Hazard Mitigation Plan Brighton, VT

April 2017

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CERTIFICATE OF ADOPTION
April 5, 2017
A RESOLUTION ADOPTING THE BRIGHTON, Vermont
2017 Local Hazard Mitigation Plan

WHEREAS, the Town of Brighton has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of the hazards profiled in the **2017, Brighton Vermont Local Hazard Mitigation Plan**, which result in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Brighton has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its **2017 Brighton, Vermont Local Hazard Mitigation Plan (Plan)** under the requirements of 44 CFR 201.6; and

WHEREAS, the **Plan** specifically addresses hazard mitigation strategies, and Plan maintenance procedures for the Town of Brighton; and

WHEREAS, the **Plan** recommends several hazard mitigation actions (projects) that will provide mitigation for specific natural hazards that impact the Town of Brighton with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this **Plan** will make the Town of Brighton eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by Town of Brighton Selectboard:

1. The **2017 Brighton, Vermont Local Hazard Mitigation Plan** is hereby adopted as an official plan of the Town of Brighton;

2. The respective officials identified in the mitigation action plan of the **Plan** are hereby directed to pursue implementation of the recommended actions assigned to them;

3. Future revisions and **Plan** maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as part of this resolution for a period of five (5) years from the date of this resolution; and

IN WITHNESS WHEREOF, the undersigned have affixed their signature and the corporate seal of the Town of Brighton this 5TH day of APRIL 2017.

Selectboard Chair (Chair) Selectboard Member Selectboard Member

ATTEST
Town Clerk

Hazard Mitigation Plan
Brighton, VT

Plan Purpose.

This plan, and the process of developing it, has helped the Town of Brighton identify the most likely future disaster events that could be experienced there, and to prioritize action strategies that should be taken to lessen or avoid losses from those events. The possible risks from both natural and manmade disaster events were assessed in relationship to vulnerable structures, infrastructure and populations for impacts from those events.

The benefits of hazard mitigation planning include:

- increasing public awareness and understanding of community and individual vulnerabilities and risks from likely disaster events,
- increasing the public's understanding of how climate change could affect the intensity of those events on the town's future land use plans
- increasing support for specific actions the town may propose to take to reduce losses in the future,
- strengthening partnerships among diverse interests, establishing communication on the issues and opening opportunities to leverage resources,
- reducing physical, financial and emotional losses caused by both natural and manmade disasters, and
- preparing Brighton's eligibility for federal grants and aid following a federally declared disaster and completing a step to become eligible for a higher match of state funds to repair infrastructure following disaster events.

Community Profile[1].

Brighton's economy and history is tightly linked to its natural resource base. Island Pond, the village center for Brighton, includes remnants of large buildings and railroad infrastructure that illustrate the town's history as a regional center for the transport of timber and more from the north woods.

Logs move through town by truck now, but the area has become a tourism mecca for snowmobile and other winter sports enthusiasts, bicyclists in summer, foliage in the fall and the maple industry in the spring. Brighton State Park includes a beach and campground on the opposite shore of Island Pond from the downtown. Island Pond is a sizeable, 608 acre, lake with a 22 acre island, surrounded by mountains: the Bluff and Dolloff Mountains and more in the Seneca range. The commercial village of Island Pond has the advantage of being located directly on the lakeshore. Brighton is surrounded by the sparsely populated towns of Newark, Morgan, Westmore and Charleston, and the unified towns and gores (UTG) of Ferdinand, Lewis, Warren Gore, and Avery's Gore. It's the commercial center of a beautiful, wild place – in the center of the Northeast Kingdom of Vermont.

History from the town plan indicates how the town thrived as a mid-point transportation point between Montreal and Portland, Maine, key to export of goods and merchandise to Europe. In 1853, a U.S. Customs Office was opened in Island Pond that drew many more workers and residents to Brighton. The town's population grew in the mid-1800's to about 2000 people as many lumber mills, powered by water, were erected. When much of the timber was gone, farms appeared.

Of the 17 largest lakes in Vermont only three have the distinction of having a downtown adjacent to them: Burlington, Newport, and Island Pond. From The Island Pond Plan, October 1989, G.H. Trebor, Black River Design, and Germain Page

The importance of Island Pond as a rail center for international transport of goods and soldiers peaked again during the World Wars. The U.S. Customs office closed its doors in Island Pond in 1973, an indicator of economic struggles, and today many fewer trains pull through the town, all carrying freight. As the economy has shifted to

[1] Most of the information in this section is derived from the 2013 Town Plan.

tourism, the village maintains a sprinkling of local services, and restaurants and shops that attract visitors from distances. From the town plan: the historic and very large RR "station's grandeur has survived" via local rehabilitation and houses "the local bank, office space, and the Island Pond Historical Society and Museum".

Other important rehabilitation projects in recent years have included a library renovation, a new pedestrian bridge (shown right) to link the upper village residential neighborhoods with the downtown, a community welcome center, and a new park pavilion on the lakeshore.

The Town Hall "Opera Block" (shown left) has been undergoing restoration to restore its lost historical and architectural features. A lakeshore walking path has also been constructed.

The town's population is about 1200 residents, but has been experiencing decline over the last decade. The latest closure of the Ethan Allen furniture manufacturing facility in the year 2000 was another economic

blow to the region – a subset manufacturing operation of Ethan Allen was located in Brighton. The plant employed 120 people, and when it left town, the impact was very severe economically. Tourism, attracted to the area's largely undisturbed natural beauty, is a key part of the economy. A world-renowned center for snowmobiling, the dry winter of 2016 will have an impact on businesses in Brighton. Recent regional economic activity has brought controversy with them: industrial wind facilities were opposed and some road issues came up with an industrial-scale maple sugar operation.

Even by midwinter 2016, no trails were listed as being open in Vermont on the VAST (VT Association of Snow Travelers) website. VAST trail membership and bookings near Nordic skiing centers were down as much as 20%. Long time managers of Nordic operations, for upwards of 30 yrs, couldn't remember a worst year. Snow depth on Mt Mansfield had never been as low, since 1954, when the measurements began to be recorded. Source: *Andrew Nemethy article, VT Digger, 2.14.16*

The median age of Brighton residents is 49.3 years, which is higher than the average for Essex County and for Vermont and may be because Brighton has several senior housing facilities in a town with a small population.

From the town plan: household "incomes in Brighton are lower than the average for Essex County and significantly less than the average for Vermont. Similarly, average housing values, ownership costs, and rents are lower in Brighton than averages for the county and state." The 2010 Census data notes that residential buildings are older than the Vermont average as well, with 54% built earlier than 1940.

Town Departments, Infrastructure, Utilities and Basic Services

Water System: Operated by the Brighton Water Commission, the water system has two reservoirs in town, located at its northern and southern ends, which serve most of the village of Island Pond and the houses around the lake. The North reservoir holds 250,000 gallons of water - the South one holds 333,000 gallons. Each reservoir has a state approved Wellhead Protection Plan. They have completed several recent projects to upgrade infrastructure, including replacement of inadequate water lines on Ripple Cove, Lakeshore Drive, Lake Street, East Brighton Road, Island View, and the Spectacle Pond area.

The water lines around the lake were looped to aid in fire protection. Town plan goals include one to "install dry hydrants in remote rural areas to sufficiently meet local fire protection needs, and replace or remove inadequate hydrants."

Wastewater: The municipal wastewater systems is treated by an aerated lagoon, installed 40 years ago. The municipal system is currently operated through a contract with

Piscataqua Environmental Services. The treatment capacity of 150,000 gallons daily currently operates at approximately 52% of capacity.

Roads: The town garage is located on Railroad Street adjacent to the state highway garage where supplies of sand, salt and gravel serve both town and state needs. The town maintains 27 miles of highway - 16 more miles of road in town are state highway. With much of the surrounding area being prime moose habitat, collisions with these large animals are the primary road hazard, with collisions occurring each year.

Railroad: The St. Lawrence & Atlantic Railway (SLR) operates through Brighton with a terminal in Island Pond Village. The rail line extends from Portland, Maine to St. Rosallie, Quebec where it connects with Canadian National Railway, and then into Montreal for access to the entire Canadian Rail network. In St. Rosallie it also connects with the Canadian American Railroad Company. Approximately four trains per day run between Island Pond and Canada and six per day between Island Pond and Maine. Lumber is still the principal freight.

Transit: Rural Community Transit (RCT) is the non-profit transportation group, serving a wide range of passengers through a variety of programs, covering Brighton residents and relying heavily on a volunteer driver network. As the Medicaid/Reachup broker for Essex and other counties, RCT coordinates medical trips for Medicaid eligible persons. It also provides transportation services for area social service agencies, and is the regional coordinator for the statewide Rideshare and Van Pool programs.

Island Pond Community Services is a non-profit organization that has teamed up with RCT to provide free transportation with its 12-passenger van to residents of Brighton and local communities. Currently there is weekly transportation from Island Pond to Newport. The trip is open to anyone that needs a ride. The bus will pick up people along its route and bring them where they need to go in the Derby/Newport area, picking them up and dropping them off as requested. There are also two monthly trips to Littleton, run in a similar way.

Solid Waste: The town garage is also the location of the recycling center. Like all towns in Vermont, solid wastes are disposed of at the Coventry landfill, which is close by Island Pond.

Fire Department: The Brighton Volunteer Fire Department is run by approximately 22 dedicated volunteers. The fire department is depended on to provide service to most of its surrounding towns, resulting in a need for a greater number of volunteers, especially during daytime working hours. One of the fallouts, from the closure of the Ethan Allen manufacturing facility in Island Pond fifteen years ago, is that many of the volunteer

ambulance squad members were also employees at the plant, and the company was generous in allowing them to leave work in case of an emergency. When the company left town, many of the squad members had to find work elsewhere, and that work took them too far away to respond.

In 2008 the voters approved a bond to construct an addition to the fire station on Railroad Street. Through its annual budget, Brighton maintains the station building, vehicles and equipment. A cooperative agreement between the Fire and Water Departments exists for the care of the 95 hydrants located within the town.

Emergency Response: Brighton is a member of Local Emergency Planning Commission District 10 (www.lepcl0.org). Local Emergency Planning Committees (LEPC's) were established by the Federal Emergency Planning and Community Right-To-Know Act. Rapid Response Plans for each LEPC member can be found on the LEPC website. The LEPC planning efforts have been refocused in the last decade to address emergencies from a full range of disasters that could affect the community.

Rescue Department: Brighton contracts with Lyndon Rescue, Inc., from Lyndonville for round-the-clock emergency ambulance service. The service is particularly important given the high number of elderly residents in the area.

Police Protection: Brighton has a Police Chief on staff, who appoints deputies as needed, all of whom are part-time. The Constable is an appointed position. Brighton also receives limited coverage from the Essex County Sheriff's Department and the Vermont State Police.

Utilities: Fairpoint, Inc. provides landline telephone and internet services to the Brighton area, and they now are offering to provide internet service to anywhere there is a phone line. The Vermont Electric Cooperative supplies electric power and several dealers from other towns provide propane fuel. Comcast provides cable television and internet service to the townspeople, and there are also satellite television customers within Brighton.

Community Assets

Municipal Buildings: Besides being the Town Hall, the massive downtown municipal building houses the Brighton Public Library a branch bank, the offices of the Town Clerk, Town Administrator, and the Listers. The building also has a gymnasium that is used for sports, town meetings, talent shows, and other community functions.

Brighton serves as the regional center for a number of services for the surrounding towns. The Northeast Kingdom Learning Services (NEKLS, www.neklsvt.org) office is in the basement of the Town Hall. NEKLS provides comprehensive educational programs and

services to community members who would like to advance their education or workplace skills. In addition, they serve children and families through an array of support programs. The NEKLS Community Education Center in Island Pond serves both adults and out-of-school youth with Adult Basic Education, GED preparation and testing, and two high school credentialing programs. Basic computer skills training is provided on an on-going basis, and CDL training is offered through periodic classes. Other job-skills training and certification are available as well.

Northeast Kingdom Community Action (NEKCA, www.nekca.org), coordinates efforts with NEKLS, and rents adjacent office space in the town hall.

Island Pond Historic District: Established in 1979 and encompassing thirty historic buildings and sites located along Depot, Main, Railroad (Pherrin), Maple, South, Walnut, Cross, Elm, Middle, North, and Mountain Streets, the district is essentially the "Upper Village" perched on the hill overlooking the village, but it also includes a number of buildings fronting on Main Street. The Town of Brighton owns the Historic Grand Trunk Railroad Station, a key downtown building that was restored in the early 1990s. The first floor houses a local bank branch, and the Brighton Police Department. The second floor is used mostly by the Island Pond Historic Society and by a venture capital firm. Other offices are available for rent on the second floor.

Medical: The Island Pond Health Center, part of the Northern Counties Health Care system, is located on Maple Street in Island Pond. The Island Pond Health Center is a family practice designed to make health care and health education more readily available to area residents. The center offers complete, coordinated, and individualized health care to people of all ages and provides a one-stop location for many family health care needs, including primary medical care, laboratory tests, and a variety of programs geared toward health maintenance.
The facility was established in 1977. Prior to that, Island Pond was the site of one of the first National Health Service Corps doctors in the country. The health center is unique in the fact that it consists of 3 different sources of healthcare under one roof – a medical office with 2 physicians and a physician assistant, a dental office with 1 dentist and 2 hygienists and a dispensary for medicines for patients.

Schools: Brighton's elementary and junior high school-age children (grades K-8) receive public education at the Brighton Elementary School located at the lower end of Railroad Street. Brighton Elementary is a member of the Orleans Essex North Supervisory Union. Students in grades 9-12 attend North Country Union High School in Newport. All are experiencing declining enrollment.

Snowmobiles & All-Terrain Vehicles: Island Pond is a nationally renowned destination for snowmobiling, because of extensive and well-maintained trails in the area, and snowfall depths. The town allows snowmobiles to come into the village on specific routes and allows certain roads to be open to snowmobile traveling, following state statute. The town has a Snowmobile Ordinance, as well as an All Terrain Vehicle ordinance. At present the town restricts ATV travel to very limited sections of certain town highways.

