Multi-Hazard Mitigation Plan Update 2017

Town of Milton, NH

Adopted 2006
Updated November, 2012
Updated _____, 2017

Submitted to the New Hampshire Homeland Security & Emergency Management

By the

Town of Milton, NH
with Strafford Regional Planning Commission

This project was funded from the fiscal year 2015 Hazard Mitigation Grant Program (HMGP), which was awarded to the Department of Safety, Division of Homeland Security and Emergency Management (HSEM) from the Federal Emergency Management Agency (FEMA).

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The 2006 and 2012 Milton Multi-Hazard Mitigation Committee
New Hampshire Homeland Security Emergency Management (HSEM)
Town of Milton

The 2017 Town of Milton Multi-Hazard Mitigation Planning Committee

9 people have attended meetings and/or been instrumental in completing this plan:

- Nick Marique — Fire Chief/EMD, Town of Milton
- Bruce Woodruff — Town Planner, Town of Milton
- Devon Pageau — Assistance Fire Chief, Town of Milton
- Rich Krauss — Police Chief, Town of Milton
- Pat Smith — Department of Public Works Director, Town of Milton
- Heather Thibodeau — Town Administrator, Town of Milton
- Michelle Beauchamp — Town Clerk, Town of Milton
- Brian Boyers — Code Enforcement Officer, Town of Milton
- Jason Behrens — Fire Department, Town of Milton

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Cover: April 2007 Flooding Event, Milton NH
Photo credit: Doreen Valente, former Selectmen's Secretary

Executive Summary

This Plan was revised and updated to meet statutory requirements and to assist the Town of Milton in reducing and mitigating future losses from natural and man-made hazardous events. An initial edition of this Plan was developed and presented to FEMA in 2006. The plan was revised in 2012, and was updated in 2017 to reflect the most recent information obtained through the evolution of the hazard mitigation program at the State. This update was developed by Strafford Regional Planning Commission (SRPC) and participants from the Multi-Hazard Mitigation Planning Team. This team was made up by the Fire Chief/EMD, Town Planner, Assistance Fire Chief, Police Chief, Department of Public Works Director, Town Administrator, Town Clerk, and a member of the Board of Selectmen.

The Plan references historical events, as well as identifies specific vulnerabilities that are likely to impact the Town. Overall threats include:

- ∴ 3 hazards rated as having a High overall risk in Milton: Winter Storms, Flooding, and Drought
- ∴ 4 hazards rated as having a Moderate overall risk in Milton: hurricane & Tropical Storms, Severe Thunderstorms, Extreme Temperatures, and Public Health Threats
- ∴ 4 hazards rated as having a Low overall risk in Milton: Hazardous Materials, Wildfire, Tornado & Downburst, and Earthquake & Landslide

Each hazard was provided with a description and information on the hazard's extent, past events and impacts, potential future impacts to the community, and potential loss estimates. As part of this analysis, the planning team reviewed past and existing mitigation strategies and made updates for improvement. Lastly, the planning team developed a series of new mitigation actions to be completed over the course of this plan's five-year cycle. Each mitigation action was prioritized using the STAPLEE Method and responsibilities for implementation were identified.

This plan provides an updated list of Critical Infrastructure and Key Resources (CI/KR) categorized as follows: Emergency Response Services (ERS), Non-Emergency Response Facilities (NERS), Critical Infrastructure (CI), and Water Resources (WR). All critical assets were inventoried and mapped.

The revision process included reviewing other Town Hazard Plans, technical manuals, federal and state laws, the State Hazard Mitigation Plan, research data, and other available mitigation documents from multiple sources. Combining elements from these sources, the Planning Team was able to produce this integrated multi-hazards plan and recognizes that such a plan must be considered a work in progress.

The Town of Milton received conditional approval on July 18 2017. A public meeting was held and the plan was adopted by the Select Board on XX, 2017. The Plan received formal approval from HSEM on XX, 2017.

In addition to periodic reviews there are three specific situations, which require a formal review of the plan. The plan will be reviewed:

- ∴ Annually to assess whether the existing and suggested mitigation strategies have been successful and remain current in light of any changes in federal state and local regulations and statutes. This review will address the Plan's effectiveness, accuracy and completeness in regard to the implementation strategy. The review will address any recommended improvements to the Plan, and address any weaknesses identified that the Plan did not adequately address. This report will be filed with the Board of Selectmen. Every Five Years the Plan will be thoroughly reviewed, revised and updated using the same criteria outlined above. At that time it is expected to be thoroughly reviewed and updated as necessary. The public will be allowed and encouraged to participate in that five year revision process.
- ∴ After any declared emergency event, the EMD using the same criteria outlined above.
- ∴ If the Town adopts any major modifications to its land use planning documents, the jurisdiction will conduct a Plan review and make changes as applicable.

Chapter 1: Multi-Hazard Mitigation Planning Process

Authority

Milton's original Multi-Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act), herein enacted by Section 104 of the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390). This Act provides new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts. This revised multi-hazard plan will be referred to as the "Plan". Milton's Plan has been prepared by the Multi-Hazard Mitigation Planning Team with the assistance and professional services of Strafford Regional Planning Commission (SRPC) under contract with New Hampshire Homeland Security Emergency Management (HSEM) operating under the guidance of Section 206.405 of 44 CFR Chapter 1 (10-1-2010 Edition). This plan is funded, in part, by HSEM through grants from FEMA (Federal Emergency Management Agency). Funds from town dues and matching funds for team member's time are also part of the funding formula.

Purpose and History

The ultimate purpose of Disaster Mitigation Act of 2000 (DMA) is to:

- *establish a national disaster hazard mitigation program –*
- *reduce the loss of life and property, human suffering, economic disruption and disaster assistance costs resulting from natural disasters; and*
- *provide a source of pre-disaster hazard mitigation funding that will assist States and local governments (including Indian tribes) in implementing effective hazard mitigation measures that are designed to ensure the continued functionality of critical services and facilities after a natural disaster.*

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section "322 – Mitigation Planning" which states:

As a condition of a receipt of an increased Federal share for hazard mitigation measures under subsection (e), a State, local, or tribal government shall develop and submit for approval to the President a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government.

HSEM's goal is for all New Hampshire communities to complete a local multi-hazard plan as a means to reduce future losses from natural and man-made events before, during, or after they occur. HSEM has outlined a process whereby communities throughout the state may become eligible for grants and other assistance upon completion of this multi-hazard plan. The state's regional planning commissions are charged with providing assistance to selected communities to help develop local plans.

Milton's Multi-Hazard Mitigation Plan is a planning tool for reducing future losses from natural and man-made disasters as required by the Disaster Mitigation Act of 2000.

The DMA places new emphasis on local mitigation planning. It requires local a local jurisdiction to prepare and adopt a FEMA approved jurisdiction-wide Hazard Mitigation Plan as a condition for receiving Hazard Mitigation Assistance (HMA) project grants and other grants every five years. In addition to updating their plans every five years to continue program eligibility, local governments should review the plan yearly.

Jurisdiction and Scope of the Plan

This Plan addresses only one jurisdiction: the Town of Milton, NH. The Plan addresses 11 types of natural and man-made hazards that may affect the town:

- Flooding
- Hurricane & Tropical Storms
- Tornado & Downburst
- Winter Storms
- Severe Thunderstorms
- Wildfire
- Earthquake/Landslide
- Extreme Temperatures
- Drought
- Public Health Threats
- Hazardous Material

It describes each hazard and identifies past occurrences of hazard events and assesses probability of future hazard events in the Town. The Plan assesses the vulnerability of key infrastructure and critical facilities; existing residential buildings and other structures within Milton; and future development. The Plan also addresses the administrative, technical, and physical capacity of emergency response services and response coordination between federal, state, and local entities.

Multi-Hazard Mitigation Goals

The Town's multi-hazard goals are based on the State of New Hampshire Multi-Hazard Mitigation Plan (2013) goals and include:

- *Ensure the protection of the general population, citizens and guests of Milton New Hampshire, before during and after a hazard.*
- *Protect existing properties and structures through mitigation activities.*
- *Provide resources to residents of Milton, when needed, to become more resilient to hazards that impact the town's critical support services, critical facilities, infrastructure, economy, environment, historical & cultural treasures and private property.*
- *Support the Presidential Policy Directive (PPD-8) through prevention, mitigation, preparedness, and response and recovery actions.*
- *Work regionally to identify, introduce and implement cost effective hazard mitigation measures in order to accomplish the town's goals.*
- *Develop and implement programs to promote hazard mitigation to protect infrastructure throughout the town to reduce liability with respect to natural and human-caused hazards generally.*
- *To address the challenges posed by climate change as they pertain to increasing risks in the town's infrastructure and natural environment.*

Multi-Hazard Mitigation Planning Process

Overview

The Plan was developed and updated with substantial local, state, and federal coordination. The completion of this new multi-hazard plan required significant planning preparation and represents the collaborative efforts of the Town of Milton, an ad-hoc local Multi-Hazard Mitigation Planning Committee, and SRPC. The Committee followed an established ten step multi-hazard mitigation planning process (see box, right).

The Committee met four times over a three month period to discuss the range of hazards included in this plan as well as brainstorm mitigation needs and strategies to address these hazards and their impacts on people, business, and infrastructure in the Town. All meetings were geared to accommodate brainstorming, open discussion, and an increased awareness of potential threats to the Town. This process results in significant cross talk regarding all types of natural and man-made hazards.

Ten Step Multi-Hazard Mitigation Planning Process

1. Establish and Orient a Hazard Mitigation Planning Committee
2. Identify Past and Potential Hazards
3. Identify of Hazards and Critical Facilities
4. Assess Vulnerability – Estimating Potential Losses
5. Analyze Development Trends
6. Identify Existing Mitigation Strategies and Proposed Improvements
7. Develop Specific Mitigation Measures
8. Prioritize Mitigation Measures
9. Prepare Mitigation Action Plan
10. Adopt and Implement the Plan

Committee Meetings

The Plan is being developed with substantial local, state and federal coordination; completion of this new multi-hazard plan required significant planning preparation. All meetings are geared to accommodate brainstorming, open discussion and an increased awareness of potential threats to the Town. Below is a brief summary of each meeting. Full meeting agendas and sign-in sheets are included in the Plan's Appendix B.

Meeting # 1: April 20, 2017

Members present: Michelle Beauchamp (Town Clerk/Tax Collector), Richard Kraus (Chief of Police), Bruce W. Woodruff (Town Planner), Brian Boyers (Code Enforcement Officer), Pat Smith (Public Works Department), Nick Marique (Fire Department), Jason Behrens (Fire Department), and Devon Pageau (Fire Department)

Strafford Regional Planning Commission (SRPC) staff provided a brief overview of the update process and the requirements set forth in the town's grant. This included information on the five-year plan cycle, eligibility of future funding opportunities, and the town's existing plan that is set to expire on 11/29/17. SRPC staff detailed the in-kind match documentation, committee responsibilities, and steps towards successful adoption.

SRPC staff solicited committee comments on the community chapter section of the plan update. Committee members provided the following feedback:

1. Remove Police Station to list of critical infrastructure located in the town center; add High School
2. Committee members asked SRPC staff to investigate summer-time population increase due to seasonal homes and campgrounds. See below for the information gathered by SRPC staff on this issue.

There are a large number of seasonal homes and campgrounds, which causes the population to fluctuate during the summer months (April – October). This yearly increase of approximately 2,000 in population often puts strain on municipal services and emergency responders.

Table 1: Seasonal Population Data (2010)

	# of units	Household size	Population
Year-round residential	1,800	2.55	4,590
Seasonal homes	225	5.0	1,125
Campground(s)	175	5.0	875
TOTAL	2,025	-	6,590

3. Add the two villages of Milton and Milton Mills as more densely populated areas.
4. Committee members asked SRPC staff to investigate the discrepancy between vacant housing units as reported by the U.S. Census. See below for the information gathered by SRPC staff on this issue.

Currently, the town exhibits an 18.6% vacancy rate; however this number is somewhat misleading because it does not take into consideration all of Milton's seasonal homes. The 2010 Census estimates that of the 392 vacant housing units, 225 of them are for seasonal, recreational, or occasional use. Unfortunately, these

estimates are not available for other years, but in 2010 a more accurate vacancy rate would have been closer to 7.5%.

5. Committee members asked SRPC staff to include a sentence about the town's ongoing master plan update and zoning changes into the land use changes section of the chapter. See below for the language SRPC included into the plan update.

   The Town's ongoing Master Plan update process hopes to improve existing land use regulations which may include zoning amendments, as well as density changes around the villages to guide development.

SRPC staff solicited committee comments on the asset inventory section of the plan update and associated maps. Committee members provided the following feedback:

1. Add that the Town Hall acts as the off-site emergency evacuation shelter for the Elementary School
2. Add a note that the Rochester Middle School acts as the town's long-term shelter
3. Change address of Fire Station #1 from 400 to 865 White Mountain Highway
4. Remove State Highway Department
5. Edit the helipad locations to the town beach ballfield and Elementary School ballfield
6. Add Assembly of God (church) as an emergency shelter for High School
7. Edit address of one of the cell towers from Fords Road to Ford Farm Road
8. Add second communication tower at Fire Station #1
9. Change PSNH to Eversource
10. Change water pump station address to read Vachon Drive (Rocky Point Pumping Station)
11. Remove Allen Hastings Way over Jones Brook bridge
12. Identify the Townhouse Road over Northeast Pond bridge as slated for reconstruction in 2019
13. Change address on dry hydrant to read Thurston Road and Hopper Road
14. Remove Cistern on Spring Brook Drive
15. Add two dry hydrants at Index Packaging and Guptil Road
16. Consider adding a recommendation to address issues with subdivision regulations for building dry hydrants

SRPC staff solicited committee comments on the national flood insurance program section of the plan update. Committee members provided the following feedback:

1. The Planning Board and Code Enforcement Officer have become more familiar with the existing flood maps
2. Former Board of Selectmen, Tom Gray and former Town Administrator Liz Dione attended the December FEMA Discovery Floodplain Remapping Project meeting to represent the Town of Milton.
3. Over the course of the last several years, Milton has made significant upgrades to their transportation infrastructure, including stormwater runoff improvements, culvert resizing, new ditches, and the installation of armored rip-rap in some areas. These upgrades have limited recent wash-outs and addressed safety issues along the following roads: Cross Road, Hare Road, Nute Road, Teneriffe Road, Northeast Pond Road, and Mason Road.

Meeting # 2: May 9, 2017

Members present: Michelle Beauchamp (Town Clerk/Tax Collector), Bruce W. Woodruff (Town Planner), Brian Boyers (Code Enforcement Officer), Pat Smith (Public Works Department), Nick Marique (Fire Department), and Heather Thibodeau (Town Administrator)

Strafford Regional Planning Commission (SRPC) staff went over the meeting notes from the April 20th meeting. There were no additional edits received from the planning committee.

SRPC went over unfinished business from the April 20th meeting in regard to the town's existing floodplain regulations, the need for assessing data, and a discussion of the future protocols for the use of SRPC's GPS unit. According to the Town Planner, the town's site-plan and subdivision floodplain regulations compliment the stand-alone Floodplain Ordinance that the Town has currently, so the site plan and subdivision regulations may continue as they are; however, it may make sense to review the existing stand-alone ordinance for compliance with state and federal requirements and then move over to the zoning ordinance because this is where developers usually look for floodplain regulations. This will be a recommendation made to the Planning Board for their consideration over the next several months. The Town Clerk offered to pull the assessing information for the police station, two water pump stations, and a sewer station (all of which were determined to be potentially vulnerable structures to past and future hazards), in order to assess potential value loss. SRPC staff informed the planning committee that their GPS unit could be used, but needed to adopt protocols to ensure the safety of equipment.

Next, the planning committee discussed three past disasters emergency declarations that occurred within the timeframe of their existing plan. This included two severe snowstorms (Juno and Nemo) and Hurricane Sandy. The planning committee determined the following:

1. March 19, 2013 – Significant snow storm that brought heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $32,136 for snow removal costs, plowing, and staff overtime.
2. March 25, 2015 – Similar to the storm in 2013, this snow storm brought heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $20,561 for snow removal costs, plowing, and staff overtime.
3. October 30, 2012 – Hurricane Sandy had limited impact on Milton. There were periods of heavy rain and strong gusts of wind; however, there were no major flooding issues, road closures, or damage to any of the dams. Downed tree limbs did cause minor power outages and road closures. The town was reimbursed in the amount of $6,568 for fire standby, police overtime, and public works staff time.

Next, the planning committee reviewed all the past mitigation strategies from the 2012 plan. Each proposed mitigation strategy was determined to have been a completed, deferred, removed, or on going action. All information was included into Table 18: Accomplishments since Last Plan Adoption in Chapter 7: Action Plan.

Lastly, the planning committee reviewed all existing programs and policies from the 2012. Each existing program was determined to have been an excellent, good, average, or poor program and provided information on potential ways for improvement. All information was included into Table 19: Existing Programs and Policies in Chapter 7: Action Plan.

The next meeting date was set for June 13th. SRPC staff indicated that materials would be sent out prior to the meeting date to give the committee adequate time to be prepared to discuss agenda items.

Meeting # 3: June 13, 2017

Members present: Jason Behrens (Fire Department), Nick Marique (Fire Department), Pat Smith (Public Works Department), Heather Thibodeau (Town Administrator), Brian Boyers (Code Enforcement Officer), Michelle Beauchamp (Town Clerk/Tax Collector), Bruce W. Woodruff (Town Planner), and Richard Krauss (Chief of Police)

Strafford Regional Planning Commission (SRPC) staff went over the meeting notes from the May 5th meeting. There were no additional edits received from the planning committee.

Next, SRPC staff completed a vulnerability analysis for each of the eleven identified hazards. The planning committee discussed each hazard and provided input on local events, as well as completed a hazard ranking for human, property, and business impacts. After determining severity and probability, the committee reached consensus for each overall threat. After each hazard was ranked, the committee discussed potential mitigation actions and implementation schedules. Draft actions were completed and would be fine-tuned at the committee's final meeting.

In order to give the committee the remainder of the summer off, the next meeting date was set for June 28th. SRPC staff indicated that materials would be sent out prior to the meeting date to give the committee adequate time to be prepared to discuss agenda items.

Meeting #4: June 28, 2017

Members present: Jason Behrens (Fire Department), Nick Marique (Fire Department), Pat Smith (Public Works Department), Heather Thibodeau (Town Administrator), Brian Boyers (Code Enforcement Officer), Michelle Beauchamp (Town Clerk/Tax Collector), Bruce W. Woodruff (Town Planner), and Richard Krauss (Chief of Police)

Strafford Regional Planning Commission (SRPC) staff went over the meeting notes from the June 13th meeting. There were no additional edits received from the planning committee.

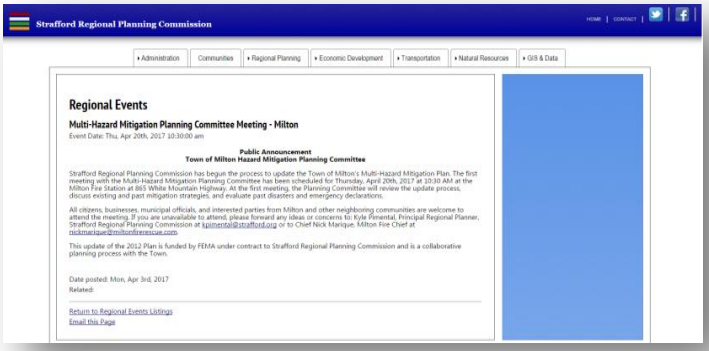
SRPC reviewed the mitigation actions and implementation tables to solicit final input. The committee also had an opportunity to make any final edits to the draft chapter before submittal to HSEM for conditional approval.

Public Involvement

Public involvement is an important part of the planning process. A local Multi-Hazard Mitigation Planning Committee (the Committee) was formed to guide and oversee the development of this Plan. Board of Selectmen; administrative staff; Conservation Commission members; Planning and Zoning Board of Adjustment Members; the Police, Fire, and Highway Departments; and local business owners, interested organizations, and residents of Milton were invited to

participate on the Committee. Community officials were encouraged to contact as many people as they could to participate in the planning process. Members of the public and other stakeholders from neighboring communities were also informed of and encouraged to attend the Committee's meetings.

To build awareness of the Plan and opportunity to be involved, an announcement about the Plan update was included on the Strafford Regional Planning Commission's website and information about the Plan was included in SRPC's news updates in order to ensure that adjacent communities were aware of Milton's committee meetings and had the opportunity to attend. A public notice, stressing the public nature of the process, was posted on the Town's website and notices were hung at the Town Hall in advance of each Committee meeting. The Committee met four times between April, 2017 and June, 2017. All feedback from participants of the planning committee was incorporated into the Plan. There was no participation from surrounding communities. There was no other public participation in the plan update process.



The public will have the opportunity for future involvement as the Plan will be periodically reviewed and the public will be invited to participate in all future reviews and updates to this plan. There will also be a public meeting before each formal review and before any change/update is sent to HSEM.

Once final approval by HSEM has been received, copies of the Plan will be distributed to the relevant Town Departments and personnel, HSEM, and FEMA and other state and local governmental entities; the Plan will then be distributed by these entities per requirements. Copies of the Plan will remain on file at the Strafford Regional Planning Commission (SRPC) in both digital and paper format.

Adoption and Integration

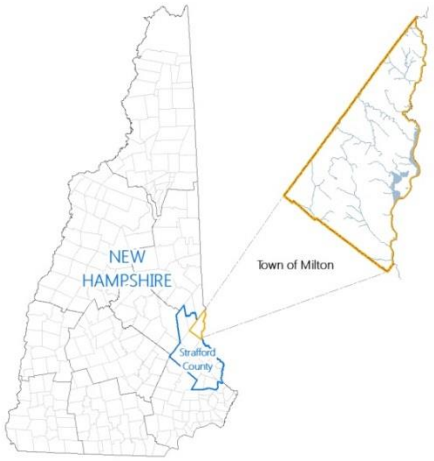
Once approved by the Planning Committee, the Plan will be forwarded to HSEM for Conditional Approval. Upon review and conditional approval by HSEM, the Board of Selectmen will hold a public meeting, to consider public comments and must promulgate a signed Resolution to Adopt the Plan.

Elements of the Plan will be incorporated into other planning processes and documents, such as the Town's Master Plan, Capital Improvement Plan, and Emergency Operations Plan. The Town will refer to this Multi-Hazard Mitigation, as appropriate, in other documents.

Chapter 2: Community Profile

Overview

The Town of Milton is located in southeastern New Hampshire within Strafford County. The towns bordering Milton are: Wakefield to the north, Salmon Falls River to the east running north to south, Middleton to the west, and Farmington to the south With a population of 4,606 (according to the 2015 American Community Survey), Milton has experienced roughly a 15.1% increase in total population since 2000 (3,910). This population increase is somewhat higher than the regional demographic trend of Strafford County, which experienced a 10.9% increase between 2000 and 2010 and represents one of the fastest growing areas in the state of New Hampshire. It is important to note that Milton's population is seasonal in nature. There are a large number of seasonal homes and campgrounds, which causes the population to fluctuate during the summer months (April – October). This yearly increase of approximately 2,000 in population often puts strain on municipal services and emergency responders.



Map 1: Milton Locus Map (Source: SRPC, 2017)

Table 1: Seasonal Population Data (2010)

	# of units	Household size	Population
Year-round residential	1,800	2.55	4,590
Seasonal homes	225	5.0	1,125
Campground(s)	175	5.0	875
TOTAL	2,025	-	6,590

Milton is geographically quite large with limited development. The town is roughly 21,936 total acres (33.1 square miles), including, 20,955 acres of land (32.7 square miles) and 981 acres of water (1.5 square miles).[1] Milton is lightly developed. Most of the developed land is of residential nature, with only scattered commercial and public uses. The residential uses are predominantly single-family detached homes.

In general, the pattern of developed uses is dispersed and requires driving to get around, except perhaps for the relatively few people living in the Town Center, and the two villages of Milton and Milton Mills. Commuting out of town to work is also clearly a necessity for the majority of people given the relatively small number of commercial land uses in Milton. The Town center, at which are located the Town Hall, Library, High School and Elementary School, is not densely settled, and maintains a comfortable rural scale. Remaining development naturally follows along the road network. The dispersed nature of roads, however, has kept density low.

There is municipal water and sewer in the downtown area and the Town controls density through zoning ordinances, site plan review regulations and subdivision regulations. Lakes and ponds have clearly attracted their share of camps and homes. A ring of homes and camps surrounds the Milton Three Ponds.

[1] 2015 Land Use Data. NH GRANIT, Earth Systems, Research Center, Institute for the Study of Earth, Oceans, and Space. University of New Hampshire.

Housing

In the period between 2010 and 2015, Milton experienced an overall decrease of 154 total housing units (roughly 7.5%). Milton experienced the lowest number of total housing units in 2014, and the highest in 2010. According to housing tenure data for that same 5-year time period, the total renter-occupied unit counts decreased by 3% while owner-occupied housing units decreased by 9.7%. During this time period, the vacant housing units decreased by 2.6% and total occupied housing units decreased by 8.6%. As of 2015, Milton's occupied housing units are roughly 84.1% owner-occupied and 15.9% renter occupied. Vacant housing units varied from a high of 464 in 2011 to a low of 305 in 2014. Currently, the town exhibits an 18.6% vacancy rate; however this number is somewhat misleading because it does not take into consideration all of Milton's seasonal homes. The 2010 Census estimates that of the 392 vacant housing units, 225 of them are for seasonal, recreational, or occasional use. Unfortunately, these estimates are not available for other years, but in 2010 a more accurate vacancy rate would have been closer to 7.5%.

