

Town of Leicester, Vermont



Single Jurisdiction All-Hazards Mitigation Plan

Final Plan Adopted:

FEMA Approval Date:

Leicester, Vermont Single Jurisdiction All-Hazards Mitigation Plan

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1 Planning Process

1.1 Current Plan Development Process 44 CFR 201.6 (c)(1)

The Town of Leicester indicated an interest in working through the process to create an All-Hazards Mitigation Plan following an inquiry by the Addison County Regional Planning Commission in 2012. The town's interest was used in developing a background narrative to support inclusion in a FEMA Pre-Disaster Mitigation request sponsored by the Northwest Regional Planning Commission (NWRPC). Following an extensive review and contracting process ACRPC was authorized by NWRPC to begin the planning process in late 2013. The Leicester Selectboard met on 12/2/2013 and re-authorized its support for this planning process. In April of 2014 ACRPC was requested by the Northwest Regional Planning Commission, the grant administrator, to stop all work until contract wording could be clarified. As of May 2014, ACRPC was given the go ahead by DEMHS to continue the process of developing a plan.

An initial draft single jurisdiction plan was prepared by staff of the Addison County Regional Planning Commission (ACRPC) converting a previous draft annex to a regional plan into a single jurisdiction plan. The Leicester select board, in a public meeting, appointed the following residents to a Hazard Mitigation planning committee:

Diane Benware –	Selectboard Chair
Ron Fiske –	Selectboard Member
Tom Barker –	Selectboard Member, Salisbury Road Foreman
Ray Lalumiere -	Emergency Manager
Julie Delphia –	Town Clerk/Treasurer
Arlan Pidgeon -	Road Foreman
Mark Raishart –	Leicester School Board

All committee meetings were open to the public and those who attended were asked to give input. The committee met on 5/29/14 at the town office (see Annex A) to complete a Hazards Inventory and Risk Assessment matrix, review draft plan language and to identify potential mitigation projects associated with the hazards identified. Following the 5/29 meeting, edits were made to the draft plan and the draft was distributed to committee members via e-mail for review. The committee met again on 6/12/14 (see Annex A) to complete their review and brainstorming session. On 6/12/14 a copy of the draft was placed for public comment in the Town Office along with a sign in sheet for comments. The committee continued to make suggested changes via e-mail to confirm suggested revisions and corrections to the initial draft plan. An initial draft plan was submitted to staff at the Northwest Regional Planning Commission for review and suggestions on 6/30/2014.

Based on comments from the public process described below, the draft plan was further edited and forwarded to Vermont's State Hazard Mitigation Officer on 7/10/2014 for comments and preliminary approval. Comments were received and incorporated. The plan was resubmitted to DEMHS on 12/11/2014 and comments were received on 12/15/2014. Further changes were made and the plan was resubmitted to DEMHS on 1/7/2015. Preliminary approval by the SHMO was provided on 1/13/2015. Following approval by the Leicester Hazard Mitigation Committee and the Selectboard, the draft plan was provided for FEMA reviewers on XXXXX. Comments were received back from FEMA reviewers on XXXXX.

Changes were made to the draft plan based on FEMA recommendations and an updated draft was completed on XXXXX. Upon completion of this draft, the plan was further circulated to the Town Selectboard and hazard mitigation committee for approval prior to being returned to FEMA for Approval Pending Adoption (APA) status. Upon receipt of the FEMA APA on XXXXX, the resulting document was adopted by the

Leicester Selectboard on **XXXXXX**. The final adopted plan was then forwarded to FEMA Region I for confirmation. Final FEMA approval was received on _____.

1.2 Opportunities for public comment/input 44CFR 201.6(b)(1) and 44 CFR 201.6(c)(1)

Multiple opportunities for public comment were made available during the planning process:

- A plan review/update committee was appointed from volunteers by the Town Selectboard.
- The plan was made available in the town office for public comment while in draft form on 6/12/2014 and input was requested.
- Meetings of the Town Selectboard were open for public comment of the plan throughout the planning and draft phases of this plan.

1.3 Opportunities for additional comments 44CFR 201.6(b)(2)

Additional opportunities for regional and state-level comments in the draft stage were provided throughout the planning process.

- A copy of the draft plan was provided to the State Hazard Mitigation Officer Ray Doherty for comments which were received on 7/10/2014.
- A draft was made available to the State of Vermont Agency of Natural Resources staff for comment on 6/26/2014. No comments received.
- A copy of the draft plan was posted on the ACRPC website www.acrpc.org for regional review and notice was given during an ACRPC full commission meeting as to its availability. No comments.
- An updated copy was provided to Misha Bailey of DEMHS for SHMO review on 12/4/2014. Comments were received on 12/8/2014.
- The December ACRPC newsletter included an announcement that a draft plan was available for public review and comment. That draft was posted in the ACRPC office on 12/11/2014. No comments.
- The bordering towns of Whiting, Salisbury, Goshen and Brandon were notified of the posting of the draft plan on 12/31/2013 and comments were requested. No comments received.
- A further updated copy was sent to Ray Doherty for further review on 1/7/2015. Comments were received on 1/13/2015
- FEMA Region 1 staff received a draft for comment on **XXXXXX**

1.4 Extent of review 44 CFR 201.6(b)(3)

Throughout the planning process all sections of an earlier regional plan were reviewed for accuracy. Recently completed studies and newly developed data were included in the document. Information from the following documents and sources were incorporated into this plan either as data or to inform the committee's prioritization process:

- 2014 Local Emergency Operations Plan (previously identified high hazard and vulnerable sites)
- 2012 Leicester Town Plan (support for the committee's prioritization process and section 2 narrative)
- 2011 Addison County Regional Plan (transportation section used to identify high accident locations)
- 2013 State of VT Hazard Mitigation Plan (provided a listing of statewide hazard concerns)
- 2012 Report of the State Fire Marshall (provided data to inform structure and wild fire risks)
- www.fema.gov (provided official data on declared disasters)
- The Vermont Weather Book by David Ludlum (provided historic accounts of disasters for Section 4.3)
- National Climatic Data Center website (provided information for Section 4.3)
- FEMA Snow Load Safety Guide (informed Section 4.3)
- FEMA FIRMS dated 11/1/1985 (incorporated into maps and section 4.3)

- VT Center for Geographic Information data layers (incorporated into map products)
- LEPC #8 Tier II reports (incorporated into Section 4.3)
- Town of Leicester Grand List for 2013 (utilized to determine value of identified properties)
- www.healthvermont.gov (incorporated arbovirus information into section 4.3)
- State of Vermont dam inventory database (incorporated into section 4.3)
- Leicester Annual Town Reports 1980-2013 (informed FEMA reimbursements in table #1)

DRAFT

2. Community Background

The Town of Leicester, Vermont was chartered in 1761 by Benning Wentworth. The town center, known as Leicester Four Corners, contains the Town Hall, Town Office, Town Shed, Meeting House, Leicester Central School, and the Town Green.

Leicester Junction, located on the western side of town, served as a railroad stop dating back to the 1800's. The Junction once had a hotel, livery stable, general store, school, and post office. Today, the area is almost entirely residential – the only exception being a farm supply store and gas storage facility occupying the old rail stop. While it no longer serves as a gathering point for the town, the area is still referred to as 'Leicester Junction' or 'The Junction'.

The Town of Leicester has a number of lakes including Fern Lake, Silver Lake, and Lake Dunmore. Silver Lake is accessed by trails through the neighboring towns of Salisbury and Goshen. Fern Lake and Lake Dunmore, which also extends north into Salisbury, are home to numerous year round and seasonal residences.

US Route 7 passes through Leicester Four Corners from north to south and bisects the town almost equally east and west. VT State Rte 53 lies east of Lake Dunmore and Fern Lake in the eastern half of town and serves the lakeshore residents. East of Rte 53 is primarily in the ownership of the Green Mountain National Forest. Also of significance, the Leicester-Whiting Road connects Leicester Four Corners, Leicester Junction and the Village of Whiting to the west. This local road is used as a detour when VT State Rte 73 west of Brandon becomes flooded.

Leicester has seen a rapid increase in population since 1970. As of the 2010 census, the population was at 1100 and is expected to grow to 1200 by 2015. The population shown on the census does not include many lakeshore residents, who may make their primary residences in other states.

According to the 2010 census, there are 658 housing units in Leicester. Of those units, 448 are year-round and 191 are seasonal. There has been a recent trend toward conversion of seasonal homes into year-round homes which is being monitored carefully by the town planning commission to ensure public safety in the form of clean waters and adequate services are maintained. In Leicester, most year-round homes are single-family structures (~81%), a little more than 17% are mobile homes and less than 2% are multi-family homes.

Leicester has a workforce of 580 workers based on the 2010 US Census and 85% of them work outside of the town in nearby communities. The town is quite dependent upon the income generated from these workers as there are limited economic opportunities within the town. Green Mountain Power Corp. is the sole provider of electrical power and landline telephone service is provided by FairPoint Communications. Leicester is seeing an increase in use of Comcast for voice over internet protocol (VOIP) telephone service. Cellular reception is available in some areas of town but is very limited in others due to the limited number of towers. To date, cellular phone companies have focused on serving the Route 7 corridor. Residents of Leicester provide for their own water and sewage needs through wells and springs as well as individual on-site septic systems. In the more rural areas of town this system has worked quite well but along the seasonal lake shore communities the limited ability to dispose of wastewater is becoming a concern.

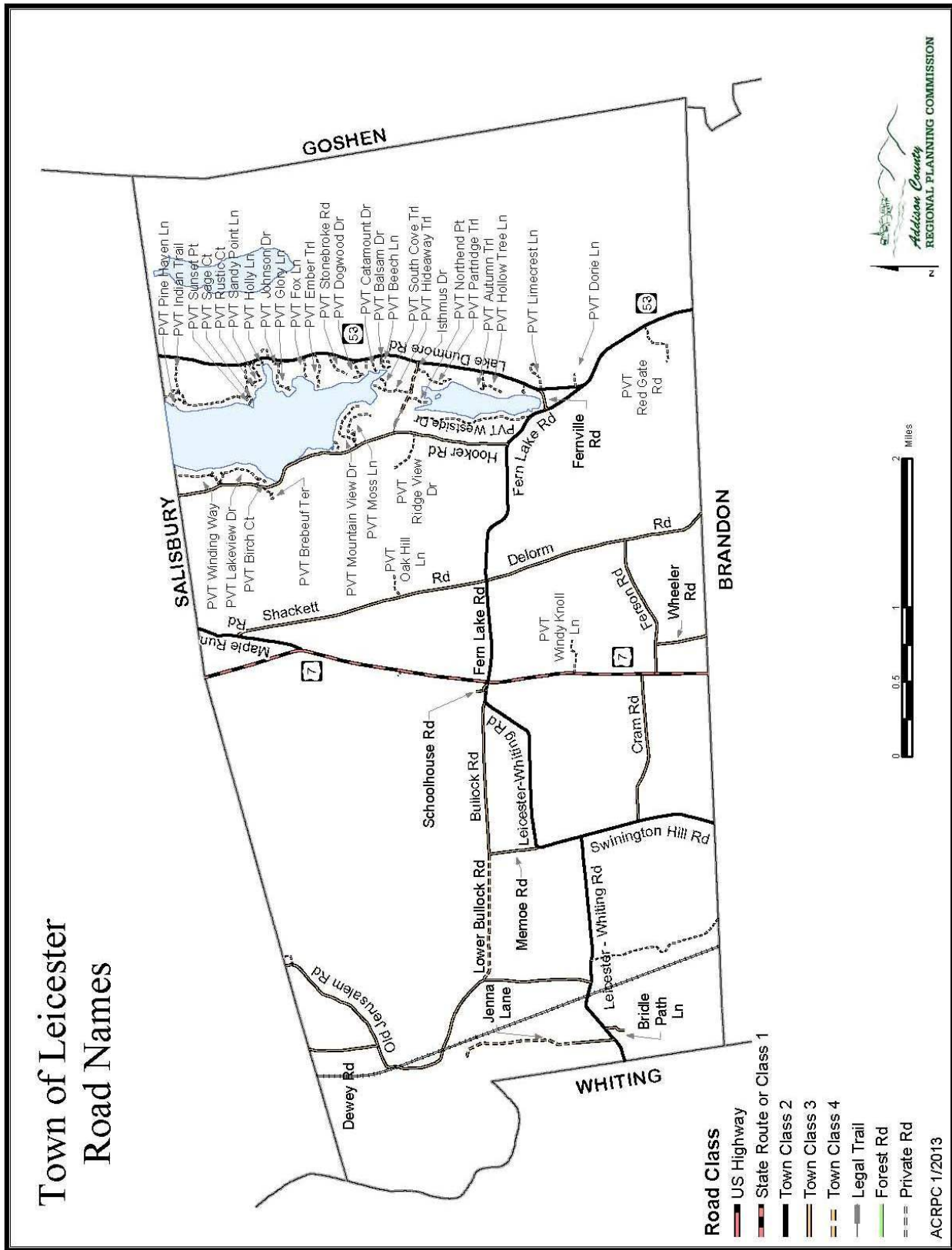
The Town of Leicester is host to no first response agencies and is entirely dependent upon agencies located in surrounding communities for these services. Fortunately, the Town of Brandon lies to the south and it is a

medium sized town with both a fire department and a rescue squad. Fire services, averaging 25 calls per year, are provided through a contract with the Brandon Fire Department which expands its capacity through mutual aid assistance from the Pittsford Fire Department further south. If needed, Brandon Fire Department can also call upon Salisbury and Whiting volunteer fire departments to the north and west of Leicester though no formal mutual aid agreements exist between the agencies. Calls for response to structure fires occur, on the average of fewer than 2 per year. Emergency Medical Services are provided by the Brandon Area Rescue Squad with support from the Middlebury Regional Ambulance. Patients are transported to either Porter Medical Center (10 miles) or the Rutland Regional Medical Center (22 miles). Law enforcement for the Town is provided by the Vermont State Police. The Town annually elects two constables who do not provide law enforcement services. On occasion, the Town has contracted the services of the Addison County Sheriff's Department for traffic control.

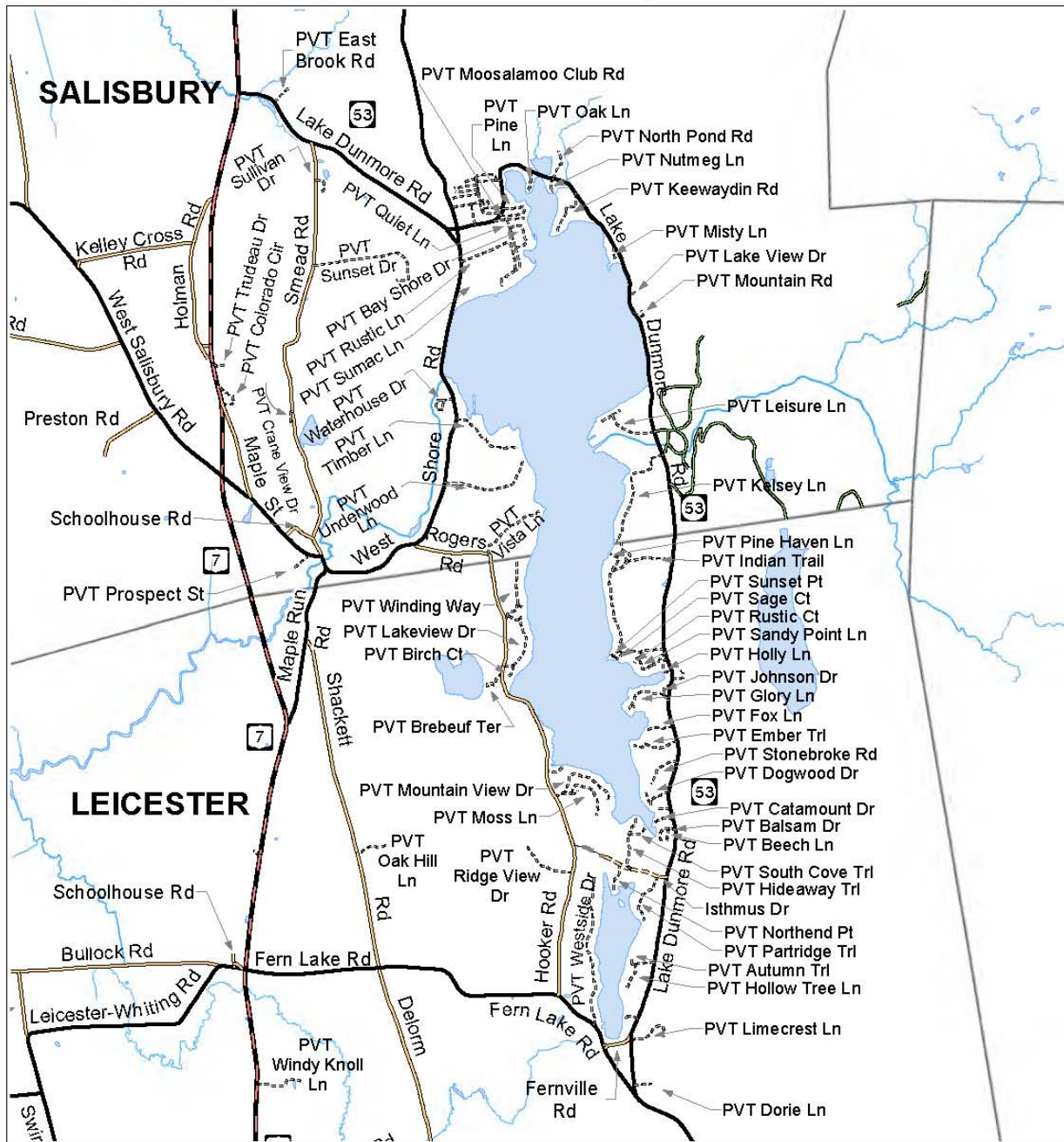
The Town has an appointed Emergency Management Coordinator and uses a Local Emergency Operations Plan (LEOP) to coordinate response to larger incidents. The LEOP identifies the Town Office as its emergency operations center. It also identifies the availability of the County mobile command post if the town office is unavailable. Three emergency shelters are identified in the LEOP as the Town Hall, Leicester Central School and the Nazarene Church. The LEOP also identifies high hazard areas and vulnerable sites primarily based on Flooding, HAZMAT and likely transportation incidents. Specifically called out are flooding along Old Jerusalem Road and likely hazardous material spills associated with transportation along Route 7.

The Town is a member of the National Flood Insurance Program and as such, has adopted zoning by-laws designating Flood Hazard Areas including associated regulations for administering those areas. The Flood Insurance Rate Maps (FIRMs) associated with Leicester date from November of 1985 are based on approximate studies as no detailed studies have been created within the Town of Leicester. In keeping with the approximate studies, no estimation of base flood elevation has been created. Fortunately, much of the floodplain shown on the FIRMs is associated with Otter Creek which floods regularly once or twice a year. This frequent flooding has effectively discouraged development in recent times due to difficulties in disposing of septage and the availability of alternative non-flooding sites in town. Unfortunately, development along the Otter Creek in Leicester Junction preceded the NFIP and current septic regulations. Structures in this area were built so as to take advantage of access to the railroad tracks which follow the creek. This area can be isolated by floodwaters which cause the Junction area itself to become an island. Emergency evacuation of these residents requires qualified water rescue personnel when roads become overtopped by flood waters. Fortunately for the residents of this area, the Otter Creek flooding is extremely predictable and can be forecast 2-3 days in advance, giving time to elevate belongings and evacuate in advance of the flood waters.

2.1 Local Maps

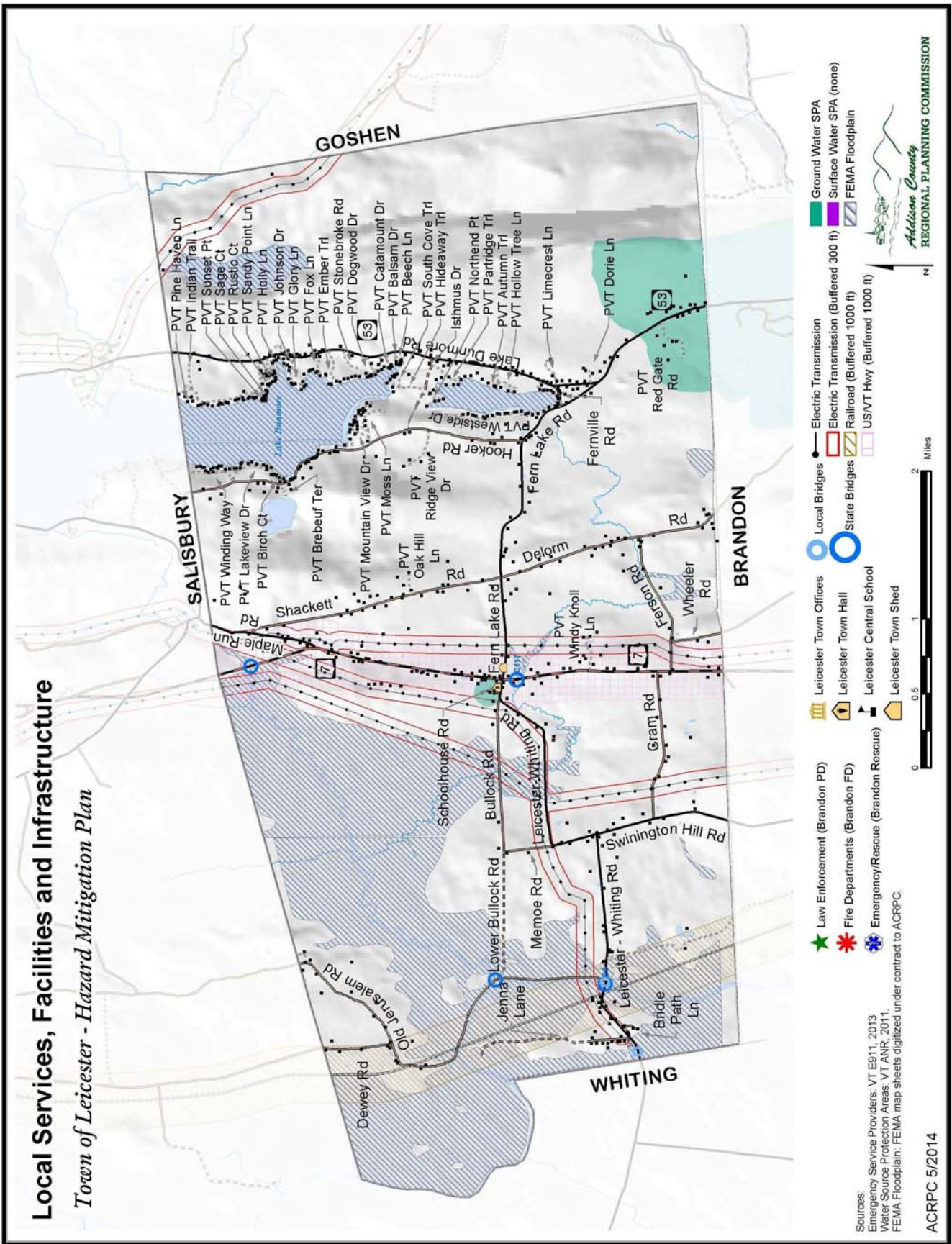


Lake Dunmore Area Road Names in the Towns of Salisbury and Leicester



Local Services, Facilities and Infrastructure

Town of Leicester - Hazard Mitigation Plan



Utilities, Facilities and Education

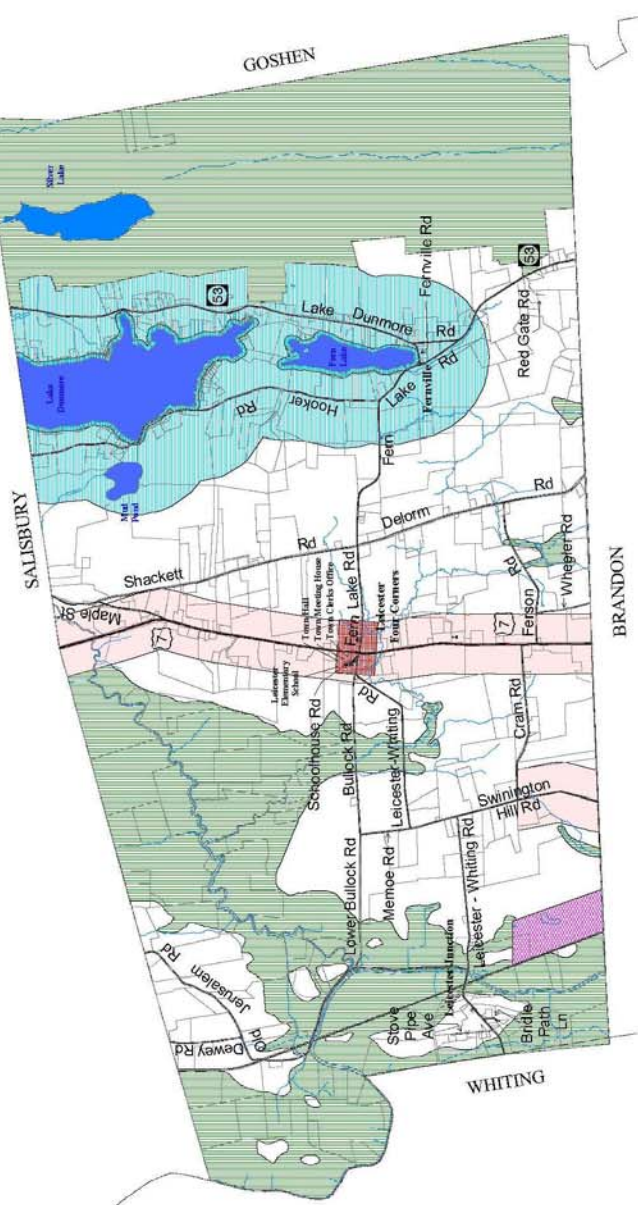


Tax Parcels: Current as of 2002, refer to the Town Clerk for current information. (1/3/00)
Water Supply Source Projection Areas: VT Dept of Env. Conservation, 1996 (1/24/00)
Town Boundary: Digitized from USGS 7.5 minute Quad-angles
Road Centerlines: VT Agency of Transportation (1/2000)
Road Names: ERIE Contracts for Towns (1998)
Surface Waters: Interpolated from VT Mapping Program Completion, 1/2000, 1978



