Multi-Hazard Mitigation Plan Update 2022

Town of Rollinsford, NH

Adopted 2004
Updated August 30, 2011
Updated March 4, 2016
Updated January 20, 2022

Submitted to the New Hampshire Homeland Security & Emergency Management

By the

Town of Rollinsford, NH
with Strafford Regional Planning Commission

This project was funded from the fiscal year 2019 Pre-Disaster Mitigation (PDM) program, which was awarded to the Department of Safety, Division of Homeland Security and Emergency Management (HSEM) from the Federal Emergency Management Agency (FEMA).

Cover: Salmon Falls River at Lower Mill, 2007 Mother's Day Flooding Event
Photo credit: Bob Ducharme, Former Chief of Police/EMD

Acknowledgements

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The 2004, 2011, 2016, and 2022 Rollinsford Hazard Mitigation Committee's
New Hampshire Homeland Security Emergency Management (HSEM)
Town of Rollinsford

The 2022 Town of Rollinsford Multi-Hazard Mitigation Planning Team

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

• Caroline Kendall	Town Administrator, Town of Rollinsford
• Judy Nelson	School Board Chair, Town of Rollinsford
• Jon Uraskevich	Police Chief, Town of Rollinsford
• Ed Walsh	Assistant Road Agent, Town of Rollinsford
• Ray McNeil	Water and Sewer District Superintendent, Town of Rollinsford
• Dick Fortier	Grade School Facilities Manager, Town of Rollinsford
• Richard Fogerty	Planning Board, Town of Rollinsford
• George Guilmette	Road Agent, Town of Rollinsford
• Shawn Glidden	Assistant Fire Chief, Town of Rollinsford
• Sean Kelly	Interim Police Chief, Town of Rollinsford
• Stef Casella	Regional Planner, SRPC
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Executive Summary

This Plan was revised and updated to meet statutory requirements and to assist the Town of Rollinsford 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 2004. The plan was revised in 2011, 2016, and 2022 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, which was made up by the Town Administrator, School Board Chair, Police Chief (EMD), Assistant Road Agent, Water and Sewer District Superintendent, Grade School Facilities Manager, Planning Board, Road Agent, Assistant Fire Chief, and Interim Police Chief

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

- ∴ 4 hazards rated as having a high overall risk in Rollinsford are: Hazardous Material, Flooding (Riverine/Extreme Rain), Winter Weather, and Public Health
- ∴ 6 hazards rated as having a moderate overall risk in Rollinsford are: Hurricane & Tropical Storms, Tornado & Downburst, Radiological, Severe Thunderstorms, Drought, and Wildfire
- ∴ 6 hazards rated as having a low overall risk in Rollinsford are: Coastal Flooding, Terrorism, Dam Failure, Extreme Temperatures, Earthquake, and 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 also 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 Facilities (CF), Vulnerable Populations to Protect (VPP), 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 Team was able to produce this integrated multi-hazard plan and recognizes that such a plan must be considered a work in progress.

The Town of Rollinsford received conditional approval on September 24, 2021. A public meeting was held, and the plan was adopted by the Board of Selectmen on December 14, 2021. The Plan received formal approval from FEMA on January 20, 2022.

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 regarding 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.

Flooding caused by Hurricane Sandy, 2012 – Rollinsford Police Department

Chapter I: Multi-Hazard Planning Process

Authority

Rollinsford's original 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". Rollinsford'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 & History of the FEMA Mitigation Planning Process

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 to have all New Hampshire communities complete a local multi-hazard plan 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 aiding selected communities to help develop local plans.

Rollinsford'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 governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition for receiving Hazard Mitigation Grant Program (HMGP) project grants. Local governments must review the plan yearly and update their plans every five years to continue program eligibility.

Jurisdiction

This plan addresses only one jurisdiction – the Town of Rollinsford, NH. The Plan references historical events, as well as identifies specific vulnerabilities that are most likely to impact the Town. This plan addresses the following hazards that affect the Town:

- Flooding
- Coastal Flooding
- Dam Failure
- Severe Thunderstorms
- Wildfire
- Severe Winter Weather
- Earthquake
- Landslide
- Drought
- Hurricane & Tropical Storms
- Hazardous Materials
- Tornado & Downburst
- Extreme Temperatures
- Public Health Threats
- Terrorism
- Radiological

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 Rollinsford; 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.

Debris on Pine Street from Hurricane Sandy, 2012 – Rollinsford Police Department

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 Rollinsford New Hampshire, before during and after a hazard.*
- *Protect existing properties and structures through mitigation activities.*
- *Provide resources to residents of Rollinsford, 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 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 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 Rollinsford, 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 five times over a four-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

All meetings are geared to accommodate brainstorming, open discussion, and an increased awareness of potential threats to the town. Below is a summary of each meeting. Meeting agendas are included in the Plan's Appendix B.

Meeting #1: March 12, 2021

Members present: Caroline Kendall (Town Administrator), Judy Nelson (School Board Chair), Jon Uraskevich (Police Lieutenant), Barbara Henderson (resident), Richard Fogerty (Planning Board), George Guilmette (Road Agent), Shawn Glidden (Assistant Fire Chief), Sean Kelly (Interim Police Chief), Stef Casella (Regional Planner, SRPC), and Kyle Pimental (Principal Regional Planner, SRPC).

Strafford Regional Planning Commission (SRPC) staff provided a brief overview of the update process and the federal 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 expired on March 3, 2021. SRPC staff detailed the in-kind match documentation, committee responsibilities, funding from HSEM, and steps towards successful adoption.

SRPC and the committee then reviewed the draft asset inventory chapter. Committee members provided the following feedback:

1. Revisions to the Emergency Response Facilities Table
    a. Added the Strafford County Warming Center
    b. Revised the following secondary fuel facilities
        i. Corrected address for Turnpike Maintenance Shed in Dover
        ii. Added Turnpike Maintenance Shed in Rochester
        iii. Corrected address for Maintenance Garage in Durham
        iv. Added the Irving in Somersworth
    c. Added Rollins Road to evacuation routes
    d. Added the following notes:
        i. The Police Station, Town Hall, and Fire Station all have generators; the Rollinsford Grade School is in the process of getting a generator; there is no generator at the American Legion and can only be used as a secondary shelter if they have power; the Highway Department has a smaller generator that provides limited power to run emergency systems and offers diesel fuel only.
        ii. The emergency shelters identified in this plan are to be used locally for immediate shelters and due to lack of certain resources may not quality as emergency shelters as defined by the Red Cross. If needed, Rollinsford will send residents to regional shelters in neighboring communities, such as Dover or Somersworth, for more long-term needs. Somersworth also has a new warming facility. To date, the Town has never had to use any regional shelter.

iii. There may be other roads in Town that could be used as secondary egress, depending on the type of hazard, to move larger amounts of people in and out, such as Somersworth Road and Main Street, as well as Central Ave in Dover to access the hospital. During any large-scale evacuation, the Town should reference the ERF map in the Appendix of this plan to locate other possible local evacuation routes in neighboring communities when making decisions.

2. Revisions to the Non-Emergency Response Facilities Table
    a. Corrected address of Transfer Station

3. Revisions to Critical Facilities Table
    a. Follow up is needed with the water/sewer department to determine any additional pump stations and to provide addresses (911 response may have addresses)
    b. Determine if the power substation is on Mill Road or Front Street
    c. Added a second power substation on Foundry Street
    d. Determine waterbody or street crossing for Moscato Recreation Pond Dam
    e. The Planning Committee referenced two additional hazardous materials sites, but did not know the names or addresses
    f. Added a repeater on the water tower for communication functions
    g. Added the water tower and three wells (these were also kept in the water resources table)
    h. Added that the Oak Street bridge is identified as a redlist bridge
        i. According to the City of Dover's 2022-2027 Capital Improvements Program, the Oak Street bridge replacement project is set for construction in FY2025. With a cost of $5M, this project will replace the existing wood and iron bridge with a new structure that allows all weight vehicle loading, including fire and emergency vehicles and public transit buses.

4. Revisions to Vulnerable Populations to Protect Table
    a. Removed Lucky Duck Daycare
    b. Removed Historic and Economic Impacts Areas for inclusion in new table (Historic, Cultural, Recreation, and Economic Resources)

5. Creation of Historic, Cultural, Recreation, and Economic Resources
    a. Added that the Grade School was in the National Registry
    b. SRPC was tasked with adding known recreational facilities

6. Revisions to Water Resource Table
    a. Approximate addresses for the dry hydrants are needed
    b. The status of several dry hydrants remains unconfirmed as working hydrants with uncertain plans to replace and/or repair. A recommendation in this plan should reference the need for the Town to

investigate what future maintenance needs will be required, as well as to determine if the Foundry Street boat launch is a suitable location.

Next, the committee provided feedback on the National Flood Insurance Program, including:

1. The Road Agent and the Town Administrator would provide more information on the following projects:
    a. Culvert replacement on Willey Street
    b. Culvert replacement on Mill Road (stormwater and drainage improvements)
    c. Culvert replacement on Pine Street
    d. Culvert replacement on Sligo Road
    e. Culvert replacement on Foundry Street
    f. Bank stabilization and erosion control on Sligo Road
    g. Construction of a temporary bridge (box culvert), which included the widening and replacement on Old Mill road for firetruck access

SRPC, and the committee, reviewed the all the past mitigation strategies. Committee members provided feedback on each of the ten actions, including:

1. The Willey Street culvert project has been completed. More information is needed.
2. The drainage project at the Town Hall has been completed. The Town installed exterior and interior drainage improvements to eliminate water seepage and damage to the lower level of Town Hall.
3. Provided all-hazard training is ongoing. The Town's Emergency Operations Plan called for classes and a round table for mass casualty scenarios. The Fire Department conducted two different train derailment trainings. The Police and Fire Departments take active shooter training each year. In addition, the School conducts similar drills.
4. Inventory the Town's drainage infrastructure is ongoing. The Town has hired Hoyle and Tanner to assist in stormwater mapping to remain in compliance with MS4 requirements.
5. Revise stormwater management requirements is ongoing. The Town worked on and approved several updates to its stormwater regulations. Hoyle, Tanner Associates will be assisting with implementing other MS4 stormwater requirements. In 2021, the Town, in partnership with SRPC, received a sourcewater protection grant from NHDES to review and ensure the Town's stormwater management regulations are compliant with MS4 requirements.
6. Consider climate culvert ready results has not been accomplished. SRPC will reshare the results from the culvert report with the Town's Road agent and this action will be carried forward.
7. Implement a program to identify high risk populations has not been accomplished and this action will be carried forward.

8. Improve communication has been completed. The Town now operates off a local frequency, has installed a repeater on the water tower, and has purchased radios for all the municipal trucks to streamline radio functions and improve communication.
9. Conduct a feasibility study and install a repeater has been completed. A repeater has been installed on the water tower at the Transfer Station.
10. Update street annotation has been completed. The last street annotation map update was completed in December 2020. The Town will continue to update maps, as necessary.

The next meeting, which will be virtual, was set for Thursday, April 1st at 11:30AM. 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 #2: April 1, 2021

Members present: Members Present: Caroline Kendall (Town Administrator), Ed Walsh (Assistant Road Agent), Richard Fogerty (Planning Board Member), Jon Uraskevich (Chief of Police), Shawn Glidden (Assistant Fire Chief), George Guilmette (Road Agent), Stef Casella (Regional Planner, SRPC), and Kyle Pimental (Principal Regional Planner, SRPC).

Strafford Regional Planning Commission (SRPC) staff led the group through introductions and started the meeting by asking each committee member to provide an estimated amount of time they spent reviewing materials prior to the meeting to be captured as in-kind match. Times are summarized below.

- Rich – 1.0 hr.
- Caroline – .50 hr.
- Ed – 0 hr.
- George – .50 hr.
- Jon – .50 hr.
- Shawn – .50 hr.

Next SRPC staff led a review of the draft meeting one summary. The following items were added to the asset inventory:

- Wentworth Greenhouses (hazardous material)
- Railroad Transfer Yard (hazardous material)
- Wentworth Oil Service (hazardous material)
- Oil Energy Recovery Inc. (hazardous material)

The following are items flagged for additional information that was still needed before plan approval.

- Culvert and bridge projects that have been completed. George and Caroline will work with SRPC staff to provide a brief description of each completed project.

SRPC staff then reviewed the Action Plan. Committee members provided the following feedback:

1. Revisions to the Existing Mitigation Strategies
    a. Building Code/Permits
        i. Addition - BOS is not currently pushing a building code update
        ii. Addition - Town defers to State approved building code
    b. Elevation certificate effectiveness
        i. Changed from "excellent" to "good"
        ii. Addition - Now part of the permitting process
    c. Local Emergency Operations Plan (LEOP)
        i. Town still has 2014 LEOP in place
        ii. Caroline and Jon requested more time to review and revisit next steps at a later meeting
            1. No plan currently in place, looking for recommendations to prepare a plan. Grant funding through HSEM, 5-year cycle
    d. Storm Drain Maintenance
        i. Effectiveness changed from "average" to "good"
        ii. Addition - Hoyle and Tanner are currently doing mapping system updates
        iii. Addition - Catch basins are cleaned once a year and monitored for deterioration
    e. Road Design Standards
        i. Addition - Town adopted stormwater regulations
    f. Tree Maintenance
        i. Effectiveness changed from "poor" to "good"
        ii. Addition - Tree maintenance by Urban Tree
        iii. Addition - Eversource has done a good job maintaining the trees on Clement Rd, Rollins Rd, Sligo Rd, Bear Rd
            1. Uses Lewis Tree for maintenance
    g. Emergency Backup Power
        i. Caroline will review and get back with an update
        ii. School upgraded from single to 3-phase (2016 and 2017), adaptable for generator, no plans for adding a generator at this time.
            1. Keep generator as future action.
    h. Public Education Program
        i. Addition – Town need to re-evaluate the focus before future disasters
    i. Mutual Aid (Police)

        i. Mutual aid agreements are to be updated soon
    j. Mutual Aid (Fire)
        i. Addition – Automated response from South Berwick on certain types of calls
    k. Addition of Highway Department mutual aid section
    l. Floodplain Management Ordinance
        i. Adopted and approved
            1. Update on the year

Next, the committee provided feedback on the hazard description section.

1. Revisions to the Hazard Descriptions
    a. Flooding (Riverine/Extreme Rain) - Past Events and Impacts
        i. Sligo Road has closed twice
            1. Two culverts were replaced to eliminate flooding
        ii. Foundry street closed twice
            1. New culvert placed to eliminate flooding
        iii. General John Sullivan Way springtime flooding
            1. Shawn G. will follow up with date and details
            2. No power and basement flooding (up to 8ft in some areas)
            3. Follow-up mitigation efforts
                a. Town altered ditches, and catch basin system expanded
                b. Homeowners invested in generators and sump pumps
    b. Dam Failure
        i. Add that the Lower Great Falls Dam is in Milton
        ii. Add that Green Mt Power currently leases the power from the upper dam in Rollinsford. Inspection and maintenance are a result of the relicensing process
            1. SRPC will follow-up with Caroline for additional info
    c. Severe Thunderstorms & Lightning – Past events and impacts
        i. Add lightning strike at Wishmaker Stables
        ii. Add wind/Lightning storm responses from FD on Bear Rd, Sligo Rd, and Clement Rd.
        iii. Add mutual aid responses by the FD responded to dover for micro-bursts (more info needed?)
    d. Wildfire – Past events and impacts
        i. Add planned brush/fuel clean up on South East Land Trust property
        ii. Add Greenview cut in 2016 (more details needed)
        iii. Add increase hazard potential during drought conditions
    e. Severe Winter Weather – Past events and impacts
        i. Add now drifts on Sligo Rd and Roberts Rd (winter 2017/2018)

1. Encroachment on propane tanks due to plowing of large snow volume

f. Landslide
    i. Add Sligo road closure in the area of the civil war culvert
        1. (2006 Mothers day flood)

g. Drought – Past impacts and events
    i. 2020 Additions
        1. Select board water restrictions, water and sewer restrictions, Veil farm (Roberts rd) lost a large portion of crops and was not able to supply food to farm stands and larger supply chain
    ii. 2018 Additions
        1. Resident well ran dry and needed water trucked in, one resident had inconsistent water in well (did not have water trucked in)

h. Hurricane and Tropical Storms – Past impacts and events
    i. Shawn will look at incident reports for more details
    ii. 8 service calls
    iii. Mutual aid call (structure fire and down trees)

i. Hazardous Materials – Past impacts and events
    i. 2020 Additions
        1. Wastewater treatment facility leak. One fifty-five-gallon drums of hydrochloric acid spilled during transfer. START team and local clean up company response
            a. Lead to change in drum transportation procedures

j. Tornado and Downburst – Past impacts and events
    i. Add Tolend Rd (Dover, mutual aid response Highway and fire) response (2018)
    ii. Add Main St down tree. Road closure and power outage for 6-8 hours. (2021). Same event, down trees on Rollins Rd.

k. Extreme Temperatures
    i. Add library as cooling shelter
    ii. Add that the highway department has one small ac in breakroom
    iii. Add Fire department and grade school do not have AC
    iv. Add Somersworth warming shelter (just opened)
    v. Add average of three resident pipe burst calls per winter

l. Public Health Threats
    i. Add state and county level data to be included for COVID-19
    ii. Add COVID-19 impacts
        1. Townhall closure
        2. Town operations adjustments
        3. Virtual public meetings
        4. Mask regulations within town facilities and in departments

5. School shutdown
6. Two homes had issues connecting to internet (comcast)
    a. Connecting residents to comcast and state funding
7. New cleaning protocols
8. Department travel restrictions and quarantine protocols
9. Fire Department temperature checks, department closed to public, early eligibility for vaccines (90% vaccination as of 4/1/2021), closed for non-emergency visits
10. Police department two officer quarantines, staffing restrictions, vacation time backlog, stress of public interactions, protective eye gear, taking interactions outside of the home when possible, strained mental health resources, non-emergency, entrance way entrance for employees and arrests
11. Public meetings experienced possible increase in attendance to meetings due to virtual availability
12. Increase in staff time to educate and instruct committee members, boards, and public on virtual interface
13. High speed internet demand likely to increase

iii. Add Water/sewer improvements made due to arsenic testing failure
    1. Arsenic testing failures, corrosion control led to Lead and copper mitigations
        a. Corrosion control exceeded EPA standards

m. Terrorism
    i. Add fire department is part of the Seabrook nuclear power plant response and decontamination team

n. Radiological
    i. Fire department sends manpower for reception center, 7 radiological meters that are supplied by the state

The next meeting, which will be virtual, was set for Thursday, April 29th at 11:30AM. 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.

<u>Meeting #3: April 29, 2021</u>

Members present: Richard Fogerty (Planning Board Member), Caroline Kendall (Town Administrator), Ed Walsh (Ass. Road Agent), George Guilmette (Road Agent), Ray McNeil (Water and Sewer), Dick Fourtier (School), Shawn Glidden (Fire Department), Jon Uraskevich (Police Chief), Stef Casella (SRPC), and Kyle Pimental (SRPC).

Strafford Regional Planning Commission (SRPC) staff led the group through introductions and started the meeting by asking each committee member to provide an estimated amount of time they spent reviewing materials prior to the meeting to be captured as in-kind match. Times are summarized below.

- Richard Fogerty – .50 hr.
- Caroline Kendall – .50 hr.
- Ed Walsh – .50 hr.
- George Guilmette – 1.0 hr.
- Dick Fourtier – .50 hr.
- Shawn Glidden – .50 hr.
- Jon Uraskevich – .50 hr.

Next, SRPC staff led a review of the April 1, 2021 meeting summary. Minor revisions and edits were made, including that the school updated its electrical from a single phase to three phase and could be updated to include a generator as the panel is wired and ready, as well as the water treatment process was producing water with high levels of arsenic (exceeding EPA standards) due to lead and copper corrosion. Treatment, flushing, and an improved process at the treatment facility have been completed to address this issue.