Table 2: Housing Data 2010 - 2015

	2010	2011	2012	2013	2014	2015	% Change 2010-2015
Total Housing Units	2,212	2,177	2,085	2,096	1,961	2,058	-7.5
Occupied Housing Units	1,820	1,713	1,660	1,741	1,656	1,676	-8.6
Owner Occupied Housing Units	1,545	1,439	1,445	1,531	1,396	1,409	-9.7
Renter Occupied Housing Units	275	274	215	210	260	267	-3.0
Vacant Housing Units	392	464	425	357	305	382	-2.6

Source: U.S. Census Bureau, American Community Survey 5-Year Estimates

Building Permit Data

According to the data that was received from the town, a total of 26 building permits have been issued from 2012 through 2016 (2017 data was not available). This data shows that within this time period, the net number of permits has been relatively low.

Milton experienced an average of roughly five new structures between 2012 and 2015, with a small spike of 14 in 2016. Outside factors, like the housing market crash, may have had an impact on the limited growth of new development in the town. This data represents the best available information at the time of the preparation of the Plan; however, it should be noted that the issuance of a building permit does not always directly correlate with new development.

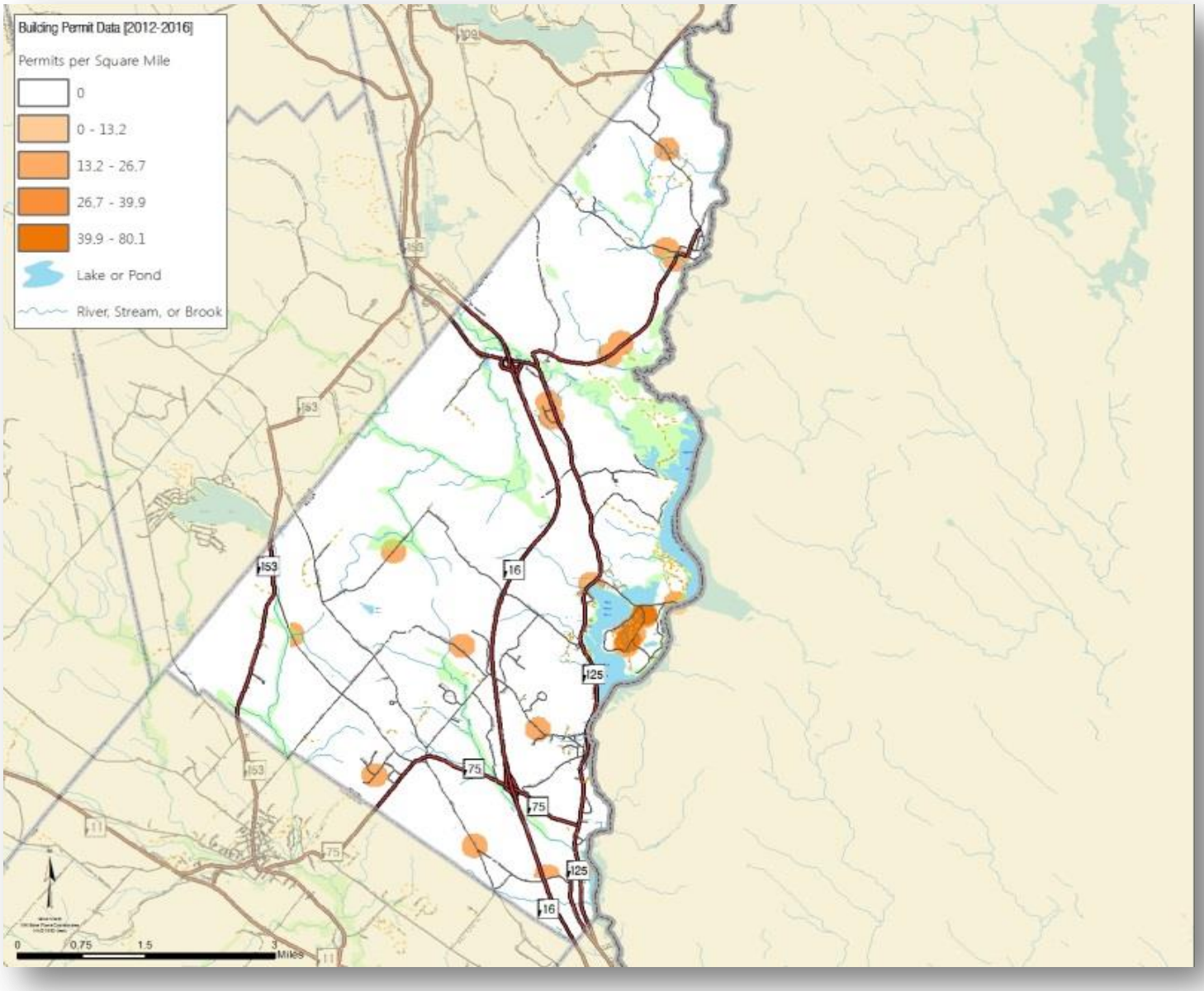
Figure 1: New Building Permits 2012 - 2016

Source: Milton's Code Enforcement Officer

Development Trends

A GIS density analysis was completed using building permit data collected from 2012 – 2016 in order to identify and map clusters of development. The results show some concentrations of manufactured housing development taking place on Pineland Park Road adjacent to Town House Pond; however it could not be determined as to whether or not this was new development or redevelopment. The remaining development was sporadic in nature with minor clusters on Applebee Road, White Mountain Highway, and Industrial Way.

By looking at these past development trends the Town recognizes that it will grow slowly in the coming years and will continue to improve their floodplain management regulations for all subdivisions and proposals for other developments in order to reduce or eliminate flood damage.



Map 2: Development Density Map (Source: SRPC/Milton, 2017)

Development within the FEMA Floodplain

Of all the building permits issued over the course of the last five years (2012 – 2016), there were four homes identified to be within the FEMA floodplain. It is important to note building permit data does not always correlate directly with new construction; permits may refer to renovations or additions to existing structures.

Over the course of the last five years, there were four new developments. One near Town House Pond, the second along the Salmon Fall River, the third on Hare Road near Dames Brook, and the fourth is in the northern most point in town along the Salmon Falls River.

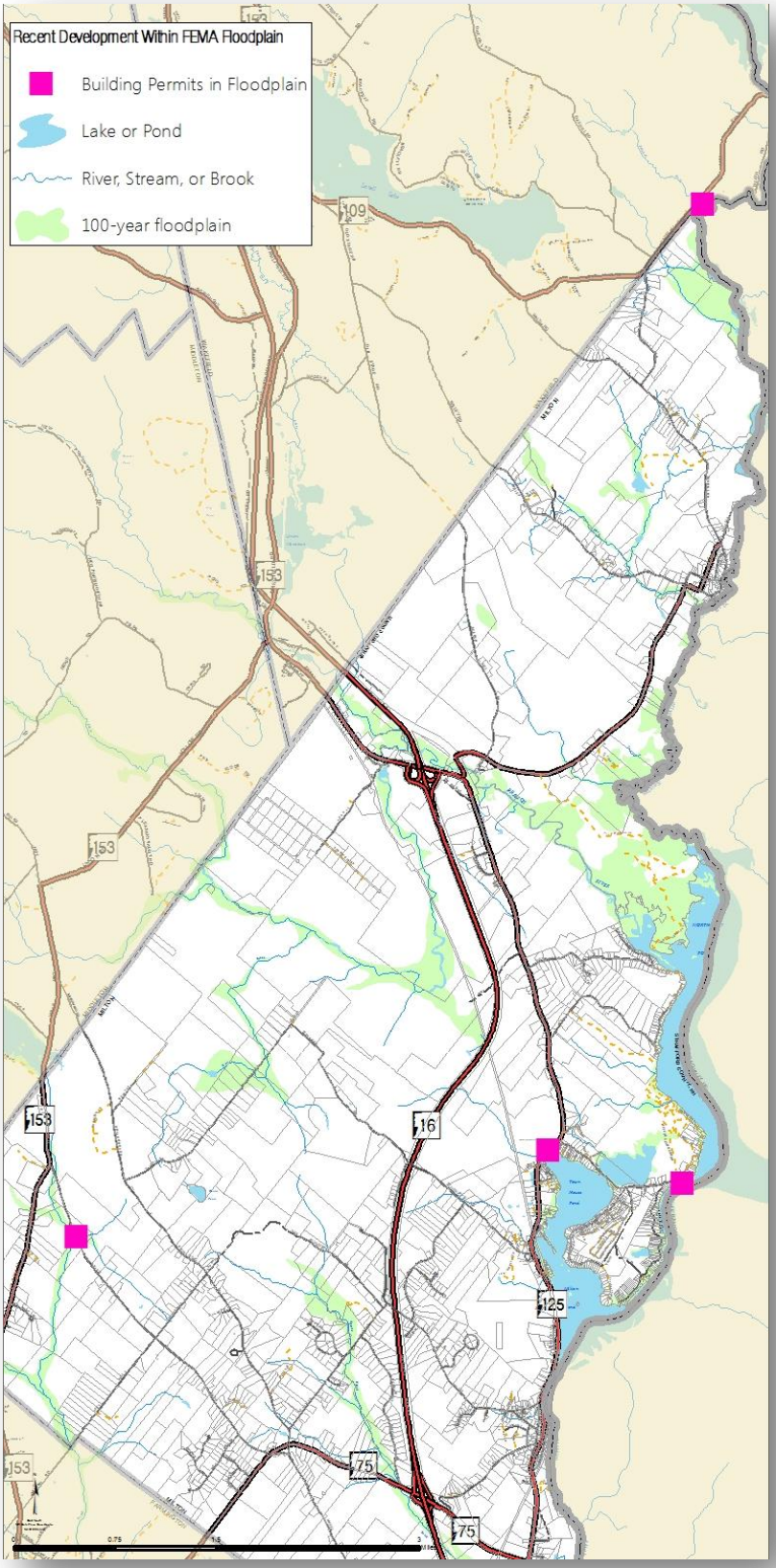
Table 3: Building Permits Within Floodplain

Location	Year	Type
Lovell Lake Road	2012	Single Family
Lakeside Drive	2014	Single Family
Hare Road	2016	Single Family
White Mountain Hwy	2016	Fire Station

[Source: Town of Milton, 2016]

Milton has successfully steered the majority of residential developments into existing crossroads, out of rural countryside, and away from potential flooding dangers. The Town will use this Plan as a guide to determine where past hazards have been documented and try to steer potential development away from these hazard areas. Therefore, the community's vulnerability has remained the same.

The Town will use this Plan as a guide to determine where past hazards have been documented and try to steer potential development away from these hazard areas.



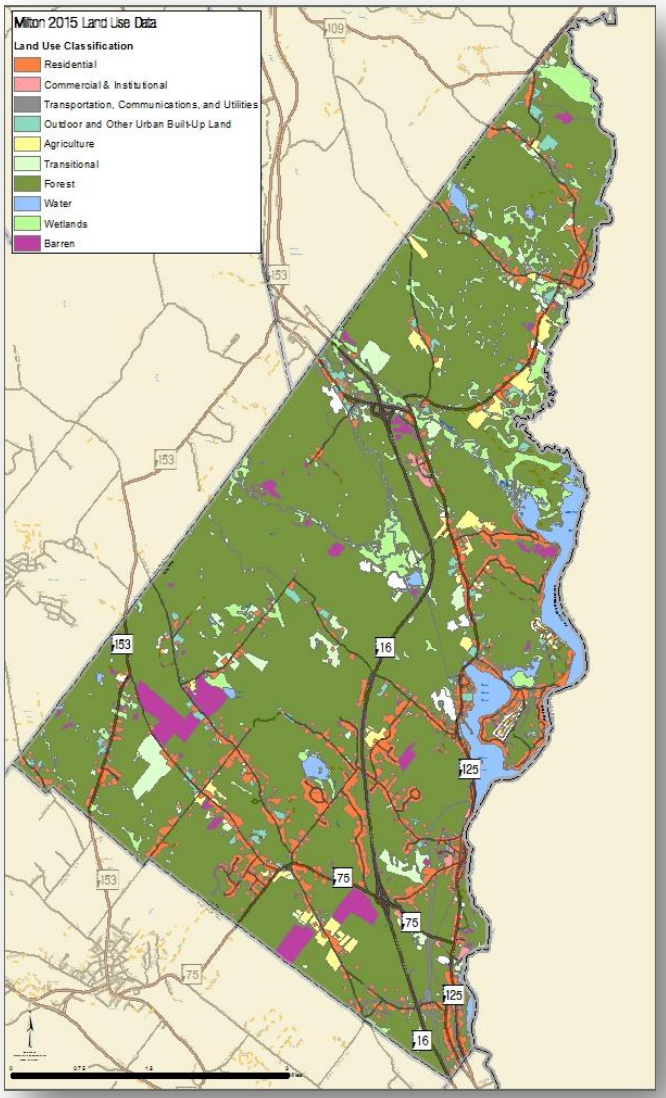
Map 3: Building Permits within the FEMA Floodplain (Source: SRPC/OEP, 2017)

Land Use Changes

It is much easier to identify and analyze regional land use trends, compared to strictly looking at land use conversion changes at the local level; however, this data remains an important component of long-term planning efforts. As previously mentioned, Milton has experienced some population increases over the course of the last decade. This has resulted in an increase in the amount of land converted to residential use over the span of the last fifteen years. See Table 4 for a more detailed analysis of land use changes of time.

According to the 2015 regional land use layer, roughly 9% (1,914 acres) of the town's total acreage is currently classified as residential, scattered throughout town and along existing road corridors. Milton did not experience a substantial increase in residential land use conversion in the last five years (>1%). Nor did the town see any major changes in commercial and industrial uses, agriculture, or wetlands. The town experienced roughly a 3% loss of forest land due to land conversion.

The Town's ongoing Master Plan update process hopes to improve existing land use regulations which may include zoning amendments, as well as density changes around the villages to guide development.



Map 4: 2015 Land Use Data (Source, GRANIT, 2017)

Table 4: Land Use Data 2010 - 2015

Land Use Classification	Acres (2010)	% of total acreage	Acres (2015)	% of total acreage	5-year (+/-) % change
Residential	1,865.6	8.5%	1,914	8.7%	+0.2%
Commercial & Industrial	109.6	0.5%	138.2	0.6%	+0.1%
Agriculture	350.1	1.6%	348.9	1.6%	No change
Forest Land	15,993.1	72.9%	15,395.7	70.2%	-2.7%
Wetlands	1,337.0	6.1%	1,287.6	5.9%	-0.2%
TOTAL	19,655.4	89.6%	19,084.4	87.0%	N/a

This analysis does not include: transportation, communications, and utilities; outdoor and other urban built-up land; transitional; open water; and barren lands, which together make up the remaining 10-13%.

Chapter 3: Asset Inventory

Critical Facilities and Key Resources

This chapter includes Critical Facilities and Key Resources (CF/KR) within the Town of Milton that were identified by the Committee during the update of this plan.

FEMA describes the term 'critical facilities' as all manmade structures or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if they are destroyed, damaged, or if their functionality is impaired.[2] These facilities include all public and private facilities that a community considers essential for the delivery of vital services for the protection of the community, such as emergency operations centers, shelters, or utilities. [3]

"Critical facilities, and the functions they perform, are the most significant components of the system that protects the health, safety, and well-being of communities at risk."

-FEMA Critical Facility Design Considerations

Tables include a list of CF/KR, including the type of facility and building, and the address of the CF/KR, if available. Appendix D contains a correlating map set. Facilities in bold are located in other communities and are not mapped.

Table 5: Emergency Response Facilities (ERF)

ERF's are primary facilities and resources that may be needed during an emergency response		
Facility	Type	Address
Town Hall (Emma Ramsey Center)	Off-site emergency evacuation shelter for Elementary School	424 White Mountain Highway
Fire Station #1	Emergency Operations Center/Fire Department	865 White Mountain Highway
Fire Station #2	Fire Department	24 Jug Hill Road, Milton Mills
Police Station	Police Department	7 Townhouse Road
Public Works Garage	Highway Department	803 White Mountain Highway
Nute High/Middle School	Daytime Emergency Shelter	22 Elm Street
Elementary School	Daytime Emergency Shelter	8 School Street
Assembly of God	Emergency Shelter for High School	370 White Mountain Highway
Helipad Location(s)	Emergency Medical Care	Town Beach ballfield Elementary School ballfield
White Mountain Medical Center (Wakefield)	**Medical Facility**	**2531 White Mountain Highway**
Frisbie Memorial Hospital (Rochester)	**Medical Facility**	**11 Whitehall Road**
Family Care of Farmington (Farmington)	**Medical Facility**	**316 NH Route 11**

Note: Milton's long-term shelter is located at the Rochester Middle School (operates as a regional shelter)

[2] https://www.fema.gov/media-library-data/20130726-1557-20490-2839/fema543_chapter1.pdf
[3] Ibid

Table 6: Non-Emergency Response Facilities (NERF)

NERF's are facilities considered essential, that although critical, not necessary for the immediate emergency response effort.

Facility	Type	Address
Cell Tower(s)	Communication Facility	Industrial Park Elm Street of Rt. 75 Harmony Drive Ford Farm Road
Communication Tower	Communication Facility	Teneriffe Mountain Road Fire Station #1
Switching Station(s)	Communication Facility	Silver Street Western Ave, Milton Mills
Eversource	Power Station	McKeaghney Road White Mountain Highway at Laskeys Corner
Water Pump Station(s)	Water Pump Station	White Mountain Highway Vachon Drive (Rocky Point Pumping Station)
Wastewater Treatment Plant	Treatment Plant	White Mountain Highway
Sewer Pump Station	Sewer Pump Station	Charles Street

Table 7: Critical Infrastructure (CI)

CI are important structures that may be vulnerable during a hazardous event

Facility	Type	Address
Rowe Dam (Hopper Dam)	*Low Hazard	Salmon Falls River
Waumbek Dam	Low Hazard	Salmon Falls River
South Milton Dam	Low Hazard	Salmon Falls River
O'Malley Gardens Detention Pond	Low Hazard	Tributary to Salmon Falls
Milton Wastewater Lagoons	**Significant Hazard	N/A
Milton Three Ponds Dam	Significant Hazard	Salmon Falls River
Milton Leather Board Dam	Significant Hazard	Salmon Falls River
Great East Lake Dam (Wakefield)	Significant Hazard	Salmon Falls River
Horn Pond (Wakefield)	Significant Hazard	Salmon Falls River

* A Low Hazard dam has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no possible loss of life and low economic loss to structures/property.

** A Significant Hazard dam has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no possible loss of life but major economic loss to structures or property

Local #064/167	***Transportation	Hopper Street over Salmon Falls River
Local #077/163	Transportation	Church Street over Salmon Falls River
Local #081/159	Transportation	Lebanon Street over Salmon Falls River
Local #168/152 (Closed; reconstruction for 2019)	Transportation	Townhouse Road over Northeast Pond
Local #190/101	Transportation	Winding Road over Lyman Brook
Local #198/131	Transportation	Garage Way over Salmon Falls River
Turnpike #098/115	Transportation	NH16, Spaulding TPK over Branch River
Turnpike #114/115	Transportation	NH16, Spaulding TPK over NH125

Table 7: Critical Infrastructure (CI)		
Turnpike #124/116	Transportation	NH16, Spaulding TPK over Jones Access Road
Turnpike #141/122	Transportation	NH16, Spaulding TPK over NHNCRR
Turnpike #162/110	Transportation	NH16, Spaulding TPK over Teneriffe Road
Turnpike #187/109	Transportation	NH16, Spaulding TPK over Silver Street
Turnpike #216/112	Transportation	NH16, Spaulding TPK over NH75
Turnpike #219/112	Transportation	NH16, Spaulding TPK over Lyman Brook
Turnpike #219/124	Transportation	NH75 over NHNCRR
Turnpike #237/126	Transportation	NH16, Spaulding TPK over McKeaghney Road
State #078/156	Transportation	Branch Road over Miller Brook
State #101/110	Transportation	NH125 over Jones Brook
State #102/120	Transportation	Applebee Road over Branch River
State #212/116	Transportation	NH75 over Lyman Brook
State #212/128	Transportation	NH125 over NHNCRR
State #229/125	Transportation	NH125 over Lyman Brook
Railroad #236/124	Transportation	NHNCRR over Old Wakefield Road

*** Bridges have been identified by the NHDOT Bridge Design Bureau; Dams have been identified by the NHDES, Water Division

Table 8: Water Resources		
Auxiliary Fire Aid		
Facility	Type	Address
Dry Hydrant (2)	Fire Aid	Waumbek Dam
Dry Hydrant	Fire Aid	Thurston Road
Dry Hydrant	Fire Aid	Applebee Road: Branch Hill Farm
Dry Hydrant	Fire Aid	Across from Farm Museum
Dry Hydrant	Fire Aid	Hopper Road
Dry Hydrant	Fire Aid	Index Packaging
Dry Hydrant	Fire Aid	Guptil Road
Cistern	Fire Aid	Industrial Park
Cistern	Fire Aid	Shortridge Academy
Cistern	Fire Aid	Ashwood Road
Cistern	Fire Aid	Briar Ridge Road
Cistern	Fire Aid	Lord Lane
Cistern	Fire Aid	Yankee Way

Chapter 4: Vulnerable Structures and Potential Loss

Critical Facilities/Key Resources and Other Assets

It is important to identify critical facilities and other structures that are most likely to be damaged by hazards. A GIS-based analysis was completed to determine, spatially, which critical facilities and key resources (CF/KR) within the town intersected with dam inundation zones, the FEMA floodplain, or identified past and potential flooding areas from previous hazard mitigation updates. Table 9 lists the 24 CF/KRs located within those areas with a potential loss value estimate of **$25,190,100** at 100%.

Table 9: Vulnerable Critical Facilities/Key Resources

CF/KR and Other Assets	Hazard	100% of Structure Value
Emergency Response Facilities		
Police Station	Wind Shear	$211,200
Non-Emergency Response Facilities		
Water Pump Station (White Mountain Highway)	Past Flooding & FEMA Floodplain	$36,300
Water Pump Station (Rocky Point Road)	Wind Shear	$93,000
Sewer Pump Station	Dam Inundation	$9,600
Critical Infrastructure		
South Milton Dam	Dam Inundation Zone	The Dam Bureau at NHDES has looked into assessing values for state-owned dams with marginal success. They considered bond ratings, market value, and construction costs. They also developed a formula that calculated the cubic feet of water impounded as a monetary value. Because dams serve different purposes (recreational, hydro-power), assessed values are hard to estimate and cannot be determined.
Milton Leather Board Dam	FEMA Floodplain & Dam Inundation	
Milton Three Ponds Dam	FEMA Floodplain	
Waumbek Dam	FEMA Floodplain	
Rowe Dam	FEMA Floodplain	
Bridge #212/116 (NH75 over Lyman Brook)	Past Flooding & FEMA Floodplain	$480,000 (20 x 24 x $1,000)
Bridge #168/152 (Townhouse Rd over Northeast Pond)	Wind Shear & FEMA Floodplain	$2,256,000 (94 x 24 x $1,000)
Bridge #229/125 (NH125 over Lyman Brook)	FEMA Floodplain & Dam Inundation	$672,000 (28 x 24 x $1,000)
Bridge #077/163 (Church St over Salmon Falls River)	FEMA Floodplain	$1,560,000 (65 x 24 x $1,000)
Bridge #078/156 (Branch Rd over Miller Brook)	FEMA Floodplain	$312,000 (13 x 24 x $1,000)
Bridge #081/159 (Lebanon St over Salmon Falls River)	FEMA Floodplain	$768,000 (32 x 24 x $1,000)

CF/KR and Other Assets	Hazard	100% of Structure Value
Bridge #098/115 (NH16, Spaulding TPK over Branch River)	FEMA Floodplain	$3,960,000 (165 x 24 x $1,000)
Bridge #101/110 (NH125 over Jones Brook)	FEMA Floodplain	$672,000 (28 x 24 x $1,000)
Bridge #102/120 (Applebee Rd over Branch River)	FEMA Floodplain	$3,096,000 (129 x 24 x $1,000)
Bridge #064/167 (Hopper St over Salmon Falls River)	FEMA Floodplain	$576,000 (24 x 24 x $1,000)
Bridge #219/112 NH16, Spaulding TPK over Lyman Brook	FEMA Floodplain	$7,488,000 (312 x 24 x $1,000)
Bridge #190/101 (Winding Road over Lyman Brook)	FEMA Floodplain	$504,000 (21 x 24 x $1,000)
Bridge #198/131 (Garage Way over Salmon Falls River	FEMA Floodplain	$2,496,000 (104 x 24 x $1,000)
Water Resources		
Dry Hydrant (Waumbek Dam)	FEMA Floodplain	Dry hydrants and identified fire protection river access points are intentionally located in close proximity to waterbodies to allow fire trucks to draft water during an emergency; therefore, they will inherently be vulnerable to flooding issues. There is no feasible way to determine values for these resources.
	Total	$25,190,100

Note: The approximate assessed value for the bridges was calculated by multiplying $1,000.00 per square foot of bridge. This estimate was provided by the Bridge Design Bureau at NHDOT and includes all cost (engineering, consulting and in-house design, construction, etc.) to build a new bridge.

The Police Station was the only emergency facility identified as vulnerable to a past wind shear event. Due to limitations with the mapping data, the planning committee could not determine if the Police Station was impacted during that event. It is likely that if another wind shear event took place, the damage to the building would be relatively small. Two water pump stations and one sewer pump station were located within past hazard areas, including the wind shear event, FEMA 100-year floodplain, past flooding, and dam inundation zones.