Town of Leicester

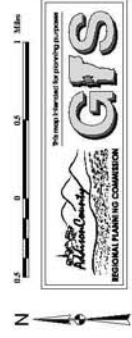
Land Use Map



Source:
 Land Use Districts: Town Plan, Town of Leicester
 Adopted: Oct 16, 1997
 Town of Leicester and the 2009 Office of the Town Clerk
 for current information, 11/15/2009
 Water Supply: Source Protection Areas: VT Dept of
 Environmental Conservation, 1996 (1/24/2008)
 Town Knowledge: Digitized from 1955 7.5 minute
 USGS Topographic Map
 Road Centerlines: VT Agency of Transportation (1/1/2009)
 Road Centerlines: VT Agency of Transportation (1/1/2009)
 Statewide: 1:111 Contour Map for Towns (1998)
 Statewide: 1:111 Contour Map for Towns (1998)
 Statewide: 1:111 Contour Map for Towns (1998)

- Legend**
- Forest
 - Water
 - Residential Single-Family
 - Residential Medium-Density
 - Residential High-Density
 - Commercial
 - Industrial
 - Agriculture
 - Conservation
 - Other

- W Town Rd Obs 1 or State Rt
- W Town Rd Obs 2
- W Town Rd Obs 3
- W Town Rd Obs 4
- W Private Rd



ACBPC 3/2003

3. Existing Adopted Plans which support Hazard Mitigation

The following plans pre-date this plan and are used to illustrate how the community, the Addison region and the State of Vermont have incorporated mitigation into standard planning mechanisms. As the Leicester Selectboard, Planning Commission and Emergency Manager continue to work on annual or 5 year updates of these plans, the Town of Leicester All Hazards Mitigation Plan will be able to provide needed information for those planning processes.

3.1 Leicester 2014 Local Emergency Operations Plan (High Hazard and Vulnerable Sites)

- *Road Flooding -Leicester-Whiting Road*
- *Road Flooding - Old Jerusalem Road*
- *General Flooding -Leicester Jct.*
- *Propane Leak (Synergy) - Leicester Jct.*
- *Power Failure (GMP Substation) - Leicester Jct.*
- *Large Scale Power Failure - Varied throughout town*

3.2 Leicester Town Plan (2012) Goals that support Hazard Mitigation

- *Ensure the health, safety and welfare of Leicester's residents and visitors.*
- *Provide our residents and visitors with safe and well-maintained roads that support vehicular, bicycle and pedestrian traffic.*
- *Support local distribution of energy including installation of net metering.*
- *Maximize the ecological services provided by our forestlands such as soil protection, water filtration...*
- *Seek to protect and enhance the air quality in Leicester to reduce associated health problems...*
- *Capture and slow storm water in order to lessen its negative impacts...and on infrastructure*

3.3 Leicester Town Plan (2012) Statements supporting Hazard Mitigation

- *The Town participates in the National Flood Insurance Program*
- *Efforts to conserve these floodplains further ensure that Leicester residents will be protected into the future.*
- *While natural disasters and other emergencies cannot be totally prevented, damages associated with them can be reduced through the process of municipal planning. The Town of Leicester has taken the initial steps toward limiting potential damage and is committed to continuing this process to protect the health and safety of its residents.*

3.4 Leicester Town Plan (2012) Recommended actions supporting hazard mitigation:

- *Provide educational information to residents regarding emergency contact information and procedures in the event of an emergency.*
- *Maintain an active Emergency Management Coordinator position to ensure Leicester stays current with Regional and State resources and procedures.*
- *Continue communication with the community regarding the maintenance of public and private roads for access in emergencies.*
- *Implement a maintenance plan for all town-owned community facilities.*
- *Promote the road construction and maintenance practices illustrated in the Vermont Better Backroads Manual...*
- *Improve ditch and culvert conditions on Hooker and Lake Dunmore Road.*
- *Ensure property owners refrain from making changes that significantly increase runoff into ditches...*

- *Incorporate the standards for erosion and storm water management...into town zoning regulations.*

3.5 Addison County Regional Planning Commission Regional Plan (2011) Goals that support Hazard Mitigation

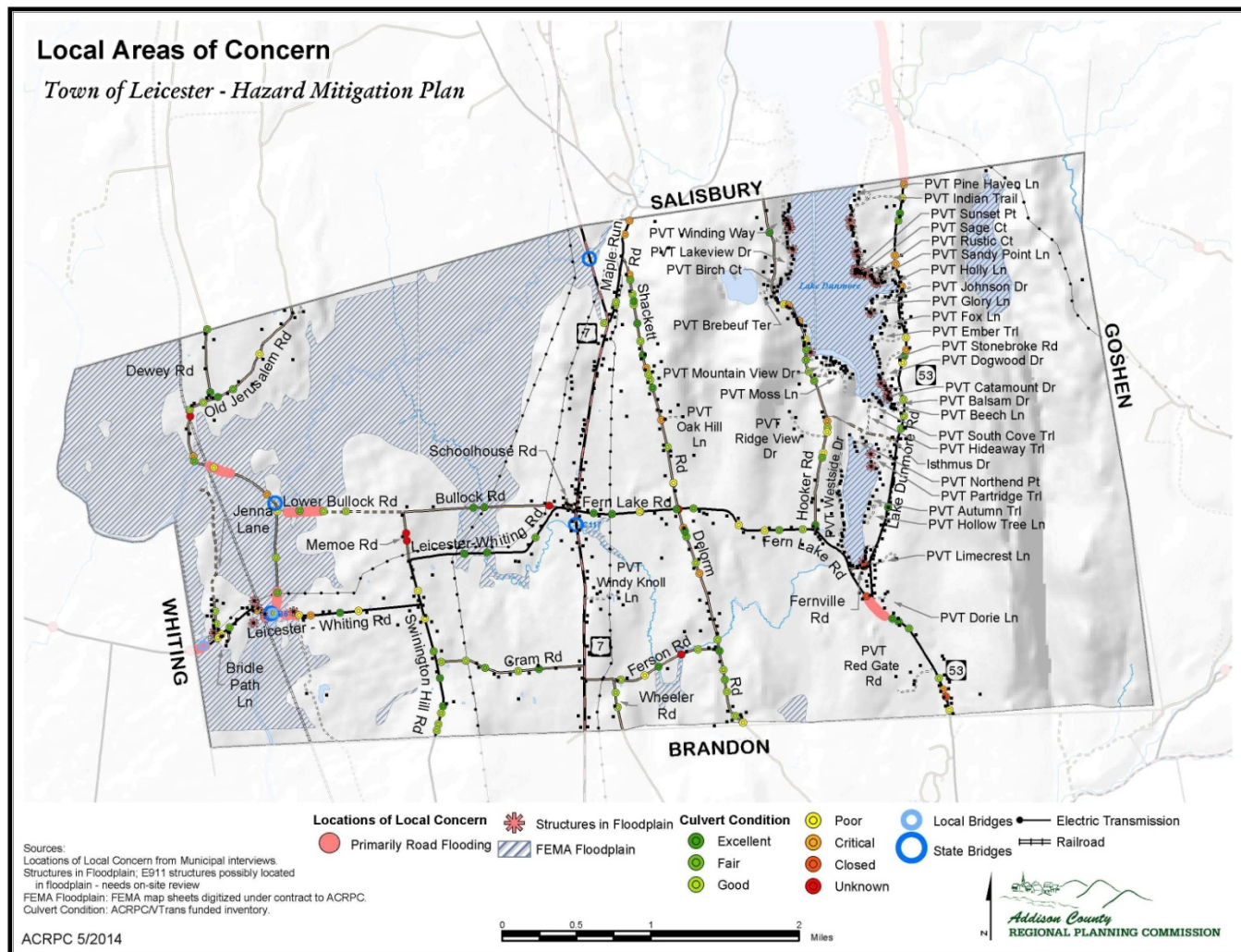
- *Work to restore and maintain stream equilibrium by developing and implementing river corridor plans.*
- *Reduce flooding and related damages through appropriate mitigation techniques.*
- *Encourage watershed based cooperation and educate towns and the general public about water quality and stream dynamics*
- *Provide communities the support they need to be proactive in reducing flood and erosion hazards by adopting appropriate zoning regulations to limit development in hazardous areas.*
- *Encourage proper maintenance and sizing of bridges, culverts and other structures to accommodate flow from storm events and to mitigate flood hazards.*
- *Reduce the loss of life and injury resulting from all hazards.*
- *Mitigate financial losses incurred by municipal, residential, industrial, agricultural and commercial establishments due to disasters.*
- *Reduce the damage to public infrastructure resulting from all hazards.*
- *Recognize the connections between land use, storm-water, road design/ maintenance and the effects from disasters.*
- *Ensure that mitigation measures are sympathetic to the natural features of the region's rivers, streams and other surface waters; historic resources; character of neighborhoods; and the capacity of the community to implement them.*
- *Encourage hazard mitigation planning as a part of the Municipal Planning Process.*
- *Encourage municipalities and landowners to consider VT Agency of Natural Resources riparian guidelines for habitat and flood protection.*

3.6 State of Vermont Hazard Mitigation Plan (2013) Hazard Mitigation Goals

- *Ensure that current and proposed legislation and regulatory policies require effective hazard mitigation practices throughout the State.*
- *Ensure that grant-related funding processes allow for expedient and effective mitigation actions to take place at the municipal and State level.*
- *Provide timely and accurate technical assistance that supports hazard mitigation activities to regional and local jurisdictions as well as private sector partners.*
- *Identify state-level risks and vulnerabilities and protect or harden state infrastructure against hazards.*
- *Conduct hazard assessments, mapping and data collection projects to increase knowledge about both the hazards facing Vermont and the most effective mitigation actions for minimizing public exposure to hazards.*

4. Community Risk Assessment

4.1 Local Areas of Concern Map



4.2 Risk Prioritization Results

The Town of Leicester's Hazard Mitigation Planning Committee reviewed the following hazards in its Hazard Inventory/Risk Assessment – Drought, Widespread Power Failure, Flooding, High Winds, Landslide, Transportation Accident/Hazardous Material Spill, Structure Fire, Wildfire, Winter Storm/Ice Storm, Earthquake, Dam Failure, and Mosquito-borne Infectious Disease. In terms of overall vulnerability, the committee scored the following hazards as their five highest: Widespread Power Failure, Transportation Accident/Hazardous Material Spill, Earthquake, Mosquito-borne Infectious Disease and Winter Storm/Ice Storm. (see Leicester, VT HI/RA)

Leicester, VT.

Hazard Inventory/Risk Assessment

Hazard Type	Probability	Warning	Geo graphic Impacts	Property damage	Vulnerability
Drought	2	1	4	3	10 – (2)
Widespread Power Failure	3	4	4	3	14 – (4)
Flood (Inundation)	4	1	1	2	8 – (1)
Flood (Flash Flood)	2	4	1	2	9 – (2)
High Winds	3	4	1	2	10 – (2)
Landslide/Erosion	1	1	1	1	4 – (1)
HazMat/Transportation Accident	4	4	2	2	12 – (3)
Structure Fire	4	4	1	1	10 – (2)
Wildfire	4	4	1	1	10 – (2)
Winter Storm/Ice Storm	4	1	4	2	11 – (3)
Earthquake	3	4	4	1	12 – (3)
Dam Failure	1	1	1	2	5 – (1)
Mosquito-borne Illness	4	1	4	3	12 – (3)

Probability: Frequency of Occurrence

- | | |
|------------------|------------------------------------|
| 1= Unlikely | <1% in a given year |
| 2= Occasionally | 1%-10% probability in a given year |
| 3= Likely | >10% but <100% in any given year |
| 4= Highly Likely | 100% probability in a given year |

Warning: Time available to give notice to the majority of the population

- 1= More than 12 hours
- 2= 6-12 Hours
- 3= 3-6 hours
- 4= <3 hours (minimal)

Geographic Impacts: How much of the population is expected to be impacted

- | | |
|------------------------------------|--|
| 1= Isolated Locations/neighborhood | <20% of population impacted |
| 2= Moderate impact | >20% and <75% of population impacted |
| 3= Community-wide | >75% of population impacted within community |
| 4= Region-wide | Level 2 & 3 impacts in surrounding communities |

Property Damage: Severity of damages and disruption

- | | |
|---------------|---|
| 1= Negligible | Isolated property damage, minimal disruption to infrastructure |
| 2= Minor | Isolated moderate to severe property damage, brief disruption to infrastructure |
| 3= Moderate | Severe damages at neighborhood level, temporary closure of infrastructure |
| 4= Major | Severe damages town-wide, temporary to long-term closure of infrastructure |

Vulnerability: Total score of Probability, Warning, Geographic Impact and Property Damage

- | | |
|---------------------------------|---|
| 1= Low Priority | ≤ 8 total score, low cost –no cost mitigation projects only |
| 2= Medium Priority | >8 and ≤10 total score |
| 3= High Priority | >10 and ≤12 total score |
| 4= Regional/State-wide Priority | >12 total score |

Declared Disasters by County 2003-2013

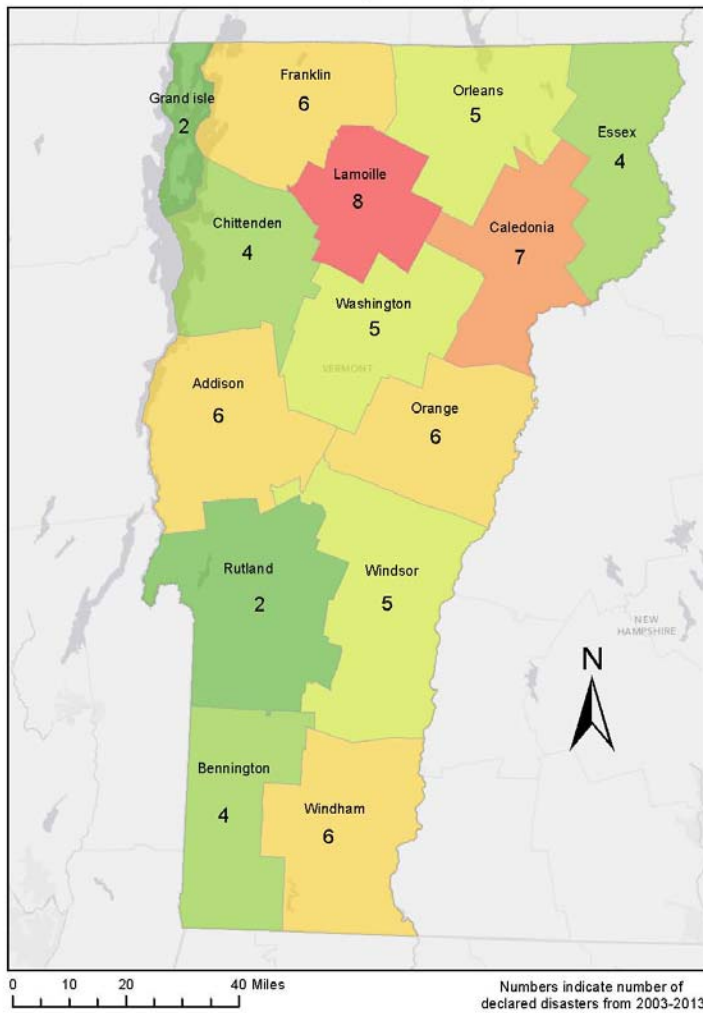


Table #1 Federally declared disasters affecting Addison County

Year	Date	Description	Dec. #	County Cost	Leicester
1973	7/6/1973	Severe Storms, Flooding, Landslides	DR397	\$ Unavailable	\$ Unavailable
1976	8/5/1976	Severe Storms, High Winds, Flooding	DR518	\$ Unavailable	\$ Unavailable
1977	9/6/1977	Drought	EM3053	\$ Unavailable	\$ Unavailable
1989	8/4-5/1989	Severe Storms, Flooding	DR840	\$ 31,033	\$ Unavailable
1993	4/24-5/26/1993	Flooding, Heavy Rain, Snowfall	DR990	\$ 17,639	\$ Unavailable
1996	1/19-2/2/1996	Storms, Flooding	DR1101	\$ 130,529	\$ Unavailable
1998	1/6-16/1998	Ice Storms	DR1201	\$ 662,388	\$ Unavailable
1998	7/17-8/17/1998	Severe Storms and Flooding	DR1228	\$2,146,484	\$ Unavailable
2000	7/14-18/2000	Severe Storms and Flooding	DR1336	\$ 744,075	\$ Unavailable
2001	3/5-7/2001	Snowstorm	EM3167	\$ Unavailable	\$ Unavailable
2004	8/12-9/12/2004	Severe Storms and Flooding	DR1559	\$ 365,661	\$ 15,622
2008	6/14-17/2008	Severe Storms and Flooding	DR1778	\$ 486,850	\$ Unavailable
2008	7/21-8/12/2008	Severe Storms and Flooding	DR1790	\$ 438,900	\$ 34,503
2011	4/23-5/9/2011	Severe Storms and Flooding	DR1995	\$ Unavailable	\$ Unavailable
2011	8/26-9/2/2011	Hurricane Irene	EM3338	\$ Unavailable	\$ Unavailable
2011	8/27-9/2/2011	Tropical Storm Irene	DR4022	\$ Unavailable	\$ 5,737
2012	5/29/2012	Severe Storm, Tornado and Flooding	DR4066	\$ Unavailable	\$ Unavailable

4.3 Hazard Type, Location, Extent, Previous Occurrences, Future Probability and Vulnerability 44CFR 201.6 (c)(2)(i), 44CFR 201.6(c)(2)(iii)

The following hazard types have been identified, evaluated and prioritized in a risk assessment exercise conducted with the Leicester hazard mitigation committee. The matrix in 4.2 shows the results of that evaluation process for the Town of Leicester. The following hazard types are listed in their order of priority with highest vulnerability described first.

- **Widespread Power Failure** (Risk Score-14)

Location: Based on local knowledge, power outages are a common event throughout the Town of Leicester.

Extent: Depending on the cause of the failure, a widespread outage could last for days or even weeks, in the case of either a failing national grid or downed power lines throughout the northeast.

Previous occurrences: In 1998 a severe ice storm hit northern Vermont and much of the Addison region. No community in the region was spared damage associated with downed power lines. Power outages continued for several days as remote power lines originally laid out by Rural Electrification in the 1930s and 1940s were accessed by off-road vehicles. In December 2014 a power outage of several days duration impacted much of Vermont including the Town of Leicester.

Future probability: Subsequent to the ice storm of 1998, power companies have re-routed many remote lines onto town highway rights of way and increased annual pruning efforts. Frequency of occurrence and length of outage duration have been reduced thereby also reducing the overall impact impacts to residents. If these and similar efforts continue, a reasonable person would predict fewer power outages of shorter duration. The effect of these improvements to infrastructure may be cancelled out by the general increase in the types of storms which lead to power outages.

Vulnerability summary: During summer months, localized power outages caused by severe summer storms mostly cause inconveniences to residents unless extended outages impact a family's frozen food supply or their ability to pump water from wells. Extended outages during winter months coupled with extreme cold have periodically resulted in more extensive damage associated with freezing pipes. The town is most vulnerable in its lack of back-up power to run the school well. A lack of power to this resource effectively rules out the town hall as a shelter.

Green Mountain Power Circuits in Leicester



A regionally significant electric substation lies in the mapped floodplain west of Leicester Junction. A catastrophic failure of this substation would cause a widespread power outage. Widespread outages have been common through much of the past 50 years with limited overall impact to the community.

With the highest vulnerability score of hazards assessed, the perceived community vulnerability to Widespread Power Outage (4) would make it a Regional/Statewide Priority. Because of this statewide priority, Green Mountain Power, the utility serving Leicester, is actively mitigating widespread power outages through tree pruning efforts and line upgrades. Actual vulnerability could be considered MODERATE based on limited unmitigated impacts to infrastructure, health, and environment.

- **Hazardous Materials & Highway/Transport Accidents** (Risk Score – 12)

Fixed facility HazMat Spill/Release

Location: There are two sites in town that have sufficient types and/or quantities of hazardous materials to require Tier II reporting.

- Green Mountain Power Leicester Jct. Substation – 33 Jenna Lane.
- Leicester Plant - Synergy Gas – 2685 Leicester-Whiting Road

Extent: Based on a recommended public safety evacuation distance from the 2012 Emergency Response Guidebook, a 1000-foot circle has been drawn around those sites. Structures inside the circle are those that are at risk and may need to be evacuated if an incident were to occur. Identified within the 1000ft circle include 19 residences, 7 mobile homes, 1 industrial site and 2 commercial sites.

Previous Occurrences: Minor releases of propane have occurred, primarily during product transfer between rail and storage tanks or storage tanks and delivery truck.