Next, the committee reviewed the mitigation strategies document. Minor revisions included:

- The School needs shower facilities (has space) and a generator to be considered a long-term shelter
- Wellhead protection testing for potential contaminated July 2021 to be completed (last was done in 2018)

Next, the committee reviewed the vulnerability assessment tool. The committee changed the following hazard scores:

- Drought probability from 2 to 3
- Public health human losses from 1 to 2

Next, the planning team used an online platform to review the location of past hazards. The following hazards will be added to the map set:

- Flooding location Sligo Road at Sligo Brook (old box culvert)
    - Riprap along walls
- Remove Silver Lane flooding
    - New flooding area on Cottage Lane
- Add wind shear on Baer Road (area with a lot of pine trees)
- Add wildfire along railroad, Baer Road, and Scoutland Trails
- Add hazardous materials on Watson Lane (waste oil or oil from refinery being loaded to railroad cars)
- Add hazardous material on Green View Drive (oil refinery)
- Add hazardous material at WWTP on Lower Mill Road

Lastly, the committee began to brainstorm several actions. SRPC will follow up with mitigation materials prior to the next meeting.

The next meeting, which will be virtual, was set for Thursday, June 3rd at 11:30AM. 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 3, 2021

Members present: Richard Fogerty (Planning Board Member), Caroline Kendall (Town Administrator), Ed Walsh (Ass. Road Agent), George Guilmette (Road Agent), Shawn Glidden (Fire Department), Jon Uraskevich (Police Chief), and Kyle Pimental (SRPC).

Strafford Regional Planning Commission (SRPC) staff led the group through introductions and started the meeting by asking each committee member to provide an estimated amount of time they spent reviewing materials prior to the meeting to be captured as in-kind match. Times are summarized below.

- Richard Fogerty – .50 hr.
- Caroline Kendall – .50 hr.
- Ed Walsh – .50 hr.
- George Guilmette – .50 hr.
- Shawn Glidden – .50 hr.
- Jon Uraskevich – .50 hr.

Next, SRPC staff reviewed the final vulnerability assessment tool with the committee. The committee decided to make one revision, which included changing the probability of wildfire from two (2) to three (3) raising the overall threat from 3.3 (low) to 5.0 (moderate).

Next, the committee brainstormed several new mitigation strategies and worked through the STAPLEE method to try and prioritize actions based on potential challenges to completion. The committee will work on the implementation table at the final meeting.

The next meeting, which will be virtual, was set for Thursday, June 24th at 11:30AM. 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 #5: June 24, 2021

Members present: Richard Fogerty (Planning Board Member), Caroline Kendall (Town Administrator), Ed Walsh (Ass. Road Agent), George Guilmette (Road Agent), Shawn Glidden (Fire Department), Jon Uraskevich (Police Chief), Ray McNeil (Water and Sewer Supervisor), and Kyle Pimental (SRPC).

Strafford Regional Planning Commission (SRPC) staff led the group through introductions and started the meeting by asking each committee member to provide an estimated amount of time they spent reviewing materials prior to the meeting to be captured as in-kind match. Times are summarized below.

- Richard Fogerty – .75 hr.
- Caroline Kendall – .50 hr.
- Ed Walsh – .25 hr.
- George Guilmette – 0.5 hr.
- Shawn Glidden – .50 hr.
- Jon Uraskevich – .50 hr.
- Ray McNeil – .50 hr.

Next, the committee reviewed the meeting summary from the June 3rd meeting. There were no comments or revisions.

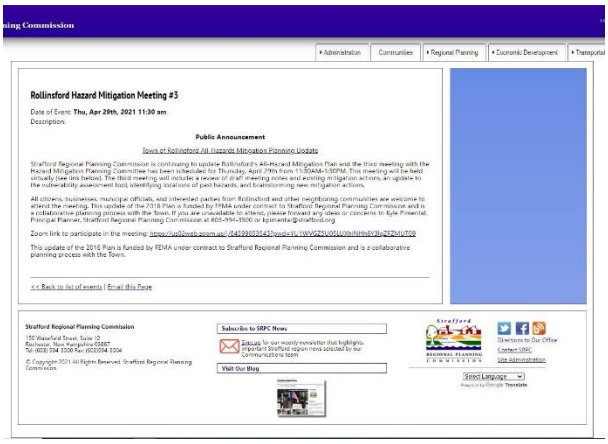
Next, the committee reviewed the draft inventory maps. Comments included: removing the well locations from the public maps (they will be kept on the municipal maps), add the railroads, add the two transmission line locations, and to change the transmission line category from communication to electricity function.

Next, the committee finalized the mitigation actions and implementation table. The STAPLEE method was used to prioritize all actions. Actions included, outreach and engagement, planning, and structure and infrastructure projects.

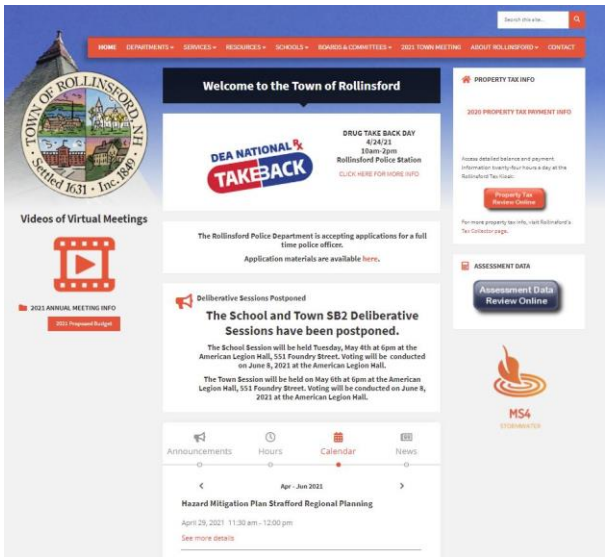
Lastly, SRPC went over next steps for adoption. The final plan would be submitted to HSEM by SRPC in July for conditional approval. Then it would be adopted at a public meeting by the Board of Selectmen. Finally, an approval letter would be obtained by FEMA to complete the update.

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. The following staff and personnel were invited to participate: The Town Administrator, School Board Chair, Police Chief (EMD), Assistant Road Agent, Water and Sewer District Superintendent, Grade School Facilities Manager, Planning Board, Road Agent, Assistant Fire Chief, and Interim Police Chief. 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 to ensure that adjacent communities were aware of Rollinsford'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 Town Hall in advance of each Committee meeting. The Committee met five times between March 12, 2021 and June 24, 2021. 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

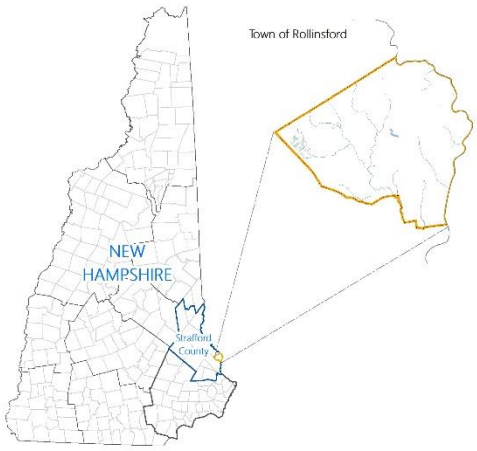
Once approved by the Planning Committee, the Plan will be forwarded to HSEM for Conditional Approval. Upon review and conditional approval by HSEM, the Board of Selectmen will hold a public meeting, to consider public comments and must promulgate a signed Resolution to Adopt the Plan.

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 II: Community Profile

Overview

The Town of Rollinsford is in southeastern Strafford County, New Hampshire. It sits on the border of New Hampshire and Maine, bounded by the Towns of Berwick and South Berwick, Maine, northwesterly by Somersworth, and southwesterly by Dover and easterly by the Salmon Falls River. With an estimated population of 2,522 (according to the 2019 American Community Survey, US Census), Rollinsford has experienced roughly a 5% decrease in total population since 2000 (2,648). This decrease is not in line with the regional demographic trend of Strafford County, which has experienced an estimated 13% increase in population over the same period and is one of the fastest growing areas in the state of New Hampshire.



Map 1: Rollinsford Locus Map (Source: SRPC, 2021)

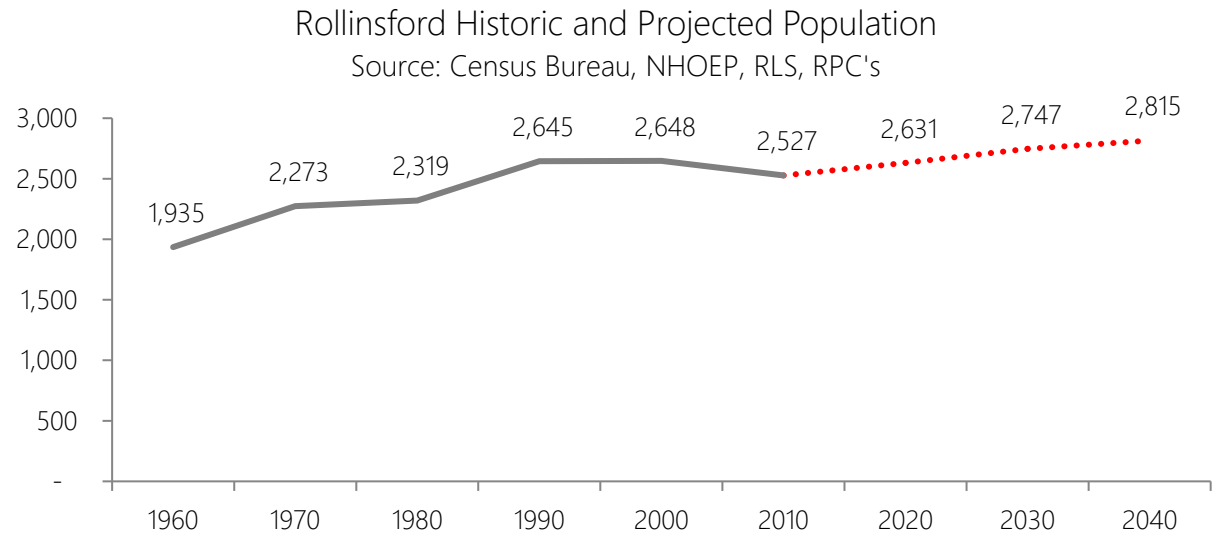
The Town of Rollinsford covers an area of 7.56 square miles (4,838.4 acres), with land area of 7.31 square miles (4,678.4 acres), and water area of 0.25 square miles (160 acres). Rollinsford is triangular in shape with each of the three sides measuring about 4 miles in length. Most of the town is rural and residential composed of large and small farms with historic and new homes.

Topographically, Rollinsford is relatively flat with open, rolling hills. The highest point is 304 feet above sea level on Garrison Hill, which is on the west end of Rollinsford, and borders the City of Dover. The lowest point is sea level at the water's edge. Rollinsford is bounded easterly by the Salmon Falls River. With its source at Great East Lake in Wakefield, and traveling south through Milton's Three Ponds, the river runs from north to south along the border of New Hampshire and Maine into the Piscataqua River. There are some rapids or falls along the river because of the resistant rocks deposited glacially, which made the river good for manufacturing purposes in the 17th century. Another stream in Rollinsford is Fresh Creek that flows into the Cocheco River in the southern part of the town. It flows parallel with the Salmon Falls River and is located about half a mile from Salmon Falls. The water supplying this creek comes from both Rollins Brook and Twombly Brook, which flow in a southern direction through the central part of the town and meet several miles from the Cocheco River to form Fresh Creek.

According to the Rollinsford C-RiSe Report [2017], the inland coastal portion of Town that is most susceptible to coastal flooding is located in low areas along the Salmon Falls River. Sections of Foundry Street and Sligo Road are both within the coastal floodplain area, making them particularly vulnerable to flooding from seasonal high tides, coastal storms, and sea-level rise.

Population Growth

Historically, Rollinsford (and much of the Strafford Planning Region and New Hampshire) experienced rapid population growth beginning in the 1960s and continuing through 1990. In the past two decades however, population growth rate has slowed. In fact, Rollinsford witnessed complete stagnation between 1990 and 2000 and a loss in population between 2000 and 2010. In the three decades between 1960 and 1990, Rollinsford's population grew at an average rate of 6%. In the two decades between 1990 and 2010, the rate of change was -2%.



Project Population Change

National population projections by the Census Bureau suggest that the United States will reach a population of approximately 380 million by 2040 (an 18% overall population growth). Although the Stafford Planning Region is not expected to grow on pace with the national rate, it is expected to grow by close to 10%, a significantly higher rate than projected for the state of New Hampshire (7.2%). Population projections completed by the New Hampshire Office of Energy and Planning and the state's Regional Planning Commissions, suggest that the town of Rollinsford can expect an overall growth in population of 11% (approximately 3.8% per decade) in the 30-year period between 2010 and 2040.

Housing

In the period between 1990 and 2010, Rollinsford experienced an increase of nearly 60 total housing units. Occupancy-type data show that in the same 20-period, total renter-occupied unit count decreased, and owner-occupied units represented all growth.

According to 5-year estimates from the U.S. Census Bureau, Rollinsford's total housing units have remained steady, with a slight increase of approximately 3% since 2015. Similarly, owner occupied and renter occupied housing units have held at a 75 – 25 splits with small variable changes. With little population growth projected over the coming three decades, limited new housing unit development is expected.

Table 1: Housing Data 2015-2019

	2015	2016	2017	2018	2019	% Change 2015-2019
Total Housing Units	1,010	1,026	1,048	1,031	1,040	+2.9%
Owner Occupied Housing Units (%)	74.4%	72.7%	73.0%	73.3%	76.7%	+2.3%
Renter Occupied Housing Units (%)	25.6%	27.3%	27.0%	26.7%	23.3%	-2.3%

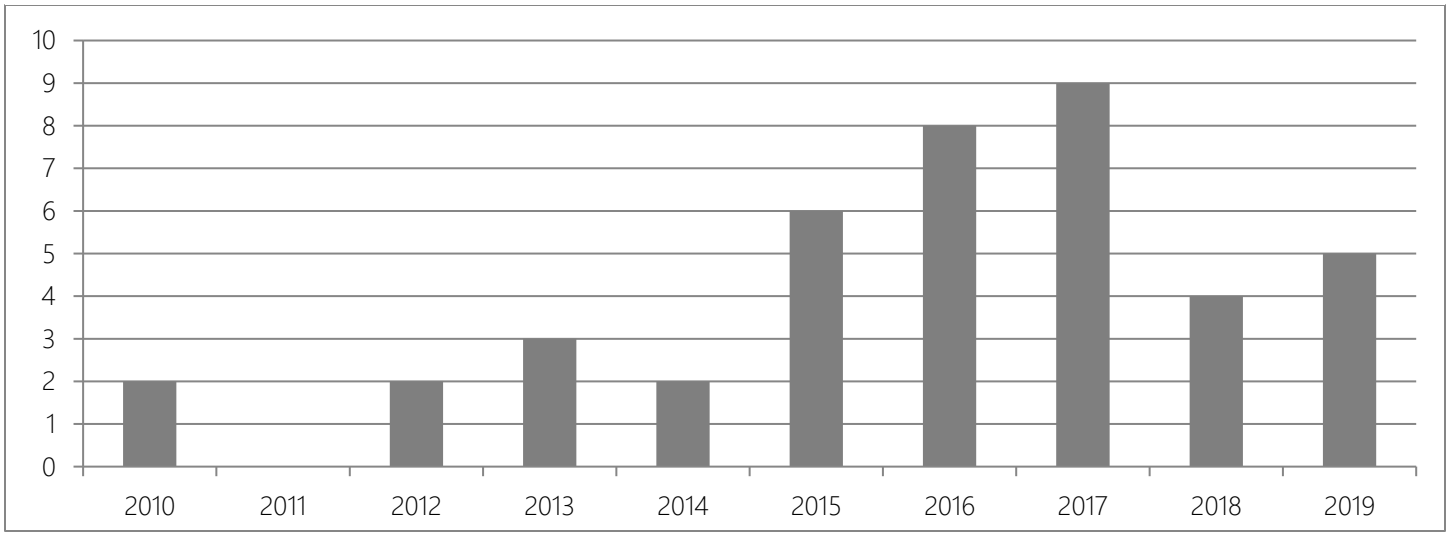
Source: U.S. Census Bureau, American Community Survey 5-Year Estimates

Building Permit Data

Building trend data suggest that in the period between 2010 and 2019, the average annual net building permits in Rollinsford was around 4.1 units per year. This is slightly up from below two units per years between 2000 and 2013. This is representative of not only stagnating population growth, but also of the impacts of the economic recession of the mid-late 2000's. Development has been pretty scattered and not falling into any particular scheme, but the Town recognizes that it will continue to grow slowly in the coming years. Rollinsford is dominated by medium and high-density residential zoning in the outlying areas of town with the commercial and industrial zones near the Salmon Falls Mills (except for commercial 2, which is on the western side of town adjacent to the Dover city line). Subsequently, development is likely to be driven by parcel size and tax stabilization efforts.

As mentioned in earlier sections, the Planning and Select Boards have tried to steer any major commercial developments into existing crossroads, out of rural countryside, and away from potential flooding dangers. While there are no major subdivisions soon, Rollinsford has recently amended their Flood Hazard District zoning ordinance to help reduce or eliminate flood damage and will review the new OSI Model Ordinance.

Figure 1: Net Building Permits 2010-2019

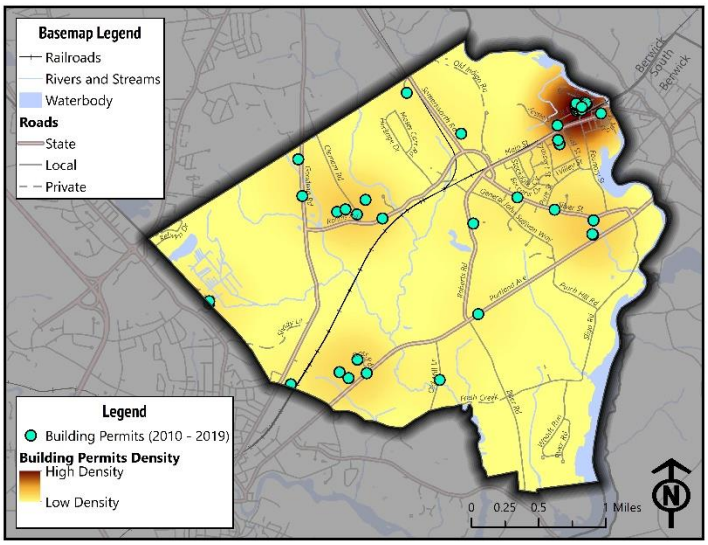


Source: NHOSI

The Town will also 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.

Development Trends

A GIS density analysis was completed using building permit data collected from 2010 – 2019 to identify and map clusters of development. By looking at these past development trends the town recognizes that it will continue to grow in the coming years and will continue to monitor and improve their floodplain management regulations, as needed, for all subdivision and site plan proposals to reduce or eliminate flood hazards and damage.



Map 2: Development Density Map (Source: SRPC, 2021)

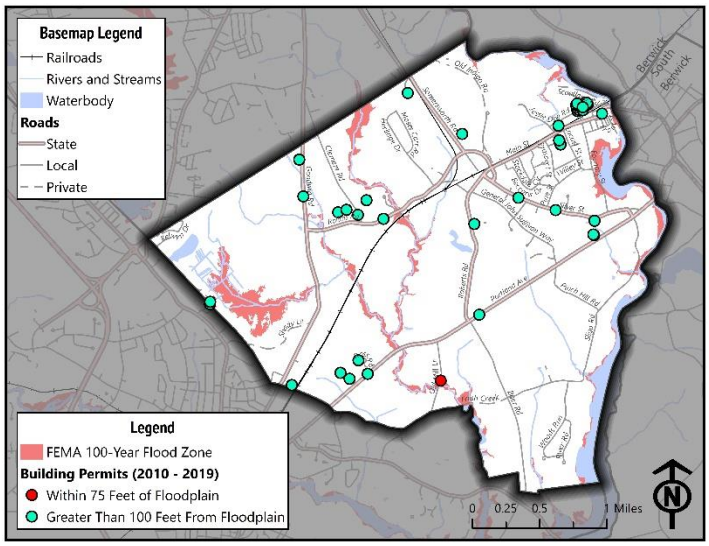
The results indicate that the predominant development type over the last several years has been residential and has been largely scattered throughout the town along existing major transportation corridors, including Rollins Road, Portland Ave (Route 4), and Silver Street. Most of the higher density development was in the downtown area.

