maximum sustained wind speed of 39–73 mph. A hurricane is a tropical cyclone with sustained winds that have reached speed of 74 mph or higher.

**Location:** Thunderstorms and associated hazards can affect the entire community however, parts of community most at risk have been the ones located in the floodplain and along river corridors. These areas are shown on the attached Flood Hazard Map. In the Village, most of the past damages occurred to properties along Main and Railroad Streets and impacted homes, municipal waste water plant, municipal library and the post office shopping plaza. In Town, primary impacts have been to town roads located along Lamoille and Gihon Rivers and associated culverts and bridges.

**Extent:** The worst windstorm that can be anticipated in Johnson would be comparable to that of the September 1938 hurricane, which caused widespread property damage throughout the state (reaching a force of 12 on the Beaufort Wind Scale, with estimated winds of 74 mph).

#### Table 3: Johnson Wind Storm Hazard History 1938-2016

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Extent in Lamoille County</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 28, 2016</td>
<td>Thunderstorm wind</td>
<td>Wind gusts up to 58 mph</td>
</tr>
<tr>
<td>July 19, 2013</td>
<td>Thunderstorm wind</td>
<td>Wind gust up to 63 mph</td>
</tr>
<tr>
<td>Dec 21, 2012</td>
<td>High wind event</td>
<td>Wind gusts up to 70 mph</td>
</tr>
<tr>
<td>Oct 29, 2012</td>
<td>High wind event</td>
<td>Wind gusts up to 55 mph</td>
</tr>
<tr>
<td>Aug. 8, 2011</td>
<td>Tropical Storm Irene</td>
<td>Sustained winds of 30-45 mph</td>
</tr>
<tr>
<td>April 16, 2011</td>
<td>High wind event</td>
<td>Wind gusts up to 60 mph</td>
</tr>
<tr>
<td>Dec. 1, 2010</td>
<td>High wind event</td>
<td>Wind gusts up to 90 mph</td>
</tr>
<tr>
<td>Sept. 19, 2003</td>
<td>High wind event</td>
<td>Wind gusts up to 55 mph</td>
</tr>
<tr>
<td>Sept. 16, 1999</td>
<td>Tropical Storm Floyd</td>
<td>Wind gusts up to 60 mph</td>
</tr>
<tr>
<td>Jan 27, 1996</td>
<td>High wind event</td>
<td>Wind gusts of 30-50 mph</td>
</tr>
<tr>
<td>Sept. 1938</td>
<td>Hurricane</td>
<td>74 mph</td>
</tr>
</tbody>
</table>

Source: National Centers for Environmental Information

### 3.2. Low Natural Hazards

#### 3.2.1. Landslides

**Hazard Definition:** The term "landslide" describes a wide variety of processes that result in the downward and outward movement of slope-forming materials including rock, soil, artificial fill, or a combination of these.
The risk of a landslide is most often associated with flooding, erosion, and other impacts of heavy rain. Roads located in ravines adjacent to steep slopes are particularly vulnerable to landslides. Such locations include portions of Plot Road, Wilson Rd, River Rd East and Hogback Road, as well as Route 100c near the intersection of Route 15. The latter location poses an additional hazard due to the high traffic volume and numerous structures nearby, including critical facilities. This is a low probability and low impact hazard.

3.2.2. Drought
Hazard Definition: Drought is defined as a water shortage with reference to a specified need for water in a conceptual supply and demand relationship. It is a complex phenomenon that is difficult to monitor and assess because it develops slowly and covers extensive areas, as opposed to other disasters that have rapid onsets and obvious destruction.

Droughts represent a hazard in late summer, when local spring and well levels are reduced to minimal flows. The Village owned water system has in the past provided water to residents not on the water system and residents have also obtained water from Johnson Cold Spring. Drought poses low risk to the entire community and is low probability.

3.2.3. Wild/Forest Fire
Hazard Definition: A wildfire is the uncontrolled burning of woodlands, brush, or grasslands.

Across much of Vermont, small wild land and brush fires are common, but the probability of major forest fire is very low. Every town in Vermont has a designated Forest Fire Warden, who receives daily updates from the Division of Forestry during periods of elevated risk. The risk of wildfires is most severe in outlying areas of development—away from the town’s major highways—where structures are surrounded by ignitable hard and softwood forests. The threat of extensive wild land fires is low. In 2010-11, LCPC developed a CommunityWildfire Protection Plan (CWPP) for the towns of Johnson and Hyde Park. This is a low probability and low impact hazard.

3.2.4. Hail Storm
Hazard Definition: Hail is a form of precipitation composed of spherical lumps of ice. Known as hailstones, these ice balls typically range from 5–50 mm in diameter on average, with much larger hailstones forming in severe thunderstorms.

With Vermont’s variable weather patterns, hail is a four-season threat to both public and private property. Smaller storms may damage homes and automobiles. This is a low probability and low impact hazard.

3.2.5. Earthquakes
Hazard Definition: An earthquake occurs when two blocks of the Earth suddenly slip past one another.

According to the U.S. Geological Survey (USGS), the risk of earthquakes in Vermont and much of northern New England is rated moderate, compared with the high risk attributed to much of the West Coast and lower-Midwest. Lamoille County has not experienced any property damage or loss of life attributed to an earthquake in its history. This is a low probability and low impact hazard.