Future Probability: A proposed natural gas pipeline through the Addison region would likely reduce the demand for propane as a heating source and potentially reduce the risk associated with the Synergy facility. However, increased traffic on the rail system would increase the likelihood of an incident that would affect this facility.

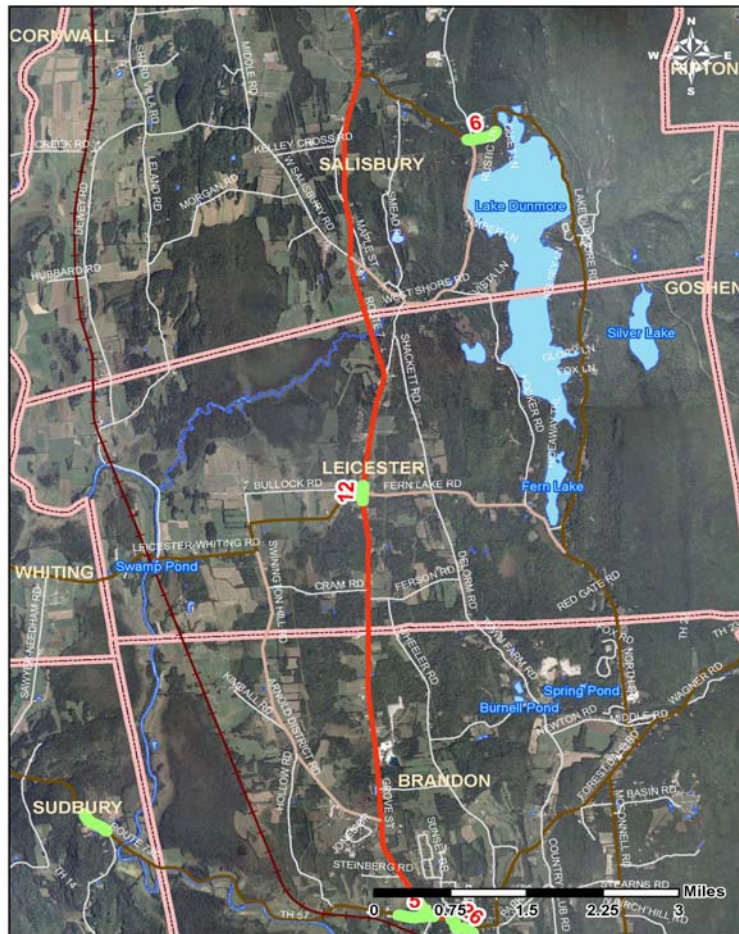
Vulnerability Summary: Were there to be a large-scale release of propane from the Synergy plant, gas could migrate into low lying areas and ignition could result in a severe explosion, destroying homes and businesses. If a large-scale leak of hydrochloric acid from the substation were to occur, there would be a health risk to persons in the area of the plume. Hydrochloric acid could also contaminate soils, groundwater, and equipment.

HazMat Transport Spill/Release

Location: The Town recognizes certain locations along town and state highways are high accident locations(HAL). Only one HAL has been identified in the Town of Leicester through police and VTrans reports:

- The intersection of US Route #7, Fern Lake Rd and the Leicester/Whiting Road

Leicester ~ High Crash Locations: 2006-2010



* Labels ~ indicate "Total Number of Crashes" within the 5-year period

Additional frequent accident locations were identified by members of the hazard mitigation committee which do not show up on the State of Vermont's database:

- The intersection of Route #73 and the Fern Lake Road
- The intersection of the Leicester/Whiting Road and Old Jerusalem Road

Extent: Along US Route #7 there are 90 structures within 1000 ft. of the highway that could be impacted should an incident with a vehicle carrying HAZMAT occur. These include 76 residential structures, 8 classified as commercial addresses and 5 public use addresses

The 5 public use addresses which could be impacted by a large hazardous material spill within the Town of Leicester are:

- Leicester Town Hall
- Leicester Town Office
- Leicester Central School
- Leicester Town Shed
- Leicester Meeting House

Previous Occurrences: The junction of Route #7 Leicester four corners was the site of a fatal accident in recent years.

The intersection of Route # 53 and the Fern Lake Road is the site of frequent accidents caused by conflicting turning patterns.

There has been an observable increase in cars not able to make the turn onto Old Jerusalem Road when coming from the west along the Leicester/Whiting Road since improvements to the bridge over Otter Creek were completed.

Future Probability: Increased demand for products whether they be hazardous or non-hazardous, shows up as increased freight traffic on Route #7 and the Vermont Railway. An increase in traffic is generally followed by an increase in accidents, leading to an increasing probability that some type of large hazardous material spill will occur within the Town of Leicester.

Vulnerability Summary: Route #7 is the primary north/south route on the western side of the state and trucks carry a mix of hazardous materials through Leicester along this highway. The Leicester/Whiting Road, along its length has been determined eligible under the VTrans High Risk Rural Road program due to a high traffic volume and status as an alternate route should Route #73 west of Brandon flood. The Leicester Selectboard requested to be included in this program in 2013 and improvements to signage designed to create a safer road were implemented in 2014.

With a community vulnerability score of 3 for a transportation related, hazardous materials incident, this hazard would be considered HIGH PRIORITY based on the high probability of an incident and its potential for critical impact to town infrastructure in the Leicester Four Corners area.

- **Earthquake** (Risk Score – 12)

Location: Surprising as it is to some, all of Vermont, including the Town of Leicester, is classified as an area with “moderate” seismic activity. This can be compared to the west coast of the U.S., which is classified as “very high” and the north-central states classified as “very low.” Located in the Champlain Valley, Leicester is at higher risk for earthquake than some other areas.

Extent: Based on information provided by the Vermont Geological Survey, Department of Environmental Conservation, Agency of Natural Resources, HAZUS outputs for the region are summarized as follows:

The Middlebury Once-in-500 year earthquake (5.7 magnitude) could cause significant damage in Addison County. The Goodnow, NY Once-in-500 year earthquake (6.6 magnitude) could cause shaking just above the lower limit for building damage. The Montreal, Quebec (6.8 magnitude) and the Tamworth, NH (6.2 magnitude) Once-in-500 year earthquakes probably would not cause damage in Addison County. Only the loss data from the Middlebury and Goodnow events are shown below:

Middlebury Scenario:

- Building damage – HAZUS estimates that over 1600 buildings will receive at least moderate damage. This is a little more than 13% of the total number of buildings in the county. (13% of buildings in Leicester would be 102). HAZUS also estimates that all essential facilities

(hospital, schools, police stations and fire stations will receive at least moderate damage. 7 families would be predicted to be displaced from their homes and will need temporary shelter in Leicester.

- Transportation & utility systems – HAZUS estimates minimal disruption of the transportation and utility systems. However, over 9000 households in the region are expected to be without electrical power for up to three days.
- Casualties – Minimal casualties are also expected with less than twenty-five requiring medical attention and less than three needing hospitalization in the region.
- Economic loss – Direct building losses are estimated at > \$83 million and business interruption losses are expected to be as much as \$105 million. HAZUS estimates that although there was minimal damage to the transportation system the loss would still be close to \$15 million. Approximately \$4.4 million would be needed to repair damaged communications systems.

Goodnow Scenario:

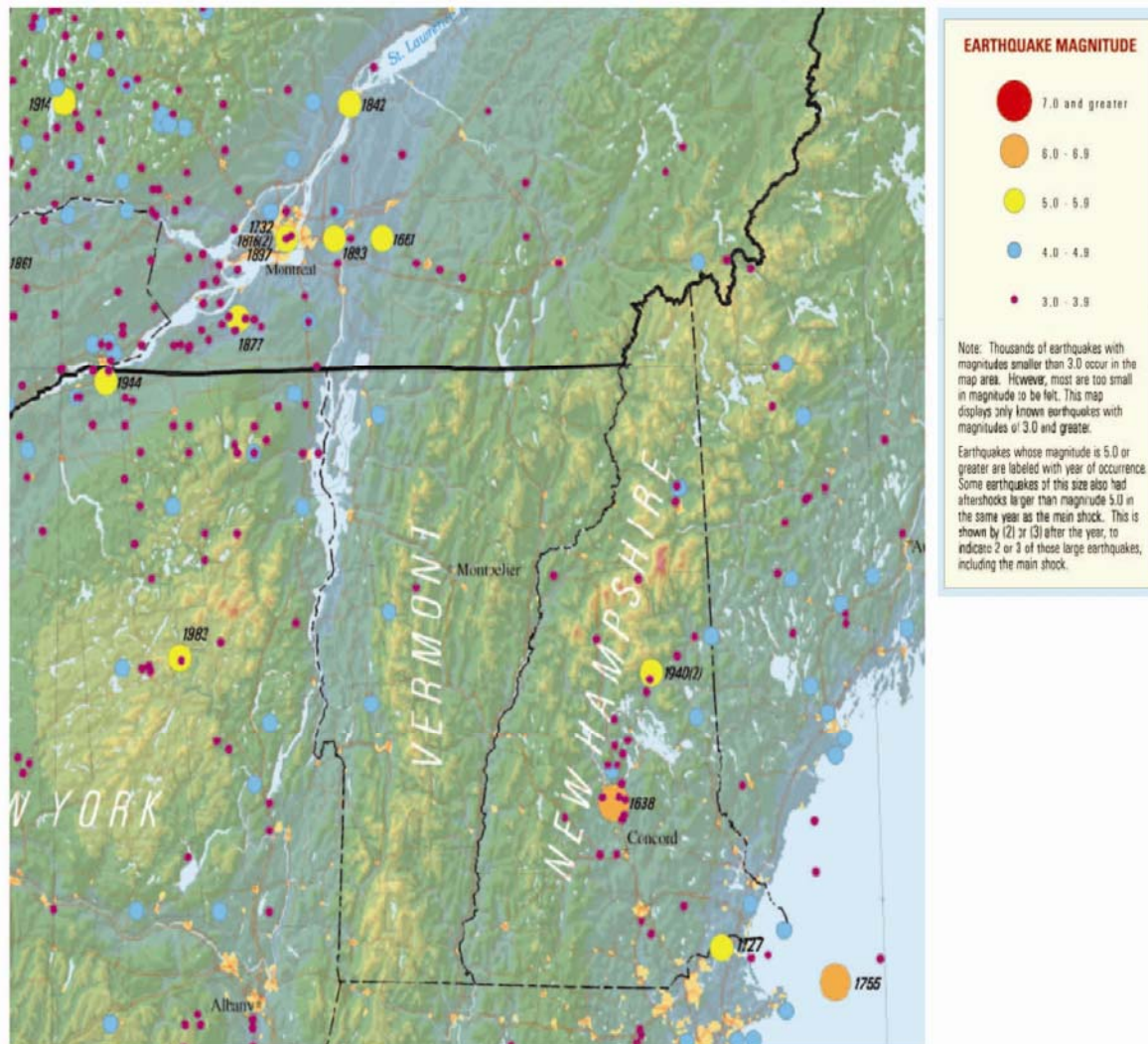
- Building damage – HAZUS estimates that over 600 buildings will receive at least moderate damage. This is a little more than 5% of the total number of buildings in the county. (5% of buildings in Leicester would be 34) HAZUS also estimate that all essential facilities (hospital, schools, police stations and fire stations will receive at least moderate damage. 3-4 families are predicted to be displaced from their homes and will need temporary shelter.
- Transportation & utility systems – HAZUS estimates minimal disruption of the transportation and utility systems. However, over 4000 households are expected to be without electrical power for up to three days in the region.
- Casualties – Minimal casualties are also expected with less than six requiring medical attention and only one needing hospitalization.
- Economic loss – Direct building losses are estimated at > \$17 million and business interruption losses are expected to be as much as \$24 million. HAZUS estimates that although there was minimal damage to the transportation system the loss would still be close to \$3.6 million. Approximately \$0.9 million would be needed to repair damaged communications systems.

Previous Occurrences: Sixty-three known or possible earthquakes have been centered in Vermont since 1843 (*Ebel, et al 1995*). The two strongest recorded quakes measured in Vermont were of a magnitude 4.1 on the Richter scale. One was centered in Swanton and occurred on July 6, 1943, and the second occurred in 1962 in nearby Middlebury. The Swanton quake caused little damage, but the Middlebury quake did result in broken windows, cracked plaster and falling objects (*VEM, 1995*).

Earthquakes centered outside the state have also occasionally been felt in Vermont. Twin quakes of 5.5 occurred in New Hampshire in 1940. In 1988, an earthquake with a magnitude 6.2 on the Richter scale took place in Saguenay, Quebec and caused shaking in the northern two thirds of Vermont (*Ebel, et al 1995*).

In May 2001 and again in the summer of 2010, earthquakes in the 5.0-5.5 range have been felt in Leicester with epicenters in New York and Quebec respectively.

Regional Historical Earthquake Records



Future Probability: The USGS database shows there is a 2.26% probability of an earthquake measuring 5.0 or above within 31 miles of the Town of Leicester in the next 50 years.

Vulnerability Summary: The Leicester Hazard Mitigation Committee scored Earthquake hazard a risk score of 14 resulting in a vulnerability score of 3. Residents of the community do not generally consider earthquake to be a high enough risk to require preparing for one. This results in little or no preparedness should an earthquake occur. With a community vulnerability score of 3, earthquakes would be considered HIGH PRIORITY based on a low probability of a significant event in any given year but with a high overall impact to infrastructure should a significant event occur.

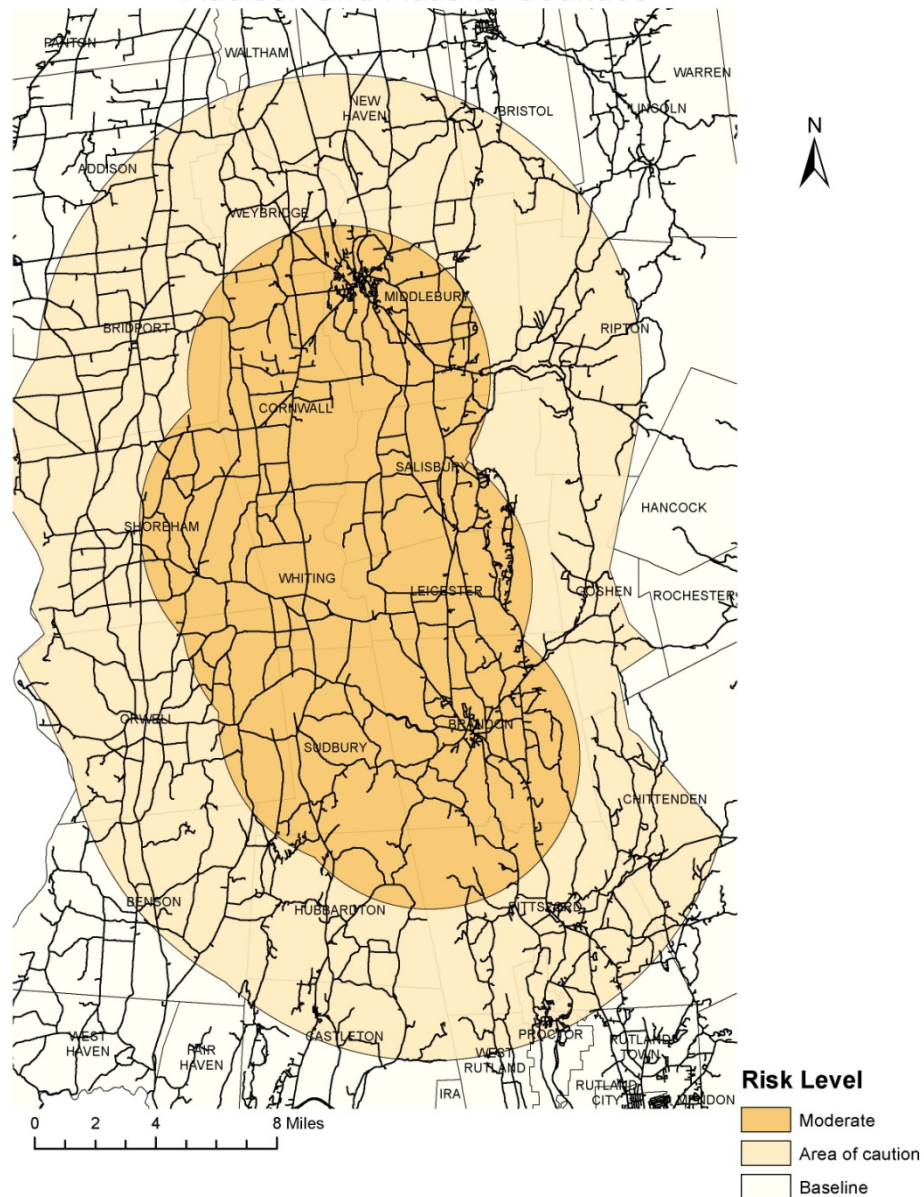
- **Mosquito-Borne Illness** (Risk Score – 12)

Location: Mosquitoes are common throughout Leicester and the surrounding towns due to the large acreages of swamp and poorly drained soils. *Culiseta melanura* (CM), the species specific vector for Eastern Equine Encephalitis (EEE), lives in hardwood swamps which are particularly prevalent along the Otter Creek in Leicester. Trapping efforts funded by the Vermont Agency of Agriculture

and the Vermont Department of Health have identified populations of CM carrying EEE in the Town of Leicester.

Extent: The discovery of West Nile Virus (WNV) in mosquito populations in the Addison region and a 2012 outbreak of Eastern Equine Encephalitis (EEE) have elevated the awareness of risks associated with mosquito bites. Due to the endemic mosquito populations, infection from either of these arboviruses is highly likely and could result in multiple deaths in the Town of Leicester.

2014 EEE Estimated Risk Addison and Rutland Counties



Previous Occurrences: A 2012 EEE outbreak resulted in two deaths in the Addison/Rutland region due to the disease which was first recorded in animal populations in Vermont in 2010. Unfortunately, spraying of larvicides for the nuisance species normally conducted by the mosquito control district, has only a marginal effect on this specific EEE carrier. In late summer of 2012, the

State of Vermont conducted targeted aerial spraying of known population centers in an effort to knock down these populations. While no human cases of EEE were reported in Vermont in 2013, it is assumed that the disease is endemic in the local mosquito population.

Future Probability: Mild winters and a high water table have lead to an increased population of mosquitoes which carry WNV and EEE in the State of Vermont. Two conflicting assumptions can be made to forecast the current trend. If the current climatic trend is a temporary spike, populations of many of these mosquitoes would be expected to be reduced as the trend reverses itself. On the obverse, if the current trend continues over the next few decades, these and other disease carrying insect populations will likely increase. This increase in populations will likely result in an increasing risk to the local population

Vulnerability Summary: Concerns about the hazards related to mosquito bites and the transmission of diseases resulting from those bites have accelerated in Leicester over the past few years. Mosquitoes have been a known nuisance pest and have limited the enjoyment of outdoor activities in Leicester including the areas surrounding Lake Dunmore and Fern Lake for years. In 1990, the towns of Leicester, Brandon, Salisbury and Goshen created the State's first mosquito control district to help combat this nuisance problem. Ongoing programs that monitor populations and spray larvacides have been successful in keeping overall nuisance populations to within acceptable levels. Recently, however, public concerns have evolved from nuisance issues to life safety issues associated with two arbovirus types. The Vermont Department of Health identifies Leicester within their moderate risk areas for EEE due documented infected CM.

With a community vulnerability score of 3, mosquito-borne illness would be considered HIGH PRIORITY. Assuming recent conditions projected forward, there is a high likelihood of occurrence with a high economic impact to the community.

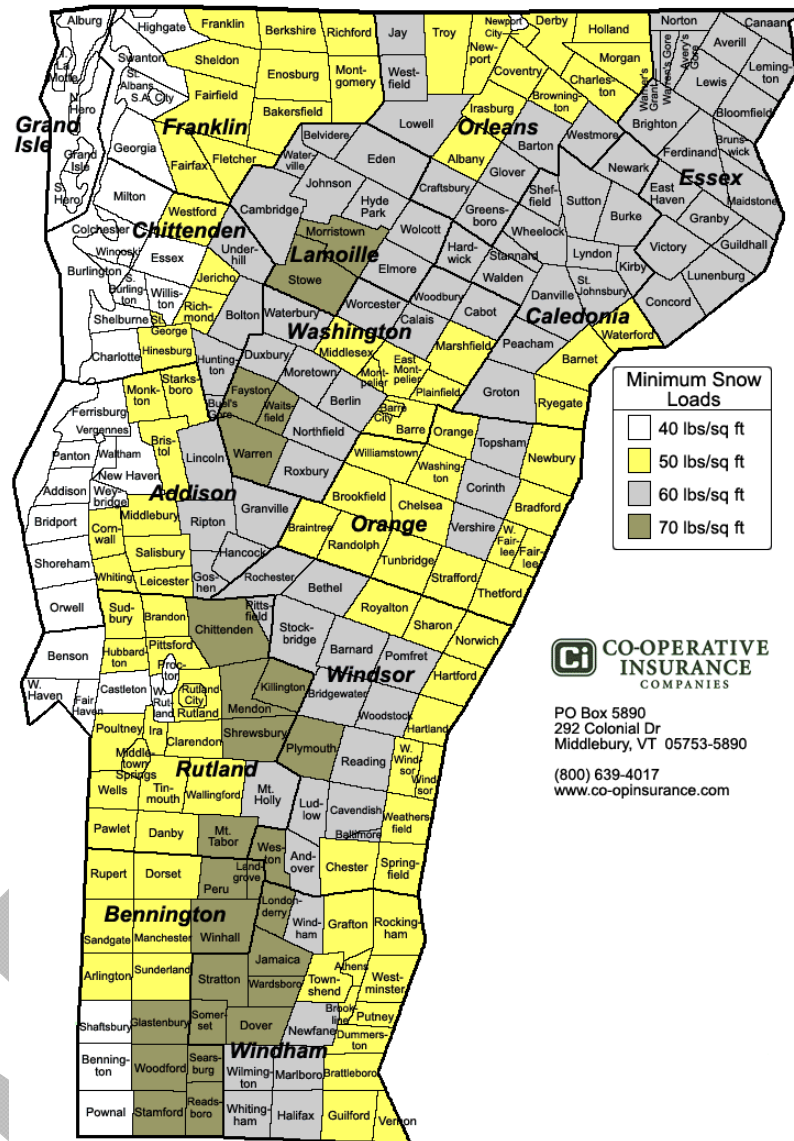
- **Winter Storm/Ice Storm** (Risk Score – 11)

Location: Severe winter storms are common throughout Vermont and can occur geographically in any part of Leicester. As in much of the Champlain Valley, the prevailing winds are either from the south or the north. Due to these winds, blowing and drifting snow impacts east/west roads the most.

Extent: When conditions are predicted, the National Weather Service issues warnings ranging from a Winter Storm Warning (heavy snowstorm predicted within 24 hours) to Blizzard Warning (sustained wind and snow with gusts up to 35 mph for at least 3 hours) to Heavy Snow Warning (accumulations of over 6 inches in a 24 hour period).

Construction standards for snow load (see map) indicate that structures in the Town of Leicester should be built to withstand loads of 50 pounds per square foot. This would indicate an average depth of snow of 40 inches or 10 inches of ice on a square foot of roof surface. At that point, design standards would be exceeded and the structure runs the risk of collapse. Given this standard, a snowstorm which dumped 40 inches of snow or 5 inches of ice would likely result in a few collapsed roofs, especially on structures which are not built to these standards.