The issuance of a building permit does not always directly correlate with new development and these maps should be used for general planning purposes only.

Development within the FEMA Floodplain

According to a simple GIS analysis, of all the building permits issued over the course of the last ten years (2010 – 2019), there were zero homes identified within the FEMA floodplain; however, a follow-up analysis was completed to select locations that may be within 75 feet adjacent to the FEMA floodplain. The results of that analysis indicated one home within 75 feet of the floodplain (shown on Map 3) on Old Mill Lane.

It is important to note building permit data does not always correlate directly with new construction. Due to limitations with the analysis, it is unclear as to the exact location of those structures and whether they are vulnerable to flooding.



Map 3: Building Permits within 75' of Floodplain (Source: SRPC, 2021)

Table 2: Building Permits Within or Close Proximity to FEMA Floodplain (2010-2019)

Location	Year	Type	Proximity
Old Mill Lane	2016	Single Family Residential	Within 75 Feet of FEMA Floodplain

[Source: Town of Rollinsford, 2021]

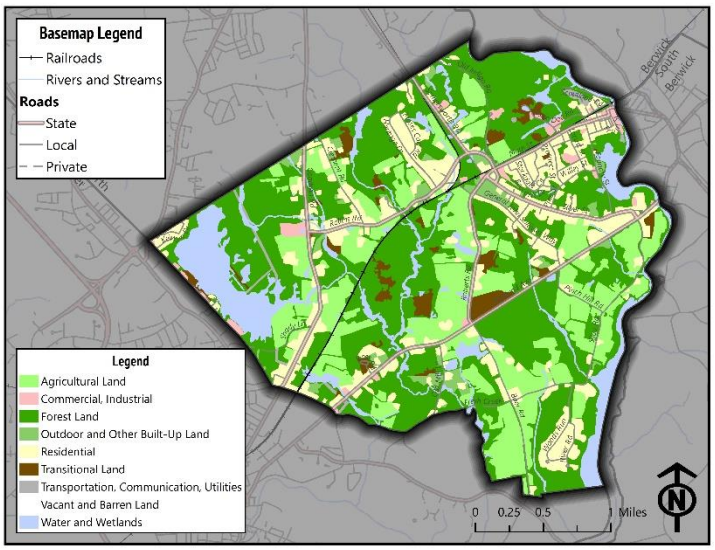
Over the course of the last ten years, Rollinsford has successfully steered new developments away from existing and potential flooding dangers; however, as more extreme precipitation events occur Rollinsford will need to continue to proactively plan for future flooding scenarios along with guiding development away from vulnerable areas. Therefore, the community's vulnerability has remained the same. Looking ahead, the Town will use this Plan as a guide to determine where past hazards have been documented and guide development away from these hazard areas.

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, Rollinsford has seen a slight decrease in population over the course of the last two decades. This has resulted in a negligible amount of land converted to residential. See Table 3 for a more detailed analysis of land use changes of time.

According to the 2015 regional land use layer, roughly 16% (795 acres) of the total acreage is currently classified as residential, scattered throughout the town and along existing major transportation corridors. Rollinsford 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 nearly 1% loss of forest land due to land conversion.

The town will continue to review and improve existing land use regulations, which may include zoning amendments and/or revisions to their site plan and subdivision regulations, as necessary, to help guide development in a sustainable and responsible manner.



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

Table 3: Land Use Data 2010-2015

Land Use Classification	Acres (2010)	% of total acreage	Acres (2015)	% of total acreage	5-year (+/-) % change
Residential	766.6	15.8%	795.1	16.4%	0.6%
Commercial & Industrial	56.4	1.2%	63.8	1.3%	0.2%
Agriculture	1043.1	21.5%	1021.2	21.1%	-0.5%
Forest Lands	2075.3	42.9%	2042.4	42.2%	-0.7%
Wetlands	374.1	7.7%	374.9	7.7%	0.0%
TOTAL	**4315.5**	**89.1%**	**4297.4**	**88.7%**	**N/A**

This analysis does not include transportation, communication, utilities, outdoor and other urban built-up land, transitional land, open water, and barren lands, which make up the remainder of the land in Rollinsford.

Chapter III: Asset Inventory

This chapter includes Critical Facilities and Key Resources (CF/KR) within the Town of Rollinsford 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. 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.

"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 in other communities may not mapped.

Table 4: Emergency Response Facilities (ERF)

ERF's are primary facilities and resources that may be needed during an emergency response

Facility	Type	Address
*Police Station	Emergency Operation Center	667 Main Street
*Town Hall	**Emergency Shelter	667 Main Street
*Fire Station	**Emergency Shelter	17 Roberts Road
*Rollinsford Grade School	**Emergency Shelter	487 Locust Street
*American Legion Hall	Secondary Shelter	551 Foundry Street
Dover Middle School (Dover)	Regional Shelter	16 Daley Drive
Idlehurst School (Somersworth)	Regional Shelter	46 Stackpole Road
Flanagan Center (Somersworth)	Regional Shelter	25 Bartlett Street Somersworth Housing Authority
Strafford County Warming Center (Somersworth)	Warming Shelter	30 Willand Drive
Rochester Middle School (Rochester)	Regional Shelter	47 Brock Street
Community Center (Rochester)	Regional Shelter	150 Wakefield Street
*Highway Department	Emergency Fuel	35 Jessie Doe Road
Turnpike Maintenance (Dover)	Secondary Fuel	95 Indian Brook Drive
Turnpike Maintenance (Rochester)	Secondary Fuel	Exit 16 Spaulding Turnpike
Maintenance Garage (Durham)	Secondary Fuel	213 Main Street
Irving (Somersworth)	Secondary Fuel	425 High Street
***Evacuation Routes	Evacuation Planning	Route 4 Rollins Road

*The Police Station, Town Hall, and Fire Station all have generators; the Rollinsford Grade School is in the process of getting a generator; there is no generator at the American Legion and can only be used as a secondary shelter if they have power; the Highway Department has a smaller generator that provides limited power to run emergency systems and offers diesel fuel only.

**The emergency shelters identified in this plan are to be used locally for immediate shelters and due to lack of certain resources may not quality as emergency shelters as defined by the Red Cross. If needed, Rollinsford will send residents to regional shelters in neighboring communities, such as Dover or Somersworth, for more long-term needs. Somersworth also has a new warming facility. To date, the Town has never had to use any regional shelter.

***There may be other roads in Town that could be used as secondary egress, depending on the type of hazard, to move larger amounts of people in and out, such as Somersworth Road and Main Street, as well as Central Ave in Dover to access the hospital. During any large-scale evacuation, the Town should reference the ERF map in the Appendix of this plan to locate other possible local evacuation routes in neighboring communities when making decisions.

Table 5: Non-Emergency Response Facilities (NERF)

NERF's are facilities considered essential, that although critical, not necessary for immediate emergency response effort.		
Facility	**Type**	**Address**
Wastewater Treatment Plant	Water Facility	5 Lower Mill Road
Rollinsford Transfer Station	Recycling Center	37 Jessie Doe Road

Table 6: Critical Facilities (CF)

CF are important structures that may be vulnerable during a hazardous event		
Facility	**Type**	**Address**
Pump Station	Pump Station	Foundry Street
Power Plant	Power Substation	Lower Mill Road
Power Plant	Power Substation	Foundry Street
Moscato Recreation Pond Dam	*Low Hazard	Location needed
Rollinsford Dam	**Significant Hazard	Salmon Falls River
South Berwick Dam	**Significant Hazard	Salmon Falls River
Lower Great Falls Dam (*Somersworth*)	***High Hazard	Salmon Falls River

* A Low Hazard Structure means a 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.
** A Significant Hazard Structure means a 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.
*** A High Hazard Structure means a 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.

Wentworth Douglass Hospital	Helipad	789 Central Ave (Dover)
Wentworth Greenhouses	Hazardous Material	141 Rollins Road
Taylor Rental	Hazardous Material	432 Portland Ave

Table 6: Critical Facilities (CF)		
Wentworth Greenhouses	Hazardous Material	141 Rollins Road
Railroad Transfer Yard	Hazardous Material	Watson Lane
Wentworth Oil Service	Hazardous Material	141 Rollins Road
Oil Energy Recovery Inc.	Hazardous Material	141 Rollins Road
Transfer Station (closed land fill)	Hazardous Material	37 Jessie Doe Road
Affordable Oil	Hazardous Material	145 Rollins Road
Greenview Technologies (Safe-tee clean)	Hazardous Material	131 Greenview Drive
Janco Inc.	Hazardous Material	50 Goodwin Road
Note: The gas pipeline along Route 4 has also been identified by the planning committee as a hazardous waste facility.		
Cell Tower (Verizon)	Communication Function	Jessie Doe Road
Cell Tower (Nextel)	Communication Function	19 Highland Ave (Garrison Hill, Dover)
Repeater	Communication Function	Water Tower at Transfer Station
Switching Station	Communication Function	37 Jessie Doe Road
Switching Station	Communication Function	17 Roberts Road
Transmission Lines	Electricity Function	Foundry Street
Transmission Lines	Electricity Function	Rollins Road
Water Tower	Water Tank/Tower	Jessie Doe Road
Well	Water Facility	Scoutland Road
Well	Water Facility	General John Sullivan Way
Well	Water Facility	Foundry Street
Rollinsford #108/098 (NHDOT)	Transportation	Front Street over Salmon Falls
Rollinsford #106/098 (Railroad)	Transportation	Pan Am RR over Church Street & Scoutland Road
Rollinsford #116/086 (NHDOT)	Transportation	NH4 over Salmon Falls River
Rollinsford #091/085 (NHDOT)	Transportation	Rollins Rd over Main St & Pan Am RR
*Rollinsford #069/046 (NHDOT)	Transportation (Redlist)	Oak Street over Pan Am Railways
Rollinsford #090/052 (Local)	Transportation (Redlist)	Old Mill Lane over Fresh Creek

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

*NHDOT has indicated that the Oak Street Bridge is slated for replaced in calendar year 2027, with the completion of design work in 2023. The City of Dover has chosen to remove this project from their CIP and will be looking at how the City can add pedestrian amenities to this section of Oak Street.

Table 7: Vulnerable Populations to Protect (VPP)		
Vulnerable populations can be defined broadly to include those who are not able to access and use the standard resources offered in disaster preparedness and planning, response, and recovery		
Facility	Type	Address
Rollinsford Grade School	School	487 Locust Street
St. Mary's Church	Religious Facility	411 Church Street
Fun Time University	Daycare Facility	487 Locust Street

Table 8: Historic, Cultural, Recreation, and Economic Resources

Historic, Cultural, Recreation, and Economic Resources are those local assets that have been identified by the community that play an important role in the overall quality of life and should be considered during emergency planning

Facility	Type	Address
Hiram Roberts Grange	Historic	449 Roberts Road
Pony Truss Bridge (Old Dodge Farm)	Historic	Off Rollins Road over Pan Am Railways
St. Mary's Church	Historic	411 Church Street
Upper and Lower Mill	Historic	1 & 3 Front Street
Mill Agent's Home	Historic	75 South Street
Intact Mill Village	Historic	Downtown Rollinsford
Pear Tree School	Historic	Rollins Road
Rollinsford Grade School	Historic	487 Locust Street
Town Hall	Historic (*National Register*)	667 Main Street
Salmon Falls Mill Historic District	Historic (*National Register*)	Front Street
Rollinsford Grade School	Historic *(National Register)*	487 Locust Street
Morton Park	Historic	Roberts Road & Silver Street
Old Town Cemetery	Historic	Roberts Road
New Town Cemetery	Historic	Silver Street
St. Patrick's Cemetery	Historic	Silver Street
St. Michael's Cemetery	Historic	Silver Street
Town's Oldest Cemetery	Historic	Off Heritage Drive
Col. Wentworth Mansion	Historic	47 Water Street
Lower Salmon Falls Mill	Economic Impact Area	Front Street
Upper Salmon Falls Mill	Economic Impact Area	Front Street
Salmon Falls Village District	Economic Impact Area	Front Street
Little League Field (Softball field next to fire station)	Recreational Site	Roberts Road
Gold Star Park	Recreational Site	Foundry Street
Morton Memorial Park	Recreational Site	Roberts Road
Rollinsford Community Garden	Recreational Site	464 Foundry Street
Grade School Playground	Recreational Site	487 Locust Street
Grade School Sports Field	Recreational Site	487 Locust Street
Salmon Falls Park	Recreational Site	Front Street
Sandy Bank	Recreational Site	Locust Street
Scoutland Trails	Recreational Site	Scoutland Road
Foundry Boat Launch	Recreational Site	Foundry Street

Table 9: Water Resources		
Sources of water that may be of potential use during emergencies.		
Facility	Type	Address
Janco Fire Pond	Fire Aid	Rollins Road
Robert's Road Fire Pond	Fire Aid	Roberts Road
*Dry Hydrant	Fire Aid	Front Street
*Dry Hydrant	Fire Aid	Rollins Road
*Dry Hydrant	Fire Aid	Moses Carr Road
Water Tower	Water Tank/Tower	Jessie Doe Road
Well	Water Facility	Scoutland Road
Well	Water Facility	General John Sullivan Way
Well	Water Facility	Foundry Street

*The status of several dry hydrants remains unconfirmed as working hydrants with uncertain plans to replace and/or repair. A recommendation in this plan should reference the need for the Town to investigate what future maintenance needs will be required, as well as to determine if the Foundry Street boat launch is a suitable location.

Chapter IV: 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 the FEMA floodplain, identified past and potential hazard areas (flooding, hazardous materials, wildfire, and wind shear) from previous hazard mitigation updates, or the 6.3ft of sea-level rise with a storm surge. Table 10 lists the 19 CF/KRs located within those areas with a potential loss value estimate of $12,234,020 at 100%.

Table 10: Vulnerable Critical Facilities/Key Resources

Facility Name	Facility Type	Hazard	100% of Structure Value
Lower Great Falls Dam *(Somersworth, NH)*	High Hazard Dam	Flooding; Dam Breach Salmon Falls River	The Dam Bureau at NHDES has investigated 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, hydropower), assessed values are hard to estimate and cannot be determined accurately.
South Berwick Dam	Significant Hazard Dam	Flooding; Dam Breach Salmon Falls River	
Rollinsford Dam	Significant Hazard Dam	Flooding; Dam Breach Salmon Falls River	
Route 4 over Salmon Falls River	State Bridge (116/086)	FEMA Flood Zone	$7,872,000 (164 x 48 x $1,000)
Old Mill Lane over Fresh Creek (REDLIST)	Local Bridge (090/052)	Past & Potential Flooding	$252,000 (21 x 12 x $1,000)
Route 4 at Roberts Road	Transportation	Hazardous Waste	The planning committee identified the entire length of both Route 4 and the Pan Am rail-line as potential structures that could be damaged during an accident or collision. The value for each structure along any stretch of roadway or rail-line would depend largely on the circumstances of the event. Therefore, it is hard to estimate an assessed value and cannot be determined accurately at this time.
Pan Am Rail Line	Transportation	Hazardous Waste	
Greenview Technologies	Hazardous Materials	Hazardous Waste	$742,320
Upper and Lower Salmon Falls	Economic Impacts Area & Historic	FEMA Flood Zone	$2,643,000
New Town Cemetery	Historic	Past & Potential Flooding	N/A

Facility Name	Facility Type	Hazard	100% of Structure Value
St. Michael's Cemetery	Historic	Past & Potential Flooding	N/A
Mill Agent's Home	Historic	Past & Potential Flooding	$404,500
Colonel Wentworth Mansion	Historic	Past & Potential Flooding	$320,200
Pony Truss Bridge (Old Dodge Farm)	Historic	Wildfire	N/A
Rollinsford Community Garden	Recreation Site	FEMA Flood Zone	N/A
Foundry Boat Launch	Recreation Site	FEMA Flood Zone; Past & Potential Flooding	N/A
Scoutland Trails	Recreation Site	Past & Potential Flooding	N/A
Dry Hydrant	Fire Aid	FEMA Flood Zone; Past & Potential Flooding	N/A
Dry Hydrant	Fire Aid	Past & Potential Flooding	N/A
		TOTAL	$12,234,020

The GIS analysis completed by Strafford Regional Planning Commission showed that no emergency or nonemergency response facilities fell within the FEMA floodplain, identified past and potential hazard areas (flooding, hazardous materials, wildfire, and wind shear) from previous hazard mitigation updates, or the 6.3ft of sea-level rise with a storm surge. The data did reflect impacts to several of the town's critical facilities, including three dams (one of which is in Somersworth), state and local bridge crossings, and the rail line It should be noted that due to limitations with the mapping data, it was impossible to determine what the extent of the damage would be at each location; however, it is safe to say that these areas are likely vulnerable to flooding under a variety of scenarios.

Other infrastructure included Greenview Technologies; the Mills (Upper and Lower); several cemeteries, historic resources, and recreational sites, and two fire aids. Fire aids are intentionally located near 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.

Flooding on the Salmon Falls River after Hurricane Sandy – Rollinsford Police Dept

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. Therefore, we have used the assumption that hazards that impact structures could result in damage **0-1%**, **1-5%**, or **5-10%** of Rollinsford's structures, depending on the nature of the hazard, whether the hazard is localized, and its economic impact.

The total local assessed value included in this analysis is $182,839,000 including $178,968,000 for buildings and $3,871,000 for utilities. Based on this assumption, the potential loss from any of the identified hazards would range from **$0 to $1,828,390 (low)** or **$1,828,390 to $9,141,950 (medium)** or **$9,141,950 to $18,283,900 (high)** based on the 2019 Rollinsford Town valuation. Table 11 provides more detail on these estimated economic losses.

Table 11: Economic Loss Data

Local Assessed Valuation

	Total Assessed Value (2019)	Economic Loss		
		Low (1% damage)	Medium (5% damage)	High (10% damage)
Buildings				
Residential	$142,815,100	$1,428,151	$7,140,755	$14,281,510
Manufactured	$489,500	$4,895	$24,475	$48,950
Commercial	$35,663,400	$356,634	$1,783,170	$3,566,340
Total Buildings	**$178,968,000**	**$1,789,680**	**$8,948,400**	**$17,896,800**
Public Utilities				
Public Water	$0	$0	$0	$0
Gas	$179,000	$1,790	$8,950	$17,900
Electric	$3,692,000	$36,920	$184,600	$369,200
Total Utilities	**$3,871,000**	**$38,710**	**$193,550**	**$387,100**
Net Valuation of Buildings and Utilities	**$182,839,000**	**$1,828,390**	**$9,141,950**	**$18,283,900**

Source: NH Department of Revenue Administration. 2019 Annual Report. Assessed value does not include value of land or local exemptions. https://www.revenue.nh.gov/mun-prop/property/equalization-2019/documents/tbc-alpha-order.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 V: National Flood Insurance Program (NFIP)

The Office of Strategic Initiatives, (OSI) administers the National Flood Insurance Program (NFIP) in New Hampshire. The NFIP is a partnership between a community and the federal government. Communities participate by agreeing to adopt and enforce a floodplain management ordinance designed to reduce future flood risks and in return all residents in those participating communities (whether in floodplain or not) can purchase flood insurance. Currently 217 communities (92 percent) that participate in the NFIP have adopted at least the minimum standards of the NFIP.

Through FEMA's Community Assistance Program, OSI provides technical assistance to communities and the public on floodplain management and helps to promote sound land use planning techniques that will reduce flood losses. OSI conducts Community Assistance Visits to ensure that communities participating in the NFIP are meeting program goals.

Rollinsford Flood Insurance Program (NFIP) Status

According to FEMA's Community Status Book Report, Rollinsford has been a member of the National Flood Insurance Program (NFIP) since April 2, 1986. The Town does have a few significant portions of land in the 100-year floodplain; along the Salmon Falls River, Fresh Creek, Rollins Brook, and Twombly Brook. There are limited structures within this floodplain according to available GIS Flood Insurance Rate Map (FIRM) data and aerial imagery.