Source: islandpond.com

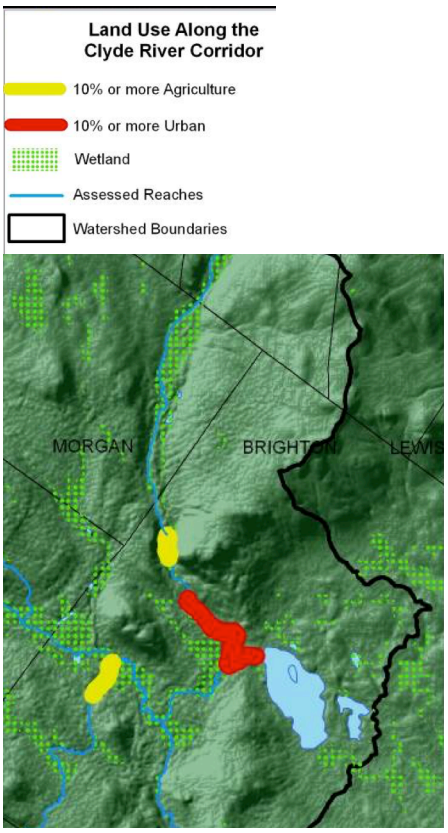
Brighton State Park: Brighton State Park has a day use area with a long sandy beach, for swimming, boating and picnicking on the south end of Island Pond, looking across at the village. The camping, hiking trails and a nature museum are located around Spectacle Pond. Spectacle Pond is an undeveloped, more shallow pond, compared with Island Pond. The campground has 5 cabins, 61 RV/tent sites (no hookups) and 23 lean-tos. In 2000, an additional 430 acres were added to the park. Most of this acreage includes a series of complex wetlands and fens as well as critical wildlife habitat.

Natural Resources

Impervious, developed land only covers 2% of the approximately 29,000 acres of Brighton. The vast majority, 82%, is forested. Agricultural and open land occupies 14% of the land area. Much of the remainder is wet. From the town plan: Island Pond is the headwater source for the Clyde River. The town also has McConnell, Spectacle, and Beecher Ponds, and other smaller ponds. "The majority of the landscape is covered by boreal forests and wetlands providing an amazing diversity of wildlife and vegetation." The downtown and water body of Island Pond are located in the Upper Watershed of the Clyde River Watershed, with the Brighton headwaters eventually draining into Lake Memphramagog.

The National Wetlands Inventory for Brighton shows 27 wetlands areas, also apparent on the land use map of the town plan. The wetlands along the west inlet stream of Nulhegan Pond include a diverse complex of bogs, soft wood swamps, alder swamps and beaver meadows. The Clyde River wetlands consist mainly of shrub and cedar swamps. The Meehan Hill Swamp and other wetlands surround Beecher, Spectacle, and Island Ponds. The flood storage capacity of the area - to soak up a large quantity of stormwater or snowmelt, and then release the moisture slowly over time, is high.

Flood Plains, Streams, Rivers: The town adopted flood plain zoning in 1986, making flood insurance through the National Flood Insurance Program (NFIP) available to those who own structures in Brighton. Enforcement of the zoning requirements has included requiring any structure in the flood hazard area to be raised enough to avoid damage by flooding. The town plan notes, however, that "enforcement is expected to get more aggressive due to increasing insurance claims. Also, assistance to towns from this program is now based on how restrictive [the town's] regulations are. This may be a good reason to consider adopting regulations that provide the town and property owners with the maximum benefits possible."



Map from p. 17 of Restoring Water Quality in the Lake Memphremagog Basin:Clyde River Phase I and II Stream Geomorphic Assessments, April 2008

A Phase I Stream Geomorphic Assessment was completed for the Clyde River and its tributaries in Brighton by the North Woods Stewardship Center, along with a Phase II assessment for three of its sections totaling less than eight river miles (including the settled areas downstream of downtown). The Phase II assessment (over the entire watershed – not just within Brighton's boundaries) found the majority of the streambanks to be stable, with 12% actively eroding. Within Brighton, the "Clyde River is a slow, low gradient river snaking its way through broad valleys, vast wetlands, and floodplain forests"[2]. Except in a few areas directly adjacent to roads and development, the river has retained more than 25' of vegetated buffer. There are many beaver dams, as the river meanders through alder swamps.

[2] North Woods Stewardship Center, Restoring Water Quality in the Lake Memphremagog Basin:Clyde River Phase I and II Stream Geomorphic Assessments, April 2008, p.9

Debris dams are also common. A short section from the pond, under the Clyde River Hotel, has been channelized. "This reach could… benefit from a volunteer clean-up effort; a lot of trash was found in the river in Island Pond and in the wetlands just downstream of the village."[3]

Along the Cold Brook, the geomorphic assessment found that current and historic channel straightening have resulted in a highly incised and entrenched G stream type that is unable to flood, disperse its energy and deposit sediment during high flows. The report also states that little to no buffer was found along both sides of much of this channel, making bank failures common. Farmers lose corn, with it falling into the stream in several places. The scientists at North Woods Stewardship Center concluded that the bridge at VT Route 105 is undersized, noting that "an ice jam formed during winter 2007 that caused the brook to flood the highway, run through [a bare] field, and rejoin the channel downstream."[4] "It is clear that this reach sends excessive sediment into the Clyde River. Boulders were piled along eroding banks in some places along the reach, but these attempts only focus the erosion to downstream portions as this tributary attempts to re-establish a floodplain at a lower elevation."[5] The report recommends stabilizing the stream banks in this section by creating a vegetated buffer.

The rest of Brighton is located in the Nulhegan River Watershed. Much of this watershed is protected state and federal land, including the large Silvio O. Conte Fish and Wildlife Refuge (very little of which is in the town of Brighton). The refuge is surrounded by Plum Creek Timber Company lands, some of which are in Brighton.

The North Woods Stewardship Center has also completed a river corridor plan for the Nulhegan River. As that plan notes, for the first 9 miles after leaving Nulhegan Pond in Brighton, the river meanders in a wide wetland. "In fact, the river drops only 20 feet in elevation over this distance. Due to a combination of its gentle gradient and its broad valley setting, this portion of the river is slow flowing, very sinuous, and features many backwaters and secondary channels."[6]

This upper watershed area, surrounded by mountains up to an elevation of 3300', has boreal characteristics and species, like the gray jay, spruce grouse and boreal chickadee. The river supports wild populations of native brook trout. With the exception of some logging roads, "the watershed here contains almost entirely natural land cover."[7]

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[3] Ibid, p.34
[4] Ibid, p. 40
[5] Ibid, p. 40
[6] North Woods Stewardship Center, 2010, River Corridor Plan for the Nulhegan River: Stone Dam Road to Connecticut River, p. 7

[7] Ibid, p.8

Credit: Northern Forest Canoe Trail blog at blog.northernforestcanoetrail.org

The relatively small human population and low intensity development maintain excellent habitats for a variety of animals and plants, both large and small. Common wildlife in the area includes moose, black bear, deer, bobcat, and small game species. The watershed of the Upper Clyde is one of a very small percentage in Vermont still supporting brook trout populations. This part of the state is Vermont's largest IBA (Important Bird Area), due to the extensive boreal forest and associated wetlands. Boreal species like the Gray Jay, Boreal Chickadee and Black-backed Woodpecker, not found elsewhere in Vermont, nest here.

Local Plans and Regulations

The current Town Plan was adopted in April 2013. Brighton's zoning regulations, last updated in March 2012, reflect its tourist-based economy that relies heavily on the unspoiled character of the region. In the face of industrial wind project applications, "to protect our quality of life" Brighton prohibits structures above 40 feet, including on ridgelines. The following review of the regulations reflect on elements that help protect the flood resilience of the watershed and town infrastructure.

Zoning Regulations: Applications for zoning permits must include proposed erosion and sedimentation control measures that will be done, and in reviewing site plans, the Development Review Board may impose appropriate safeguards with respect to the following erosion and sedimentation control measures. An application for subdivision must include: location of waterways, wetlands, and flood plains, and a topographic survey may be required.

A Shoreland Overlay District is included, which is designed to protect all surface water quality and applies to all natural lakes and ponds in the Brighton. A 30-foot vegetative buffer, consisting of grass, shrubs and/or trees, is required to be maintained adjacent to the shorelines, with an exception for paths (not more than 8 feet wide) and stairs (not exceeding

4 feet wide) to provide access to the water (provided that the path or stairs are as perpendicular to the water as possible). Application of fertilizer, pesticides, or nutrients in the buffer zone is prohibited.

The zoning regulations also require that any new curb cuts adjoining or affecting town roads, state highways, or surrounding private properties must have adequate drainage. Prior to creating a curb cut, an individual must first obtain approval from the Brighton Road Foreman or the appropriate district office of the Vermont Agency of Transportation, depending on whether the highway the new access joins is a town or state road. Approval of the access may be conditioned on installation of one or more culverts of a specified size and location.

Road Standards: The Brighton town road and bridge standards were updated to reflect the state standards in April 2013 and are updated yearly.

Flood Hazard Bylaws: Brighton joined the National Flood Insurance Program (NFIP) in 2000 by adopting flood hazard regulations, which are included in the zoning bylaws. The flood hazard regulations are in place to regulate any development that might be proposed in Special Flood Hazard Areas (SFHAs). The date on the town's FIRM (Insurance Rate Maps created to implement the NFIP) maps is 1990 (see map selection showing the most vulnerable part of Island Pond village in Appendix D). The longtime Town Administrator, Joel Cope, also serves as the official Zoning Administrator and administers and enforces the flood hazard bylaws. He requests assistance from the state in determining Base Flood Elevations, when that's in question. As he says, "When a permit comes in, if it is in the flood hazard zone, I call on the state to look at it. And, as he described, there is little building in the flood zone, so that assistance isn't needed for years at a time.

Due to the current lack of a LHMP, Brighton is only eligible for a state match from the ERAF of 7.5%. The state match for town highway structures is 90% and for Class 2 roads is 80%. Brighton participates in the state transportation agency culvert and bridge inventory.

Emergency Operations Plan: The Brighton Local Emergency Operations Plan (LEOP) is updated and adopted annually, most recently on May 1, 2015, filling in the standard 2014 state template on who is in charge of which responsibilities and their contact information.

Hazard Mitigation Plan: Brighton's Hazard Mitigation Plan (LHMP, which was an addendum to the regional hazard mitigation plan) was adopted in 2005 and expired in 2010. The 2005 LHMP for Brighton identified accidents involving hazardous materials and securing the public water supply as the two main threats the town should take action to mitigate. It also identified flooding as a natural hazard the town was already addressing via road maintenance and land use regulations. The town's newly adopted road standards, the incorporation of flood hazard bylaws into the town's zoning bylaws, the 1994 NRCS study

of flooding solutions, and the description of recommendations and changes to the town plan and zoning regulations described above in more detail, are the extent of integration of the 2005 LHMP into the town's other plans and bylaws thus far. Brighton has experienced little new development since the 2005 LHMP was adopted, and none in the flood hazard zone. The minor development that occurred hasn't had any impact on vulnerability in Brighton. Improved information and outreach on the impacts of climate change that Brighton is experiencing (complete lack of snow during 2015-2016 winter tourist season), and the impacts felt elsewhere in Vermont during 2011, new statewide requirements and incentives (such as the 2013 road standards) have influenced the changes in Brighton's priorities on addressing potential hazards that are documented here.

The goals for this plan are unchanged from the 2005 LHMP. While concerns for transport of hazardous materials and flooding are unchanged, concern for security of the public water system has been overridden by priorities regarding extended power outages, hazardous travel, roof failure and other impacts from severe winter or thunderstorms.

Process for Development of this Plan

This hazard mitigation planning process has included a strong effort by Brighton to engage the key experts, diverse stakeholders and the broader public. The broad public process had two main goals: to gather background needed to make sound decisions for the future, and to both invest and educate more people about the roles they can take in hazard mitigation planning and action for Brighton.

The Northeastern Vermont Development Association (NVDA - the regional planning commission) coordinated the planning process. NVDA staff supported the planning process throughout and were key to public outreach. NVDA assisted the work of the planning consultant (Peg Elmer, AICP), and Brighton's Town Administrator, Joel Cope, in collecting data and creating maps. NVDA notified key officials who are strong contacts in the surrounding towns about the public meetings in Island Pond, and invited their participation. These included:

- Stephen Matson, Morgan Planning Commission
- Louisa Dotoli, Westmore Planning and Zoning Commission
- Kim Fried, Newark Planning Commission
- Barb Nolan, Unified Towns and Gores (UTG) Planning Commission
- Craig Nolan, UTG Board of Governors
- Tom Jensen, Charleston Selectboard

In addition, NVDA invited emergency responders from the region through the Local Emergency Planning Committee (LEPC). Brighton, through Joel Cope, invited critical stakeholders (such as the utility company, VT Electric Coop; telecommunications tower owner, Vince Illuzzi, State Senator; key fire, rescue, school and water system staff and

volunteers) to participate in both of the public meetings and to contribute to the draft plan development and review. Joel Cope also created a core planning team, which consisted of:

- Melinda Gervais, Brighton Selectboard Chair
- Jeanne Gervais, Brighton Planning Commission Chair
- Bill Hawkins, Brighton Planning Commissioner
- Jeff Noyes, Brighton Police Chief
- Richard Hannux, Chief, and Walt Driscoll, Assistant Chief of the Brighton Volunteer Fire Department
- Marty Frizzell, Brighton Water and Sewer System Chief Operator, and
- Peder Pedersen, Development Review Board Chair

In order to determine the priority hazards to focus this plan update on, to reduce losses for Brighton in the future, the planning team:

- examined the Vermont Hazard Mitigation Plan and federal resources for information about high priority hazards for the state,
- researched more than 100 years of historical records of hazard events in the region,
- surveyed Brighton community members about their recollections of hazard events and their sense of vulnerability, and
- requested feedback from local leaders and emergency managers on vulnerability and hazard probability.

Plan Goals, 2005 Plan and the State Hazard Mitigation Plan: The 2005 Hazard Mitigation Plan for Brighton included the following goals and, upon review at the public meeting for this plan, it was agreed that these goals remain applicable for this plan update:

- 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 and maintenance and the effects from disasters.
- Ensure that mitigation measures are compatible with the natural features of community rivers, streams and other surface waters; historic resources; character of neighborhoods; and the capacity of the community to implement them.
- Encourage all-hazard mitigation planning as a part of the municipal planning process.

The 2005 All Hazards Mitigation Plan for Brighton was a brief "annex" to the regional *All Hazards Mitigation Plan* produced by NVDA for all of its 55 towns. The public process was limited to the topic being an agenda item at regular Selectboard meetings, and inviting key

responsible parties such as the fire chief and water treatment plant supervisor. The priority hazards chosen at that time were:

- Water Supply Contamination
- Accidents Involving Hazardous Materials, and
- Flooding

The 2005 Hazard Mitigation Plan included 3 actions to address the 3 hazards:

- to secure the water system by covering pump stations, locking buildings and installing a phone line for instant notification and alarm system
- to gain generator backup for the school, town garage and wastewater treatment plant, pending grant assistance and
- to transfer the NFIP maps onto GIS maps via assistance from NVDA.