The Town's largest impacts are its critical facilities, which include dams and bridges. Fourteen bridges were identified to be within the FEMA 100-year floodplain, and five dams were identified as being within the 100-year floodplain or a dam inundation zone. There is one dry hydrant at the Waumbek Dam vulnerable to flooding. Typically, dry hydrants are intentionally located in close proximity to waterbodies to allow fire trucks to draft water during an emergency; therefore, they will inherently be vulnerable to flooding issues and do not raise big concerns for the town.

Buildings and Utilities

It is difficult to ascertain the amount of damage that could be caused by a natural or man-made hazard because the damage will depend on the hazard's extent and severity, making each hazard event somewhat unique. The assumption used here when calculating the damage to property is equal to: 0-1%, 1-5%, or 5-10% of Milton's structures, depending on the nature of the hazard, whether or not the hazard is localized, and its economic impact.

The total local assessed value included in this analysis is $248,122,384, including $242,180,984 for buildings and $5,941,400 for utilities. Based on this assumption, the potential loss from any of the identified hazards under a low, medium, and high damage scenario of buildings and utilities would range from **$0 to $2,481,223.84 (low)** or **$2,481,223.84 to $12,406,119.20 (medium)** or **$12,406,119.20 to $24,812,238.40 (high)** based on the 2014 Milton Town valuation. Table 9 provides more detail on these estimated economic losses.

Table 10: Economic Loss Data

Local Assessed Valuation				
	Total Assessed Value (2014)	Economic Loss		
		Low 1% Damage	Medium 5% Damage	High 10% Damage
Buildings				
Residential	$198,847,684	$1,988,476.84	$9,942,384.20	$19,884,768.40
Manufactured Housing	$12,903,900	$129,039.00	$645,195.00	$1,290,390.00
Commercial Industrial	$30,429,400	$304,294.00	$1,521,470.00	$3,042,940.00
Total Buildings	**$242,180,984**	**$2,421,809.84**	**$12,109,049.20**	**$24,218,098.40**
Utilities				
Public Water	$0.00	$0.00	$0.00	$0.00
Electric	$5,941,400	$59,414.00	$297,070.00	$594,140.00
Total Utilities	**$5,941,400**	**$59,414.00**	**$297,070.00**	**$594,140.00**
Net Valuation Building and Utilities	**$248,122,384**	**$2,481,223.84**	**$12,406,119.20**	**$24,812,238.40**

Source: NH Department of Revenue Administration. 2015 Annual Report. Assessed value does not include value of land or local exemptions. (http://revenue.nh.gov/publications/reports/documents/ar-2015.pdf)

Human loss of life was not included in the potential loss estimates, but could be expected to occur, depending on the severity and type of the hazard.

Chapter 5: National Flood Insurance Program (NFIP)

The Office of Energy & Planning (OEP) administers and coordinates the State's role in the National Flood Insurance Program (NFIP). The NFIP is a Federal program administered by the Federal Emergency Management Agency (FEMA) that allows property owners in participating communities to purchase insurance protection against losses from flooding. Communities that participate in the NFIP have adopted and enforce community floodplain regulations. One of the community's requirements is to require and obtain certain elevation data for all new and substantially improved structures located in a special flood hazard area. Community permitting officials must review this elevation data to ensure floodplain development complies with the regulations.[4] Currently 217 communities (92 percent) that participate in the NFIP have adopted at least the minimum standards of the NFIP.

Milton's National Flood Insurance Program Status

Milton has been a member of the National Flood Insurance Program (NFIP) since August 28, 1989. The Town does have significant portions of land and property in the 100-year floodplain; along the Salmon Falls River, Lyman Brook, Great Brook, Dames Brook, Hart Brook, Jones Brook, Branch River, and Miller Brook. There are also significant portions of land in the 100-year floodplain around Milton Pond, Town House Pond, and Northeast Pond. There are a large number of structures within this floodplain according to available GIS Flood Insurance Rate Map (FIRM) data and aerial imagery (2015).

Section IV-7 of Milton's Site Plan Review Regulations (as revised on December 6, 2016) outlines the Town's floodplain regulations. These regulations apply to all development proposals which contain lands designated as Special Flood Hazard Area by the Federal Emergency Management Agency (FEMA) in its "Flood Insurance Study for the Town of Milton, NH" together with the associated Flood Insurance Rate Maps (FIRM) and the Flood Boundary and Floodway Maps dated May 17, 2005.

According to information from the FEMA Community Overview (as of 2/19/2016) provided by NH OEP Assistant Planner and State Floodplain Program Assistant Coordinator Kellie Walsh, Milton has 60 total policies (all of which are single family homes, except for 1 condo) in the floodplain hazard area, has had 15 paid loss claims totaling $257,304 and 0 repetitive loss claims. Of the 60 total policies, 10 are preferred risk and are not required. Preferred risk offers policies for buildings that are located in moderate-to-low areas (B, C, and X Zones). Table 11 provides more detail on Milton's insurance policies.

[4] (https://www.nh.gov/oep/planning/programs/fmp/documents/fs-2-elevation-certificate.pdf)

Table 11: Milton's Insurance Zone Policies

Zone	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Loses	$ of closed Paid Loses	Repetitive Loses
A Zones	50	$69,312	$8,921,900	10	$136,353.64	0
B,C & X Zone (Preferred Risk)	10	$4,921	$2,875,000	5	$120,950.44	0
TOTAL		$74,233	$11,796,900	15	$257,303.00	0

In order to remain NFIP compliant, Milton has implemented a number of actions, including:

∴ A FEMA Community Assistance Visit (CAV) was completed in 2004, which did not find any problems with the existing floodplain management regulations. The report indicated there were some minor issues with administration and enforcement procedures and recommended a follow up with the Code Enforcement Officer to ensure use of the existing flood maps. It was also recommended that the Planning Board become more familiar with the NFIP process. The Planning Committee reported that this has been accomplished. It will be recommended that the town schedule another CAV within the next cycle of this plan.

∴ Milton is currently part of the FEMA Discovery Floodplain Remapping Project to develop new DFIRMs for Rockingham/Strafford County. UNH, the Office of Energy and Planning, AECOM, and FEMA held a regional meeting in December, 2015. Former Board of Selectmen, Tom Gray and former Town Administrator Liz Dione attended the December meeting to represent the Town of Milton.

∴ As part of this plan update process, there will be a new mitigation action for the town to consider revising criteria for new development and redevelopment of residential structures located within the special flood hazard areas to require two (2) feet of freeboard to the base flood elevation as recommended by the New Hampshire Coastal Risk and Hazards Commission's Final Report and Recommendation (November, 2016).

∴ Over the course of the last several years, Milton has made significant upgrades to their transportation infrastructure, including stormwater runoff improvements, culvert resizing, new ditches, and the installation of armored rip-rap in some areas. These upgrades have limited recent wash-outs and addressed safety issues along the following roads: Cross Road, Hare Road, Nute Road, Teneriffe Road, Northeast Pond Road, and Mason Road.

Chapter 6: Hazards & Mitigation Strategies

Overview

This section describes the location and extent of hazards that could impact the Town of Milton, presents past hazard events in the Town or elsewhere in New Hampshire, and discusses their rank order placement. The Multi-Hazard Mitigation Planning Committee investigated past and potential hazards using a variety of sources and techniques, including but not necessarily limited to interviewing Town historians and other citizens; researching historical records archived at the Town Library; scanning old newspapers; reading published Town histories; consulting various hazard experts; and extracting data from the NH Hazard Mitigation Plan and other state and federal databases. Past and potential hazards were mapped where spatial data was available.

Rating Probability, Severity, and Overall Risk of Future Disasters

The nature of each hazard type and the quality and availability of corresponding data made the evaluation of hazard potential difficult. The Multi-Hazard Planning Committee considered what data was at hand and used its collective experience to formulate statements of impact or potential. Each hazard type was rated using a hazard vulnerability assessment tool (refer to Table 11).

This tool estimates the probability of occurrence, severity, and overall risk of an event using a projected number system answering questions, which answer High (3), Moderate (2), and Low (1). A zero (0) score meant that there is no likelihood the hazard would impact the Town in the next 25 years. The ranges established for the average to determine severity were:

- ∴ High = >3
- ∴ Moderate = 2
- ∴ Low = 1 or below

The overall risk is a numeric indication developed by multiplying the total numbers of the probability and the severity.

Probability of Occurrence

Probability is based on a limited objective appraisal of a hazard's probability using information provided by relevant sources, observations and trends. The Planning Committee discussed and rated probability of each hazard.

- ∴ High: There is a very strong likelihood (67-100% chance) that Milton will experience a hazardous event within the next 25 years. Score = 3
- ∴ Moderate: There is moderate likelihood (34-66% chance) that Milton will experience a hazardous event within the next 25 years. Score = 2
- ∴ Low: There is little likelihood (0-33% chance) that Milton will experience a hazardous event within the next 25 years. Score = 1

Severity

Severity is an estimate generally based on a hazard's impact human, property and business. The Planning Committee discussed the severity of each hazard. The severity was calculated by the average of human, property and business.

- ∴ High: The total population, property, commerce, infrastructure and services of the Town are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions. Score = 3
- ∴ Moderate: The total population, property, commerce, infrastructure and services of the Town are exposed to the effects of a hazard of moderate influence; or the total population, property, commerce, infrastructure and services of the community is exposed to the effects of a hazard, but not all to the same degree; or an important segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of moderate to major, though not catastrophic, proportions. Score = 2
- ∴ Low: A limited area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of minor to moderate proportions. Score = 1

Overall Risk

The risk number is one, which can help the Town weigh the hazards against one another to determine which hazard is most detrimental. This is calculated by multiplying the Probability of Occurrence score by the average of the Severity score (human, property, and business impacts).

- ∴ High: There is a great risk of this hazard in Milton. Score = 4 or greater
- ∴ Moderate: There is moderate risk of this hazard in Milton. Score = 2-3
- ∴ Low: There is little risk of this hazard in Milton. Score = 1 or less

Hazards Ratings in Milton, NH

The Committee determined that the hazards are distributed as follows:

- ∴ 3 hazards rated as having a High overall risk in Milton: Winter Storms, Flooding, and Drought
- ∴ 4 hazards rated as having a Moderate overall risk in Milton: hurricane & Tropical Storms, Severe Thunderstorms, Extreme Temperatures, and Public Health Threats
- ∴ 4 hazards rated as having a Low overall risk in Milton: Hazardous Materials, Wildfire, Tornado & Downburst, and Earthquake & Landslide

Table 11 is the Town's vulnerability assessment tool, which provides more information on the multi-hazard threat analysis that was completed during a brainstorming session with the Planning Committee.

Hazard Vulnerability Table

Table 11: Hazard Vulnerability Assessment Tool – Town of Milton

Impact Rankings 0 – N/a 1-Low 2-Moderate 3-High	Human Impact *Probability of death or injury*	Property Impact *Physical losses and damages*	Business Impact *Interruption of service*	Severity *Average of human, property, and business impacts*	Probability *Likelihood this will occur within 25 years*	Overall Threat *Low = 0-1* *Moderate = 2-3* *High = > 4* *(Severity x probability)*
Hazard Event						
Flooding	1	3	3	2.3	2	4.7
Hurricane & Tropical Storms	1	1	1	1.0	3	3.0
Tornado & Downburst	1	2	1	1.3	1	1.3
Winter Storms	1	2	3	2.0	3	6.0
Severe Thunderstorms	1	1	1	1.0	3	3.0
Wildfire	1	1	1	1	2	2.0
Earthquake & Landslide	0	1	0	0.3	1	0.3
Extreme Temperatures	1	1	1	1.0	3	3
Drought	0	2	2	1.3	3	4.0
Public Health Threats	2	1	0	1.0	3	3.0
Hazardous Materials	1	1	2	1.3	2	2.7

Declared Disasters and Emergency Declarations

Table 12: Presidentially Declared Disasters (DR) 1990-October 2016 impacting the Town of Milton

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
September 9, 1991	Hurricane Bob	August 18-20, 1991	FEMA 917-DR	PA	$2,293,449	Severe storm and wind; no power; trees knocked down
October 29, 1996	Severe Storms & Flooding	Oct 20-23, 1996	FEMA 1144-DR	PA	$2,341,273	Severe storms, flooding
January 15, 1998	Ice Storm	January 7-35, 1998	FEMA 1199-DR	PA/IA	$12,446,202	Major tree damage, electric power interrupted for many days; schools were closed
May 25, 2006	Severe Storm & Flooding	May 12-23, 2006	FEMA 1643-DR	PA/IA	$17,691,586	Severe storm causing; massive flooding; road closures; dams breaching, evacuations
April 27, 2007	Severe Storm & Flooding	April 15-23, 2007	FEMA 1695-DR	PA/IA	$26,826,780	Severe storms and flooding.
August 11, 2008	Severe Storms, Tornado, & Flooding	July 24, 2008	FEMA 1782-DR	PA	$3,673,097	Severe storms; tornado; and wind damage
January 2, 2009	Severe Winter Storm	December 11-23, 2008	FEMA 1812-DR	DFA/PA	$14,898,663	Winter storm; snow removal; some people without power for a week
March 29, 2010	Severe Winter Storm	February 23-March 3, 2010	FEMA 1892-DR	PA	$6,841,093	Severe winter storm; minor power outages; no major damage

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
September 3, 2011	Tropical Storm Irene	August 26 – Sept 6, 2011	FEMA 4026-DR	PA	$17,684,244	Powerful gusts of wind and periods of heavy rain; no major damage; a few trees down, but no long-term power outrages or closures.
March 19, 2013	Severe Snow and Blizzard	February 9-11, 2013	FEMA 4105-DR	PA	$6,153,471	Significant snow storm that brought heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $32,136 for snow removal costs, plowing, and staff overtime.
March 25, 2015	Severe Snow & Snowstorm	January 26-29, 2015	FEMA 4209-DR	PA	$4,799,048	Similar to the storm in 2013, this snow storm brought heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $20,561 for snow removal costs, plowing, and staff overtime.
11 declarations totaling approximately $115,648,906						
Program Key: PA: Public Assistance, IA: Individual Assistance, DFA: Direct Federal Assistance						

Table 13: Emergency Declaration (EM) 1990-October 2016 impacting the Town of Milton

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
March 16, 1993	Heavy Snow	March 13-17, 1993	FEMA 3101-EM	PA	$832,396	Snow removal; high winds.
March 28, 2001	Snow Emergency	March 5-7, 2001	FEMA 3166-EM	PA	$3,433,252	Snow removal
March 11, 2003	Snow Emergency	February 17-18, 2003	FEMA 3177-EM	PA	$2,288,671	Snow removal
March 30, 2005	Snow Emergency	January 22-23, 2005	FEMA 3207-EM	PA	$3,611,491	Snow removal
December 13, 2008	Severe Winter Storm	December 11-23, 2008	FEMA 3297-EM	DFA/PA	$900,000	Winter storm; snow removal
November 1, 2011	Severe Winter Storm	October 29-30, 2011	FEMA 3344-EM	PA	Data not available	Heavy, wet snow brought down tree branches and caused major power outrages throughout town for at least 24 hours.
October 30, 2012	Hurricane Sandy	October 26-31, 2012	FEMA 3360-EM	PA	$643,660	Limited impact on Milton. There were periods of heavy rain and strong gusts of wind; however, there were no major flooding issues, road closures, or damage to any of the dams. Downed tree limbs did cause minor power outages and road closures. The town was reimbursed in the amount of $6,568 for fire standby, police overtime, and public works staff time.
7 emergency declarations totaling approximately $11,709,470						
Program Key: PA: Public Assistance, DFA: Direct Federal Assistance						

Flooding

Overview	
Hazard Type	Flooding
Location/Extent	Along the Salmon Falls River and the Milton Three Ponds (Milton Pond, Northeast Pond and Town House Pond) have a fairly expansive floodplain area
Vulnerability	
Severity	2.3
Probability	2
Overall Threat	4.7

Description of the Hazard

Riverine flooding is the most common natural disaster to impact New Hampshire. Riverine flooding occurs when surface water runoff introduced into streams and rivers exceeds the capacity of the natural or constructed channels to accommodate the flow. As a result, water overflows the river banks and spills out into adjacent low lying areas.[5] Floods are most likely to occur in the spring due to the increase in rainfall and the melting of snow; however, floods can occur at any time of the year because of heavy rains, hurricane, or a Nor'easter.

New Hampshire's climate ranges from moderate coastal to severe continental, with annual precipitation ranging from about 35 inches in the Connecticut and Merrimack River valleys, to about 90 inches on top of Mount Washington. Localized street flooding occasionally results from severe thundershowers, or over larger areas, from more general rain such as tropical cyclones and coastal "nor'easters." More general and disastrous floods are rare, but some occur in the spring from large rainfall quantities combined with warm, humid winds that rapidly release water from the snowpack. Causes of flooding that could potentially affect Milton include:

The "100-year flood" Term:

The "100-year flood" is a term often used to describe a flood that has a 1% chance of occurring in any year. But the phrase is misleading, and often causes people to believe these floods happen every 100 years on average. The truth is, these floods can happen quite close together, or not for long stretches of time, but the risk of such a flood remains constant from year to year. The 100-year-flood term was originated to delineate areas on a map to determine what properties are subject to the National Flood Insurance Program. Properties within the 100-year-floodplain, as defined by the Federal Emergency Management Agency, have special requirements and mortgage holders will require owners to carry flood insurance on these properties.

[Source: The Nurture Nature Center: Focus on Floods]

- ∴ 100-year rainstorm event
- ∴ Severe tropical storm (hurricane or tropical storm) that can bring torrential rainfall in excess of that from a 500-year storm.
- ∴ Rapid snow pack melt in spring can be a significant potential flooding source, given the northern, relatively cold location and climate of Milton
- ∴ River ice jams, which could occur, although the Army Corps of Engineers Ice Jam Database contains no record of ice jams in Milton; the Committee could not recollect any records either.
- ∴ Dam breach or failure.

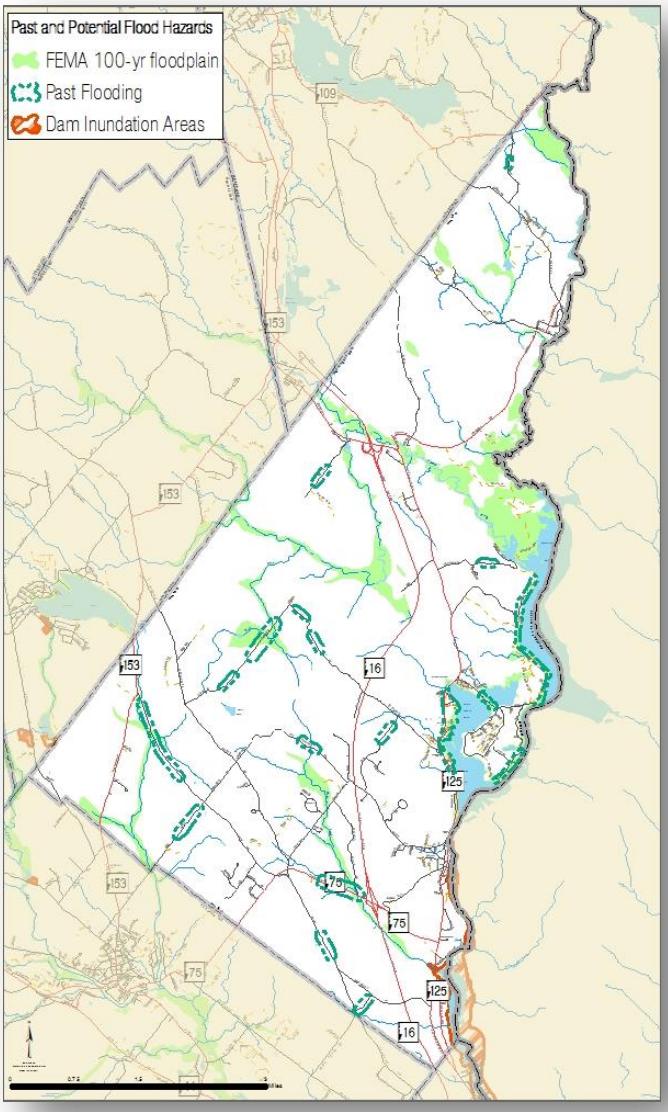
[5] FEMA Training Chapter 2 Types of Floods and Floodplains (https://training.fema.gov/hiedu/docs/fmc/chapter%202%20-%20types%20of%20floods%20and%20floodplains.pdf)

Extent of the Hazard

Flooding can occur in any area of the Town but is more likely to occur within the 100-year floodplain, downstream of dams, along river and stream banks, near wetlands and road crossings, and other low-lying areas. Milton has approximately 7.9% (17,337.7 acres) of its area in 100-yr. floodplain (see Map 5). It should be noted that this estimation is likely overstated due to the fact that the FEMA floodplain contains open water. If the area around Milton Three Ponds were removed the approximate acreage may be closer to 5-6%.

Based on extent of the floodplain, Milton has significant flooding potential along the Salmon Falls River, Lyman Brook, Great Brook, Dames Brook, Hart Brook, Jones Brook, Branch River, and Miller Brook. There are also significant portions of land in the 100-year floodplain around Milton Pond, Town House Pond, and Northeast Pond. Areas where roads cross streams are also more susceptible to flooding.

Although flooding of the full extent of this floodplain by definition would require a 100-year storm, smaller storms with a higher annual probability of occurrence could still flood significant portions of that floodplain. Structures that could be impacted by a 100-year storm could also be affected by smaller, more frequent flooding. There are a large number of structures within this floodplain. It is likely that the 100-year floodplain will change in area when flood maps are updated due to better mapping technology and current precipitation data.



Map 5: Past and Potential Hazards (Source/FEMA, 2017

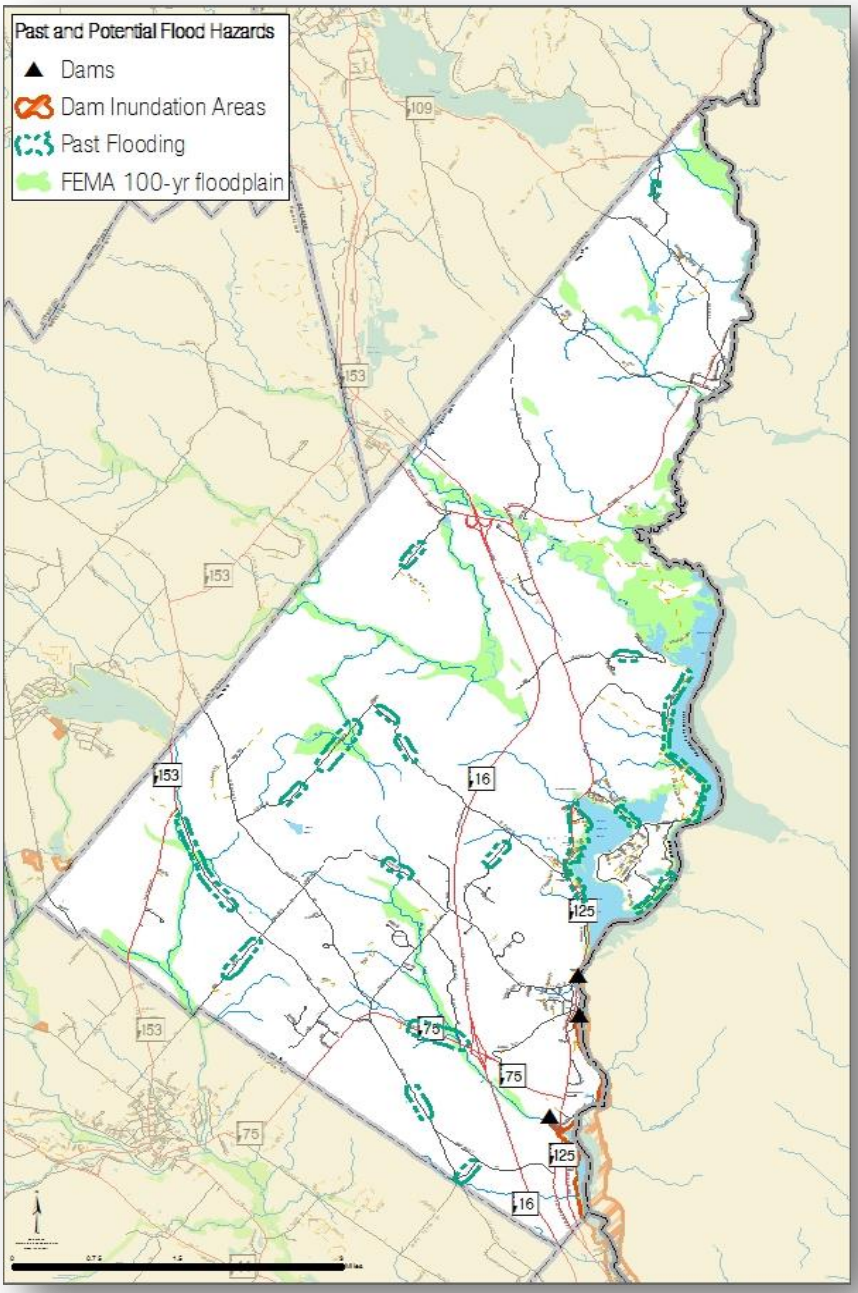
Past Events and Impacts

Although the storm could not be classified, a 1936 event was described at the time as causing "the greatest damage in New Hampshire's history" (Fahey 1936). Two other consequential flooding events took place in 2006 and 2007, both of which were considered 100-year events. During those events, there were several areas where Milton experienced severe impacts, including: along Cross Road, Hare Road, Nute Road, Teneriffe Road, Northeast Pond Road, and Mason Road.