According to FEMA's Community Information System (as of 3/2/2021) Rollinsford is listed as having 4 total policies (two are single family homes and two are non-residential buildings) in the floodplain hazard area and has had zero paid losses and zero repetitive loss claims. All four policies are preferred risk and are not required. Preferred risk offers policies for buildings that are in moderate-to-low areas (B, C, and X Zones).

Table 12: Rollinsford's Insurance Zone Policies

Zone	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Loses	Amount of closed Paid Loses	Repetitive Loses
AE Zones	0	$0	$0	0	$0	0
A Zones	0	$0	$0	0	$0	0
B,C & X Zone						
Standard	4	N/A	$1,700,000	12	$0	0
TOTAL	**4**	**N/A**	**$1,700,000**	**12**	**$0**	**0**

To remain NFIP compliant, the Town has accomplished the following floodplain management actions:

- The Rollinsford Board of Selectmen adopted the new floodplain maps (Coastal NH Floodplain Mapping Update) by approving a resolution at a public selectmen's meeting on July 13, 2015. The resolution references RSA 674:57, which is the state law that authorizes the selectmen to adopt such a resolution. The legislature enacted this statute because it was understood that there would be a time lag between the date by which

new floodplain maps would become effective and New Hampshire's town meeting date. The purpose of the statute authorizing the selectmen to adopt the maps by resolution was to avoid requiring town to hold special town meetings. However, it is understood that Rollinsford will vote on the map amendments at its 2016 town meeting. The resolution also allows the selectmen to make changes in the Town's Flood Hazard District zoning ordinance. As noted in the Flood Hazard District:

- Rollinsford is actively using data from FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) initiative to increase public awareness, which will lead to action that reduces risk to life and property.

- Rollinsford continues to reference the 2011 culvert assessment to help identify transportation infrastructure most threatened and reduce flooding impacts. This assessment assists town officials minimize future flooding, protect lives, property, and infrastructure, thus enhancing public safety.

- The committee provided the following projects.
    a. Culvert replacement on Wiley Street: In August of 2017, the Town financed the replacement of a 30" culvert that went across the width of the road at the lowest point at the location of a stream bed with a 36" diameter pipe. The pipe was lengthened by 10 feet at the outlet and the downstream roadway side slope was flattened and stoned. Headwalls were installed at the inlet and outlet and a stone swale was constructed along the northern pavement edge.
    b. Culvert replacement on Mill Road: In August of 2017, the Town replaced an existing 15" CMP with a 30" PVC and 36" PE pipe outfall to the Salmon Falls River. Construction included the replacement of a catch basin and drainage manhole, and the resetting of a dry rubble masonry wall.
    c. Culvert replacement on Pine Street: In August of 2017, the Town replaced an existing 36" diameter CMP with a 36" R.C. pipe. The pipe was lengthened at the outlet and headwalls constructed at the inlet and outlet. Stone protection was installed at the inlet and outlet.
    d. Culvert replacement on Sligo Road: The Town received an engineering report from Hoyle Tanner Associates in 2015 outlining the full condition of the culvert. Since then, the road was reduced to one-lane travel. The Town since took the immediate action recommended by the engineers allowing the road to be fully reopened. In 2020 a wetlands permit was issued from NH DES allowing the Town to install riprap and larger rocks to curb erosion on the inlet side. The Town needs to evaluate the engineering report against the work that has been and will be completed to ensure all the outlined concerns have been addressed.
    e. Culvert replacement on Foundry Street: In 2020 the Town installed a culvert near the sewer pump station. The culvert connected the ditch on the westerly side of the road with the outlet leading toward the river on the easterly side of the road. The culvert originally connected a stormwater drain located in the middle of the road to the outlet.
    f. Construction of a temporary bridge on Old Mill Road: The bridge is on the New Hampshire Department of Transportation's red listed bridge list. A letter received from NH DOT in 2017 provides

a preliminary estimate of $965,000 to replace the bridge which would qualify for 80% reimbursement. The Town's portion would be $193,000 should the bridge be replaced with a permanent structure rather than replacing it with a new, temporary bridge. In December 2019, the Town applied for State Bridge Aid for this project.

- The Town continues to evaluate their flood areas and will look to improve floodplain management in the community.

Chapter VI: Hazards & Mitigation Strategies

Overview

This section describes the location and extent of hazards that could impact the Town of Rollinsford, 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 Team 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.

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 probably of each hazard.

- High: There is a very strong likelihood that Rollinsford will experience a hazardous event within the next 25 years. Score = 3
- Moderate: There is moderate likelihood that Rollinsford will experience a hazardous event within the next 25 years. Score = 2
- Low: There is little likelihood that Rollinsford 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 Team came together and broke down the Town's impact to these hazards. 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 Rollinsford. Score = 6.0 or greater
- **Moderate:** There is moderate risk of this hazard in Rollinsford. Score = 3.5 – 5.9
- **Low:** There is little risk of this hazard in Rollinsford = less than 3.5

Hazard Ratings in Rollinsford, NH

The Team determined that the hazards are distributed as follows:

- 4 hazards rated as having a **high** overall risk in Rollinsford are: Hazardous Material, Flooding (Riverine/Extreme Rain), Winter Weather, and Public Health
- 6 hazards rated as having a **moderate** overall risk in Rollinsford are: Hurricane & Tropical Storms, Tornado & Downburst, Radiological, Severe Thunderstorms, Drought, and Wildfire
- 6 hazards rated as having a **low** overall risk in Rollinsford are: Coastal Flooding, Terrorism, Dam Failure, Extreme Temperatures, Earthquake, and Landslide

Table 13 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 Team.

Hazard Vulnerability Table

Table 13: Hazard Vulnerability Assessment Tool – Town of Rollinsford

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 = 0-3* *Moderate = 4-6* *High = > 7* *(Severity x probability)*
Hazard Event						
Hazardous Material	3	3	3	3	3	9.0
Flooding (Riverine/Extreme Rain)	1	2	3	2	3	6.0
Winter Weather	1	2	3	2	3	6.0
Public Health	1	2	3	2	3	6.0
Hurricane & Tropical Storms	2	3	3	2.7	2	5.3
Tornado & Downburst	3	2	3	2.7	2	5.3
Radiological	3	2	3	2.7	2	5.3
Severe Thunderstorms & Lightning	1	2	2	1.7	3	5.0
Drought	1	2	2	1.7	3	5.0
Wildfire	1	2	2	1.7	3	5.0
Coastal Flooding	1	2	2	1.7	2	3.3
Terrorism	3	2	3	2.7	1	2.7
Dam Failure	2	3	3	2.7	1	2.7
Extreme Temperatures	1	2	1	1.3	2	2.7
Earthquake	1	1	1	1	1	1.0
Landslide	1	1	1	1	1	1.0

Declared Disaster and Emergency Declaration

Table 14: Presidentially Declared Disasters (DR) 1990-March 2021 impacting the Town of Rollinsford

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	Caused extensive damage in Rockingham and Strafford counties, but the effects were felt statewide.
October 29, 1996	Severe Storms & Flooding	Oct 20-23, 1996	FEMA 1144-DR	PA	$2,341,273	Excess of 12 inches of rain. Rate of 1 to 2 inches per hour causing road closing, flooded residents, damage to low lying public facilities and general erosion. Sligo Road was flooded from Lower Pond, causing roadbed damage. Lower floors of the Mill buildings were flooded.
January 15, 1998	Ice Storm	January 7-35, 1998	FEMA 1199-DR	PA/IA	$12,446,202	Significant power outages. The school was closed for several days.
May 25, 2006	Severe Storm & Flooding	May 12-23, 2006	FEMA 1643-DR	PA/IA	$17,691,586	Major flooding and road closures. Damage to the Lower Mill and Foundry Street.
April 27, 2007	Severe Storm & Flooding	April 15-23, 2007	FEMA 1695-DR	PA/IA	$26,826,780	Major flooding. Damages to Foundry Street and Clement Road.
August 11, 2008	Severe Storms, Tornado, & Flooding	July 24, 2008	FEMA 1782-DR	PA	$3,673,097	No major damage was recorded in Rollinsford.
January 2, 2009	Severe Winter Storm	December 11-23, 2008	FEMA 1812-DR	DFA/PA	$14,898,663	Numerous power lines were down, and a significant number of roads were closed.

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
March 29, 2010	Severe Winter Storm	February 23-March 3, 2010	FEMA 1892-DR	PA	$6,841,093	Tree removal and power outages. There was no access to residential houses on Sligo Road. Power was out for most of the town for 4-7 days.
September 3, 2011	Tropical Storm Irene	August 26 – Sept 6, 2011	FEMA 4026-DR	PA	$17,684,244	Emergency Operations Center was opened and staffed by Chief Robert Ducharme and Deputy Fire Chief Kevin Hurd. Strafford Dispatch and WebEOC were both notified. Throughout the storm there were significant power outages to portions of Clement Road, Rollins Road, Portland Avenue, Baer Road, Silver Street, Sligo Road, Oak Street, Highland Avenue, and Berwick Street due to downed trees. Several roads including: Pinch Hill Road, Heritage Drive, Woods Run were closed due to live wires and trees in the roadways. There was also a telephone pole that snapped due to high winds.
March 19, 2013	Severe Snow and Blizzard	February 9-11, 2013	FEMA 4105-DR	PA	$6,153,471	Known as "NEMO", this storm brought heavy snow, however there was no major damage. There may have been some minor power outages and school closures for short periods of time. Clean-up and snow removal took more time and resources than smaller storms.

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
March 25, 2015	Severe Snow & Snowstorm	January 26-29, 2015	FEMA 4209-DR	PA	$4,939,214	Known as "JUNO" this storm was much more problematic than the winter storm in 2013. At the time of the event, there was an abundance of snow already on the ground. Snow removal was slower and more costly. The Town had to hire a construction company in order to haul snow to the backside of the transfer station (snow dump). Municipal facilities, such as the Police Station and the School, needed their roofs cleared. The School was closed for a number of days and numerous town meetings were cancelled. The storm caused downed trees and spotty power outages throughout the community. Currently, Rollinsford applied to FEMA in the order of $11,000 for reimbursement costs for snow removal.
June 7, 2018	Severe Winter Storm and Snowstorm	March 13-14, 2018	FEMA 4371-DR	PA	$820,824.38	Produced several tall snow drifts on Sligo and Roberts Road. While pushing snow out of the way, several plows hit existing propane tanks that were hidden under the large amount of snow.
April 3, 2020	COVID19 Pandemic	January 2020 - present	FEMA 4516-DR	N/A	N/A	
13 declarations totaling approximately $122,007,363						
Program Key: PA: Public Assistance, IA: Individual Assistance, DFA: Direct Federal Assistance						

Table 15: Emergency Declaration (EM) 1990-March 2021 impacting the Town of Rollinsford

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	Large snow removal with 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	Numerous power lines were down and road closures.
November 1, 2011	Severe Winter Storm	October 29-30, 2011	FEMA 3344-EM	PA	Data not available	This storm was known as the "Halloween Storm". Due to heavy, wet snow and leaf-on conditions there was significant power outages town-wide, as well as damage to trees and telephone wires. Community events were rescheduled (including Garden Club and the local trick or treating) due to the storm. Because the ground wasn't frozen, plows had a difficult time on the roadways without damaging equipment.

Date Declared	Event	Date of Event	Source	Program	Amount (Statewide)	Remarks
October 30, 2012	Hurricane Sandy	October 26-31, 2012	FEMA 3360-EM	PA	$643,660	During the storm the Emergency Operations Center was opened and staffed by Chief Robert Ducharme or Lt. Jon Uraskevich and Deputy Fire Chief Kevin Hurd or Explorer Driscoll. Live wires and downed trees caused road closures along Pine Street, Baer Road, Highland Avenue, Foundry Street, and Sligo Road. Significant power outages were experienced on Pine Street, Baer Road, Highland Avenue, Woods Run, River Road, Sligo Road, and Rollins and Goodwin.
April 3, 2020	COVID19 Pandemic	January 2020 - present	FEMA 3445-EM	N/A	N/A	
8 emergency declarations totaling approximately $13,887,134						
Program Key: PA: Public Assistance, DFA: Direct Federal Assistance						

Flooding (Riverine/Extreme Rain)

Overview	
Hazard Type	Flooding
Location/Extent	Potential along Rollins, Yeaton, and Twombly Brooks, Fresh Creek, and the Salmon Falls River
Vulnerability	
Severity	2
Probability	3
Overall Threat	6 (high)

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 riverbanks and spills out into adjacent low-lying areas.[1] 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 Rollinsford 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]

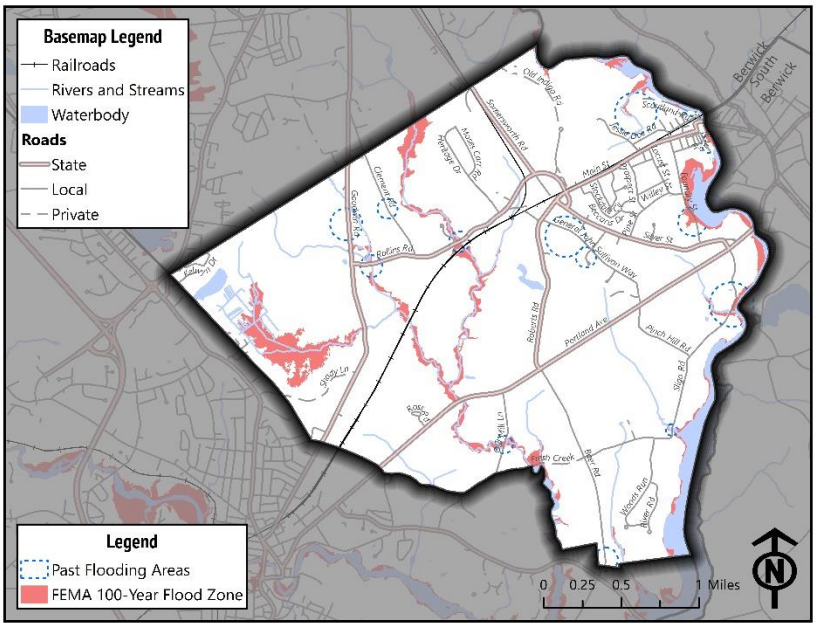
- ∴ 100-year rainstorm event
- ∴ Severe tropical storm (hurricane or tropical storm) that can bring torrential rainfall more than that from a 500-year storm.
- ∴ Rapid snowpack melt in spring can be a significant potential flooding source, given the northern, relatively cold location and climate of Rollinsford
- ∴ River ice jams, which could occur, although the Army Corps of Engineers Ice Jam Database contains no record of ice jams in Rollinsford. The Planning Committee confirmed there have been no records of any ice jams in any of the major rivers in town.
- ∴ Dam breach or failure.

[1] 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

The Salmon Falls River forms the boundary between Rollinsford, NH, and South Berwick, ME. Sections of Foundry Street and Sligo Road are located within the floodplain area and are susceptible to flooding. As part of the "Coastal NH Floodplain Mapping Project", which was FEMA's revised mapping of the Atlantic Coast and Great Bay watershed area of New Hampshire, FEMA provided new digital flood insurance maps (DFIRMs) for communities in a portion of both Rockingham and Stafford counties. Based on the floodplain extent of the new DFIRM, Rollinsford has flooding potential along Rollins, Yeaton, and Twombly Brooks, Fresh Creek, and the Salmon Falls River. Rollinsford has approximately 8.4% (405.9 acres) of its area in 100-yr. floodplain. However, it should be noted that a large portion of the floodplain is delineated over open water along the Salmon Falls, which influences the total acreage. If the floodplain were removed from open water, the amount of floodplain impacting the Town would be smaller.

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



Map 5: Flood Zones and Past Events (Source: FEMA, 2005; Town of Rollinsford)

Past Events and Impacts

Rollinsford was hit the hardest during the severe weather events in 2006, 2007, and 2010. During the 2006 and 2007 storms, the Town saw major flooding along Lower Mill Road, Foundry Street, and Clement Road that caused major damage, road closures, and general erosion. In 2010, Rollinsford experienced major flooding at Twombly Brook over Rollins Road. Other locations throughout town included Foundry Street, Old Mill Lane and Baer, Goodwin, Clement, Lower Mill, and Scout Land roads.

During Tropical Storm Irene (2011), a culvert on Sligo Road was washed out due to accumulated impacts of heavy rain and erosion. This has been identified as an area that routinely floods on a yearly basis. Part of the road has been closed since the spring of 2014, which has adversely impacted a local farming operation.

Since the last plan update, Sligo Road has been closed twice due to flooding. As a result, two culverts at this location were replaced to alleviate flooding. Similarly, Foundry Road was forced to be closed twice due to flooding and a culvert was replaced to reduce flooding issues. Over the course of three days, springtime flooding in the General Sullivan Way neighborhood led to several basements needing to be pumped (there is a high-water table in this area) by the Fire Department. There was as much as eight feet of water in some basements due to power outages. Recent

mitigation efforts include new ditch lines, installation of new generators and sump pumps by homeowners, and expansion of the catch basin system. Flooding has also caused road closures and damage on the narrow portion of Sligo Road near the Civil War culvert.

In early November 2021, a portion of Rollins Road caved in due to a culvert failure at the Rollins Brook crossing. The failure was a result of a beaver dam three feet into the pipe. The pipe was rotted and as road crews tried to clear the pipe the force of the water sent the pipe to the road surface causing the road to collapse. According to the Rollinsford Police Chief no one was injured during the event. The New Hampshire Department of Transportation (NHDOT) announced the emergency closure of Rollins Road creating detours for local drivers. The road was closed between Goodwin Road in Rollinsford and Oak Street in Dover. Signs and message boards were put in place to alert local traffic of the detour. Motorists were asked to follow all posted signs and obey all traffic signals. At the time this plan was being prepared, repairs were scheduled to take between 7-10 days.

Potential Future Impacts on the Community

Overall, flooding potential is high and flood conditions will continue to affect the Town of Rollinsford. Both seasonal flooding and flooding due to extreme weather events have the potential to occur during all seasons. Future sea-level rise may impact certain low-lying, tidal areas.

Estimated Potential Losses

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $9,141,950 to $18,283,900 in estimated potential losses from flooding.

Dam Failure

Overview	
Hazard Type	Flooding
Location/Extent	Potential along Rollins, Yeaton, and Twombly Brooks, Fresh Creek, and the Salmon Falls River
Vulnerability	
Severity	2.7
Probability	1
Overall Threat	2.7 (low)

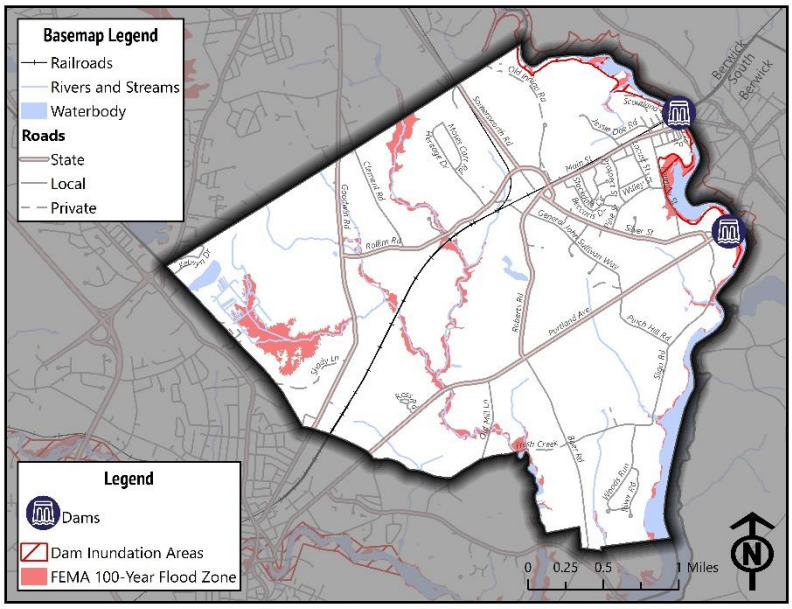
Description of the Hazard

A dam failure can be defined as an uncontrolled release of water from a reservoir through a dam because of structural failures or deficiencies. Dam failures are comparatively rare but can cause immense damage and loss of life when they occur. Primary causes of dam failure include: sub-standard construction, design errors, lack of maintenance, and geological instability (earthquakes).