Since 2005, the water treatment buildings are secured with locks and phone alarm systems have been installed. The wastewater treatment plant has a backup generator and another generator was acquired for the town hall that is kept at the town garage. The school still has no back up. The map project, to transfer the flood hazard areas onto GIS maps, has been completed as well as possible, using the old FIRM maps, with the caveat that the actual FIRM maps should be the guiding documents for issuing permits. Flooding and accidents involving hazardous materials are concerns from the 2005 plan carried forward into this plan as well, while water supply contamination no longer rose to the same priority consideration level.

Table 1. Vermont Statewide Hazard Priority Ranking, in Order

1. Flooding and Fluvial Erosion	10. Wildfires
2. Terrorism	11. Dam failure
3. Earthquakes	12. Severe winter storms
4. Infectious Disease Outbreak	13. Hail
5. Hurricanes/Tropical Storms	14. Ice jams
6. Tornadoes	15. Drought
7. Nuclear Power Plant Failure	16. Rock cuts
8. Landslides/Rockslides	17. Invasive species
9. Severe Thunderstorms	18. Extreme temperatures

Source: 2013 State of Vermont Hazard Mitigation Plan

The state hazard mitigation plan was updated in 2013. Even though Vermont is small geographically, weather effects vary across the state. The planning team reviewed the state's ranking of hazards, and could understand why terrorism or an infectious disease outbreak needs to be part of the state's mitigation plans, but agreed that those do not rise to the same level of concern, especially given their ability to address those hazards, for the town of Brighton.

Outreach and Communication: A vigorous effort was made to inform and involve the public in this planning process, to gather their input on Brighton's hazard history and chief hazard risks, and to gain their feedback on prioritizing the action strategies to include in this plan. The planning team was created to include Joel Cope, along with members of the

Planning Commission, Development Review Board and Selectboard, Police and Fire Chiefs, and the Water and Sewer Operations staff (see page 13).

Beyond the standard public meeting notices, NVDA and town staff publicized the process and engagement opportunities in many ways. They gained articles promoting the public meeting in the *Caledonian Record*, the daily newspaper based in St. Johnsbury (see copy in H), the *Newport News* and in the *Barton Cronicle*. They posted posters in public locations around town and made announcements on the town's website and via social media channels. Most importantly, Joel Cope identified key residents and stakeholders who should be present and issued direct and personal invitations to those individuals to attend.

The public and key stakeholders were heavily engaged in the planning process at two major points:

1st Public Meeting (Hazard History + Vulnerability Analysis), held September 21, 2015

2nd Public Meeting (Action Planning), held November 16, 2015

Priority Hazards for Brighton:

- ***flooding*** (from hurricanes, severe thunderstorms or severe winter storms)
- ***severe wind, snow or ice build-up*** (from severe thunderstorms or winter storms)
- ***hazardous materials accidents***
- ***large structure fire in village***

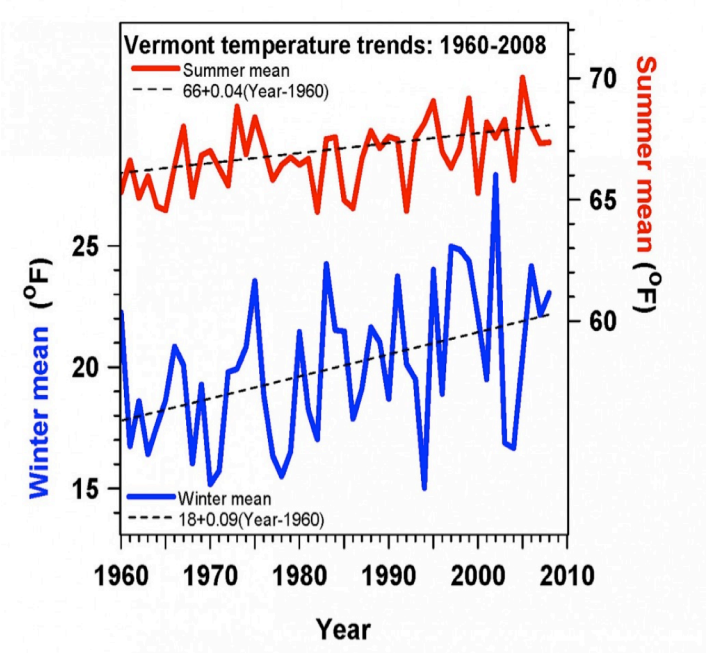
The first public meeting was held on September 21, 2015, in the Gym at the Town Hall in Island Pond, with more than 15 people in attendance. Joel Cope had issued personal invitations to key officials to attend the meeting, and those people were the ones primarily in attendance: fire department volunteers, planning commission, development review board and selectboard members, Lyndon Rescue, VT Electric Co-op, Brighton Water and Sewer, and the district watershed coordinator for the State's Agency of Natural Resources.

Attendees engaged in a lively review of hazard memories and discussion of key risks. After a brief overview of the changes in weather patterns due to climate change and related to Brighton, the group used the Hazard History Checklist (see Appendix C) to review the history of disaster events, discuss the probability of future events by hazard type and the level of probable impact and extent of damages that the town should anticipate from those hazards. The Vulnerability Audit survey was also used to see how well informed, connected and prepared the community and local institutions are for major disaster events. This was a collection of the well-informed individuals. Attendees reviewed the priorities of the 2005 plan and the State's hazard mitigation plan, as they relate to more recent weather events and the experience of the community with disaster situations.

The group present at this first meeting then examined the list of probable hazards for Brighton and honed the list down to what they viewed as the top priority hazards for this plan to focus on, to include: flooding, severe wind or ice build-up (resulting in extended power outages or unsafe travel), hazardous materials incidents and downtown fire. The list of causes that can bring these hazards to town is longer: blizzards, thunderstorms, ice storms, railroad or highway accidents. This list was then re-checked with the Town Administrator and planning team, as the hazards this plan would focus on. Once these priority hazards were identified, Brighton set the second public meeting date for November 16, to formulate a set of goals for the planning process, and evaluate possible action strategies to take over the next five years. A long list of possible strategies was narrowed down by the town administrator, Joel Cope, and the planning team to forty-five choices to be evaluated in that public meeting.

The team held its second public meeting on November 16th , using the same variety of outreach methods (posters, online notices, newspaper, social media and direct invitations) to inform and invite the public. Joel Cope's direct invitations were probably the most effective. More than a dozen people attended again, including Joel (Town Administrator) and Irene Nagle (staff representative from the regional planning commission). Also attending were three members of the fire department, two of whom also serve on Lyndon Rescue. Marshall Frizzell (water and sewer system chief operator) attended again, as well as the E911 coordinator. Three members of the planning commission and one selectboard member also attended.

After a brief slide presentation describing possible mitigation strategies to lessen losses from Brighton's priority hazards, attendees broke into two groups, each discussing a different set of possible mitigation actions that Brighton could adopt for the next five years. The groups were divided in part based on expertise (with representatives of the fire department considering actions related to fire hazards, for example). The groups scored the actions using an abridged STAPLEE (Social, Technical, Administrative, Political, Legal, Environmental and Economic) cost-benefit analysis worksheet (see Appendix E). After the meeting, Joel reviewed the final



Source: Alan Betts

STAPLEE scores with the planning team, adjusting for consistency between the groups, further discussing primarily technical, administrative and political feasibility, and finalized the priority actions, as highlighted, on the Table found in Appendix E.

Finally, the results were compiled into the draft plan as the implementation plan, and reviewed again at two publicly noticed meetings of the the Selectboard in May and June 2016. The board carefully weighed the political, fiscal and technical feasibility of the plan actions for the next five years, reviewing Appendix E again, determined priorities among the actions, assigned implementation responsibilities and timelines in Table 5, and then approved passing the draft plan on to the state Department of Emergency Management and Homeland Security and FEMA Region 1 for review.

Hazard History for Brighton

There is no question that weather has become unusual, as the climate changes, across the planet. The National Weather Service in Burlington has presented and interpreted federal disaster information for Vermont to show that, while there have been 37 federally-declared disasters in Vermont since 1973, fully half of those have occurred in the last decade, and a third of them in the last five years. The entire Northeast has been experiencing, and is projected to gain, more precipitation, as shown by this trends map.

It's fortunate that weather data has been collected in St Johnsbury at the Fairbanks Museum for well over 100 years. That data indicates an increase in precipitation, as well as temperatures. Both the Fairbanks Museum weather station data and the data illustrated by Alan Betts, a climate scientist based in Vermont, indicate that Vermont is getting warmer in winter twice as fast as in summer.

Most of the increase in precipitation is projected for fall and winter, with earlier spring melt and runoff. Vermont in general is anticipating shorter, warmer, wetter winters. Rain events have become heavier, with 2-4" downpours becoming more common.
Summers have more hot periods, across the region.

Broken down into county information, and the experience of 2011, when Vermont had four federal disasters in one year, the trends show that Brighton is in a fairly safe corner of the maelstrom. Not so hot or wet as the

Table 2: Natural Hazard Events 1960-2013

Hazard	Events
Winter Weather	391
Wind	185
Severe Storm/Thunder	123
Lightning	49
Flooding	34
Hail	25
Hurricane/Tropical Storm	2
Fog	2
Heat	1
Tornado	3
Total	815

Source: SHELDUS Database

band through central and southern Vermont, and surrounded by a large sponge of wetlands and forest. Brighton is in a cool corner, not experiencing the highest heat of summer, and a colder corner in winter.

The number of recorded natural hazard events for Essex County in the last 50 years are shown in the Table 2 above, using data from the SHELDUS database (Spatial Hazard Events and Losses Database for the United States).

Natural Hazards History and Risk Assessment: A review of federal, state, and local disaster event data was completed prior to the first public meeting, covering all hazards addressed in the state hazard mitigation plan. That first meeting provided further key information, from long time residents, on Brighton's hazards history. This section of the plan is divided into (1) this description of all natural hazards the state is concerned about and the level of risk for Brighton, due to its history and vulnerabilities (2) manmade hazards history and (3) a summary of the priority hazards chosen by Brighton research more deeply and to focus mitigation action on in the five year span of this plan.

Dam failure: Review of the Agency of Natural Resources maps showed there are no manmade dams at issue, and the public in the first meeting agreed that there are three small manmade dams that are not a problem. One beaver dam was noted because of its proximity and being above Arthur John Road on the southeast edge of town. The watershed supports an active beaver population but the group agreed that the probability that failures of old dams could cause any significant loss is low and any impact would be isolated.

Drought: The National Climate Data Center indicates zero drought events for Island Pond or Essex County. The town did institute water saving practices during a dry spell in 1995.

Earthquake: The National Climate Data Center indicates Essex County has a very low earthquake risk. 10 earthquakes have been recorded as affecting the area since 1931. The USGS database shows that there is a 1.55% chance of a major earthquake (5.0 or greater) within 50km of Island Pond, VT within the next 50 years. The largest earthquake within 30 miles of Island Pond, VT was a recent 2.2 Magnitude in 2015. At the public meeting it was noted that the water intake for Island Pond's public system had some damage from an earthquake 14 years.

Flooding: Flooding can be the result of a range of storm events and sudden snowmelt in Brighton. From the SHELDUS data for Essex County (but averaged over all counties reporting), in July 1997 there was a flood from a summer storm about equivalent in damage costs for Essex County to the spring 2011 events (which, for Island Pond, caused twice the damage that Tropical Storm Irene did). Flooding, from extreme thunderstorms in May of 1984, was even worse, causing six times the damage listed for above. The worst flooding for

the last 50 years of data was in June of 1973, again from extreme thunderstorms, with property damage.

The Brighton Town Administrator, Joel Cope, notes that Meadow Street has washed out at least five times in the last thirty years: twice in 1986, in 1987, 2002 and April 2011. Those are an even mix of spring snowmelt periods and summer storms. The inadequate double culvert there is noted as a problem site on the Village area Map in the Appendices, along with the bridge on Railroad Street, which was also pointed out as inadequate during flooding events.

A 1994 Soil Conservation Service Study examined constructing a dike on the upstream side of Meadow Street. Thinking about that study now, Joel Cope states: "Walling off the water might take care of the flooding of the houses in that area, but wouldn't do anything for the road washing out and might in fact worsen the situation because those houses were built in what we now consider the flood plain. Walling it off would force the water level higher, which would impact the nearby road."

Hail: Two events are recorded for Island Pond, one in June 1985 with 1" stones and another in June 1990 with .75" stones. No damage was recorded.

Ice Jams: No major events or risk anticipated from flooding are associated with ice jams in Brighton.

Ice Storms: The ice storm of January 1998, that hit a wide swath of the Northeast, including Quebec, caused about $80,000 damage in Brighton according to the National Climate Data Center. The town was without power for three days. A storm a decade ago only caused an 18 hour outage in Brighton but some parts of Vermont were without power for four weeks. Ice storms can wreak havoc via flooding, extended power outage or infrastructure failures, and are seen by the Town Administrator as a top risk for the town. There is no data available on number of inches of ice accumulation.

Credit: video-vermont.com

Landslides: Although there have been a couple of incidences of subsidence recorded in the SHELDUS data for Essex County in the last 50 years, this hazard is viewed a very low risk for Brighton.

Lightning: One event, in June 2007, is

listed on the National Climate Data Center. It is not viewed as a major risk to plan for.

Moose Collisions: The probability for collisions in this area is high, and too common, but the impact is isolated. People do lose their lives to moose, though, and the warning time is non-existent.

Severe Winter Storm: Brighton is in the cold and snowy part of Vermont. Travel logistics and power outages in the extreme cold and wind chill can add to the risk for losses. Winter storms in November 1990 and March '91 caused damage statewide that affected Brighton. January '86 and Febuary 85 were expensive in damages from winter storms as well, but the source for this data averages the losses across the state. (SHELDUS) The National Climate Data Center, a subset of the NOAA, maintains data on major storm events by type, and is the best available data found. Since the data began being kept on "winter storms" in December, 1996, Essex County demonstrates a likelihood to experience 3-6 recorded "winter storms" per year, with damages between $5-50,000 each. There are still more separate events of strong wind, and those with heavy wind occurring in the winter months, or heavy snow such as a Valentine's Day storm during a long difficult winter in 2007 that racked up $100,000 in damage (also recorded for a winter weather event with $10,000 in damage), or extreme cold/wind chill – all recorded as separate events. Zero blizzard events are recorded for the Island Pond area.[8] These storms cause power outages two to three times each winter season, especially from heavy wet snow. There are, however, now two major utility lines into town, with some backup on the Canaan side.

