Town of Hollis, NH
Hazard Mitigation Plan Update 2012

Adopted by the:
Hollis Board of Selectmen

Date Approved Pending Adoption: August 7, 2012
Date Adopted: August 27, 2012
Date Approved: November 28, 2012

Prepared with the assistance of the:

NRPC

NASHUA REGIONAL PLANNING COMMISSION

This project was partially funded by:

New Hampshire Department of Safety — Homeland Security and Emergency Management

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Certificate of Adoption

Town of Hollis, New Hampshire
BOARD OF SELECTMEN
A RESOLUTION ADOPTING THE TOWN OF HOLLIS HAZARD MITIGATION PLAN UPDATE 2012
8-27, 2012

WHEREAS, the Town of Hollis received funding, administered by the Nashua Regional Planning Commission, from the New Hampshire Bureau of Emergency Management to prepare the Hollis Hazard Mitigation Plan Update 2012; and

WHEREAS, several public planning meetings were held between March 2011 and June 2011, regarding the development and review of the Hollis Hazard Mitigation Plan Update 2012; and

WHEREAS, the Town of Hollis Hazard Mitigation Plan Update 2012 contains several potential future projects to mitigate hazard damage in the Town of Hollis; and

NOW, THEREFORE BE IT RESOLVED that the Hollis Board of Selectmen adopts the Town of Hollis Hazard Mitigation Plan Update 2012.

ADOPTED AND SIGNED this 27th day of August.

David Petry, Chair

Frank Cadwell, Vice Chair

Peter Band

Mark Le Doux

Vahrij Manoukian

ATTEST

Nancy Jambard, Town Clerk

ORIGINAL

U.S. Department of Homeland Security
99 High Street, 6th Floor
Boston, MA 02110-2320

FEMA

November 29, 2012

Dave Petry, Chair
Hollis Board of Selectmen
Town Hall
7 Monument Square
Hollis, NH 03049

Dear Mr. Petry:

Thank you for the opportunity to review the Town of Hollis, NH Hazard Mitigation Plan. The Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) Region I has evaluated the plan for compliance with 44 CFR Part 201. The plan satisfactorily meets all of the mandatory requirements set forth by the regulations. Congratulations on this achievement!

With this plan approval, the Town is eligible to apply for Mitigation grants administered by FEMA. Requests for mitigation funding will be evaluated individually according to the specific eligibility and requirements of each of these programs. Furthermore, a specific mitigation activity or project identified in your community's plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved for FEMA funding under the programs referenced above.

The Town's Hazard Mitigation Plan must be reviewed, revised as appropriate, and resubmitted to FEMA for approval within **five years of the plan approval date of November 28, 2012** in order to maintain eligibility as an applicant for mitigation grants. Over the next five years, we encourage the town to continue updating the plan's assessment of vulnerability, adhere to its maintenance schedule, and begin implementing, when possible, the mitigation actions proposed in the plan.

Once again, thank you for your continued dedication to public service demonstrated by preparing and adopting a strategy for reducing future disaster losses. Should you have any questions, please do not hesitate to contact Marilyn Hilliard at (617) 956-7536.

Sincerely,

Paul F. Ford
Acting Regional Administrator

PFF:mh

cc: Lance Harbour, Acting State Hazard Mitigation Officer
Beth Peck, NH Homeland Security and Emergency Management Planner
Jennifer Gilbert, NFIP Coordinator
Jill Longval, Nashua Regional Planning Commission

Enclosure

ACKNOWLEDGEMENTS

The Hollis Board of Selectmen extends special thanks to those that assisted in the development of this Plan:

Hazard Mitigation Team

- Don McCoy, Emergency Management Director, Town of Hollis, NH
- Rick Towne, Fire Chief, Town of Hollis, NH
- Cathy Hoffman, Assistant Town Administrator, Hollis, NH
- Troy Brown, Town Administrator, Hollis, NH
- Mark Fougere, Town Planner, Hollis, NH
- Jeff Babel, Public Works Director, Town of Hollis, NH
- James Sartell, Police Chief, Town of Hollis, NH

Additional Staff

- Patrick Blaisdell, Nashua Regional Planning Commission
- Camille Pattison, Nashua Regional Planning Commission
- Jack Moorhouse, New Hampshire Department of Safety, Division of Homeland Security and Emergency Management Field Representative

The Hollis Board of Selectmen offers thanks to the New Hampshire Department of Safety, Division of Homeland Security and Emergency Management (HSEM) and the Federal Emergency Management Administration (FEMA) for their assistance in developing the Plan. In addition, special thanks are extended to the staff of the Nashua Regional Planning Commission (NRPC) for professional services, process facilitation, and preparation of this document.

EXECUTIVE SUMMARY

The Hollis Hazard Mitigation Plan Update 2012 (herein after, the Plan) serves as a tool for Town and emergency personnel by identifying hazards to citizens, public and private property, assessing the frequency, intensity, and potential damage anticipated from these local and regional hazards, and identifying actions and strategies that are intended to protect citizens and reduce or prevent damages to property. The Plan was developed by the Hollis Hazard Mitigation Team (herein after, the Team) with the assistance of NRPC and contains statements of policy adopted by the Board of Selectmen.

The following natural hazards are addressed:

- Flooding
- Dam Failure
- Hurricanes
- Tornados
- Downbursts
- Lightning
- Wildfires
- Severe Winter Weather
- Earthquakes
- Landslides
- Radon
- Drought

The following man-made hazards are addressed:

- Explosions/Fires
- Traffic Congestion/Accidents
- Hazardous Materials Incidents
- Terrorism

The list of critical facilities includes:

- Electric Power Lines, Sub-Stations;
- Water Facilities;
- Gas Facilities;
- Fire Stations and Law Enforcement Facilities;
- Schools;
- Childcare Facilities;
- Commercial Centers;
- Bridges;
- Transportation Routes; and
- Facilities Storing Chemicals and/or Hazardous Materials.

The list of areas of concern includes:

- Large Open Spaces Susceptible to Wildfire/Lightning Strikes;
- Known Flooding Locations;
- Cellular Towers;
- Bridges;
- Motels/Hotels;
- Areas of Traffic Congestion and Accidents;
- Recreational Facilities;
- Churches; and
- Multi-Family Housing.

The Hollis Hazard Mitigation Plan Update 2012 is considered a work in progress and should be revised on a regular basis to assess whether the existing and suggested mitigation strategies are successful. Copies have been distributed to all municipal departments, and a copy will remain on file at NRPC.

This is an update to the original Plan adopted in 2006. As part of the update process, NRPC staff developed a list of new sections and text that are now required and must be incorporated into subsequent updates and plans. Each section of the Plan has been reviewed in great detail and relevant updates have been made as needed throughout the Plan. Updates were completed with a combination of input from Town staff and demographic and land use data from NRPC. These updates included the following changes:

- Chapter I, Section B – Methodology (Updated plans to consider in the Plan update process)
- Chapter I, Section C - Hazard Mitigation Goals and Objectives of the State of New Hampshire (Updated hazard mitigation goals)
- Chapter II, Section A – Town Overview (Updated population figures)
- Chapter II, Section B – Development Trends (Updated population and housing trends)
- Map 2: Watershed Boundaries in Hollis and Table 1: Watersheds in Hollis (Based on more recent watershed classifications)
- Figure 1: Population Trends of Hollis (New table displaying population trends in Hollis 1860-2030)
- Table 2: General Land Use Types in Hollis and Map 3: Land Use Classes in Hollis, 2011 (New graphics illustrating most recent land use types in Hollis)
- Chapter III, Section B – Past Hazard Events (Photos of notable past hazard events added)
- Map 4: Location of Past Hazards in Hollis and Table 3: Past Hazard Events in Hollis, Hillsborough County, and State of NH (Additional past hazard events added)
- Chapter III, Section C – Potential Hazards to Critical Facilities and Areas of Concern (Additional dams and areas of high traffic congestion/accidents added)
- Map 5: Location of Critical Facilities and Areas of Concern in Hollis and Table 4: Hazards to Critical Facilities and Areas of Concern in Hollis (Updated businesses, locations, and critical facilities and areas of concern)
- Table 5: Structures in the Floodplain (Newly added table displaying all structures in the 100 and 500 year floodplain)
- Map 6: Structures Partially or Completely Located in the 100 and 500 Year Floodplain (Based on more recent floodplain classifications)
- Chapter IV, Section A – Prioritization of Critical Facilities and Areas of Concern (Updated emergency response, facilities and areas to protect in a hazard event, and potential resources)
- Chapter IV, Section B – National Flood Insurance Participation (New section on National Flood Insurance Participation)
- Table 6: Critical Facilities Matrix (Reviewed and updated for relevancy)
- Chapter IV, Section D – Calculating the Potential Loss (Updated traffic congestion and vehicular accidents, dam failure, and flooding (riverine) based on up to date structures and assessed building value)
- Table 7: Risk Probability Matrix (Newly added table indicating the probability that a particular hazard will occur in Hollis)
- Chapter IV, Section E – Assessment of Future Development Losses (Updated assessment of future development losses)
- Map 7: Facilities in Hollis Identified in Potential Loss Analysis (Updated with additional past hazards and critical facilities/areas of concern)
- Table 8: Existing Mitigation Strategies (Added items from Table 9 that have been accomplished since the last update. Removed items no longer deemed relevant)
- Chapter V, Section B – Completed or Implemented Mitigation Measures (New section detailing mitigation actions that have been added, moved, or removed from Table 8 and 9)
- Table 9: Proposed Mitigation Strategies (Added newly proposed mitigation strategies. Removed items no longer deemed relevant)
- Table 10: STAPLEE Analyses of Proposed Mitigation Strategies (Updated with new mitigation strategies)
- Table 11: Prioritized Mitigation Projects and Action Plan (Updated to show new prioritization and strategies)

CHAPTER I. INTRODUCTION

A. Background

The New Hampshire Department of Safety, Division of Homeland Security and Emergency Management (HSEM) has a goal for all communities within the State of New Hampshire to establish Local Hazard Mitigation Plans as a means to reduce and mitigate future losses from natural or man-made hazard events. HSEM outlined a process whereby communities throughout the State may be eligible for grants and other assistance upon completion of a local Hazard Mitigation Plan. A handbook entitled Hazard Mitigation Planning for New Hampshire Communities was created by HSEM to assist communities in developing local plans. The State's Regional Planning Commissions are assigned the task of providing assistance to selected communities to develop local plans.

This Plan was prepared by Town of Hollis staff with the assistance and professional services of NRPC under contract with the HSEM operating under the guidance of Section 206.405 of 44 CFR Chapter 1 (10-1-97 Edition). The Plan serves as a strategic planning tool for use by the Town of Hollis in its efforts to identify and mitigate the future impacts of natural and/or man-made hazard events. This Plan does not constitute any section of the (Hollis Master Plan, Zoning Ordinances, or Emergency Management Plan).