Extent of the Hazard

The potential for catastrophic flooding from dam breach or failure does exist in Rollinsford. The Lower Great Falls Dam (Code #218.01) located in Somersworth is classified as a High Hazard Dam, which means that a dam has potential to cause substantial danger if misoperated. Failure of the dam would likely result in probable loss of human life. Other impacts include major economic loss to structures and property, render roads impassable, and cause major public health and environmental issues. According to the dam inundation mapping that was completed for the region, if the Lower Great Falls dam either failed or was breached there would be approximately 120 acres of inundation in Rollinsford along the Salmon Falls River.

Map 6: Significant Hazard Dams and Inundation Areas (Source: NHDES)



The Strafford Regional Planning Commission provided delineated dam inundation zone data to the Town. The NHDES Dam Bureau may have additional GIS data. A more comprehensive list of dams, their associated classifications, and inspection schedules in Rollinsford are in Table 16.

Table 16: Active Dams in Rollinsford

Dam Classification	Classification Definition	# of Dams in Rollinsford	Inspection Interval (years)
High	Location and of a size that failure or misoperation of the dam would result in probable loss of human life	0	2
Significant	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	2	4
Low	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	1	6
Non-Menacing	Location and of a size that failure of misoperation of the dam would not result in probable loss of life or loss to property	8	6

Past Events and Impacts

Rollinsford received an evacuation order from the State during the 2007 flood event for fear of failure at the Lower Great Falls Dam (high hazard) in Milton. However, the dam did not fail, and residents were able to return to their homes quickly. As part of the hydroelectric facility's relicensing process the Federal Energy Regulatory Commission (FERC) with assistance from NHDES performed maintenance on the dam and surrounding area. The work was done in 2019 though the license is not set to expire until 2021. Selected trees were cut around the dam and spillway and the top of the dam was repaired. This work was done at no expense to the Town. FERC has the primary authority of inspection (they have the dam hazard class as significant) due to the dam's license to produce hydropower. Green Mt. Power currently leases the power from the upper dam. Inspection and maintenance have been completed because of the relicensing process.

In 2015, the Town's dam crossing the Salmon Falls River was changed from a low risk to a significant risk because of an inspection earlier that year. According to an email correspondence from the FERC received by the Police Chief on Thursday, November 12, 2015, the Salmon Falls dam had been previously classified as having a low hazard potential since failure of the dam did not pose a hazard to life or property. However, the project has a concrete penstock that passes under Main Street and is adjacent to Mill buildings. Based upon events unrelated to this site FERC had become more aware of the issues that penstocks pose should they fail. For this reason and to be extremely cautious they changed the hazard potential of many projects to significant and will be requiring periodic inspections of these buried features. The owner of this project is developing a comprehensive penstock inspection program and has proposed to inspect this penstock in 2016.

Since the last plan update, there has not been any flooding issues associated with dam failure.

Potential Future Impacts on the Community

Due to relicensing processes, state inspection schedules, and ongoing maintenance requirements the potential for catastrophic flooding damage from dam failure is relatively low.

Estimated Loss Potential

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $0 to $1,828,390 in estimated potential losses from dam failure.

Coastal Flooding

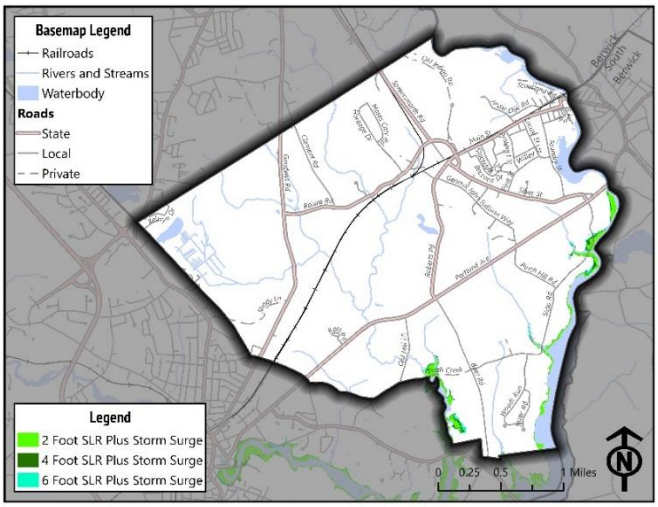
Overview	
Hazard Type	Flooding
Location/Extent	Low areas along the Salmon Falls River
Vulnerability	
Severity	1.7
Probability	2
Overall Threat	3.3 (low)

Description of the Hazard

Coastal flooding occurs when storms and high winds push waves of sea water towards the coast. Damage can be exacerbated when a storm coincides with a king tide. This is when the gravitational pull of both the sun and the moon combine to create astronomically high tides.

Extent of the Hazard

Key findings for Rollinsford are based on evaluation of the 2ft (intermediate-low), 4.0ft (intermediate), and 6ft (highest) sea-level rise projections at the year 2100 and these sea-level rise projections with the 100-year storm surge. Map 7 provides the spatial extent of the three different sea-level rise scenarios. Groundwater rise and salt water intrusion associated with sea level rise will also likely affect the Town in various ways, including impacts to public and private drinking water supplies and existing septic systems in low-lying areas.



Map 7: Future Sea-Level Rise + Storm Surge (Source: NHDES)

Past Events and Impacts

Rollinsford is an inland coastal community and has limited risk and vulnerability regarding flooding caused by wave action. The planning committee was not aware of any impacts from coastal flooding since the last plan update.

Potential Future Impacts on the Community

According to the C-RiSe assessment report, the inland coastal portion of Rollinsford that is most susceptible to coastal flooding is in low areas along the Salmon Falls River. Sections of Foundry Street and Sligo Road are both within the coastal floodplain area, making them particularly vulnerable to flooding from seasonal high tides, coastal storms, and sea-level rise. However, storm surges brought on by large storm events like hurricanes and nor'easters, accompanied by high tides and potential sea level rise are valid concerns along the Salmon Falls River.

Estimated Potential Losses

Based on the **low hazard** ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of **$0 to $1,828,390** in estimated potential losses from coastal flooding.

Severe Thunderstorms & Lightning

Overview	
Hazard Type	Severe Thunderstorm and Lightning
Location/Extent	Town-wide (sporadic)
Severity	1.7
Probability	3
Overall Threat	5.0 (moderate)

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 more than 50 knots (57.5 mph), or a tornado. Thunderstorm-related hazards that could impact Rollinsford 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 is a naturally occurring electrostatic discharge during which two electrically charged regions, both in the atmosphere or with one on the ground, temporarily equalize themselves, causing the instantaneous release of energy.

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) over the last decade, lightning kills an average of 32 people each year in the United States. There were 275 fatalities (213 were men; 62 were women) in the United States from 2010 to 2020. There were none in NH.

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 17: 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 National Climatic Data Center Storm Events database (NCDC 2020) lists 11 reported events of severe thunderstorm winds in Strafford County from March 1, 2016 to November 30, 2020. During that time there were no reported events in Rollinsford. The steering committee could not recall any major impacts.

The National Climatic Data Center Storm Events database (NCDC 2020) lists 0 reports of lightning events in Strafford County from March 1, 2016 to November 30, 2020. It should be noted that there has not been a report of a significant event reported in Strafford County since 2008. There was a lightning strike at Wishmaker Stables within the last couple of years. Other wind and lightning events required a response from the Fire Department, which included regional mutual aid assistance on Baer Road, Sligo Road, and Clement Road. The Fire Department also responded to mutual aid requests in Dover for micro-burst activity.

Finally, hail is a fairly common part of thunderstorms in New Hampshire, but damaging hail is apparently not. The damage that can result is mostly to cars and windows. The NCDC Storm Events database lists 4 reported hailstorms in Strafford County from March 1, 2016 to November 30, 2020. None of these events took place in Rollinsford. The steering committee could not recall any major impacts.

Potential Future Impacts on Community

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

Estimated Potential Losses

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $1,828,390 to $9,141,950 in estimated potential losses from severe thunderstorms and lightning.

Wildfire

Overview	
Hazard Type	Wildfire
Location/Extent	Town-wide (Unfragmented, wooded areas)
Severity	1.7
Probability	3
Overall Threat	5.0 (moderate)

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. Rollinsford has an urban core with a surrounding forested landscape. Exposure to natural factors such as lightning that can cause wildfires is consequently high and can occur throughout the jurisdiction.

According to the State of New Hampshire Multi-Hazard Mitigation Plan (2013), New Hampshire is a heavily forested state and is therefore vulnerable to this hazard, particularly during periods of drought and/or large-scale natural disturbances causing unusual fuel buildup. The proximity of many populated areas to the State's forested lands exposes these areas and their populations to the potential impact of wildfire.

The Granite State is the second most forested state in the United States (trailing Maine). Forests occupy 84 percent, or 4.8 million acres. The southern portion of the State has seen rapid commercial and residential development which has extended into previously forested areas. Although this development has slowed, this sprawl has created its own concerns regarding the increased risk of damage in the wildland-urban interface. In a study conducted by the United States Forest Service in 2006, New Hampshire was ranked as having the highest percentage of homes in the wildland-urban interface of any state in the nation.

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 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.[2]

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;
Class G - 5,000 acres or more.

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

Past Impacts and Events

Rollinsford is a rural town, and much of the land cover of the Town is unfragmented woodland and grassland. Exposure to natural factors, such as lightning, that start wildfires is consequently high. 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.[3] 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 March 1, 2016 to November 30, 2020. There have been no major wildfires.

The steering committee recognized that there have been recent efforts by the Southeast Land Trust to clean up brush and fuel load on the Franklin-McElheny Preserve. In addition, Greenview conducted a managed cut and collected some of the dead wood. Fire Department staff recognize that due to ongoing drought conditions, the potential threat of a larger wildfire remains high.

Since the last plan update, there have been several small grass fires the Town has experienced during the dry, summer months caused by sparks from the railroad. The fire department responded to these fires, and none led to any major injuries, fatalities, or significant loss to public infrastructure.

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 **moderate hazard** ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of **$1,828,390 to $9,141,950** in estimated potential losses from wildfire.

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

Severe Winter Weather

Overview	
Hazard Type	Severe Winter Weather
Location/Extent	Town-wide
Severity	2
Probability	3
Overall Threat	6 (high)

Description of the Hazard

According to the State Hazard Mitigation Plan (2018), the State experiences four types of severe weather during the winter months, which usually bring snow, high winds, and/or rain depending on temperatures:

Heavy Snow

In forecasts, the amount of snow that is expected to fall is expressed as a range of values, such as 10- 12". Heavy snow is generally defined as:

- Snowfall accumulating to 4" or more in depth in 12 hours or less; or
- Snowfall accumulating to 6" or more in depth in 24 hours or less.

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.

Blizzard

A blizzard is a snowstorm with the following conditions that is expected to prevail for a period of 3 hours or longer:

- Sustained wind or frequent gusts to 35mph or greater; AND,
- Considerable falling and/or blowing snow that frequently reduces visibility to less than ¼ mile

Nor'easter

A Nor'easter is a large cyclonic storm that tracks north/northeastward along the East Coast of North America. It is so named due to the northeasterly prevailing wind direction that occurs during the storm. While these storms may occur at any time of the year, they are most frequent and severe during the months of September through April.

Ice Storm

Ice storms typically occur with warm frontal boundaries, where warm air rises up and over a shallow mass of cold air near the earth's surface. When snow falls from clouds near just north of the warm frontal boundary, it will fall through the deep warm layer aloft first and melt completely into a liquid water droplet. As it passes through the shallow cold layer near the surface, the water droplet cools to the point of being supercooled (a liquid raindrop that remains a

liquid at the freezing point). When these supercooled water droplets make contact with freezing surfaces on the ground, such as streets and walkways, they freeze on contact forming layers of ice. This process of freezing rain, when persistent over a long period of time, will form layers that may exceed over an inch thick in extreme cases.

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

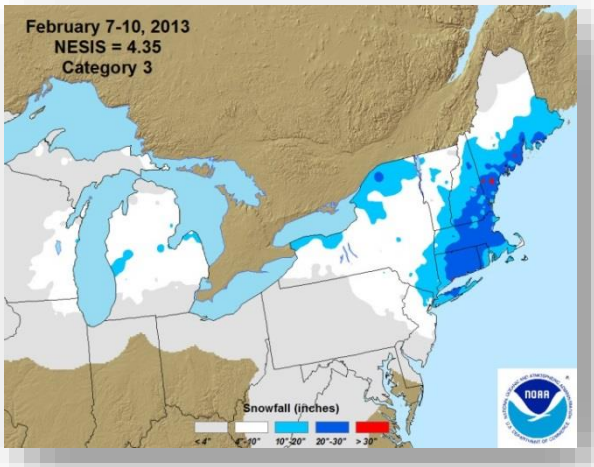
The NCDC Storm Events database reports 21 heavy snow events, zero blizzards, zero ice storms, 3 winter storms/winter weather (nor'easters) among large winter weather events impacting Strafford County from March 1, 2016 to November 30, 2020. Heavy snow typically brings significant snow removal costs along with delays in transportation schedules. Four events of those listed in the NCDC database are of 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. Those impacted 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. Local impacts included major power outages ranging from a couple of days to a week.

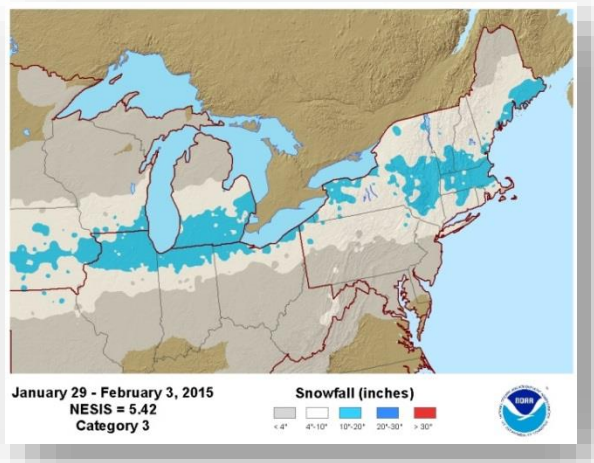
The Ice Storm of 2008 (December 11th – 12th) was a major winter storm that brought a mixture of snow, sleet, and freezing rain. The greatest impact in the state was in southern and central New Hampshire where a significant ice storm occurred. Following the ice storm, recovery and restoration efforts 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.

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. This storm brought heavy snow, however there was no major damage. There may have been some minor power outages and school closures for short periods of time. Clean-up and snow removal took more time and resources than smaller storms.



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. Along the coast, large waves combined with a storm surge produced coastal flooding and splash over. In Hampton, the Tuesday morning tide was 1.43 feet above flood levels (see graph below), inundating many streets on the bay side of town. Snowfall amounts ranged from 10 to more than 30 inches across much of the southeastern part of the state. This storm was much more problematic than the winter storm in 2013. At the time of the event, there was an abundance of snow already on the ground. Snow removal was slower and more costly. The Town had to hire a construction company to haul snow to the backside of the transfer station (snow dump). Municipal facilities, such as the Police Station and the School, needed their roofs cleared. The School was closed for several days and numerous town meetings were cancelled. The storm caused downed trees and spotty power outages throughout the community. Rollinsford received $11,000 for reimbursement costs for snow removal from FEMA.



The Halloween Storm in 2011 was also problematic. Due to heavy, wet snow and leaf-on conditions there was significant power outages town-wide, as well as damage to trees and telephone wires. Community events were

rescheduled (including Garden Club and the local trick or treating) due to the storm. As the ground was not frozen, plows had a difficult time on the roadways without damaging equipment.

The 2017-18 winter produced several tall snow drifts on Sligo and Roberts Road. While pushing snow out of the way, several plows hit existing propane tanks that were hidden under the large amount of snow.

Potential Future Impacts on Community

Rollinsford will continue regularly to receive impacts from severe, regional winter weather events.

Estimated Loss Potential

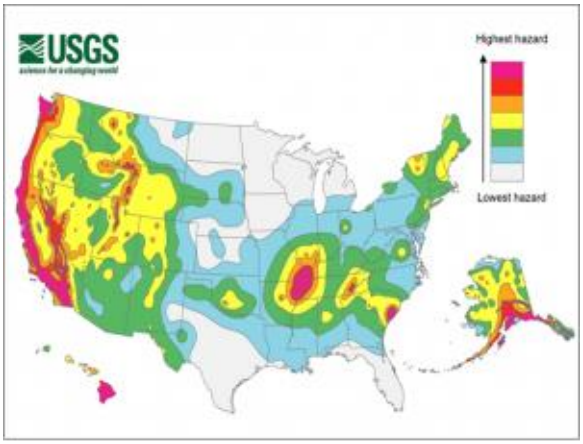
Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $9,141,950 to $18,283,900 in estimated potential losses from severe winter weather.

Earthquake

Overview	
Hazard Type	Earthquake
Location/Extent	Town-wide
Severity	1
Probability	1
Overall Threat	1 (low)

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.[4] Earthquakes in the Northeast are not associated with specific known faults.

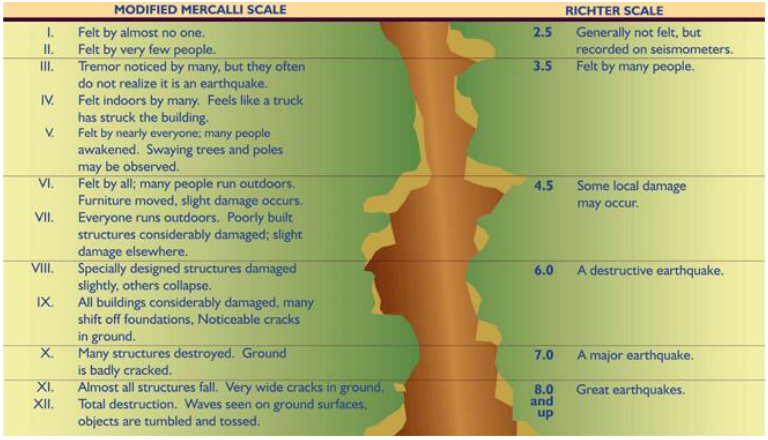


USGS 2014 Seismic Hazard Map

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.[5]

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



[4] The Northeast States Emergency Consortium Earthquake Hazards. http://nesec.org/earthquakes-hazards/. Viewed on 8/10/15
[5] http://nesec.org/earthquakes-hazards/

included for the variation in the distance between the various seismographs and the epicenter of the earthquakes.[6]

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 arbitrary ranking based on observed effects actually experienced at a given place and therefore has a more meaningful measure of severity.[7]

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, 2015) 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 2018. However, New Hampshire has only experienced ten earthquakes of significant magnitude (Richter Magnitude 4.0 or greater) in that time. Since the last plan update, the steering committee could not recall any major impacts.

Table 18: 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. Data would suggest, then, that earthquakes are on average an annual occurrence but that significant quakes have an annual probability of occurrence (based on the 1638 to 2018 period) of about 2.6%.

Estimated Loss Potential

Based on the **low hazard** ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of **$0 to $1,828,390** in estimated potential losses from earthquakes and landslide.

[6] USGS. Earthquake Hazard Program. http://earthquake.usgs.gov/learn/glossary/?term=Richter%20scale. Viewed on 8/10/15
[7] USGS. Earthquake Hazard Program. http://pubs.usgs.gov/gip/earthq4/severitygip.html. Viewed on 8/10/15

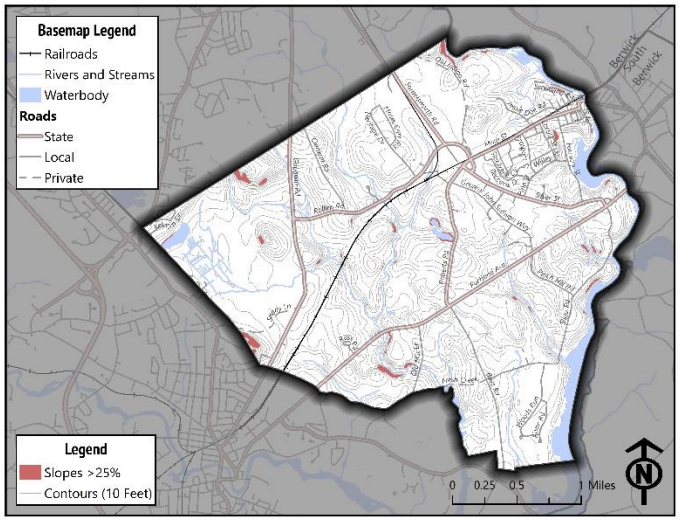
Landslide

Overview	
Hazard Type	Landslide
Location/Extent	Areas with steep slopes (>25%)
Severity	1
Probability	1
Overall Threat	1 (low)

Description of the Hazard

According to the USGS, a landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of "mass wasting," which denotes any down-slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses five modes of slope movement: falls, topples, slides, spreads, and flows. These are further subdivided by the type of geologic material (bedrock, debris, or earth). Debris flows (commonly referred to as mudflows or mudslides) and rock falls are examples of common landslide types.