Terrorism: This hazard scored fairly low, but should be mentioned. Because of being a larger town close to the Canadian border, the water and sewer superintendent noted he loses some sleep over the possibilities for a terrorist attack on the water supply.

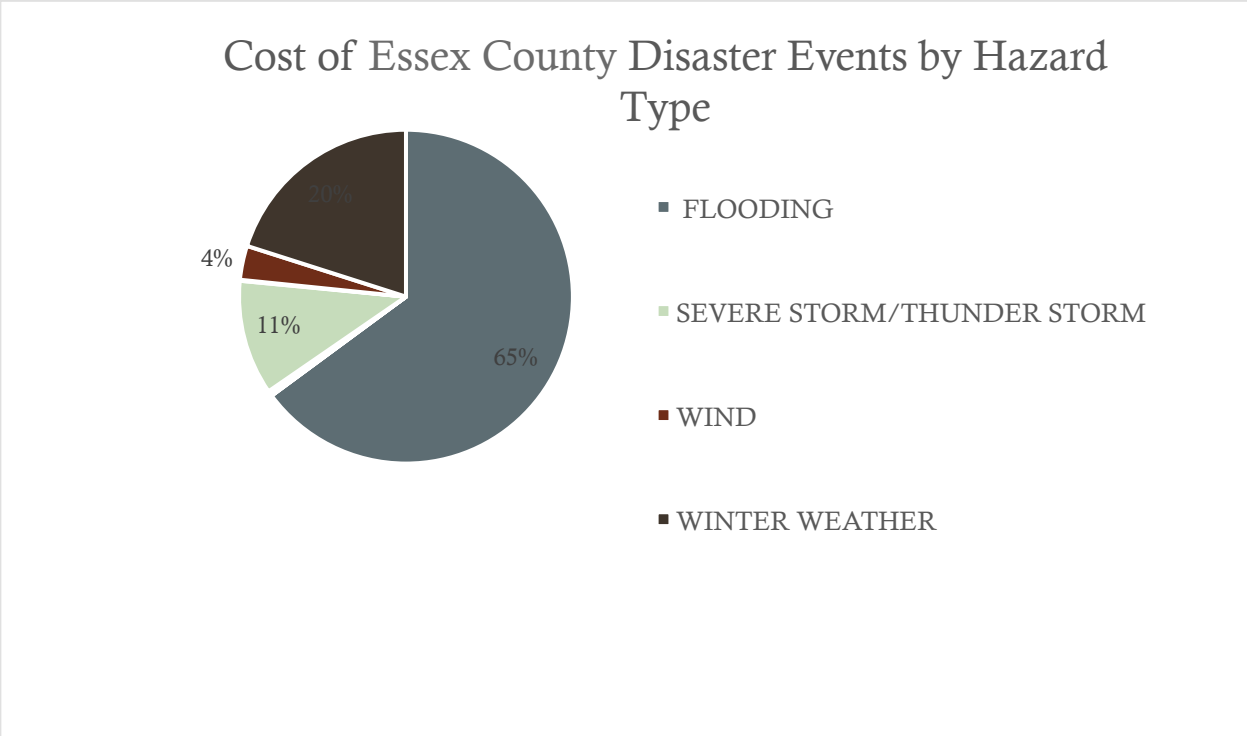
Tornadoes (and wind shear): Brighton is a Very Low Risk area for tornados, with 15 occurring within 30 miles of the town since 1950. Three were in 2011, a tough year for Vermont. The majority, 60%, haven't registered even as a F1 tornado. According to records, the largest tornado in the Island Pond area was a F1 in 1962 that caused 1 recorded injury – the remainder caused 0 injuries and 0 deaths.[9] Only two have been strong enough to be recorded on the National Climate Data Center. The public input on hazard history gave tornadoes a medium level of risk, however, noting a 1993 event that mowed trees in a 1000' wide swath and moved a couple of houses off foundations, just to the north of Rte 14. Most impacts have been to forest cover. That same 1993 event destroyed a 1000 tree sugarbush. A strong wind shear event just occurred in summer 2015 in the neighboring town of Ferdinand, which is mostly forested.

[8] www.ncdc.noaa.gov/stormevents

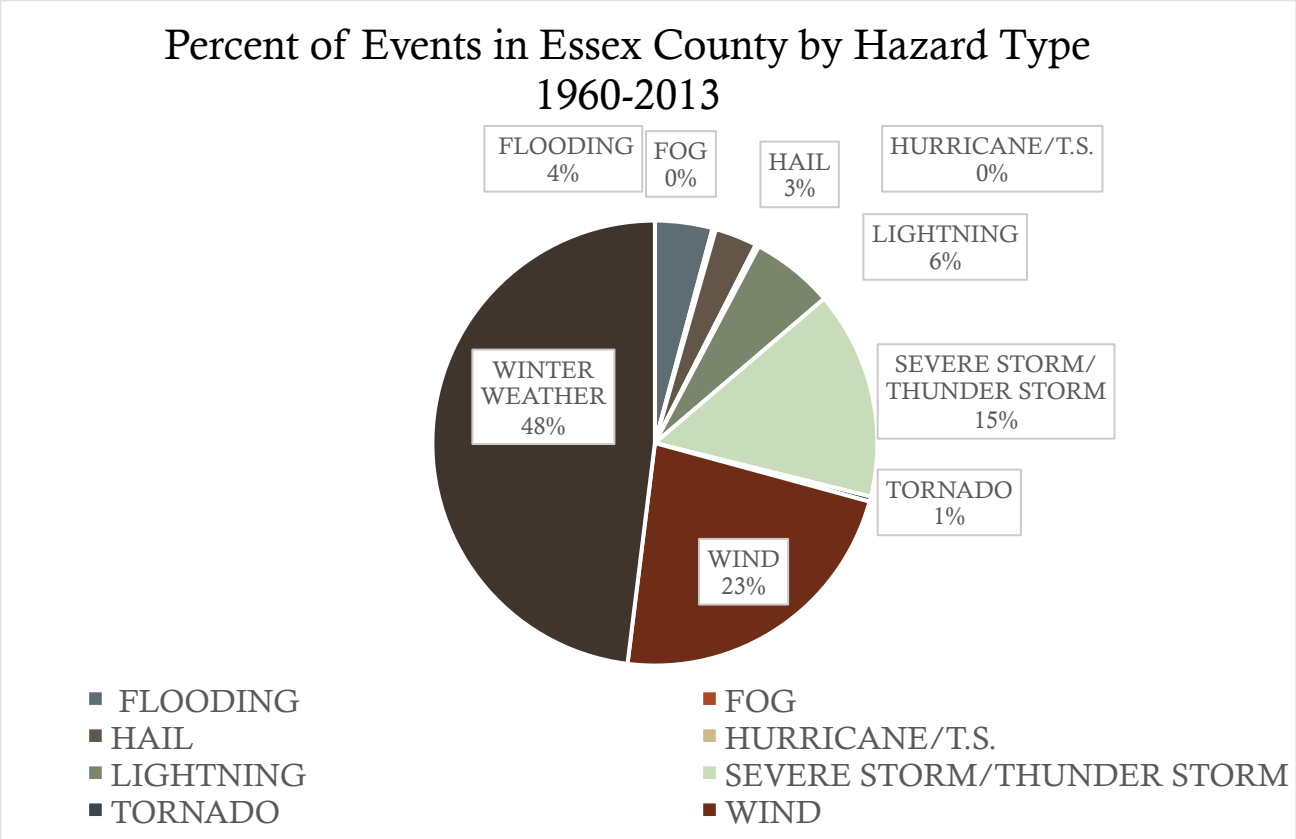
[9] www.homefacts.com/tornadoes/Vermont/Essex-County/Island-Pond/05846.html

Wildfire: Zero wildfires are recorded for Essex County in the NCDC database. The group at the public meeting noted a large burn on Dolloff Mountain in the early 1970's but agreed that wildfires are not a major problem.

Wind (thunderstorm, hurricane): One data source states that Island Pond, VT is in a very low risk hurricane zone. This source[10] notes that 9 hurricanes have been recorded in Island Pond, VT since 1930 with the highest winds being from Frances in 2004.
On the other hand, wind events get spread out over a mix of categories in the NCDC database, and cover only the last 20 years. It states that zero hurricane events are recorded for Essex County in those two decades, but "high wind" events happen fairly frequently with 10 events over the last decade of 30-70 knot winds usually causing $5-10,000 in damage. There is an exception of an April 2007 storm causing $100,000 in damage. Another category, "strong wind" appears to be the favored term in the first decade, with another 13 events recorded, between 39-48 knots and $1-25,000 in damage. Then there's "thunderstorm wind" holding steady at 50 knots, with another 9 events spread over the two decades causing $500-30,000 in damage. From the practical viewpoint, the utility representative at the public meeting noted this area has a half dozen power outages each year due to wind.



[10] www.homefacts.com/hurricanesVermont/Essex-County/Island-Pond/05846.html



Putting the Essex County SHELDUS data into the pie charts format above is telling for the difference between frequency of occurrence and the cost of damages incurred. Winter weather, wind and severe storm/thunderstorms account for at least 80% of the events causing enough damage to be recorded as a hazard event. While flooding only accounts for 4% of the number of serious hazard events, it accounts for 65% of the damage costs from all events. So, even though flooding only accounts for a medium risk to Brighton, its costs keep it on the list of priority hazards to work on mitigating.

Manmade Hazards History:

Chemical: Due to the active railroad line through the town of Brighton and the village of Island Pond, and being close to the Canadian border, the rail car traffic and an accident involving the hazardous materials carried, is viewed as a high risk hazard for the town. Island Pond is the location

where the railroad changes over from Canadian to US crews, resulting in a regular, lengthier stop. Fire department volunteers monitor the hazardous material placards on the rail cars. They see minor rail derailments about once every five years.

The large number of trucks passing through Brighton on their way to or from Canada are also unknowns as to what might be on board, which is also a concern.

Compared to other places, Brighton does not have much in the way of hazardous material residing in town. Vermont Agency of Natural Resources data indicate that Brighton has experienced the usual groundwater contamination, with no extraordinary above ground sites. There are a dozen sites listed in the state inventory, half of which are closed cases. In the last 20 years there are only two listed as open cases still, both having a medium priority level: the town hall site had a leaking underground storage tank of heating fuel, and there was naphthalene contamination found in a groundwater well at Brighton Motorsports on Cross Street.

Gas: Stored propane is also a worry, especially since the rail accident in Megantic, Quebec. The rail tanker cars holding propane are parked in the village now, during the winter, as a method of regional storage for the fuel. The rail line bisects the town, and follows a main road, where homes, and almost all the town's critical facilities, lie.

Structural Fire[11]: If a building fire occurred in the downtown, they could lose an entire block. Big hotels were lost in the 1880's. The last large fire destroyed the Common Sense Restaurant 26 years ago, in 1990, which resulted in the loss of the three-story building it was part of. Two adjacent apartment buildings needed to be torn down as well. It was 20 degrees below zero – creating very difficult conditions. Today, only the Clyde River Hotel (re-named the Green Mountain Hotel) and Ace Hardware buildings have sprinkler systems in place. Some of the older village structures have shared walls or very narrow spaces between the buildings.

The volunteer fire department does regular pre-planning, including tabletop exercises on how to battle a downtown fire. They keep in mind the dangers present: propane at the restaurant, black powder at the sporting goods store, the high-powered electric (VELCO) line cutting across town. Brighton has a well-equipped fire department and keeps up with training. They have a 125' ladder truck, giving them the capacity to combat a blaze in the tallest, three-story buildings remaining. There is a hydrant system with a good supply of water in the village, and the Lake as a backup.

The largest problem is finding and holding on to volunteers since the Ethan Allen plant closed. Only 6 of the 22 volunteers are present in town during the day, making working

[11] Information from phone interview with Walter Driscoll, Assistant Fire Chief

hours a dangerous time for a large fire. Their department is also responsible for parts of the town of Morgan, Brunswick and the UTG (Unifed Towns & Gores).

Priority Hazards Summary: Based on the data and public discussion to assess the level of risk of each hazard type, Brighton determined that the priority hazards to address via mitigation action in this plan include flooding, severe wind, ice buildup and heavy snow (resulting in extended power outages and unsafe travel), and the manmade risks of a transportation accident involving hazardous materials or a major downtown fire.

As noted under the hazards reviewed and discussed (dam failure, drought, earthquake, hail, ice jam, landslides, lightning, moose collisions, tornado and wildfire), each of these were found to be of such low incidence or overall risk and impact to town residents, as described in Appendix C, as to be omitted as priorities to plan mitigation for the next five years. Rock cuts are not an issue of concern for the Town of Brighton, and invasive species were also not found to be an issue of concern for the town's hazard mitigation planning at this time.

Table 3. Events, Hazards and Cascading Effects

Events (Causes)		Hazards		Effects
Thunderstorms Severe winter storms Hurricanes Tornadoes Microbursts Ice jams Accidents (all types) Chemical spills	>	High winds Flooding Flash flooding Lightning Ice Structural Fires Wildfires HazMat Incidents	>	Extended power outages Property + crop damage Infrastructure damage Road closures + isolation Unsafe travel Water contamination Environmental damage Erosion Loss of business Injury + death

At both public meetings there was a discussion of the difference in terminology between "causes", "hazards", and "cascading hazards". Severe winter storms are an "event", rather than a hazard (as noted in Table 3 above). The resulting effects of "unsafe travel" and "extended power outages" are the most typical outcome of weather-related disaster events for Brighton, and many of the possible mitigation strategies would also apply to the effects of severe wind events. Thus, a priority hazard to plan for, in order to address mitigation for the effects that cause losses for Brighton, became "severe wind, snow, or ice buildup".

Assessment of Vulnerability

Flooding: Brighton is supported by its extensive and undisturbed wetlands that help sponge up excess water from major rainfall events. Flooding does happen however, in a few areas in the village of Island Pond where denser development and roads constrain flows. The buildings affected can be seen on the map selection from the NFIP FIRM in Appendix D. The river bend in the middle of that map which has the cluster of structures is at the intersection of Railroad and Meadow Streets. In particular, there are five culverts in place on Meadow Street, and still the washouts occur. Flooding of the adjacent properties is even more common, although the high water rarely actually reaches the first floor of the houses in the area. Town officials believe a bridge is needed, to replace a current double culvert, to solve the washout and flooding problems. The road acts as a dam when the water gets high.