B. Methodology

In March of 2011, NRPC organized the first public meeting with representatives from the Town of Hollis to begin the initial planning stages of the Plan. NRPC and the Team developed the content of the Plan using the nine-step process set forth in Hazard Mitigation Planning for New Hampshire Communities. In addition, the Team referenced the Hudson Hazard Mitigation Plan and the Pelham Hazard Mitigation Plan as templates for a general outline and format. Meetings were held on March 15th, 2011, April 19th, 2011, May 17th, 2011, and June 21st, 2011 at the Hollis Town Hall. The Team sought participation from neighboring communities, industry, education and the general public via direct mail to key contacts in the region listed below (see Appendix H for additional information).

Dartmouth Hitchcock Family Practice, Milford, NH
St. Joseph's Medical Center, Milford, NH
Homeland Security and EMS, Concord, NH
American Red Cross, Nashua, NH
American Red Cross, Manchester, NH
Southern NH Medical Center, Nashua, NH
St. Joseph's Medical Center, Nashua, NH
Granite State Concrete, Milford, NH
Suburban Propane, Milford, NH
Souhegan River Local Advisory Committee, Merrimack, NH
Public Service of NH, Manchester, NH
Manchester Boston Regional Airport, Manchester, NH
Nashua Airport Authority, Nashua, NH
Guilford - Pan Am, North Billerica, MA
Wilton/Lyndeborough Cooperative, Wilton, NH
Town of Milford, NH
Town of Brookline, NH
Town of Amherst, NH
City of Nashua, NH
Town of Merrimack, NH
Nashua Community College, Nashua, NH
Hesser College, Nashua, NH
Franklin Pierce College, Rindge, NH
Southern NH University, Nashua, NH
Daniel Webster College, Nashua, NH
Diamond Casting & Machine Company, Inc., Hollis, NH
Morin's Landscaping, Hollis, NH
Lull Farm, Hollis, NH
Brookdale Farm, Hollis, NH
Town of Pepperell, MA

In addition, information and recommendations from the following documents were considered and included if applicable into the update of this Plan: Hollis Master Plan, Hollis Zoning and Subdivision Regulations, Hollis Emergency Management Plan, Hollis Hazardous Materials Response Plan, State Transportation Improvement Plan, Mutual Aid with Souhegan Valley Fire Association, Mutual Aid with Hillsborough County, Greater Nashua Regional Pandemic Plan, NRPC Transportation Emergency Management Preparedness Plan, and Emergency Operations Plan.

The following is a summary of the nine-step process conducted to compile the Plan.

Step 1 - Establish and Orient Hazard Mitigation Team

The Team was established in the spring of 2011 and was comprised of representatives from the following departments: Emergency Management, Town Administration, Fire, Police, Planning, and Public Works. Meeting notifications were posted in the Town Hall, the Public Access Television Channel, the Library, the Town website, and the Hollis/Brookline Journal.

Step 2 – Map the Hazards and Identify Critical Facilities

Participants updated data about damage from historic natural disasters that have occurred and areas where critical man-made facilities and other features may be at risk in the future for loss of life, property damage, environmental pollution, and other risk factors. NRPC generated a set of base maps that were used in the process of identifying past and future hazards.

Participants updated facilities and areas that were considered to be important to the Town for emergency management purposes, for provision of utilities and community services, evacuation routes, and for recreational and social value. Using existing databases, local orthophotos, community maps, local assessing data, and floodplain maps, NRPC plotted the location of these sites on a map. The locations marked on the map represent the entrance to a building or the approximate center of open area sites.

Step 3 – Assessing Vulnerability

Once the critical facilities and areas of concern were identified, NRPC discussed the potential loss of critical facilities based on the frequency and potential severity of the following hazards:
1) Severe winter weather;

2) Hurricanes;

3) Dam failure;

4) Landslides/earthquakes;

5) Wildfires;

6) Tornado/downbursts;

7) Lightning,

8) Flooding;

9) Dam failure;

10) Traffic congestion and vehicular accidents;

11) Explosions/fires;

12) Hazardous materials incidents; and

13) Terrorism

A Critical Facilities Matrix that ranks each critical facility and area of concern, by the potential risk of being affected by a natural or manmade hazard was also constructed. Each hazard is ranked as having a low, medium, or high risk of potentially severely affecting the facility.

Step 4 - Analyzing Development Trends

Current development trends are identified at the end of Chapter II, in Section B, Development Trends. Future development trends are identified at the end of Chapter IV, in Section E, Assessment of Future Development Losses.

Step 5 - Identify Currently Established Strategies and Gaps in Current Protection

After collecting detailed information on each critical facility in Hollis, the Town participants and NRPC staff identified existing Town mitigation strategies relative to flooding, wind, fire, ice and snow events, earthquakes, hazardous material leaks, and traffic congestion and vehicular accidents. The existing strategies were then reviewed for coverage and effectiveness, as well as the need for improvement. The *Hollis Emergency Management Plan* was also referenced to avoid replication of existing protection measures.

Step 6 - Brainstorm and Evaluate Disaster Minimization Alternatives

After developing a list of existing hazard mitigation strategies, the Team was able to identify gaps in the existing mitigation measures. These gaps were taken into consideration during the development of mitigation goals and proposed mitigation measures. The Team also determined which proposed mitigation activities had been completed and they were moved to the Table of Existing Mitigation Strategies.

Step 7 – Select Actions

The proposed hazard mitigation actions and strategies were reviewed and each strategy was rated (good, average, or poor) for its effectiveness according to seven factors (e.g., technical and administrative applicability, political and social acceptability, legal authority, environmental impact, financial feasibility). Each factor was then scored and all scores were totaled for each strategy. Strategies were ranked by overall score for preliminary prioritization then reviewed again under Step 8.

The preliminary prioritization list was reviewed in order to make changes and determine a final prioritization for new hazard mitigation actions and existing protection strategy improvements identified in previous steps.

Step 8 – Develop a Strategy

The implementation strategy was updated and included person(s) responsible for implementation (who), a timeline for completion (when), and a funding source and/or technical assistance source (how) for each identified hazard mitigation action.

Step 9 – Adopt and Monitor the Plan and Continued Public Input

The Assistant Town Administrator will be responsible for ensuring that the Town Departments and the public have an opportunity to participate in the maintenance and update of the Plan. The Team may solicit direct involvement from the Board of Selectmen and Town Departments. The Team will advertise the process in the local paper, in Town offices, and via the internet.

C. Hazard Mitigation Goals and Objectives of the State of New Hampshire

HSEM identified twelve overall goals of the State, which are listed in the NH State Natural Hazards Mitigation Plan, October 2000 Edition and are listed in the following order:

1. To improve upon the protection of the general population, the citizens of the State and guests, from all natural and man-made hazards
2. To reduce the potential impact of natural and man-made disasters on the State's Critical Support Services
3. To reduce the potential impact of natural and man-made disasters on Critical Facilities in the State
4. To reduce the potential impact of natural and man-made disasters on the State's infrastructure
5. To improve Emergency Preparedness
6. To improve the State's Disaster Response and Recovery Capability
7. To reduce the potential impact of natural and man-made disasters on private property
8. To reduce the potential impact of natural and man-made disasters on the State's economy
9. To reduce the potential impact of natural and man-made disasters on the State's natural environment
10. To reduce the State's liability with respect to natural and man-made hazards generally
11. To reduce the potential impact of natural and man-made disasters on the State's specific historic treasures and interests as well as other tangible and intangible characteristics which add to the quality of life of the citizens and guests of the State
12. To identify, introduce, and implement cost effective Hazard Mitigation measures so as to accomplish the State's Goals and Objectives and to raise the awareness of and acceptance of Hazard Mitigation generally

The Team declared a set of overall goals to help guide the development of the Plan. These goals support Hollis's Master Plan and are derived from recommendations of the Team and the New Hampshire Multi-Hazard Mitigation Plan Goals and Objectives.

The primary goal of the Team is to comply with the FEMA requirement to update the Hazard Mitigation Plan not more than every five (5) years, and to update or make the necessary changes so that the Plan will continue to be a useful tool in helping mitigate or avoid future injury, loss of life, damage, or destruction of property caused by natural and man-made hazards.

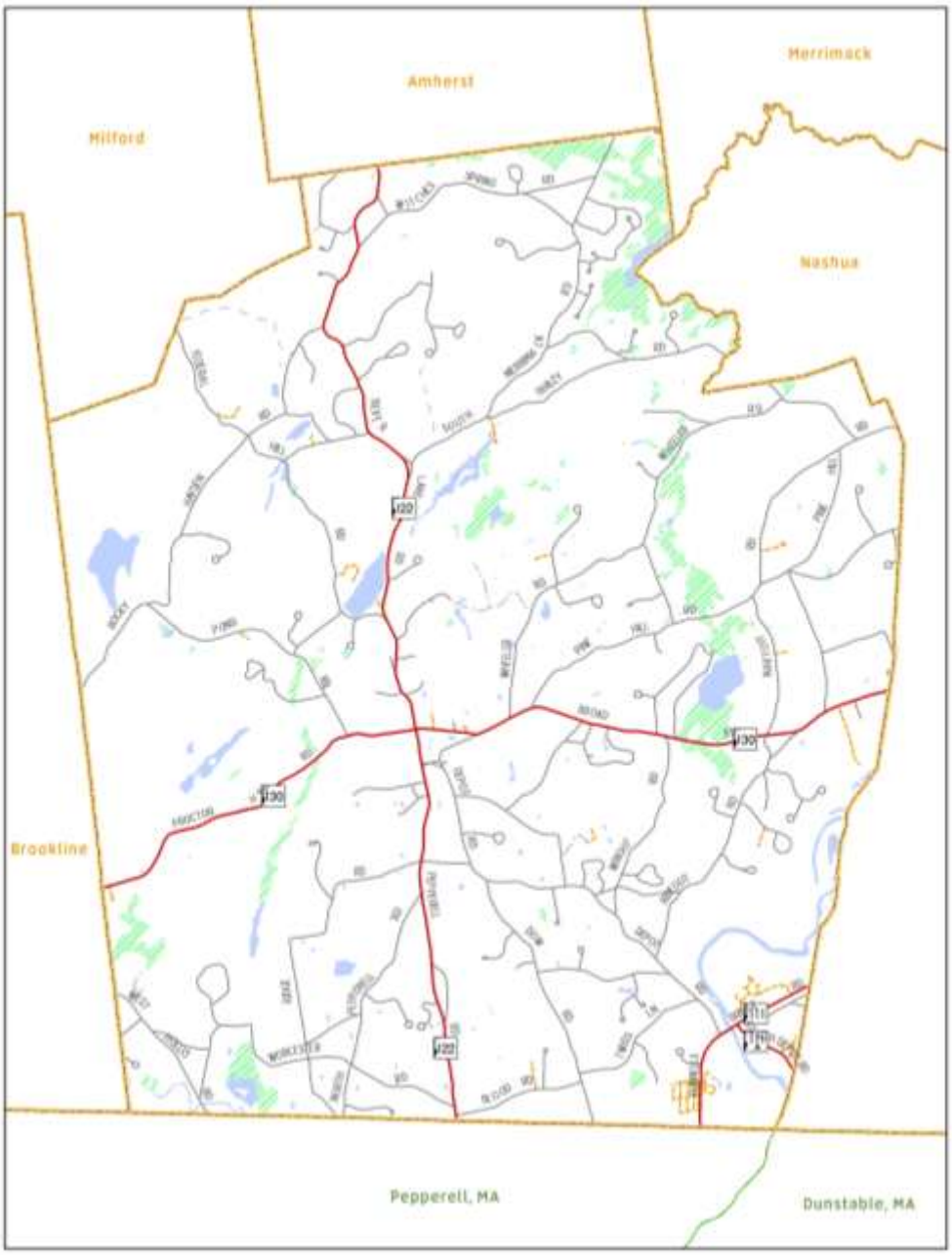
The following additional goals are useful for successful maintenance and implementation of the Plan:

- Identify the natural hazards that may impact Hollis.
  Examples include landslides, earthquakes, snowstorms, and wildfires.
- Identify possible risks from natural hazards.
  Examples include identifying where these hazards have occurred in the past as well as what areas might be impacted if to occur again in the future.
- Identify resources, strategies, actions, or plans available to Hollis to help mitigate the impact of the natural hazard events.
  Examples include critical facility protection and ordinance/regulation revision.
- Increase public awareness of natural and manmade hazards and how to prepare for and react to them through continued public outreach and education.
- Develop a more efficient and sustainable process for Plan maintenance that may permit local annual "minor" updates that can be easily incorporated into the FEMA 5-year update.

CHAPTER II. COMMUNITY PROFILE

A. Town Overview

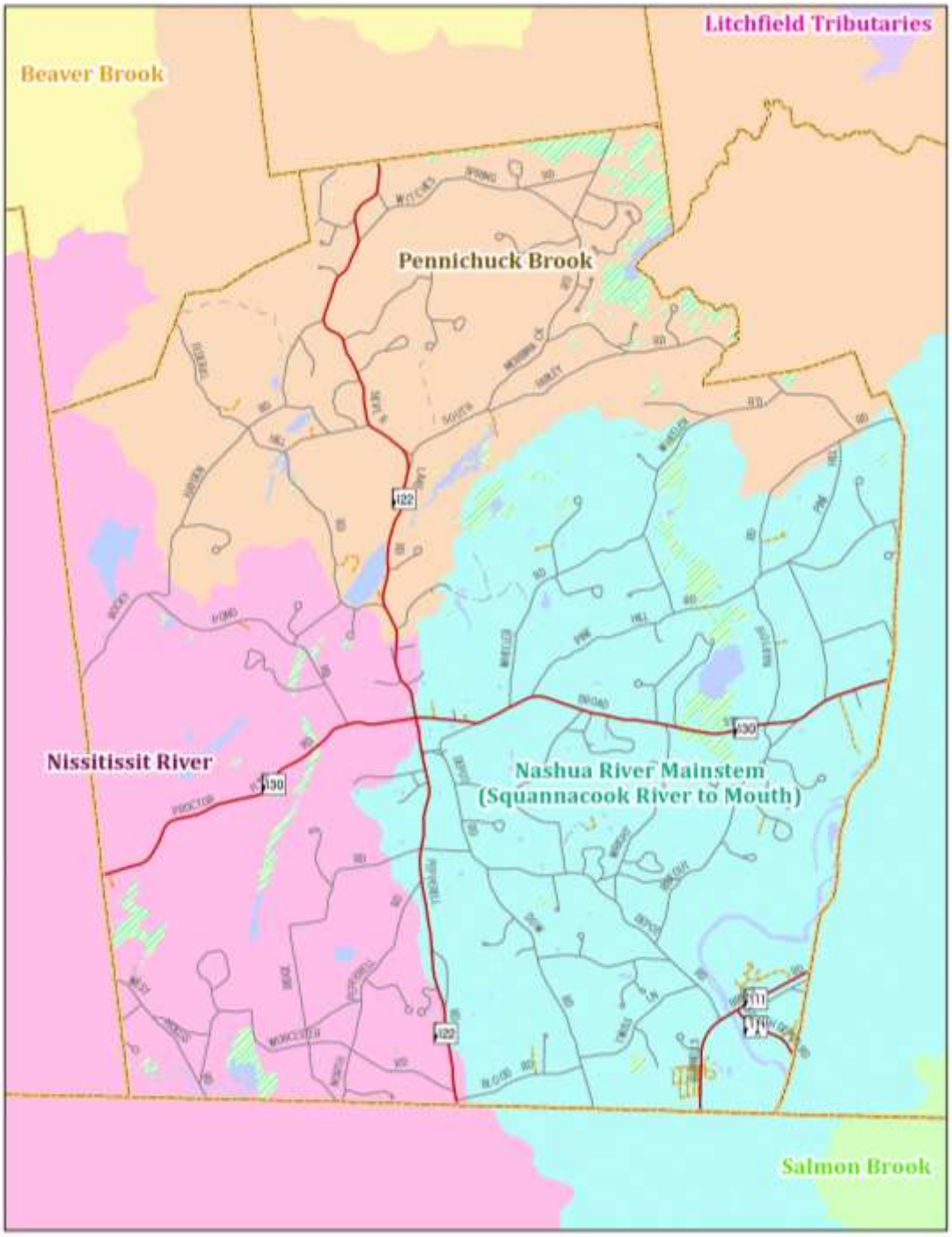
MAP 1: LOCATION OF HOLLIS, NH



Source: NRPC GIS, 2011

The Town of Hollis is located in Hillsborough County in south central New Hampshire. Hollis is bordered on the west by the Towns of Brookline and Milford, the State of Massachusetts to the south, the Town of Merrimack and the City of Nashua to the east, and the Town of Amherst to the north. Hollis had a population of 7,684 in 2010 and consists of approximately 20,668 acres or 32.3 square miles. Elevations range from approximately 120 feet above mean sea level (aMSL) near the Nashua River to 821 feet aMSL on top of Birch Hill, the Town's highest point. Map 2 illustrates the watershed boundaries within the Hollis. Four major bodies of water are found in Hollis: Dunklee Pond, Flints Pond, Rocky Pond, and Silver Lake. A portion of the Nashua River flows through the bottom right corner of the Town.

MAP 2: WATERSHED BOUNDARIES IN HOLLIS



Source: NRPC GIS, 2011

TABLE 1: WATERSHEDS IN HOLLIS

Watershed	Acres in Hollis	Percentage of Hollis
Nashua River (Squannacook River to Mouth)	8,908.65	43.1%
Nissitissit River	5,573.60	26.9%
Pennichuck Brook	6,185.75	30%
Total Area:	20,668	**100%**

Source: NRPC GIS, 2011

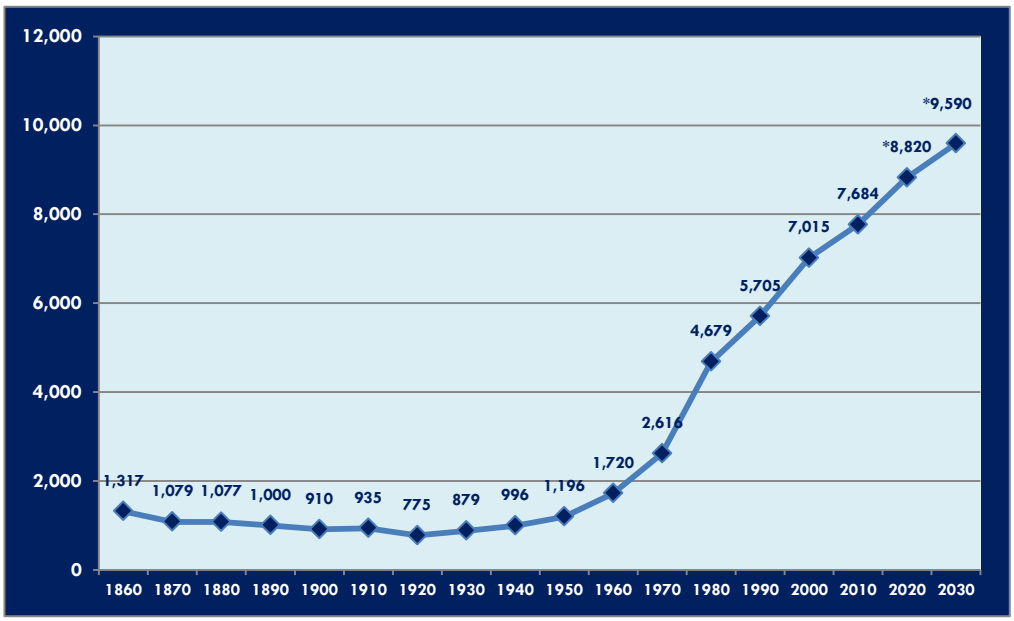
B. Development Trends[1]

In 1930, Hollis has a population of 879 people. The Town then grew moderately throughout the next four decades. Between 1970-1980, the population then grew rapidly in response to the expansion of industry in the Boston metropolitan region made possible by major improvements to the State and federal highway system. Within these years, Hollis grew by 79% to 4,679 people. From 1980 to 2000, the Town grew at a moderate rate of 22% to 7,015 people. However, that rate of growth slowed according to the 2010 Census, which showed a 9.54% increase in Hollis' population to 7,684. This trend is similar to the trend across the NRPC region, Hillsborough County, the state, and the country, which all experienced lower population growth rates between 2000 and 2010 than between 1990 and 2000. According to the US Census Bureau, Hollis has 31.8 square miles of land. With the 2010 population of 7,684 the current population density is 242 people per square mile.

Hollis experienced 17.58% change in housing units from 2000-2010. The most prevalent housing type in Hollis is 1-unit, detached housing. A total of 842 building permits were issued in Hollis from 1992-2009. 689 of these permits were for single family homes. The general trend has been a decline in the number of building permits issued on an annual basis since 1994. There were only a select number of manufactured housing units in the Town in 2009. New residential developments such as the recently constructed Lovejoy Lane Subdivision are generally found on lots of about one acre in size and are spread throughout Town. There are no centralized clusters of housing in Hollis. Due to the Town's hilly terrain, much of the development has consumed farmland or encroached on the Town's sensitive wetland and hilly areas.