Minimum Snow Loads for Estimating Construction Design (Leicester=50lb/sq ft)



Previous Occurrences: The National Climatic Data Center reports that the Addison Region has experienced 2 major Ice Storm events over the past 25 years. The highest recorded damages were incurred during the 1998 Ice Storm which impacted most of the northeastern US and resulted in \$750,000 in damages to Addison County properties. During the 25 year period an estimated \$850,000 in cumulative property damages due to winter storms, were recorded in the region. The Town of Leicester recorded limited damages during these ice events though residents were impacted by loss of power and the occasional downed tree or branches in the road.

NCDC records indicate that the Addison Region also experienced 123 winter storm events over the past 25 years. The worst storms resulted in \$100,000 in damages in both 2010 and 2005. During the period an estimated \$1,743,000 in cumulative property damages and \$10,000 in crop damages were incurred.

In March of 2001, the so-called “Town Meeting Day” snow event (Emergency Declaration #EM3167) caused reduced ability for residents to travel to the voting booth due to hazardous conditions. In some Addison County communities, additional efforts to keep polling places open were reimbursed with federal funds but Leicester managed without any additional assistance.

As recently as February 2007, a significant snowstorm coupled with high wind nearly crippled much of Vermont including the Addison County region which suffered a reported \$237,000 in damages. This “Valentines’ Day Blizzard” stressed the resources of most local communities, including the Town of Leicester, to capacity but did not ultimately result in a federal declaration.

Future Probability: The number and severity of winter storms have been increasing since the 1980’s. If the current trend continues, it is likely there will be a continued increase in severe winter storms that will impact the Town of Leicester in the future.

Vulnerability Summary: With a regular occurrence of a significant snow or ice storm, the town feels the impact of a winter storm most on the transportation infrastructure of the community. The town is able to keep the roads open and treated for most storms and rarely has lost the ability to keep up with a winter storm due to the Town’s high preparedness level and ongoing mitigation actions. Fortunately, the regular occurrence of winter storms also causes most residents to maintain a high level of preparedness for winter storms.

As population growth and housing expand along remote road corridors, increasing dependency on local roads by the new homeowners requires changes in winter maintenance. The town has, thus far, been able to keep up with those increased demands on its services through its combination of town employee utilization and equipment purchases coupled with contract rental of larger equipment as needed.

Without that preparedness level and with a community vulnerability score of 3, Winter Storm/Ice Storm would be considered HIGH PRIORITY based on the highly likely occurrence and the high portion of the community impacted.

- **Drought** (Risk Score – 10)

Location: Drought, due to lack of rain resulting in a receding water table is generally a regional issue due to its widespread nature. Any location within the town could experience drought and/or lowered water table. Residents along the lakes and creek live close enough to these sources that non-potable water could be taken from them. Potable water would have the same limited availability in these areas as in all other areas of town.

Extent: Four types of drought are identified in the State of Vermont’s Hazard Mitigation Plan: meteorological, agricultural, hydrological and socioeconomic. Local knowledge indicates dry spells are periodic in nature and would be considered moderate to severe every 10 years on the average. Within the Town of Leicester the most obvious risks associated with drought include drying up of shallow wells (Hydrological) and reduced productivity of agricultural crops (Agricultural). Lands bordering Otter Creek, Fern Lake and Lake Dunmore would suffer least from a drought due to the ability to pump water from those sources. Camps along the lakes historically have drawn water from the lake and brought in their own drinking water. Agricultural lands along Otter Creek can reduce the effects of an agricultural drought due to the possibility of irrigating from that water source.

Palmer Drought Index Table

≥ 4	3. -3.99	2.-2.99	1-1.99	.5-.99	.49 -.49	-.5 -.99	-1 -1.99	-2 -2.99	-3 -3.99	≤ -4
Extremely Wet	Very Wet	Moderately Wet	Slightly Wet	Incipient Wet Spell	Near Normal	Incipient Dry Spell	Mild Drought	Moderate Drought	Severe Drought	Extreme Drought

Previous Occurrences: Within the past 25 years NCDC reported no severe drought events. However, an extended drought period in the region occurred during the 1960s when much of Vermont experienced severe drought in 1964 and extreme drought in 1965 and 1966. The years following this drought period saw the development of several community-owned water systems in communities along Lake Champlain. Similar conditions could result in new calls for a public water supply in communities like Leicester. Most recently, a dry period in 2000 saw a few residents in the Addison region without water for several weeks which was finally relieved by fall rains.

Future Probability: Historical records show periods of moderate to severe drought impact Vermont every 30 -40 years with the last occurring during the 1990s. Were this pattern to continue, a moderate to severe drought would be expected sometime in the decade between 2020 and 2030.

Vulnerability Summary: Residents depending on shallow wells always run the risk of them drying up in droughty years. When these wells do dry up, residents tend to depend on a neighbor's water supply or another nearby water source. Following occurrences such as that, an increase in well drilling can often be observed in the Addison region. The limiting factor in drilling a deep well is usually the cost of the drilling itself. Direct costs of drought conditions tend to be borne by individual residents and therefore are difficult to track accurately. The well that supplies the town offices and Town Hall are dependent on a well owned by the school and are more dependent on a back-up power source than the depth of the well itself.

With a community vulnerability score of 2, drought would be considered MEDIUM PRIORITY based on a moderate overall impact to the community with a relatively common period of occurrence.

- **Winds-(Extreme)** (Risk Score – 10)

Location: Damages due to high winds are rare in Leicester and are dependent on the location of the wind gusts and/or cyclonic wind. While these weather events generally cannot be precisely located, the prevailing winds are generally from the north or south. Wind can also be compressed along the base of the mountains causing increased velocities in the areas of Lake Dunmore Road and Route #73. The entire Town of Leicester is at risk of high wind damage depending on where the winds strike.

Extent:

High winds come in many forms in Addison County and are included in damages associated with Hurricane, Tornado, Wind-shear and Hail Storms. The National Weather Service issues a wind advisory for sustained strong winds of 31 to 39 mph (Beaufort #7) or gusts of 46 to 57 mph. Winds of greater than 58 mph trigger a High Wind Warning.

Often, thunderstorms are accompanied by hail which generally results in minor property damages but can have a large effect on agricultural crops like apples and corn.

Remnants of hurricanes striking Vermont are uncommon and bring not only heavy rain but high winds as well. Similarly, tornadoes are known to occur and have been reported in the Addison Region. Tornadoes are less common than hail storms and high winds, but have occurred throughout Vermont.

The worst case high wind event could uproot trees, tear roofing from structures and collapse old or poorly constructed buildings. The loss of power and land line phone service is also possible during these events due to downed power lines caused by the falling trees.

Beaufort Wind Scale

MPH	Beaufort #	Description	Effects
0-1	0	Calm	Calm; Smoke rises straight up
1-3	1	Light Air	Wind motion causes smoke to drift slowly
4-7	2	Slight Breeze	Leaves rustle, wind is felt on exposed skin
8-12	3	Gentle Breeze	Leaves and small twigs in constant motion
13-18	4	Moderate Breeze	Small branches move; dust and loose paper raised
19-24	5	Fresh Breeze	Small trees sway;
25-31	6	Strong Breeze	Large branches sway; overhead wires “whistle”
32-38	7	Near Gale	Whole trees in motion; walking into wind takes effort
39-46	8	Gale	Twigs break off trees; cars veer on the road
47-54	9	Severe Gale	Branches break; Light structural damages
55-63	10	Whole Gale	Trees blown over; considerable structural damage
64-73	11	Storm	Widespread structural damages
74+	12	Hurricane	Considerable and widespread damage to structures

Past Occurrences: NCDC records indicate The Addison Region has experienced 34 High Wind events and 35 Strong Wind events over the past 25 years resulting in \$1,451,000 in cumulative property damage and \$25,000 in crop damages. No information was found that would corroborate specific wind damage in the Town of Leicester.

In June of 2005 and in July of 2003, locally developing lines of thunderstorms resulted in a combined total of over \$150,000 in damages to communities in Addison County. Another high wind event occurred in 2007 to the south of Addison County which resulted in a so-called Nor-icane. This storm became a presidentially declared event (DR 1698) and resulted in over \$1,000,000 in reported damages. A total of 108 Thunderstorm wind events have been recorded in the Addison Region over the past 25 years with the highest recorded winds of 65knots in July of 2012. Within the 25 year record a total of \$1,433,000 in cumulative property damages due to high wind events were recorded.

The largest recorded hail size in the past 25 years was 2" in diameter in New Haven in December of 2012.

Since 1953 40 tornadoes have been recorded in the State ranging from F1 to F2 on the Fujita Scale. These storms killed 9 people and caused over \$8.4 million dollars in estimated property damage. Addison County experienced two of those storms. In June of 1965, a twister touched down resulting in \$37,000 in damage and one death. Another in 1983 struck the northern portion of the county and resulted in crop losses exceeding \$500,000. On May 27, 2014 a tornado was reported to have touched down in the Addison County communities of Bridport and Cornwall.

Hurricanes in 1938 and 1950 are still remembered by older residents when barns collapsed and animals needed to be rescued or put down due to injuries. More recently the remnants of Tropical Storm Irene in 2011, brought heavy rains and flooding to Vermont, fortunately without the typical high winds.

Future Probability: Over the past 15-20 years there has been an observable increase in the severity and frequency of storms in Leicester. Extremes in warming and cooling which we have seen in recent years lead to high winds as convective forces meet cooling forces. It is probable that in the future, we will not see a lessening in winds or wind producing storms. The current cycle would also predict an increase in tropical storms and tornados.

Vulnerability Summary:

While Leicester has managed to avoid many of the larger high wind events, localized strong winds have resulted in occasional damage to roof panels and loss of shingles. High winds also result in increased damage to trees which, in turn, leads to power outages. Because of its gently rolling terrain, the entire Town of Leicester is at risk for damage during high wind events.

With a community vulnerability score of 2, a High Wind incident is a MEDIUM PRIORITY based on the likely annual occurrence of an incident with the potential for isolated impacts.

- **Fire (Structural)** (Risk Score – 10)

Location: There are wood frame structures susceptible to structure fire scattered throughout the Town of Leicester with the highest concentrations along the shores of Lake Dunmore and Fern Lake. Most of these were built before modern fire-resistant construction material and methods were developed. Particularly along the lakes, these summer residences, prior to current zoning, were built

close together to take advantage of lakeshore access, thus making them more vulnerable to a wind-spread multiple structure fire.

Extent: The community's greatest risks for structure fire are within the shorelines of Lake Dunmore and Fern Lake where traditional growth patterns of small seasonal camps have resulted in tightly packed individual structures accessed via narrow and poorly constructed driveways. The combination of tightly packed structures and poor access for fire equipment is at its highest risk during winter months. The combination of snow, unplowed driveways, and lack of residents during the off season could lead to a fire getting out of control and spreading to nearby structures before the fire department could even get close enough to access the incident.

Past Occurrences: Responses by the Brandon Fire Department for structure fires have averaged less than 2 annually over the past few years. This number represents less than 10% of the calls made to Leicester, the majority of which are associated with motor vehicle accidents.

Annual responses to Leicester fire calls from the Brandon Fire Department

2005	2006	2007	2008	2009	2010	2011	2012	2013
19	26	26	24	16	17	22	24	25

Probably the largest structure fire in Leicester's history took place in 1942 when the abandoned Silver Lake Hotel, a three story structure located on the shores of Silver Lake burned to the ground.

Future Probability: Over the past 20 years, prices for these summer cottages have skyrocketed mostly due to the value of the land they sit on. The increased purchase costs of these properties drives a slow conversion from seasonal to more expensive year-round residences because owners feel a need to get more use out of them. The pre-existing small lot size converted to year-round homes increases the per acre value and increases the potential losses from wind driven fire.

Vulnerability summary: Except within these camp neighborhoods, new development has not had a huge impact on fire risk due to improved construction methods. State codes for commercial construction have fire protection embedded within the standards. Unfortunately, risks to firefighters continue to escalate as newer construction materials often produce a dangerous combination of gasses when burned.

The town's contract with Brandon's well trained and equipped fire department including access to mutual aid from neighboring departments helps reduce risks to life and loss of property.

The community vulnerability score is 2 for structure fire which is a MEDIUM PRIORITY based on the highly likely occurrence of an incident with the potential for negligible impact.

- **Fire (Wildfire)** (Risk Score – 10)

Location: Generally, two different wildfire fuels can be found within the boundaries of the Town of Leicester. The forested areas of town, primarily located in the eastern half are characterized by fuels found in the duff layer (leaves, fallen branches, etc.). The central and eastern portions of Leicester, except for the wooded wetlands, generally have a fuel base of dried grasses and shrubs. The entire community is at risk of wildfire during dry periods. Forested areas and open fields are both most at risk each year in the spring following snow melt and before spring growth has started.

Extent: Springtime burning of open fields has been a longstanding historic practice thought to improve field fertility. Every few years, these get out of control due to either poor planning or unexpected winds. Generally, this type of wildfire is limited to a few acres and poses limited threats to structures lying close to the fuel source in the path of the fire. Fires in the forest tend to be smaller, usually limited to under an acre in size. These are generally mitigated by hardwood tree species and cover on the forest floor. Lakeside camps can sit among evergreen trees with a deep duff layer comprised primarily of needles. These camps also traditionally have open fires as part of the summer camping experience. The combination of these factors can lead to a higher fire risk in these areas.

Past Occurrences: No records of wildfire activity have been found for the Town of Leicester. However, the State Agency of Natural Resources keeps track of fires in the entire state. Most wildfires are never reported to State forestry officials and are therefore not shown in their annual reports. Based on the period between 2001 and 2010 the fires which were reported averaged just under 120 fires which burned a total of 215 acres.

Vermont Wildfire Statistics

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
# fires	189	100	101	86	221	118	81	115	95	88
# Acres	295	146	95	250	547	254	180	138	164	84
Ave. Size	1.56	1.46	.95	2.91	2.48	2.15	2.22	1.20	1.73	.95

Addison County Wildfire Statistics

Year	2006	2007	2008	2009	2010
# fires	2	4	6	10	1
# Acres	.5	9	10	4.5	1.2

Within the past 50 years, forests have been closed to recreation state-wide 3 times due to extreme fire conditions. While these incidents have not resulted in large-scale damage in the Town of Leicester, the conditions existed for widespread forest fires. In addition, an unusually dry spring will often result in a no-burn proclamation most recently seen in 2009.

Future Probability: The combinations of factors which lead to widespread wildfires usually coincide with extended droughty conditions. Periodic droughts occur every 30-40 years in Vermont and based on observed patterns, would be next expected in the decade between 2020 and 2030. During this period additional risk for wildfire would exist and an increase in wildfires would also be expected.

Vulnerability Summary: In spite of an active agricultural base, much of the Town of Leicester is forested. Consequently, many structures, especially camps along the lakeshores in town would fall within an urban/wildfire interface. This increased risk for forest fire due to proximity is moderated by the so-called “Teflon Forest” conditions of the Northeastern US. While moisture levels generally tend to be higher than in the fire-plagued western forests, scattered periods of drought can increase fire danger levels to *Extreme* particularly during spring and fall seasons when dry leaves cover much of the forest floor.

Increased development within the urban/wildfire interface continues throughout the state and Leicester has not escaped that trend. It is becoming increasingly important that residences and

essential facilities be constructed with an eye toward wildfire resistance by establishing no-burn zones around structures and by providing suitable water supplies for fire fighting to more remote residences.

With a community vulnerability score of 2, wildfire is considered a MEDIUM PRIORITY based on a high likelihood of occurrence and a low overall impact to the community.

- **Flood- (Flash Flood)** (Risk Score – 9)

Location: In the Town of Leicester, conditions susceptible to flash flooding generally only occur along the town's eastern border at the base of the Green Mountains. The remainder of town is much more a rolling landscape which doesn't usually lead to flash floods.

Extent: Summer downpours and remnants of tropical storms can have the effect of concentrating flood waters into small and narrow areas, particularly in steeper geographic regions. According to NCDC statistics, the Addison Region has experienced 31 flash flood events over the past 25 years. The highest record of damage was \$1,000,000 during that period in July of 1998. During the period an estimated \$32,310,000 in property damages and \$1,500,000 in crop damages were incurred. None of this damage was experienced in Leicester due to the limited infrastructure located in susceptible terrain. Generally, the largest impact to Leicester from flash flooding is damage in its neighboring towns which restrict the flow of traffic along Rte #73.

Past Occurrences: In 2008, a series of summer downpours caused flash flooding in the nearby towns of Goshen, Ripton and Middlebury. This incident (DR1790) caused extensive damage to a bridge on Route 73 in the neighboring town of Salisbury. Previous declared disasters which included Addison County had little or no effect on the Town of Leicester.

Future Probability: Since much of the eastern part of Leicester and its eastern neighbors is under the ownership of the Green Mountain National Forest, much of the flash flood susceptible portion of town is unavailable for future development. With the increased frequency of heavy rains experienced in the past 25 years, conditions for flash flooding would be more common. The lack of impact to Leicester from recent events, however, would indicate a similar result in spite of the increased frequency.

Vulnerability Summary: Flash flooding is generally not a major concern for residents of the Town of Leicester. The limited area conducive to flash flooding and limited infrastructure in that area make the community relatively resistant to large scale damages caused by flash flooding.

Flash flooding shows a community vulnerability score of 2 which would be considered a MEDIUM PRIORITY based on a relatively low probability but extremely short warning with a minor impact to infrastructure.

- **Flood (Inundation)** (Risk Score – 8)

Location: The Town of Leicester is most susceptible to inundation flooding in the mapped floodplains along Otter Creek and its tributaries. This area includes the Leicester-Whiting Road and Old Jerusalem Road which runs along the creek banks. Approximately ¼ of the land area in Leicester lies within this area.

Extent: FIRM flood maps, digitized in 2006 by ACRPC and E911 points as documented by the State E911 database were compared digitally and where the two sets of data intersect, there are 22 single-family residential, 7 mobile homes, 30 Camps, 2 Commercial, 1 Industrial and 1 church-owned structures in the town that are potentially vulnerable to flooding. The primary areas of concentration for these structures centers along the shores of Lake Dunmore and Fern Lake and along the Leicester/Whiting Road in the Leicester Junction area. The grand list values of these properties, listed according to Vermont's standards at 1/100 of their estimated value, totals \$142,000. This represents 5.7% of the grand list.

Past Occurrences: The Addison Region has experienced 21 flooding events over the past 25 years with reportable damages. The highest record of damages experienced during that period was \$250,000 in Panton in 2011. During the 25 year period an estimated \$570,000 in property damages were incurred.

The Town of Leicester has been hit with 3 of these presidentially declared disasters in the past 10 years (July 2005, August 2008, and September 2011) as a result of flooding which has resulted in more than \$55,000 in FEMA reimbursements.

Future Probability: Since the desirability of a "home on the water" is quite high, pressure to develop additional lands within floodplains is increasing. While current long-term residents of Leicester generally know better than to build on any floodplain that floods every few years, newcomers to town could view these locations as desirable. Given the poor quality of the FIRMs serving the Town of Leicester, it is not hard to imagine the incremental process of filling in the natural floodplain to elevate new homes. While these new homes would be considered safe from flooding, the impacts of lands both upstream and downstream would likely put additional infrastructure at risk.

Vulnerability Summary: The Town of Leicester, in its historic development patterns, is relatively flood-safe. Homes along Lake Dunmore are shown in the FIRMs to be at flood risk only by virtue of a fudge factor on this elevation controlled lake. Similarly, several of the structures in Leicester Junction shown to be at risk are, in fact, located well above the elevation of a 1% flood. Limitations for development in floodplains provided by base NFIP standards subsidize growth in a mapped floodplain and may not sufficiently address the hazards associated with proximity to the river. In addition to an increased demand for development, the Town is limited in its ability to effectively regulate the mapped flood areas due to the overall poor quality of the available FIRMs. These factors leave the door wide open to increasing the town's overall vulnerability to inundation flooding.

The community vulnerability score of 2 for inundation flooding is a **MEDIUM PRIORITY** based on the highly likely occurrence of an incident with only an isolated extent and minor impacts.

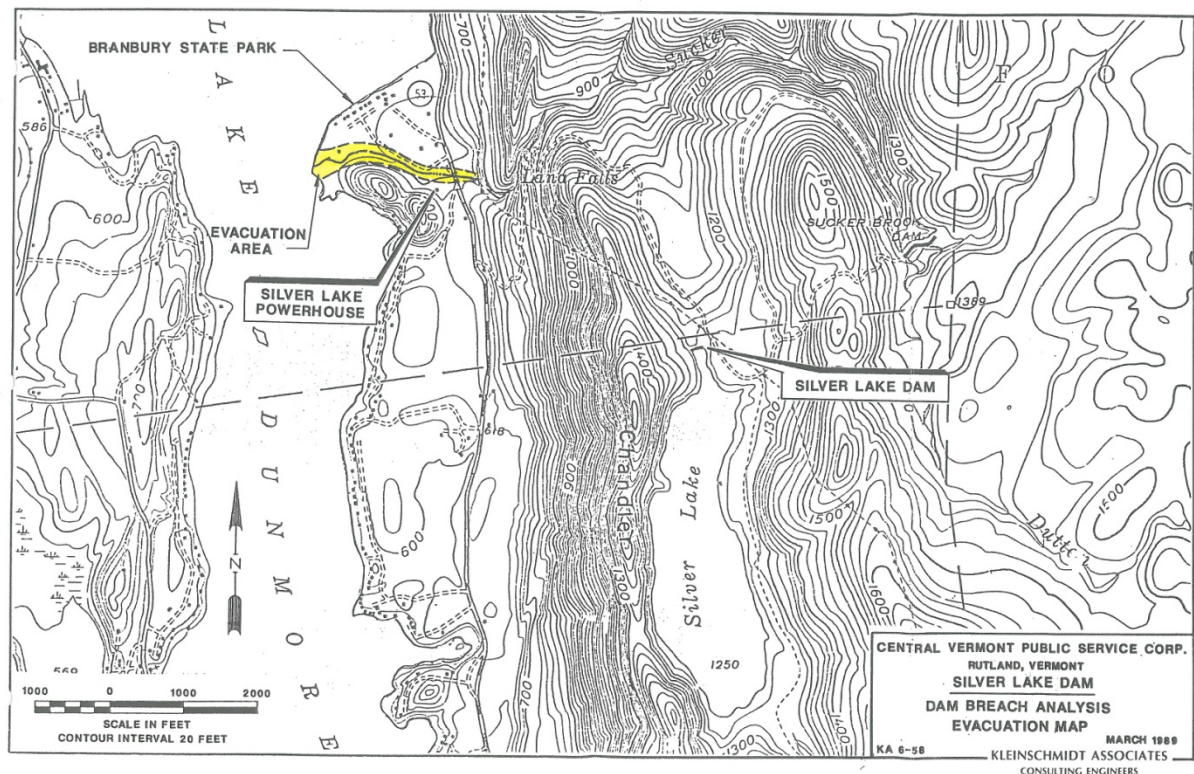
- **Dam Failure** (Risk Score – 5)

Location: Leicester has one dam identified in the State's dam inventory database. The Silver Lake Dam is located in the eastern portion of Leicester within the bounds of the Green Mountain National Forest and is much higher in elevation than most of town.

Extent: The Silver Lake Dam in Leicester is a 280 foot long and 30 foot high structure which creates Silver Lake, containing 3003 acre feet of water. The dam is part of the overall Silver Lake Project owned by Green Mountain Power Corp. The Silver Lake Project consists of the Sugar Hill

Dam located in the Town of Goshen, the Sucker Brook Diversion Dam and penstock located in the Town of Salisbury, the Silver Lake Dam located in the Town of Leicester and a penstock/powerhouse combination located in the Town of Salisbury. Failure of any of the upstream structures could overwhelm a downstream dam and cause a cascading flood event.