Photo of village flooding overwhelming road in late April 2011, a bad year for Vermont. Credit: Frizzells

A 1994 Soil Conservation Service Study looked mainly at how to protect the houses in that area. The culverts are inadequate, resulting in backing up the flow of water, which leads to washing out the road. At the time, a dike to wall off the water was considered, thinking that might prevent the houses being flooded. It is understood now is that the floodwater is too powerful, that walling it off would force the water higher, and likely make the situation worse for both houses and roads. The town now believes that replacing the culverts with a bridge could solve the washouts and the flooding. Another site of concern for flooding is an undersized bridge on Railroad Street. Both the Meadow Street and Railroad Street sites are located in the historic village of Island Pond.

Table 4: Brighton Flood Hazard Risk Assessment Table

	Number of Structures			**Value of Structures** (not incl land)		
Type of Structure	# in town*	# in Hazard Area	% in Hazard Area	Total $ in town (Incl Outbldgs)	$'s in Hazard Area	% in Hazard Area
All Residential	554	32	5.8%	$69,198,600	$1,470,350	2%
Mobile Homes	0	0	0	145,000	0	0

(no land)						
Mobile Homes (w/land)	47	1	2%	1,865,000	0	0
Commercial	42	0	0	14,267,500	0	0
Industrial	3	0	0	2,965,400	0	0
Exempt (Govt, NGO)	4	0	0	7,383,600	0	0
Agricultural	7	0	0	1,098,000	0	0
Total	657	33	5%	96,923,100	1,470,350	1.5%

**Note: Outbuildings are included. Industrial includes manufacturing. Commercial includes apartment buildings. Utilities not included for lack of a category, but are valued at $45,200. Our list includes an "Other" category valued at $7,832,400. None of it is in the Flood Hazard Areas, except possible utilities (e.g., poles and wires).*

The Community Report for Brighton on the state Agency of Natural Resources Flood Ready website states that there are seven flood insurance policies in effect in the town in the SFHA and no repetitively flooded structures.

Ice Storms, Severe Winter Storms, Thunderstorms and Wind: Ice storms, severe winter storms and thunderstorms all carry impacts from wind and weight on infrastructure, including the impacts associated with extended power outages. These hazards can't be pinpointed to one area of town, but are of concern townwide. One of the vulnerabilities associated with such storms, raised at the first public meeting, is that a key cell tower is located on private property and accessed only by a steep, private road. If power were lost during a bad storm, it could be difficult to reach the tower under storm conditions. Not all of the cell providers on the tower antenna have backup power.

The discussion on communication further noted that, in case of emergency, there is a radio antenna on Town Hall for emergency communications. There is also a solar array located at the fire department on Railroad Street, which is meant to operate cell phones in a emergency if the user is nearby with a signal. The discussion also noted that emergency responders have sometimes had to resort to door-to-door communication, traveling with a megaphone, and posting notices on the bulletin board outside the Post Office.

Brighton is located in a cold corner of Vermont. An extended power outage can be dangerous for vulnerable citizens. Icy or obstructed travel, when the wind chill is frigid, adds to the danger for those involved in, and responding to, any traffic accidents or other disaster incidents. The extreme cold poses potential additional challenges and provides an example where one incident can have cascading impacts that build into a larger disaster for the community.

Transportation incident involving hazardous materials: The chief concern raised at the public meeting centered on transport of hazardous chemicals by rail and truck through Brighton, to and from Canada, along with the storage of propane tankers and other chemicals in the rail yard in the downtown, near people and critical facilities in the village. There is discomfort in its proximity and unknown potential for danger.

Downtown Fire: Brighton has been either been lucky, or careful, in regard to downtown fires. A fire destroyed the Common Sense Restaurant in 1990, and there are historical fires of downtown landmarks further back in history. Brighton does not have a municipal building code (very few towns in Vermont do, and none the size of Brighton). Any public buildings (those with commercial uses, having employees or renting dwelling units) are subject to state review by the fire marshal and state building code requirements. Fires are "largely unforeseeable," however, making it "difficult to identify how and where fires may occur."

It was decided, that given the level of risk, vulnerability and sense of what could be lost, that a major downtown fire is a priority hazard for the town. The fire department does what it can to pre-plan via table exercises and works at recruiting volunteers. It has adequate equipment and training. Island Pond property owners could work at identifying "exacerbating conditions" and building awareness of how they could improve building design, electrical and heating systems to help prevent risks and vulnerability from fire. [12]

Municipal Capacity

Brighton is a regional center, but the regional center of Vermont's most wild and sparsely populated region. While it is the location of the county courthouse, and other county services, the town does not have a large enough population, or need, to support many professional staff. See Appendix F for the standard FEMA table for charting municipal capability. The town appoints a police chief, depends on volunteers for its fire department and contracts with Lyndon Rescue to cover emergency response. Their Town Administrator, Joel Cope, wearing many hats, covers the responsibilities normally carried by a town manager, a town planner, and a zoning administrator in larger towns. Along with all those other hats, he is, in large part, responsible for coordinating any tasks committed to by this plan. As Joel notes, "The items listed in Appendix F represent long-range planning on a broad scale, but Brighton has limited resources. Day-to-day maintenance of existing infrastructure and systems takes up most of the time we have available, and some of those items fail to rise to the level of immediacy that so often dictates where our time and money are spent."

[12] Integrating Manmade Hazards into Mitigation Planning; FEMA 386-7; pp. 2-4; https://www.fema.gov/media-library/assets/documents/4528

The town remains current on its town plan and bylaws, and has incorporated its subdivision and flood hazard bylaws into its zoning regulations. It has been fortunate to gain thorough watershed work via the Northwoods Stewardship Center.

Analysis of Mitigation Choices and Implementation Program

A compendium list of possible mitigation strategies (see Appendix G) was provided to the planning team by the consultant who had pulled them from FEMA and other resources. That list, as shown in the Appendix G, was culled for approaches that would have no political support.

At the November 16th public meeting, after a background powerpoint of the possible mitigation strategies that could address the priority hazards chosen for Brighton, and armed with printouts of that list of possible mitigation strategies, those gathered broke into two groups to score the possible strategies. The people present with knowledge of the town's infrastructure addressed scoring of the strategies related to A. All Hazards and B. Flooding. Others present from the fire department and emergency response were assigned to work on scoring the hazards under C. Severe Wind, Snow and Ice Build-up, D. Hazardous Materials Accidents, and E. Large Village Fire. An Abridged STAPLEE scoring sheet was used to rank the possible strategies on:

- social and political readiness
- administrative and technical feasibility
- range of public benefit anticipated
- range of environmental benefit anticipated
- local cost, and
- outside assistance available

Channelized stream in village adjacent to Railroad Street

The results went back to the Planning Team members, who made some adjustments. Understanding the town's capacity, the planning team chose only strategies that had scored 5's & 6's to address over the next five years. Some strategies, such as limiting impervious surfaces, were downgraded in score for lack of political support. Some were lowered due to their knowledge of work already done or knowing that it is not likely to be improved on, such as

annual tree maintenance by the town (most work is done by the utility companies), or strategies related to public outreach when there would be no staff time available for it in light of other priorities. Including stream buffers in development review, was elevated to a 4, meaning they might want to address it in the future but not in the next five years.

The resulting scoring sheet is shown in Appendix E. The final list of priority strategies was modified into Table 5 to add who would be responsible for leadership on the strategy, how they will do that (with what resources), when within the five year plan this work will happen, what outside support may help, and the status column for the annual check-in. Brighton's implementation program for hazard mitigation for the next five years is shown as Table 5 on the following pages.

Plan Maintenance, Integration and Monitoring

Annual progress check-in and evaluation: The Selectboard will review the list of mitigation strategies in the town's Mitigation Program listed in Table 5 each year with the Town Administrator, in tandem with their annual process of review and re-adoption of the Emergency Operations Plan. This annual check-in will include an evaluation of the continued level of importance of the individual strategies and effectiveness of those elements completed in meeting the goals of the plan. The annual review, which will happen between April and May, will also serve as a reminder of upcoming commitments for the year. Those tasks completed will be noted, by filling in the "status" column in Table 5. Those meetings are public meetings advertised via public notice. Town officials key to implementation of the tasks, such as road foreman, planning commission chair, fire chief, will be invited to attend.

Integration with other plans and bylaws: The bylaws and the town comprehensive plan will be updated during these next five years. Strategies under A. and B. in Table 5 note the needed and intended integration of elements of this plan into those plan and regulatory updates.

Next HMP update: Anticipating that this plan may not be approved by FEMA for adoption by Brighton until 2017, the Selectboard via the Town Administrator will expect to initiate the planning process for the next five year update in 2020. If a disaster were to affect Brighton before that time, this plan would be reviewed and priorities updated to address any changes in needed action that emerge. When the plan update is launched, a new planning team will be appointed, having a similar cross-section of interests and expertise as the team drafted for this plan. Outreach on a public process, similar to that employed during this plan, would be done to promote broader engagement than usually occurs during regular Selectboard meetings. The hazard data and priorities will be re-researched and updated. During that planning process they will review Table 5 to summarize the relative

effectiveness of completed measures, and determine those actions that need continued work or revision.

Table 5: Mitigation Program: Strategies and Implementation Responsibilities							
Actions	**Priority**	**Cost**	**Who (leadership)**	**How ($'s, resources)**	**When**	**Outside Support**	**Status**
A. All Hazards							
1. Integrate hazard mitigation plan into town plan	high	low	Planning Commission (PC)	PC and Selectboard (SB)	Winter 2017 to December 2017	NVDA	In process
2. Seek funding to design and implement replacement of Meadow St. culverts with bridge, at flooded location, and increase capacity of Railroad St bridge	high	high	Selectboard, Town Administrator, Road Crew	Town Budget, and dependent on HM grant	Apply Fall 2018 for HM and other funding, and proceed as funds become available.	FEMA	Pending. Project depends on outside funding
B. Flooding							
1. Develop Flood Resilience element in town plan update	high	low	PC	PC	Winter 2017 to December 2017	NVDA, DHCD planning grant	Pending
2. Require all new structures be 1' above BFE	high	low	PC, SB and Town Administrator	Assigned to Zoning Administrator	Flood hazard bylaw update begun Spring 2018, completed winter 2019	VT ANR	Pending
3. Require/enforce propane tank tie-downs in flood plains (preparedness action)	medium	low	SB, PC, Town Administrator	Assigned to Zoning Administrator	Winter 2019	NA	Pending
4. Encourage ZA to gain CFM certification	high	low	PC, Town Administrator	VT ANR	Spring '17 to Spring 2020	VT ANR	Pending
5. Seek funding to increase	high	high	Selectboard,	Town Budget,	Fall 2017 - 2022	FEMA,	As

capacity of culverts noted on Meadow St and bridge on Railroad St.			Town Administrator	HM grant, Better Roads Program, VTrans Structures Grants		VTrans	needed and available
6. Condition zoning permits on submission of required culvert permits for private driveways	high	low	Selectboard, PC	Road Foreman, Zoning Adminstrator	Spring 2018 – winter 2019	NA	Pending
7. Promote flood storage capacity via site design, where appropriate	medium	low	Planning Commission	LID trainings via VLCT, NVDA	Winter 2017-December 2017	Low cost or free	In planning stages
8. Investigate stormwater mgt measures for town facilities	medium	medium	Selectboard, Town Administrator, PC	LID trainings via VLCT, NVDA	Winter 2017 – winter 2020	Low cost or free	Pending
C. Severe Wind, Snow and Ice Buildup							
1. Encourage landscaping as wind buffer in development review	high	low	Planning Commission	Zoning Administrator	Winter 2017 to December 2017	Low cost or free	Pending
2. Tree maintenance to protect public bldgs, roads, powerlines	medium	low	Selectboard, Town Administrator	Road Crew, Water/Sewer Dept	Review annually each spring and after events	Low cost	Review annually
D. Hazardous Materials Accidents							
1. Conduct emergency exercise for downtown rail accident w/chemicals	medium	low	Selectboard, Fire Department	Collaboration with property owners, road crew, railroads, other	Summer '18: Check with St J, Newport, others; Plan by 12.18; Conduct by 12.19	Low cost or free, help from VT DEMHS	In planning stages

				downtowns (St J, Newport)			
2. Develop and post public information sheets	medium	low	Selectboard, Fire Department	Fire Dept and Town staff (and maybe student intern)	Begin Sprint '18 and end Summer '18	Low cost or free, help from VT DEMHS	Pending
3. ID at-risk locations and discourage new development there	medium	low	Planning Commission, Zoning Administrator	NVDA GIS	Begin Winter 2017, add needed plan & bylaw language, include in dev reviews by spring 2019	Low cost or free	Pending
E. Large Structural Fire in Village							
1. Develop and implement a fire prevention plan for downtown	medium	low	Fire Department	NVDA ?	Start summer '18 –end summer '20	Low cost or free	Pending
2. Public outreach on fire prevention	high	low	Fire Department	Fire Dept (maybe with student intern)	Start summer '18 –end summer '20	Low cost or free	Pending