In addition to residential development, automobile dependent commercial uses have developed primarily along State routes 130, 122, 111, and 111A which constitute all of the Town's most important thoroughfares. A majority of Hollis's main economic contributors are present along the Town's three industrial and commercials districts in the southeast and southwest regions of Town. Generalized existing land-use classes are depicted in Table 2 and illustrated in Map 3.

FIGURE 1: POPULATION TRENDS OF HOLLIS



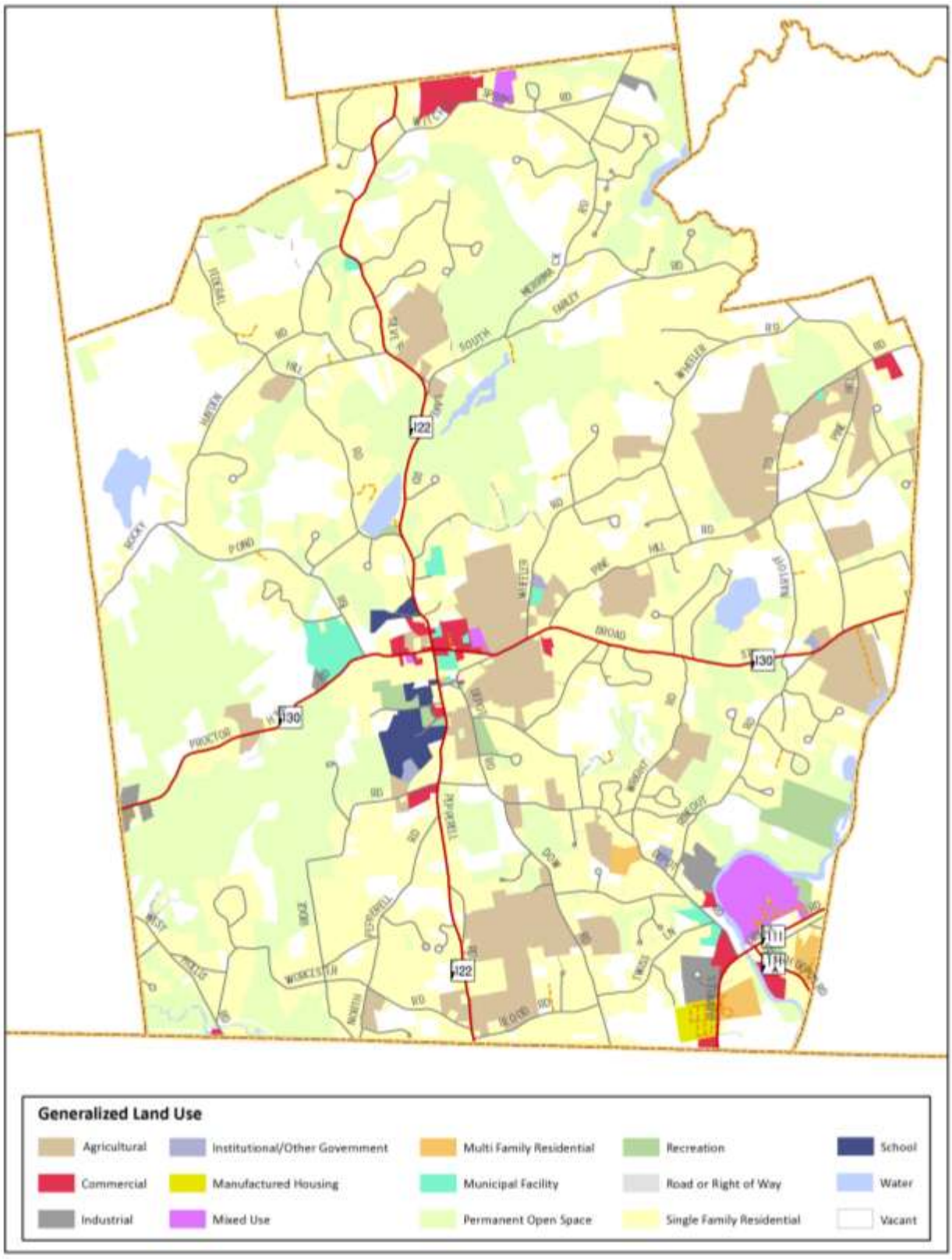
Source: US Census Bureau and NHOEP, 2011
*denotes an estimated population projection

TABLE 2: GENERAL LAND USE TYPES IN HOLLIS

Land Use	Total Acres	Percent Total Land Area
Agricultural	1,672	8.1%
Commercial	202	1%
Industrial	125	0.6%
Institutional/Other Government	28	0.1%
Mixed Use	173	0.8%
Municipal/School	252	1.2%
Permanent Open Space/Recreation	4,823	23.3%
Residential	8,454	41%
Road or Right of Way	514	2.5%
Vacant	4,113	19.9%
Water	308	1.5%
Total	**20,664**	**100.0**

Source: NRPC GIS, 2011

MAP 3: LAND USE CLASSES IN HOLLIS, 2011



Source: NRPC GIS, 2011

CHAPTER III. COMMUNITY HAZARDS

A. Hazard Descriptions

The first step in planning for natural hazards is to identify hazards that may affect the Town. Some communities are more susceptible to certain hazards (i.e., flooding near rivers, hurricanes on the seacoast, etc.). The following hazards that are most likely to target the State of New Hampshire and Hollis include:

- **Flooding** - debris-impacted infrastructure, erosion, mudslides, rapid snow pack melt, and river ice jams;
- **Dam Failure** - during severe weather such as a flood, a dam's ability to serve as a flood control mechanism may be challenged and could breach or fail;
- **Hurricanes** - a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center;
- **Tornadoes** - a violent windstorm characterized by a twisting, funnel shaped cloud;
- **Downbursts** - a severe localized wind blasting down from a thunderstorm;
- **Lightning** - giant spark of electricity that occurs within the atmosphere or between the atmosphere and the ground;
- **Wildfires** - including grass fires, forest fires, drought-related fires, and issues with isolated homes and residential areas;
- **Severe Winter Weather** - including heavy snow storms, ice storms, "Nor'-Easters," blizzards, and hailstorms;
- **Earthquakes** - geologic events related to seismic activity;
- **Landslides** - the downward or outward movement of slope forming materials reacting under the force of gravity;
- **Radon** - naturally occurring radioactive gas formed by the natural breakdown of uranium in soil, rock, and water;
- **Drought** - a long period of abnormally low precipitation, especially one that adversely affects growing conditions;
- **Explosions/Fires** - a violent release of energy due to a sudden increase in volume within a given space;
- **Traffic Congestion and Vehicular Accidents** - most likely to occur in the Town Center and along major thoroughfares;
- **Hazardous Materials** - Any substance which has been determined to be either a health hazard or a physical hazard;
- **Vandalism** - willful wanton and malicious destruction of the property of others; and
- **Terrorism** - the calculated use or threat of violence against civilians in order to attain goals that are political, religious, or ideological in nature through intimidation, coercion, or instilling fear.

Appendix A includes more in-depth definitions of these hazards that have occurred or could occur in NH and identifies the potential for each hazard to occur in the Town of Hollis.

B. Past Hazard Events

The next step in hazard mitigation planning is to identify where hazard events have occurred in the past and, if possible, what facilities or areas were adversely impacted. A base map that includes all of the critical facilities and areas of concern in Hollis, the 100 and 500 year floodplain, political boundaries, water bodies and the road network were used to locate all of the past hazard events. This step in the planning process serves as a stepping stone for predicting where future hazards could potentially occur. NRPC and the Team identified past events in the Town of Hollis, which are included in Map 4 and Table 3.