3.2.6. Tornados
Hazard Definition: A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more.

Tornados, while uncommon in New England, can occur and endanger life and property virtually anywhere, at any time. According to NCDC, there have been only two tornado incidents in Lamoille County since 1960. The most recent touched down in Cambridge in 2008 and was measured between an EF0 and EF1 on the Enhanced Fujita Scale – which characterizes tornado wind speeds and degree of expected damage. This is a low probability and low impact hazard.

3.2.7. Extreme Temperatures
Hazard Definition: Extreme Temperatures can include both unusually hot and cold events. The definition of “extreme” in this instance is based on the local climate. In Vermont, a heat wave is defined as a period of three or more consecutive days during which the diurnal maximum temperature meets or exceeds 90°F. Extended periods of cold during winters are likely to occur. One of the most prolonged cold episodes lasted from January 18 to February 3, 1969. The temperature remained below 0°F consistently and water mains around the state burst in record numbers. Other instances include February 1993 and January 1997, both of which were caused by Arctic high-pressure systems.

3.3. Major Technological Hazards

3.3.1 Dam Failure
Green River Dam in nearby Hyde Park—located approximately 4.3 miles above the confluence with the Lamoille River—poses a low risk with medium impacts. The Green River Dam is owned and operated by Morrisville Water and Light and has been utilized as a water storage project since its construction in 1947. Hydroelectric generating facilities have been installed at the site and are now in operation.

An Emergency Action Plan for the Green River Dam was developed in 2001 and is being updated at the time of writing this plan. The Green River Dam plan is housed at the Morrisville Water and Light Department and LCPC offices. The plan was developed to minimize loss of life and property along the Green and Lamoille Rivers in the downstream communities that would potentially be affected by a dam failure or flooding, including Garfield, Morrisville, Cady’s Falls, Hyde Park, and Ithiel Falls. The plan provides procedures to notify emergency response entities in the event of a dam failure. In collaboration with Morrisville Water and Light, LEPC 11 developed a discussion-based exercise designed to test emergency response and notification plans associated with a potential breach of the dam. An exercise was conducted in 2012 to test the plan’s effectiveness. Johnson would receive adequate notice if the Dam is ever breached.

The worst dam failure event that can be estimated would be a complete breach of the Green River Reservoir Dam, which would inundate properties in low-lying areas adjacent to the Lamoille River and VT Route 15. However, the number of acres or homes impacted would vary greatly depending on the height of water behind the dam at the time of breach, as well as the height of rivers downstream. Further, the dam has never breached; there is no publically available data to quantify extent for such an incident.

In Johnson, the Lower Pond at Johnson State College (JSC) is classified as a dam on JSC’s Inundation Map. According to the map, if the dam is ever breached the waters will raise the height of the Gihon
River by 1.9 feet and the impacted areas would include School Street, lower Clay Hill Road, Crab Tree Lane, MacMudgett Drive and McLelland Hall at Johnson State College. In discussions with the Town Administrator, it was determined that the probability of the Lower Pond’s breach is minimal. In the worst case scenario, an incremental release of the pond waters could occur in which case the water would empty out very slowly due to the large land mass between the edge of the pond and the embankment. The impact of this slow release on the community would be minimal.

3.3.2. Major Highway Accidents
Johnson is transected by two major State highways: VT Routes 15 and 100c. Both serve as major inter-regional trucking and transportation corridors. The volume and type of traffic on the state highway network, creates potentially dangerous intersections with local roadways. The Vermont Agency of Transportation identifies six high crash locations in Johnson; two are located along Route 15 and another four along Route 100c. Sixty-seven accidents occurred at these locations between 2008 and 2012. The high crash locations are depicted at the Transportation Concerns Map.

The Agency of Transportation also keeps a database of bridges and their “federal sufficiency rating.” In Johnson, one out of 15 bridges was identified as having the federal sufficiency rating of less than 50 (out of 100). This bridge, located on 100c near Sinclair Road, is shown on the Transportation Concerns Map and is scheduled for reconstruction in 2017.

In the last decade, through a combined Town and State leadership, three bridges in Johnson Village (Main St, Railroad St and Pearl St) and one bridge in the Town (crossing Foote Brook on Route 15 W) were replaced.

There is no data or precedent to substantiate what is the worst anticipated major highway accident for Lamoille County. We consider the probability low and potential impact medium.

3.3.3. Major Structure Fire
According to data from the 2010 Census and Vermont Center for Geographic Information, there are 1,345 housing units and approximately 81 commercial buildings within the town. Housing units are typically built on multi-acre lots; however, homes in the village are much more densely sited. The risk of large scale structure fires is low in Johnson. The most significant risks involve residences and businesses, particularly in the village where buildings are fairly close together. A structure fire at the Johnson Woolen Mill represents a significant risk for two reasons. First is the age and wood frame construction of the old mill buildings and second is the presence of wool in the buildings. Under the right circumstances, burning wool can produce arsenic gas which is highly toxic. A major structure fire at the mill could require evacuation of portions of the village. This danger is well known to the Fire Department and contingency plans have been developed to deal with this risk in the event of fire. The college has also been identified as having significant risk due to its large population in dormitory buildings and issues associated with response to large populations. The probability of a major structure fire is low and the impact is medium. It should be noted that Johnson has a highly trained fire department, first class equipment and excellent mutual aid with other area departments.