Additional local impacts include flooding on Route 75 west of Evergreen Road (stormwater drainage flooding; not riverine), Route 125 at Depot Pond due to lake flooding, and in close proximity to the train tracks at Ohio and Utah Way.

Dam Failure

Dam failure could potentially result in flooding in Milton. There are a total of twenty active dams (there are fourteen classified as ruins, removed, breached, not built, or exempt). There are no high hazard dams in Milton; however, it is important to note that the Planning Committee agreed that Waumbek and Rowe Dam are the two dams that are of the biggest concern due to their potential impacts on homes and infrastructure downstream. The Milton Leather Board, Three Ponds, and Wastewater Lagoon dams are all considered to have a significant hazard class and are at the most risk for loss of life and damage to private and public property. While the dam at Milton Three Ponds was in fear of failure during the 2006 event, it never breached, and all dams in town have been continually inspected, and are in good condition (see Map 6).



Map 6: Dam Inundation Zones (Source: NHDES, 2015)

There is one delineated dam inundation zone located south of the Milton Three Ponds dam and follows south along the Salmon Falls River.

To the best of the committee's knowledge there have been no major dam failures in town.

A more comprehensive list of dams, their associated classifications, and inspection schedules in Milton are located in Table 14.

Table 14: Dams in Milton

Dam Classification	Classification Definition	Number of Dams in Milton	Inspection Interval (Years)
High	Dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life.	0	2
Significant	Dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no probable loss of lives but major economic loss to structures or property.	3	4
Low	Dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in no possible loss of life and low economic loss to structures/property.	4	6
Non-Menace	Dam that is not a menace because it is in a location and of a size that failure of misoperation of the dam would not result in probable loss of life or loss to property.	13	6

Potential Future Impacts on the Community

Overall, flooding potential in Milton is high and flood conditions will continue to affect the town. Both seasonal flooding and flooding due to extreme weather events have the potential to occur during all seasons.

Estimated Potential Losses

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately **$24,812,238.40** in estimated potential losses from flooding.

Hurricane and Tropical Storms

Overview	
Hazard Type	Hurricane and Tropical Storms
Location/Extent	Town-wide
Severity	1.0
Probability	3
Overall Threat	3.0

Description of the Hazard

A hurricane is the term used for tropical cyclones that occur in the Northern Hemisphere east of the International Dateline to the Greenwich Meridian. Tropical cyclones originate over tropical or subtropical waters and are characterized by organized deep convection and a closed surface wind circulation about a well-defined center. These events are called typhoons if they occur west of the International Dateline. Hurricane season in the Atlantic runs from June 1 to November 30.

According to the State Hazard Mitigation Plan (2013) tropical cyclones with maximum sustained winds of less than 39 mph are called tropical depressions. Once the tropical cyclone reaches winds of at least 39 mph, they are typically called a tropical storm and assigned a name. If the winds reach 74 mph or greater, they are upgraded and called a hurricane.

Extent of the Hazard

Hurricanes may impact all areas of the Town. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating system based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

Scale Number (Category)	Sustained Winds (MPH)	Damage	Storm Surge
1	74-95	**Minimal:** Unanchored mobile homes, vegetation and signs.	4-5 feet
2	96-110	**Moderate:** All mobile homes, roofs, small crafts, flooding.	6-8 feet
3	111-130	**Extensive:** Small buildings, low-lying roads cut off.	9-12 feet
4	131-155	**Extreme:** Roofs destroyed, trees down, roads cut off, mobile homes destroyed. Beach homes flooded.	13-18 feet
5	More than 155	**Catastrophic:** Most buildings destroyed. Vegetation destroyed. Major roads cut off. Homes flooded.	Greater than 18 feet

Past Impacts and Events

These severe tropical storms may occur anytime from early spring to late fall, and in general are less common than other storms, e.g. nor'easters. As wind events, historically hurricanes have caused damage in Milton, most notably in 1938 and 1954 (Hurricane Carol).

The NOAA National Climatic Data Center's Storm Events database (NCDC 2016) does not list any Hurricanes as directly affecting Strafford County from January 1, 2008 to September 30, 2016; however, Strafford County did experience impacts from Hurricane Sandy. Hurricane Sandy was the last hurricane to hit the region during the period of October 26 to November 8, 2012. There were periods of heavy rain and strong gusts of wind; however, there were no major flooding issues, road closures, or damage to any of the dams. Downed tree limbs did cause minor power outages and road closures. The town was reimbursed in the amount of $6,568 for fire standby, police overtime, and public works staff time.

The database does report one tropical storm event, which is detailed as follows:

Tropical Storm Irene (August 28, 2011) - brought a prolonged period of strong and gusty winds and heavy rain to the state. The high winds snapped or uprooted numerous trees throughout the state causing more than 160,000 customers to lose electrical and/or communication services. The heavy rains caused rivers and streams throughout the state to flood causing damage to bridges, roads, and property. The strongest winds across the state began Sunday morning in southern areas and spread northward during the day. Winds continued to be gusty overnight as the storm moved away from the area. Observed maximum wind gusts included 63 mph at Portsmouth, 52 mph at Concord, and 51 mph at Manchester. On the top of Mt. Washington, winds gusted to 104 mph as the storm approached and 120 mph as it moved away. The combination of wet soil and the prolonged period of strong and gusty winds brought down numerous trees throughout the state. One person was killed and three people were injured across the state due to falling trees or branches. Rainfall amounts across the state

ranged from 1.5 to 3 inches across southeastern New Hampshire. Locally, there were minor impacts including, some brush removal. There were also some trees down resulting in sporadic power outages throughout town.

Potential Future Impacts on Community

Based on historical data and statistical predictors, the Atlantic Basin averages approximately 12 total named storms per year. Six of those storms will become hurricanes with three becoming a category three or higher. With variability in sea-level pressure and sea-surface temperatures in the Atlantic Ocean, it is difficult to predict with certainty the number of storms in any given year. It is even more difficult to determine which of those storms will make landfall. Because Milton is considerably inland from the New Hampshire coast, wind speeds may be diminished from their coastal strength, and significant impact on the town would be dependent on the exact track of these concentrated storms.

Milton remains vulnerable to hurricane hazards, including: high winds, heavy rainfall, and inland flooding; therefore the recurrence potential of hurricane and tropical storm hazards is moderate. It is likely that the region will be impacted by a significant storm of tropical origin within the foreseeable future.

Estimated Loss Potential

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $12,406,119.20 in estimated potential losses from impacts associated from hurricanes and tropical storms.

Tornado & Downburst

Overview	
Hazard Type	Tornado & Downburst
Location/Extent	Town-wide – dependent upon tornado track
Severity	1.3
Probability	1
Overall Threat	1.3

Description of the Hazard

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud with winds in excess of 200 mph, often accompanied by violent lightening, peripheral high winds, severe hail, and severe rain. Tornadoes develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. The atmospheric conditions required for the formation of a tornado include great thermal instability, high humidity, and the convergence of warm, moist air at low levels with cooler, drier air aloft. Most tornadoes remain suspended in the atmosphere, but if they touch down they become a force of destruction.

Tornadoes produce the most violent winds on earth, at speeds of 280 mph or more. In addition, tornadoes can travel at a forward speed of up to 70 mph. Damage paths can be in excess of one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage. A tornado is usually accompanied by thunder, lightning, heavy rain, and a loud "freight train" noise. In comparison to a hurricane, a tornado covers a much smaller area but can be more violent and destructive.

A downburst is a severe localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories: microburst, which covers an area less than 2.5 miles in diameter and macroburst, which covers an area at least 2.5 miles in diameter.

Extent of the Hazard

The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. The scale measures wind speeds of 65 to greater than 200 miles per hour. The damage path of a tornado can be in excess of one mile wide and 50 miles long, whereas a downburst is typically less than 2.5 miles. Downbursts can have wind speeds of 150 miles per hour.

Enhanced Fujita Scale	
EF–0	65–85 mph winds
EF–1	86–110 mph
EF–2	111–135 mph
EF–3	136–165 mph
EF–4	166–200 mph
EF–5	>200 mph

Past Impacts and Events

Tornadoes are rare in New Hampshire. The NCDC Storm Events database (NCDC 2016) lists only seven tornadoes that have impacted Strafford County since 1950. One was an EF-0 event (65-85 mph); one was an EF1 event (73-112 mph); and five were EF2 events (111-135 mph). Over the course of the past six decades, there haven't been any fatalities, 0 injuries, but approximately $2.9 million in property damages associated with tornados. The majority of property damage was sustained during an event that took place in 1981. The most recent touchdown was in 2008. There have been no direct impacts in Milton.

Table 14: Tornado Data for Strafford County

Date	Magnitude	Death	Injuries	Property Damages
06/09/1953	EF1	0	0	250
05/14/1963	EF2	0	0	25,000
05/03/1976	EF2	0	0	250,000
06/22/1981	EF2	0	0	2,500,000
08/02/1993	EF0	0	0	5,000
07/06/1999	EF2	0	0	0
07/24/2008	EF2	0	0	126,000
	TOTAL	0	0	$2,906,000

Between 1991 and 2010, the average annual number of tornadoes in New Hampshire was one.[6] Though the frequency of tornado events in New Hampshire is not great, the state has experienced large tornados throughout its

[6] NOAA. U.S. Tornado Climatology (https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology)

history. An early example is the tornado that stuck the state in September 1821. This tornado was reported to have tracked from the Connecticut River, near Cornish, and terminating near Boscawen. When the skies cleared, 6 people were dead, hundreds injured and thousands homeless.

In 1998 an F2 tornado in Antrim, N.H. blew down a 45-foot by 12-foot section of the Great Brook Middle School. Witnesses reported seeing a funnel cloud, and the weather service, after an inspection, confirmed it was a tornado. According to the June 2, 1998 edition of the Eagle Tribune, John Jensenius from the National Weather Service in Gray, Maine estimated that the twister cut a path half a mile long, up to 100 yards wide, and was on the ground for several minutes.

In July 2008, an F2 tornado and high winds created a path of destruction through five New Hampshire counties that destroyed homes, displaced families, downed trees and forest lands and closed major state roadways. The impact to residents was extensive, with over 100 homes rendered uninhabitable. Phone and electric service was cut off to over 12,500 customers. One fatality is attributed to a building collapse, and local hospitals reported numerous physical injuries associated with this severe storm.[7] Since the July 2008 tornado, the NCDC Storm Events database reports that nine tornados have hit New Hampshire; however, none have hit Strafford County. The most recent event occurred in July 2016 in Pittsburg.

Downburst activity is very prevalent throughout the State. However, the majority downburst activity is mostly unrecognized unless a large amount of damage has occurred. Several of the more significant and recent events are highlighted below:

- ∴ Central, NH – July 6, 1999 – Damages: Two roofs blown off structures, downed trees, widespread power outages, and damaged utility poles and wires; two fatalities.
- ∴ Stratham, NH – August 18, 1991 – Damages: $2,498,974 worth of damages; five fatalities.
- ∴ Moultonborough, NH – July 26, 1994 – Damages: Downed trees, utility poles and wires. Approximately 1,800 homes without power and 50-60 homes damages.
- ∴ Bow, NH – September, 6, 2011 – Damages: City Auto in Bow had 15 campers damaged and estimated $200,000 in damage.

Locally, the planning committee identified two downbursts that took place in the same general location (within the last several years) that came across the lake and impacted parts of Townhouse Road. Both events took place in the summer and knocked down power lines, snapped a large amount of pine trees, and caused significant damage to one residential home.

While tornados are not common, they would cause significant impacts in the town. The probability of reoccurrence of a downburst may be higher. A tornado or downburst can impact the entire jurisdiction and may cause greater damage in the community center.

[7] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.

Potential Future Impacts on Community

There have been 7 reported tornadoes over the course of 66 years; the average annual probability of recurrence, therefore, is 10.6% (7/66 x 100). The probability may be slightly higher if local reports of tornadoes were considered; however, this 10.6% probability is for all of Strafford County – not just Milton. The actual probability for Milton should be much lower, considering the great dependence of impact upon the actual track of any tornado. The Hazard Mitigation Committee identified two tornadoes that touched down relatively close (Strafford and New Durham) to the town, which would suggest the average annual probably of recurrence to be less than 3%. The tornado recurrence probability for Milton, therefore, is relatively low.

Estimated Loss Potential

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $2,481,223.84 in estimated potential losses from impacts associated from tornadoes and downbursts.

Severe Winter Weather

Overview	
Hazard Type	Severe Winter Weather
Location/Extent	Town-wide
Severity	2.0
Probability	3
Overall Threat	6.0

Description of the Hazard

Winter snow and ice events are common in New Hampshire. The National Climatic Data Center (NCDC 2016) Storm Events database reports 44 severe winter weather events, which include: 2 blizzards, 35 heavy snow events, 1 ice storm, and 6 winter storms (nor'easters) that have impacted Strafford County from January, 1 2008 to October 31, 2016.

Heavy snow typically brings significant snow removal costs along with delays in transportation schedules. Wet snow can result in major infrastructure damage from heavy snow loads and has been the cause of human harm during long periods of shoveling, including back injuries and in some cases heart attacks to older individuals. The most severe damage, though, often comes from ice storms and winter nor'easters.

The State's Multi-Hazard Mitigation Plan Update 2013 identifies four types of winter storms:

- ∴ *Heavy snowstorms*: A storm that deposits four or more inches of snow (or 10 cm) in a twelve-hour period
- ∴ *Blizzards*: A violent snowstorm with winds blowing at a minimum speed of 35 miles (56 kilometers) per hour and visibility of less than one-quarter mile (400 meters) for three hours

∴ *Nor'easter*: A large weather system traveling from south to north, passing along the coast. As the storm's intensity increases, the resulting counterclockwise winds which impact the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force winds.

∴ *Ice Storms*: An event that occurs when a mass of warm, moist air collides with a mass of cold, arctic air. The less dense warm air will rise and the moisture may precipitate out in the form of rain. When this rain falls through the colder, denser air and comes in contact with cold surfaces, ice will form and may continue to form until the ice is as thick as several inches.

Extent of the Hazard

Snow and ice storms are a town-wide hazard.

Sperry-Piltz Ice Accumulation Index

The Sperry–Piltz Ice Accumulation Index, or SPIA Index, is a forward-looking, ice accumulation and ice damage prediction index that uses an algorithm of researched parameters that, when combined with National Weather Service forecast data, predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms. It is a tool to be used for risk management and/or winter weather preparedness.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	< 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Past Events and Impacts

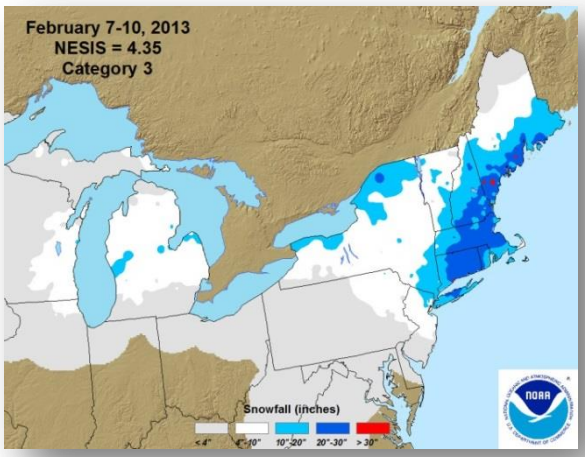
Three events of those listed in the NCDC database are of particular note for their severity:

The Ice Storm of 1998: (January 7th – 9th) was a severe ice storm that is recognized as the worst event in recent memory. Ice accreted several inches thick on trees, power lines, and other exposed surfaces causing many people in those areas to lose electrical service. Statewide, the storm knocked out power to about 55,000 customers, an estimated 125,000 people. During the time without power, residents and those involved with the restoration efforts had to contend with snow, additional freezing rain, rain, slippery roads, falling ice and other debris, sub-zero temperatures, strong winds, and dangerous wind chills.

The Ice Storm of 2008 (December 11th – 12th) was a major winter storm that brought a mixture of snow, sleet, and freezing rain. The greatest impact in the state was in southern and central New Hampshire where a significant ice storm occurred. Following the ice storm, recovery and restoration efforts were negatively impacted by additional winter weather events that passed through the state. The freezing rain and sleet ranged from 1 to 3 inches, ice accretion to trees and wires in these areas generally ranged from about a half inch to about an inch. The weight of the ice caused branches to snap, and trees to either snap or uproot, and brought down power lines and poles across the region. About 400 thousand utility customers lost power during the event, with some customers

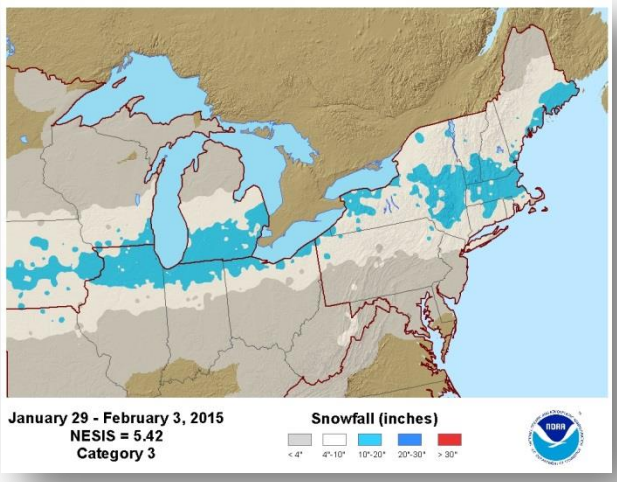
without power for two weeks. Property damage across northern, central and southeastern NH was estimated at over $5 million. Locally, Milton experienced widespread power outages for upwards of a week.

The Blizzard of 2013 – NEMO (February 8th-9th) was an area of low pressure developed rapidly off the Carolina coast late on the 7th and early on the 8th. The storm moved very slowly northeast during the 8th and 9th as it continued to intensify. By the morning of the 10th, the storm was located just to the east of Nova Scotia. The storm brought heavy snow, high winds, and blizzard conditions to the southeastern part of the state. Snowfall amounts were generally 18 inches or more in the southeast where blizzard conditions caused considerable blowing and drifting snow. In western and northern sections, snowfall amounts were in the 4 to 18 inch range. Southeastern New Hampshire had blizzard conditions for about 3 to 10 hours.



The NCDC Regional Snowfall Index for the stations near Milton reported between 18 and 24 inches of snow (Rochester and Nottingham) and 12 to 18 inches (between Epson and Northwood) from February 8-February 10, 2013. According to the NH Union Leader, wind gusts of over 30-miles-per hour were expected to occur with the storm; however, the NH Electric Co-op reported only minor power outages.[8] Locally, this storm produced heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $32,136 for snow removal costs, plowing, and staff overtime.

The Blizzard of 2015 – JUNO (January 26th – 28th) was area of low pressure developed off the Delmarva peninsula on Monday, January 26th, and intensified rapidly as it moved slowly northward through the 27th. Snow spread northward across the region Monday night and became heavy on Tuesday, the 27th. Winds became strong during the day Tuesday leading to blizzard conditions at times along and inland from the coast. The snow persisted into Tuesday night in many areas with blowing and drifting snow. Snowfall amounts ranged from 10 to more than 30 inches across much of the southeastern part of the state.



Juno was ranked on the NESIS as a 'major' event based on the area affected, the amount of snow, and the number of people living in the path of the storm. The Regional Snowfall Index for the station near Milton reported

[8] New Hampshire Union Leader. February 9, 2013.
http://www.unionleader.com/apps/pbcs.dll/article?AID=/20130209/NEWS1101/130209041/0/OPINION02

between 18 and 24 inches from January 25-January 28th, 2015[9]. Similar to the storm in 2013, this snow storm brought heavy bands of snow and wind, causing blizzard-like conditions. The town was reimbursed in the amount of $20,561 for snow removal costs, plowing, and staff overtime.

Other, less recent events were also damaging. The nor'easter of December 7, 1996 was especially damaging to power systems and is described in the NCDC database as "the most extensive and costliest weather related power outage in the state's history," at least until 1996 when that database entry was made. The 1998 ice storm probably surpassed this storm in power systems impact. This storm is thought to have been of the same magnitude as the one that occurred in the region in 1929, indicating a return period of approximately 70 years (CRREL 1998).

Extended Power Failures

When discussing extended power failure in this plan, it is referring to power failure that can last for a period of days or weeks. Many things can cause power failure: downed power lines (due to storm, wind, accident, etc.); failure of public utilities to operate or failure of the national grid. Extended power failure can present not only lighting difficulties but also heating, water supply and emergency services. In Milton, there have been extended power outages on occasion; the worst in recent years was the ice storm of 2008 where power was out for over a week in some places. Many residential homeowners in Milton have purchased personal back-up generators in recent years.

Potential Future Impacts on Community

Milton will continue regularly to receive impacts from severe, regional winter weather events. Due to its heavily forested nature, the Town is most highly exposed in terms of damage to forest resources and the secondary impacts of those damages.

Estimated Loss Potential

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $24,812,238.40 in estimated potential losses from impacts associated from severe winter weather.

Severe Thunderstorms & Lightning

Overview	
Hazard Type	Severe Thunderstorm and Lightning
Location/Extent	Town-wide (sporadic)
Severity	1.0
Probability	3
Overall Threat	3.0

[9] http://gis.ncdc.noaa.gov/map/viewer/#app=cdo&cfg=rsi&theme=rsi

Description of the Hazard

As defined by NOAA, a thunderstorm is a rain shower during which thunder is heard. Because thunder comes from lightning, all thunderstorms have lightning. A thunderstorm is the result of convection, which is the upward atmospheric motion that transports whatever is in the air (such as moisture) with it. A thunderstorm is classified as severe if it has hail one inch or greater, winds gusting in excess of 50 knots (57.5 mph), or a tornado. Thunderstorm-related hazards that could impact Milton include: high winds and downburst, lightning, hail, and, torrential rainfall. Thunderstorms and severe thunderstorms are a Town-wide hazard. They are most likely to occur in spring and summer.

Lightning can cause significant, sometimes severe, damage. Lightning strikes can cause direct damage to structures and serious injury or death to people and animals. Extensive damage also commonly results from secondary effects of lightning, such as electrical power surges, wildfire, and shockwave. According to lightning fatality data collected by the National Oceanic and Atmospheric Administration (NOAA), lightning kills an average of 49 people each year in the United States. There were 349 fatalities in the United States from 2005 to 2015.

Extent of the Hazard

Lightning heats air to a temperature of 50,000 degrees Fahrenheit and causes the air to expand and contract rapidly, which causes thunder. A lightning strike occurs very quickly but can occur multiple times during a storm.

Table 15: Lightning Activity Scale

Lightning Activity Level (LAL)	Conditions
LAL1	No thunderstorms activity
LAL2	Isolated thunderstorms
LAL3	Widely scattered thunderstorms
LAL4	Scattered thunderstorms
LAL5	Numerous thunderstorms
LAL6	Widely scattered, scattered, or numerous DRY thunderstorms

Past Events and Impacts

Thunderstorms are common in New Hampshire but can be considered generally less severe than in other areas of the country, such as the Great Plains states. Severe thunderstorms do occur in New Hampshire, though. The NCDC database lists 22 reported events of severe thunderstorm winds in Strafford County from January 1, 2008 to February 28, 2017. Four events took place in in Milton. On July 26, 2011 a severe thunderstorm produced multiple reports of trees down in Milton; on August 9th, 2012 a severe thunderstorm downed a large tree and wires across McKeagney Road near Milton; on June 7th, 2016 a severe thunderstorm downed trees on Berry Road near Milton Mills; and on September 11th, 2016 a severe thunderstorm downed multiple trees and wires in Milton.

There were no reported lightning strike related deaths in New Hampshire. The NCDC database lists two reported lightning events in Strafford Country from January 1, 2008 to February 28, 2017; one of which occurred in the Town of Milton Mills that struck the Liberty Chapel. On July 20th, 2008 lightning struck a pine tree and travelled along the ground to a nearby shed. The 8 x 10ft shed contained pool chemicals and gardening materials and exploded when struck. The planning committee also mentioned that lightning had struck the Police Station, but could not determine if it was part of the previous storms mentioned.

Finally, hail is a fairly common part of thunderstorms in New Hampshire, but damaging hail is apparently not. The damage that can result from hail is mostly to cars and windows. The NCDC Storm Events database lists 14 reported hailstorms in Strafford County from January 1, 2008 to February 28, 2017. Two of these events took place in Milton. On July 24th, 2012 a thunderstorm produced 0.75 inch hall near Milton and on June 23rd, 2013 a severe thunderstorm produced 1 inch hail near Milton.

Potential Future Impacts on Community

The annual recurrence probability of thunderstorms in general is effectively 100%. Milton will continue to experience thunderstorms and should expect to sustain significant damage periodically.

Estimated Loss Potential

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $12,406,119.20 in estimated potential losses from impacts associated from severe thunderstorms and lightning.

Wildfire

Overview	
Hazard Type	Wildfire
Location/Extent	Town-wide (Unfragmented, wooded areas)
Severity	1.0
Probability	2
Overall Threat	2.0

Description of the Hazard

Wildfire is defined as an uncontrolled and rapidly spreading fire. A forest fire is an uncontrolled fire in a woody area. Forest fires occur during drought and when woody debris on the forest floor is readily available to fuel the fire. Grass fires are uncontrolled fires in grassland areas. Milton is a rural town with a predominantly forested landscape. Exposure to natural factors such as lightning that can cause wildfires is consequently high and can occur throughout the jurisdiction.