Depot Road Culvert Failure, September 2008

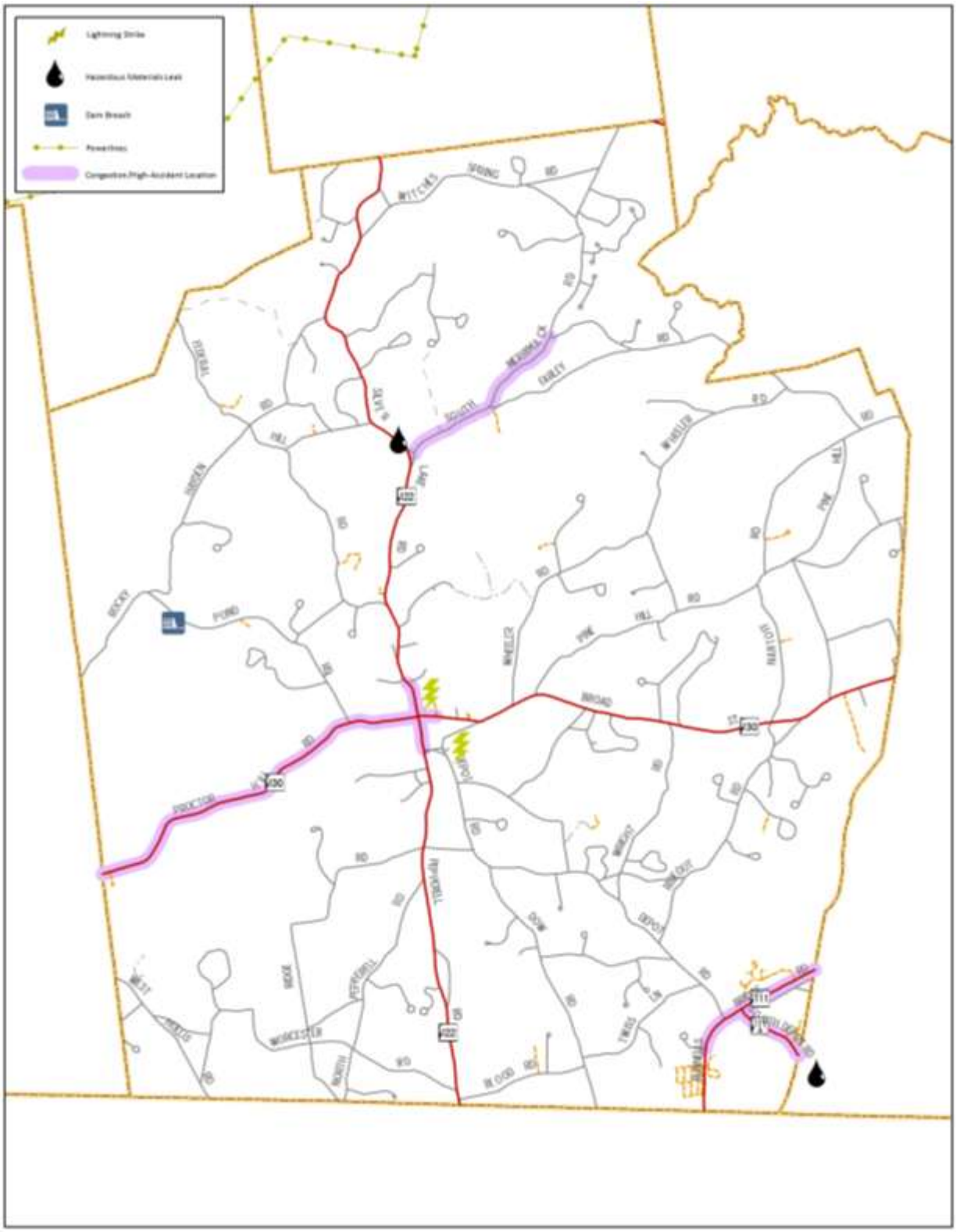
Millpond Dam Breach, April 2007

**Woodmont Orchards Containment Spill
August 2008**

Toddy Brook Road Flood, April 2007

**Town Center Vehicular Accident
April 2008**

MAP 4: LOCATION OF PAST HAZARDS IN HOLLIS



Source: NRPC GIS, 2011

TABLE 3: PAST HAZARD EVENTS IN HOLLIS, HILLSBOROUGH COUNTY, AND STATE OF NH

Hazard	Date	Location	Impact
Flood	1927	Southern NH	Primary impact on road network. Caused many roads to wash out and required money for repair
Flood	March 11-21, 1936	NH	Primary impact on road network. Flooding caused by heavy snowfall totals, heavy rains, and warm weather at the same time. Run-off from melting snow with rain overflowed the rivers.
Flood	April 16, 1987	Cheshire, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, and Sullivan County	Primary impact to low-lying agricultural fields in Hollis and along river. Caused by snowmelt and intense rain. FEMA Disaster Declaration # 789 $4,888,889 in damage.
Flood	August 7-11, 1990	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack & Sullivan Counties, NH	Primary impact to infrastructure. A series of storm events with moderate to heavy rains FEMA Disaster Declaration #-876, $2,297,777 in damage
Flood	October 1996	Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan County	Primary impact to structures and infrastructure. Heavy rains. FEMA Disaster Declaration #-1144. $2,341,273 in damage
Mother's Day Flood	May 2006	Statewide	Primary impact to road network.
Great Hurricane of 1938	September 21, 1938	All of Southern New England	Primary impact to road network, structures, trees, livestock, and crops. 13 died, 494 injured throughout NH. Total storm losses of $12,337,643 (not adjusted for inflation). Many acres of downed trees in Hollis and flooding. Some barns and chicken coops collapsed with loss of livestock and poultry.
Hurricane (Carol)	August 31, 1954	Southern New England	Primary impact to trees and crops. SAFFIR/SIMPSON HURRICANE SCALE[2] – Category 3, winds 111-130 mph
Hurricane (Donna)	September 12, 1960	Southern and Central NH	Primary impact to trees and infrastructure. Category 3, heavy flooding in some parts of the State
Hurricane (Gloria)	September 1985	Southern New England	Primary impact to electric infrastructure and trees. Category 2, winds 96-110 mph
Hurricane (Bob)	August 1991	Southern New England	Primary impact to electric infrastructure, structures, and trees. Structural damage in Town from fallen trees.
Snowstorm	March 11-14, 1888	New England	No historic data on impact. Snow accumulations 30-50 inches, one of the most severe winter storms ever to hit New England
Snowstorm	1922	Most of New England	Primary impact to road network. City of Nashua called in to help plow drifts on Broad Street. Plow failed half way to destination and Hollis became isolated for 3 to 4 days.
Snowstorm	February 14-15, 1940	New England	Primary impact to road network. Snow depths exceeded 30 cm and very high winds
Snowstorm	February 14-17, 1958	Southeastern, Western, and Central NH	Primary impact to road network. Snow accumulations to 20-33 inches
Snowstorm	March 18-21, 1958	South-Central and West-Central NH	Primary impact to road network. Snow accumulations between 22-24 inches
Snowstorm	March 2-5, 1960	South-Central and Southeastern NH	Primary impact to road network. Snow accumulations up to 25 inches in some areas
Snowstorm	January 18-20, 1961	Southeastern and South-Central NH	Primary impact to road network. Snow accumulations up to 25 inches in some areas, Blizzard or near-blizzard conditions developed across the northeast.
Snowstorm	January 11-14, 1964	Southern and Central NH	Primary impact to road network. Snow accumulations up to 12 inches

2 For a complete description of the Saffir/Simpson Hurricane Scale see Appendix F.

Hazard	Date	Location	Impact
Snowstorm	February 22-28, 1969	Central NH	Primary impact to road network. Snow accumulations between 24-98 inches (higher totals in western NH), slow moving storm with long duration
Snowstorm	December 25-28, 1969	NH	Primary impact to road network. Snow accumulations 12-18 inches in most areas
Snowstorm	January 19-21, 1978	Southern and Central NH	No historic data on impact. Snow accumulations up to 16 inches.
Snowstorm "Blizzard of '78"	February 5-7 1978	Statewide	Primary impact on road network and business. Trapped commuters on roads, businesses closed. Snow accumulations between 25-33 inches in NH, Snow accumulations between 24-38 inches in New England
Snowstorm	April 5-7, 1982	Southern and Central NH	Primary impact on road network. Late-season storm with thunderstorms produced 18-22 inches of snow
Snowstorm	March 1983	New England	Primary impact on road network and business. Winds of 30-40 mph. Deposited 18+ inches of snow in Hollis.
Snowstorm	March 1993	New England	Primary impact on road network.
Snowstorm	February 1996	New England	Primary impact on road network. Snow, ice, bitter temperatures throughout Central NH
Snowstorm	December 1996	NH	Primary impact on road network, electrical infrastructure, and business. 14" of snow deposited in Hollis. Most of Town was without power for 3-4 days.
Snowstorm	March 23, 1999	NH	Primary impact on road network. Two feet of snow accumulated on Mt. Washington and high winds were reported
Snowstorm	March, 2001	New England	Primary impact on road network.
Ice Storm	December 29-30, 1942	NH	No historic data on impact. Glaze storm of severe intensity. Little known impact to Hollis.
Ice Storm	January 7, 1998	State of NH, 52 communities in nine counties impacted	Primary impact on phone and power infrastructure and road network. FEMA Disaster Declaration-1199. Six injuries and one fatality, 20 major road closures, 67,586 without electricity, 2,310 without phone service, one communication tower failure, $12,446,202 in damages.
Ice Storm	December 2008	Statewide	Primary impacts on road network and power lines.
Severe Cold	January 16, 2004	NH	Primary impact on human health. Bitter cold and blustery winds made temperatures feel as cold as -40 degrees. Outdoor exposure in the State was deadly and lead to six deaths. Wind chills in Hollis to 30 degrees.
Drought	1929-36	NH	No historic data on impact.
Drought	1960-69	NH	Primary impact to crops and livestock. For two consecutive years in the mid-1960s, wells went dry. Longest recorded continuous spell of less than normal precipitation.
Drought	1999	NH	Primary impact to crops and dug wells. Drought warning was issued by governor's office on 06/29/99
Drought	March, 2002	All counties in the State of NH except Coos County	Primary impact to crops and dug wells. First time low-water conditions have progressed beyond the Level Two, Drought Warning stage
Earthquake	November 18, 1929	Grand Banks, Newfoundland	No recorded impact. Richter Magnitude Scale: 7.2[3]
Earthquake	December 20, 1940	Ossipee, NH	Primary impact to structures and ground cracks. Richter Magnitude Scale: 5.5. Felt over 341 miles away.
Earthquake	December 24, 1940	Ossipee, NH	Primary impact to structures and ground cracks.

3 For a complete description of the Richter Magnitude Scale and Modified Mercalli Intensity Scale, see Appendix G

Hazard	Date	Location	Impact
			Richter Magnitude Scale: 5.5. Felt over 550 KM away.
Earthquake	June 15, 1973	Near NH/Quebec Border	Primary impact to structures, minor damage. Richter Magnitude Scale: 4.8
Earthquake	January19,1982	West of Laconia	Primary impact to structures, minor damage. Richter Magnitude Scale: 4.5
Past Hazards Specific to Hollis			
Vehicle Accidents	Recurrent	Routes 111 and 111A in Hollis	Primary impact to road network. Usually caused by driver error.
Vehicle Accidents	Recurrent	Intersection of Proctor Hill Road, Silver Lake Road, Main Street, and Ash Street (4 Corners)	Primary impact to road network. Usually caused by driver error.
Vehicle Accidents	Recurrent (winter)	Route 130 – Proctor Hill Road and South Merrimack Road	Primary impact to road network. Continual accidents in winter due to winter conditions and topography.
Lightning Strikes	Date Unknown	Town Hall and Police Station hit during storms	Primary impact to electric infrastructure. Two structures struck by lightning.
Hazardous Material Leak	Date Unknown	From Propane Company in Nashua into Hollis	No historic data on impact. Spill leaks downhill from South Depot Road (111A) in Nashua into Hollis.
Hazardous Material Leak	August 2008	Woodmont Orchards	Primary impact to road network and neighboring water bodies.
Dam Breaches	April 2007	Mill Road and Mossman Dam	Primary impact to road network.

Sources: American Meteorological Society;
Concord Monitor, September 1938;
Hollis Historical Society, http://www.hollis-history.org/;
National Earthquake Information Center;
New Hampshire Department of Environmental Services;
New Hampshire Office of Emergency Management, 2000; Town of Hollis;
Northeast States Emergency Consortium (NESEC) Website: http://www.nesec.org;
Pembroke Town History, http://www.pembroke-nh.com/history.asp;
US Army Corp of Engineers Ice Jam Database, http://www.crrel.usace.army.mil/cgi-bin/ice/ijdb;
The Bow Times, http://www.yourneighborhoodnews.com/bow-times/index.html;
The Manchester Union Leader, http://www.theunionleader.com/;
Tornado Project, http://www.tornadoproject.com;