There was one major structure fire in Johnson in 2004 that completely destroyed the Johnson Fire Station building. The Fire Station was rebuilt in 2005. Within the past four years, were also three smaller structure fires which included a business and a neighboring residential building on Stearns Street, a
resident property on Railroad Street and the Church Studios building on Main Street, all in Johnson Village.

3.4. Low Technological Hazards

3.4.1. Hazardous Materials (HAZMAT) spill

In Vermont, businesses and facilities storing hazardous materials are required to file a Tier II report with DEMHS and their Local Emergency Planning Committee (LEPC), detailing the volume and type of substance. LEPCs receive funds from DEMHS to carry out planning and preparedness activities, such as commodity flow studies to track the transport of hazardous substances and outreach to non-reporting HAZMAT storage sites.

The inventory maintained by LEPC 11 identifies 9 Tier II sites in Johnson. A Tier II site is defined by federal law under the Emergency Planning & Community Right to Know Act (EPCRA) and is generally any facility which uses or possesses reportable quantities of chemicals requiring material safety data sheets by VOSHA, known human carcinogens, extremely hazardous substances, explosives which require licensing or certain threshold quantities of petroleum products.

In Johnson, 303 structures are within 1000 feet of a Tier II site. The estimated potential loss for damage to these properties was calculated by using available data, in this case the median housing value estimated by the 2015 American Community Survey and assuming total loss of the structure. The estimated potential loss for all properties, using the residential housing value, within 1000 feet of a Tier II is $46,131,750. The estimated potential loss for the 425 properties within 500 feet of a major roadway is $64,706,250.

Hazardous waste sites have the potential to contaminate and pollute water systems and other ecosystems, as well as threaten human health. The Vermont Agency of Natural Resources maintains a web-based atlas, which includes data about hazardous materials. According to the State Waste Management Interactive database, between 2009 and 2014 thirteen incidents were reported involving hazardous materials spills in Johnson, as shown in Table 4. These spills mostly involved very limited quantities of oil or other petroleum products.

Table 4. Johnson hazardous waste spill sites (2009-2014)

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Facility Name</th>
<th>Mailing Address</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>VTR000521211</td>
<td>FRED'S PLUMBING &amp; HEATING JOHNSON SHOP</td>
<td>FRED'S PLUMBING &amp; HEATING</td>
<td>3725 VT RTE 100C</td>
</tr>
<tr>
<td>VTR000011874</td>
<td>JOHNSON STATE COLLEGE</td>
<td>JOHNSON STATE COLLEGE</td>
<td>337 COLLEGE HILL RD</td>
</tr>
<tr>
<td>VTR000513051</td>
<td>JOHNSON TOWN/VILLAGE PUBLIC WORKS</td>
<td>TOWN/VILLAGE OF JOHNSON</td>
<td>635 RAILROAD ST</td>
</tr>
<tr>
<td>VTR000512236</td>
<td>JOHNSON TRANSFER STA</td>
<td>LAMOILLE REGIONAL SWD</td>
<td>WILSON RD</td>
</tr>
<tr>
<td>VTR000506873</td>
<td>KATY-WIN MOBILE HOME PARK</td>
<td>KATY-WIN MOBILE HOME PARK</td>
<td>KATY-WIN RD</td>
</tr>
<tr>
<td>VTR000007690</td>
<td>LAMOILLE AMBULANCE SERVICE INC</td>
<td>LAMOILLE AMBULANCE SERVICE INC</td>
<td>RAILROAD ST</td>
</tr>
</tbody>
</table>
3.4.1.1. Critical Facilities and other vulnerable sites

The Critical Facilities Map depicts Johnson’s critical facilities and sites vulnerable to natural hazards. The critical facilities are: Municipal offices (shared by Town and Village), Emergency Operations Center, Fire Department, Elementary School. A HAZMAT accident could disrupt functions of all these facilities.

Vulnerable sites include:

- Village of Johnson (due to risk of flooding)
- Wastewater Treatment Facility (due to risk of flooding)
- Village and VEC substations (risk of oil spills; the village substations have oil containment)
- Intersection of Rt. 15 and Rt. 100c (risk of hazardous spills)
- Johnson State College TIER II sites
- Brosseau Fuels Route 15 West
- Fred’s propane and Heating Fuel on Rte. 100C
- Ambulance House
- Low lying areas in and around the floodplain

High Risk populations include:

- Nazarene Church Day Care
- Johnson State College
- Laraway Youth and Family Center
- Mobile Home Parks: Katy Winn and Highland Heights
- St. John’s Knoll - Elderly Housing
- Johnson Elementary School
- Lamoille Mental Health Residential Care
- Johnson Community Housing Project School Street Elderly units
- Johnson Water and Light electric “lifeline” customers
- Turtles and Tots Daycare

4.1. Johnson Town and Village Mitigation Strategy and Goals

4.2. Integration of the mitigation plan into other planning mechanisms
For this hazard mitigation plan to be effective, it cannot stand on its own. A comprehensive Town and Village Municipal Development Plan was adopted in 2016 and will be in effect for eight years. Implementation recommendations from the Flood Resilience Element of the Municipal Development Plan were reviewed during the preparation of this hazard mitigation plan and incorporated into the list of mitigation actions as deemed appropriate.