The potential impacts downstream of a dam failure would impact campers in the Branbury State Park in the Town of Salisbury, resulting in this dam on the State's high hazard dam list.



Past Occurrences: No records of past dam failures have been found in the Town of Leicester.

Future Probability: The Silver Lake Dam is an earthen structure with a concrete core initially constructed in 1914 which raises the natural elevation of the lake ten feet. The dam is closely monitored with periodic site visits and remote sensing gauges. As long as the dam is kept in good repair, it is unlikely it will have a catastrophic failure in the near future.

Vulnerability Summary: The Silver Lake Project complex has an extensive emergency action plan which addresses both emergency actions and preparedness actions that consist of routine inspections of the dam by GMP employees and a regular exercising of the project's plans.

Considering that the downstream impacts of a dam failure would be seen only in the Town of Salisbury, the community vulnerability score for Dam Failure is 1, and would be considered a LOW PRIORITY based on the low likelihood of occurrence and the limited area impacted.

- **Landslide/Erosion**(Risk Score – 4)

Location: Landslide/erosion issues are generally limited to erosive actions of high water on riverbanks in town. The banks of the Otter Creek along Old Jerusalem Road near Leicester Jct. is the most at risk for erosion associated with river channel movements.

Extent: The ongoing erosion of the river banks along Old Jerusalem Road threatens the stability of that road. A major flood has the potential of undermining and eventually collapsing the entire riverbank destroying Old Jerusalem Road in the process.



Stone applied to undermined bank on Old Jerusalem Road

Past Occurrences: Small portions of riverbank along Old Jerusalem Road have failed in recent years since the elevation of the Leicester-Whiting Road. Where flood waters formerly flowed evenly across the Leicester-Whiting Road dispersing its erosive potential, they are now concentrated and flow under the new bridge. That, in turn, results in a stronger/faster current just downstream of the bridge where riverbank erosion is showing.

Future Probability: Without any mitigation action it is likely that the riverbank along Old Jerusalem Road will continue to erode eventually resulting in a massive failure that will take the road along with it.

Vulnerability Summary: Due to historic patterns of development, landslide/erosion issues are generally limited to erosive actions of high water on riverbanks in town. The banks of the Otter Creek along Old Jerusalem Road near Leicester Jct. is the most at risk for erosion associated with river channel movements.

Much of the erosion susceptible property along the river and its floodplain is in agricultural use and is not currently at risk. However, future development along the river is still possible due to the limited protection provided by basic NFIP requirements adopted by Leicester. Among infrastructure at risk is Old Jerusalem Road which has a high level of scour due to the migration of the river channel.

Community vulnerability score for an Erosion/Landslide incident is 1 which is a LOW PRIORITY based on a low probability of occurrence and relatively small area impacted. The communities risk could change depending on future development since the area most susceptible to erosion is not protected from future development by current NFIP-based bylaws.

DRAFT

5. Community Mitigation Strategies

5.1 Hazard Mitigation Goals by Hazard Type **44CFR 201.6(c)(3)(i)**

Each hazard type identified in Section 4 “Community Risk Assessment” can be mitigated dependent on the willingness to do so at the local, state or federal level. For example, the mitigation of flood damage is basically a simple fix- don’t allow anything in the floodplain that can’t afford to be lost and when it is lost, don’t replace it. This would include all forms of infrastructure whether it be homes, highways, dams or croplands. Unfortunately, political will can rarely stand up to the simplicity of mitigation.

The Town of Leicester has identified that its goals for hazard mitigation are to reduce and/or avoid all long and short term vulnerabilities to the hazards identified in section 4.3. In doing so, it also recognizes that political will and lack of funding stand in the way of many mitigation projects. The Town particularly supports local residents’ efforts to mitigate their own personal risks. The Town also supports projects that lead to a positive benefit vs. cost evaluation and which the voters find affordable.

Identified Hazard	Primary Mitigation Goal
Widespread Power Failure	Ensure that essential services can function during disaster
Haz Mat and Transportation Accidents	Ensure that highway improvements result in safer conditions
Earthquake	Protect existing and new properties and structures
Mosquito-borne Illness	Provide for the outdoor recreational safety of the public
Winter Storm/Ice Storm	Ensure that essential services can function during disaster
Drought	Ensure that all new and existing residences are drought resistant
High Winds	Ensure that essential services can function during disaster
Structure Fire	Protect the health and safety of the public
Wildfire	Protect the health and safety of the public
Flash Flood	Reduce loss of infrastructure due to flash flooding
Inundation Flooding	Protect existing floodplain from development
Dam Failure	Protect the health and safety of the public
Landslide/Erosion	Reduce loss of infrastructure due to erosion

5.2 Authorities, Policies, Programs, Resources (and the ability to expand upon these) **44CFR 201.6(c)(3)**

Authorities of Town Officials:

Selectboard: The Selectboard is responsible for the basic administration of the town. They take care of roads, make appointments to other boards and commissions, and authorize expenditures of voted budgets. The selectboard may enact ordinances and rules in many areas including traffic regulation, regulating nuisances, managing solid waste, dogs and recreation, and establishing bike paths.

Planning Commission: The Planning Commission is responsible for long range planning in a town particularly as it relates to future land uses. They prepare a municipal plan and zoning bylaws which are adopted by the Selectboard. Planning Commission members are appointed by the Selectboard.

Zoning Administrator: The Zoning Administrator (ZA) is appointed by the town’s Selectboard with consideration given to the recommendation of the planning commission. Their responsibilities

include administration and enforcement of a town's zoning bylaws, The ZA and usually also serve as the administrator of town floodplain regulations.

Tree Warden: The Town Tree Warden is responsible for the shade and ornamental trees within the town rights-of-way. They oversee tree health and removal when necessary. The tree warden is appointed by the Selectboard.

Fire Warden: The Town Forest Fire Warden has the responsibility for suppression of wildland fires, regulating open burning in the town by issuing burn permits, and wildfire education/prevention. The Town Fire Warden is appointed by the state Commissioner of Forests, Parks and Recreation with approval by the town's Selectboard.

Health Officer: The Town Health Officer is the executive officer of the local Board of Health. A local board of health may make and enforce rules and regulations...relating to the prevention, removal, or destruction of public health hazards and the mitigation of public health risks. The Town Health Officer is appointed by the Commissioner of Health with approval by the local Selectboard. They take direction from the state Department of Health in investigation and enforcement of public health issues.

Emergency Manager or Coordinator: By default, a towns Selectboard chair is the town's emergency management director (EMD) unless one is appointed. Many communities retain the authorities of an EMD within the Selectboard and appoint an emergency coordinator instead. The emergency manager is responsible for the organization, administration and operation of the local emergency management organization. Emergency managers prepare local emergency operations plans, coordinate a local emergency management group and perform emergency management functions at the local level.

Current policies, programs, resources and the ability to expand on these for identified hazards:

Widespread Power Failure

Many private residences have back-up power sources and essential Town facilities such as the Leicester Town Hall have been retrofitted with back-up power in recent years.

As population growth and housing expands along local road corridors, increasing reliance on dependable power by the new homeowners requires changes in line maintenance. Green Mountain Power (GMP), the utility servicing the Town of Leicester has an ongoing program of line clearing and relocation to ensure outages are kept to a minimum. In addition, recent improvements to the transmission system in northwest Vermont have provided redundant systems to bring electric power to the region.

The Town of Leicester supports development of a robust and redundant local electric generation and transmission system for its residents by providing access to the town rights of way for the power company. This support is limited to that which can prove that the benefit to local residents outweighs the societal costs associated with industrial generation and transmission degradation impacts to the local landscape.

In the future, providing back-up power to the school and the school well would ensure that town infrastructure would be less impacted by widespread power failure.

Hazardous Materials and Highway Transport Accidents

A representative from the Town of Leicester is an active member of the Local Emergency Planning Committee in planning for hazardous materials incidents. The Town mitigates risk to local responders by reporting its Tier II facilities as required at both the state and local levels.

The Brandon Fire Department, contracted to respond within Leicester, is host to a regional HazMat Decontamination trailer, providing mitigation through proximity of response resource.

The Town zoning bylaws section 500 specifically limit storage of flammable liquids above ground and within specified distances of schools, hospitals, libraries, and religious institutions. In addition, Town zoning bylaws limit storage of hazardous materials in the mapped floodplain.

A representative from the town sits on the local Transportation Advisory Committee, a regional group whose purpose is to prioritize potential transportation related projects within the region. This group rates High Accident Locations (HAL) highly in prioritizing projects to mitigate the risks associated with these locations. TAC assists the town by changing alignments, added signage and reduced speeds. Funding a safety study of the HAL at Leicester 4 corners would be an example of an appropriate request for the ACRPC annual TAC grants.

Earthquake

Despite the probability of an earthquake within the next 50 years, most town residents do not even attempt to mitigate its hazard.

As in most communities in Vermont, no building codes exist in the town which would serve to mitigate the impacts of an earthquake. The Town of Leicester has not identified earthquake as a hazard it feels is imminent enough to justify much in the way of mitigation actions.

Making educational materials on earthquake hazards available would allow reasonable decisions to be made during new construction.

Mosquito-Borne Illness

The Town of Leicester, is committed to lessening the risks associated with mosquito-borne illness by monitoring mosquito populations and applying appropriate control measures when warranted. As a member of the Leicester, Brandon, Salisbury and Goshen Mosquito Control District, the town supports the district through an annual financial contribution and through the efforts of resident volunteers who monitor insect populations and assist in spray applications. Recent developments in diseases has increased awareness in the community and has resulted in targeted spray applications by the State of Vermont

Making mosquito pamphlets available to residents would increase their knowledge of actions they could take to mitigate this hazard.

Winter Storm/Ice Storm

Mitigation activities by power companies have re-routed many of the remote lines along town highways since a 1998 ice storm and an increased pruning effort has reduced the impact of a similar event would it happen today.

The Town of Leicester mitigates its winter storm risk through preparedness activities in the form of appropriately sized equipment and training. The periodic cutting of brush along town highways also mitigates the effects of large winter storm events by reducing their ability to act as snow fence dropping windblown snow into the town highway system.

All improvements to the road system will take into account ease of snow removal in design.

Drought

Most homeowners with shallow wells have learned to live with the inconvenience of dry spells by purchasing bottled water and using public toilets and laundries for the short periods they would be without a dependable water supply. When the inconvenience has become too much, many of these homeowners have mitigated the problem by drilling deep wells. Increasingly, home mortgages are requiring a dependable deep well water supply as a condition of a loan.

Agricultural activities highly dependent on water such as fruit and vegetable crops can be severely impacted by lack of rain. Most of these businesses mitigate the effects of periodic droughts by providing irrigation systems. Other farms, dependent on crops to feed livestock rather than humans, are highly impacted by low water supplies and may be dependent on a USDA disaster declaration to find relief.

Reduced water supplies also impact the community's fire fighting capabilities. Since no public water supply is available, the contract fire department is highly dependent on surface water supplies for fire fighting. As housing continues to expand into rural areas, the potential lack of a dependable water supply for fighting fire is becoming an issue.

Leicester's current subdivision regulations call for "adequate" water supply to be provided for any subdivision. As a mitigation measure shared with structure fire and wildfire, future development may need to be required to provide fire ponds as part of an impact assessment.

Recent changes to state water/wastewater rules require adequate potable water and septic as part of any subdivision of land. The town planning commission requires adherence to these rules as part of any subdivision approval. The potable water requirements in these rules should have the effect of lessening the impacts of drought.

High Winds

Residents of the Town generally do not recognize high wind as a hazard which can be mitigated with the exception of the effects previously discussed under widespread power failure.

Newly constructed buildings may have tie downs between roof and side walls but no building codes exist within the community that require construction to any particular standard.

Where high wind hazards have been recognized, it is usually a function of damage that might be caused if a tree were to be blown over and its effect on a residents' home. For this reason, some trees are removed from the landscape to reduce their vulnerability to high wind events.

The Town of Leicester removes dead and otherwise hazardous trees in the town right-of-ways which mitigates the hazards associated with their falling either on town highways or on power lines.

Structure Fire

Installation of dry hydrants at water supply locations can increase the availability of and speed in which water can be accessed for firefighting purposes. To date, the Brandon Fire Department, who contracts with the town to provide fire suppression services, has not installed any dry hydrants in Leicester. The Selectboard of Town of Leicester supports installation of these hydrants as funding permits and suitable locations can be identified.

Actions identified under the Drought hazard would also mitigate structure fire and wildfire risk in future developments.

Wildfire

Leicester has an active fire warden who requires permits prior to any outdoor burning in the town. This process includes a site visit at the proposed burn site and a subsequent issuance of a permit. Enforcement is usually limited to a warning if the fire seems lit out of ignorance and can result in fines if the fire department is called out.

The town has no guidelines for home construction in place that would limit the risk to wildfire in Leicester. Actions taken as described above should limit the setting of uncontrolled outdoor fires and should result in an overall limited risk. In addition, fire ponds required as an impact assessment should mitigate fire risk in future developments.

Flash Flood

Leicester is active in mitigating the hazards associated with flash flooding which are limited to the eastern side of town. Culvert upgrades and ditch treatments are implemented as part of normal maintenance activities along roads in this area.

The Town of Leicester adopted the 2013 version of road and bridge standards as recommended by VT AOT on 4/1/2013. These standards address road and bridge construction, are designed to mitigate local traffic issues and are particularly designed to mitigate potential damages due to flooding and flash flooding. The standards address culvert sizing, ditch treatments and driveway access to reduce flood-caused erosion. The adopted standards are attached as Annex F of this mitigation plan.

Flood (Inundation) 44CFR 201.6(c)(2)(ii), 44CFR 201.6(c)(3) (ii)

The Town has been a member in good standing of the NFIP for over 30 years. There are no identified “Repetitive Loss” properties or “Severe Repetitive Loss” properties located in Leicester. One flood insurance policy is in effect for a single residence in the town and it is insured for \$280,000.

The Town understands the risks associated with development in the floodplain even if new structures are properly elevated and supports limiting all new construction within mapped floodplains. The Town, however, is reticent to implement such regulations given the broad inaccuracies of the current FIRMS. The Town will require new FIRMS proven to be more accurate than the current ones before taking action that might limit development on lands improperly mapped.

The Town supports continued compliance with the NFIP. The local zoning administrator is charged with administering the local floodplain ordinance in addition to their regular zoning duties. Leicester would support Community Rating System (CRS) improvements when the benefits to the town’s residents would outweigh the costs of additional administration and compliance.

Dam Failure

The Town of Leicester does not generally address dam failure mitigation in its day-to-day activities leaving the protection of the public up to State dam safety inspectors. Since the only registered dam would impact the neighboring town and not Leicester, there is little concern and mitigation actions have been left up to the State and Federal authorities.

Landslide/Erosion Hazard

Unfortunately, the relatively short lives (compared to geologic time) of property owners lead them toward the belief that the river has always been stable and that it is poor management that causes channel migration rather than the unstoppable forces of nature.

In the most current Town Plan, adopted in 2012, the town planning commission indicates a desire to reduce the erosion of river banks and the resultant sedimentation which cause nutrient loading into the river systems. By encouraging vegetative buffers along riverbanks it is believed that future erosion will be reduced.

Adoption of zoning regulations which would require a buffer along all riverbanks would mitigate some of the effects of channel migration but could be difficult to adopt as property owners often do not recognize the threats associated with river channel migration over time.

5.3 Project Prioritization process

Projects and actions included in Section 5.2 are conducted by the Town of Leicester or regional and State agencies where noted. The Town encourages its residents to adopt mitigation actions which could protect their personal property by making educational materials available to residents. Many of these potential actions are contained in Annex C as mitigation measures for individuals. Mitigation actions identified in Section 5.4, however, are considered the jurisdiction's priority mitigation actions. These actions/projects are constantly evaluated for benefit to the community, estimated project cost and political will to implement and will be implemented as those factors indicate. The actions identified in Section 5.4 under each hazard have passed a preliminary evaluation utilizing those general concepts by the hazard mitigation committee, and are listed in their order of priority. Before undertaking these projects, they will additionally be prioritized based on their feasibility and a benefit vs. cost review. A minimum C/B result of 1.0 will be required prior to any request for federal mitigation funds. Annex D identifies only some of the available programs which can help to fund some of these actions/projects. All projects in section 5.4 will be reviewed for progress following any local disaster declaration and will be considered annually as part of overall town budgeting.

5.4 Proposed Mitigation Projects/Action Plan by Hazard Type 44CFR 201.6(c)(3)(ii)

In developing the following list of proposed mitigation actions and projects, care was taken to include only those projects which could be considered reasonable and feasible based primarily on cost and political willingness. The town will maximize 406 mitigation opportunities whenever possible when making repairs to P/A eligible damages during a declared disaster.

Each project in this action plan includes an estimated cost, possible funding sources, the lead person or agency responsible for completion of the project and an estimated timeframe for project completion. Timeframes are indicated as Short Term (1-2 years), Medium Term (2-4 years) and Long Term (> 4 years)

Widespread Power Failure

The Town of Leicester has identified loss of use of the well at the Leicester Central School which provides potable water to the town office and Town Hall/designated shelter as being critical. Installation of a back-up power source for the school's well is necessary to keep the facilities operational in the event of a widespread power outage that would require sheltering.

Estimated cost: \$18,000-\$24,000

Source of Funds: Town General Fund, School Budget, Federal and State grant sources (HMGP, EMPG, etc.)

Responsibility: Town Emergency Manager, School board (with support from the Selectboard)

Timeframe: Medium (as funding allows)

In future requests for Right of Way usage for maintenance purposes, the Town will normally grant access. Due consideration in granting these permissions will be given when such access will adversely impact scenic corridors and residents desires to keep the beauty of tree-lined streets and roads.

Estimated cost: \$0

Source of Funds: None needed

Responsibility: Selectboard

Timeframe: Short term-Long term

Hazardous Materials and Highway Transport Accidents

The Town has identified the following high risk locations on the highway system and supports mitigation of the hazard in any future construction/reconstruction activities:

- The intersection of US Route #7, the Leicester/Whiting Road / Fern Lake Road is a high accident location and efforts should be taken to reduce that risk. The town will request additional safety measures be applied to this location.

Estimated cost: None to town

Source of funds: State highway budget, TAC Grant

Responsibility: Joint Selectboard and State AOT

Timeframe: Short term

- The intersection of the Leicester/Whiting Road and Old Jerusalem Road is an identified accident location and the town will request additional signage and/or guard rail installation.

Estimated cost: None to town

Source of funds: High Risk Rural Roads Grant,

Responsibility: Joint Selectboard and State AOT

Timeframe: Short term

Earthquake

The Town believes it is the responsibility of private homeowners to be ready for earthquakes. The town generally believes that building construction standards are the responsibility of each private homeowner. The Town also does not believe the risks associated with earthquake are large enough to require any town building retrofits at this time.

The Town feels education is the key to preparing private homes for an earthquake and will make earthquake education materials available at the town office when available.

Estimated cost: None to town

Source of funds: Government Printing Office

Responsibility: Town Clerk/ACRPC

Timeframe: Short term

Mosquito-Borne Illness

The Town believes it has a responsibility to its residents to address heavy mosquito populations and is a partner in funding the efforts of the Leicester, Brandon, Salisbury and Goshen Mosquito Control District.

Estimated cost: \$15,000 annually

Source of funds: Annual Town Meeting allocation- general fund

Responsibility: LBSG and Selectboard with support from the voters

Timeframe: Short term

The Town believes its residents also share in this responsibility and encourages use of appropriate repellants and behavior patterns which reduce the likelihood of mosquito bites through education.

Estimated cost: None to town

Source of funds: VT Dept Health printing

Responsibility: Town Clerk/ACRPC

Timeframe: Short term

Winter Storm/Ice Storm

The Town has historically mitigated the effects of winter storms/ice storms through the annual funding of the highway crew and its equipment. While an eye is always kept open for new approaches and equipment options, no actions are currently required.

The Town has identified installation of back-up power for the school well as an important need to allow operation of the town's shelter as a warming shelter in the event of a severe winter storm. This project has previously been identified and evaluated in the Widespread Power Outage section.

Drought

The town believes the State of Vermont's new water/wastewater rules will likely help mitigate the impacts of future droughts. No new action is needed at this time.

High Winds

The town road crew, with assistance from the tree warden, currently removes dead and dying trees from its right of way as part of normal maintenance. This is ongoing work which requires no new actions.

Structure Fire

The Town will support efforts to install dry hydrants throughout town through assisting with applications and providing grant match when available.

Estimated cost: Grant match requirements only

Source of funds: Federal Rural fire protection grants and town funds

Responsibility: Town Selectboard, Brandon Fire Dept

Timeframe: Short Term

The Planning Commission will add upgrading of driveway standards in future zoning bylaw rewrites to support basic accessibility for emergency vehicles to all structures in town.

Estimated cost: \$2,000 as part of an overall rewrite
Source of funds: Municipal planning grants.
Responsibility: Joint Selectboard and Planning Commission
Timeframe: Medium Term

Wildfire

The Town believes it is the homeowner's responsibility to mitigate their susceptibility to wildfire through "firewise" practices. The town will support education in this area by providing educational materials in the town office.

Estimated cost: None to town
Source of funds: Government printing office
Responsibility: Town Clerk/ACRPC
Timeframe: Short term

Flash Flood

Though flash flooding is not a major hazard in Leicester, the following generalized road projects have been identified which will help mitigate the effects of flash flooding in the road network system. These projects will be implemented as funding allows. All identified culvert and bridge replacements will be subject to the State of Vermont's stream alteration permit and the codes and standards adopted by the Town of Leicester.

- Stone Line ditches according to the town's road and bridge standards when work is being completed on any road.

Estimated cost: Varies dependent on project
Source of funds: Town highway budget.
Responsibility: Joint Town Highway Dept and Selectboard
Timeframe: Short term

- Replace culverts along Route 53 east of Lake Dunmore with larger sizes if called for following hydraulic review.

Estimated cost: Varies dependent on project
Source of funds: Town highway budget, State Bridge and Culvert Program
Responsibility: Joint Town Highway Dept and Selectboard
Timeframe: Medium term

Flood (Inundation)

The town will fund attendance by the Zoning Administrator at local NFIP trainings when offered locally.

Estimated cost: \$200-\$300
Source of Funds: Town General Fund Planning and Zoning budget
Responsibility: Town Zoning Administrator/ACRPC
Timeframe: Annual

The Town will evaluate the adoption of more stringent floodplain/river corridor regulations by the town Planning Commission in its next zoning update.

Estimated cost: \$200-\$300
Source of Funds: Town General Fund Planning and Zoning budget
Responsibility: Town Planning Commission
Timeframe: Medium term

The Town will request updated and digitized FIRMs from FEMA to support their flood mitigation efforts.

Estimated cost: None to town

Source of Funds: FEMA map modernization funds

Responsibility: Selectboard to make the request

Timeframe: Short term

The following specific road projects have been identified which will serve to mitigate the effects of inundation flooding in the road network system to be implemented as funding allows. All identified culvert and bridge replacements will be subject to the State of Vermont's stream alteration permit and the codes and standards adopted by the Town of Leicester and will mitigate the impacts on town infrastructure.