Landslides would occur in Rollinsford 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. In Rollinsford, steep slopes cover approximately 0.7% (36 acres) of the total area in town. The Hazard Mitigation Committee did not have the expertise available to analyze the actual probability of a landslide happening. However, the USGS (1997) classifies landslide incidence regionally as very low (less than 1.5% of land area involved).



Map 8: Steep Slope Areas (Source: GRANIT)

Extent of the Hazard

While no universally accepted standard or scientific scale has been developed for measuring the severity of all landslides, severity can be measured several other ways:

- Steepness/grade of the Slope (measured as a percent)
- Geographical Area
    - Measured in square feet, square yards, etc.
    - More accurately measured using LiDAR/GIS systems
- Earthquake, either causing the event or caused by the event (measured using the Moment
- Magnitude Intensity or Mercalli Scale)

There are also multiple types of landslides:

- Falls: A mass detaches from a steep slope or cliff and descends by free-fall, bounding, or rolling
- Topples: A mass tilts or rotates forward as a unit
- Slides: A mass displaces on one or more recognizable surfaces, which may be curved or planar
- Flows: A mass moves downslope with a fluid motion. A significant amount of water may or may not be part of the mass

Like flooding, landslides are unique in how they affect different geographic, topographic, and geologic areas. Therefore, consideration of a multitude of measurements is required to determine the severity of the landslide event.

Past Impacts and Events

A major landslide behind the American Legion occurred a few months after the Mother's Day flood event. The hill had been slowly deteriorating for years prior to the big landslide, but finally gave way following a significant rain event. The Legion hired Hussey Construction to repair the damage. The cost of removal and replanting was approximately $20,000; however, they do not expect any further damage.

Since the last plan update, the steering committee could not recall any landslide impacts.

Potential Future Impacts on Community

Given seismic or precipitation events that could initiate landslide, landslide hazard is likely quite high in steep slope areas. The Committee did not have the expertise available to analyze the actual probability of landslide in Rollinsford; however, to the best of the committee's knowledge no significant landslides have ever occurred. The USGS (1997) classifies landslide incidence regionally as very low (less than 1.5% of land area involved). The local probability in Rollinsford, 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 a range of $0 to $1,828,390 in estimated potential losses from earthquakes and landslide.

Drought

Overview	
Hazard Type	Drought
Location/Extent	Town-wide
Severity	1.7
Probability	3
Overall Threat	5.0 (moderate)

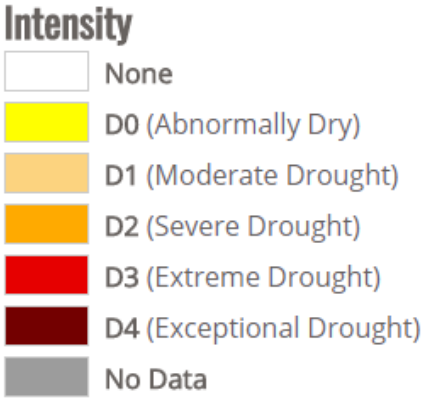
Description of the Hazard

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 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 development of this Plan, Rollinsford was less than a year removed from 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. Seven 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.[8]

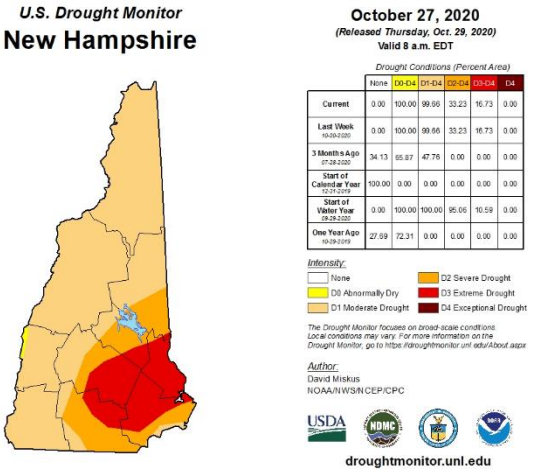
Table 19 Severe Drought Conditions in New Hampshire

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
2020	Statewide	Extreme	Recurrence interval cannot yet be determined

In 1999, a drought warning was issued by the Governor's Office. In March 2002, all counties in New Hampshire except for 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.

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.

Drought conditions continued and intensified into 2016 in New Hampshire and in Southeast New Hampshire in particular. The drought was due to a combination of a below average snowpack in the spring, little precipitation to recharge the groundwater, an increase of evapotranspiration (the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants) in the summer, and the inability of New Hampshire watersheds to store large volumes of water due to their geology. In October 2016, at the peak of the drought, nearly 20% of the state was categorized as being in



[8] 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

extreme drought. One hundred and sixty community water systems had reported implementing a water restriction or ban, and 13 towns have reported implementing voluntary or mandatory outdoor use bans in the state.

More recently, the State experienced a significant drought in 2020, where at one point 100% of New Hampshire's population was experiencing abnormally dry conditions. According to the United States Drought Monitor, it was estimated that 16.7% (see figure to the right) of the State faced extreme drought conditions, categorized by major crop or pasture losses and widespread water restrictions and shortage.

The NHDES Drought Management Program has stated that the drought was due to a combination of a below average snowpack in the spring, little precipitation to recharge the groundwater, and the inability of watersheds to store large volumes of water due to their geology.

In 2018, there was at least one resident whose well ran dry and needed water to be trucked in. During that same time, there was another resident who experienced spotty water; however, they did not require a truck to deliver to them. During the most recent drought in 2020, the Select Board enacted water restrictions. The Town's water and sewer department also enacted their own restrictions. Also in 2020, Viel's Farm lost a large portion of their crops and were unable to supply food to larger supply chains and only able to produce food for local farm stands.

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 and population increases, drought probability may grow in the future and put more of a strain on long-term water resources. 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. In addition, extreme variation in environmental conditions due to climate change possibly on the rise, drought probability may grow in the future.

Rollinsford is unique regarding the number of active farms in town. According to 2010 land use data, there are approximately 1,020 acres of land (21% of the community's total area) classified as agriculture (it should be noted that the land use layer is based on aerial photography and may not accurately represent the full extent of local farming operations). The social and economic impact of a long-term drought has the potential to have a larger impact than in other communities in the Seacoast.

Estimated Potential Losses

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $1,828,390 to $9,141,950 in estimated potential losses from drought.

Hurricane & Tropical Storms

Overview	
Hazard Type	Hurricane and Tropical Storms
Location/Extent	Town-wide
Severity	2.7
Probability	2
Overall Threat	5.3 (moderate)

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 (2018), once the maximum sustained winds of a developing tropical cyclone reach 39 MPH, the low-pressure system is typically called a tropical storm and is assigned a formal name. The tropical cyclone maintains a tropical-storm status as long as its maximum sustained winds are above 74 MPH. Once a tropical cyclone's maximum sustained winds reach 74 MPH, the storm becomes a hurricane. It is designated as a major hurricane once maximum stained winds reach 111 MPH or higher.

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 Rollinsford, most notably in 1938 and 1954 (Hurricane Carol). Quite a few other hurricanes have impacted the Town, including Hurricane Donna, Gloria, and Bob, with high winds but relatively little damage. The NOAA National Climatic Data

Center's Storm Events database (NCDC 2020) does not list any Hurricanes as directly affecting Strafford County from March 1, 2016 to November 30, 2020.

The last hurricane to hit the region was Hurricane Sandy during the period of October 26 to November 8, 2012. Declaration FEMA-4095 requested funds for debris removal and emergency protective measures. Live wires and downed trees caused road closures along Pine Street, Baer Road, Highland Avenue, Foundry Street, and Sligo Road. Significant power outages were experienced on Pine Street, Baer Road, Highland Avenue, Woods Run, River Road, Sligo Road, and Rollins and Goodwin.

The NOAA National Climatic Data Center's Storm Events database (NCDC 2020) does report two tropical storm events, which are 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.

During the storm, the Emergency Operations Center was opened and staffed by Chief Robert Ducharme and Deputy Fire Chief Kevin Hurd. Strafford Dispatch and WebEOC were both notified. Throughout the storm there were significant power outages to portions of Clement Road, Rollins Road, Portland Avenue, Baer Road, Silver Street, Sligo Road, Oak Street, Highland Avenue, and Berwick Street due to downed trees. Several roads including: Pinch Hill Road, Heritage Drive, Woods Run were closed due to live wires and trees in the roadways. There was also a telephone pole that snapped due to high winds.

Topical Storm Isaias (August 4, 2020) - was the first tropical storm to impact New Hampshire since 2011. The center of the storm tracked west of the state, keeping the flooding rain associated with the storm across New York. The storm brought moderate impacts to Strafford County with multiple reports of snapped and uprooted trees along with broken branches due to wind gusts in the 40-mph range. Strafford County reported scattered power outages with most power being restored within 24 hours. No flooding was reported. The Fire Department reported eight service calls, including a structure fire that required mutual aid response and several trees down.

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 Rollinsford 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. However, the community remains vulnerable to flooding from both high amounts of precipitation and coastal surge along the Salmon Falls River.

Rollinsford 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. Given that the 2017 Atlantic hurricane season was hyperactive, which featured 17 named storms (tying it with 1936 as the fifth-most active season since reliable records began in 1851) and three that were major hurricanes (Harvey, Irma, and Maria), 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 a range of $1,828,390 to $9,141,950 in estimated potential losses from hurricane and tropical storms.

Hazardous Materials

Overview	
Hazard Type	Hazardous Materials
Location/Extent	Town-wide
Severity	3
Probability	3
Overall Threat	9 (high)

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

The possibility of vehicular accidents involving hazardous materials is identified as a serious hazard in Rollinsford. Route 4 is a major thoroughfare and is very heavily traveled, both by large and small vehicles. Small delivery vehicles, often traveling at fast speeds, and carrying materials to residents use this highway; the contents of these vehicles are rarely known. The freight train that runs through Rollinsford is often hauling fuel, propane, radioactive waste, and other hazardous materials on a constant basis.

Past Impacts and Events

There were two major derailments over the past 30+ years. The first in the late 1980's where a couple of carts were involved. The second was a major accident that took place in 1992. Although there were not any reports of a hazardous spill, there was a significant amount of damage and the potential for a spill in the future is there.

The planning committee sited the release of petroleum from the Mr. Mike's gasoline station (2000) as an example of a local hazardous waste spill. This site demonstrated how a leaking underground storage tank can lead to groundwater contamination and state water quality monitoring for several years. More recently, in 2020, there was a leak at the wastewater treatment facility that resulted in one 55-gallon drum of hydrochloric acid to be spilled during a transfer. The START team responded, in conjunction with a local clean-up company. Since then, several transportation procedures have been updated to prevent the likelihood of a similar spill.

Potential Future Impacts on Community

The planning committee was deeply concerned with the potential for hazardous spills impacting the community from both increases in truck traffic and materials being transported along the railway. In recent years, the shale oil boom in

the Midwest has led to increasing numbers of trains, each carrying thousands of gallons of crude, passing through Rollinsford and southern NH on their way north to Canada. Given a situation involving derailment or vehicle collision, these shipments have the potential to spill and cause massive amounts of contamination in groundwater and significantly interrupt services in town. The planning committee identified Green View Technologies as another potential operation that could lead to a hazardous material threat. Green View Technologies is an oil recycling facility that processes used oil in large silo-like tanks to filter and clean dirt and grime, making it reusable for lubricating purposes. It is then shipped off-site for further refining. Oil Recovery Systems is also located in Rollinsford, at 145 Rollins Road. As a heating oil delivery services, their shipping trucks are consistently on the roadways and pose a potential threat. Lastly, the C&J Bus garage, which is located on Jessie Doe Road, acts as a service and maintenance shed for the bus fleet. Two or three fuel shipments are delivered by trucks to the site each week. This additional truck traffic carrying large amounts of fuel is another concern the community has identified.

Estimated Potential Losses

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $9,141,950 to $18,283,900 in estimated potential losses from hazardous materials.

Tornado & Downburst

Overview	
Hazard Type	Tornado & Downburst
Location/Extent	Town-wide - dependent upon tornado track
Severity	2.7
Probability	2
Overall Threat	5.3 (moderate)

Description of the Hazard

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud with winds more than 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 more than one mile wide and 50 miles long. Violent winds and debris slamming into buildings cause the most structural damage. The Fujita Scale is the standard scale for rating the severity of a tornado as measured by the damage it causes. 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.

The Enhanced 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 more than 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 2020) lists only 7 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 have not been any fatalities, 0 injuries, but approximately $2.9 million in property damages associated with tornados. Most 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 Rollinsford.

Table 20: 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.[9] Though the frequency of tornado events in New Hampshire is not great, the state has experienced large tornados throughout its 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.[10] An E-F1 tornado, moving north northeast out of Belknap County entered Strafford County approximately 2.2 mile north northwest of New Durham and skipped along for more than eight miles before exiting into Carroll County. The intensity of the tornado varied between F0 and F2 and numerous trees were blow down along the path of the storm.[11] Sustained winds of 86 to 110 mph were recorded. The tornado's path was centrally located over undeveloped land and forested areas, however at least 20 buildings were damaged in the town. Since the July 2008 tornado (through July 2015), seven tornados have hit New Hampshire, however none have hit Strafford County. The steering committee could not recall any major impacts.

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 recent events in the region are highlighted below:

[9] NOAA. U.S. Tornado Climatology (https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology)
[10] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.
[11] NOAA National Climatic Data Center. Storm Events Database. (https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=123355)

- Stratham (08/18/1991) - Eleven (11) Injured, five (5) killed, and nearly $2.4 Million in damages
- Barrington (07/20/2017) - Dozens of trees blown down, thousands of people without power across multiple towns, multiple roads closed Route 125 Barrington
- Bow Lake, Strafford County (07/28/2018) - More than 45 properties damaged by hurricane force winds and hail associated with a microburst. Eight people were injured when a tree crashed through the roof of a cabin; two required transport to the hospital after a beam came down and hit one in the head and the other in the back. Many downed trees and wires. Eleven people huddled near a stone fireplace within a cabin for protection.

In July 2017, the Town's Fire Department responded to a mutual aid request in Dover, where there was a significant microburst that impacted a handful of residential homes and a few small businesses along Tolend and French Cross roads. According to Fosters.com there were several downed trees that blocked roads, took down power lines and hit homes and cars. In 2021, a large pine street was knocked over during a microburst that took down power lines on Main Street. The road was closed, and power was out for 6-8 hours. During the same event, several trees on Rollins Road came down.

Potential Future Impacts on Community

There have been 7 reported tornadoes over the course of 70 years in Strafford County; the average annual probability of recurrence, therefore, is 10% (7/70 x 100). The probability may be slightly higher if local reports of tornadoes were considered; however, this 10% probability is for all of Strafford County – not just Rollinsford. The actual probability for Rollinsford should be much lower, considering the great dependence of impact upon the actual track of any tornado. The NCDC 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%. 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.

Estimated Loss Potential

Based on the moderate hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $1,828,390 to $9,141,950 in estimated potential losses from tornados.

Extreme Temperatures

Overview	
Hazard Type	Extreme Temperatures
Location/Extent	Town-wide
Severity	1.3
Probability	2
Overall Threat	2.7 (low)

Description of the Hazard(s)

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.[12]

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.

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.

NOAA's National Weather Service

Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

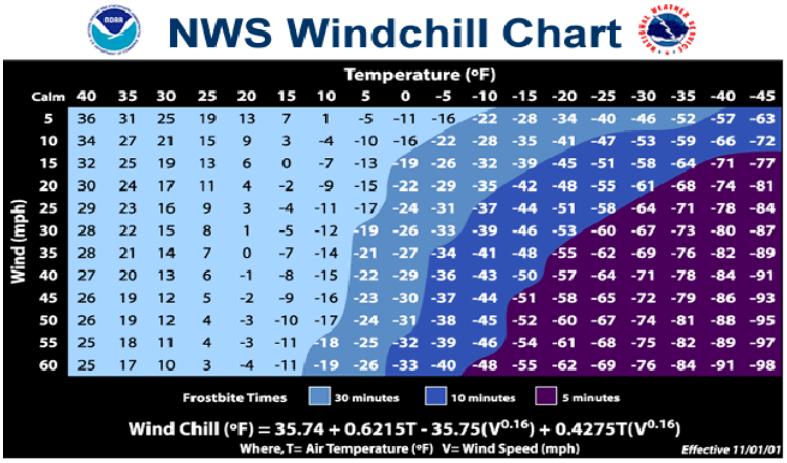
Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

[12] 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/

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. According to the National Weather Service (NWS), extreme cold is a daily concern during the winter months for northern states. The NWS Wildchill Temperature index calculates the dangers from winter winds and freezing temperatures (Source: NWS)



Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

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.[13] 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 Rollinsford included in the study). During this time the hottest day of the year averaged 95.0°F. Annual average temperatures may increase on average by 3-5°F by 2050 and 4-8°F by 2100.

Since the last plan update, there have been several significant heat waves. During one such event, the Town Hall was opened and acted as a cooling station to offer secondary shelter for residents. No records of death due to extreme heat were found for Rollinsford during the preparation of this plan. During times of extreme heat, residents use the library as a cooling shelter. The steering committee also noted that the Highway Department, Fire Department, and Grade School all do not have air conditioning.

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 Rollinsford included in the study).[14] 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.

Since the last plan update, the Fire and Police Departments recognize that, on average, two to three pipes burst each winter and is not out of the ordinary. The steering committee did not know if any residents used the new warming shelter in Somersworth.

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

Potential Future Impacts on Community

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

Estimated Loss Potential

Based on the low hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $0 to $1,828,390 in estimated potential losses from extreme temperatures.

Public Health Threats

Overview	
Hazard Type	Public Health Threats
Location/Extent	Town-wide
Severity	2
Probability	3
Overall Threat	6 (high)

Description of the Hazard

Epidemic

As defined by the Center for Disease Control (CDC) an 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."11F11F11F11F[15] 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[16]:

- 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).[17] For the purposes of this Plan, widespread drug and substance abuse may also be considered epidemics.

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

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 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).[18]

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.[19] 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

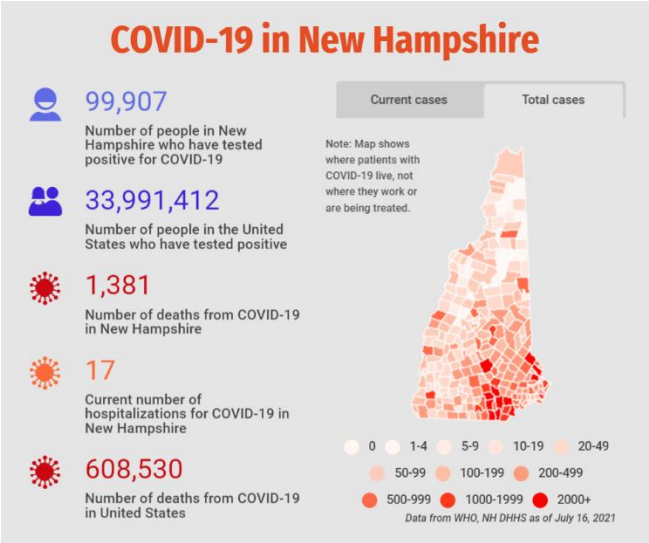
Epidemic/Pandemic

During March of 2020, the COVID-19 virus spread to the United States and effected the town of Rollinsford in various ways. To keep town officials and staff safe, the Townhall and the Fire Department closed their doors to the public and the Police Department operated with limited access. Municipal operations across the town were altered due to this response. All public meetings, including land use boards and selectmen meetings, were conducted virtually via the Zoom platform. The transfer from in person to virtual meetings allowed a wider variety of attendees but also was dependent on the user knowledge of the Zoom interface. Municipal officials undertook the responsibility to educate the committee and board members as well as the public on Zoom meeting function and etiquette. Municipal building cleaning and sanitizing routines increased in frequency and all employees and public were required to wear masks while in municipal buildings and while completing municipal functions.