Appendices

A. Village Map

B. Town Map

C. Hazards History Worksheet, including Extent/Probability, from Public Meeti

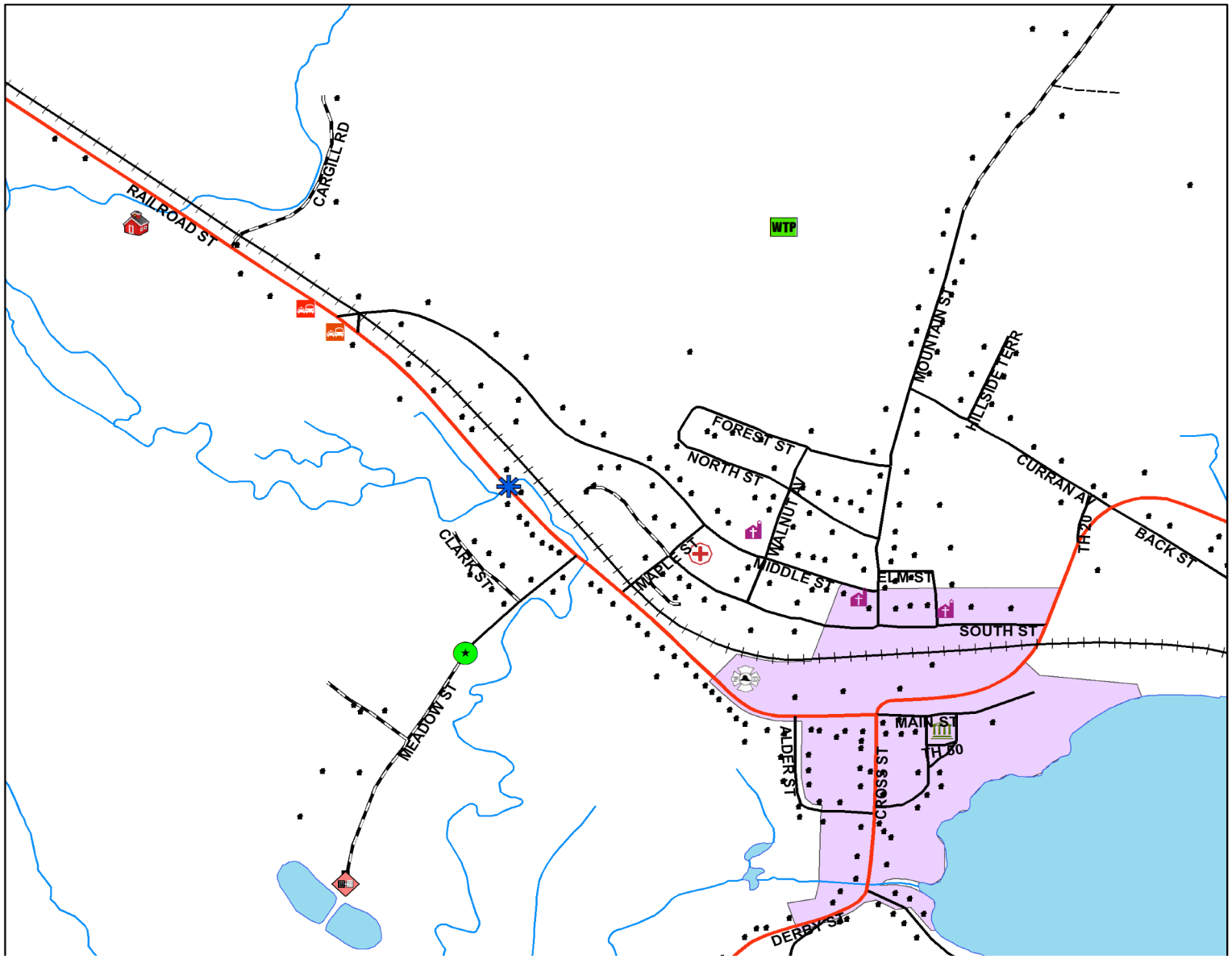
D. Village section of NFIP FIRM Map

E. Abridged STAPLEE scoresheet, finalized from 11.16.15 Meeting

F. Brighton's Municipal Capability Assessment Sheet

G. Compendium List of Hazard Mitigation Strategies

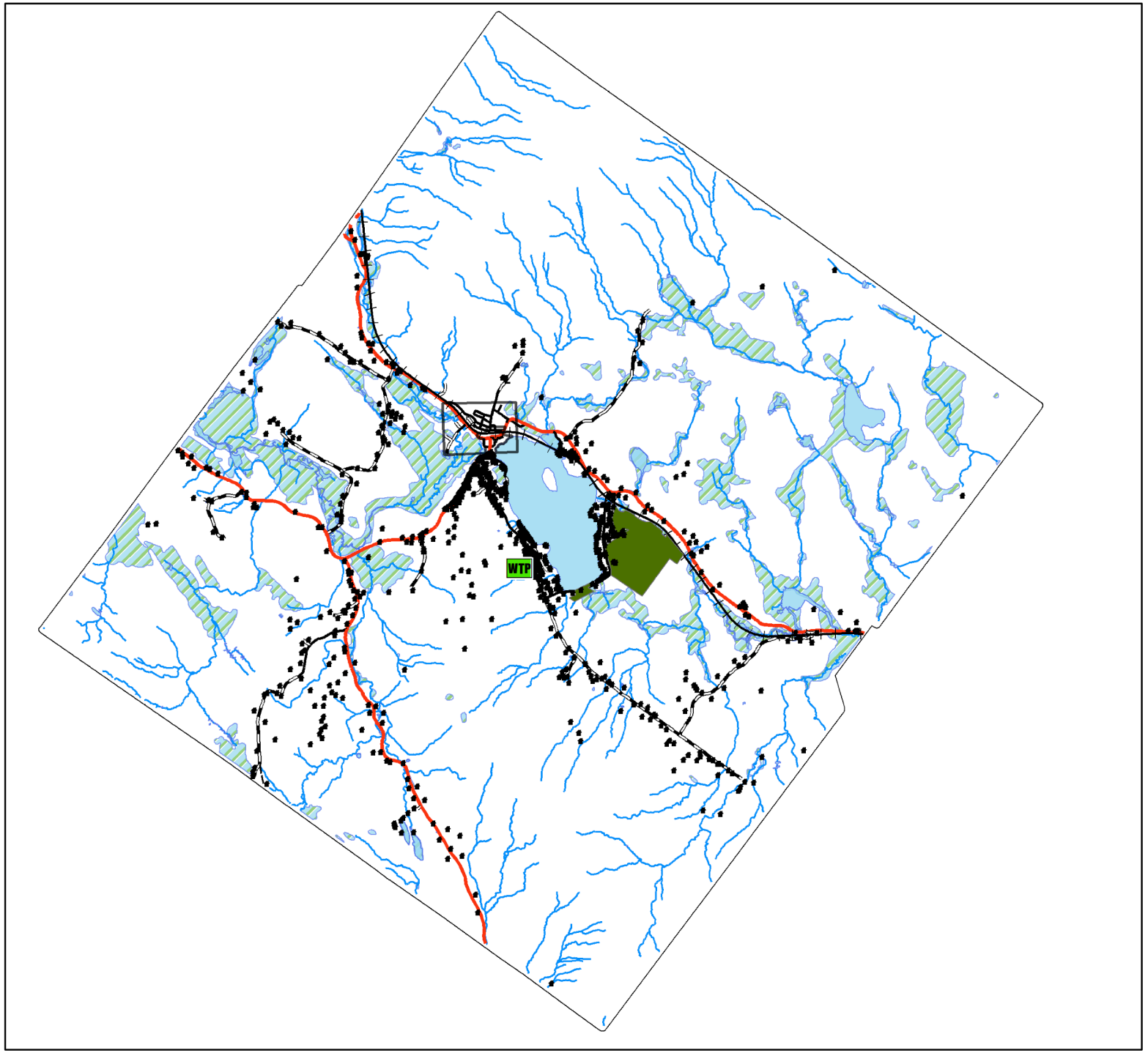
H. Public Meeting Posters



Brighton, Vermont
Village Area

Legend

- SCHOOL
- FIRE STATION
- HEALTH CLINIC
- HOUSE OF WORSHIP
- TOWN HALL/POLICE
- TOWN GARAGE
- VTRANS GARAGE
- WASTEWATER PLANT
- WTP WATER PLANT
- STRUCTURES
- DOUBLE CULVERT
- NARROW BRIDGE
- VILLAGE BOUNDARY
- WATER
- US & State Highway
- Paved Town Road
- Unpaved Town Road
- RIVER/STREAM
- RAILROAD



Brighton, Vermont

N
W E
S

Legend

- WTP — WATER PLANT
- BRIGHTON STATE PARK
- WETLANDS
- WATER
- RAILROAD
- US & State Highway
- Paved Town Road
- State Forest Road
- Unpaved Town Road
- RIVER/STREAMS
- see Village Area map

Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale sources, there may be some discrepancies between data layers.

This map should NOT be used to make determinations about whether structures and/or activities are in or out of a flood hazard area. In ALL cases, a flood specialist should be contacted to make any determination about the status of a structure or proposed structure.

NVDA
Northeastern Vermont Development Association

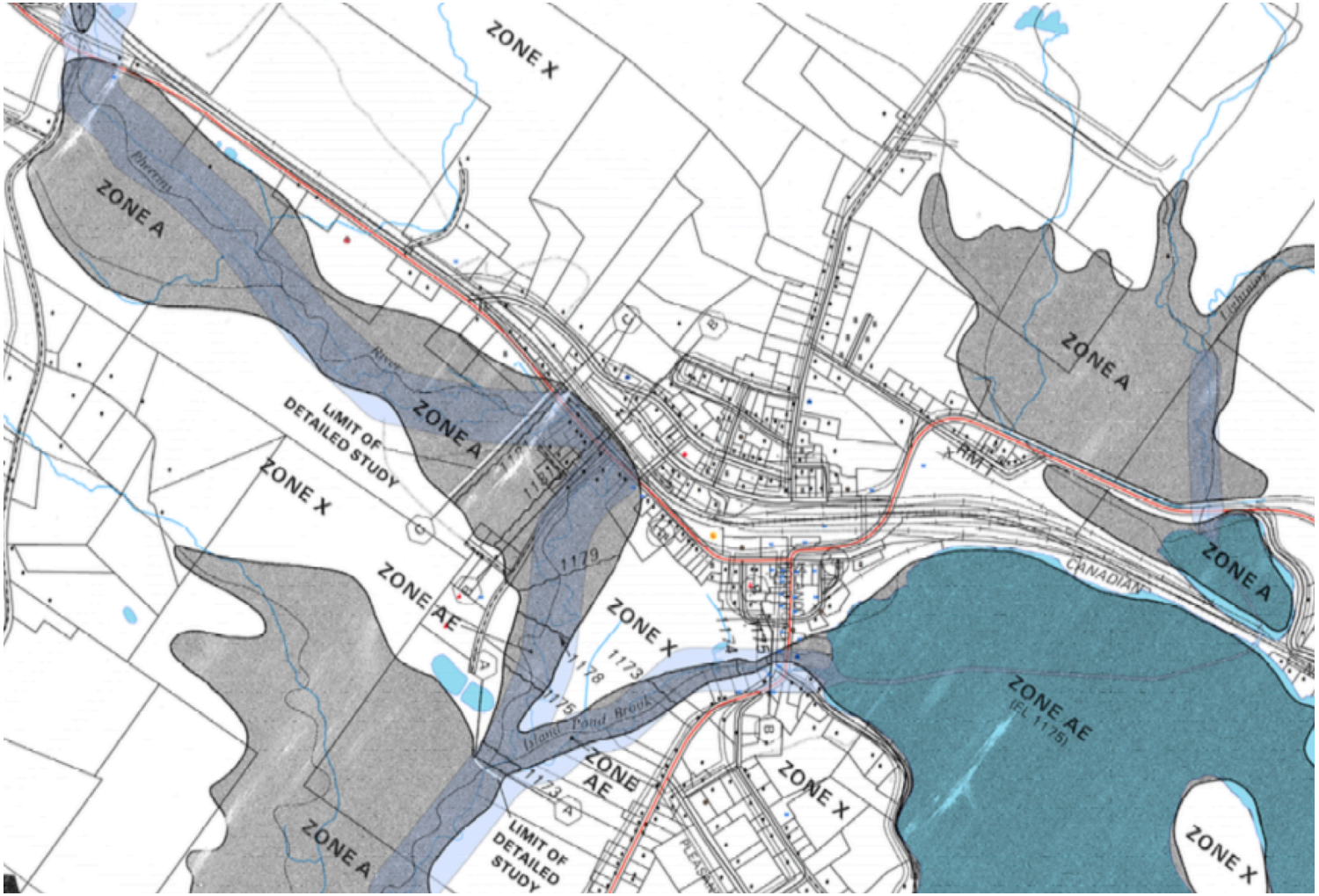
Appendix C: Hazards History Checklist, with Risk Assessment:

Natural Hazards	**Probability** Likelihood of happening in any given year - **High** = 100% **Med** = 10-99% **Low** = 1-9% (happens less than once every 10 years)	**Impact** Damage, injuries, disruption **Minor** = isolated, minor **Moderate** =some moderate to severe **Major** = severe damage town-wide, multiple injuries/fatalities, critical facilities shutdown	**Risk Level** Based on Probability and Impact, and warning time, is the risk level: **High** or **Low**?	**History: When, Where, Extent, Impact** (only for the big events) **Extent =** The strength (mph wind…), magnitude (snow depth…), or characteristics of the hazard, regardless of the people and property affected. **Impact** = The effect of the hazard on people and property, including infrastructure damaged (barn roof lost…), fatalities, and dollar value of damage, where known.
Dam failure	Low	Minor	Low	No big failure in memory, plenty of beaver dams but nothing looming
Drought	Low	Minor	Low	Water saving ban in 1995
Earthquake (structural damage)	Low	Minor	Low	Small water intake damage,14 yrs ago
Flood (from severe thunderstorm, hurricane or tropical storm event)	Medium	Mod	Moderate	’27, ’38, April 27 ’11 (melted 3’ of snow in a hurry, Marty Frizzell), affecting 5 Mile Square Rd, Iron bridge Rd and Taylor Rd. NOAA’s NCDC data indicates 1.74” rain for 4.27.11 storm (see photo on p.25)
Hailstorm	Low	Minor	Low	Nothing in memories. NCDC database notes a June 1985 storm with 1” stones and another in June 1990 with .75” stones. No damage recorded.
Hurricane	Low	Moderate	Low	Hurricanes fade out to heavy rainstorms by the time they get this far north
Ice Jams (flooding)	Low	Minor	Low	Not much from memories or database
Ice storm (flooding, extended	Med	Major	High	’98 Lost all the power for 3 days – lost trees on

power outage or infrastructure failures)				the high ridges. NCDC records $80,000 in damage. '05 18 hours (local utilities were over in Grand Isle doing repairs for 4 weeks) Joel=top risk
Landslide/Land subsidence	Low	Minor	Low	Nothing of concern
Severe Winter Storm (extended power outage, infrastructure failures, roof collapse, wind, cold)	High	Moderate	High	Group noted 2' heavy wet snow April 2015. NCDC data noted February 2007 storm that caused $100,000 in wind damage (also recorded for a winter weather event with $10,000 in damage and under extreme cold/wind chill) Power is out 2-3x/yr Two utility feeds into town, and some backup from Canaan side
Tornado (wind)	Med	Moderate	Moderate	9/3/93 – 1000' wide swath, moved a couple of houses; destroyed 1000 tree sugarbush; 1980's just trees; two months ago in Ferdinand (wind sheer)
Wildfire	Low	Minor	Low	Dolloff Mtn early 70's
Wind (thunderstorm, hurricane)	Combine w/severe storms above			'38 hurricane; 6-8 outages/yr for this VEC district due to winds that have ranged from 39-50 knots during many storms recorded in last 2 decades
Moose Collisions	High	Minor	Moderate	Can be fatal for individuals involved
Terrorism	Low	Major	Low	Close to Canadian border, if they targeted the RR….it could be bad – Water Treatment Officer loses some sleep on this, BUT others doubted Island Pond would be a target
Manmade Hazards	**Probability**	**Impact**	**Risk Level**	**History: When, Where, Extent, Impact**
Nuclear	Low	Minor	Low	
Chemical	Low (based on	Major	High	Fire Dept has monitored the placards – cars are

	past experience)			placed too close together. Trucks are unknowns, and a worry
Gas	Low	Major	High	Do park the propane cars in town now in the winter, since Megantic accident. IP is where they change Canadian/US crews – Idle for a long time, because lose power to the braking system if shut down in cold
Infrastructure failure (bridge, water, sewer, road segment)	Low	Low	Low	All 100 yrs old, expect to keep up the maintenance. Missed the freezing water lines many others had this winter. Lots of laughter; too small bridges and culverts
Large transportation incident	Low	Low	Low	RR derailment 1/5 yrs; train derailed in Norton was due to flooding
Large structural (downtown) fire	Low	Major	High, could lose entire downtown block	Common Sense Restaurant '90 Well-equipped dept – hard to hold onto volunteers – not many work in town,
Infectious Disease Epidemic	Low	Major	Moderate	Water T Operator does worry