Mitigation actions identified in this plan will be reviewed during the next update of the Municipal Development Plan. Additionally, the list of actions will be made available to state agencies for their incorporation into statewide plans including the Tactical Basin Plan for Lamoille River watershed of the VT Agency of Natural Resources, and the List of Priority Infrastructure Projects developed annually by the VT Agency of Transportation.

Johnson’s staffing capacity is limited in terms of some technical capabilities, and works closely with LCPC to accomplish certain hazard planning and mitigation actions including: geomorphic assessments, flood modeling, infrastructure improvements, and Hazard Mitigation Grant Program applications and projects. Johnson does maintain and support other planning and preparedness mechanisms such as: funding for the fire and rescue squads; sustain positions of Emergency Management Director, Deputy Director and Coordinator; periodic review and update of bylaws and ordinances, including current Flood Resiliency efforts; capital planning and budgeting to improve infrastructure; annual LEOP updates.

Vermont’s Division of Emergency Management & Homeland Security encourages a collaborative approach to achieving mitigation at the local level through partnerships with Vermont Agency of Natural Resources, VTrans, Vermont Agency of Commerce and Community Development, Regional Planning Commissions, FEMA Region 1, and others. That said, these agencies and organizations can work together to provide assistance and resources to towns interested in pursuing hazard mitigation projects. Local officials and property owners can always contact the State Hazard Mitigation Officer with questions, technical assistance, or to find out about grant opportunities.

4.3. Continued Public Involvement
There are three principal avenues for continued public participation during the maintenance of this plan:
- Community involvement through the local and regional planning process relating to updating existing planning mechanisms;
- Participation at the regular LEPC 11 meetings (LEPC 11 meetings are typically attended by a variety of parties: first responders, municipal officials, non-profit health care agencies, disaster assistance groups, communications industry officials and Tier II HAZMAT operators); and,
- Posting of the LHMP on the Johnson and LCPC websites for public comment.

The general public will be notified of review and update efforts over the next five years through press releases to local newspapers, announcements by local radio stations, updates to the Johnson and LCPC websites and postings on Front Porch Forum and the Friends of Johnson electronic newsletter. Additionally, LCPC will reach out to other regional stakeholders, including the Lamoille Mutual Aid Association and Lamoille County Sheriff’s Department, to ensure mitigation planning efforts align with the county’s public safety interests.

4.4. Community Preparedness Activities
The following is a list of ongoing or recently completed mitigation programs, projects or activities in Johnson. In parentheses, “T” or “V” indicate which jurisdiction, town or village benefit from these activities.
1. **Land Insurance**

- Adopt and maintain a Local Emergency Operations Plan (LEOP). **Completed. The town adopted a LEOP in 2016, which it will update annually after Town Meeting.** (T,V)
- Maintain an evacuation plan for village and critical facilities and a process for notifying community. **Ongoing.** (T,V)
- Emergency Response and Management Staff attending professional emergency and mitigation training sessions. **In Progress. Johnson representatives participate in workshops organized by LEPC, Vermont Emergency Management and the Johnson Fire Department.** (T,V)
- Regularly scheduled maintenance programs (culvert survey and replacement, ditching along roadways, cutting vegetation to allow visibility at intersections). **In Progress. Maintenance priorities are dictated by local needs and budget considerations.** (T)
- Participation at Local Emergency Planning Committee meetings and activities. **In Progress. Johnson has been represented at recent LEPC meetings and activities.** (T,V)

**Financial and Tax Incentives**

- Annual investment of local tax dollars in highway mitigation projects. **Ongoing. The Town budgets road, bridge, and culvert investments in the annual highway budget.** (T)
- Use of State and Federal funding for mitigation projects and activities. **In Progress. Since the previous LHMP update, Johnson received an implemented grant from the Vermont Agency of Natural Resources (ANR) Vermont Better Roads Program for drainage and erosion control on River Rd East, Gould Hill Rd., Foote Brook Rd., and at the intersection of Railroad St and French Hill Rd. In 2016, with funds from FEMA, State of VT and its own matching funds, the Town implemented a project to replace a culvert on Coddie Hollow Road damaged by a severe storm in 2014. The Vermont Agency of Transportation (AOT) also provides competitive grants for the replacement of deficient and under-sized drainage structures.** (T)
- The Village of Johnson has a revolving loan fund that provides low interest loans for building improvements. **Under consideration is a proposal from a member of the Village Trustee Board to offer loans to projects that improve flood resiliency of structures located in floodplains.** (V)

**Hazard Control and Protective Works**

- Develop a Highway Maintenance Program (culvert survey & replacement, ditching along roadways, infrastructure repairs to mitigate river/road conflicts, cutting vegetation to allow visibility at intersections). **A Culvert Inventory and Erosion Hazard Assessment was completed in 2014 with assistance from LCPC. Additional new requirements will be imposed under new water quality general permits beginning in 2017-18. Maintenance priorities are dictated by local needs and budget considerations.** (T)

**Insurance Programs**

- Participation in NFIP. **Completed. The Town and Village of Johnson are enrolled in NFIP and are in good standing with the program.** (T,V)
- Adopt the revised 2013 Vermont Agency of Transportation recommended Codes and Standards for town highways. **Completed. The Codes and Standards were adopted on March 21st, 2016.** (T)