Extent of the Hazard

The National Wildfire Coordinating Group (NWCG) categorizes the size of a wildfire in six classes depending on acres burned, ranging from less than ¼ acre to greater than 5,000 acres (see box to the right). The US Forest Service's surface fire behavior fire characteristics chart illustrates primary fire

The National Wildfire Coordinating Group (NWCG) defines the size of a wildfire as:
Class A - one-fourth acre or less;
Class B - more than one-fourth acre, but less than 10 acres;
Class C - 10 acres or more, but less than 100 acres;
Class D - 100 acres or more, but less than 300 acres;
Class E - 300 acres or more, but less than 1,000 acres;
Class F - 1,000 acres or more, but less than 5,000 acres;

behavior values including the spread rate and the intensity of the fire, which can be used to compare predicted and observed fire behavior and to describe potential fire behavior.[10]

Past Impacts and Events

Wildfires in New Hampshire historically have tended to run in 50-yr cycles, which can be observed starting from the 1800s. This 50-year cycle is partially based upon human activities and, therefore, may not prove to be accurate into the future.[11] The peak in wildfires in the late 1940's and early 1950's is thought to be related to the increased fuel load from trees downed in the 1938 hurricane. Here, 60 years later, New Hampshire officials are again concerned about the high fuel load created by the 1998 and 2008 ice storms that hit New Hampshire. The NCDC Storm Events database lists 0 reported wildfires in Strafford County from January 1, 2008 to February 28th, 2017. The planning committee identified three events that took place locally: 1) behind Pine Park, off Teneriffe Road, and along the Middleton/Milton town border. The planning committee discussed that a majority of these fires are due to human activities (most likely juveniles with lighters, ATV's, and fireworks).

Potential Future Impacts on Community

The probability of occurrence of wildfires in the future is effectively impossible for the Hazard Mitigation Committee to predict due to the dependence of wildfire on the occurrence of the causal hazards and the variability of numerous factors that affect the severity of a wildland fire.

In general, if a wildfire occurred in one of the large, unfragmented woodland areas, the cost of the timber loss would probably be in the range of several million dollars.

Estimated Loss Potential

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $2,481,223.84 in estimated potential losses from impacts associated from wildfire.

Earthquakes & Landslide

Overview	
Hazard Type	Earthquake & Landslide
Location/Extent	Town-wide and areas with steep slopes (>25%)
Severity	0.3
Probability	1
Overall Threat	0.3

[10] How to Generate and Interpret Fire Characteristics Charts for Surface and Crown Fire Behavior. (https://www.fs.fed.us/rm/pubs/rmrs_gtr253.pdf)

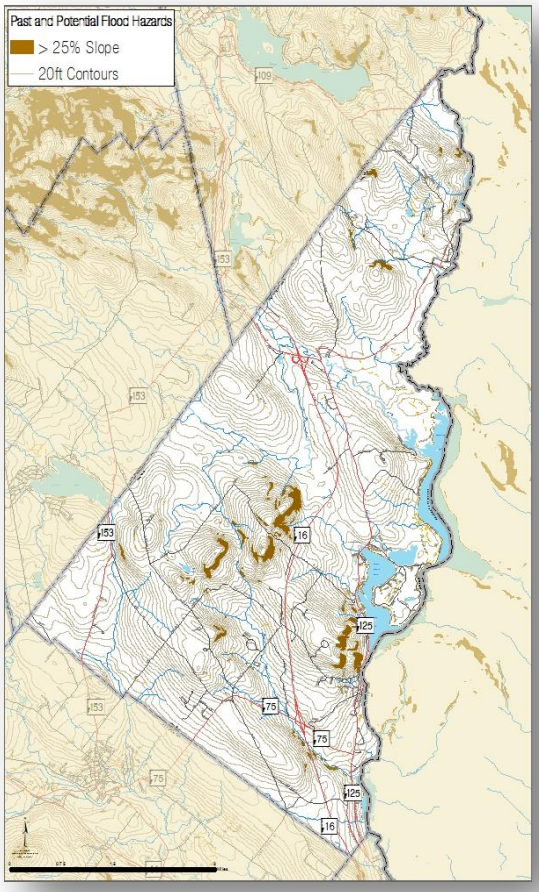
11 New Hampshire Department of Safety. State of NH

[11] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.

Description of the Hazard

The USGS defines an earthquake as a term used to describe both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth. Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, avalanches, and tsunamis. Larger earthquakes usually begin with slight tremors but rapidly take the form of one or more violent shocks, and are followed by vibrations of gradually diminishing force called aftershocks.[12] Earthquakes in the Northeast are not associated with specific know faults.

Due to the geology of the region, the area impacted by an earthquake in the Northeast can be up to 40 times greater than the same magnitude event occurring on the West coast. Earthquakes can occur at any time without warning. An earthquake can impact all areas of the jurisdiction. People at greatest risk from earthquakes are those who live in unreinforced masonry buildings build on filled land or unstable soil.[13]



Map 7: Steep Slopes in Milton (Source: SRPC, 2015)

Landslides could occur in Milton in areas with steep slopes, where soils and loose bedrock formations would tend to slough off and move en masse downhill under gravity. Earthquakes could readily cause landslides, as could ground saturation from extended heavy precipitation events. Given seismic or precipitation events that could initiate landslide, landslide hazard is likely quite high in steep slope areas. There are approximately 399.8 acres (1.8%) of steep slopes greater than 25% in Milton.

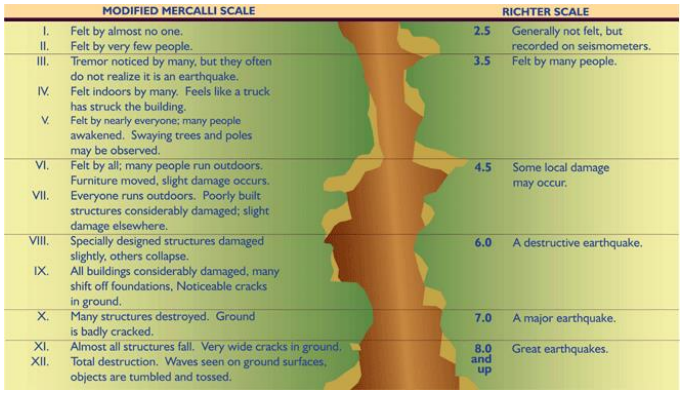
Extent of the Hazard

The magnitude and intensity of an earthquake is measured by the Richter scale and the Modified Mercalli Intensity (MMI) scale, respectively. The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes.

The Modified Mercalli Intensity (MMI) scale was developed in 1931 by the American seismologists Harry Wood and Frank Neumann. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an

[12] The Northeast States Emergency Consortium Earthquake Hazards. http://nesec.org/earthquakes-hazards/. Viewed on 8/10/15
[13] http://nesec.org/earthquakes-hazards/
[14] USGS. Earthquake Hazard Program. http://earthquake.usgs.gov/learn/glossary/?term=Richter%20scale. Viewed on 8/10/15

arbitrary ranking based on observed effects actually experienced at a given place and therefore has a more meaningful measure of severity.[15]



Past Impacts and Events

Due to the state's location in an area of moderate seismic activity earthquakes are a common event in New Hampshire, but significantly damaging earthquakes are not. The Northeast States Emergency Consortium (NESEC, 2016) website presents a history of earthquake in the Northeast and documents that New Hampshire is an area of high earthquake probability. Three hundred and sixty earthquakes occurred in New Hampshire from 1638 to 2007. Approximately 40-50 earthquakes are detected in the Northeast annually.[16] However, New Hampshire has only experienced ten earthquakes of significant magnitude (Richter Magnitude 4.0 or greater) in that time period (one was located in Maine). The 2012 earthquake was felt locally, albeit impacts were minor (pictures were knocked off walls).

Earthquakes are on average an annual occurrence but significant quakes have an annual probability of occurrence (based on the 1638 to 2012 period) of about 2.7%.

Table 16: Notable Historic Earthquakes in NH 1638-2012 (Magnitude 4.0 or Greater)

Location	Date	*Intensity MMI Scale*	Magnitude *Richter Scale*
Central New Hampshire	June 11, 1638	-	6.5
Portsmouth	November 10, 1810	V	4.0
Near Hampton	July 23, 1823	IV	4.1
Ossipee	October 9, 1925	VI	4.0
Ossipee	December 20, 1940	VII	5.5
Ossipee	December 24, 1940	VII	5.5
West of Laconia	January 19, 1982	-	4.7
Northeast of Berlin	October 20, 1988	-	4.0
Southeast of Berlin	April 6, 1989	-	4.1
Hollis Center (Maine)	October 16, 2012	-	4.0

Potential Future Impacts on Community

Earthquakes could readily cause landslides, as could ground saturation from extended heavy precipitation events. Given seismic or precipitation events that could initiate landslide, landslide hazard is likely quite high in steep slope areas. The Hazard Mitigation Committee did not have the expertise available to analyze the actual probability of landslide in Milton; however, to the best of the committee's knowledge no significant landslides have ever occurred.

[15] USGS. Earthquake Hazard Program. http://pubs.usgs.gov/gip/earthq4/severitygip.html. Viewed on 8/10/15
[16] http://nesec.org/earthquakes-hazards/

The USGS (1997) classifies landslide incidence regionally as very low (less than 1.5% of land area involved). The local probability in Milton however, will depend on specific soil/rock types and upon the probability of initiating events.

Estimated Loss Potential

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $2,481,223.84 in estimated potential losses from impacts associated from earthquakes and landslides.

Extreme Temperatures

Overview	
Hazard Type	Extreme Temperatures
Location/Extent	Town-wide
Severity	1.0
Probability	3
Overall Threat	3.0

Description of the Hazard(s)

Extreme temperatures can be describes as heat waves and cold waves (or winter storm and extreme winter conditions.

A *heat wave* is a prolonged period of excessively hot and sometimes also humid weather relative to normal climate patterns of a certain region. Heat kills by pushing the human body beyond its limits. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature. Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat. Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the "urban heat island effect."[17]

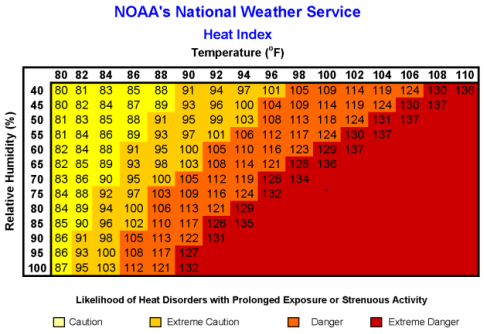
A *cold wave* can be both a prolonged period of excessively cold weather and the sudden invasion of very cold air over a large area. Along with frost it can cause damage to agriculture, infrastructure, and property. Cold waves, heavy snowfall and extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. Winter storms can result in flooding, storm surge, closed highways, blocked roads, downed power lines and hypothermia.

[17] International Federation of Red Cross and Red Crescent Societies. Climatological hazards: extreme temperatures. http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/definition-of-hazard/extreme-temperatures/

Extent of the Hazard

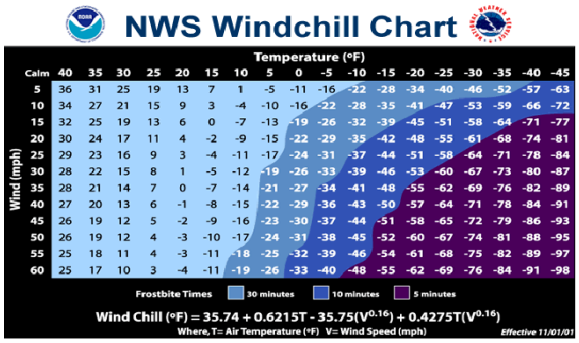
Extreme Heat

Extreme heat events can be described as periods with high temperatures of 90°F or above. The graph to the right displays the likelihood of heat disorders with prolonged exposure or strenuous activity.



Extreme Cold

What constitutes extreme cold varies by region. Characteristics of an extreme cold event in northern states include temperatures at or below zero for an extended period of time. According to the National Weather Service (NWS), extreme cold is a daily concern during the winter months for northern states. The NWS Windchill Temperature index calculates the dangers from winter winds and freezing temperatures (Source: NWS)



Past Impacts and Events

According to a 2014 study of climate change by Climate Solutions New England, Climate Change in Southern New Hampshire, from 1970 to 1999, southern New Hampshire experienced an average of seven days per year above 90°F each year. This is projected to increase to 22 days per year under a low emissions scenario to nearly 50 days per year under a high emissions scenario. Between 1980 and 2009, an average of one day per year reached 95°F in southern New Hampshire. By the end of the century, the number of days per year over 95°F is expected to increase as much as six to 22 days per year. Additionally, the average daytime maximum temperature on the hottest day is expected to increase to as much as 98°F to 102°F (depending on the emissions scenario), compared to the historical average of 93°F.[18] Between 1960 and 2012, there was an average of 8.3 days per year (or 0.8 days/decade) greater than 90°F recorded in Durham (the closest of four stations to Milton included in the study). During this time the hottest day of the year averaged 95.0°F.[19] The planning committee did not recall any heat-related losses.

Between 1960 and 2012, the average temperature of the coldest day of the year was -14.5°F in Durham (the closest of four stations to Milton included in the study).[20] Between 1980 and 2009, there were an average of 164 days per year under 32°F and 16 days per year under 0°F in southern New Hampshire. By the end of the century, southern New Hampshire is expected to see 20 fewer days below 32°F and only about 2 to 5 days per year under 0°F. The planning committee did not recall any cold-related losses.

Potential Future Impacts on Community

Annual average temperatures may increase on average by 3-5°F by 2050 and 4-8°F by 2100.[21]

[18] Wake, C. et al. "Climate Change in Southern New Hampshire; Past, Present, and Future." Climate Solutions of New England. 2014
[19] Ibid
[20] Ibid
[21] Ibid

Estimated Loss Potential

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $12,406,119.20 in estimated potential losses from impacts associated from extreme temperatures.

Drought

Overview	
Hazard Type	Drought
Location/Extent	Town-wide
Severity	1.3
Probability	3
Overall Threat	4.0

Description of the Hazard

A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. The impacts of droughts are indicated through measurements of soil moisture, groundwater levels, and stream flow. The effect of drought on these indicators is variable during any particular event. For example, frequent minor rainstorms can replenish the soil moisture without raising groundwater levels or increasing streamflow. Low streamflow also correlates with low ground-water levels because ground water discharge to streams and rivers maintains streamflow during extended dry periods. Low streamflow and low ground-water levels commonly cause diminished water supply.

Drought is a regional hazard and can impact the entire jurisdiction. Agricultural land and residents who use dug, shallower wells may be more vulnerable to the effects of drought.

Extent of the Hazard

The National Drought Monitor classifies the duration and severity of the drought using precipitation, stream flow, and soil moisture data coupled with information provided on a weekly basis from local officials. There are five magnitudes of drought outlined in the New Hampshire State Drought Management Plan: Exceptional, Extreme, Severe, Moderate, and Abnormally Dry. At the time of the preparation of this Plan, Milton was just coming out of an extreme drought.

Past Impacts and Events

While the impacts of drought are typically not as damaging and disruptive as floods or storm events, the impacts of long term drought or near drought conditions can impact crops and the water supply.

Periods of drought have occurred historically in New Hampshire. Six droughts of significant extent and duration were evident in the 20th century as noted below in Table 2.5. The most severe drought recorded in New Hampshire occurred from 1960 to 1969. This drought encompassed most of the northeastern United States (1956-1966). The

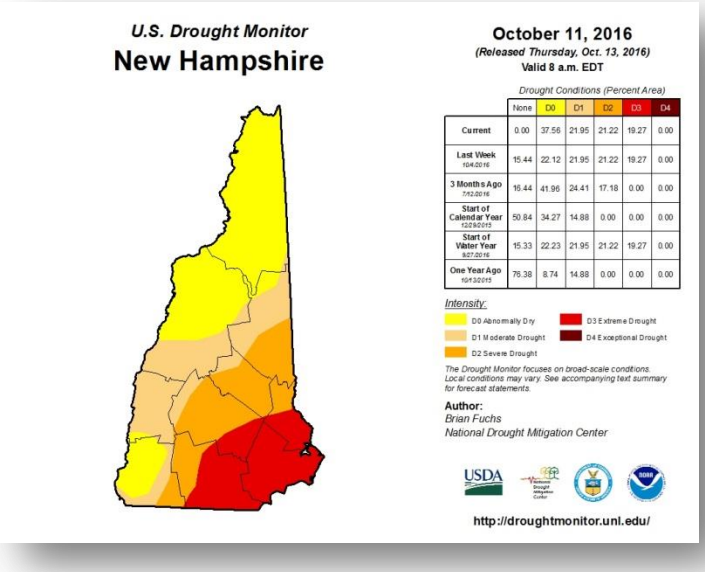
drought of 1929-1936 was the second worst and coincided with severe drought conditions in large areas of the central and eastern United States. The drought of 2001-2002 was the third worst on record.[22]

Table 17: Severe Drought Conditions in New Hampshire

Dates	Area Affected	Magnitude	Remarks
1929 – 1936	Statewide	-	Regional; recurrence interval 10 to > 25 years
1939 – 1944	Statewide	Severe Moderate	Severe in southeast NH and moderate elsewhere in the State. Recurrence interval 10 to > 25 years.
1947 – 1950	Statewide	Moderate	Recurrence interval 10 to >25 years
1960 – 1969	Statewide	Extreme	Longest recorded continuous spell of less than normal precipitation. Encompassed most of the northeast US. Recurrence interval >25 years.
2001 – 2002	Statewide	Severe	Recurrence interval 10 to >25 years
2015-2016	Central & Southern NH	Moderate	Recurrence interval cannot yet be determined

In more recent years, drought has again become a problem in New Hampshire. In 1999, a drought warning was issued by the Governor's Office. In March 2002, all counties in New Hampshire with the exception of Coos County were declared in Drought Emergency. This was the first time that low-water conditions had progressed beyond the Level Two, Drought Warning Stage. With extreme variation in environmental conditions due to global warming possibly on the rise, drought probability may grow in the future. Currently, drought possibility seems moderate. The large amount of water resources and relatively sparse population in New Hampshire have tended to minimize the impacts of drought events in the region, but this regional protection may be endangered in the future with increases in drought frequency or severity.

Normal precipitation for the state averages 40 inches per year. During the summer of 2015, most of central and southern New Hampshire experienced its most recent drought, the first since 2001 – 2002 (was the 3rd worst on record, exceeded only by the national droughts of 1956-1966 and 1941-1942). While many communities experienced record snowfall totals this past winter (2014-2015), the lack of rainfall and higher-than-average temperatures resulted in river and groundwater levels to be lower than average. This resulted in the implementation of local water conservation plans throughout the region.



[22] NHDES. Drought Management Program. Publications. *NH Drought Historical Events*. Viewed on 8/10/15. http://des.nh.gov/organization/divisions/water/dam/drought/documents/historical.pdf

Locally, there were a number of private wells that ran dry (may have had to be re-drilled) and the water department had to institute water bands within the village district, including limiting irrigation activities, for a period of time.

Drought conditions continued in intensified into 2016 in New Hampshire and in Southeast New Hampshire in particular. As of October 2016, nearly 20% of the state was categorized as being in extreme drought. One hundred and sixty community water systems have reported implementing a water restriction or ban, and 13 towns have reported implementing voluntary or mandatory outdoor use bans in the state.

See: http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/documents/waterban.pdf.

Potential Future Impacts on Community

The National Drought Mitigation Center website (NDMC 2004) emphasizes that reliable drought prediction for regions above 30°N latitude is effectively impossible.

With extreme variation in environmental conditions due to climate change possibly on the rise, drought probability may grow in the future. Currently, drought possibility seems moderate. The large amount of water resources and relatively sparse population in New Hampshire have tended to minimize the impacts of drought events in the region, but this regional protection may be endangered in the future with increases in drought frequency or severity.

Historically, droughts in New Hampshire have had limited effect because of the plentiful water resources and sparse population. Since 1960, the population has more than doubled, which has increased demand for the State's water resources. Further droughts may have considerable effect on the State's densely populated areas along the seacoast and in the south-central area.

Estimated Potential Losses

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $24,812,238.40 in estimated potential losses from drought.

Public Health Threats

Overview	
Hazard Type	Public Health Threats
Location/Extent	Town-wide
Severity	1.0
Probability	3
Overall Threat	3.0

Description of the Hazard

Epidemic

As defined by the CDC, and epidemic is "the occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time."[23] In addition to being categorized by the type of transmission (point-source or propagated), epidemics may occur as outbreaks or pandemics. As defined in the State Hazard Mitigation Plan, an outbreak is a sudden increase of disease that is a type of epidemic focused to a specific area or group of individuals. A pandemic is an epidemic that spreads worldwide, or throughout a large geographic area.

Epidemics may be caused by infectious diseases, which can be transmitted through food, water, the environment or person-to-person or animal-to-person (zoonoses), and noninfectious diseases, such as a chemical exposure that causes increased rates of illness. Infectious disease that may cause an epidemic can be broadly categorized into the following groups[24]:

- Foodborne (Salmonellosis, Ecoli)
- Water and Foodborne (Cholera, Giardiasis)
- Vaccine Preventable (Measles, Mumps)
- Sexually Transmitted (HIV, Syphilis)
- Person-to-Person (TB, Aseptic meningitis)
- Arthropodborne (Lyme, West Nile Virus)
- Zoonotic (Rabies, Psittacosis)
- Opportunistic fungal and fungal infections (Candidiasis).

An epidemic may also result from a bioterrorist event in which an infectious agent is released into a susceptible population, often through an enhanced mode of transmission, such as aerosolization (inhalation of small infectious disease particles).[25] For the purposes of this Plan, widespread drug and substance abuse may also be considered epidemics.

Lyme Disease

Lyme disease, which is spread to humans by the bite of an infected tick, is a growing threat in New Hampshire. New Hampshire has one of the highest rates of Lyme disease in the U.S.

Radon

Radon is a radioactive gas which is naturally occurring as a result of the typical decay of uranium commonly found in soil and rock (especially granite). Radon has carcinogenic properties and is a common problem in many states; New Hampshire has some isolated areas that are among the highest levels of radon in the United States according to the US Environmental Protection Agency (EPA). Whether or not a particular type of granite emanates radon is dependent on the geochemistry of that particular granite, some types are a problem and some are not. In other parts of the

[23] Slate; http://www.slate.com/id/2092969/
[24] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.
[25] Ibid

country, radon is associated with certain black shales, sandstones, and even limestones. The EPA has estimated that radon in indoor air is responsible for about 13,600 lung cancer deaths in this country each year (EPA document, EPA 811-R-94-001, 1994).[26]

Arsenic

Arsenic is a semi-metal element that is odorless and tasteless. Arsenic is a hazard because it can enter drinking water supplies, either from natural deposits in the earth or from agricultural and industrial practices.[27]

Wells drilled into New Hampshire's bedrock fractures have about a 1 in 5 probability of containing naturally occurring arsenic above 10 parts per billion. In addition, wells within short distances (~50 feet) can present very different water quality because of our highly fractured bedrock. Arsenic in water has no color or odor, even when present at elevated levels. Therefore, the only way to determine the arsenic level in your well water is by testing.

Extent of the Hazard

Public health threats are events or disasters that can affect an entire community.

Past Impacts and Events

Epidemic

Currently, New Hampshire is among those states in the Northeast combating a serious opioid epidemic, which has resulted in 558 drug overdose deaths since January 2014.[28] Leading causes have been from heroin and/or fentanyl. New Hampshire has some of the highest percentages of illicit drug use among young adults in not just the Northeast, but the entire country. According to the planning committee, there have been two deaths in 2017 and at least five or six within the last few years. Carfentanyl has emerged as an additional drug that is causing significant problems.

Lyme Disease

The number of New Hampshire residents diagnosed with Lyme disease has increased over the past 10 years, with significant increases occurring since 2005.[29] In 2009, the rate of cases of Lyme disease reported in New Hampshire residents was 108 cases per 100,000 persons, which is significantly higher than the Healthy People 2010 science-based 10-year national objective for improving the health of all Americans objective of 9.7 cases per 100,000 persons.[30] From 2009 to 2013, reported cases of Lyme disease in New Hampshire increased by approximately 20%

[26] Ibid

[27] EPA. Arsenic in Drinking Water. (http://water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/index.cfm)

[28] New Hampshire Medical Examiner's Office. http://www.nhshp.org/resources/Documents/Opioid%20Crisis%20FACTSheet_FINAL.pdf

[29] 2011 New Hampshire State Health Profile; Improving Health, Preventing Disease, Reducing Costs for All. NH Division of Public Health Services Department of Health and Human Services. http://www.dhhs.nh.gov/dphs/documents/2011statehealthprofile.pdf

[30] HealthyPeople.gov. About Healthy People. Accessed April 2014. Available at: http://healthypeople.gov/2020/about/default.aspx

from 1416 cases per year to 1691 cases per year.[31] Rockingham, Strafford, and Hillsborough counties had the highest rates of disease in 2008-2009. In 2012, there were 172 reported cases of Lyme disease in Strafford County.[32]

Radon

Exposure is a significant hazard in New Hampshire. According to a NH Bureau of Environmental & Occupational Health (BEOH) study looking at >15,000 indoor radon test results in single-family dwellings, households in northern, eastern, and southeastern regions of New Hampshire especially tend to have nominally high concentrations of radon in air or water (BEOH 2004); however, values in excess of the US Environmental Protection Agency's 4.0 picocurie per liter (pCi/L) action guideline have been found in nearly every community in New Hampshire. Values exceeding 100 pCi/L have been recorded in at least eight of New Hampshire's ten counties. The highest indoor radon reading in New Hampshire known to NHDES is greater than 1200 pCi/L; higher values probably exist.