- Increase culvert size to prevent flooding ¼ mile east of town shed on Fern Lake Road.
Estimated Cost: \$60,000-\$75,000
Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant
Responsibility: Town Selectboard and road crew
Timeframe: Long term
- Installation of 4 concrete "Dry Bridges" to allow unrestricted flood flow through along Leicester-Whiting Road near Old Jerusalem Road and west of Leicester Jct.
Estimated Cost: \$400,000-\$500,000@
Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant
Responsibility: Town Selectboard and road crew
Timeframe: Long term
- Installation of larger culvert on Shackett Road to allow flood waters unrestricted passage.
Estimated Cost: \$40,000-\$50,000
Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant
Responsibility: Town Selectboard and road crew
Timeframe: Medium term
- Elevate Bullock Road and add larger culverts to prevent flooding.
Estimated Cost: \$10,000-\$15,000
Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant
Responsibility: Town Selectboard and road crew
Timeframe: Long term
- Installation of larger culvert on Old Jerusalem Road near the railroad crossing to allow flood waters unrestricted passage.
Estimated Cost: \$40,000-\$50,000
Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant
Responsibility: Town Selectboard and road crew
Timeframe: Medium term
- Installation of larger culverts on the south end of Swinington Hill Road to allow flood waters unrestricted passage.

Estimated Cost: \$10,000-\$20,000

Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant

Responsibility: Town Selectboard and road crew

Timeframe: Medium term

Dam Failure

There are no identified impacts to the Town of Leicester which would result from a dam failure. No action is necessary.

Landslide/Erosion Hazard

The Town will evaluate adoption of a Fluvial Erosion Hazard Overlay district in its next zoning bylaw rewrite.

Estimated cost: \$2,000 as part of an overall rewrite

Source of funds: Municipal planning grants.

Responsibility: Joint Selectboard and Planning Commission

Timeframe: Medium term

Relocate Old Jerusalem Road along Otter Creek toward the east to avoid erosion hazards associated with the movement of Otter Creek.

Estimated Cost: \$800,000-\$1,000,000

Source of Funds: Town Highway funds, HMGP, VTrans Structures Grant, VTrans transportation funding

Responsibility: Town Selectboard and road crew

Timeframe: Long term

6. Plan Maintenance Procedures

Any Hazard Mitigation Plan is dynamic and should not be fixed. To ensure that the plan remains current and relevant, it is important that it be updated periodically. The plan will be updated at a minimum every five years in accordance with the following procedure:

6.1 Plan Review/Update Process (5 year cycle) 44CFR 201.6 (c)(4)(i) and 44CFR 201.6 (c)(4)(iii)

1. The Leicester Selectboard assembles a Review/Update Committee to include government officials and interested public.
2. The Committee will discuss the process to determine if any modifications or additions are needed due to changing conditions since the last update occurred. Data needs will be reviewed, data sources identified and responsibility for collecting/updating information will be assigned to members.
3. Other Town plans (Emergency Operations Plan, Town Plan, Road Plan, etc) will be reviewed to ensure a common mitigation thread still exists throughout.
4. A draft update will be prepared based on these evaluation criteria:
 - Changes in community and government processes, which are hazard-related and have occurred since the last review.
 - Progress in implementation of plan initiatives and projects.
 - Effectiveness of previously implemented initiatives and projects.
 - Evaluation of unanticipated challenges or opportunities that may have occurred between the date of adoption and the date of the report.
 - Evaluation of hazard-related public policies, initiatives and projects.
 - Review and discussion of the effectiveness of public and private sector coordination and cooperation.
5. The public will be invited to review and give input on drafts as they are produced.
6. Selectboard members will have an opportunity to review the draft update. Consensus will be reached on any changes to the draft.
7. The Selectboard will notify and schedule a public meeting to ensure adequate public input.
8. The Selectboard will recommend incorporation of community comments into the draft update.

6.2 Programs, Initiatives and Projects Review

Although the plan will be reviewed and updated in its entirety at least every five years as described above, the Town will monitor and evaluate its goals, strategies and actions/projects annually as the town budget is created. This will ensure that progress will be reviewed and actions/projects either added or removed from the towns work plan based on changing local needs and priorities. In creation of the municipal plan by the

planning commission, concepts, goals and strategies from this plan will be used to inform the development of that plan and incorporated into that plan when appropriate.

6.3 Post-Disaster Review Procedures

Should a declared disaster occur, a special evaluation process will occur in accordance with the following procedures:

1. Within six (6) months of a declared emergency event, the Town will initiate a post disaster review and assessment of actions.
2. This post disaster review and assessment will document the facts of the event and assess whether the existing Hazard Mitigation Plan effectively addressed the hazard.
3. A report of the review and assessment will be created by a Review/Update Committee.
4. The committee will make a determination whether the plan needs to be amended. If the committee determines that NO modification of the plan is needed, then the report is distributed.
5. If the committee determines that modification of the plan IS needed, then the committee drafts an amended plan based on its recommendations and forwards to the Selectboard for their input.
6. Following completion of a public input process, further amendments may be made and a final plan delivered to the Selectboard for adoption.
7. The Selectboard adopts the amended plan.

7. Plan Adoption Resolution

RESOLUTION

Selectperson, _____ offers the following resolution and moves its adoption. Seconded by
Selectperson_____.

RESOLVE: That in order to provide for sustained actions to reduce or eliminate long-term risk to people and property from hazards and their effects in the Town of Leicester, VT, the Town Selectboard deems it advisable and in the best interests of the community to adopt the attached Hazard Mitigation Plan.

PASSED AND APPROVED THIS ____ DAY OF _____, 2014.

_____, Chairperson

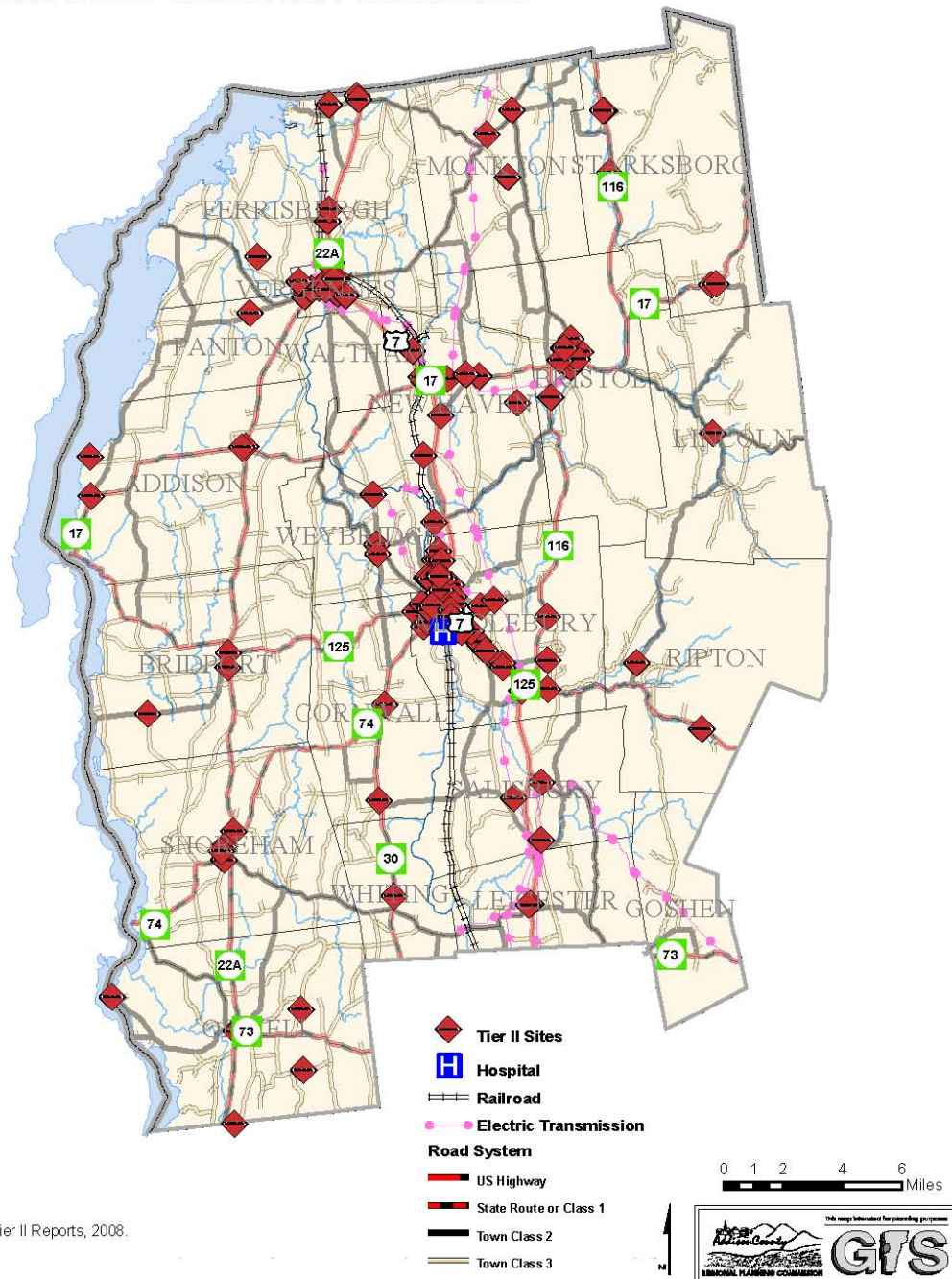
Town of Leicester, VT

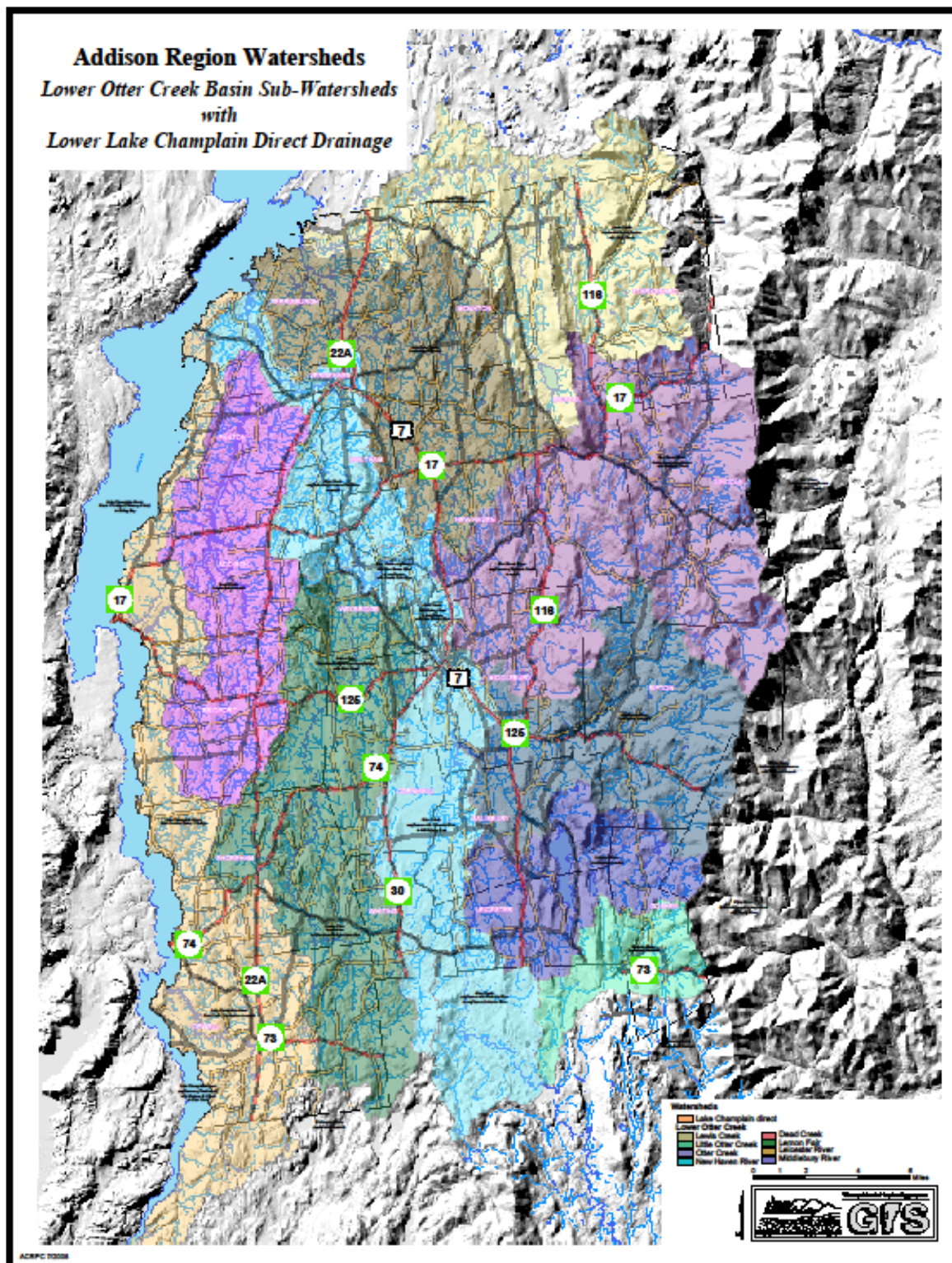
ATTEST:

Town/City/Village Clerk

Annex A Regional Maps

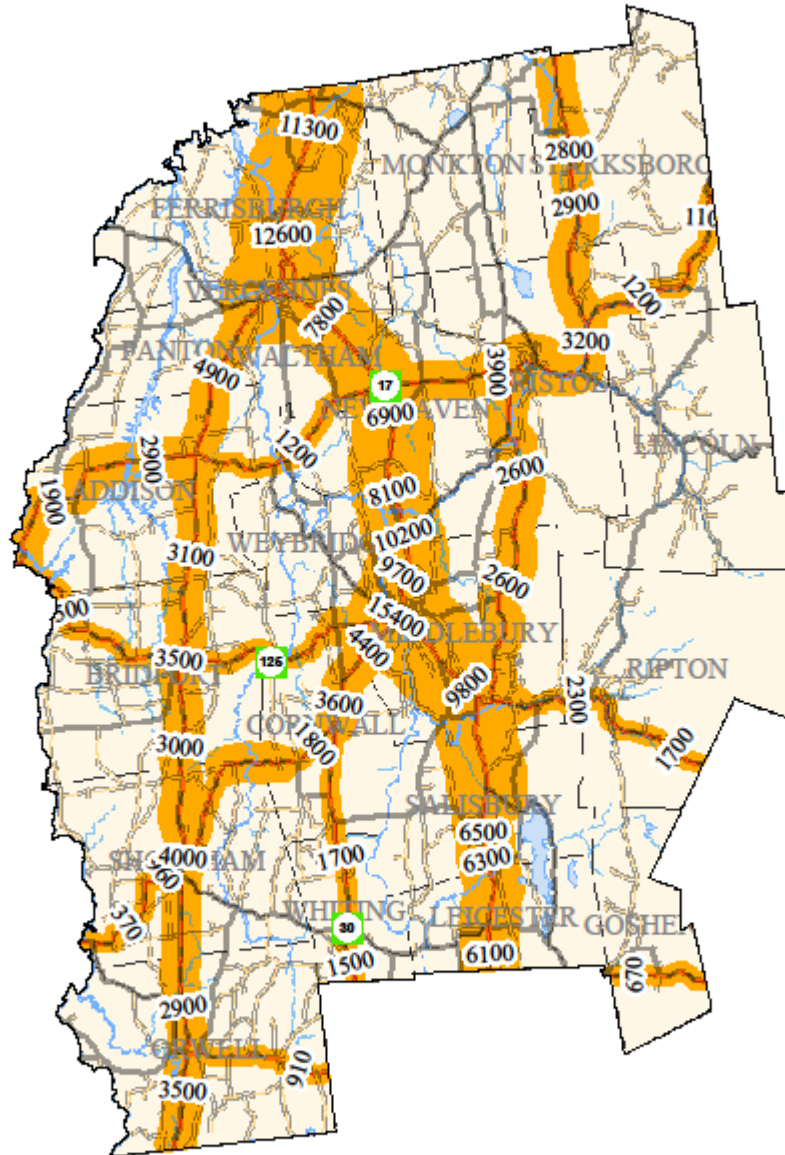
Addison Region *Hazardous Material Locations*





Addison Region

Average Annual Daily Traffic 2002



Source:
Vermont Agency of Transportation, 2007.

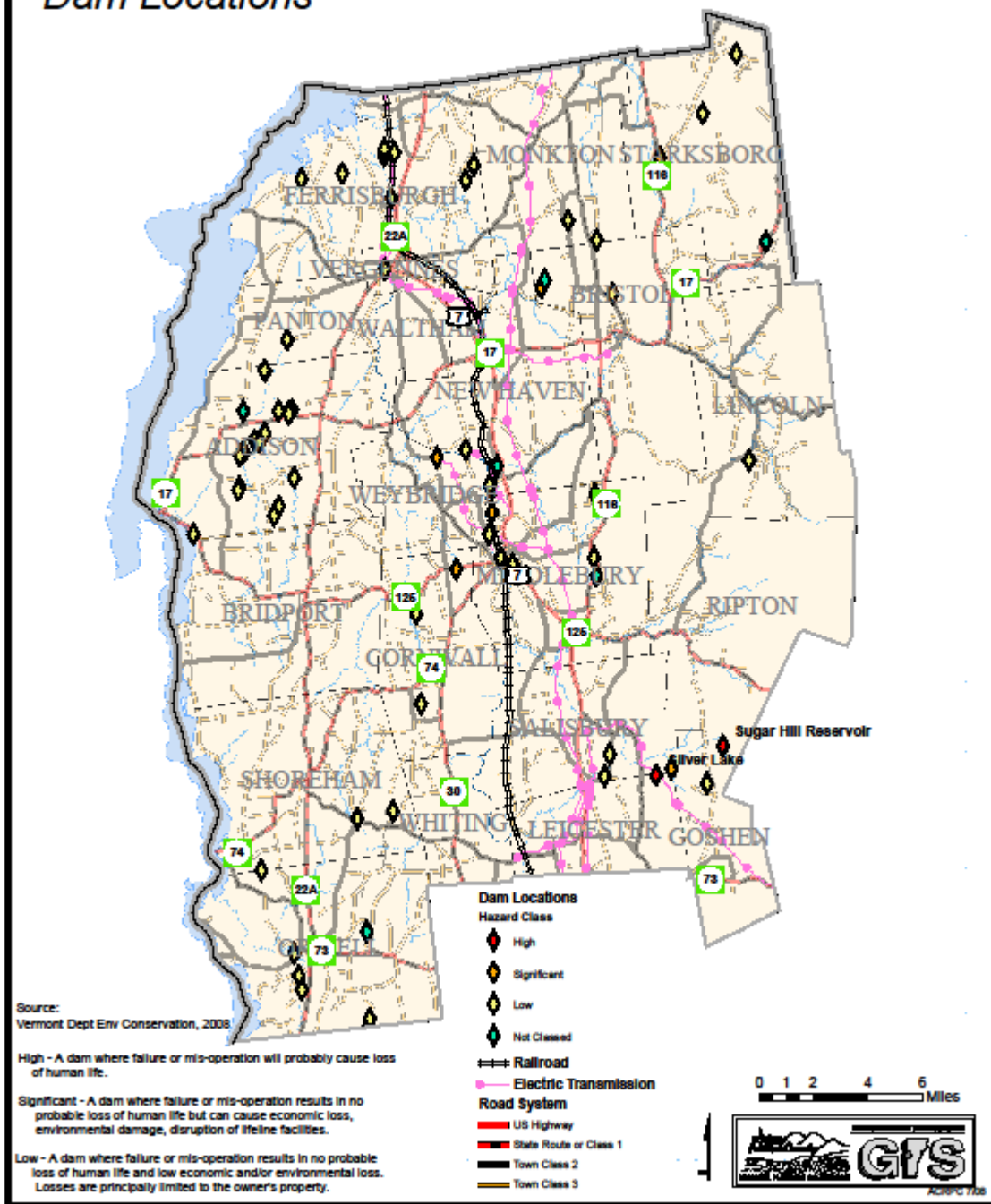
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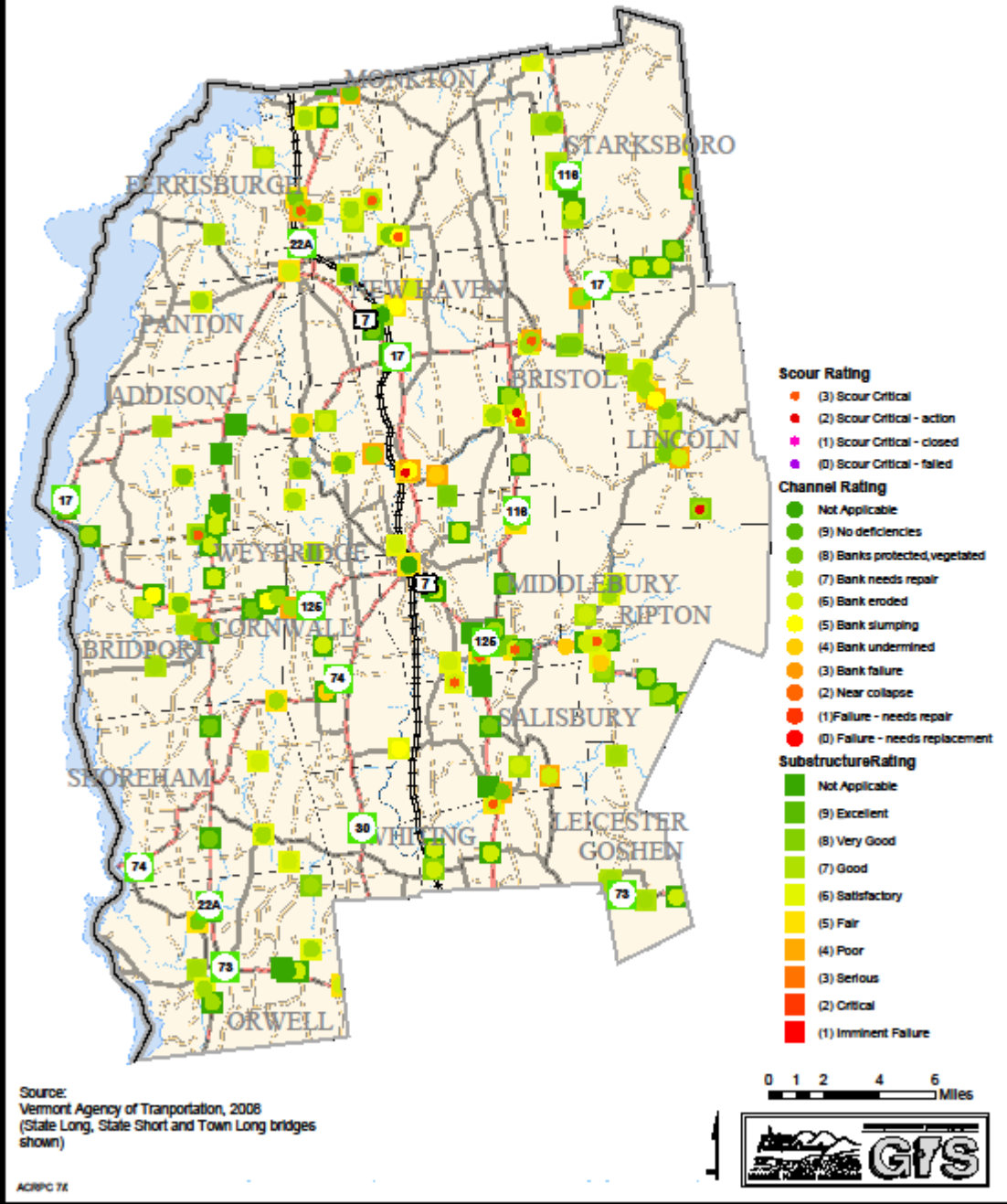
Addison Region

Dam Locations



Addison Region

Bridge Locations with fluvial associated ratings



Annex B
Local Documents:
Local Road and Bridge Standards

January 23, 2013

TOWN ROAD AND BRIDGE STANDARDS
TOWN OF Leicester, VERMONT

The Town of Leicester hereby adopts the following Town Road and Bridge Standards which shall apply to the construction, repair, and maintenance of all town roads and bridges.