**Land Use Planning/Management**

- Flood Hazard Ordinance adopted March 3, 1998. **Under review for updates.** (T,V)
- Under consideration by Johnson Planning Commission is a proposed Form Based Code for downtown Johnson. (V)
Protection/Retrofit of Infrastructure and Critical Facilities

- Mapping of Critical and Essential Facilities (LCPC). In Progress. LCPC completed an update of its database of critical facilities in Lamoille County in 2015. The Agency of Natural Resources will map water supply and waste water facilities. (T,V)

Public Awareness, Training & Education

- Hazard Identification and Mapping. In Progress. Since the first plan iteration, the disaster/declaration and response process has informed Town operations and the general public concerning the need for infrastructure and systems evaluation, monitoring and documentation especially as related to floods, winter storms, and power outages. This process will continue as public discussion, input and funding options for hazard mitigation projects are brought forward to the Selectboard. Additionally, all local and regional partners will use disaster events as a trigger to evaluate and improve the efficacy of this plan and necessary mitigation efforts. (T,V)
- NFIP, flood hazard and flood protection outreach through LCPC. Ongoing. LCPC is available to work with the Johnson Planning Commission on flood hazard outreach during the plan cycle. In May 2016, the LCPC organized a workshop presenting techniques for floodproofing of buildings. The Town and Village will also make FEMA pamphlets available, free of charge, to residents seeking added resources for flood preparation. The LCPC will bulk request pamphlets and pass out to towns. (T,V)

Public Protection

- Survey and execute emergency shelter agreements with the American Red Cross. Completed. Johnson has Red Cross-certified emergency shelters at the elementary school and Johnson State College gymnasium. (T,V)
- Work with local and regional providers to develop an informational database on special needs populations and elderly residents. In Progress. In 2009 a partnership of health, human services and emergency response agencies and organizations developed a notification card to be used by special populations. This self-reporting card was distributed to the public and returned to the Lamoille County United Way. Locations of self-reporting persons have been mapped, and the maps and information are stored at dispatch locations and shared with responders on an as-needed basis. Lamoille County’s program has become a model for a statewide effort in Vermont. (T,V)

Science and Technology

- Stream Geomorphic Assessments to identify flood and erosion hazards. In Progress. Four rivers corridors in town and village have undergone various stages of assessment since the previous LHMPs adoption. Generally, assessments are classified as Phase 1 and Phase 2. Assessments conducted under LCPC’s PDM-C scope of work are classified as either Phase 1 or Phase 2. A Phase 1 assessment consists of a remote analysis, identifying potential sites and issues that would benefit from further field study. Accordingly, Phase 2 includes field assessments of issues identified through the Phase 1 process, or other field observation. (T,V)
  - Gihon River – Phase 1, Phase 2 and River Corridor Management Plan was completed. A Fluvial Erosion Hazard (FEH) Risk Assessment and Map was developed for the Gihon.
  - Lamoille River Main stem, HUC 1 (includes parts of Johnson and points west) – Phase 1 fieldwork and report are completed. (T,V)
• Lamoille River Main stem HUC 2 (includes parts of Johnson and points east) – Phase 1 and Phase 2 fieldwork and report are completed. A river corridor management plan was also completed. (T,V)
• Foote Brook – Phase 1 and Phase 2 fieldwork and report are completed. (T)
• Judevine Brook – Phase 1 fieldwork completed. (T)
• Fluvial Geomorphic and Erosion Hazard Assessment to evaluate erosion potential in Johnson. In Progress. A Fluvial Erosion Hazard (FEH) Risk Assessment and Map was developed for the Gibon. The RPC conducted an initial outreach workshop on the FEH corridor and discussed potential projects in May 2010. The RPC met with the Conservation Commission to discuss FEH corridors in September 2011. The RPC will continue to be actively involved in project identification and municipal outreach during this next planning cycle. (T,V)

Overall, the Town’s and the Village’s capabilities to address vulnerabilities and hazards are considered adequate in relation to the size of the community and the available financial resources. Added demands to improve emergency response and hazard mitigation would necessitate a need for more staffing and financial resources which, for small communities with a modest tax base, is a significant challenge. Due to the lack of staffing and financial resources. At this time the ability to expand or improve on preparedness or mitigation capabilities does not exist within the Village or the Town of Johnson.

4.4 Johnson’s Hazard Mitigation Goals, Projects and Activities

Johnson’s overarching hazard mitigation goal is to reduce/avoid long-term vulnerabilities to major hazards identified in this plan. Johnson’s hazard mitigation priorities have not changed and remain focused on flooding, fluvial erosion, ice jams, major winter storms and ice storms, and severe wind storms - Johnson’s predominant natural hazards.

Since the completion of the last hazard mitigation plan in 2015, Johnson completed three mitigation actions from the 2015 plan.

1. Johnson State Collee purchased an emergency generator for the emergency shelter at Johnson State College.
2. Town hired Dubois and King Engineers to evaluate mitigation alternative for the Scribner Bridge covered area.
3. Village implemented floodproofing measures to protect the Village wastewater plant from hazardous weather events.