In Milton, between 40.0 – 49.9% of homes tested by homeowners from 1987 to 2008 tested at or above the radon action level of 4.0 pCi/L. The probability of significant radon exposure is fairly high.[33]

Arsenic

From 1975 until 2001, the federal maximum contaminant limit (MCL) for arsenic in water supplied by public water systems was 50 parts per billion, because the health effects of exposure to lower concentrations was not recognized. Based on an exhaustive review of the new information about arsenic's health effects, in January 2001 EPA established a goal of zero arsenic in drinking water. At the same time, EPA adopted an enforceable MCL of 10 parts per billion (ppb) based on balancing treatment costs and public health benefits. Studies have shown that chronic or repeated ingestion of water with arsenic over a person's lifetime is associated with increased risk of cancer (of the skin, bladder, lung, kidney, nasal passages, liver or prostate) and non-cancerous effects (diabetes, cardiovascular, immunological and neurological disorders). The same studies found that dermal absorption (skin exposure) of arsenic is not a significant exposure path; therefore, washing and bathing do not pose a known risk to human health.[34]

Locally, there are naturally high levels of arsenic throughout town. According to the planning committee the public works building on Teneriffe Road has failed arsenic level tests on more than one occasion. It is likely there are other municipal buildings and homes that have high levels of arsenic and residents should take precautions before drinking.

Potential Future Impacts on Community

With the occurrence of worldwide pandemics such as SARS, H1N1 and Avian Flu, Milton could be susceptible to an epidemic and subsequent quarantine. While all individuals are potentially vulnerable to the hazard of an epidemic, epidemics often occur among a specific age group or a group of individuals with similar risk factors and exposure.[35]

[31] NHDHHS. State of New Hampshire Tickborne Disease Prevention Plan. March 31, 2015. http://www.dhhs.state.nh.us/dphs/cdcs/lyme/documents/tbdpreventionplan.pdf)

[32] 2011 New Hampshire State Health Profile; Improving Health, Preventing Disease, Reducing Costs for All. NH Division of Public Health Services Department of Health and Human Services. http://www.dhhs.nh.gov/dphs/documents/2011statehealthprofile.pdf

[33] NHDES http://des.nh.gov/organization/divisions/air/pehb/ehs/radon/documents/radon_by_town.pdf

[34] New Hampshire Environmental Services. Drinking Water and Groundwater Bureau. Arsenic in Drinking Water Fact Sheet.

[35] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.

Lyme disease will continue to impact public health, and with changes in climate, in particular warmer winters, higher rates of Lyme disease will be an ongoing concern.

Radon, arsenic, and other potential groundwater containments will continue to need to be addressed. There have been reports by the EPA that lung cancer deaths nationwide can be attributed to radon exposure, but nothing inclusive has been determined at this point. With assistance from epidemiological health experts, for future plan updates the Committee may be able to use the life-table or concentration risk analysis methodologies in the EPA study (EPA 2003) together with demographic and behavioral health data to arrive at a reasonable estimate of risk

Estimated Potential Losses

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $12,406,119.20 in estimated potential losses from impacts associated from public health threats.

Hazardous Materials

Overview	
Hazard Type	Hazardous Materials
Location/Extent	Town-wide
Severity	1.3
Probability	2
Overall Threat	2.7

Description of the Hazard

Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines. Chemical manufacturers are one source of hazardous materials, but there are many others, including service stations, hospitals, and hazardous materials waste sites. Hazardous materials continue to evolve as new chemical formulas are created.

Extent of the Hazard

Incidents involving hazardous materials could potentially occur at any residence or business or along any road; however, it is more likely that a spill would occur along the Spaulding Turnpike, Applebee Road, and the railroad.

Past Impacts and Events

The planning committee could not identify any significant spills or hazardous materials event taking place within the town.

Potential Future Impacts on Community

The planning committee identified the railroad as a potential site for a propane spill. Trucks along the Spaulding Turnpike carry a number of hazardous materials and are difficult to determine what the town's risk is on a daily basis. As previously mentioned, carfentanyl/fentanyl are additional drugs that may be being housed in residential buildings, which may lead to future locations that need HAZMAT clean up.

Estimated Potential Losses

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately $2,481,223.84 in estimated potential losses from hazardous materials impacts.

Hazards Not Included in this Plan

The State of New Hampshire identifies avalanches as a hazard in the State Multi-Hazard Mitigation Plan Update of 2013. Avalanches are not included in this Plan for the Town of Milton. Avalanches were not identified by the present or past Planning Committee as a local hazard due to the fact that there are no significant mountains or topographical features, other than the Moose Mountain Range, where avalanches would be likely to or have occurred in the past. The Town will re-evaluate the need to include additional hazards to this Plan during subsequent updates of the Plan.

Chapter 7: Action Plan

Past Mitigation Strategies

During that update the Planning Committee developed a list of strategies to implement over the course of the Plan's life-cycle. Table 18 summarizes those strategies, and provides information as to if the strategy was accomplished or not.

Table 18: Accomplishments Since Last Plan Adoption

Proposed Mitigation Action	Update 2017
Install and implement a new outreach notification system that connects residents. Research NIXLE communication system.	Removed action. After researching NIXLE, the town decided to use the Code Red system. Currently, Police and Fire has been authorized to use the system and has been trained; however, another refresher class is needed in order to implement.
Obtain NFIP brochures from FEMA and have them available at the Town Offices for new developers and current homeowners.	Completed. Brochures are located in the Land Use Department at the Town Hall.
Response personnel should have training and exercise experience.	Completed. Training for Police, Fire, Highway, and Town Hall and Assembly of God staff on events including active shooter ("warm zone") and off-site evacuation needs have been completed. There is a need to complete a full drill.
Partner with the Town's Conservation Commission to discuss potential future easements that would direct development to areas that are not environmentally significant and out of flooding areas.	Removed action. The conservation commission actively pursues land protection efforts on a consistent basis. This no longer needs to be a strategy in this particular plan.
Installation of gates, bars, and signage on the lower portion of McKeagney Road (Class VI section) in order to eliminate the risk of illegal dumping and fires	Completed. This was completed in 2012/2013. Drainage improvements (culvert upgrade and overflow pipe) were also completed as part of this project. Ongoing discussions include whether or not this route should be opened for emergency egress for public passage during emergency events.
Purchase and install a generator at the Highway Department.	Deferred action. There has been no action taken to this point, but remains an important strategy as emergency vehicles are worked on at this location. Power is needed to operate the air, hydraulics, and electricity systems.

Proposed Mitigation Action	Update 2017
Purchase and install a generator at the Town Hall.	Deferred. No action has been taken on this item to date. A generator is needed to ensure continuity of business operations, as well as to assist during times the facility is being used as a short-term storage location for off-site evacuations.
Purchase and install a generator at the repeater site on Teneriffe Road to increase communications.	Completed. The generator from the old fire station was purchased and installed in 2017. It is not automatic and needs to be manually started.
Upgrade local government radio communication frequencies and equipment to provide interoperable communication	Completed. In 2014, a new repeater system was installed. As part of a FEMA grant, the town purchased radios for the Highway Department. Separate local channels for Fire, Police, and Highway have improved communication between departments.
Construct new Fire Station. It will have generator, adequate space, and all equipment needed during emergency events.	Completed. Construction was completed in 2017. The new fire station is a modern up-to-date emergency operations center, which has overnight accommodations for personnel during events and adequate space for existing and future operations.
Maintain transportation infrastructure by identifying and assessing potential areas (roads and culverts) of concern recognized in this plan.	Ongoing. This remains an ongoing strategy. Specific needs include: upgrades to Townhouse Road, geo-referencing the locations of existing culverts, and the purchase of GIS software.
Add dry hydrant maintenance program back into the Town's budget in order to continue to establish new dry hydrant and cistern locations.	Deferred. No action has been taken on this item to date. This action should be altered to say that the locations of existing dry hydrants should be mapped, along with attribute data to complete a water resource analysis to identify future needs. GIS software is needed to implement this action.
Maintain/expand the number of automated external defibrillators (AEDs) to other public locations such as the Highway Department and Transfer Station.	Ongoing. New AEDs have been purchased and installed at the Town Hall (Selectman's Office) and the Town Beach. There is still a high priority need to have one at the Transfer Station. The town should also consider applying to be a heart safe community (CPR classes, outreach and awareness, etc.).

Status Update:

Completed Action – This program continues to be an implemented mitigation action item since the last updated plan was developed

Deferred Action – At the time of developing this plan, more time is required for completion

Removed Action – This existing program is no longer a priority to the Town

Ongoing Action – This program will occur throughout the life of the plan

Existing Mitigation Strategies

During the update the Planning Committee developed a list of existing programs and strategies that were ongoing planning mechanisms to help reduce impacts from future hazards. Table 19 summarizes those programs, and provides information on the effectiveness, any changes in priority, and a list of recommendations to improve them during the next life-cycle of this plan.

Table 19: Existing Programs and Policies

Existing Program	Description	Effectiveness	2017 Update
Building Codes	Establishes regulations for the design and installation of building systems	Good	The town is currently using the 2009 IBC and is waiting for the state to adopt the new codes. At the time of this plan update, the state building code review board was trying to get legislation passed to adopt the 2015 codes (House Bill 92).
Local Emergency Operations Plan (LEOP)	Defined notification procedures and actions that should be taken in different emergency situations.	Average	The current EOP is due for an update. Once the hazard mitigation plan is adopted the town will begin the EOP update process and should be completed in 2017/2018.
Storm Drain Infrastructure Improvements	Infrastructure is maintained and upgraded on an as needed basis	Good	The Highway Department continues to upgrade the town's stormwater infrastructure on an as needed basis. New MS4 requirements will impact stormwater infrastructure improvements within the town's delineated urbanized areas. GIS software is needed to implement this strategy.
Tree Maintenance	Utility companies and NHDOT have tree maintenance programs to clear trees and limbs from power lines and roadways.	Excellent	Eversource and NHDOT have implemented aggressive tree trimming and roadside mowing schedules. The Highway Department handles responsibilities for class VI roads. One issue that has arose is Eversource sometimes leaves behind logs and small tree stumps, which have been hit by the town's plow trucks in the winter – causing damage to the plows.
Evacuation and Notification	Evacuation and notification procedures are defined in Milton's LEOP.	Good	News updates and evacuation notification can be sent out through reverse 911 channels. The town needs to improve and utilize the website more to increase awareness.

Existing Program	Description	Effectiveness	2017 Update
Emergency Back-Up Power and Emergency Shelters	Offers temporary shelter during extended periods without power	Good	The Rochester Middle School acts as the regional long-term emergency shelter. It offers proper staffing and capacity. Milton does not have back-up power at all municipal facilities.
Hazardous Materials Response Team	Technical assistance and guidance with regards to hazardous material incidents	Good	Milton is serviced by the Carroll County Hazard Materials Team, which assists agencies with the mitigation of hazardous materials emergencies. The Fire Department participates in ongoing trainings with the Seacoast Technical Assistance Response Team (START).
Emergency Communications	Communication amongst Town departments, emergency personnel, and residents.	Average	News updates and town communications (road closures; the opening of shelters) are sent out through the use of Facebook, the emergency management website, and webEOC.
Floodplain Management Ordinance	Local ordinance to regulate development in the floodplain.	Average	Milton's FEMA flood maps are being remapped and will be available within this update's cycle. When new maps are adopted, the town should be added to the town's zoning ordinance. GIS software would help to implement this strategy.
Shoreline Water Quality Protection Act	Establishes minimum standards for the subdivision, use and development of the shorelands along the state's larger waterbodies	Good	State requires are on portions of the Salmon Falls River, Branch River, Milton Three Ponds, Spaulding Pond, and the Salmon Falls River Reservoir are referenced in the town's zoning as an overlay district. Local regulations are more stringent than state requirements.
Master Plan	A guiding document used to manage Milton's growth and development through municipal land use regulations.	Average	The town is in the midst of a master plan update (land use, vision, and natural resources). Community facilities and transportation chapter will be developed in the upcoming years.
Capital Improvements Program (CIP)	A program that helps to address improvement projects over a period of time.	Good	The town has instituted a new process in 2016 that will rate and prioritize important capital project from community department heads. This is a year-year program adopted by the Planning Board.

Effectiveness:
Excellent – The existing program works as intended and is exceeding its goals
Good – The existing program works as intended and meets its goals
Average – The existing program does not work as intended and/or does not meet its goals
Poor – The existing program is negatively impacting the community

2017 Update:
Recommendations for improvement

The Planning Committee's Understanding of Multi-Hazard Mitigation Strategies

The Planning Committee determined that any strategy designed to reduce personal injury or damage to property that could be done prior to an actual disaster would be listed as a potential mitigation strategy.

This decision was made even though not all projects listed in Tables 20 (New Mitigation Actions and 21 (Implementation Plan) are fundable under FEMA HMA grant programs. The Planning Committee determined that this Plan was in large part a management document designed to assist the Select Board and other town officials in all aspects of managing and tracking potential emergency planning strategies. For instance, the Planning Committee was aware that some of these strategies are more properly identified as readiness issues. The Planning Committee did not want to "lose" any of the ideas discussed during these planning sessions and thought this method was the best way to achieve that objective.

The Planning Committee identified eleven new strategies to implement during the life of this Plan. These strategies are intended to supplement existing programs and the ongoing and not yet completed mitigation strategies identified in previous plan updates. When identifying new strategies, the Planning Committee balanced a number of factors including capacity to implement strategies, priority projects, existing strategies, policies, and programs, the hazard ranking, and whether a strategy will reduce risk associated with multiple hazards.

Future Mitigation Strategies

The Committee identified several new mitigation strategies to reduce vulnerability to hazards. The Committee focused on identifying the best appropriate strategies for the community and the hazards it is most vulnerable based on the vulnerability assessment. Some of the mitigation strategies are strategies for multiple hazards. The goal of each proposed mitigation strategy is reduction or prevention of damage from a multi-hazard event.

New mitigation strategies are listed in Table 20, which also includes a feasibility assessment and prioritization of each hazard.

Feasibility & Prioritization

A technique known as a STAPLEE evaluation, which was developed by FEMA, was used to evaluate new mitigation strategies based on a set of criteria (see below). The STAPLEE method is commonly used by public administration officials and planners.

S	Social:	Is the proposed strategy socially acceptable to the community? Is there an equity issue involved that would result in one segment of the community being treated unfairly?
T	Technical:	Will the proposed strategy work? Will it create more problems than it solves?
A	Administrative:	Can the community implement the strategy? Is there someone to coordinate and lead the effort?
P	Political:	Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
L	Legal:	Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
E	Economic:	What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits?
E	Environmental:	How will the strategy impact the environment? Will it need environmental regulatory approvals?

The Committee evaluated each mitigation strategy using the STAPLEE and ranked each of the criteria as poor, average, or good. These rankings were assigned the following scores: *Poor=1; Average=2; Good=3.*

The following questions were used to guide further prioritization and action:

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures?
- Can the action be implemented quickly?

The prioritization exercise helped the committee evaluate the new hazard mitigation strategies that they had brainstormed throughout the multi-hazard mitigation planning process. While all actions would help improve the Town's multi-hazard and responsiveness capability, funding availability will be a driving factor in determining what and when new mitigation strategies are implemented.

Table 20: Future Mitigation Actions & STAPLEE

New Mitigation Project	S	T	A	P	L	E	E	Total
Consider revising criteria for new residential and non-residential structures or substantial improvements located within the special flood hazard areas. Review the existing ordinance for compliance with state and federal requirements and then move over to the zoning. *This strategy may not be completed until new FEMA maps are completed.	3	3	3	2	3	3	3	20
				New flood zone boundaries may be challenged by residents				
Upgrade culvert on Townhouse Road, which links Townhouse Pond with Lakehurst Pond, to handle higher precipitation flows to limit future flooding at that location.	2	3	3	2	3	3	3	19
	During construction there may be access complaints			During construction there may be access complaints				
Coordinate with Highway Department to conduct a spatial inventory to geolocate all culverts in town. Attribute information could be consolidated into a GIS system in order to help prioritize repair and replacement schedules.	3	3	3	3	3	3	3	21
						Need GIS to implement		
Work with the NHDES Dam Bureau to reevaluate hazard classes for Waumbek and Rowe dams. Determine if failure at either of those sites would result in damage to property downstream through a mapping analysis.	3	3	2	2	3	3	3	19
			Working with the State	There may be issues, depending on whether or not there are changes to hazard classes				

New Mitigation Project	S	T	A	P	L	E	E	Total
Maintain and improve existing tree maintenance program.	3	3	3	3	3	3	3	21
Repair class VI and fire roads, if significantly damaged, in order to ensure roads are passable for emergency vehicles.	3	3	3	3	1	3	2	18
					Potential issues with legal authority		Permits may be required for drainage improvements	
Update sections of the town's existing subdivision regulations to require performance bonds, when necessary, by the applicant in order to ensure that dry hydrants and cisterns are constructed.	3	3	3	3	3	3	3	21
Conduct a spatial inventory to geolocate all existing fire aids (cisterns/dry hydrants). Attribute information could be consolidated into a GIS system in order to help with maintenance schedules.	3	3	2	3	3	3	3	20
			Town does not currently have GIS capabilities			Need GIS to implement		
Support drug assistance services and referral information in public places to target individuals battling addiction.	3	3	3	3	3	3	3	21
Maintain and improve relationship with the Strafford County Regional Public Health Network to assist with enhancing public health-related services in town.	3	3	3	3	3	3	3	21

New Mitigation Project	S	T	A	P	L	E	E	Total
Map locations of all existing hazardous material sites (ex. Eastern Boats) to determine high hazard areas. High hazard activities may include leaking tanks or contaminated locations.	3	3	2	3	3	3	3	20
			Town does not currently have GIS capabilities			Need GIS to implement		
*Purchase and install a generator at the Highway Department.	3	3	3	3	3	1	3	19
						Budget Constraints		
*Purchase and install a generator at the Town Hall.	3	3	3	3	3	1	3	19
						Budget Constraints		
*Maintain transportation infrastructure by identifying and assessing potential areas (roads and culverts) of concern recognized in this plan.	3	3	3	3	3	2	2	18
						Budget Constraints	Possible environmental impacts with construction	
*Add dry hydrant maintenance program back into the Town's budget in order to continue to establish new dry hydrant and cistern locations.	3	3	3	3	3	2	3	20
						Budget Constraints		
*Maintain/expand the number of automated external defibrillators (AEDs) to other public locations such as the Highway Department and Transfer Station.	3	3	3	3	3	2	3	20
						Budget Constraints		

*Ongoing and deferred actions from the 2012 Plan. Previous STAPLEE scores were reaffirmed.

Implementation Schedule for Prioritized Strategies

After reviewing the finalized STAPLEE numerical ratings, the Team prepared to develop the Implementation Plan (Table 21). To do this, the Team developed an implementation plan that outlined the following:

- ∴ Type of hazard
- ∴ Affected location
- ∴ Type of Activity
- ∴ Responsibility
- ∴ Funding
- ∴ Cost Effectiveness; and
- ∴ Timeframe

The following questions were asked in order to develop an implementation schedule for the identified priority mitigation strategies.

WHO? Who will lead the implementation efforts? Who will put together funding requests and applications?

WHEN? When will these actions be implemented, and in what order?

HOW? How will the community fund these projects? How will the community implement these projects? What resources will be needed to implement these projects?

In addition to the prioritized mitigation projects, Table 21, Implementation Plan, includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN).

Table 21: Implementation Plan

New Mitigation Project	Type of Hazard	Affected Location	Type of Activity	Responsibility	Funding	Cost Effectiveness	Timeframe
							Ongoing/Continuous
						Low = < $5,000	*6 months - 1 year*
						Medium = $5,000 - $10,000	*1 - 2 years*
						High = > $10,000	*2 - 5 years*
Consider revising criteria for new residential and non-residential structures or substantial improvements located within the special flood hazard areas. Review the existing ordinance for compliance with state and federal requirements and then move over to the zoning. *This strategy may not be completed until new FEMA maps are completed.	Flooding	FEMA Flood Hazard Areas	Local Planning and Regulations	Town Planner & Planning Board	Town funding	Low = < $5,000	2 - 5 years
Upgrade culvert on Townhouse Road, which links Townhouse Pond with Lakehurst Pond, to handle higher precipitation flows to limit future flooding at that location.	Flooding	Townhouse Road	Structure and Infrastructure Project	Highway Department	Town funding	High = > $10,000	6 months – 1 year
Coordinate with Highway Department to conduct a spatial inventory to geolocate all culverts in town. Attribute information could be consolidated into a GIS system in order to help prioritize repair and replacement schedules.	Flooding	Town-wide	Local Planning	Highway Department, Town Planner, & Town Administrator	Town funding	Low = < $5,000 (The purchase of a GIS license would cost roughly $8,000)	1 - 2 years

Work with the NHDES Dam Bureau to reevaluate hazard classes for Waumbek and Rowe dams. Determine if failure at either of those sites would result in damage to property downstream through a mapping analysis.	Dam Failure	Downstream of Waumbek and Rowe dams	Floodplain Protection	EMD and NHDES Dam Bureau	Town Funding and grants	Low = < $5,000 (mapping may be more costly)	1 - 2 years
Maintain and improve existing tree maintenance program.	Multi-hazard	Town-wide	Prevention	Highway Department	Town funding	Low = < $5,000	Ongoing/continuous
Repair class VI and fire roads, if significantly damaged, in order to ensure roads are passable for emergency vehicles.	Wildfire	Town-wide	Prevention	Highway Department & Fire	Town funding	Low = < $5,000	Ongoing/continuous
Update sections of the town's existing subdivision regulations to require performance bonds, when necessary, by the applicant in order to ensure that dry hydrants and cisterns are constructed.	Wildfire	Town-wide	Local Planning and Regulations	Town Planner & Planning Board	Town funding and grants	Low = < $5,000	1 - 2 years
Conduct a spatial inventory to geolocate all existing fire aids (cisterns/dry hydrants). Attribute information could be consolidated into a GIS system in order to help with maintenance schedules.	Wildfire	Town-wide	Local Planning	Town Planner and EMD	Town funding	Low = < $5,000 (The purchase of a GIS license would cost roughly $8,000)	2 - 5 years
Support drug assistance services and referral information in public places to target individuals battling addiction.	Public Health Threats	Town-wide	Education & Awareness	EMD & Police Department	Town funding and grants	Low = < $5,000	Ongoing/continuous
Maintain and improve relationship with the Strafford County Regional Public Health Network to assist with enhancing public health-related services in town.	Public Health Threats	Town-wide	Education & Awareness	EMD	Town funding	Low = < $5,000	Ongoing/continuous

Map locations of all existing hazardous material sites (ex. Eastern Boats) to determine high hazard areas. High hazard activities may include leaking tanks or contaminated locations.	Hazardous Materials	Town-wide	Local Planning	EMD	Town funding and grants	Low = < $5,000 (The purchase of a GIS license would cost roughly $8,000)	2 - 5 years
*Purchase and install a generator at the Highway Department.	Multi-hazard	Highway Department	Equipment Purchase	Highway Department	Town funding and grants	Medium = $5,000 - $10,000	2 - 5 years
*Purchase and install a generator at the Town Hall.	Multi-hazard	Town Hall	Equipment Purchase	Board of Selectmen	Town funding and grants	Medium = $5,000 - $10,000	2 - 5 years
**Maintain transportation infrastructure by identifying and assessing potential areas (roads and culverts) of concern recognized in this plan.	Multi-hazard	Town-wide	Prevention	Highway Department	Town funding and grants	High = > $10,000	Ongoing/continuous
*Add dry hydrant maintenance program back into the Town's budget in order to continue to establish new dry hydrant and cistern locations.	Multi-hazard	Town-wide	Local Planning	EMD and Fire Department	Town funding	Low = < $5,000	1 - 2 years
**Maintain/expand the number of automated external defibrillators (AEDs) to other public locations such as the Highway Department and Transfer Station.	Multi-hazard	Designated Public Places	Prevention	EMD	Town funding	Low = < $5,000	Ongoing/continuous
*Deferred actions from the 2012 Plan. Previous implementation notes were reaffirmed. **Ongoing and continuous actions will be completed on an ongoing basis throughout the life of the plan.							

Chapter 8: Monitoring, Evaluation, and Updating the Plan

Introduction

A good mitigation plan must allow for updates where and when necessary, particularly since communities may suffer budget cuts or experience personnel turnover during both the planning and implementation states. A good plan will incorporate periodic monitoring and evaluation mechanisms to allow for review of successes and failures or even just simple updates.

Multi-Hazard Plan Monitoring, Evaluation, and Updates

To track programs and update the mitigation strategies identified through this process, the Town will review the multi-hazard mitigation plan annually or after a hazard event. Additionally, the Plan will undergo a formal review and update at least every five years and obtain FEMA approval for this update or any other major changes done in the Plan at any time. The Emergency Management Director is responsible for initiating the review and will consult with members of the multi-hazard mitigation planning team identified in this plan. The public will be encouraged to participate in any updates and will be given the opportunity to be engaged and provide feedback through such means as periodic presentations on the plan at town functions, annual questionnaires or surveys, and posting on social media/interactive websites. Public announcements will be made through advertisements in local papers, postings on the Town website, and posters disseminated throughout the Town. A formal public meeting will be held before reviews and updates are official.

Changes will be made to the Plan to accommodate projects that have failed or are not considered feasible after a review for their consistency with STAPLEE, the timeframe, the community's priorities or funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, will be reviewed as well during the monitoring and update of the plan to determine feasibility of future implementation. In keeping with the process of adopting this multi-hazard mitigation plan, a public meeting to receive public comment on plan maintenance and updating will be held during the annual review period and before the final product is adopted by the Board of Selectmen. Chapter 9 contains a representation of a draft resolution for Milton to use once a conditional approval is received from FEMA.