C. Potential Hazards to Critical Facilities and Areas of Concern

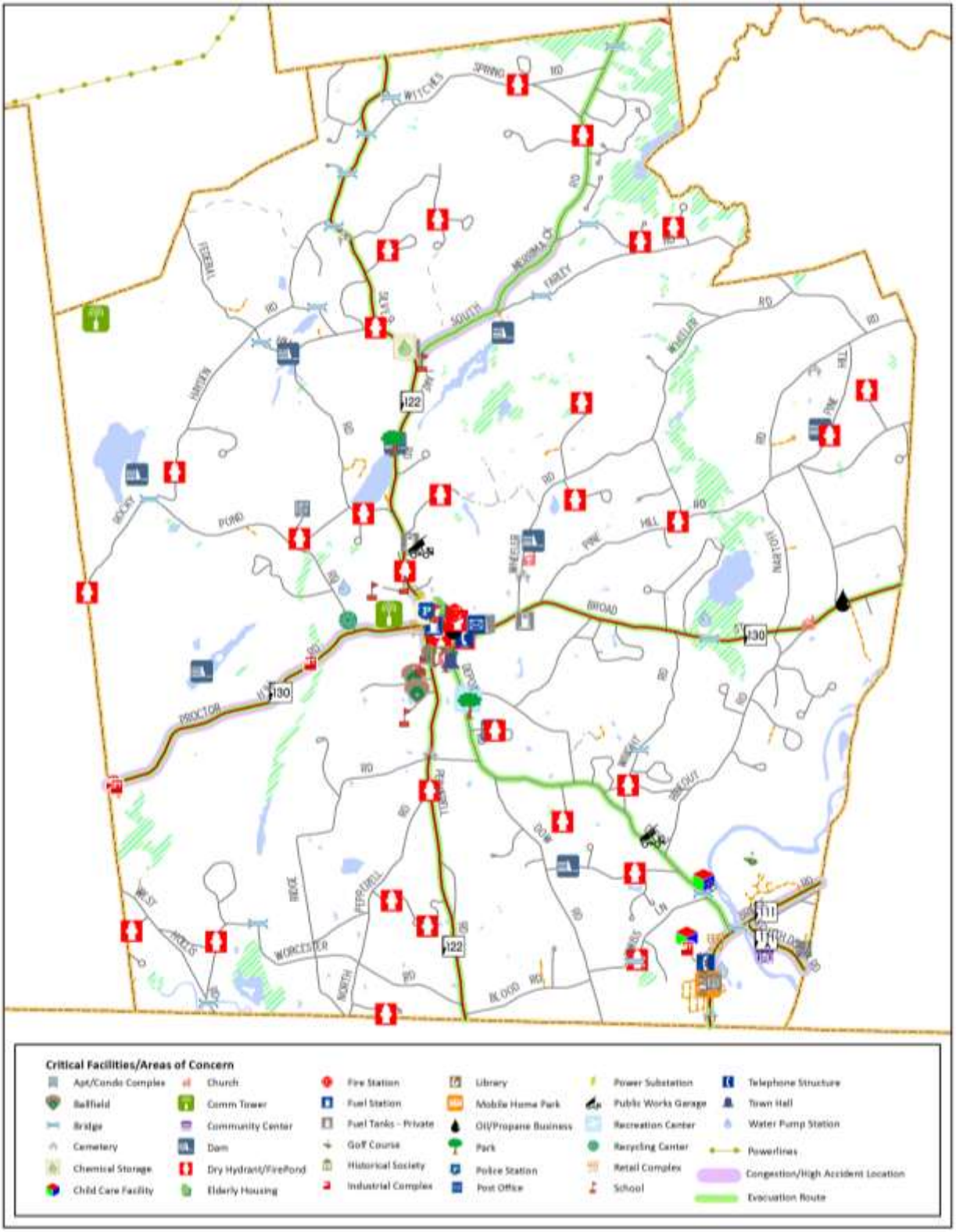
After past events have been identified, the next step in the planning process is to determine where future hazards could potentially occur and what structures or areas could be affected. This requires determining which facilities and areas in the community are considered critical and why they are considered critical (i.e., is the facility in the floodplain? Storing hazardous materials? A primary shelter?). Each critical facility and area was mapped. Table 4 presents the critical facilities and areas of concern identified by the Town of Hollis. Map 5 illustrates the locations of these facilities and areas in Hollis. Chapter IV will present an analysis of each of these facilities and areas in the community and their priority in case of an emergency.

- Flooding
  The entire Town is vulnerable to this hazard. The areas that are most susceptible to the 100 and 500 year floodplain are depicted in Map 6. However, even people who do not live near water are susceptible to this hazard.
- Dam Failure
  Two dam breaches recently occurred concurrently at the Mill Road and Mossman Dam. This event resulted in only minor flooding as a direct result of the failure. Hollis is home to 9 active dams including four Class A and 5 Class AA. In New Hampshire the Division of Water classifies dams into the following:
  Class AA – a dam that, if it were to fail, would not be a menace to public safety
  Class A – a low hazard potential dam
  Class B – a significant hazard potential dam
- Hurricane
  The entire Town is vulnerable to this hazard. Properties, adjacent rivers, brooks, and low lying areas are most susceptible to associated flooding. Exposed and elevated structures are most susceptible to wind damage.
- Tornado
  The entire Town is vulnerable to this hazard. Early warning from the media and National Oceanic and Atmospheric Administration weather radios are the key to survivability. While tornados are generally weak and short lived in NH, the State had a long-duration tornado in July, 2008 that was on the ground for 1.5 hours, covering over 50 miles, and produced Enhanced Fujita (EF)-0 to EF-2 damage up to ¼ mile wide, including 1 fatality.
- Downburst
  The entire Town is vulnerable to this hazard. Associated with severe thunderstorms, downbursts cause straight-line wind damage ranging from about 60 – 150 mph. Typically short-lived and a narrow damage path; commonly called a "microburst."
- Lightning
  The entire Town is vulnerable to this hazard. Campgrounds, lakes, and athletic fields are most susceptible to injury due to large groups of people in one place. Open fields and hilltops put individuals at higher risk. Education, lightning detection devices, and advanced warning of approaching storms can greatly reduce risk.
- Wildfire
  Usually limited to the wild or urban-wild-land interface, when coupled with high wind, low relative humidity and an abundance of fuel on the ground, wildfires can strike anywhere fuel exists and can jump breaks and fire lines affecting homes within urban and suburban neighborhoods.
- Severe Winter Weather
  The entire Town is vulnerable to this hazard. Greatest impacts are to flat-roofed buildings, trees, and roadways. Related vehicular accidents or impassible roads are major concerns.
- Earthquake
  The entire Town is vulnerable to this hazard.
- Landslide
  There is a minimal risk of landslides in Hollis. Landslide events typically occur on steep slopes and river banks and after prolonged heavy rain and cutting into slopes during development of land. While there are some steep slopes in portions of Town, there have not been any significant landslide events in Town.
- Drought
  The entire Town is vulnerable to this hazard.
- Explosions/fire
  Gas and fuel storage facilities and fueling stations are the most likely sites to have an increased risk of explosions/fire. Any structure that uses natural gas or propane is at a slightly higher risk of explosion. Professional installation and education can reduce residential risk and best management practices and corporate health and safety policies, audits, and training help to lower risk in commercial buildings.

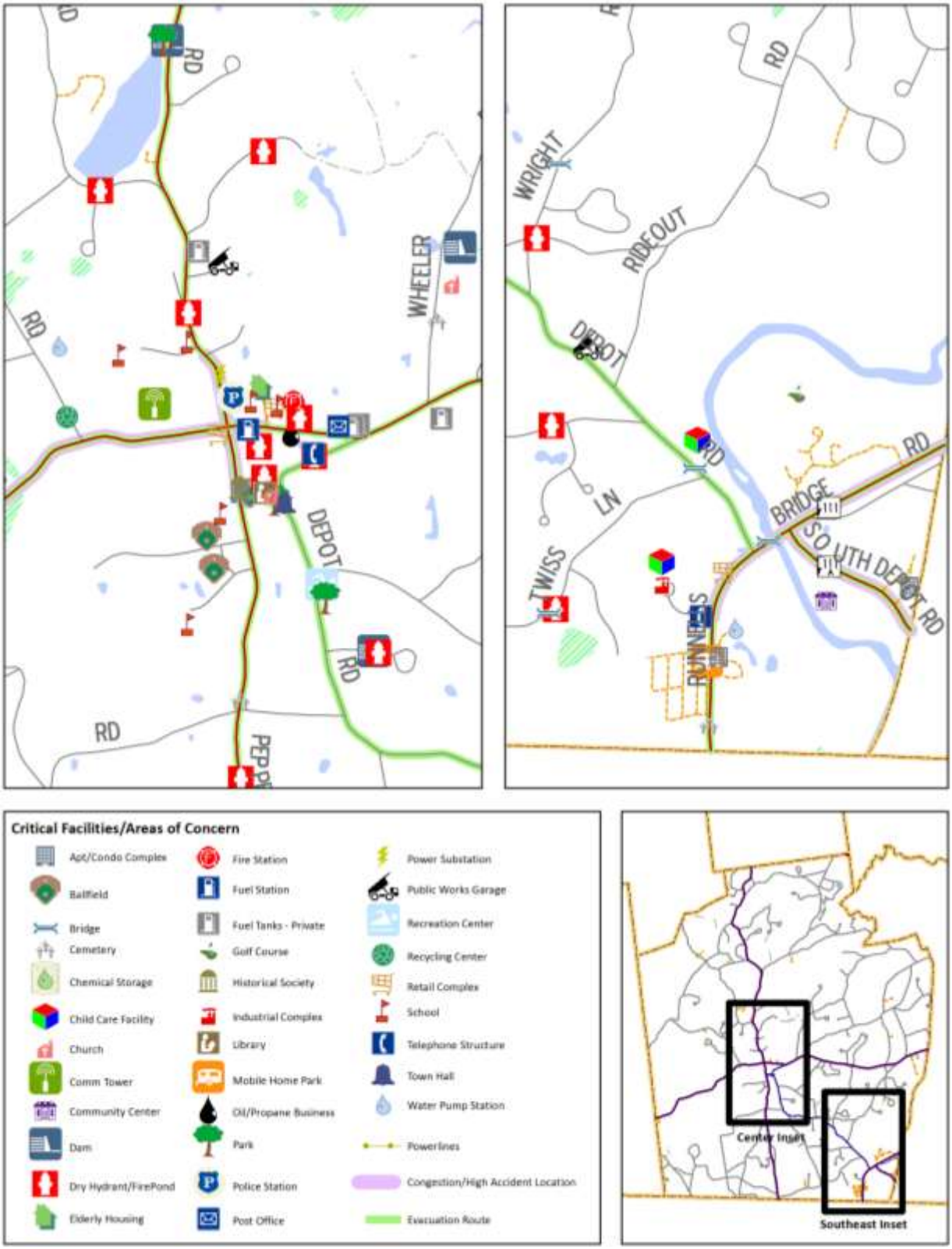
- Traffic Congestion/Accidents
  State routes 130, 122, 111, and 111A as well the street network in the Town center and South Merrimack Road are most susceptible to this hazard. Rain, ice, snow, and fog are the top natural causes, and speed, distraction, and experience are man-made causes of accidents.
- Hazardous Materials Incidents
  These types of incidents are most prevalent along State routes 130, 122, 111, and 111A. Gas and propane fueling stations and industrial centers also have a higher risk of incident.
- Vandalism
  The entire Town is vulnerable to this hazard. Schools, private property, and some commercial buildings are typical targets of vandals.
- Terrorism
  Typically designed to maximize damage or injury, large or high importance locations are at highest risk. Schools and child care facilities might be targeted for the psychological impact. Infrastructure like power lines, communications networks, and pipelines may also be targeted. Domestic terrorism can strike clinics, businesses, and mail and package centers. "Hardening" at risk facilities, surveillance, education, and vigilance are some ways to reduce risk.