The standards listed here are considered minimum and apply to construction projects and repair and maintenance activities. The standards include management practices and are designed to: ensure the safety of the traveling public, minimize damage to road infrastructure during flood events, and enhance water quality protections by minimizing sediment delivery to surface waters and/or wetlands.

The select board reserves the right to modify the standards for a particular project or repair or maintenance activities where, because of unique physical circumstances or conditions, there is no possibility that the project or activities can be completed in strict conformance with these provisions. Any modifications to the standards must be done in a manner that serves the underlying intent of the management practice, be it public safety, flood hazard avoidance, or water quality protection. Fiscal reasons are not a basis for modification of the standards. Questions about modifications to the standards should be directed to the VTrans District Office.

Municipalities must comply with all applicable state and federal approvals, permits and duly adopted standards when undertaking road and bridge activities and projects.

Any new road regulated by and/or to be conveyed to the municipality shall be constructed according to the minimums of these standards. If any federal and/or state funding is involved in a project, the VTrans district office must be notified prior to any field changes taking place that would alter the original scope of work.

Roadways

- All new or substantially reconstructed gravel roads shall have at least a 12-inches thick processed gravel sub-base, with an additional 3 inches (minimum) top course of crushed gravel.
- All new or substantially reconstructed paved roads shall have at least a 15 inches thick processed gravel sub-base.
- All roadways shall be graded so water does not remain on the road surface. For roadways that are not super-elevated, this generally means a 2-4% ($\frac{1}{4}$ " - $\frac{1}{2}$ " per ft) crown for gravel roads and a 1-2% ($\frac{1}{8}$ " - $\frac{1}{4}$ " per ft) crown for paved roads to promote sheeting of water.
- Proper grading techniques for gravel roadways must be used to avoid creating a ridge or berm between the crown and the ditch.
- Any berm along the roadway shoulder that prevents the proper sheeting of water must be removed.

Ditches and Slopes

Soil exposed during ditch and slope construction, repair or maintenance must be treated immediately following the operation and temporary erosion prevention and sediment control practices must be installed and maintained during construction activities and until the ditch or slope is permanently stabilized.

The following are minimum erosion control measures. Careful attention must be given to areas vulnerable to erosion and immediately adjacent or discharging to surface waters and/or roadway drainage facilities:

- Seed and mulch all ditches with grades less than 5% when undertaking projects or repairs or maintenance activities that result in exposed soil. Vegetation must be established and monitored. If vegetation is not established within 10 days of placement, install biodegradable non-welded matting with seed.
- Stone line all new or reconstructed ditches or whenever soils are disturbed by maintenance activities with grades equal to and greater than 5%; alternatively, install stone check dams. The check dams must meet criteria outlined in the *"Standards and Specifications for Check Dams,"* from the *Vermont Standards and Specifications for Erosion Prevention and Sediment Control*. Specifically, dams must be placed so that the crest of the downstream check dam is at the same elevation as the base of the upstream dam.
- Create parabolic (wide "U" shaped) ditches when constructing new or substantially reconstructing ditches, rather than narrow "V" shaped ditches wherever lateral space allows. Ditches with gradual side slopes (maximum of 1:2, vertical to horizontal ratio) and a wide bottom (at least 2 feet) are preferred. Use biodegradable, non-welded matting to stabilize side-slopes where slopes are greater than 1:2 and less than 1:1 ½; apply seed and mulch to any raw or exposed side-slope if slopes are less than 1:2.
- All ditches must be turned out to avoid direct outlet into surface waters. There must be adequate outlet protection at the end of the turnout, either a structural (rock) or vegetative filtering area.
- If in the best professional engineering judgment of the VTrans Operations Division, there is a cost effective ditch treatment that will meet the intent of the management practices described above, but represents a departure from these standards, the municipality may implement the more cost effective ditch treatment alternative with the professional recommendation submitted in written form by VTrans prior to the municipality executing the work.
- When constructing new or substantially reconstructing side slopes, use appropriately sized stone armament on slopes that are 1:1 ½ or greater. If perennial streams are affected by the toe of slope the project must conform to the statewide Stream Alteration standards.

Culverts and Bridges

- Replacement of existing culverts and any new culvert must have a minimum culvert diameter of 18 inches.
- Replacement of existing bridges and culverts and any new bridges and culverts must be designed in accordance with the VTrans Hydraulics Manual, and, in the case of perennial streams, conform to the statewide Stream Alteration standards.
- All new driveway culverts must have a minimum diameter of 15 inches.
- When installing or replacing culverts, use appropriate techniques such as headwalls and wingwalls, where there is erosion or undermining or where it is expected to occur.
- Install a splash pad or plunge pool at the outlet of new or repaired drainage culverts where there is erosion or where erosion may occur. Splash pads and plunge pools are not appropriate for use in streams supporting aquatic life.

Guardrails

When roadway, culvert, bridge, or retaining wall construction or reconstruction projects result in hazards such as foreslopes, drop offs, or fixed obstacles within the designated clear-zone, a roadside barrier such as guardrail must be installed. The most current version of the AASHTO Roadside Design Guide will govern the analysis of the hazard and the subsequent treatment of that hazard.

Access Management

The town must have a process in place, formal or informal, to review all new drive accesses and development roads where they intersect Town roads, as authorized under 19 V.S.A. Section 1111. Towns may reference VTrans A-76 Standards for Town & Development Roads and B-71 Standards for Residential and Commercial Drives; and the VTrans Access Management Program Guidelines for other design standards and specifications.

Training

Town highway maintenance crews must collectively attend a minimum total of 6 hours of training per year on best road management practices. The town must keep documentation of their attendance for a period of three years.

Passed and adopted by the Selectboard of the Town of Leicester, State of Vermont on April 1, 2013

Select Board:

Deane Barnard Mark Schilling
Ronald Fink
Tom Barker

Meeting Documentation: 44CFR 201.6(c)(1)

5/29/14 HM Committee Meeting

Town of Leicester

Hazard Mitigation Planning Committee Initial Meeting

Thursday, May 29. 7:00pm – 8:30pm

Town of Leicester Town Office

Minutes:

1. Convene meeting/Introductions: Attendees present-

- Raymond Lalumiere – Leicester EMD
- Diane Benware – Leicester Selectboard Chair
- Tom Barker – Leicester Selectboard
- Arlan Pidgeon – Leicester Road Foreman
- Julie Delphia – Leicester Town Clerk/Treasurer
- Mark Raishars – Leicester School Board

2. Brief overview of the hazard mitigation planning process:

Tim gave a brief overview of what the hazard mitigation planning process looks like including an expected timeframe. The committee will meet to complete a hazard inventory/risk assessment, brainstorm mitigation projects/activities, and conduct reviews and edits of plan drafts. A reviewable draft should be complete before the end of the year with a hoped for final local adoption of a FEMA approved plan by the Selectboard within a year.

3. Filling out the Hazard Inventory/Risk Assessment matrix:

A Hazard Inventory/Risk Assessment was completed via consensus by the committee (attached) The highest risk identified was Widespread Power Failure due to the regional impacts it would have. Particular concern was expressed about Mosquito-Borne Illnesses due to recent discovery of EEE-carrying mosquitoes in locations in Leicester and Brandon. Also identified as high priority were: HazMat Transportation Accident, Earthquake and winter storm/ice storm.

Medium priority hazards were: Drought, Flash Flood, High Winds, Structure Fire, and Wildfire.

As part of the HIRA process, committee members identified highest risk areas on maps provided for drifting snow, rail and highway risk areas, high winds, inundation flooding and flash flooding.

4. Adjourn

1. Meeting/Class Name Leicester HM Committee Mtg		2. Operational period Date: 5/29/14 Time: 7:00-9:00pm		3. Check-In (Meeting/Class)Location .Leicester Town Office		Check-In List ICS 211-P
4. Name	5. Town or Agency	6. Position?	7. Volunteer? (Y/N)	8. Mileage? (to & from)	9. Travel Time? (to & from)	
Ray Lalumiere	Leicester	EMD	Y			
Diane Benware	Leicester	Selectboard Chair	Y			
Tom Barker	Leicester	Selectboard	Y			
Arlan Pidgeon	Leicester	Road Crew	Y			
Julie Delphia	Leicester	Town Clerk/Treasurer	Y			

6/12/14 HM Committee Meeting

Town of Leicester

Hazard Mitigation Plan Committee Meeting

Leicester Town Office

Monday, June 12, 2014 7:00 PM-9:00PM

Minutes

1. Call to Order- Meeting was called to order at 7:00. Members present:

- Raymond Lalumiere – Leicester EMD
- Diane Benware – Leicester Selectboard Chair
- Tom Barker – Leicester Selectboard
- Arlan Pidgeon – Leicester Road Foreman
- Julie Delphia – Leicester Town Clerk/Treasurer

2. Review Risk Assessment- On the committees' suggestion, Tim had made some changes to the scale at the bottom of the original table to show a realistic vulnerability range. The previous scale had underestimated the seriousness of each hazard. The risk assessment as developed at the last meeting was reviewed and approved with those changes.

3. Mitigation Project Brainstorming- Tim lead a brainstorming session for committee members to identify possible mitigation solutions for each of the hazards that had been identified in the risk assessment. Tim had prepared several examples for the committee to work from and some hazard locations were removed where the committee felt there were limited hazards. A broad range of actions/projects were identified with items to address each of the identified hazards.

4. Next Meeting- To be Determined. Tim will collate all the ideas and information from the two meetings and provide new draft copies to committee members for an editing session at the next meeting. He will need to visit the town office to get additional information on property values and Julie may be able to provide photos for inclusion in the final plan. Tim will deliver current drafts as they are created.

5. Adjourn- 8:45pm

1. Meeting/Class Name Leicester HM Committee Mtg		2. Operational period Date: 6/12/14 Time: 7:00-9:00pm		3. Check-In (Meeting/Class)Location .Leicester Town Office		Check-In List ICS 211-P
4. Name	5. Town or Agency	6. Position?	7. Volunteer? (Y/N)	8. Mileage? (to & from)	9. Travel Time? (to & from)	
Ray Lalumiere	Leicester	EMD	Y			
Diane Benware	Leicester	Selectboard Chair	Y			
Tom Barker	Leicester	Selectboard	Y			
Arlan Pidgeon	Leicester	Road Crew	Y			
Julie Delphia	Leicester	Town Clerk/Treasurer	Y			
Tim Bouton	ACRPC	HM Planner	N			
Page _____ of _____	10. Prepared by: Tim Bouton		Date/Time	6/12/14		

Annex C

Common Mitigation Measures by Hazard Type

Mitigation measures for “all-hazards” have been adapted from a flood mitigation approach developed by French Wetmore, of Wetmore and Associates in Park Forest, Illinois, into six categories:

- Prevention – measures intended to keep a hazard risk problem from becoming worse. They ensure that future development does not increase hazard losses. Examples would include: Planning and Zoning, Open space preservation, Land Development regulations, Storm water management.
- Property Protection – measures used to modify buildings, or their surroundings, subject to hazard risk rather than prevent the hazard from occurring. Examples are: Acquisition of vulnerable properties, Relocation from hazard prone areas, Rebuild or modify structures to reduce damage by future hazard events, Flood-proofing of flood-prone buildings.
- Natural Resource Protection – measures intended to reduce the intensity of hazard effects as well as improve the quality of the environment and wildlife habitats. Erosion and sediment control and Wetlands protection are examples.
- Emergency Services – measures that protect people before and after a hazard event. That would include: Warning, Response, Critical facilities protection, Health and safety maintenance.
- Structural Projects – measures that involve construction of man-made structures to control hazards. Some examples would include: dams, reservoirs, debris basins, channel modifications, storm sewers, elevated roadways.
- Public Information – activities intended to inform and remind people about hazardous areas and the measures to avoid potential damage and injury. Examples are: Outreach projects, Real estate disclosure, Technical assistance, Community education programs.

The following suggested Mitigation Measures were taken from the website of the Northeast States Emergency Consortium (NSEC).

ALL HAZARDS

- Map vulnerable areas and distribute information about the hazard mitigation strategy and projects.
- Provide information to contractors and homeowners on the risks of building in hazard-prone areas.
- Develop a list of techniques for homeowner self-inspection and implementation of mitigation activities.
- Organize and conduct professional training opportunities regarding natural hazards and hazard mitigation.
- Distribute NOAA weather radios.
- Develop sound land use planning based on known hazards.
- Enforce effective building codes and local ordinances.
- Increase public awareness of community hazards.
- Provide sites that are as free as possible from risk to natural hazards for commercial and industrial activities.
- Consider conservation of open space by acquisition of repetitive loss structures.
- Consider conservation of open space by acquisition of areas identified as “vulnerable or at risk”
- Ensure a balance between residential growth, conservation of environmental resources through a detailed analysis of the risks and vulnerability to natural hazards.

- Conduct joint planning and sharing of resources across regions, communities, and states.
- Establish a hazard mitigation council.
- For future proposed development design guidelines, incorporate hazard mitigation provisions, including improved maps.
- Consider adding a "safe room" requirement for all new buildings.
- Establish incentives to encourage business owners and homeowners to retrofit buildings with hazard - resistant features.
- Teach disaster and hazard awareness in schools.

FLOOD

Flood Hazard Mitigation Measures for Communities:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into future land use plans through riparian corridor protection, limiting flood hazard area development, and other measures.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.
- Participate in the National Flood Insurance Program (NFIP).
- Conduct watershed geomorphic assessments.
- Encourage riparian corridor protection.

Flood Hazard Mitigation Measures for Individuals:

How to Protect Your Property:

- Keep insurance policies, documents, and other valuables in a safe-deposit box. You may need quick, easy access to these documents. Keep them in a safe place less likely to be damaged during a flood.
- Avoid building in a floodplain. Some communities do not permit building in known floodplains. If there are no restrictions, and you are building in a floodplain, take precautions, making it less likely your home will be damaged during a flood.
- Raise your furnace, water heater, and electric panel to higher floors or the attic if they are in areas of your home that may be flooded. Raising this equipment will prevent damage. An undamaged water heater may be your best source of fresh water after a flood.
- Install check valves in building sewer traps to prevent flood water from backing up into the drains of your home. As a last resort, when floods threaten, use large corks or stoppers to plug showers, tubs, or basins.
- Seal walls in basements with waterproofing compounds to avoid seepage through cracks.
- Consult with a construction professional for further information if these and other damage reduction measures can be taken. Check local building codes and ordinances for safety requirements.
- Contact your local emergency management office for more information on mitigation options to further reduce potential flood damage. Your local emergency management office may be able to provide additional resources and information on ways to reduce potential damage.

HAZARDOUS MATERIALS

Hazardous Material Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

Natural hazard events have often triggered technological hazards such as ruptured pipelines and building fires, clearly linking the natural and technological risks. Accordingly, the National Mitigation Strategy, as an all-hazards strategy, will build upon existing programs that mitigate technological hazards, and focus on the critical importance of coordination among efforts to mitigate hazards, regardless of the source of the risk.

- Recognize the dangers posed by hazardous materials.
- Identify places where hazardous materials are likely to be encountered.
- Understand when a hazard may exist.
- Contact the appropriate persons or agencies to give or receive specific hazardous materials information.
- Identify procedures to minimize personal and community exposure to hazardous materials.

Hazardous materials events can and do occur as independent events. Natural hazard events, however, have often triggered technological hazards such as ruptured pipelines and building fires, clearly linking the natural and technological risks. Accordingly, the National Mitigation Strategy, as an all-hazards strategy, will build upon existing programs that mitigate technological hazards, and focus on the critical importance of coordination among efforts to mitigate hazards, regardless of the source of the risk.

Communities can and should:

- Recognize and identify the dangers posed by hazardous materials in the community.
- Identify industries and other locations places where hazardous materials are stored and used.
- Develop a community hazardous materials emergency plan.
- Develop an early warning and notification system.
- Work with local businesses and industry to identify procedures to minimize personal and community exposure to hazardous materials.

Hazardous Materials Hazard Mitigation Measures for Individuals: Individual and families should develop a personal plan of what to do in case of a hazardous materials accident.

How to Plan for a Hazardous Materials Incident:

- Learn to detect the presence of a hazardous material.
- Many hazardous materials do not have a taste or an odor. Some materials can be detected because they cause physical reactions such as watering eyes or nausea. Some hazardous materials exist beneath the surface of the ground and can be recognized by an oil or foam-like appearance.

- Contact your Local Emergency Planning Committee (LEPC) or local emergency management office for information about hazardous materials and community response plans.
- Find out evacuation plans for your workplace and your children's schools.
- Be ready to evacuate. Plan several evacuation routes out of the area.
- Ask about industry and community warning systems.
- Have disaster supplies on hand.
- Flashlight and extra batteries
- Portable, battery-operated radio and extra batteries
- First aid kit and manual
- Emergency food and water
- Non-electric can opener
- Essential medicines
- Cash and credit cards
- Sturdy shoes
- Develop an emergency communication plan. In case family members are separated from one another during a hazardous materials accident (this is a real possibility during the day when adults are at work and children are at school), develop a plan for reuniting after the disaster. Ask an out-of-state relative or friend to serve as the "family contact." After a disaster, it's often easier to call long distance. Make sure everyone knows the name, address and phone number of the contact person.

STRUCTURE FIRE

Fire Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting driveway and water supply standards for new development.
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

The United States Fire Administration (USFA) serves as the national focus on reducing fire deaths, injuries, and property losses. In 1974, Congress passed the Federal Fire Prevention and Control Act which established the USFA and the fire research program at the National Institute of Standards and Technology (NIST). The USFA works to involve the public and private sector to reduce losses through public education, arson detection and control, technology and research, fire data collection and analysis and fire service training and education. NIST performs and supports research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires.

Fire Hazard Mitigation Measures for Individuals:

How to Protect Your Property:

- Keep lawns trimmed, leaves raked, and the roof and rain-gutters free from debris such as dead limbs and leaves.

- Stack firewood at least 30 feet away from your home.
- Store flammable materials, liquids and solvents in metal containers outside the home at least 30 feet away from structures and wooden fences.
- Create defensible space by thinning trees and brush within 30 feet around your home.
- Landscape your property with fire resistant plants and vegetation to prevent fire from spreading quickly.
- Post home address signs that are clearly visible from the road.
- Provide emergency vehicle access with properly constructed driveways and roadways, at least 12 feet wide with adequate turnaround space.
- Make sure water sources, such as hydrants and ponds, are accessible to the fire department.
- Burning yard waste is a fire hazard. Check with your local fire agency on a non-emergency number for fire permit requirements and restricted burning times.
- Use fire resistant, protective roofing and materials like stone, brick and metal to protect your home. Avoid using wood materials that offer the least fire protection.
- Cover all exterior vents, attics and eaves with metal mesh screens no larger than 6 millimeters.
- Install multipane windows, tempered safety glass or fireproof shutters to protect large windows from radiant heat.
- Use fire-resistant draperies for added window protection.
- Have chimneys, wood stoves and all home heating systems inspected and cleaned annually by a certified specialist.
- Fire Alarm Safety requires checking on or installing fire alarms in your home.
- Residential sprinklers have become more cost effective for homes. Currently, they protect few homes.

How to Prepare for a Fire Emergency:

- Know how to contact fire emergency services in your area.
- Plan ahead. Make sure you and your family are prepared for a fire emergency.
- Develop and practice escape and evacuation plans with your family.
- Install smoke alarms on every level of your home. Test them monthly and change the batteries at least once a year. Consider installing the new long-life smoke alarms.

WINTER STORM

Winter Storm Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

In addition, FEMA recommends the following actions to further protect communities from the effects of Winter Storms:

- Building code development and enforcement of snow loads

- Develop a storm water management plan for snowmelt
- Assuring adequate supplies of sand and salt
- Maintaining snow removal equipment so that it is ready to be deployed
- Retrofitting public buildings to withstand snowloads and prevent roof collapse
- Clearing roofs of excessive snow accumulations
- Develop a winter storm plan or annex to the local emergency management plan
- Develop a capability to monitor weather forecasts, conditions and warnings issued by the National Weather Service
- Identify appropriate shelters for people who may need to evacuate due to loss of electricity, heat or coastal flooding due to storm surge
- Assure that critical facilities such as police and fire stations and schools are accessible and equipped
- Clearing streets and roads of snow to assure the passage of public safety vehicles and general traffic.

Winter Storm Hazard Mitigation Measures For Individuals:

How to Protect Your Property:

- Make sure your home is properly insulated. If necessary, insulate walls and attic. This will help you to conserve electricity and reduce your home's power demands for heat. Caulk and weather-strip doors and windowsills to keep cold air out, allowing the inside temperature to stay warmer longer.
- Install storm windows or cover windows with plastic from the inside. This will provide an extra layer of insulation, keeping more cold air out.
- To keep pipes from freezing:
- Wrap pipes in insulation or layers of old newspapers.
- Cover the newspapers with plastic to keep out moisture.
- Let faucets drip a little to avoid freezing.
- Know how to shut off water valves.
- If the pipes freeze, remove any insulation or layers of newspapers and wrap pipes in rags. Completely open all faucets and pour hot water over the pipes, starting where they were most exposed to the cold (or where the cold was most likely to penetrate). A hand-held hair dryer, used with caution to prevent overheating, also works well.
- Consider storing sufficient heating fuel. Regular fuel sources may be cut off. Be cautious of fire hazards when storing any type of fuel.
- Before winter, be sure you install and check smoke alarms.
- Consider keeping safe emergency heating equipment:
- Fireplace with ample supply of wood.
- Small, well-vented wood, coal, or camp stove with fuel.
- Portable space heater or kerosene heater. Check with your local fire department on the legality of using kerosene heaters in your community. Use only the correct fuel for your unit and follow the manufacturer's instructions. Refuel outdoors only, and only when cool. Keep your kerosene heater at least three feet away from furniture and other flammable objects.
- When using alternative heat from a fireplace, wood stove, space heater, etc., use fire safeguards and ventilate properly. Fire hazard is greatly increased in the winter because alternate heating sources are used without following proper safety precautions.
- Install snow fences in rural areas to reduce drifting in roads and paths, which could block access to homes, barns, and animals' feed and water.

- If you live in a flood-prone area, consider purchasing flood insurance to cover possible flood damage that may occur during the spring thaw. Homeowners' policies do not cover damage from floods. Ask your insurance agent about the National Flood Insurance Program if you are at risk.