Integration with Other Plans

Both the 2004 and 2012 plans were used during periodic updates to the Milton Master Plan. Input on impacts to roads and other critical infrastructure from hazards was included in relevant master plan sections. Both plans were also used during capital improvements planning updates and prioritization of municipal culverts and stream crossings for repair and replacement schedules.

This multi-hazard plan will only enhance mitigation if balanced with all other town plans. Milton will take the necessary steps to incorporate the mitigation strategies and other information contained in this plan with other town activities, plans and mechanisms, such as comprehensive land use planning, capital improvements planning, site plan regulations, and building codes to guide and control development in the Town of Milton, when appropriate. The local

government will refer to this Plan and the strategies identified when updating the Town's Master Plan, Capital Improvements Program, Zoning Ordinances and Regulations, and Emergency Action Plan. The Board of Selectmen and the Hazard Mitigation Committee will work with Town officials to incorporate elements of this Plan into other planning mechanisms, when appropriate. The Emergency Management Director along with other members of the Hazard Mitigation Committee will work with the Planning Board to suggest including the updated Hazard Mitigation Plan as a chapter in the Town's Master Plan. In addition, the Town will review and make note of instances when this has been done and include it as part of their annual review of the Plan.

Chapter 9: Plan Adoption

Conditional Approval Letter from HSEM

Good afternoon!

The Department of Safety, Division of Homeland Security & Emergency Management (HSEM) has completed its review of the Milton, NH Hazard Mitigation Plan and found it approvable pending adoption. Congratulations on a job well done!

With this approval, the jurisdiction meets the local mitigation planning requirements under 44 CFR 201 pending HSEM's receipt of electronic copies of the adoption documentation and the final plan.

Acceptable electronic formats include Word or PDF files and must be submitted to us via email at HazardMitigationPlanning@dos.nh.gov. Upon HSEM's receipt of these documents, notification of formal approval will be issued, along with the final Checklist and Assessment.

The approved plan will be submitted to FEMA on the same day the community receives the formal approval notification from HSEM. FEMA will then issue a Letter of Formal Approval to HSEM for dissemination that will confirm the jurisdiction's eligibility to apply for mitigation grants administered by FEMA and identify related issues affecting eligibility, if any. If the plan is not adopted within one calendar year of HSEM's Approval Pending Adoption, the jurisdiction must update the entire plan and resubmit it for HSEM review. If you have questions or wish to discuss this determination further, please contact me at Whitney.Welch@dos.nh.gov or 603-223-3667.

Thank you for submitting the Milton, NH Hazard Mitigation Plan and again, congratulations on your successful community planning efforts.

Sincerely,

Whitney

Hazard Mitigation Planning
NH Homeland Security and Emergency Management
33 Hazen Drive
Concord, NH 03301
NEW: 603-223-3667
603-223-3609 (fax)

Signed Certificate of Adoption

A signed copy will be inserted into the plan once adopted by the town.

CERTIFICATE OF ADOPTION

Town of Milton, New Hampshire
Board of Selectmen
A Resolution Adopting the Milton, NH Multi-Hazard Mitigation Plan Update 2017

Plan Dated: _____
Conditionally Approved: _____

WHEREAS, the Town of Milton authorizes responsible departments and/or agencies to execute their responsibilities demonstrated in the plan, and received funding from the NH Office of Homeland Security and Emergency Management under a Flood Mitigation Assistance Project Grant and assistance from Strafford Regional Planning Commission in the preparation of the Milton, NH Multi-Hazard Mitigation Plan Update 2017; and

WHEREAS, several public planning meetings were held between April 20, 2017 and June 28, 2017 regarding the development and review of the Milton, NH Multi-Hazard Mitigation Plan Update 2017; and

WHEREAS, the Milton, NH Multi-Hazard Mitigation Plan Update 2017 contains several potential future projects to mitigate hazard damage in the Town of Milton; and

WHEREAS, a duly-noticed public meeting was held by the Milton Board of Selectmen on _____ to formally approve and adopt the Milton, NH Multi-Hazard Mitigation Plan Update 2017.

NOW, THEREFORE BE IT RESOLVED that the Milton Board of Selectmen adopts the Milton, NH Multi-Hazard Mitigation Plan Update 2017.

ADOPTED AND SIGNED this day of _____, 2017

_____
Milton Board of Selectmen, Chair

_____
Milton Board of Selectmen

_____
Milton Board of Selectmen

_____
Town Seal or Notary

Date_____

Final Approval Letter from FEMA

The final approval letter will be inserted into plan once received.

Appendices

Appendix A: Bibliography

Appendix B: Planning Process Documentation

Appendix C: Summary of Possible All-Hazard Mitigation Strategies

Appendix D: Technical and Financial Assistance for All-Hazard Mitigation
- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

Appendix E: Maps

Appendix A: Bibliography

Documents

- Local Mitigation Plan Review Guide, FEMA, October 1, 2011
- Multi-Hazard Mitigation Plans
    - Town of Albany, 2010
    - Town of Rollinsford, 2016
- State of New Hampshire Multi-Hazard Mitigation Plan (2013) - State Hazard Mitigation Goals
- Disaster Mitigation Act (DMA) of 2000, Section 101, b1 & b2 and Section 322a http://www.fema.gov/library/viewRecord.do?id=1935
- Economic & Labor Market Information Bureau, NH Employment Security, 2015; Census 2010 and Revenue Information
- NCDC [National Climatic Data Center, National Oceanic and Atmospheric Administration]. 2017. Storm Events

Photos

- Nick Marique, Emergency Management Director, Town of Milton

Appendix B: Planning Process Documentation

Agendas

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #1

April 20, 2017
10:30AM – 12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

Agenda

1. Introductions
2. Update process and the requirements of the grant
3. Responsibilities, in-kind match documentation, and the steps towards successful adoption
4. Review community profile chapter
5. Review critical facilities and key resources table and maps
6. Discuss national flood insurance program status
7. Adjourn

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #2

May 9, 2017
10:30AM-12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

Agenda

1. Introductions
2. Meeting notes from April 20th meeting
3. Unfinished business
4. Review past disasters and emergency declarations
5. Past mitigation strategies
6. Existing mitigation strategies
7. Adjourn

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #3

June 13, 2017
10:30AM-12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

Agenda

1. Introductions
2. Meeting notes from May 5th meeting
3. Existing hazards analysis
    a. Discussion of existing hazards
    b. Fill out hazard vulnerability assessment tool
    c. Develop actions for each hazard
    d. Determine responsibilities for implementation
4. Adjourn

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #4

June 28, 2017
10:30AM-12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

Agenda

1. Introductions

2. Meeting notes from June 13th meeting

3. Review and discuss Chapter 7: Action Plan (*Action_Plan_Chapter.pdf*)

    a. Table 18: Past Mitigation Strategies
    b. Table 19: Existing Programs and Policies
    c. Table 20: Future Mitigation Projects (needs to be filled out by committee)
    d. Table 21: Implementation Plan

4. Final edits to draft chapter (*Milton_2017_Final_draft_v1.pdf*)

5. Adjourn

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #1

April 20, 2017
10:30AM – 12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

ATTENDANCE SHEET

Name	Position Title/ Department Affiliation	E-mail	Time spent reviewing materials
Michelle Beauchamp	Town Clerk / Tax Collector	townclerk-taxcollector@miltonnh-us.com	1 Hour
Richard Krauss	Chief of Police	rkrauss@miltonnhpd.com	
BRUCE W WOODRUFF	TOWN PLANNER	banduvian@msn.com	1 hr.
BRIAN BOYERS	CODE ENFORCEMENT	BUILDINGCODEMILTONNH-GOV.com	1 HR
Pat Smith	PWD	highway@metrocast.net	
Nick Marique	Fire Dept	nickmarique@miltonfirerescue.com	1hr
Jason Behrens	Fire Department	Jbehrens@miltonfirerescue.com	
Devon Pageau	Fire Department	dpageau@miltonfirerescue.com	1hr.

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #2

May 9, 2017
10:30AM – 12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

ATTENDANCE SHEET

Name	Position Title/ Department Affiliation	E-mail	Time spent reviewing materials
Nick Marique	Fire Chief / EMD	nickmarique@miltonfirerescue.com	1hr
Heather Thibodeau	Town Admin /	Miltonta@miltonnh-us.com	1hr
Pat Smith	PWD	highway@metrocast.NET	1hr
BRIAN BOYERS	CODE OFFICIER	BLDGCODE@MiltonNH-US.com	1HOR
Michelle Beauchamp	Town Clerk / Tax Coll	tawnclerktaxcollector@miltonnh-us.com	2hrs
BRUCE W WOODRUFF	TOWN PLANNER	banduvian@msn.com	1.5hrs.

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #3

June 13, 2017
10:30AM – 12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

ATTENDANCE SHEET

Name	Position Title/ Department Affiliation	E-mail	Time spent reviewing materials
Jason Behrens	Lieutenant / Milton Fire	Jbehrens@miltonfirerescue.com	
Nick Marigue	Fire Chief / EMD	nickmarigue@miltonfirerescue.com	
Pat Smith	PWD	highway@metrocast.net	
Heather Thibodeau	TA	miltonta@miltonnh-us.com	
Brian Bayers	CEO		
Michelle Beauchamp	Town Clerk/Tax Collector	townclerk.taxcollector@miltonnhus.com	
BRUCE W WOODRUFF	TOWN PLANNER	banduvian@msn.com	2
Richard Krauss	Chief of Police	rkrauss@miltonnhpd.com	1

Town of Milton, New Hampshire

Hazard Mitigation Committee Meeting #4

June 28, 2017
10:30AM – 12:30PM

Milton Fire Station
865 White Mountain Highway
Milton, NH 03851

ATTENDANCE SHEET

Name	Position Title/ Department Affiliation	E-mail	Time spent reviewing materials
Jason Behrens	Lieutenant Milton Fire	Jbehrens@miltonfirerescue.com	
Richard Krauss	Chief of Police	rkrauss@miltonnhpd.com	.5
BRIAN BOYERS	CODE OFFICIAL		.5
BRUCE W WOODRUFF	TOWN PLANNER	banduvian@msn.com	1
Michelle Beauchamp	Town Clerk / Tax Collector	townclerktaxcollector@miltonnh-us.com	
Pat Smith	Public Work Dir.	highway@metrocast.net	
Heather Thibodeau	Town Administrator	miltonta@miltonnh-us.com	.5

Appendix C: Summary of Possible All-Hazard Mitigation Strategies

I. RIVERINE MITIGATION

A. Prevention

Prevention measures are intended to keep the problem from occurring in the first place, and/or keep it from getting worse. Future development should not increase flood damage. Building, zoning, planning, and/or code enforcement personnel usually administer preventative measures.

1. Planning and Zoning[36] - Land use plans are put in place to guide future development, recommending where - and where not - development should occur and where it should not. Sensitive and vulnerable lands can be designated for uses that would not be incompatible with occasional flood events - such as parks or wildlife refugees. A Capital Improvements Program (CIP) can recommend the setting aside of funds for public acquisition of these designated lands. The zoning ordinance can regulate development in these sensitive areas by limiting or preventing some or all development - for example, by designating floodplain overlay, conservation, or agricultural districts.

2. Open Space Preservation - Preserving open space is the best way to prevent flooding and flood damage. Open space preservation should not, however, be limited to the floodplain, since other areas within the watershed may contribute to controlling the runoff that exacerbates flooding. Land Use and Capital Improvement Plans should identify areas to be preserved by acquisition and other means, such as purchasing easements. Aside from outright purchase, open space can also be protected through maintenance agreements with the landowners, or by requiring developers to dedicate land for flood flow, drainage and storage.

3. Floodplain Development Regulations - Floodplain development regulations typically do not prohibit development in the special flood hazard area, but they do impose construction standards on what is built there. The intent is to protect roads and structures from flood damage and to prevent the development from aggravating the flood potential. Floodplain development regulations are generally incorporated into subdivision regulations, building codes, and floodplain ordinances.
    a. Subdivision Regulations: These regulations govern how land will be divided into separate lots or sites. They should require that any flood hazard areas be shown on the plat, and that every lot has a buildable area that is above the base flood elevation.
    b. Building Codes: Standards can be incorporated into building codes that address flood proofing for all new and improved or repaired buildings.
    c. Floodplain Ordinances: Communities that participate in the National Flood Insurance Program are required to adopt the minimum floodplain management regulations, as developed by FEMA. The regulations set minimum standards for subdivision regulations and building codes. Communities may adopt more stringent standards than those set forth by FEMA.

[36] All zoning should be carefully reviewed on a consistent basis by municipal officials to make sure guidelines are up-to-date and towns are acting in accordance with best management practices.

4. Stormwater Management - Development outside of a floodplain can contribute significantly to flooding by covering impervious surfaces, which increases storm water runoff. Storm water management is usually addressed in subdivision regulations. Developers are typically required to build retention or detention basins to minimize any increase in runoff caused by new or expanded impervious surfaces, or new drainage systems. Generally, there is a prohibition against storm water leaving the site at a rate higher than it did before the development. One technique is to use wet basins as part of the landscaping plan of a development. It might even be possible to site these basins based on a watershed analysis. Since detention only controls the runoff rates and not volumes, other measures must be employed for storm water infiltration - for example, swales, infiltration trenches, vegetative filter strips, and permeable paving blocks.

5. Drainage System Maintenance - Ongoing maintenance of channel and detention basins is necessary if these facilities are to function effectively and efficiently over time. A maintenance program should include regulations that prevent dumping in or altering water courses or storage basins; regrading and filling should also be regulated. Any maintenance program should include a public education component, so that the public becomes aware of the reasons for the regulations. Many people do not realize the consequences of filling in a ditch or wetland, or regrading.

B. Property Protection

Property protection measures are used to modify buildings subject to flood damage, rather than to keep floodwaters away. These may be less expensive to implement, as they are often carried out on a cost-sharing basis. In addition, many of these measures do not affect a building's appearance or use, which makes them particularly suitable for historical sites and landmarks.

1. Relocation - Moving structures out of the floodplain is the surest and safest way to protect against damage. Relocation is expensive, however, so this approach will probably not be used except in extreme circumstances. Communities that have areas subject to severe storm surges, ice jams, etc. might want to consider establishing a relocation program, incorporating available assistance.

2. Acquisition - Acquisition by a governmental entity of land in a floodplain serves two main purposes: 1) it ensures that the problem of structures in the floodplain will be addressed; and 2) it has the potential to convert problem areas into community assets, with accompanying environmental benefits. Acquisition is more cost effective than relocation in those areas that are subject to storm surges, ice jams, or flash flooding. Acquisition, followed by demolition, is the most appropriate strategy for those buildings that are simply too expensive to move, as well as for dilapidated structures that are not worth saving or protecting. Acquisition and subsequent relocation can be expensive, however, there are government grants and loans that can be applied toward such efforts.

3. Building Elevation - Elevating a building above the base flood elevation is the best on-site protection strategy. The building could be raised to allow water to run underneath it, or fill could be brought in to elevate the site on which the building sits. This approach is cheaper than relocation, and tends to be less disruptive to a

neighborhood. Elevation is required by law for new and substantially improved residences in a floodplain, and is commonly practiced in flood hazard areas nationwide.

4. Floodproofing - If a building cannot be relocated or elevated, it may be floodproofed. This approach works well in areas of low flood threat. Floodproofing can be accomplished through barriers to flooding, or by treatment to the structure itself.
    a. Barriers: Levees, floodwalls and berms can keep floodwaters from reaching a building. These are useful, however, only in areas subject to shallow flooding.
    b. Dry Floodproofing: This method seals a building against the water by coating the walls with waterproofing compounds or plastic sheeting. Openings, such as doors, windows, etc. are closed either permanently with removable shields or with sandbags.
    c. Wet Floodproofing: This technique is usually considered a last resort measure, since water is intentionally allowed into the building in order to minimize pressure on the structure. Approaches range from moving valuable items to higher floors to rebuilding the floodable area. An advantage over other approaches is that simply by moving household goods out of the range of floodwaters, thousands of dollars can be saved in damages.

5. Sewer Backup Protection - Storm water overloads can cause backup into basements through sanitary sewer lines. Houses that have any kind of connection to a sanitary sewer system - whether it is downspouts, footing drain tile, and/or sump pumps, can be flooded during a heavy rain event. To prevent this, there should be no such connections to the system, and all rain and ground water should be directed onto the ground, away from the building. Other protections include:
    a. Floor drain plugs and floor drain standpipe, which keep water from flowing out of the lowest opening in the house.
    b. Overhead sewer - keeps water in the sewer line during a backup.
    c. Backup valve - allows sewage to flow out while preventing backups from flowing into the house.

6. Insurance - Above and beyond standard homeowner insurance, there is other coverage a homeowner can purchase to protect against flood hazard. Two of the most common are National Flood Insurance and basement backup insurance.
    a. *National Flood Insurance:* When a community participates in the National Flood Insurance Program, any local insurance agent is able to sell separate flood insurance policies under rules and rates set by FEMA. Rates do not change after claims are paid because they are set on a national basis.
    b. *Basement Backup Insurance:* National Flood Insurance offers an additional deductible for seepage and sewer backup, provided there is a general condition of flooding in the area that was the proximate cause of the basement getting wet. Most exclude damage from surface flooding that would be covered by the NFIP.

C. Natural Resource Protection

Preserving or restoring natural areas or the natural functions of floodplain and watershed areas provide the benefits of eliminating or minimizing losses from floods, as well as improving water quality and wildlife habitats. Parks, recreation, or conservation agencies usually implement such activities. Protection can also be provided through various zoning measures that are specifically designed to protect natural resources.

1. Wetlands Protection - Wetlands are capable of storing large amounts of floodwaters, slowing and reducing downstream flows, and filtering the water. Any development that is proposed in a wetland is regulated by either federal and/or state agencies. Depending on the location, the project might fall under the jurisdiction of the U.S. Army Corps of Engineers, which in turn, calls upon several other agencies to review the proposal. In New Hampshire, the N.H. Wetlands Board must approve any project that impacts a wetland. Many communities in New Hampshire also have local wetland ordinances.

   Generally, the goal is to protect wetlands by preventing development that would adversely affect them. Mitigation techniques are often employed, which might consist of creating a wetland on another site to replace what would be lost through the development. This is not an ideal practice since it takes many years for a new wetland to achieve the same level of quality as an existing one, if it can at all.

2. Erosion and Sedimentation Control - Controlling erosion and sediment runoff during construction and on farmland is important, since eroding soil will typically end up in downstream waterways. Because sediment tends to settle where the water flow is slower, it will gradually fill in channels and lakes, reducing their ability to carry or store floodwaters.

3. Best Management Practices - Best Management Practices (BMPs) are measures that reduce non-point source pollutants that enter waterways. Non-point source pollutants are carried by storm water to waterways, and include such things as lawn fertilizers, pesticides, farm chemicals, and oils from street surfaces and industrial sites. BMPs can be incorporated into many aspects of new developments and ongoing land use practices. In New Hampshire, the Department of Environmental Services has developed Best Management Practices for a range of activities, from farming to earth excavations.

D. Emergency Services

Emergency services protect people during and after a flood. Many communities in New Hampshire have emergency management programs in place, administered by an emergency management director (very often the local police or fire chief).

1. Flood Warning - On large rivers, the National Weather Service handles early recognition. Communities on smaller rivers must develop their own warning systems. Warnings may be disseminated in a variety of ways, such as sirens, radio, television, mobile public address systems, or door-to-door contact. It seems that multiple or redundant systems are the most effective, giving people more than one opportunity to be warned.

2. Flood Response - Flood response refers to actions that are designed to prevent or reduce damage or injury, once a flood threat is recognized. Such actions and the appropriate parties include:
    a. Activating the emergency operations center (emergency director)
    b. Sandbagging designated areas (Highway Department)
    c. Closing streets and bridges (police department)
    d. Shutting off power to threatened areas (public service)
    e. Releasing children from school (school district)
    f. Ordering an evacuation (Board of Selectmen/emergency director)
    g. Opening evacuation shelters (churches, schools, Red Cross, municipal facilities)

These actions should be part of a flood response plan, which should be developed in coordination with the persons and agencies that share the responsibilities. Drills and exercises should be conducted so that the key participants know what they are supposed to do.

3. Critical Facilities Protection - Protecting critical facilities is vital, since expending efforts on these facilities can draw workers and resources away from protecting other parts of town. Critical facilities fall into two categories:
    a. Buildings or locations vital to the flood response effort:
        i. Emergency operations centers
        ii. Police and fire stations
        iii. Highway garages
        iv. Selected roads and bridges
        v. Evacuation routes
    b. Buildings or locations that, if flooded, would create disasters:
        i. Hazardous materials facilities
        ii. Schools

All such facilities should have their own flood response plan that is coordinated with the community's plan. Schools will typically be required by the state to have emergency response plans in place.

4. Health and Safety Maintenance - The flood response plan should identify appropriate measures to prevent danger to health and safety. Such measures include:
    a. Patrolling evacuated areas to prevent looting
    b. Vaccinating residents for tetanus
    c. Clearing streets
    d. Cleaning up debris

The Plan should also identify which agencies will be responsible for carrying out the identified measures. A public information program can be helpful to educate residents on the benefits of taking health and safety precautions.

E. Structural Projects

Structural projects are used to prevent floodwaters from reaching properties. These are all man-made structures, and can be grouped into the six types discussed below. The shortcomings of structural approaches are:

- Can be very expensive
- Disturb the land, disrupt natural water flows, & destroy natural habitats.
- Are built to an anticipated flood event, and may be exceeded by a greater-than expected flood
- Can create a false sense of security.

1. Diversions - A diversion is simply a new channel that sends floodwater to a different location, thereby reducing flooding along an existing watercourse. Diversions can be surface channels, overflow weirs, or tunnels. During normal flows, the water stays in the old channel. During flood flows, the stream spills over the diversion channel or tunnel, which carries the excess water to the receiving lake or river. Diversions are limited by topography; they won't work everywhere. Unless the receiving water body is relatively close to the flood prone stream and the land in between is low and vacant, the cost of creating a diversion can be prohibitive. Where topography and land use are not favorable, a more expensive tunnel is needed. In either case, care must be taken to ensure that the diversion does not create a flooding problem somewhere else.

2. Levees/Floodwalls - Probably the best known structural flood control measure is either a levee (a barrier of earth) or a floodwall made of steel or concrete erected between the watercourse and the land. If space is a consideration, floodwalls are typically used, since levees need more space. Levees and floodwalls should be set back out of the floodway, so that they will not divert floodwater onto other properties.

3. Reservoirs - Reservoirs control flooding by holding water behind dams or in storage basins. After a flood peaks, water is released or pumped out slowly at a rate the river downstream can handle. Reservoirs are suitable for protecting existing development, and they may be the only flood control measure that can protect development close to a watercourse. They are most efficient in deeper valleys or on smaller rivers where there is less water to store. Reservoirs might consist of man-made holes dug to hold the approximate amount of floodwaters, or even abandoned quarries. As with other structural projects, reservoirs:
    a. are expensive
    b. occupy a lot of land
    c. require periodic maintenance
    d. may fail to prevent damage from floods that exceed their design levels
    e. may eliminate the natural and beneficial functions of the floodplain.

4. Channel Modifications - Channel modifications include making a channel wider, deeper, smoother, or straighter. These techniques will result in more water being carried away, but, as with other techniques mentioned, it is important to ensure that the modifications do not create or increase a flooding problem downstream.

5. Dredging: Dredging is often cost-prohibitive because the dredged material must be disposed of in another location; the stream will usually fill back in with sediment. Dredging is usually undertaken only on larger rivers, and then only to maintain a navigation channel.

6. Drainage Modifications: These include man-made ditches and storm sewers that help drain areas where the surface drainage system is inadequate or where underground drainage ways may be safer or more attractive. These approaches are usually designed to carry the runoff from smaller, more frequent storms.

7. Storm Sewers - Mitigation techniques for storm sewers include installing new sewers, enlarging small pipes, street improvements, and preventing back flow. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving body of water can absorb the increased flows without increased flooding. In many developments, streets are used as part of the drainage system, to carry or hold water from larger, less frequent storms. The streets collect runoff and convey it to a receiving sewer, ditch, or stream. Allowing water to stand in the streets and then draining it slowly can be a more effective and less expensive measure than enlarging sewers and ditches.

F. Public Information

Public information activities are intended to advise property owners, potential property owners, and visitors about the particular hazards associated with a property, ways to protect people and property from these hazards, and the natural and beneficial functions of a floodplain.

1. Map Information - Flood maps developed by FEMA outline the boundaries of the flood hazard areas. These maps can be used by anyone interested in a particular property to determine if it is flood-prone. These maps are available from FEMA, the NH Homeland Security and Emergency Management (HSEM), the NH Office of Energy and Planning (OEP), or your regional planning commission.

2. Outreach Projects - Outreach projects are proactive; they give the public information even if they have not asked for it. Outreach projects are designed to encourage people to seek out more information and take steps to protect themselves and their properties. Examples of outreach activities include:
    a. Presentations at meetings of neighborhood groups
    b. Mass mailings or newsletters to all residents
    c. Notices directed to floodplain residents
    d. Displays in public buildings, malls, etc.
    e. Newspaper articles and special sections
    f. Radio and TV news releases and interview shows
    g. A local flood proofing video for cable TV programs and to loan to organizations
    h. A detailed property owner handbook tailored for local conditions. Research has shown that outreach programs work, although awareness is not enough. People need to know what they can do about the hazards, so projects should include information on protection measures. Research also shows that locally designed and run programs are much more effective than national advertising.