MAP 5: LOCATION OF CRITICAL FACILITIES AND AREAS OF CONCERN IN HOLLIS

(CONTINUED ON NEXT PAGE)



Source: NRPC GIS, 2011



Source: NRPC GIS, 2011

TABLE 4: HAZARDS TO CRITICAL FACILITIES AND AREAS OF CONCERN IN HOLLIS

Facility Name	Facility Type	Stories	Generator	100 -Year Flood	500 - Year Flood	Size of Building (gross ft²)	Type of Hazard
Police Station/ Emergency Operations Center	Emergency Facility/Town Facility	2	Yes	No	No	10,659	All Natural and Manmade Hazards
Town Hall	Town Hall/Historic Structure	2	Yes	No	No	12,595	All Natural and Manmade Hazards
Public Works Department	Public Works Department	1	Yes	No	No	8,358	All Natural and Manmade Hazards
Fire Station	Emergency Facility/Town Facility	2	Yes	No	No	19,312	All Natural and Manmade Hazards
Hollis Village	Elderly Housing	2	No	No	No	23,396	All Natural and Manmade Hazards
Hollis Upper Elementary School	School/Shelter	2	No	No	No	80,569	All Natural and Manmade Hazards
Hollis-Brookline High School	School/Shelter	3	Yes	No	No	159,994	All Natural and Manmade Hazards
Hollis Academy	School	2	No	No	No	9,424	All Natural and Manmade Hazards
Hollis Preschool	School	2	No	No	No	4,952	All Natural and Manmade Hazards
Hollis Primary School	School	1	No	No	No	56,750	All Natural and Manmade Hazards
Hollis-Brookline Middle School	School	2	No	No	No	51,827	All Natural and Manmade Hazards
TLC Nursery	Child Care	2	No	Yes	No	6,020	All Natural and Manmade Hazards (flooding)
Young Minds Preschool	Child Care	1	No	No	No	Unknown	All Natural and Manmade Hazards
Electrical Substation - PSNH	Electrical Substation	n/a	n/a	No	No	Unknown	Fire/Explosion
Water Pump Stations	Pump Stations	n/a	n/a	No	No	n/a	Earthquake and Ice Storm
Flint Pond Co. Water Pump Station	Pump Station	n/a	n/a	No	No	64	Earthquake and Ice Storm

Facility Name	Facility Type	Stories	Generator	100 -Year Flood	500 - Year Flood	Size of Building (gross ft²)	Type of Hazard
Wells	Wells	n/a	n/a	No	Yes	n/a	Contamination
Dams	Dam	n/a	n/a	Yes	No	n/a	Dam failure/Flooding
Lorden Oil	Hazardous Materials	2	No	No	No	960/4,858 2 Buildings	Fire/Explosion
Hollis Construction	Hazardous Materials	1	No	No	No	unknown	Fire/Explosion
Hollis Auto	Hazardous Materials	1	No	No	No	5,542	Fire/Explosion
Woodmont Orchards	Hazardous Materials	1	No	No	No	6,478	Fire/Explosion
Lull Farm	Hazardous Materials	1	No	No	No	3,959	Fire/Explosion
Brookdale Fruit Farm	Hazardous Materials	1	No	No	No	unknown	Fire/Explosion
State Maintenance Garage	Hazardous Materials	1	No	No	No	5,940	Fire/Explosion
Diamond Casting	Hazardous Materials	1	Yes	No	No	75,842	Fire/Explosion
Kerk Motion Products	Hazardous Materials	1	Yes	No	No	23,308	Fire/Explosion
RMR Restoration	Hazardous Materials	2	No	No	No	9,452	Fire/Explosion
Hollis Transfer Station	Hazardous Materials	1	No	No	No	144	Fire/Explosion
Hatch Plaza	Commercial Complex/ Emergency Supplies	1	No	No	No	7,026	All Natural and Manmade Hazards
Hollis Village Grocery	Commercial/ Emergency Supplies	1	No	No	No	3,584	All Natural and Manmade Hazards
Hollis Village Pharmacy	Commercial/ Emergency Supplies	1	No	No	No	unknown	All Natural and Manmade Hazards
Harvest Market	Commercial/ Emergency Supplies	1	No	No	No	39,785	All Natural and Manmade Hazards

Facility Name	Facility Type	Stories	Generator	100 -Year Flood	500 - Year Flood	Size of Building (gross ft²)	Type of Hazard
Runnells Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Dam Failure/Flooding (could flood evacuation routes)
South Merrimack Road Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Dam Failure/Flooding (could flood evacuation routes)
Toddy Brook Crossing	Bridge	n/a	n/a	No	No	n/a	Dam Failure/Flooding (could flood evacuation routes)
West Hollis Road Bridge	Bridge	n/a	n/a	Yes	No	n/a	Dam Failure/Flooding (could flood evacuation routes)
TDS Telecom Telephone Structure	Tele-communication	n/a	No	Yes	No	966	Snowstorm, Lightning, and Earthquake
Belltronics Cellular Tower	Tele-communication	n/a	n/a	No	No	n/a	Snowstorm, Lightning, and Earthquake
Birch Hill Cellular Tower	Tele-communication	n/a	Yes	No	No	n/a	Snowstorm, Lightning, and Earthquake
Hollis Social Library	Town Facility/Historic Structure	1	No	No	No	16,201	All Natural and Manmade Hazards
US Post Office	Federal	2	No	No	No	18,048	All Natural and Manmade Hazards
Silver Lake State Park	Outdoor Recreation	n/a	n/a	Yes – Near Silver Lake	Yes – Near Silver Lake	1,568	Extreme Weather and Flooding
Nichols Field	Park	n/a	n/a	No	N0	n/a	Extreme Weather
Little Nichols Field	Ball Field	n/a	n/a	No	No	n/a	Extreme Weather
Overlook Golf Club	Golf Course	1	No	Yes	Yes	3,773	Extreme Weather and Flooding
Middle School Fields	Ball Field	n/a	n/a	No	No	n/a	Extreme Weather
High School Fields	Ball Field	n/a	n/a	No	No	n/a	Extreme Weather
Hollis Historical Society	Historic Structure	2	No	No	No	3,108	All Natural and Manmade Hazards
Lawrence Barn	Historic Structure	1	No	No	No	unknown	All Natural and Manmade Hazards

Facility Name	Facility Type	Stories	Generator	100 -Year Flood	500 - Year Flood	Size of Building (gross ft²)	Type of Hazard
Wheeler House	Historic Structure	2	No	No	No	unknown	All Natural and Manmade Hazards
Congregational Church of Hollis	Church/Historic Structure/ Potential Shelter	2	No	No	No	11,951	All Natural and Manmade Hazards
Silver Lake Road Bridge	Bridge	n/a	n/a	Yes	No	n/a	Flooding
Ames Road Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Flooding
Federal Hill Road Bridge	Bridge	n/a	n/a	Yes	No	n/a	Flooding
Broad Street Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Flooding
Depot Road Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Flooding
Runnells Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Flooding
Twiss Lane Bridge	Bridge	n/a	n/a	Yes	Yes	n/a	Flooding
Worcester Road Bridge	Bridge	n/a	n/a	Yes	No	n/a	Flooding
Future School (Formerly First Wesleyan Church)	School	1	No	No	No	5,100	All Natural and Manmade Hazards
Kingdom Hall Jehovah's Witnesses	Church/ Potential Shelter	1	No	No	No	5,751	All Natural and Manmade Hazards
Faith Baptist Church	Church/ Potential Shelter	2	No	No	No	12464/2832 2 Buildings	All Natural and Manmade Hazards
TDS Telecom Telephone Structure	Tele-communication	n/a	No	No	No	n/a	Snowstorm, Lightning, and Earthquake
Pitary's Homes	Mobile Home Park	1	No	No	No	139,500 (approx.)	All Natural and Manmade Hazards
Runnells Landing	Condominiums	2	No	No	No	226,000	All Natural and Manmade Hazards
Village at Hollis Depot	Condominiums	2	No	No	No	148,334	All Natural and Manmade Hazard Events-High Potential for Flooding

Facility Name	Facility Type	Stories	Generator	100 -Year Flood	500 - Year Flood	Size of Building (gross ft²)	Type of Hazard
The Block	Apartments	3	No	No	No	13,488	All Natural and Manmade Hazards
Lund Farm	Apartments	2	No	No	No	51,184	All Natural and Manmade Hazards
Phone Switch Box	Tele-Communication	n/a	n/a	No	No	n/a	Snowstorm, Lightning, and Earthquake
Powerlines	PSNH Powerlines	n/a	n/a	n/a	n/a	n/a	All Natural and Manmade Hazards
Evacuation Routes	Road Network and Bridges	n/a	n/a	Yes – In Places	Yes – In Places	n/a	All Natural and Manmade Hazards