The remaining actions from the 2015 plan were reassessed as preparedness actions of an ongoing nature and were incorporated into the preparedness section of this plan (section 4.3). These actions are:

1. Implement Highway Maintenance Program and annually review the Johnson Culvert Inventory to assess existing infrastructure
2. Continue next phases of Fluvial Geomorphic and Erosion Hazard Assessments
3. Develop an evacuation plan for village and critical facilities and a process for notifying community of process.
4. Educate residents about disaster preparedness, such as having a home fire emergency plan, keeping bottled water / batteries in the home, and proper roof maintenance during winter. Utilize FEMA homeowner outreach and education materials, which are available free of charge. Distribute at town functions.
5. Support applications for property acquisitions and elevations
In addition to the actions from the 2015 plan, the following additional actions were completed:

1. LCPC developed a coarse level model of flood levels along the mainstream of the Lamoille River. In partnership with Town, LCPC refined the model with surveyed data in the area of Johnson’s Railroad Street and the Johnson waste water treatment facility to be used in future evaluation of mitigation alternatives.

2. With Town’s and LCPC’s assistance, Johnson Public Library obtained elevation certificate.

New mitigation actions for the 2017-2022 period are detailed below. Actions are aimed at addressing the following significant hazards: flooding, flash floods, fluvial erosion, ice jams and severe wind events accompanied by rain. The Town and the Village considered the need to mitigate winter storm and ice storm hazard, and determined that the continued focus of the Town Highway Department and the Village Public Works Department will be on managing the storms as they happen.

Ultimately, hazard mitigation priorities are determined by Johnson’s ability to finance and implement these activities with the Town and Village’s existing tax base. The mitigation activities will be completed as funding, time, and public support will allow. The list of mitigation actions is in Table 5 below. The actions, as prioritized, are in Appendix B. The method for prioritizing the actions is the same in this plan as it was in the 2015 plan.

Table 5: Johnson Town and Village Mitigation Actions

<table>
<thead>
<tr>
<th>Mitigation Action</th>
<th>Hazard</th>
<th>Responsible Party(ies)</th>
<th>Funding Sources</th>
<th>Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Johnson</td>
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<tr>
<td>Relocate public library heating and electrical systems from the basement to the first floor or higher.</td>
<td>Flooding, Severe Wind Storms</td>
<td>Town Administrator, Public Library Board, LCPC</td>
<td>Town</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Implement the armored low water crossing recommended by 2013 Dubois and King Flood Mitigation Study developed for the Scribner Covered Bridge over Gihon River.</td>
<td>Flooding, Fluvial Erosion, Ice Jams, Severe Wind Storms</td>
<td>Town Administrator, LCPC</td>
<td>State and Federal Grants, Town</td>
<td>High – Very High</td>
</tr>
<tr>
<td>Request from ANR the ground-truthing of river corridor areas in places where such ground-truthing has not been done.</td>
<td>Flooding, fluvial erosion</td>
<td>Johnson Planning Commission; VT Agency of Natural Resources River Management</td>
<td>State and Federal Grants</td>
<td>Low</td>
</tr>
<tr>
<td>Mitigation Action</td>
<td>Hazard</td>
<td>Responsible Party(ies)</td>
<td>Funding Sources</td>
<td>Cost*</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
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<td>---------</td>
</tr>
<tr>
<td>Upon request from the Town, review the Town and Village Flood Hazard Regulations to ensure that they meet minimum NFIP requirements.</td>
<td>Flooding</td>
<td>LCPC, LEPC 11</td>
<td>Emergency management or hazard mitigation planning grants</td>
<td>Low</td>
</tr>
<tr>
<td>Implement, where feasible, restoration projects identified in the River Corridor Management Plans.</td>
<td>Flooding, Fluvial Erosion, Ice Jams, Severe Wind Storms</td>
<td>Johnson Conservation Commission; Lamoille Co. Conservation District; VT River Conservancy; VT Land Trust</td>
<td>VT River Conservancy; VT Land Trust; Ecosystem Restoration Grants; Vermont Better Roads; FEMA</td>
<td>Low-High</td>
</tr>
<tr>
<td>Replace two side by side culverts on French Hill Road.</td>
<td>Flooding, fluvial erosion, Severe wind storms</td>
<td>Selectboard, Town of Johnson Highway Department</td>
<td>FEMA or VTrans grant, Vermont Better Roads</td>
<td>High</td>
</tr>
<tr>
<td>Upgrade minimum culvert sizes to Town Highway Road and Bridge Standards to lessen flood damage as identified in the Culvert Inventory</td>
<td>Flooding; fluvial erosion, Severe wind storms</td>
<td>Selectboard, Town of Johnson Highway Department</td>
<td>LCPC Transportation Planning Initiative; Town budget</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Upgrade undersized bridges located on the State transportation network and on Town Roads</td>
<td>Flooding; fluvial erosion, Ice Jams, Severe wind storms</td>
<td>VTrans, Selectboard, Town of Johnson Highway Department</td>
<td>VT Agency of Transportation; LCPC Transportation Planning Initiative; Town budget</td>
<td>Low-High</td>
</tr>
<tr>
<td>Upgrade existing stormwater management systems as per new general stormwater requirements.</td>
<td>Flooding, Fluvial Erosion Severe wind storms</td>
<td>Selectboard, Town of Johnson Highway Department</td>
<td>Watershed management, Emergency management or hazard mitigation grants</td>
<td>Medium – Very High</td>
</tr>
<tr>
<td>Village of Johnson</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Update borrowing guidelines for Village Revolving Loan Fund to enable borrowing for projects that improve structures’ flood resiliency.</td>
<td>Flooding, Severe Wind Storms, Ice Jams</td>
<td>Village Trustee Board</td>
<td>Village of Johnson</td>
<td>Low</td>
</tr>
<tr>
<td>Implement back-up transmission service to avoid long-term electric outages.</td>
<td>Flooding, Fluvial Erosion Severe wind storms</td>
<td>Village Trustee Board</td>
<td>Village of Johnson Electric Department</td>
<td>Very High</td>
</tr>
<tr>
<td>Upgrade existing stormwater management systems as per new general stormwater requirements.</td>
<td>Flooding, Fluvial Erosion Severe wind storms</td>
<td>Village Trustee Board</td>
<td>Watershed management, Emergency management or hazard mitigation planning grants</td>
<td>High – Very High</td>
</tr>
</tbody>
</table>