[18] New Hampshire Department of Safety. State of NH Natural Hazard Mitigation Plan 2013. Homeland Security and Emergency Management.
[19] EPA. Arsenic in Drinking Water. (http://water.epa.gov/lawsregs/rulesregs/sdwa/arsenic/index.cfm)

The Rollinsford Grade School made an immediate transition to a remote learning model and produced a five (5) phase return to school plan. Police and Fire staff were subject to travel quarantine and staffing restrictions. During this time Police saw an increase in mental health response calls.

Two (2) homes within the Rollinsford town boundaries reached out to municipal officials requesting assistance with issues connecting to Comcast internet networks. The residents were put in touch with Comcast representatives and introduced to state funding opportunities. As virtual workspaces and learning environments continue, the demand for high-speed internet is likely to increase.



According to data from the NH Department of Health and Human Services, as of July 2021, Rollinsford had zero active cases with 164 total.

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.[20] 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.[21] From 2009 to 2013, reported cases of Lyme disease in New Hampshire increased by approximately 20% from 1416 cases per year to 1691 cases per year.[22] Rockingham, Strafford, and Hillsborough counties had the highest rates of disease in 2008-2009. According to CDC data, there have been 2,050 reported cases of Lyme disease between 2000-2018. There were 170 cases in 2018. The steering committee could not recall any major impacts.

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 more than 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. The steering committee could not recall any major impacts.

[20] 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

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

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

In the BEOH study, 44.0% of tests in Strafford County exceeded the 4.0 pCi/L action level and 13.0% even exceeded 12.0 pCi/L. In Rollinsford, the town experienced between 30% and 40% of tests exceeded the 4.0 pCi/L action level, which results in the probability of significant radon exposure as quite high. The steering committee could not recall any major impacts.

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.[23]

In recent years, there were some issues with testing failures and some arsenic levels that exceeded EPA standards. Corrosion control led to lead and copper mitigation and the Town's drinking water now meets EPA's standard for arsenic, it does contain low levels (5 ppb through 10 ppb) of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. Some people who drink water containing arsenic in excess of the MCL (above 10 ppm) over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. More recently, there were several drinking water tests that failed due to arsenic. Since then, improvement have been made to address this issue.

Potential Future Impacts on Community

There was a discussion on the potential threat of an epidemic stemming from the growing population at the University of New Hampshire. Thousands of students, some of which travel from other locations throughout the world, are constantly in close quarters with their classmates, faculty staff, and local business owners for two semesters each year (not counting summer classes), making it easier for the transmittal of infectious diseases. There are also many upper classmen that find off-campus housing in towns that are near the University. This yearly influx of students does create the potential for an outbreak and poses a risk to Rollinsford and the area surrounding the University. Lastly, the committee recognized that New Hampshire maintains a tourism-driven economy and that the state welcomes visitors from all over the country. Because New Hampshire boasts a four-season climate, there are people visiting the state virtually every month of the year. Like the University, this influx of people traveling through New Hampshire poses a threat of an epidemic outbreak.

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

Because of these factors, an epidemic or pandemic could present a possible threat to Rollinsford. With the occurrence of worldwide pandemics such as SARS, H1N1 and Avian Flu, the community could be susceptible to an epidemic and subsequent quarantine. Rollinsford is an active member of the Strafford County Public Health Network (SCPHN): a collaborative of local governments and health and human service agencies preparing for and responding to public health emergencies on a regional level. 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.[24]

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 lifetable 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.

The heroin and drug epidemic remains an ongoing problem.

Estimated Potential Losses

Based on the high hazard ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of $9,141,950 to $18,283,900 in estimated potential losses from public health threats.

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

Terrorism

Overview	
Hazard Type	Terrorism
Location/Extent	Town-wide
Severity	2.7
Probability	1
Overall Threat	2.7 (low)

Description of the Hazard

The New Hampshire State Hazard Mitigation Plan (2018) defines terrorism as premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents. According to the Federal Bureau of Investigation (FBI), the term terrorism can be subcategorized into two categories:

- International Terrorism: Perpetrated by individuals and/or groups inspired by or associated with designated foreign terrorist organizations or nations (state-sponsored).
- Domestic Terrorism: Perpetrated by individuals and/or groups inspired by or associated with primarily U.S.-based movements that espouse extremist ideologies of a political, religious, social, racial, or environmental nature.

Extent of the Hazard

The entire Town is vulnerable to both terrorist attacks and violent crimes.

Past Impacts and Events

Over the years, domestic and foreign terrorism has become a major focal point for state and federal agencies, not only in major cities, but smaller communities throughout the United States. The Rollinsford planning committee identified four primary concerns, including: active shooter events at schools or other municipal facilities, cyber-attacks that impact the regional power grid, deliberate contamination to regional and local water supplies, and specific targets to the rail system (transporting passengers, freight, and shale oil).

After tragic events experienced in Newtown, CT. and Virginia Tech, VA., smaller communities, like Rollinsford, have started preparing for an active shooter event. The Police Department has invested in extra ballistic vests (protection against high impact trauma), riot helmets, and replaced shotguns with pistol rifles. Law enforcement officials have also participated in active shooting training scenarios to better prepare for such an event if it should ever occur. The steering committee could not recall any major impacts.

Potential Future Impacts on Community

As technology continues to advance at an exponential rate, threats including cyber-attacks and online hackers have become more challenging. Many of today's systems rely heavily on electrical power and their importance is exasperated during emergency events. A non-functioning power grid would have various impacts to emergency services, including communications and response times. Rollinsford does not anticipate any attacks to knock out power to their local power supply. However, the entire Seacoast is part of the regional Boston grid, which may be a larger target area.

Rollinsford's water supply is mostly from groundwater resources. There is very limited infrastructure and most residents have private wells that supply their drinking water. Like the cyber threat, Rollinsford does not anticipate any local attacks to their water supply. However, regional contamination to surrounding surface waters could be a risk.

Purposeful derailment of the railway has potential to cause massive damage to infrastructure, such as residential housing, municipal buildings, bridge crossings, and other vital transportation systems. Many of the trains passing through the Town often begin their journey at North Station in Boston, where there may be limited oversight and inadequate inspections for potential security risks.

While the threat of a direct attack on Rollinsford is relatively low, the Seacoast of New Hampshire has a much higher vulnerability. Targets such as the Navy Shipyard, Pease Airforce Base, the Seabrook nuclear plant, and the numerous oil storage tanks along the Piscataqua River are all potential targets that would impact surrounding communities in varying degrees. The Fire Department is part of the Nuclear power plant response and decontamination team.

Estimated Potential Losses

Based on the **low hazard** ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of **$0 to $1,828,390** in estimated potential losses from terrorism.

Radiological

Overview	
Hazard Type	Radiological
Location/Extent	Town-wide
Severity	2.7
Probability	2
Overall Threat	5.3 (moderate)

Description of the Hazard

The New Hampshire State Hazard Mitigation Plan (2018) states that radiological hazards can range from relatively localized incidents involving small amounts of radioactive materials to large-scale catastrophic events. Smaller sources of radiation hazards may be found in medical facilities, industrial, and laboratory facilities where radioactive materials and/or radiation producing devices are used. Some radiation is produced naturally from decomposition of radioactive isotopes in soils and underlying strata.

Extent of the Hazard

The Seabrook Nuclear Power Plant is the largest individual electrical generating unit (approximately 1,244 – megawatt) on the New England power grid.

Past Impacts and Events

After the fallout from recent nuclear disasters, including Fukushima, federal agencies have revisited potential impacts from serious nuclear malfunctions. For this region, there have been recent discussions that would redefine the plume exposure pathway zone, which currently has a radius of 10 miles. This zone is concerned primarily with exposure to, and inhalation of, airborne radioactive contamination. The redefining would shift this zone from 10 to 50 miles. The steering committee could not recall any major impacts.

Potential Future Impacts on Community

Along with the immediate threat of contamination during any kind of catastrophic failure, there would also be stress on local emergency responders from the surge of people being evacuated from the emergency planning zone to the nearest reception center. The nearest reception centers are located in Dover, Manchester, and Rochester.

The Planning Committee also discussed the potential for low level radioactive waste being transported on freight trucks, the rail line, and common delivery services distributing specific medical supplies to local hospitals and other health care providers. The Fire Department sends manpower for the reception center and receives seven (7) radiological meters that are supplied by the state.

Estimated Potential Losses

Based on the **moderate hazard** ranking and assessed value of residential, commercial, and utilities structures, there is approximately a range of **$1,828,390 to $9,141,950** in estimated potential losses from radiological events.

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 2018. Avalanches, Space Weather, and Solar Wind are not included in this Plan for the Town of Rollinsford. Avalanches were not identified by the present or past Planning Committee as a local hazard since there are no significant mountains or topographical features, where avalanches would be likely to or have occurred in the past. The Steering Committee did not have enough information to make any recommendations on space weather or solar wind. The Town will re-evaluate the need to include additional hazards to this Plan during subsequent updates of the Plan.

Chapter VII: Action Plan

Past Mitigation Strategies

During past updates, the Planning Committee developed a list of strategies to implement over the course of the Plan's life cycle. Table 21 summarizes those strategies and provides updated information as to if the strategy was accomplished or not.

Table 21: Accomplishments Since Last Plan Adoption

Proposed Mitigation Action	Update 2022
1. The 80' x 30" corrugated culvert on Willey Street is deteriorating and vulnerable to erosion during flooding. This culvert needs new engineering to make the necessary repairs and upgrades. Water pipes are located above the culvert and are at risk of breaking. It should also be noted that this is a major route for school buses, which add to the stress on the pipes.	Completed Action. The Willey Street culvert project has been completed. More information is needed.
2. Consider implementing drainage project to mitigate against water infiltration at the Town Hall and Police Station.	Completed Action. Installed exterior and interior drainage improvements to eliminate water seepage and damage to the lower level of Town Hall.
3. Provide all-hazard training for emergency responders and personnel, other local agencies, and town officials. Training includes active shooter, mass casualty, and train derailment.	Ongoing Action. The Town's Emergency Operations Plan called for classes and a round table for mass casualty scenarios. The Fire Department conducted two different train derailment trainings. The Police and Fire Departments take active shooter training each year. In addition, the School conducts similar drills.
4. Inventory and GPS the local drainage system, including catch basins, outfalls, manholes, connection pipes, and detention ponds to better assess the town's drainage infrastructure.	Ongoing Action. The Town has hired Hoyle, Tanner Associates to assist in stormwater mapping to remain in compliance with MS4 requirements.
5. Revise the town's stormwater management requirements to implement minimum, consistent, and effective stormwater standards to effectively regulate land uses and mitigate flooding.	Ongoing Action. The Town worked on and approved several updates to its stormwater regulations. Hoyle, Tanner Associates will be assisting with implementing other MS4 stormwater requirements. In 2021, the Town, in partnership with SRPC, received a sourcewater protection grant from NHDES to review and ensure the Town's stormwater management regulations are compliant with MS4 requirements.

Proposed Mitigation Action	Update 2022
6. Consider results from the climate ready culvert analysis to prioritize existing infrastructure, which may be vulnerable to higher projections of precipitation during rain events.	Deferred Action. This has not been accomplished. SRPC will reshare the results from the culvert report with the Town's Road agent and this action will be carried forward.
7. Implement a volunteer-based program to identify high risk populations that may be vulnerable during emergency events. By asking residents to submit information, the Police Department will create a database and use it to set up a call-system for those at-risk residents.	Deferred Action. To the best of the committee's knowledge this has not been accomplished and this action will be carried forward.
8. Streamline radio functions and improve communications between all emergency responders during an event. Utilize one frequency to communicate from command post at the Police Station to emergency responders, road agent, and other municipal staff.	Completed Action. The Town now operates off a local frequency, has installed a repeater on the water tower, and has purchased radios for all the municipal trucks to streamline radio functions and improve communication.
9. Conduct a feasibility study to determine best location for the installation of a repeater. Install repeater, which would improve local connections, due to the many dead spots in town, for emergency responders during events.	Completed Action. A repeater has been installed on the water tower at the Transfer Station.
10. Update all street annotation on current maps to reflect the E-911 changes.	Ongoing Action. The last street annotation map update was completed in December 2020. The Town will continue to update maps, as necessary.

Status Update:

Completed Action – This program continues to be an implemented mitigation action item since the prior plan

Deferred Action – At the time of developing this plan, more time is required for completion and will be carried forward into 2022 actions

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 and will be carried forward into 2022 actions

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 22 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 22: Existing Programs and Policies

Existing Program	Description	Effectiveness	2022 Update
Building Code/ Permits	Requires builders to obtain all permits prior to action	Good	The Town is currently utilizing the 2015 edition of the International Building Code and will continue to defer to approval recommendations made by the NH State Building Code Review Board.
Elevation Certificates	An administrative tool of the NFIP, used by communities to verify and document building compliance with the community's floodplain management regulations	Good	This program continues to be administered to ensure that elevation certificates are properly filed, certified, and implemented as part of the building permit process.
Local Emergency Operations Plan (LEOP)	Defined notification procedures and actions that should be taken in different emergency situations. This was last updated 2014.	Good	The Town is still using the 2014 plan, which needs to be updated. Town is looking for recommendations to prepare the plan and funding through a grant from HSEM
Storm Drain Maintenance	Storm drains are maintained and upgraded on an as needed basis	Good	The Town hired Hoyle and Tanner to conduct mapping system updates, as well as implements catch basin cleaning once a year and monitors deterioration of catch basins.
Road Design Standards	The Town subdivision ordinance includes the road design standards that control the amount and retention of storm water.	Good	The Town adopted revised stormwater regulations and received a grant in 2021 to amend them to ensure consistency with the MS4 permit.
Tree Maintenance	Eversource and NHDOT have tree maintenance programs to clear trees and tree limbs from power lines and roadways	Good	There has been ongoing tree maintenance from the public works department. Eversource has done a good job in the last few years. Significant maintenance on Somersworth Road, Clement Road, Rollins Road, Sligo Road, and Baer Road.
Evacuation and Notification	Evacuation and notification procedures are defined in Rollinsford's LEOP.	Good	Completed in 2014. The next update is scheduled for 2019.
Emergency Back-up Power	There is emergency back-up power in the Town Hall (emergency shelter), the wastewater treatment plant, the fire department, and the highway department	Good	School upgraded from single to 3-phase (2016 and 2017), adaptable for generator, no plans for adding a generator at this time. Keep generator as future action.

Existing Program	Description	Effectiveness	2022 Update
Shoreland Protection Act	Establishes minimum standards for the subdivision, use, and development along the State's larger water bodies [Salmon Falls River].	Good	Local regulations need to agree with State standards.
State Dam Program	Dam inspections completed by NHDES dam maintenance and safety program	Good	Receives notifications from the State. There is a need to develop a comprehensive list of dam inspection schedules.
Hazardous Materials Response Team	The Town relies on the START Team, made up of Strafford and Rockingham Counties and Portsmouth Shipyard for response to any Haz-Mat spill in town.	Good	Continue to work with START team and continue training.
Public Education Program	Public awareness regarding evacuations in the events of severe weather events.	Good	Evaluated after each incident by the EMD. Town needs to have a renewed focus before future disaster events.
Mutual Aid	Mutual aid system with Police as authorized by RSA 48:11-A and 105:13.	Good	Mutual aid is in place and agreements are renewed, as necessary.
Mutual Aid	Mutual aid system with Fire as authorized by RSA 154:30.	Good	Mutual aid is in place and agreements are renewed, as necessary. Added automated response from south Berwick for certain types of calls
Mutual Aid	Highway department mutual aid as authorized by RSA 53-A	Good	This program is a network of municipalities that assist one another during emergencies through partnering agreements and a protocol for requesting and receiving aid
Floodplain Management Ordinance	Local ordinance to regulate development in the FEMA floodplain.	Good	FEMA maps have been approved and adopted as of 2015.
Wellhead Protection Areas	Ongoing testing and conservation efforts to reduce any potential contamination to drinking water supplies.	Good	Last testing was completed in 2018. Scheduled testing is set for July 2021.

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

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 23 (New Mitigation Actions) and Table 24 (Implementation Plan) are fundable under FEMA PDM grant programs. The Planning Committee determined that this Plan was in large part a management document designed to assist the Board of Selectmen 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 eight (8) new strategies to implement during the life of this Plan and carried over two (2) additional actions from the 2016 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 several 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 23, which also includes a feasibility assessment and prioritization of each hazard.

Feasibility and 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 23: Future Mitigation Actions & STAPLEE

New Mitigation Project	S	T	A	P	L	E	E	Total
Improve ways in which the community provides information to the public to encourage a renewed focus of being proactive before future disaster events. This may include using alerts, notifications, and social media (Nixle, Town website, Facebook, etc.)	3	3	2	3	3	3	3	20
			Capacity is limited. Currently, a volunteer runs the website. Move to staff.					
Conduct a feasibility analysis to determine if a dry hydrant at the boat launch is a suitable location. This should include future operation and maintenance needs.	3	2	3	3	3	3	2	19
		Potential issues with water access.					Unknown engineering & permitting costs.	
Purchase and install a generator at the grade school	2	3	3	2	3	3	2	18
	Mixed feelings about long term use of school			School is a separate governmental entity with different priorities.			Funding must pass with voters.	
Clear ditch line and add a culvert on Clement Road to address existing flooding and overtopping issues.	3	3	3	3	3	3	3	21
Determine the costs, scope of project, and funding opportunities for the long-term solution of replacing the temporary bridge on Old Mill Road.	2	3	3	3	3	3	1	18
	Maintaining access to homeowners during project						Unknown engineering & permitting costs.	