How to Plan for a Winter Storm:

- Understand the hazards of wind chill, which combines the cooling effect of wind and cold temperatures on exposed skin. As the wind increases, heat is carried away from a person's body at an accelerated rate, driving down the body temperature. "Wind chill" is a calculation of how cold it feels when the effects of wind speed and temperature are combined. A strong wind combined with a temperature of just below freezing can have the same effect as a still air temperature about 35 degrees colder.
- Service snow removal equipment before winter storm season. Equipment should be available for use if needed. Maintain it in good working order.
- Keep your car's gas tank full for emergency use and to keep the fuel line from freezing.
- Get training. Take an American Red Cross first aid course to learn how to treat exposure to the cold, frostbite, and hypothermia.
- Discuss with your family what to do if a winter storm WATCH or WARNING is issued. Designate one household member as the winter storm preparedness leader. Have him or her discuss what to do if a winter storm watch or warning is issued. Have another household member state what he or she would do if caught outside or in a vehicle during a winter storm. Everyone should know what to do in case all family members are not together. Discussing winter storms ahead of time helps reduce fear and lets everyone know how to respond during a winter storm.

HIGH WINDS

High Wind Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

FEMA also suggests that communities further reduce their vulnerability to hurricanes through the adoption and enforcement of wind- and flood-resistant building codes. Sound land-use planning can also ensure that structures are not built in the highest hazard areas.

High Wind Hazard Mitigation Measures for Individuals:

- Make a list of items to bring inside in the event of a storm. A list will help you remember anything that can be broken or picked up by strong winds. High winds, often in excess of 40 miles per hour, can turn unanchored items into missiles, causing damage or injury when they hit.
- Keep trees and shrubbery trimmed. Make trees more wind resistant by removing diseased or damaged limbs, then strategically remove branches so that wind can blow through. High winds frequently

break weak limbs and hurl them at great speed, causing damage when they hit property. Debris collection services may not be operating just before a storm, so it is best to do this well in advance of approaching storms.

- Remove any debris or loose items in your yard. High winds can pick up anything unsecured, creating damage to property when the debris hits.
- Install protection to the outside areas of sliding glass doors. Glass doors are as vulnerable as windows to breakage by wind-driven objects.
- If you live in a flood plain or are prone to flooding, also follow flood preparedness precautions. Nor'easters and severe thunderstorms can bring great amounts of rain and frequently cause floods.

EARTHQUAKE

Earthquake Hazard Mitigation Measures for Communities:

FEMA's National Mitigation Action Plan suggests that state and local mitigation plans include the following:

- Developing and enforcing all-hazards building codes,
- Adopting incentives to encourage mitigation
- Developing administrative structures to support the implementation of mitigation programs
- Mitigation should be incorporated into land use management plans.
- Developing and conducting public information campaigns on hazard mitigation should be a priority.

FEMA's Earthquake Program has four basic goals directly related to the mitigation of hazards caused by earthquakes. They are to:

- Promote Understanding of Earthquakes and Their Effects.
- Work to Better Identify Earthquake Risk.
- Improve Earthquake-Resistant Design and Construction Techniques.
- Encourage the use of Earthquake-Safe Policies and Planning Practices.

Earthquake Hazard Mitigation Measures for Individuals

How to Protect Your Property:

- Bolt bookcases, china cabinets, and other tall furniture to wall studs. Brace or anchor high or top-heavy objects. During an earthquake, these items can fall over, causing damage or injury.
- Secure items that might fall (televisions, books, computers, etc.). Falling items can cause damage or injury.
- Install strong latches or bolts on cabinets. The contents of cabinets can shift during the shaking of an earthquake. Latches will prevent cabinets from flying open and contents from falling out.
- Move large or heavy objects and fragile items (glass or china) to lower shelves. There will be less damage and less chance of injury if these items are on lower shelves.
- Store breakable items such as bottled foods, glass, and china in low, closed cabinets with latches. Latches will help keep contents of cabinets inside.
- Store weed killers, pesticides, and flammable products securely in closed cabinets with latches, on bottom shelves. Chemical products will be less likely to create hazardous situations from lower, confined locations.

- Hang heavy items, such as pictures and mirrors, away from beds, couches, and anywhere people sit. Earthquakes can knock things off walls, causing damage or injury.
- Brace overhead light fixtures. During earthquakes, overhead light fixtures are the most common items to fall, causing damage or injury.
- Strap the water heater to wall studs. The water heater may be your best source of drinkable water following an earthquake. Protect it from damage and leaks.
- Bolt down any gas appliances. After an earthquake, broken gas lines frequently create fire hazards.
- Install flexible pipe fittings to avoid gas or water leaks. Flexible fittings will be less likely to break.
- Repair any deep cracks in ceilings or foundations. Get expert advice if there are signs of structural defects. Earthquakes can turn cracks into ruptures and make smaller problems bigger.
- Check to see if your house is bolted to its foundation. Homes bolted to their foundations are less likely to be severely damaged during earthquakes. Homes that are not bolted have been known to slide off their foundations, and many have been destroyed because they are uninhabitable.
- Consider having your building evaluated by a professional structural design engineer. Ask about home repair and strengthening tips for exterior features, such as porches, front and back decks, sliding glass doors, canopies, carports, and garage doors. Learn about additional ways you can protect your home. A professional can give you advice on how to reduce potential damage.
- Follow local seismic building standards and safe land use codes that regulate land use along fault lines. Some municipalities, counties, and states have enacted codes and standards to protect property and occupants. Learn about your area's codes before construction.

How to Plan for an Earthquake:

- Pick "safe places" in each room of your home. A safe place could be under a sturdy table or desk or against an interior wall away from windows, bookcases, or tall furniture that could fall on you. The shorter the distance to move to safety, the less likely you will be injured. Injury statistics show that persons moving more than 10 feet during an earthquake's shaking are most likely to experience injury.
- Practice drop, cover, and hold-on in each safe place. Drop under a sturdy desk or table, hold on, and protect your eyes by pressing your face against your arm. Practicing will make these actions an automatic response. When an earthquake or other disaster occurs, many people hesitate, trying to remember what they are supposed to do. Responding quickly and automatically may help protect you from injury.
- Practice drop, cover, and hold-on at least twice a year. Frequent practice will help reinforce safe behavior.
- Talk with your insurance agent. Different areas have different requirements for earthquake protection. Study locations of active faults, and if you are at risk, consider purchasing earthquake insurance.
- Inform guests, babysitters, and caregivers of your plan. Everyone in your home should know what to do if an earthquake occurs. Assure yourself that others will respond properly even if you are not at home during the earthquake.
- Get training. Take a first aid class from your local Red Cross chapter. Get training on how to use a fire extinguisher from your local fire department. Keep your training current. Training will help you to keep calm and know what to do when an earthquake occurs.
- Discuss earthquakes with your family. Everyone should know what to do in case all family members are not together. Discussing earthquakes ahead of time helps reduce fear and anxiety and lets everyone know how to respond.

Annex D

External Mitigation Project Funding Sources

Federal

FEMA

- **Pre-Disaster Mitigation Program.** FEMA's Pre-Disaster Mitigation Competitive (PDM-C) Grant Program provides funds to states, territories, and federally recognized tribes for pre-disaster mitigation activities. The grant program is administered by FEMA for pre-disaster mitigation planning and projects primarily addressing natural hazards. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.
- **Hazard Mitigation Grant Program.** The Hazard Mitigation Grant Program (Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act) is activated during Presidential Disaster Declarations to assist in identifying mitigation projects, and funding these projects on a 75% Federal/25% non-Federal cost share basis. Mitigation program funding is based on 15% of the federal funds expended for the Infrastructure and Individual Assistance Programs. The HMGP supports other program activities, i.e. participation the NFIP and a current Hazard Mitigation Plan are required for recipients of HMGP funds.
- **Section 406 Hazard Mitigation.** Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act provides funding to mitigate certain projects as they are being repaired as part of overall disaster assistance to a community. Under Section 406, if it can be shown to be cost effective to mitigate a Public Assistance eligible project as part of the repair, FEMA may fund the mitigation as part of the overall project cost.
- **National Flood Insurance Program (NFIP).** The National Flood Insurance Program (NFIP) makes federally subsidized flood insurance available to property owners in locations agreeing to participate in the NFIP. If communities enter the NFIP, they are required to adopt floodplain ordinances meeting criteria established by FEMA. These criteria include: requiring permits for development within designated floodplains; review development plans and subdivision proposals to determine whether proposed sites will be reasonably safe from flooding; require protection of water supply and sewage systems to minimize infiltration of floodwater; obtain, review, and utilize all base flood elevation data; and assure the maintenance of flood carrying capacities within all watercourses.
- **The Community Rating System.** An element of the NFIP, is designed to promote the availability of flood insurance, reduce future flood damages, and ensure the accurate rating of flood insurance policies. Participating communities may receive credit for proven mitigation measures, thus reducing the cost of flood insurance within their jurisdictions.
- **The Infrastructure Program (Section 406 of the Stafford Act).** Authorizes funding for the repair, restoration, or replacement of damaged facilities belonging to public and private non-profit entities, and for other associated expenses, including emergency protective measures

and debris removal. The Infrastructure Program also authorizes funding for appropriate cost-effective hazard mitigation related to damaged public facilities.

- **The National Inventory of Dams (US Army Corps of Engineers project).** Identifies high-hazard dams and encourages the development of warning systems and emergency plans for many of these facilities.
- **Hazardous Materials Program.** FEMA's mission under this program is to provide technical and financial assistance to States and local jurisdictions and to coordinate with public and private sector entities to develop, implement, and evaluate HAZMAT emergency preparedness programs. FEMA supports State and local agencies in the design, implementation, and evaluation of HAZMAT-related training and planning exercises, and cooperates with the U.S. Department of Transportation in the maintenance of electronic bulletin boards to provide the latest information on HAZMAT planning, training, exercises, and conferences.
- **US Fire Administration (USFA).** Through the USFA, FEMA administers a nationwide program to enhance fire prevention and control activities and to reduce significantly the loss of life and property caused by fires. Programs are carried out by: National Fire Academy; Office of Fire Prevention and Arson Control; Office of Firefighter Health and Safety; Office of Fire Data and Analysis; Office of Federal Fire Policy and Coordination; Office of National Emergency Training Center Operations and Support, and Office of Educational Technology.
- **Flood Mitigation Assistance (FMA).** The Flood Mitigation Assistance (FMA) program provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the (NFIP) on an annual basis.

There are three types of FMA grants available to Applicants:

- Planning Grants - *to prepare flood mitigation plans*
- Project Grants - *to implement measures to reduce flood losses, such as elevation, acquisition or relocation of NFIP-insured structures*
- Management Cost Grants - *for the grantee to help administer the FMA program and activities*

The Emergency Planning and Community Right-to-Know Act of 1986 imposed upon state and local governments planning and preparedness requirements for emergencies involving the release of hazardous materials. The role of the federal government in response to an emergency involving the release of hazardous materials is to support local and state emergency operations. Activation of the federal Regional Response Team (RRT) provides access to federal resources not available at the state and local levels. An on scene coordinator is designated to manage federal resources and support. The national warning and communications center for emergencies involving the release of hazardous materials is manned 24 hours a day, and is located at the U.S. Coast Guard headquarters in Washington, D.C.

The National Weather Service provides meteorological and hydrologic services that include weather and hydrologic warnings, forecasts, and related information. The primary mission of the NWS is to save lives and reduce property damage through timely issuances of tornado and flood warnings and river stage forecasts. To cope with dangerous weather, the NWS interacts with

emergency services personnel throughout the state by: issuance of tornado and flash flood watches or warnings for those areas in which a threat is posed; issuance of flood watches and warnings for major streams and rivers within the state. Addison County is within the coverage area of the NWS office in Burlington but also may receive information from the Albany, NY office.

The U.S. Army Corps of Engineers undertake a broad range of civil works projects to develop, manage, and conserve the nation's water resources. No work may be undertaken without authorization and funding from Congress, either from specific legislation or continuing authorities. Projects are planned to serve as many purposes as are feasible and to protect or improve the environment as much as possible. The Corps is involved in developing and implementing plans for flood control, navigation, hydropower, recreation, and water supply. The Corps has authority for emergency operations, bank protection, permit administration, and technical assistance. Corps of Engineers assistance includes:

- Studies and Projects
- Discretionary Authority to implement certain types of water resources projects without specific Congressional approval. These projects are typically limited in cost and duration, and include:
 - Section 14 - Emergency Stream bank Protection of Public Facilities, limitation of \$500,000 per project.
 - Section 107 - Small Navigation Projects, usually for port facilities and navigation channels. Work on channels usually improves stream flow and aids flood control efforts.
 - Section 205 - Small Flood Control Projects, not to exceed \$5 million. Funds may be used for projects such as upgrading flood protection structures and channelization of streams.
 - Floodplain Technical Assistance, to include:
 - Conducting floodplain mapping surveys to provide either first-time mapping of an area or to correct older floodplain maps;
 - Conducting flood studies in cooperation with FEMA to determine actual flood levels for settlement of flood insurance claims;
 - Providing technical advice regarding proposed floodplain ordinances and building codes.
- Emergency operations to respond to flood emergencies, to include flood fighting, constructing advance temporary measures in anticipation of imminent flood, and the repair of damaged flood control works after the flood event.
- Permit authority, the Corps has the authority to issue Permits to cover construction excavation and other related work in or over navigable waterways; and Permits covering the discharge of fill material in all waters of the United States and adjacent wetlands.

Department of Housing and Urban Development

- Community Development Block Grant Program. Funds are provided as grants to units of local government. Local governments can use the funds to: construct flood and drainage facilities; finance rehabilitation projects that include flood proofing, elevation, purchase of flood insurance, etc.; finance acquisition and relocation of homes to remove them from the floodplains.

- Rental Rehabilitation Program. Funds to rehabilitate rental properties can be used for flood proofing and repair to flood damage.
- Section 312 Loan Program. Provides funds to rehabilitate both residential and non-residential properties, including flood repair and flood proofing.

Department of Agriculture Natural Resource Conservation Service (NRCS) can provide technical assistance in the conservation, development, and productive use of water resources. In addition, the NRCS monitors use of prime farmland.

- Watershed Protection and Flood Prevention. Technical and financial assistance to local entities to plan and install works of improvement for watershed protection, flood prevention, agricultural water management, and other approved purposes.
- Resource Conservation and Development. Technical and financial assistance to local entities to plan and install works of improvement for watershed protection, flood prevention, agricultural water management, and other approved purposes.
- Emergency Watershed Protection. Provides assistance to reduce hazards to life and property in watersheds damaged by severe natural events. NRCS can provide 100% of the cost of exigency situations, and 80% of the cost for non-exigency situations, if funds are available.
- Conservation Technical Assistance. Provided to land users to control erosion, sediment, and to reduce upstream flooding.
- River Basin Surveys and Investigations. Includes Conservation River Basin Studies to assist in solving existing problems or meeting existing or projected needs, and Floodplain Management Studies to provide information and assistance for reducing future flood damages. Financial assistance is provided by sponsors.

U.S. Geological Survey (USGS) provides certain hazard studies and recommendations. A portion of the mission of the USGS is to collect and analyze data on the quantity of surface water through a network of gauging stations. The data is used in preparing flood frequency reports to evaluate the severity of floods. This data is useful in flood hazard mitigation studies, establishing flood prone areas, and potential flood heights near hydraulic structures.

Economic Development Administration was established to generate new jobs, to help protect existing jobs, and to stimulate commercial and industrial growth in economically distressed areas of the United States.

Small Business Administration (SBA) Disaster Assistance Programs provide loans to businesses and individuals affected by presidential and SBA disaster declarations. The program provides direct loans to businesses to repair or replace uninsured disaster damage to property owned by the business, including real estate, machinery, and equipment, inventory and supplies. Businesses of any size are eligible. Non-profit organizations are also eligible. Assistance to individuals comes in the form of low-interest loans for repair or replacing damaged real and personal property. The SBA administers the Disaster Assistance Programs.

State

Agency of Administration

- **Emergency Relief and Assistance Fund (ERAF)** The ERAF was created following disastrous flooding in 1998 and was created so that the State of Vermont would have funding to assist municipalities in covering the 25% local share following a federally declared disaster. Communities who are active in mitigation efforts (including current hazard mitigation plans, adopted codes and standards, membership in the NFIP and others) are rewarded with a higher level of state funded reimbursement.

VTrans

- **Town Highway Grants Program.** State aid grants for highways are made annually to the governing body based on the number of Class 1,2 or 3 miles in the Municipality. The General Assembly appropriates a lump sum annually for this purpose (19 V.S.A. Section 306(a)). Distribution is made quarterly, with no application required. There is no requirement that State funds be matched with local funds, other than a requirement that municipalities expend no less than \$300 per mile of local tax revenues of their highways (19 V.S.A. Section 307).
- **Town Highway Bridge Program.** State assistance for major rehabilitation or reconstruction of bridges with a span of six feet or more on class 1, 2 or 3 town highways is made available by the Secretary of Transportation from annual appropriations for that purpose (19 V.S.A. Section 306(b)). State assistance amounts are not limited for any one project. The State assistance requires 10 percent participation or match of total project cost with town funds for replacement projects and 5% for rehabilitation projects. The local match is capped at the amount raised by a municipal tax rate of \$0.50 on the Grand List (19 V.S.A. Section 309(a)).
- **Town Highway Structures Program.** State grants for bridges, culverts and retaining walls that are part of the municipalities highway (Class 1, 2 or 3) infrastructure are made by the Secretary of Transportation from annual appropriations for the purpose. State grant amounts are limited to \$150,000 for any one project. State funds are required to be matched, as follows:
 - By at least 20% of the total project cost, or
 - By at least 10% of the total project cost providing that town has adopted Town Highway codes and standards and the town has conducted a highway infrastructure study (not less than three years old), which identifies all town culverts, bridges and identified road problems.
- **Town Highway Class 2 Roadway Program.** State grants to provide for the preservation of any Class 2 highways by providing grants for resurfacing or reconstruction are made by the Secretary of Transportation or his/her designee from annual appropriations for that purpose. State grants are limited to \$150,000 for any one project and there are match requirements for the town similar to the Town Highway Structures Program.

- **Town Road & Bridge Standards.** As a result of legislative action relating to the Town Aid programs an incentive program was created providing additional funding to towns meeting two requirements:
 - Adopted codes and standards.
 - Conducted a network infrastructure study.

Agency of Natural Resources

- **Ecosystem Restoration Grant Program.** As part of a governor's initiative to improve water quality in Lake Champlain, Funds have been allocated to assist in clean-up. Funds from this source have paid for a large portion of recent geomorphic studies in the Addison region as well as supporting the development of Fluvial Erosion Hazard Zones. Additionally, funds have been allocated to purchase development rights in hazardous locations.

Department of Public Safety, Division of Emergency Management

- **Local Emergency Management Director Program.** A continuing program of training for local emergency management directors to provide a consistent base of knowledge to understand their roles and responsibilities in Emergency Management.
- **Generator Grant Program.** VEM allocates funds from FEMA EMPG to allow towns to purchase back-up power sources for emergency shelters for continued use in the event of a power failure.

Regional

The Addison County Regional Planning Commission (ACRPC) provides assistance to local governments concerning planning for future land use, business, transportation, emergency management and population.

In addition to the specific programs mentioned below, ACRPC has identified Municipal Development Plans and Capital Improvement Plans as appropriate local planning mechanisms suitable for incorporating many of the provisions of this plan. These plans, by statute, need to be updated on a 5 year rotation. In Addison County, each municipality adopts these new or updated plans according to their own timetable and therefore, each is at a different place in the planning and adoption process. At the time of each rewrite, ACRPC generally assists local planning commissioners and will encourage inclusion of appropriate provisions of this plan into any new document.

ACRPC annually sets aside funds from its transportation planning activities to be administered by the Transportation Advisory Committee (TAC). Proposals are entertained each year to fund planning projects for transportation projects. One effective ongoing program is a local culvert survey and upgrade program, which funds updates of culvert surveys for 2-3 towns annually. TAC grants have funded several mitigation studies in the past including:

- Route 125 relocation study
- Bakers Bridge mitigation study

ACRPC assists community mitigation projects and planning through utilization of:

- FEMA PDM-C planning grants
- FEMA HMGP planning grants
- FEMA HMGP project grants
- Federal Emergency Planning Grants

DRAFT

Annex E
Local Plan Review Tool Self Assessment

LOCAL MITIGATION PLAN REVIEW TOOL

Jurisdiction Name & State: _____

Jurisdiction: Town of Leicester ,Vermont	Title of Plan: Town of Leicester Vermont Single Jurisdiction Hazard Mitigation Plan	Date of Plan: 12/30/2014
Single or Multi-jurisdiction plan? Single	New Plan or Plan Update? New	
Regional Point of Contact: Tim Bouton Title: Sr. Planner Agency: ACRPC Phone Number: (802) 388-3141 E-Mail: tbouton@acrpc.org	Local Point of Contact: Diane Benware Title: Selectboard Chair Agency: Town of Leicester, Vermont Phone Number: (802) 247-3786 E-Mail: dianembenware@gmail.com	

State Reviewer:	Title:	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region I		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

1. REGULATION CHECKLIST		Location in Plan	Met	Not
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section #1 – 1.1 Page 3. “Current Plan Development Process”			
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section #1 – 1.3 Page 4. “Opportunities for additional comments”			
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section #1 – 1.2 Page 3. “Opportunities for public comment/input”			
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section # 1 – 1.4 Page 3-4. “Extent of Review”			
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section #6 – 6.1, 6.3 Pages 48-49, “Plan Maintenance procedures”			
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section #6 – 6.1 Page 48 “Plan Review/Update Process (5 year cycle)”			
<u>ELEMENT A: REQUIRED REVISIONS</u>				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section #4 – 4.3 Pages 18-37 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section #4 – 4.3 Pages 18-37 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B3. Is there a description of each identified hazard’s impact on the community as well as an overall summary of the community’s vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section #4 – 4.3 Pages 18-37 “Hazard type, location, extent, occurrences, future probability and vulnerability”			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section #5 - 5.2 Page 38-42 “Authorities, policies, programs, resources (and the ability to expand on these)” Specifically, 5.2 page 42 Flood (Inundation)			

1. REGULATION CHECKLIST		Location in Plan	Met	Not
Regulation (44 CFR 201.6 Local Mitigation Plans)				
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction’s existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section #5 - 5.2 Pages 38-42 “Authorities, policies, programs, resources (and the ability to expand on these)”			
C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section #5 - 5.2 Page 38-42 “Authorities, policies, programs, resources (and the ability to expand on these)” Specifically, 5.2 page 42 Flood (Inundation)			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section #5 – 5.1 page 38 “Hazard Mitigation Goals by Hazard Type”			
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section #5 – 5.4 Pages 43-48 “Proposed Mitigation Projects/Action Plan by Hazard Type”			
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section #5 – 5.3 Page 43 “Project Prioritization Process”			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section #3 – Page 13-14 “Existing Adopted Plans Which Support Hazard Mitigation”			
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Section 7 Page 51 “Plan Adoption Resolution”			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	N/A			
<u>ELEMENT E: REQUIRED REVISIONS</u>				

Acknowledgements:

The creation of this plan is the result of many, many efforts to create hazard mitigation plans for communities in the State of Vermont. We have borrowed liberally from other adopted plans from throughout the state sometimes basic concepts and design, and at other times duplication of wording and illustrations.

ACRPC wants to thank specifically all other Regional Planning Commissions and their collective staff for the collaborative efforts that have resulted in this and many other plans statewide. Additional thanks for many of the same reasons need to go out to all the state agencies that are equally committed to mitigating the risks we face in Vermont.

Special thanks to the State of Vermont's Division of Emergency Management and Homeland Security and especially Ray Doherty the State Hazard Mitigation Officer (SHMO) and Misha Bailey in the mitigation division.

Lastly, thanks to the volunteers from the Town of Leicester who have spent countless hours living and working with these hazards.

Thank you for caring enough about your community to spend even more hours to bring that collective experience into this document.

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