*Cost is evaluated based on a scale of “Low” (0 - $5,000), “Medium” ($5,001 - $15,000), “High” ($15,001 - $50,000) or “Very High” (More than $50,000)
Appendix A. Johnson Supplemental Data and Maps
Flood Hazard Map; Critical Facilities Map; Transportation Concerns Map

Appendix B. Action Evaluation and Prioritization Matrix
Resolution

Approving the Johnson Local Hazard Mitigation Plan

The Selectboard of the Town of Johnson find that:

A) The adoption of a multi-hazard plan is required as a condition for communities to remain eligible for future Federal Emergency Management Agency (FEMA) mitigation grant funds.

B) The Town of Johnson has prepared the Johnson Local Hazard Mitigation Plan in order to meet FEMA's funding requirement, a copy of which is attached as Exhibit A and incorporated herein by reference.

C) The Selectboard has reviewed and considered the Johnson Local Hazard Mitigation Plan.

D) The mitigation strategies and actions identified in the plan will be implemented only when funding sources have been identified and projects have been prioritized as outlined in the Plan.

NOW THEREFORE,

BE IT RESOLVED BY THE SELECTBOARD OF THE TOWN OF JOHNSON, A MUNICIPALITY OF THE STATE OF VERMONT, AS FOLLOWS:

Section 1. Based on the above findings, which are hereby adopted, the Johnson Local Hazard Mitigation Plan attached as Exhibit A is approved as the official Comprehensive Local Hazard Mitigation Plan for the Town of Johnson.

Section 2. This resolution shall become effective immediately upon adoption.

The foregoing Resolution is hereby adopted this___, the day of____________________, 2017

Selectboard Chair ____________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Selectboard Member __________________________________________

Town Clerk received __________________________________________

26
Resolution

Approving the Johnson Local Hazard Mitigation Plan

The Board of Trustees of the Village of Johnson find that:

A) The adoption of a multi-hazard plan is required as a condition for communities to remain eligible for future Federal Emergency Management Agency (FEMA) mitigation grant funds.

B) Johnson has prepared the Johnson Local Hazard Mitigation Plan in order to meet FEMA's funding requirement, a copy of which is attached as Exhibit A and incorporated herein by reference.

C) The Board of Trustees have reviewed and considered the Johnson Local Hazard Mitigation Plan.

D) The mitigation strategies and actions identified in the plan will be implemented only when funding sources have been identified and projects have been prioritized as outlined in the Plan.

NOW THEREFORE,

BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE VILLAGE OF JOHNSON, A MUNICIPALITY OF THE STATE OF VERMONT, AS FOLLOWS:

Section 1. Based on the above findings, which are hereby adopted, the Johnson Local Hazard Mitigation Plan attached as Exhibit A is approved as the official Comprehensive Local Hazard Mitigation Plan for the Village of Johnson.

Section 2. This resolution shall become effective immediately upon adoption.

The foregoing Resolution is hereby adopted this____.the day of_______________, 2017

Board of Trustees Chair ______________________________

Board of Trustees Member ______________________________

Board of Trustees Member ______________________________

Board of Trustees Member ______________________________

Board of Trustees Member ______________________________

Board of Trustees Member ______________________________

Village Clerk received ______________________________
FLOOD HAZARD MAP
TOWN OF JOHNSON

For planning purposes only.
Not for regulatory interpretation.

Transverse Mercator,
VT State Plane,
Meters, NAD83.

Lamoille County
Planning Commission
PO Box 1637, 52 Portland Street
Morristown, VT 05661
802.888.4548 f 802.888.6938
www.lcpcvt.org February, 2017

Legend

- SPECIAL FLOOD HAZARD AREA
- RIVER CORRIDOR/FEH
- RIVER / STREAM
- LAKE / POND
- STATE HIGHWAY
- STATE FOREST HIGHWAY
- CLASS 2 ROAD
- CLASS 3 ROAD
- CLASS 4 ROAD
- PUBLIC ROAD / UNDERDTERMINED CLASS
- UNKNOWN / PRIVATE ROAD
- TRAIL

Data Sources:
100-Year and 500-Year Flood Zones: Digital Flood Insurance Rate Map (DFIRM), FEMA, 2000. Floodplains for planning purposes only.
River Corridor/Fluvial Erosion Hazard Areas: LCPC and VT ANR River Management, various dates. Much FEH boundary data is based on partial stream assessments and therefore is preliminary in nature.
CRITICAL FACILITIES
TOWN OF JOHNSON

Legend

CRITICAL FACILITIES
- Agriculture, Food, & Livestock
- Banking & Finance
- Education
- Emergency Response & Law Enforcement
- Energy
- Government & Military
- Health & Medical
- Information & Communication
- Transportation Facilities
- Water Supply & Treatment
- TIER II FACILITIES
- EHS FACILITIES

Data Sources:
CRITICAL FACILITIES, TIER II and EHS FACILITIES: DEMHS, 2011.