Appendix D. Village section of NFIP FIRM Map



Appendix E. Abridged STAPLEE scoresheet (from 11.16.15 Meeting)

(strategies chosen for implementation highlighted)

For each mitigation action strategy, evaluate the poten
benefit and/or feasibility using the criteria and numeri
defined below.
Rank each of the criteria with a -1, 0 or 1 using the foll
on feasibility or cost, as applicable:
1 = Highly effective, beneficial or feasible
0 = Neutral
-1 = Ineffective or not feasible
Low cost=< $5,000= 1
Moderate cost= $5-50,000= 0
High cost= >$50,000 =-1
6= Required Anyway
Yes=1 Maybe=0 No= -1

Mitigation Strategy	Social/ Political Readiness	Admin and Technical Feasibility	Range of Public Benefit	Range of Environ'l Benefit	Local Cost	Outside Assistance Available	Required Anyway	Total Score
A. All Hazards								
1.Integrate hazard mitigation plan into town plan	1	1	1	1	1	1		6
2. Include haz mit in town facility upgrades	1	1	0	0	0	1		3
3. Include needed haz mit, in line above, in annual budgets	1	0	1	0	0	1		3

4.Replace Meadow St. culverts with bridge, at flooded location	1	1	1	1	0	1		5
5. Develop/implement public education & outreach program	-1	-1	1	1	1	-1		0
6. Appoint a CRO to build broad community resilience	-1	-1	1	1	1	0		1

B. Flooding (from Hurricanes, Severe Thunderstorms, Ice Jams or Severe Winter Storms)

1.Develop Flood Resilience element in town plan update							6	6
2. Update flood hazard bylaws to prohibit development in floodplns	-1	0	0	1	1	0		1
3. Limit impervious surfaces in floodplain	0	0	0	1	0	1		2
4. Require stream buffers (site plan review and subdivision)	1	1	1	1	1	-1		4
5.Require all new structures be 1' above BFE							6	6
6. Require/enforce propane tank tie-downs in flood plains	1	1	1	1	1	0		5
7. Encourage ZA to gain CFM certification	1	1	1	1	1	1		6
8. Institute No Adverse Impact into flood hazard bylaw	1	1	1	1	0	-1		3

9. Extend BFE requirements to structures within river corridor	-1	-1	1	1	1	-1		0
10.Seek funding to address top priority town culverts and bridge	1	1	1	1	0	1		5
11.Require culvert permits for private driveways							6	6
12. Request that residents keep private culverts clear of debris	1	1	1	1	1	-1		4
13. Promote flood storage capacity via site design, where appropriate	1	1	1	1	1	0		5
14.Education & outreach on floodproofing private property	-1	-1	0	1	1	-1		-1
15. Prepare stormwater mgt plans for town facilities	1	1	1	1	1	0		5
16.Promote LID stormwater mgt in site plan review	1	1	1	1	1	-1		4
17.Adopt zero discharge policy for site plan review and subdivision proposals	-1	-1	1	1	1	-1		0

C. Severe Wind, Snow and Ice Buildup (from Hurricanes, Severe Thunderstorms and Winter Storms)

1.Tree maintenance to protect public bldgs, roads, powerlines	0	1	1	0	1	1		4
2.Retrofit public buildings and infrastructure to reduce wind damage	0	0	1	0	0	1		2

3. Outreach on private maintenance to protect from wind damage	0	0	1	0	1	1	3
4 Encourage landscaping as wind buffer in site plan and subdivision review	1	1	1	1	1	1	6
5. Require hedgerows on critical road segments in site plan and subdivision review	-1	0	1	1	1	1	3
6.Help keep utility corridors maintained	1	1	1	0	1	1	5
7. Require burial of utilities in new developments	0	0	1	1	1	1	4
8. Adequately insulate public buildings and facilities	1	1	1	1	0	0	4
9.Add generator capacity where possible	1	1	1	0	0	1	4
10.Plan and organize assistance for vulnerable residents	1	1	1	0	1	1	5
11.Public education/outreach on hazards related to severe winter storms	-1	1	0	0	1	1	2

D. Hazardous Materials Accidents

1. Conduct emergency exercise for downtown rail accident w/chemicals	1	1	1	0	1	1	5
2. Maintain an adequate supply of specialized foam	1	1	1	1	-1	1	4
3. Develop and post public information sheets	1	1	1	0	1	1	5

4. ID at-risk locations and discourage new development there	1	1	1	0	1	1	5

E. Large Structural Fire in Village

1. Develop and implement a fire prevention plan for downtown	1	1	1	1	0	1	5
2. Public outreach on fire prevention	1	1	1	1	1	1	6
3. Maintain mutual aid agreements with neighboring fire depts	1	1	1	1	1	1	6
4. Promoting private property maintenance	0	1	1	1	0	1	4

Appendix F. Brighton Capability Assessment (further described on p 28)		
	Yes/No	Notes [Names, adoption dates, description, etc.]
Plans		
Comprehensive Municipal Plan	Yes	Latest adopted in 2012
Capital Improvement Plan	No	Under consideration
Hazard Mitigation Plan	No	Adopted in 2005, expired 2010
Emergency Operations Plan	Yes	Updated 2015
River Corridor Management Plan	No	
Other		
Regulations		
Zoning Regulations	Yes	Adopted in 1972, amended 1996, 2007, 2009, 2012
Subdivision Regulations	Yes	In zoning regulations
Flood Hazard Area Regulations	Yes	Adopted in 1979
Fluvial Erosion Hazard Area Regulations	No	
Emergency Management Ordinance	No	
Stormwater Management Regulations	Yes	In Zoning Regulations
Highway Ordinance/Standards	Yes	
Fire Permits	Yes	
Public Works Ordinance/Standards	No	To be adopted in 2016 for water & sewer
Building Code	No	
Programs		
Open Space/Conservation Fund	No	
Right-of-way maintenance		
Other		
Administration		
Town Administrator	Yes	Same since 2000, Joel Cope
Fire Department	Yes	Brighton Volunteer Fire Dept.
Rescue Services	Yes	Lyndon Rescue, Inc.
Policing Services	Yes	Police Chief (appointed)
Emergency Management Services	Yes	Through the Fire Department
Mutual Aid Agreements	Yes	Member agreement with 21 towns
Planning Commission	Yes	5-member
Development Review Board	Yes	5-member
Staff		
Emergency Management Director	Yes	Tom Hanlon
Floodplain Administrator (FPA)	Yes	Zoning Administrator
Zoning Administrator	Yes	Joel Cope
Community Planner	No	

GIS Services	No	Use regional planning commission
Road Foreman/Commissioner	Yes	Mark Castonguay
Health Officer	Yes	Joe Arborio
Fire Warden	Yes	Walt Driscoll
Water/Sewer Operator	Yes	Marty Frizzell
Town Clerk	Yes	Teresa Potwin
Technical Resources		
E-911	Yes	Regional PSAP Center was closed 2015
Warning Systems	Yes	Fire alarm systems on footbridge and depot
Data, Information	No	
Grant Writing	Yes	Town Administrator
Hazus Analyses	No	
Other		
Financial Resources		
Property Tax	Yes	
Reserve Funds		
Other		

Appendix G: Compendium List of Potential Mitigation Strategies by Hazard Type (showing deletions by Town Administrator prior to use for STAPLEE analysis at public meeting, based on political and technical feasibility)

A. All Hazards

1. Integrate hazard mitigation into municipal decisions by:
   - Incorporating findings and action strategies of the Hazard Mitigation Plan, along with the required Flood Resilience Element, into the comprehensive town plan.
   - Including hazard mitigation measures when upgrading or retrofitting town buildings and facilities.
2. Protect infrastructure and critical facilities by:
   - Incorporating mitigation retrofits for public facilities into annual town budget decisions.
   - Engineering or retrofitting roads and bridges to better withstand hazards.
3. Develop and implement a multi-hazard public awareness program to:
   - Provide information on all hazards and hazard mitigation measures.
   - ~~Establish an annual "hazard awareness week" that promotes hazard awareness, offers workshops, maintenance and mitigation activities (e.g., culvert cleanouts).~~
   - Provide information on the town's website regarding emergency preparedness and emergency services, including the location of the local shelter.
   - ~~Distribute hazard vulnerability checklists & emergency preparedness kits for local homeowners and businesses.~~
4. ~~Create a local "Community Resilience Organization" (CRO) to promote broad public involvement in implementation of the local mitigation plan and to ensure mitigation actions are undertaken in a way that builds social cohesion through celebration. The organization's responsibilities may include:~~
   - ~~Implementing the public awareness program in #3 above.~~
   - ~~Identifying and recruiting volunteers or neighborhood groups for community mitigation projects.~~
   - Preparing annual updates for inclusion in the town report.

B. Flooding (from Hurricanes, Severe Thunderstorms, Ice Jams or Severe Winter Storms)

1. Develop the Flood Resilience Element as an update to the town plan. This should include:
   - Policies and recommendations to reduce exposure and risk within known flood hazard areas, especially for critical facilities and infrastructure, including local roads and utilities.
   - Identification of appropriate land uses within known flood hazard areas.

- Policies to protect natural resources in areas that provide floodplain protection such as riverbanks, wetlands, riparian buffers, farm and forest land and other undeveloped open space

~~2. Maintain partnerships to support floodplain management - including partnerships with adjoining towns, NVDA, regional service providers, nonprofits such as the North Woods Stewardship Center and state agencies - to improve communication, facilitate coordinated planning and response, and to share resources.~~

3. Update the town's flood hazard area regulations to further limit or restrict new development in known flood hazard areas to:
   - Require that floodplains be maintained as open space, and/or
   - Require that all new critical facilities (fire department facilities, emergency operations center (EOC), public works facilities) be built 1-foot above the 500-year base flood elevation, and ensure that they are accessible during flood events, and/or
   - ~~Prohibit new critical facilities and facilities for persons with special mobility needs within known hazard areas, and/or~~
   - ~~Prohibit new animal shelters in known flood hazard areas, and/or~~
   - Limit the percentage of allowable impervious surface within the floodplain, and/or
   - Require stream buffers to reduce flooding impacts, stabilize streambanks and protect water quality, and/or
   - Require that new structures be elevated more than 1' above the base flood elevation, and/or
   - Require/enforce standard tie-downs of all propane tanks.
4. Increase local flood risk awareness by:
   - ~~Encouraging homeowners to purchase flood insurance.~~
   - ~~Annually distributing flood protection safety pamphlets or brochures to the owners of flood-prone properties.~~
   - ~~Educating citizens about safety during flood conditions, including the dangers of driving on flooded roads.~~
   - ~~Educating property owners about options for mitigating their properties from flooding~~
   - ~~Educating the public about securing debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard if picked up and washed away by floodwaters.~~
   - Asking residents to help keep their culverts clear of debris.
5. Increase community participation in the National Flood Insurance Program (NFIP):
   - ~~Conduct an annual NFIP workshop to provide information and incentives for property owners to acquire flood insurance.~~
   - Encourage that the flood hazard bylaw administrator gain training for Certified Floodplain Manager (CFM) certification.
   - Require and maintain FEMA elevation certificates for all new and improved buildings located in floodplains.

6. ~~Consider floodplain management techniques that exceed minimum NFIP requirements, for example:~~
   - ~~Incorporate a "No Adverse Impact" policy under local floodplain management programs.~~
   - ~~Extend a higher freeboard requirement past the mapped floodplain to include the mapped river corridors.~~
7. Maintain and update the town bridge and culvert inventory on VOBCIT, and address problem sites as funding allows (see priority sites noted on p.).
   - Require proper sizing, installation and maintenance of private culverts, or implement other measures to prevent private culverts from damaging municipal highway infrastructure and other property
   - Incorporate ice jam prevention techniques where appropriate.
8. ~~Encourage creation of new flood storage capacity through redevelopment by design when opportunities occur. New flood storage capacity could be gained by:~~
   - ~~Creating parks and other open spaces in vulnerable locations,~~
   - ~~Replacing a vertical wall along a river bank with a more gradual slope to create more room in the river channel for rising water~~
   - ~~Creating a shallow depression in a lawn that can accommodate inundation~~
   - Redesigning buildings to enable the first floor or basement to be above base flood elevation rather than armoring the buildings to repel rising waters
9. Encourage flood-proofing of private property in known flood hazard areas, including the river corridors, which may include the following:
   - Elevating structures so that the lowest floor is above the base flood elevation
   - Elevating driveways and private bridges above the base flood elevation to maintain dry access.
   - Raising utilities or other mechanical devices above expected flood levels.
   - Anchoring structures within the floodplain and river corridor.
   - Relocating utilities and water heaters above base flood elevation.
   - Using water-resistant materials and paints in construction and renovation.
   - Flood-proofing water supplies and wastewater systems.
   - Acquiring easements on flood-prone property, as funding or opportunities allow, to prevent new structures or storage of floatable hazards.
10. Improve stormwater management in planning public facilities and regulating new land use.
    - Preparing stormwater management and erosion control plans for all town facilities and infrastructure.
    - Encouraging or requiring the use of green stormwater infrastructure and Low Impact Development (LID) techniques to slow and reduce storm water run-off. For example, vegetated buffers and islands, rain gardens, bio-swales, pervious drainage channels, minimizing pavement surface area, curbing, concrete drainage channels
    - Adopting a "zero discharge policy" for stormwater in subdivision and site design proposals.