3. Real Estate Disclosure - Disclosure of information regarding flood-prone properties is important if potential buyers are to be in a position to mitigate damage. Federally regulated lending institutions are required to advise applicants that a property is in the floodplain. However, this requirement needs to be met only five days prior to closing, and by that time, the applicant is typically committed to the purchase. State laws and local real estate practice can help by making this information available to prospective buyers early in the process.

4. Library - Your local library can serve as a repository for pertinent information on flooding and flood protection. Some libraries also maintain their own public information campaigns, augmenting the activities of the various governmental agencies involved in flood mitigation.

5. Technical Assistance - Certain types of technical assistance are available from the NFIP Coordinator, FEMA, and the Natural Resources Conservation District. Community officials can also set up a service delivery program to provide one-on-one sessions with property owners. An example of technical assistance is the *flood audit*, in which a specialist visits a property. Following the visit, the owner is provided with a written report detailing the past and potential flood depths and recommending alternative protection measures.

6. Environmental Education - Education can be a great mitigating tool if people can learn what not to do before damage occurs. The sooner the education begins the better. Environmental education programs for children can be taught in the schools, park and recreation departments, conservation associations, or youth organizations. An activity can be as involved as course curriculum development or as simple as an explanatory sign near a river. Education programs do not have to be limited to children. Adults can benefit from knowledge of flooding and mitigation measures; decision makers, armed with this knowledge, can make a difference in their communities

.

II. EARTHQUAKES

A. Preventive

1. Planning/zoning to keep critical facilities away from fault lines
2. Planning, zoning and building codes to avoid areas below steep slopes or soils subject to liquefaction
3. Building codes to prohibit loose masonry overhangs, etc.

B. Property Protection

1. Acquire and clear hazard areas
2. Retrofitting to add braces, remove overhangs
3. Apply Mylar to windows and glass surfaces to protect from shattering glass
4. Tie down major appliances, provide flexible utility connections
5. Earthquake insurance riders

C. Emergency Services

1. Earthquake response plans to account for secondary problems, such as fires and hazardous material spills

D. Structural Projects

1. Slope stabilization

III. DAM FAILURE

A. Preventive

1. Dam failure inundation maps
2. Planning/zoning/open space preservation to keep area clear
3. Building codes with flood elevation based on dam failure
4. Dam safety inspections
5. Draining the reservoir when conditions appear unsafe

B. Property Protection

1. Acquisition of buildings in the path of a dam breach flood
2. Flood insurance

C. Emergency Services

1. Dam condition monitoring
2. Warning and evacuation plans based on dam failure

D. Structural Projects

1. Dam improvements, spillway enlargements
2. Remove unsafe dams

IV. WILDFIRES

A. Preventive

1. Zoning districts to reflect fire risk zones
2. Planning and zoning to restrict development in areas near fire protection and water resources
3. Requiring new subdivisions to space buildings, provide firebreaks, on-site water storage, wide roads, multiple accesses
4. Building code standards for roof materials and spark arrestors
5. Maintenance programs to clear dead and dry brush, trees
6. Regulation on open fires

B. Property Protection

1. Retrofitting of roofs and adding spark arrestors
2. Landscaping to keep bushes and trees away from structures
3. Insurance rates based on distance from fire protection

C. Natural Resource Protection

1. Prohibit development in high-risk areas

D. Emergency Services

1. Fire Fighting

V. WINTER STORMS

A. Prevention

1. Building code standards for light frame construction, especially for wind-resistant roofs

B. Property Protection

1. Storm shutters and windows
2. Hurricane straps on roofs and overhangs
3. Seal outside and inside of storm windows and check seals in spring and fall
4. Family and/or company severe weather action plan & drills:
    a. include a NOAA Weather Radio
    b. designate a shelter area or location
    c. keep a disaster supply kit, including stored food and water
    d. keep snow removal equipment in good repair; have extra shovels, sand, rock, salt and gas
    e. know how to turn off water, gas, and electricity at home or work

C. Natural Resource Protection

1. Maintenance program for trimming trees and shrubs

D. Emergency Services

1. Early warning systems/NOAA Weather Radio
2. Evacuation plans

Appendix D: Technical & Financial Assistance for All-Hazard Mitigation

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. Currently, FEMA administers the following HMA grant programs[37]:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

FEMA's HMA grants are provided to eligible Applicants (States/Tribes/Territories) that, in turn, provide sub-grants to local governments and communities. The Applicant selects and prioritizes subapplications developed and submitted to them by subapplicants. These subapplications are submitted to FEMA for consideration of funding. Prospective subapplicants should consult the office designated as their Applicant for further information regarding specific program and application requirements. Contact information for the FEMA Regional Offices and State Hazard Mitigation Officers is available on the FEMA website, www.fema.gov.

HMA Grant Programs

The HMA grant programs provide funding opportunities for pre- and post-disaster mitigation. While the statutory origins of the programs differ, all share the common goal of reducing the risk of loss of life and property due to Natural Hazards. Brief descriptions of the HMA grant programs can be found below. For more information on the individual programs, or to see information related to a specific Fiscal Year, please click on one of the program links.

A. Hazard Mitigation Grant Program (HMGP)

HMGP assists in implementing long-term hazard mitigation measures following Presidential disaster declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

What is the Hazard Mitigation Grant Program?

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. Authorized under Section 404 of the Stafford Act and administered by FEMA, HMGP was created to reduce the loss of life and property due to natural disasters. The program enables mitigation measures to be implemented during the immediate recovery from a disaster.

Who is eligible to apply?

Hazard Mitigation Grant Program funding is only available to applicants that reside within a presidentially declared disaster area. Eligible applicants are:

- State and local governments
- Indian tribes or other tribal organizations

[37] Information in Appendix E is taken from the following website and links to specific programs unless otherwise noted; http://www.fema.gov/government/grant/hma/index.shtm

- Certain non-profit organizations

Individual homeowners and businesses may not apply directly to the program; however a community may apply on their behalf.

How are potential projects selected and identified?

The State's administrative plan governs how projects are selected for funding. However, proposed projects must meet certain minimum criteria. These criteria are designed to ensure that the most cost-effective and appropriate projects are selected for funding. Both the law and the regulations require that the projects are part of an overall mitigation strategy for the disaster area.

The State prioritizes and selects project applications developed and submitted by local jurisdictions. The State forwards applications consistent with State mitigation planning objectives to FEMA for eligibility review. Funding for this grant program is limited and States and local communities must make difficult decisions as to the most effective use of grant funds.

For more information on the Hazard Mitigation Grant Program (HMGP), go to:
http://www.fema.gov/government/grant/hmgp/index.shtm

B. Pre-Disaster Mitigation (PDM)

PDM provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. The goal of the PDM program is to reduce overall risk to the population and structures, while at the same time, also reducing reliance on Federal funding from actual disaster declarations.

Program Overview

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event.

Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds.

C. Flood Mitigation Assistance (FMA)

FMA provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program.

Program Overview

The FMA program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.

Types of FMA Grants

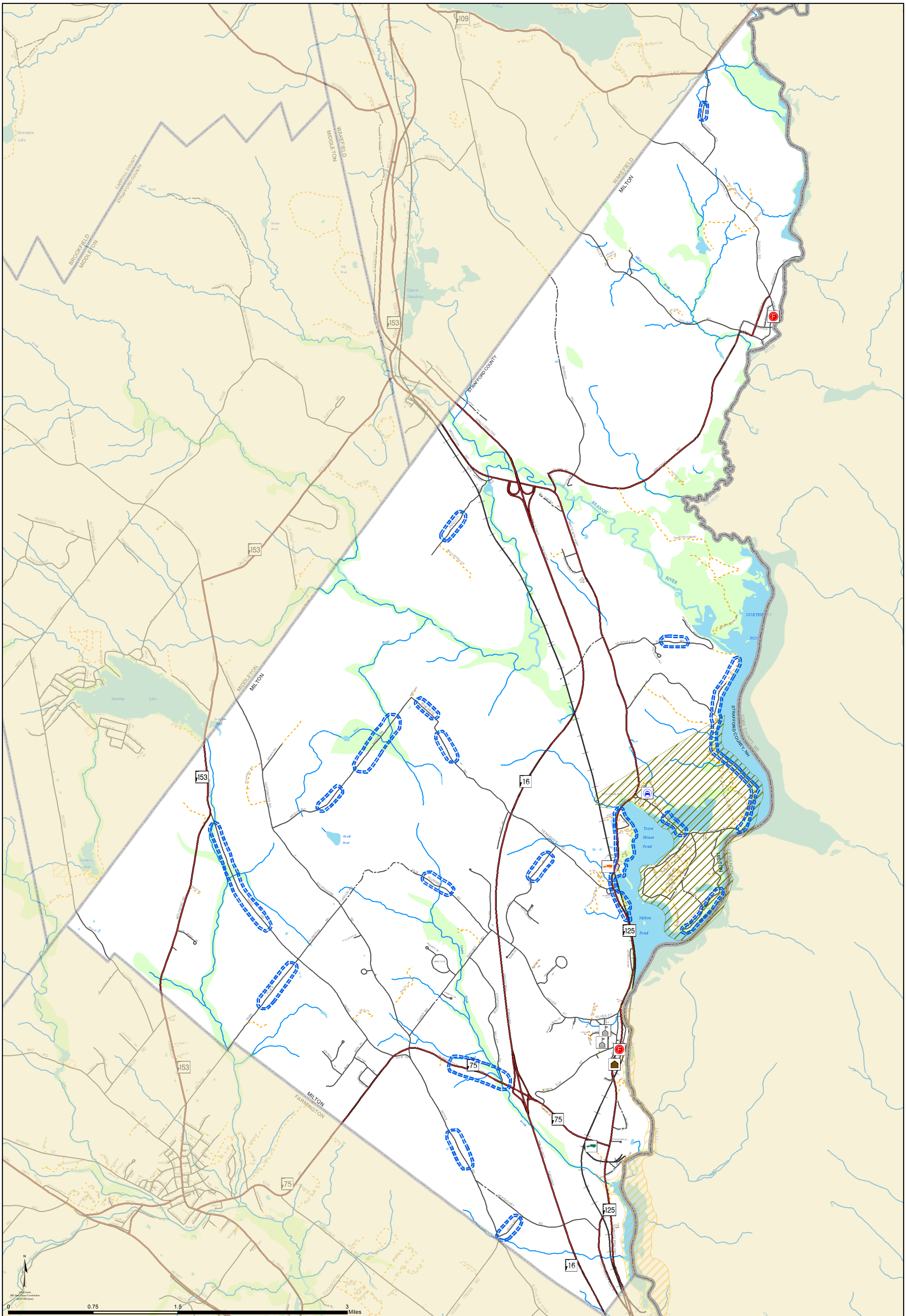
Three types of FMA grants are available to States and communities:

- Planning Grants to prepare Flood Mitigation Plans. Only NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project grants
- Project Grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures. States are encouraged to prioritize FMA funds for applications that include repetitive loss properties; these include structures with 2 or more losses each with a claim of at least $1,000 within any ten-year period since 1978.
- Technical Assistance Grants for the State to help administer the FMA program and activities. Up to ten percent (10%) of Project grants may be awarded to States for Technical Assistance Grants

Appendix E: Maps

Maps

- Emergency Response Facilities
- Non-Emergency Response Facilities
- Critical Facilities
- Water Resources



Emergency Response Facilities Legend

Facility Name
- Town Hall
- Fire Station(s)
- School(s)
- Police Station
- Public Works Garage
- State Highway Department

Past & Potential Hazards

- Past Flooding
- Dam Inundation Zone
- Wind Shear

FEMA Floodplain
- 100-year Floodplain

2017
Hazard Mitigation Plan

Milton, NH

Critical Infrastructure &
Past and Potential Hazards

Base Legend

- Municipal Boundary
- Lake or Pond
- River, Stream, or Brook
- Railroad

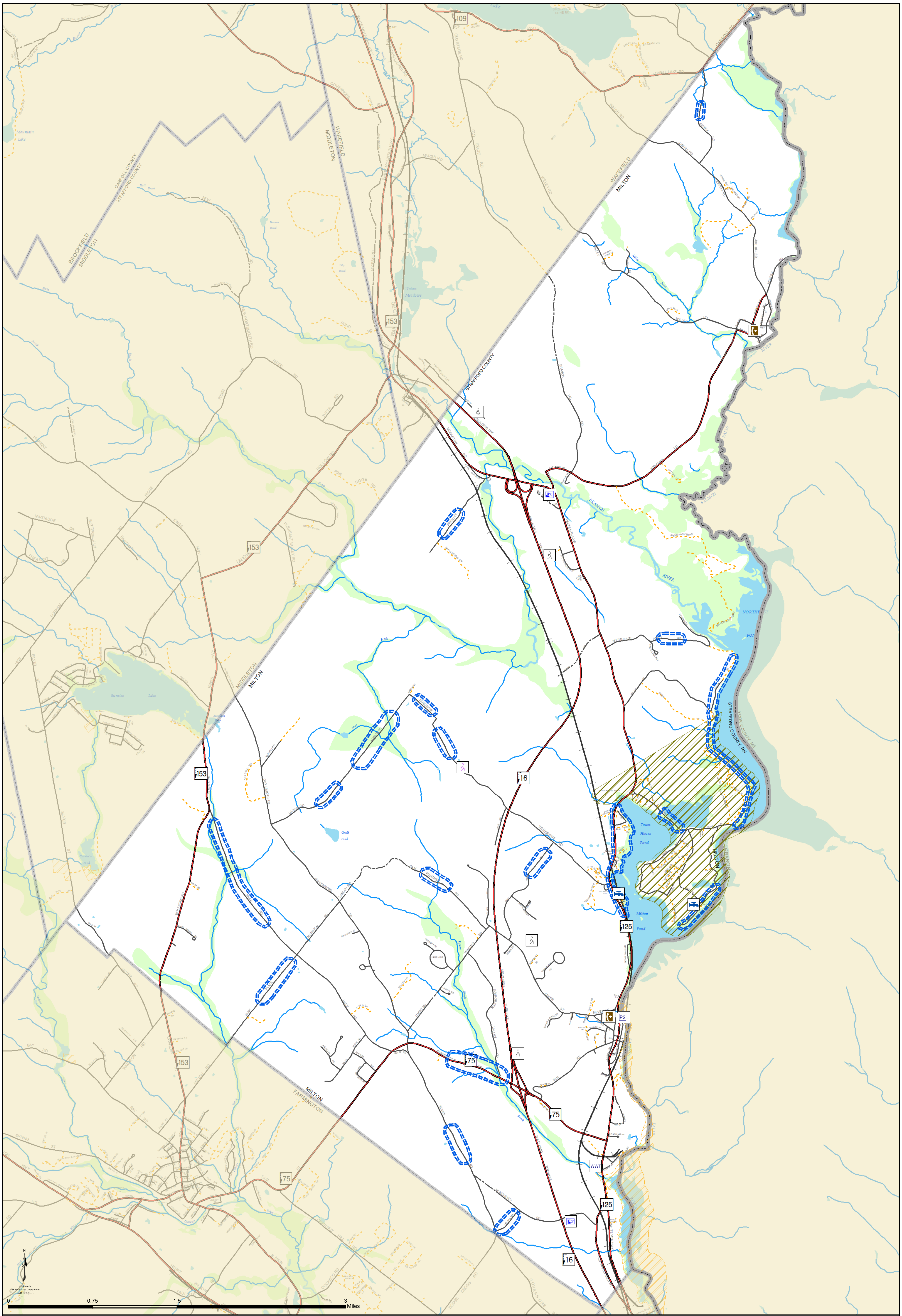
Roads
- State
- Federal
- Local
- Not Maintained
- Private

Prepared by: Strafford Regional Planning Commission
150 Wakefield St, Suite 12, Rochester, NH 03867
T: (603) 994-3500 F: (603) 994-3504 Em: srpc@strafford.org
Critical Infrastructure & Past and Potential Hazards
Date: April 2017
Path: M:\Region\OEM_haz_mit\2016_2017_Updates\Milton\Final_Maps\ERF_11x17

Maps prepared by Strafford Regional Planning Commission are for planning purposes only.

DATA SOURCES:
Base features are from USGS 1:24,000 scale Digital Line Graphs, as archived in the GRANIT database. All base features distributed by Complex Systems Research Center, Durham, NH. Digital data in NH GRANIT represent the efforts of the contributing agencies to record information from the cited source materials. Complex Systems Research Center, under contract to the NH Office of State Planning, and in consultation with cooperating agencies, maintains a continuing program to identify and correct errors in these data. OSP, CSRC and the cooperating agencies make no claim as to the validity or reliability or to any implied uses of these data.

Strafford Regional Planning Commission



Non-Emergency Response Facilities Legend

Facility Name

- Cell Tower
- Communication Tower
- PSNH - Power Station
- Sewer Pump Station
- Telephone Switching Station
- Wastewater Treatment Plant
- Water Pump Station

Past & Potential Hazards

- Past Flooding
- Dam Inundation Zone
- Wind Shear

FEMA Floodplain

- 100-year Floodplain

2017
Hazard Mitigation Plan

Milton, NH

Critical Infrastructure &
Past and Potential Hazards

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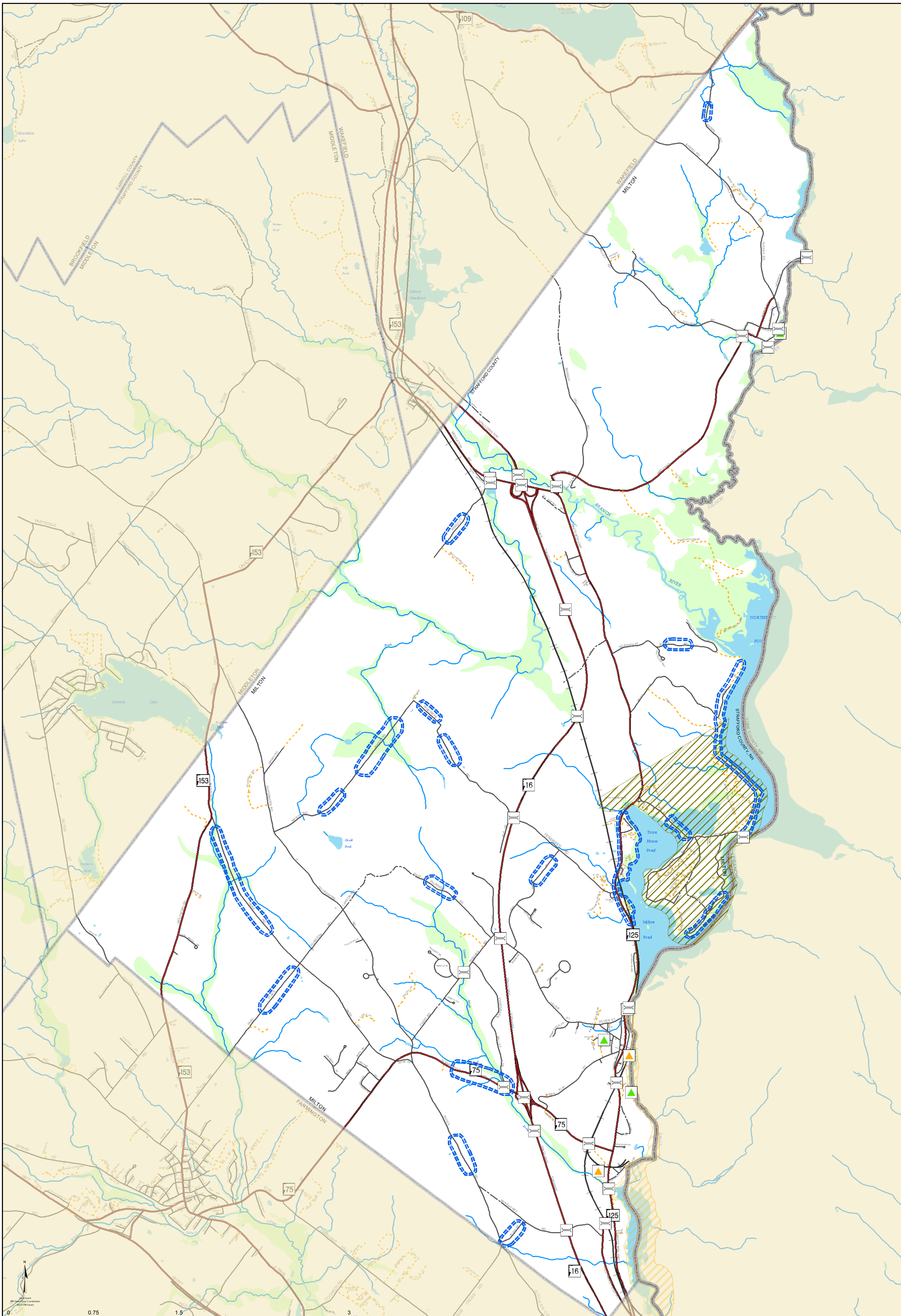
Strafford Regional Planning Commission



Critical Infrastructure Legend

- Bridges

Dam Classification

- Low
- Significant

Past & Potential Hazards

- Past Flooding
- Dam Inundation Zone
- Wind Shear

FEMA Floodplain

- 100-year Floodplain

2017

Hazard Mitigation Plan

Milton, NH

Critical Infrastructure & Past and Potential Hazards

Base Legend

- Municipal Boundary
- Lake or Pond
- River, Stream, or Brook
- Railroad

Roads

- State
- Federal
- Local
- Not Maintained
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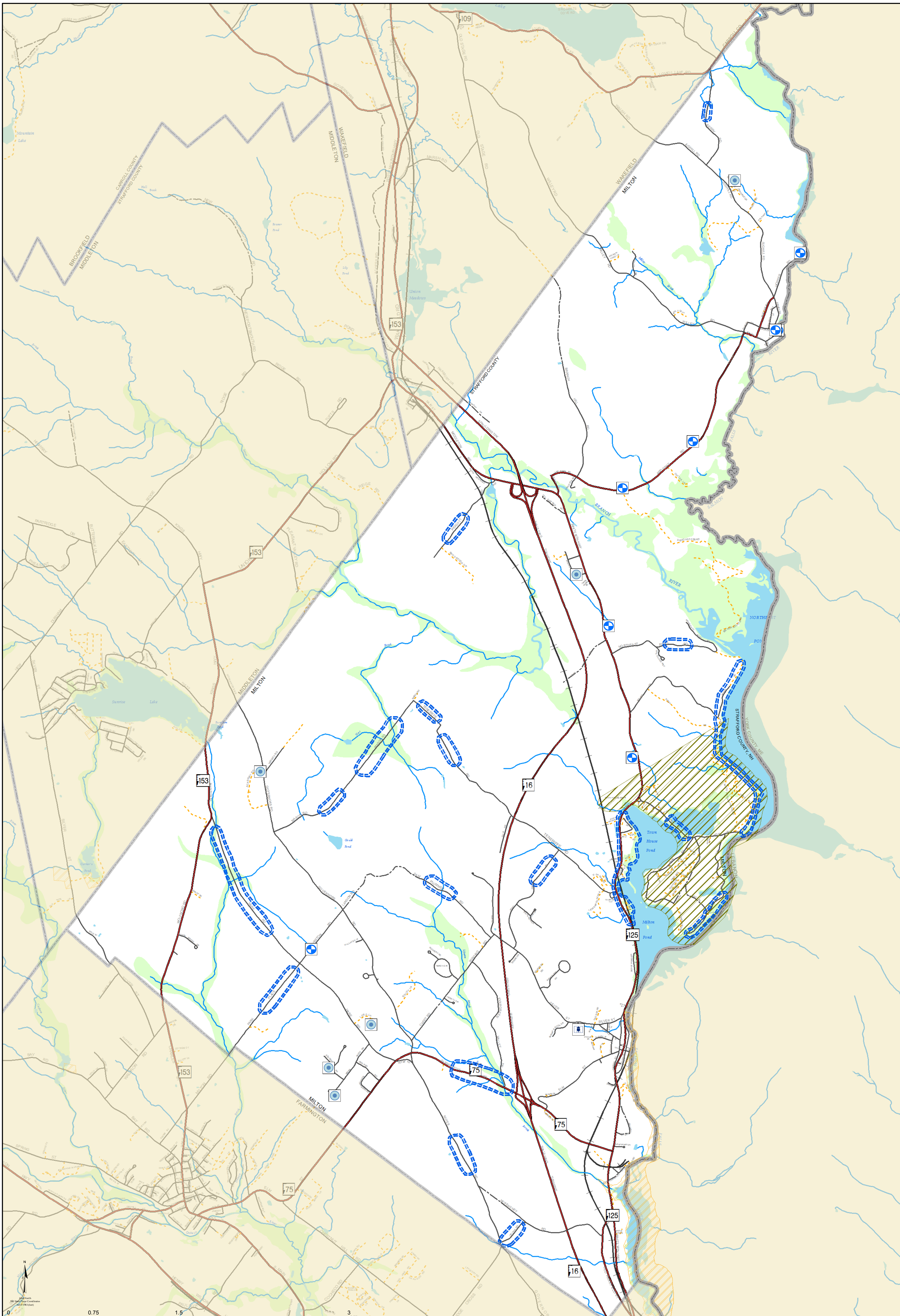
Strafford REGIONAL PLANNING COMMISSION



Water Resources Legend

Facility Name

- Dry Hydrant
- Cistern
- Water Tower

Past & Potential Hazards

- Past Flooding
- Dam Inundation Zone
- Wind Shear

FEMA Floodplain

- 100-year Floodplain

2017

Hazard Mitigation Plan

Milton, NH

Critical Infrastructure &

Past and Potential Hazards

Base Legend

- Municipal Boundary
- Lake or Pond
- River, Stream, or Brook
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Roads

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