For planning purposes only.
Not for regulatory interpretation.

Transverse Mercator,
VT State Plane,
Meters, NAD83.

Lamoille County Planning Commission
PO Box 1637, 52 Portland Street
Morrisville, VT 05661
802.888.4548 f 802.888.6938
www.lcpcvt October 2014
TRANSPORTATION CONCERNS
TOWN OF JOHNSON

Legend

- BRIDGE WITH FEDERAL SUFFICIENCY RATING LESS THAN 50 (OUT OF 100)
- HIGH ACCIDENT LOCATION
- HIGH ROAD EROSION RISK
- STATE HIGHWAY
- STATE FOREST HIGHWAY
- CLASS 2 ROAD
- CLASS 3 ROAD
- CLASS 4 ROAD
- PUBLIC ROAD / UNDETERMINED CLASS
- UNKNOWN / PRIVATE ROAD
- TRAIL
- RIVER / STREAM
- LAKE / POND
- RIVER CORRIDOR FEH RATING
  - Extrem
  - Very High
  - High
  - Moderate
  - Low
  - Very Low
  - Not Rated
- SPECIAL FLOOD HAZARD AREA

Data Sources:
Flood Hazard Areas: Digital Flood Insurance Rate Map (DFIRM), FEMA, 2006. Floodplains for planning purposes only.
River Corridor/Fluvial Erosion Hazard Areas: LCPC and VT ANR River Management, various dates. Much FEH boundary data is based on partial stream assessments and therefore is preliminary in nature.
High Road Erosion Risk: Derived from 2014 statewide GIS analysis using soils, slope, and proximity to surface waters.

For planning purposes only.
Not for regulatory interpretation.

Lamoille County Planning Commission
PO Box 1637, 52 Portland Street
Morrisville, VT 05661
802.888.4548 f 802.888.6938
www.lcpcvt October 2014
## Appendix B. Action Evaluation and Prioritization Matrix

**Town and Village of Johnson**

Criteria evaluated on a scale of 1-5 with 5 being the highest score.

<table>
<thead>
<tr>
<th>Mitigation Action</th>
<th>Responds to significant (likely or high risk) hazard</th>
<th>Likelihood of funding</th>
<th>Protect threatened infra-structure</th>
<th>Implemented quickly</th>
<th>Socially / Politically acceptable</th>
<th>Technically Feasible</th>
<th>Administratively Realistic</th>
<th>Reasonable cost to benefit ratio</th>
<th>Environmentally sound</th>
<th>TOTAL SCORE</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town of Johnson</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>35</td>
</tr>
<tr>
<td>Relocate public library heating and electrical systems from the basement to the first floor or higher.</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>28</td>
<td>2019 - 2020</td>
</tr>
<tr>
<td>Implement the armored low water crossing recommended by 2013 Dubois and King Flood Mitigation Study developed for the Scribner Covered Bridge over Gihon River.</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>25</td>
<td>2022 - 2023</td>
</tr>
<tr>
<td>Request from ANR the ground-truthing of river corridor areas in places where such ground-truthing has not been done.</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>28</td>
<td>Jan 2019 - Dec 2019</td>
</tr>
<tr>
<td>Upon request from the Town, review the Town and Village Flood Hazard Regulations to ensure that they meet minimum NFIP requirements.</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>34</td>
<td>Jan 2018 - Dec 2018</td>
</tr>
<tr>
<td>Implement, where feasible, restoration projects identified in the River Corridor Management Plans.</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>29</td>
<td>2021 - 2022</td>
</tr>
<tr>
<td>Replace two side by side culverts on French Hill Road.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>42</td>
<td>2018 - 2019</td>
</tr>
<tr>
<td>Upgrade minimum culvert sizes to Town Highway Road and Bridge Standards to lessen flood damage as identified in the Culvert Inventory</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>33</td>
<td>2018 - 2019</td>
</tr>
</tbody>
</table>
### Mitigation Action

<table>
<thead>
<tr>
<th>Town of Johnson</th>
<th>Upgrade undersized bridges located on the State transportation network and on Town Roads</th>
<th>Upgrade existing stormwater management systems as per new general stormwater requirements.</th>
<th>Village of Johnson</th>
<th>Update borrowing guidelines for Village Revolving Loan Fund to enable borrowing for projects that improve structures’ flood resiliency.</th>
<th>Implement back-up transmission service to avoid long-term electric outages.</th>
<th>Upgrade existing stormwater management systems as per new general stormwater requirements.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responds to significant or High risk likelihood of funding</td>
<td>Project threatened infra-structure</td>
<td>Likelihood of funding</td>
<td>Implemented quickly</td>
<td>Socially/ Politically acceptable</td>
<td>Technically Feasible</td>
</tr>
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<td>2</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

The table above outlines various mitigation actions along with their corresponding likelihood of funding and scores for various criteria such as likelihood, funding, and feasibility. The timeline for each action is also provided.