- As applicable, requiring developers to construct onsite retention ponds for stormwater management and firefighting.

C. Severe Wind, from Hurricanes, Severe Thunderstorms and Winter Storms

1. Protect public buildings, town roads and power lines from wind damage through regular tree pruning, maintenance and upkeep.
2. Retrofit public buildings and critical facilities to reduce future wind damage by:
   - Improving roof coverings.
   - Anchoring roof-mounted heating, ventilation, solar and air conditioning units.
   - Retrofitting buildings with load-path connectors to strengthen structural frames.
   - Avoiding placement of flagpoles or antennas near buildings.
3. Increase public awareness of severe wind by providing information on property maintenance and building retrofits.
4. Encourage use of natural protection using landscape and vegetation as wind buffers in site design proposals.

D. Unsafe Travel or Extended Power Outages, from Severe Winter Weather or Thunderstorms

1. Plan for, budget and maintain town roads for safe winter travel.
2. Require or install "living snow fences" (trees, hedgerows) near critical road segments.
3. Protect power lines by clearing and maintaining town road rights-of-way and working with local utilities to ensure that utility corridors are cleared and maintained.
4. Require burial of utilities serving new development, especially those providing for vulnerable people or services, or in locations with high likelihood of damage to above-ground utilities
5. Protect buildings and infrastructure, especially critical facilities
   - ~~Conduct engineering studies of snow/ice load capacity of at-risk facilities, critical facilities, key institutions & other buildings of concern~~
   - ~~Retrofit public buildings as needed to withstand snow loads and prevent roof collapse.~~
   - Adequately insulate public buildings and facilities.
   - Add generator capacity where possible
6. Plan and organize assistance for vulnerable residents during extreme storms.
   - Identify residents who are vulnerable to severe winter hazards, including freezing temperatures and power outages.
   - Plan for and organizing outreach and assistance.
   - ~~Maintain community~~ Purchase new shelter~~'s~~ generator and fill with fuel to last through extended power outages.

7. Increase public awareness of severe winter storms by distributing information about:

- ~~Common winter hazards~~
- ~~Family and traveler emergency preparedness~~
- ~~Winter driving safety tips~~
- ~~The installation of carbon monoxide monitors and alarms and the safe use of heaters.~~
- ~~Services available to vulnerable residents (incl. Vermont 211 C.A.R.E.).~~
- ~~Advice on use of electric vehicles as generators, if the appropriate switch is in place to temporarily disconnect the structure from the grid.~~
- Available weatherization and heating assistance programs, and how to protect pipes from freezing.

E**. Hazardous Materials Accidents**

1. Continue training (required by state) for emergency responders, including an emergency exercise around a major rail accident in the downtown that involves chemicals.
2. Gain funding to maintain an adequate supply of specialized foam for hazardous materials spills.
3. Post emergency numbers and advice in public places (whom to call if a spill happens and how the public should respond to a broad gas leak, such as propane).
    - Developing public information sheets on how the town will respond, what residents should do in such an emergency, and where or how they can get information in an event
4. Identify at-risk locations and discourage siting of new development or critical facilities in those areas.

Appendix H: Public Meeting Posters, Press, and Sign-in Sheets

ARE YOU PREPARED for a **DISASTER?**

Do you think Island Pond, or Brighton, is?

We want your input into Brighton's
HAZARD MITIGATION PLAN UPDATE!
Please join a
Public Meeting
on
Monday, September 21 at **4pm**
at the
Town Hall gym
(good refreshments will be available…)

FOR THE RECORD

OBITUARIES

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ELVA PIERCE FISHER

1929-2015

Elva Pierce Fisher passed away Sept. 13, 2015, at the St. Johnsbury Health & Rehab Center at the age of 86.

Elva was born May 15, 1929, the daughter of Frank and Marion Pierce of Concord, Vt. She was a graduate of Concord High School, Class of 1947. She received her RN nursing license from Heaton Hospital School of Nursing in Montpelier, Vt.

In 1950 she married the love of her life, Harold Fisher of East Concord. Harold predeceased her in 1977. She was also predeceased by her brother, Donald Pierce, and brother-in-law, Robert Marko.

She is survived by her three sons: Richard (Kathleen) of Concord, Michael (Lisa) of Lunenburg and David (Robbin Friend) of East Concord. Also, her three granddaughters: Amanda (Jeremy Silva) of Las Vegas, Nev., Hillary (Ben Riegel) of New Britain, Conn., and Debra Fisher of Lunenburg. Five great-grandchildren: Maxton, Alice Silva and Jacob, Kathleen and Madelyn Riegel. Survivors also include her brother, Dale Pierce, and sister, Pearl Marko; sister-in-law, Bernice Pierce, as well as many nieces and nephews.

Elva worked as an RN and spent her entire life serving others. She worked for Dr. Dickson at the clinic at the Gilman Paper Mill, St. Johnsbury Hospital, Brightlook Hospital and Weeks Memorial in Lancaster, N.H. After Harold's death she joined the Traveling Nurses Organization and traveled extensively, working in Texas, Nevada, California, Hawaii and 10 years in Saudi Arabia. She finished her nursing career working as a volunteer for Home Companions until her health began to fail.

She always liked to keep busy and was an avid reader, knitter and enjoyed crocheting and crafts. She loved to entertain. She was always ready to help with planning and cooking for any event or family gathering.

Per her request, there will be no funeral or visiting hours. The family will have a private celebration of her life at a later date.

If desired, donations in her memory may be made to a charity of ones choice.

NEWS BRIEFS

Council on Aging wins competitive EVT Grant, seeks volunteers, seniors for energy savings

ST. JOHNSBURY — The NEK Council on Aging is the recipient of a $17,000 grant from Efficiency Vermont aimed at helping older Vermonters and their families lower electric bills.

"We see this as a win-win situation for our clients and the Northeast Kingdom's highly valued volunteer community," said Executive Director Lisa Viles.

The NEK Council is actively seeking volunteers who might dedicate up to six hours a month on a flexible schedule to make home visits and help seniors install energy-efficient compact fluorescent light (CFL) bulbs, low-flow shower heads and faucet washers, smart power strips, and one LED light per household.

"We need someone for every community," said Viles who pointed out that there are 54 towns in Caledonia, Orleans and Essex counties.

To get involved call the Council's Volunteer Engagement Coordinator Jerri Ryan: 1-800-642-5119.

Brighton plans hazard mitigation meeting on Monday, Sept. 21

Are you prepared for a disaster? Do you think Island Pond and Brighton are well-prepared?

The Town of Brighton is drafting an update to its Hazard Mitigation Plan, with the help of the Northeast Vermont Development Association, and is asking for the public's input.

Please join the Brighton Hazard Mitigation planning team at its first public meeting to share stories of fires, floods, ice jams and other past damaging events. State and national information on natural and man-made hazards will also be presented, and there will be open discussion on possible impacts from future disasters. The meeting will be held Monday, Sept. 21, at 4 p.m. at the Town Hall gym, 49 Mill St. Extension, Island Pond.

At a later meeting to be held in December, possible actions that can be taken to avoid and lessen losses from future disasters will be reviewed. Public input will again be sought on the most feasible choices to include in the plan, for action over the next five years.

Please put the public meeting date on your calendar and join us September 21 for good company, information and refreshments.

Those who cannot attend but have memories or pictures to share, or questions about the meeting

VOLUNTEER FORM TO DOCUMENT IN-KIND SERVICES - MATCH INFORMATION

PROGRAM: Meetings with town officials and public
DATE OF MEETING: Sept. 21, 2015
MEETING LOCATION: Brighton Town Hall
TOPIC: Hazard Mitigation Plan
MEETING TIME: 4:00 P.M.

VOLUNTEER ATTENDEES - CLAIMED

No.	NAME	AFFILIATION	MILEAGE ROUND TRIP	MEETING HOURS	TOTAL MILEAGE	TOTAL TIME
					0.555	$20.00
1	Irene Nagle	NVDA			-	-
2	Frank Mahney	NVDA			-	-
3	Ben rapaus	VT DEC			-	-
4	Melinda L. Lamoureux	Town of Brighton			-	
5	Jeannie Gervais	Plan. Board			-	-
6	Gerald Gagnon	Planning Comm.			-	-
7	William Hawkins	Brighton Planning			-	-
8	MARSHALL C. FRIZZELL	BRIGHTON WATER & SEWER			-	-
9	James Cross	Selectmen			-	-
10	Chris D. Lawson	VEC.			-	-
11	Alan Nagem	Brighton FD			-	-
12	Mark Packwaite	Lyndon Rescue	30		-	-
13	RICK HARMAN	BRIGHTON FIRE			-	-
14					-	-
15	VINCE ILLUZZI	COMMUNICATION EQUIPMENT OWNER			-	-
16					-	-
17					-	-
18					-	-
19					-	-
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29					-	-
30					-	-
31					-	-
32					-	-
33					-	-
34					-	-
35					-	-
		Sub Total	0.00	0.00	$0.00	$0.00

FEDERALLY SUPPORTED PERSONNEL - CAN NOT CLAIM

No.	NAME	AFFILIATION	MILEAGE ROUND TRIP	MEETING HOURS	TOTAL MILEAGE	TOTAL TIME
					0.555	$20.00
1					-	-
2						
3						

COME JOIN US!

Help Brighton determine actions to take to help "weather" future disaster losses.

Please provide your input into the
HAZARD MITIGATION PLAN UPDATE
by joining the Planning Commission
at a
Public Meeting
on
Monday, November 16, 2015 at 4 pm
at the
Town Hall in Island Pond (gym)
(good refreshments will be available…)

Award-winning poet to read at The Galaxy Bookshop

The Galaxy Bookshop in Hardwick welcomes poet Kerrin McCadden for a reading and book signing on Tuesday, November 17, at 7 p.m.

Her debut collection of poetry, *Landscape with Plywood Silhouettes*, has the distinction of receiving the 2015 Vermont Book Award, the first year this award was given.

Her poems revel in the intricate details of days and of landscape, illuminating love, longing, and loneliness.

Her collection also won the 2013 New Issues Poetry Prize, judged by David St. John. A 2013 National Endowment for the Arts Fellow in Poetry, Ms. McCadden was also awarded a 2013 Sustainable Arts Foundation Writing Award, as well as support from The Vermont Arts Endowment Fund and The Vermont Studio Center. Her poems have appeared in *Best American Poetry*, The Academy of American Poets' *Poem-a-Day* series, *Verse Daily*, *American Poetry Review*, *Rattle*, *Green Mountains Review*, *Hayden's Ferry Review*, *Poet Lore*, and elsewhere. She holds a masters of fine arts from the program for writers at Warren Wilson College and lives in Plainfield. More information and photos available at author's website, kerrinmccadden.com/.

The event at The Galaxy Bookshop is free and open to the public. For more information, people can call (802) 472-5533 or visit galaxybookshop.com for a full schedule of events.

The Galaxy Bookshop, located at 41 South Main Street in Hardwick, is a locally owned and independent bookstore celebrating its twenty-sixth year in business. — from The Galaxy Bookshop.

Brighton determining how to weather hazards

The town of Brighton is drafting an update to its local Hazard Mitigation Plan, with the help of the Northeast Vermont Development Association (NVDA), and is asking for input at a public meeting Monday, November 16, at 4 p.m. at the Town Hall gym in Island Pond.

The meeting is to brainstorm individual and community strategies that will lessen impacts from disasters.

From input provided at the September public meeting, the principal hazards that should be planned for include severe winter storms and power outages, other wind events, flooding, downtown fire, and downtown rail/propane accidents.

At the upcoming meeting, participants will review possible actions that can be taken and provide input on the most feasible choices to include in the plan update for action over the next five years. Refreshments will be provided.

Those who can't attend but wish to contribute can call Peg Elmer, who's working with the town on the project, at (802) 522-3844. — from the town of Brighton.

VOLUNTEER FORM TO DOCUMENT IN-KIND SERVICES - MATCH INFORMATION			
PROGRAM: Brighton Local Hazard Mitigation Plan			
DATE OF MEETING: November 16, 2015			
MEETING LOCATION: Brighton Town Hall			
TOPIC: Review of Mitigation Actions			
MEETING TIME: 4 P.M.			
VOLUNTEER ATTENDEES			
No.	**NAME**	**AFFILIATION**	**MILEAGE ROUND TRIP**
1	Irene Nagle	NVDA	
2	MARSHALL C. FRITZELL	BRIGHTON WATER & SEWER	
3	ALAN Mabon	BRIGHTON FIRE / LYNDON RESCUE	
4	RICK HAMMOND	BRIGHTON FIRE / LYNDON RESCUE	
5	WALT DRISCOLL	BRIGHTON FIRE DEPT.	
6	Jerry Couture	Brighton Planning	
7	TED GROUT		
8	Bill Hawkins	Brighton Planning	
9	Doug Niles	Brighton Selectboard	
10	Jeanne Cervais	Brighton Planning Board & Town of Brighton	
11	Joel Cope		
12	Joe ARBORIO	Town of Brighton	
13	Jenn Hanlon	E911 Coordinator	
14			
15			
16			

Bibliography

Ainley, David and Jim Pease; May 2014; "Town of Brighton: Stormwater Infrastructure Mapping Project; Vermont Department of Environmental Conservation, Watershed Management Divison; 19 pp

North Woods Stewardship Center; 2008; Restoring Water Quality in the Lake Memphremagog Basin:Clyde River Phase I and II Stream Geomorphic Assessments;

North Woods Stewardship Center; 2010; River Corridor Plan for the Nulhegan River: Stone Dam Road to Connecticut River

http://magazine.planning.org/publication/?i=267033&p=&l=&m=&ver=&pp=

http://ncdc.noaa.gov/storm events

http://necir.org/2015/08/11/fema-tragedy-and-farce/

Acknowledgements

Brighton Planning Commission
Jeanne Gervais (chair)
Bill Hawkins
Jerry Goupee
Ted Grout
Scott Gowdy

Brighton Selectboard
Melinda Lamoureux (chair)
James Cross
Douglas Niles

Brighton Town Staff
Joel Cope, Town Administrator
Walt Driscoll, Fire Chief
Rick Hannux, Asst Fire Chief and Lyndon Rescue
Jeffrey Noyes, Police Chief
Marty Frizzell, Water & Sewer

Technical Support
Irene Nagle, AICP, NVDA
Frank Maloney, NVDA

Planning Consultant
Peg Elmer Hough, AICP

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Photo credits
Peg Elmer Hough, unless otherwise noted