New Mitigation Project	S	T	A	P	L	E	E	Total
Collaborate with the Water/Sewer District to implement long-term planning solutions to guarantee the long-term viability of the Town's water system. This includes, but is not limited to, ensuring compliance with proposed water quality standards (arsenic <0.005 mg/L As) through improved process controls, implementing capital planning improvement projects identified by Wright-Pierce for wells and the distribution system, and determining the feasibility of tying into neighboring communities, such as Berwick Maine, through interconnection studies.	3	3	3	2	3	3	2	19
				District is a separate entity.			Funding constraints	
Review the updated floodplain model ordinance from Office of Strategic Initiatives and update the town's floodplain ordinance accordingly.	2	3	2	3	3	3	3	19
	Voters need to approve at Town Meeting		Funding would be needed					
Use list of outreach campaign examples (included in the Appendices) to determine which options could be replicated in Town to help mitigate future risks from natural and manmade hazards.	3	3	3	3	3	3	2	20
							Small cost of printing and mailing	
*Consider results from the climate ready culvert analysis to prioritize existing infrastructure, which may be vulnerable to higher projections of precipitation during rain events.	3	3	3	3	3	3	3	21

New Mitigation Project	S	T	A	P	L	E	E	Total
*Implement a volunteer-based program to identify high risk populations that may be vulnerable during emergency events. By asking residents to submit information, the Police Department will create a database and use it to set up a call-system for those at-risk residents.	3	3	3	3	3	3	3	21
*Provide all-hazard training for emergency responders and personnel, other local agencies, and town officials. Training includes active shooter, mass casualty, and train derailment.	3	3	3	3	3	3	3	21
*Inventory and GPS the local drainage system, including catch basins, outfalls, manholes, connection pipes, and detention ponds to better assess the town's drainage infrastructure.	3	3	3	2	3	3	2	19
				There are questions as to the role of EPA and the MS4 permit requirements			Funding and municipal resources may be inadequate	
*Update all street annotation on current maps to reflect the E-911 changes.	3	3	3	3	3	3	2	20
							Funding would be needed for map updates	
*Revise the town's stormwater management requirements to implement minimum, consistent, and effective stormwater standards to effectively regulate land uses and mitigate flooding.	3	2	3	2	3	2	3	18
		SRPC assistance is needed		Would need to be adopted by the Planning Board		Potential development consequences		

*Ongoing and deferred actions from the 2016 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 23). 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 23, 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 24: 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*
Improve ways in which the community provides information to the public to encourage a renewed focus of being proactive before future disaster events. This may include using alerts, notifications, and social media (Nixle, Town website, Facebook, etc.)	Multi-Hazard	Town-wide	Education and Outreach	Police Department	Operating Budget	Low	Existing tasks are part of operating budget. Improving these items will take 1-2 years still under the operating budget.
Conduct a feasibility analysis to determine if a dry hydrant at the boat launch is a suitable location. This should include future operation and maintenance needs.	Wildfire	Boat Launch	Planning/ Structure & Infrastructure Project	Fire Department/ Road Agent/ Water & Sewer	Operating Budget	Medium	2-5 years depending on BOS
Purchase and install a generator at the grade school	Multi-Hazard	Grade School	Structure & Infrastructure Project	Board of Selectmen, CIP Committee & School Board	CIP Budget (Warrant Article)	High ($30,000)	2-5 years

Clear ditch line and add a culvert on Clement Road to address existing flooding and overtopping issues.	Flooding	Clement Road	Structure & Infrastructure Project	Road Agent	Culvert Reserve Fund or Operating Fund (BOS dependent)	Low	6 months to 1 year
Determine the costs, scope of project, and funding opportunities for the long-term solution of replacing the temporary bridge on Old Mill Road.	Multi-Hazard	Old Mill Road	Planning/ Structure & Infrastructure Project	Board of Selectboard, CIP Committee, Road Agent	Warrant Article	High	2-5 years depending on BOS
Collaborate with the Water/Sewer District to implement long-term planning solutions to guarantee the long-term viability of the Town's water system. This includes, but is not limited to, ensuring compliance with proposed water quality standards (arsenic <0.005 mg/L As) through improved process controls, implementing capital planning improvement projects identified by Wright-Pierce for wells and the distribution system, and determining the feasibility of tying into neighboring communities, such as Berwick Maine, through interconnection studies.	Multi-Hazard	Water/Sewer District	Planning/ Structure & Infrastructure Project	Board of Selectmen & Water/Sewer District	Operating Budget & State Revolving Fund	High	2-5 years
Review the updated floodplain model ordinance from Office of Strategic Initiatives and update the town's floodplain ordinance accordingly.	Flooding	FEMA Flood Zones	Planning	SPRC/ Planning Board	Grant Funding	Low	1-2 years

Use list of outreach campaign examples (included in the Appendix E) to determine which options could be replicated in Town to help mitigate future risks from natural and manmade hazards.	Multi-Hazard	Town-wide	Education and Outreach	Town Administration	Operating Budget	Low	1-2 years
*Consider results from the climate ready culvert analysis to prioritize existing infrastructure, which may be vulnerable to higher projections of precipitation during rain events.	Flooding	Stream crossing throughout Town	Planning	Road Agent	Operating Budget	Low	Ongoing/Continuous
*Implement a volunteer-based program to identify high risk populations (e.g., elderly) that may be vulnerable during emergency events. By asking residents to submit information, the Police Department will create a database and use it to set up a call-system for those at-risk residents.	Multi-Hazard	Town-wide	Education and Outreach	Police Department	Police Budget	Low	1-2 years
*Provide all-hazard training for emergency responders and personnel, other local agencies, and town officials. Training includes active shooter, mass casualty, and train derailment.	Multi-Hazard	Town-wide	Emergency Preparedness	Police and Fire Department	HSEM Funding	Low	1-2 years
*Inventory and GPS the local drainage system, including catch basins, outfalls, manholes, connection pipes, and detention ponds to better assess the town's drainage infrastructure.	Flooding and Drainage	Town-wide	Planning	Road Agent	Operating Budget	Medium	1-2 years

*Update all street annotation on current maps to reflect the E-911 changes.	Multi-Hazard	Town-wide	Emergency Response	Police and Assessing Department	Operating Budget	Medium	1-2 years
*Revise the town's stormwater management requirements to implement minimum, consistent, and effective stormwater standards to effectively regulate land uses and mitigate flooding.	Flooding	Town-wide	Planning	Planning Board	NHDES Funding	Medium	1-2 years
*Ongoing and deferred actions from the 2016. Previous implementation notes were reaffirmed.							

Chapter VIII: 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 Rollinsford to use once a conditional approval is received from HSEM.

Integration with Other Plans

Both the 2011 and 2016 plans were used during periodic updates to the Rollinsford Master Plan and the C-RiSe vulnerability assessment. 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 all-hazard plan will only enhance mitigation if balanced with all other town plans. Rollinsford 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 Rollinsford, 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 Select Board 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 include 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 IX: Plan Adoption

Conditional Approval Letter from HSEM

Good Morning!

The Department of Safety, Division of Homeland Security & Emergency Management (HSEM) has completed its review of the Rollinsford, 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.

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

Sincerely,

Hazard Mitigation
New Hampshire Department of Safety, Division of Homeland Security & Emergency Management
Brian Eaton, State Hazard Mitigation Officer / Brian.E.Eaton@dos.nh.gov / (603) 227 8724
Vacant, State Hazard Mitigation Planner
Olivia Barnhart, Assistant Chief of Preparedness and Mitigation / Olivia.W.Barnhart@dos.nh.gov / (603) 223-3639

Signed Certificate of Adoption

Town of Rollinsford, New Hampshire
Board of Selectmen
A Resolution Adopting the Rollinsford, NH Multi-Hazard Mitigation Plan Update 2021

Conditionally Approved: 09/24/2021

WHEREAS, the Town of Rollinsford 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 Rollinsford, NH All-Hazard Mitigation Plan Update 2021; and

WHEREAS, several public planning meetings were held between March 12, 2021 and June 24, 2021 regarding the development and review of the Rollinsford, NH All-Hazard Mitigation Plan Update 2021; and

WHEREAS, the Rollinsford, NH All-Hazard Mitigation Plan Update 2021 contains several potential future projects to mitigate hazard damage in the Town of Rollinsford; and

WHEREAS, a duly-noticed public meeting was held by the Rollinsford Board of Selectmen on 12/14/21 to formally approve and adopt the Rollinsford, NH All-Hazard Mitigation Plan Update 2021.

NOW, THEREFORE BE IT RESOLVED that the Rollinsford Board of Selectmen adopts the Rollinsford, NH All-Hazard Mitigation Plan Update 2021.

ADOPTED AND SIGNED this day of 12/14, 2021

Paul M. Cass
Rollinsford Board of Selectmen, Chair

Charles J. Goeller
Town Seal or Notary

CHARLES J. GOELLER JUSTICE OF THE PEACE MY COMMISSIONS EXPIRE AUG. 28, 2024 NOTARY PUBLIC NEW HAMPSHIRE

Date 12/14/21

Final Approval Letter from FEMA

U.S. Department of Homeland Security
FEMA Region I
99 High Street, Sixth Floor
Boston, MA 02110-2132

FEMA

January 26, 2022

Brian Eaton, State Hazard Mitigation Officer
New Hampshire Department of Safety, Homeland Security and Emergency Management
33 Hazen Drive
Concord, New Hampshire 03303

Dear Mr. Eaton:

As outlined in the FEMA-State Agreement for FEMA-DR-4457, your office has been delegated the authority to review and approve local mitigation plans under the Program Administration by States Pilot Program. Our Agency has been notified that your office completed its review of the Rollinsford, NH Multi-Hazard Mitigation Plan Update 2021 and approved it effective **January 20, 2022** through **January 19, 2027** in accordance with the planning requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the National Flood Insurance Act of 1968, as amended, and Title 44 Code of Federal Regulations (CFR) Part 201.

With this plan approval, the jurisdiction is eligible to apply to New Hampshire Homeland Security and Emergency Management for mitigation grants administered by FEMA. Requests for funding will be evaluated according to the eligibility requirements identified for each of these programs. A specific mitigation activity or project identified in this community's plan may not meet the eligibility requirements for FEMA funding; even eligible mitigation activities or projects are not automatically approved.

The plan must be updated and resubmitted to the FEMA Region I Mitigation Division for approval every five years to remain eligible for FEMA mitigation grant funding.

Thank you for your continued commitment and dedication to risk reduction demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please contact Jay Neiderbach at (617) 832-4926 or Josiah.Neiderbach@fema.dhs.gov.

Sincerely,

PAUL F FORD Digitally signed by PAUL F FORD
Date: 2022.01.26 14:13:10 -05'00'

Paul F. Ford
Acting Regional Administrator
DHS, FEMA Region I

PFF:jn
cc: Fallon Reed, Chief of Planning, New Hampshire

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)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

Appendix E: Successful Outreach Campaigns

Appendix F: Maps
- Emergency and Non-Emergency Response Facilities
- Critical Facilities
- Historic, Cultural, Recreation, and Economic Resources

Appendix A: Bibliography

Documents

- Local Mitigation Plan Review Guide, FEMA, October 1, 2011
- Multi-Hazard Mitigation Plans
    - Town of Newmarket, 2018
- State of New Hampshire Multi-Hazard Mitigation Plan (2018) - 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, 2020; Census 2000 and Revenue Information
- NCDC [National Climatic Data Center, National Oceanic and Atmospheric Administration]. 2021. *Storm Events*

Photos

Bob Ducharme, Former Police Chief, Town of Rollinsford

Appendix B: Planning Process Documentation

Agendas

Town of Rollinsford, New Hampshire

Hazard Mitigation Committee Meeting #1

Friday, March 12, 2021
9AM-10:30AM

Join Zoom Meeting
https://us02web.zoom.us/j/83769750435?pwd=dnVYU1d6NkRiVEJqcGJrZiszK1prdz09

Meeting ID: 837 6975 0435
Passcode: 218560
+1 646 558 8656 US (New York)

MEETING AGENDA

1. Call to order and introductions
2. Brief review on update process: timeframe, committee responsibilities, and in-kind match
3. Review Chapter III: Asset Inventory (*see attachment*)
4. Review Chapter V: National Flood Insurance (*see attachment*)
5. Review Chapter VII: Action Plan (*see attachments*)
    a. Past Mitigation Strategies
    b. Existing Mitigation Strategies
6. Next meeting date
7. Adjournment

Town of Rollinsford, New Hampshire

Hazard Mitigation Committee Meeting #2

Thursday, April 1, 2021
11:30AM-1:30PM

Join Zoom Meeting

https://us02web.zoom.us/j/89268277347?pwd=ZXQ2ZVdLN3N6YzBzS04zWWZFVGI5QT09

Meeting ID: 892 6827 7347
Passcode: 374107
+1 646 558 8656 US (New York)

MEETING AGENDA

1. Call to order and introductions

2. Review draft meeting summary (*see attachments*)

3. Review revisions received from committee at Meeting #1 (*see attachments*)
    a. Asset Inventory
    b. National Flood Insurance
    c. Past Mitigation Strategies

4. Review Chapter VII: Action Plan (*see attachments*)
    a. Existing Mitigation Strategies

5. Review hazard descriptions (*see attachments*)

6. Review vulnerability assessment tool (*see attachments*)

7. Next meeting date

8. Adjournment

Town of Rollinsford, New Hampshire

Hazard Mitigation Committee Meeting #3

Thursday, April 29, 2021
11:30AM-1:30PM

Join Zoom Meeting

https://us02web.zoom.us/j/84399653543?pwd=YU1WVGZ5U05LUXhlNHh6Y3lqZFZMUT09

Meeting ID: 843 9965 3543
Passcode: 998243
+1 646 558 8656 US (New York)

MEETING AGENDA

1. Call to order and introductions
2. Review draft meeting summary (*see attachment*)
3. Review existing mitigation strategies (*see attachment*)
4. Review vulnerability assessment tool (*see attachment*)
5. Identify locations of past hazards
    a. SRPC will facilitate with an online map
6. Brainstorm potential actions
    a. Use FEMA Mitigation Ideas as a guide
    b. Please come prepared to the meeting with ideas on mitigation strategies
7. Next meeting date
8. Adjournment

Town of Rollinsford, New Hampshire

Hazard Mitigation Committee Meeting #4

Thursday, June 3, 2021
11:30AM-1:30PM

Join Zoom Meeting

https://us02web.zoom.us/j/82100073897

Meeting ID: 821 0007 3897
+1 646 558 8656 US (New York)

MEETING AGENDA

1. Call to order and introductions
2. Review draft meeting summary (*see attachment*)
3. Review final vulnerability assessment tool (*see attachment*)
4. Brainstorm potential actions
    a. Use FEMA Mitigation Ideas as a guide
    b. Please come prepared to the meeting with ideas on mitigation strategies
5. Next meeting date
6. Adjournment

Town of Rollinsford, New Hampshire

Hazard Mitigation Committee Meeting #5

Thursday, June 24, 2021
11:30AM-1:30PM

Join Zoom Meeting

https://us02web.zoom.us/j/87817309120?pwd=TU8zc1NoWmRzNkNiNjJFVjJRY2c1Zz09

Meeting ID: 878 1730 9120
+1 646 558 8656 US (New York)

MEETING AGENDA

1. Call to order and introductions
2. Review draft meeting summary (*see attachment*)
3. Review draft inventory maps (*see attachment*)
4. Finalize mitigation actions (*see attachment*)
5. Fill out implementation table (*see attachment*)
6. Next steps for adoption
7. Adjournment

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[25] -** 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.

[25] 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 and Financial Assistance for Multi-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[26]:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- Severe Repetitive Loss (SRL)

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.

[26] 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

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
- 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

D. Repetitive Flood Claims (RFC)

RFC provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% federal funding for projects in communities that meet the reduced capacity requirements.

Program Overview

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al).

Up to $10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP).

Federal / Non-Federal Cost Share

FEMA may contribute up to 100 percent of the total amount approved under the RFC grant award to implement approved activities, if the Applicant has demonstrated that the proposed activities cannot be funded under the Flood Mitigation Assistance (FMA) program.

E. Severe Repetitive Loss (SRL)

SRL provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that are qualified as severe repetitive loss structures. SRL provides up to 90% federal funding for eligible projects.

Program Overview

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP).

Definition

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Purpose:

To reduce or eliminate claims under the NFIP through project activities that will result in the greatest savings to the National Flood Insurance Fund (NFIF).

Federal / Non-Federal cost share:

75 / 25 %; up to 90 % Federal cost-share funding for projects approved in States, Territories, and Federally-recognized Indian tribes with FEMA-approved Standard or Enhanced Mitigation Plans or Indian tribal plans that include a strategy for mitigating existing and future SRL properties.

Appendix E: Successful Outreach Campaigns

1. Tool for outreach material w/ search function: https://cfpub.epa.gov/npstbx/index.cfm

2. NH DES "Scoop the Poop" media kit:

https://www.des.nh.gov/resource-center/publications?keys=scoopthepoop+media&purpose=Guidance+&subcategory=Watershed+Management

3. Cumberland County Interlocal Stormwater Working Group, Education Plan per permit year, EXTENSIVE statistics on outreach campaigns & methods, specifically deals with Ms4:

https://static1.squarespace.com/static/5e4af21b92caed7f481a25b7/t/5f21788798148a15d80e1258/1596029063333/Stormwater_Awareness_Approved_7.2020.pdf

   a. Annual Reports found here: https://www.cumberlandswcd.org/iswg

   b. Comprehensive lesson catalog for outreach/engagement with kids, lesson materials can also be rented from the Cumberland County Soil and Water Conservation District : https://static1.squarespace.com/static/5e4af21b92caed7f481a25b7/t/5ffdcaba6ab8611c9d82eebb/1610468027536/Education+Lessons+Catalog.pdf

4. Messages about flood safety on city benches, outreach about flooding at CSU's housing fair for student renters/property owners: https://successwithcrs.us/fort-colins-colorado/

5. p. 61-62 case study on using open houses for floodproofing outreach: https://www.floodsciencecenter.org/koha?id=980

6. Tool for outreach: enviroscapes hands on models, watershed/nonpoint source and wetland/floodplain, mentioned in case study from link above (p 67-68) https://www.enviroscapes.com/category/hands-on-models

7. Newspaper article on pet waste campaign:

https://www.ajc.com/neighborhoods/north-fulton/roswell-launches-dog-waste-education-and-outreach-campaign/KDA2H34NVJFN3KRSE3L3OB4IK4/

8. One-month social media campaign plan with materials on pet waste education: https://www.dupagerivers.org/seasonal-campaigns/pet-waste/

9. "Write as rain" stormwater outreach campaign, won first place for best education and outreach in the bay (Chesapeake stormwater network) https://askhrgreen.org/rainyday/

Appendix F: Maps

Emergency and Non-Emergency Response Facilities
Critical Facilities
Historic, Cultural, Recreation, and Economic Resources

Critical Infrastructure & Past and Potential Hazards

Hazard Mitigation Plan (2021)
Rollinsford, NH

Critical Infrastructure Legend

Emergency Response Facilities

- Emergency Fuel
- Fire Aid
- Police Station
- Regional Shelter
- Secondary Fuel
- Secondary Shelter
- Shelter
- Town/City Hall
- Warming Shelter

Non-Emergency Response Facilities

- Recycling Center

Basemap Legend

- Rivers and Streams
- Waterbody
- Dam Inundation Areas
- FEMA 100-Year Flood Zone
- Railroads
- 2 Foot SLR Plus Storm Surge
- 4 Foot SLR Plus Storm Surge
- 6 Foot SLR Plus Storm Surge

Past Hazards

- Flooding
- Hazardous Materials
- Wildfire
- Wind Shear

Roads

- State
- Local
- Private

0 0.25 0.5 1 Miles

N

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Prepared by Strafford Regional Planning Commission
150 Wakefield Street #12, Rochester, NH 03867
603-994-3500
Author: Jackson Rand
Date: 6/29/2021

Base data layers generally from ESRI, NH GRANIT, NHDOT, MEGIS, USGS, and the Town of Rollinsford. These agencies and organizations have derived this data using a variety of cited source materials, at different time frames, through different methodologies, with varying levels of accuracy. As such, errors are often inherent in GIS data and should be used for planning purposes only. The presented data is sometimes only a subset of the original data. Please visit the original location of the data, contact the original host source, or contact SRPC for information on the full data set.

Critical Infrastructure & Past and Potential Hazards

Hazard Mitigation Plan (2021)
Rollinsford, NH

Critical Infrastructure Legend

Critical Facilities

- Communication Function
- Dam
- Hazardous Materials
- Helipad
- Power Substation
- Pump Station
- Bridge
- Bridge (Redlist)

Basemap Legend

- Rivers and Streams
- Waterbody
- Dam Inundation Areas
- FEMA 100-Year Flood Zone
- Railroads
- 2 Foot SLR Plus Storm Surge
- 4 Foot SLR Plus Storm Surge
- 6 Foot SLR Plus Storm Surge

Past Hazards

- Flooding
- Hazardous Materials
- Wildfire
- Wind Shear

Roads

- State
- Local
- Private

0 0.25 0.5 1 Miles

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Critical Infrastructure & Past and Potential Hazards

Hazard Mitigation Plan (2021)
Rollinsford, NH

Critical Infrastructure Legend

Historic, Cultural, Recreation, and Economic Resources

- Economic Impact Area
- Historic
- Historic (National Register)
- Recreational Site

Vulnerable Populations to Protect

- Daycare Facility
- Religious Facility

Water Resources

- Fire Aid

Basemap Legend

- Rivers and Streams
- Waterbody
- Dam Inundation Areas
- FEMA 100-Year Flood Zone
- Railroads
- 2 Foot SLR Plus Storm Surge
- 4 Foot SLR Plus Storm Surge
- 6 Foot SLR Plus Storm Surge

Past Hazards

- Flooding
- Hazardous Materials
- Wildfire
- Wind Shear

Roads

- State
- Local
- Private

0 0.25 0.5 1 Miles

N

D:\Local_R_Drive\W_Drive\6_State\65_OEM\HazardMitigation\Rollinsford\MXD\20210629_HazardMitigationPlan_Rollinsford_11x17.mxd

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