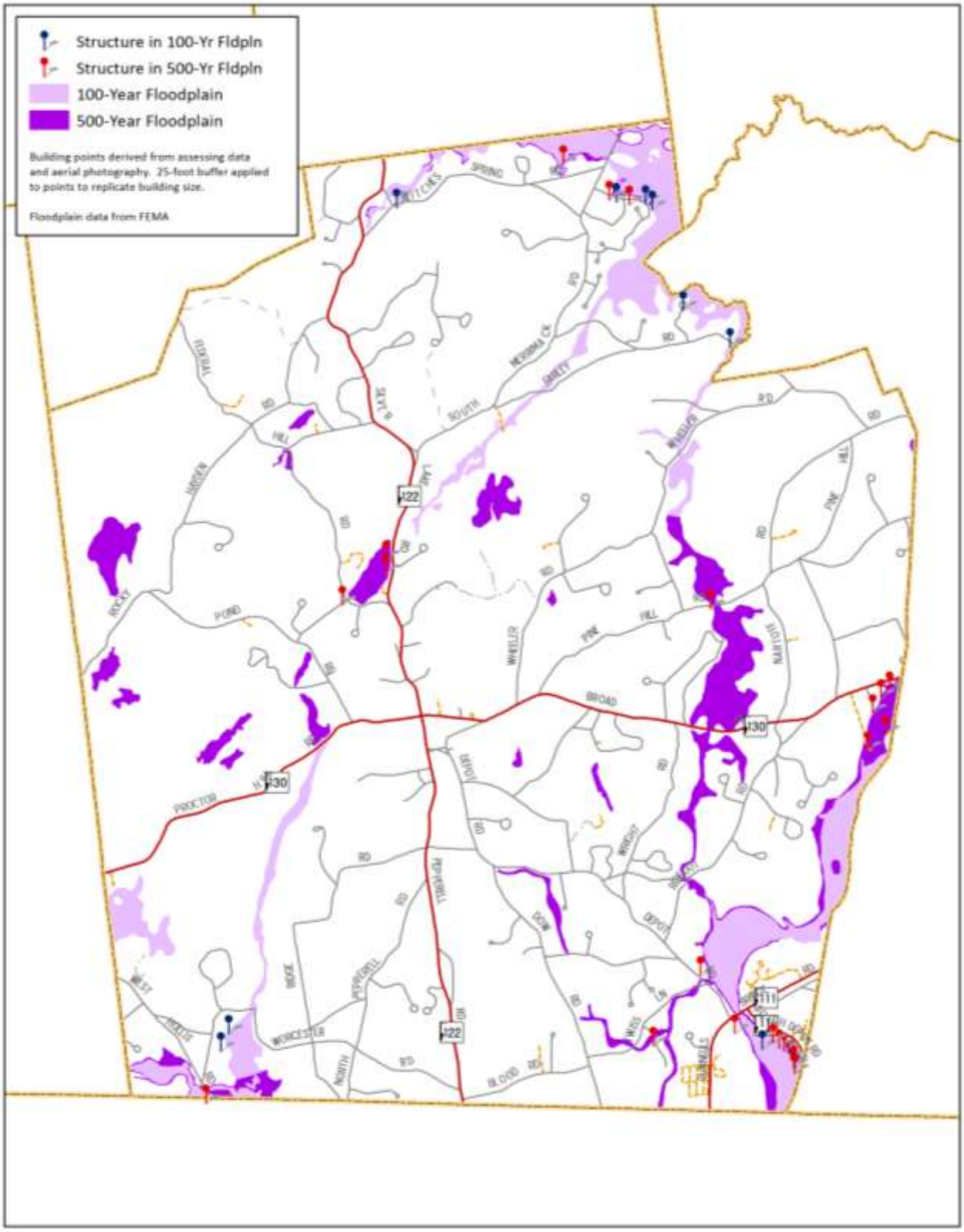
Source: Hollis Hazard Mitigation Team; NRPC, 2011

TABLE 5: STRUCTURES IN THE FLOODPLAIN

Land Use	Building Value	Floodplain
Commercial	$940,400.00	100 Year
	$177,900.00	500 Year
Single Family Residential	$65,800.00	100 and 500 Year
	$189,500.00	100 and 500 Year
	$228,800.00	100 Year
	$409,000.00	100 Year
	$317,000.00	100 Year
	$245,500.00	100 Year
	$301,300.00	100 Year
	$263,400.00	100 Year
	$239,500.00	100 Year
	$288,300.00	100 Year
	$177,100.00	100 Year
	$117,500.00	500 Year
	$515,100.00	500 Year
	$426,100.00	500 Year
	$447,800.00	500 Year
	$521,400.00	500 Year
	$312,900.00	500 Year
	$66,400.00	500 Year
	$224,500.00	500 Year
	$717,200.00	500 Year
	$652,000.00	500 Year
	$325,600.00	500 Year
	$220,400.00	500 Year
	$1,800.00	500 Year
	$126,400.00	500 Year
	$68,700.00	500 Year
	$74,400.00	500 Year
	$386,400.00	500 Year

Source: NRPC GIS, 2011

MAP 6: STRUCTURES PARTIALLY OR COMPLETELY LOCATED IN THE 100 AND 500 YEAR FLOODPLAIN



Source: NRPC GIS, 2011

CHAPTER IV. RISK ASSESSMENT

It is important to determine which critical facilities are the most vulnerable and to estimate their potential loss. The first step is to identify the facilities most likely to be damaged in a hazard event. To do this, the location of critical facilities illustrated on Map 5, are compared to the location of various topographical elements, floodplains, roads, and water bodies. Vulnerable facilities were identified by comparing their location to possible hazard events. For example, all of the facilities within the 100 and 500 year floodplain were identified and used in conducting the potential loss analysis. Similarly, facilities near steep slopes, vulnerable to severe winter weather, hazardous materials incidents, and high traffic congestion etc. were identified and included in the analysis. Map 7 displays the facilities that were identified during this analysis.

A. Prioritization of Critical Facilities and Areas of Concern

The next step in the Hazard Mitigation planning process is to prioritize the facilities and areas of concern that were identified. It is important for the community to determine what resources are needed to protect each facility and area of concern in the event of a hazard event. The facilities were broken into three prioritization categories. The first category contains services needed for emergency response in the event of a hazard event. The second category lists facilities and areas to protect in a hazard event. The third category identifies potential resources that need to be protected in the event of a disaster.

Category 1: Emergency Response

The Town has identified the following emergency response services and facilities as the highest priority for protection from natural and manmade hazards:

1. **Communications**
   - Hollis Communications Center
2. **Hollis Police Station/Emergency Operations Center (EOC)**
3. **Hollis Fire Station**
4. **Public Works/Highway Garage**
5. **Emergency Fuel Stations**
   - Lorden Oil
   - Hollis Auto
   - Bus Garage
   - Hollis Construction
   - Lull Farm
   - Brookdale Farm
   - Laveen Farms
6. **Emergency Shelters**
   - Hollis/Brookline High School (generator)
7. **Evacuation Routes**
   - State route 130 East (Broad Street)
   - State route 130 West (Proctor Hill Road)
   - State route 122 North (Silver Lake Road)
   - State route 122 South (Main Street/Pepperell Road)
   - State route 111 (Bridge Road/Runnells Bridge Road)
   - State route 111A (South Depot Road)
   - South Merrimack Road
   - Depot Road
   - Monument Square
   - Broad Street between Monument Square and State route 130 East (Ash Street)
8. **Bridges/Water Crossings Located on Evacuation Routes**
   - Bartemus Brook-NH 130E (Broad Street)
   - Flints Brook-NH 130E (Broad Street)

- Beaver Brook-NH 130W (Proctor Hill Road)
- Witches Brook-NH 122N (Silver Lake Road-3 crossings)
- Witches Brook-South Merrimack Road
- Toddy Brook-NH 122N
- Sucker Brook-Depot Road
- Nashua River- NH 111 (Runnells Bridge)
- Nissitissit River-West Hollis Road

Category 2: Facilities and Areas to Protect in a Hazard Event

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Hollis.

1. **Dams**
   - Pennichuck Brook II Dam
   - Haydens Reservoir Dam
   - Ben Hogan Estates Detention Pond
   - Silver Lake Dam
   - Rocky Pond Dam
   - Wheeler Pond Dam
   - Beaver Brook Association Wildlife Pond Dam
   - Fire Pond Dam
   - No Name Brook II Dam

2. **Water Supply Pumps/Tanks/Wells/Reservoirs**
   - Rocky Pond Well
   - Lower and Upper Elementary Schools

3. **55 and Over Housing**
   - Hollis Village
   - Pitary's Homes Inc.
   - Runnells Landing
   - Hollis Village Depot

4. **Commercial – Economic Impact Areas – Area's Largest Employers**
   - Morin's Landscaping
   - Puritan Press
   - Diamond Casting and Machine
   - Route 130 Businesses, near Brookline Town Line
   - Clinton Drive Industrial Park
   - Alpine Grove
   - Hollis Line Machine

5. **Events**
   - Hollis Old Home Days
   - Strawberry and Apple Festival
   - Apple Festival Half Marathon
   - Super Bowl Brunch
   - Town Meeting
   - School Budget Meeting
   - Elections
   - Rotary 5K Road Race
   - Hollis/Brookline Cooperative High School Graduation
   - Fourth of July at Silver Lake State Park
   - Fast Five K Race

6. **Recreational Areas**
   - Silver Lake State Park
   - Wallace's Grove
   - Lawrence Barn
   - Volunteer Park
   - Nichols Field
   - Overlook Golf Course

7. **Areas in the Floodplain**
   - All dwelling units, businesses, and bridges etc., located in the floodplain (See Map 6).

8. **Power Lines and Substations**
   - Hollis Power Substation

9. **Problem Culverts or Roads (Potential Flooding or Ice Jams)**
   - Farley Road
   - South Merrimack Road
   - Van Dyke Road
   - Wright Road
   - Depot Road
   - Dow Road
   - Twiss Lane
   - West Hollis Road
   - Rocky Pond Road
   - Deacon Lane
   - Federal Hill Road
   - Route 122 North

10. **Historic Structures**
    - Town Hall
    - Hollis Social Library
    - Congregational Church
    - Lawrence Barn
    - Wheeler House
    - Always Ready Engine House
    - Farley Building

Category 3: Potential Resources

1. **Emergency Water Supply**
   - Potentially obtain additional supply from the City of Nashua.

2. **Grocery Stores-Emergency Supplies**
   - Harvest Market
   - Hollis Pharmacy
   - Hollis Village Grocery
   - Hatch Depot Convenience Store
   - Monument Square Marketplace
   - Lull Farm
   - Brookdale Farm
   - Laveen Farms
   - Zaccardelli Marketplace
   - Orde Hardware Store

3. **Churches - Potential Shelters**
   - Congregational Church of Hollis
   - Kingdom Hall Jehovah's Witnesses
   - Faith Baptist Church

B. National Flood Insurance Participation

Hollis participates in the National Flood Insurance Program (NFIP) and has been a member since April 16, 1979. As of 2011, Hollis has 11 single family residences and 1 commercial structure within the 100 year floodplain. Hollis also has 19 single family residences and 1 commercial structure within the 500 year floodplain. Hollis does not have any repetitive loss properties. Recent amendments were made to their Floodplain Ordinance in preparation for the new Flood Insurance Rate Maps (FIRM - effective September 25, 2009).

Hollis will comply with all future requirements to maintain their participation with the NFIP. To ensure that this occurs the following measures will be undertaken:

1. Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.
2. Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.

C. Critical Facilities Matrix

The following matrix identifies critical facility types and categorizes them as having a **low (L)**, **medium (M)** or **high (H)** severity potential in the event of one of the following twelve hazards: 1) Severe Winter Weather; 2) Hazardous Material Incidents; 3) Traffic Congestion and Vehicular Accidents; 4) Explosions/Fire; 5) Hurricanes; 6) Dam Failure; 7) Terrorism; 8) Earthquakes/Landslides; 9) Wildfires; 10) Flooding; 11) Tornadoes/Downbursts; and 12) Lightning. The critical facilities risk rankings of Low, Medium, and High were determined by combining the probability that a given hazard would occur with the potential impact that hazard would have on the facility and the community. Low, Medium, and High rankings were defined as follows:

- Low probability = hazard is not likely to occur within 50 years
- Medium probability = hazard is likely to occur within 25 years
- High probability = hazard is likely to occur within 10 years
- Low impact = little impact would be caused to facility and community from hazard
- Medium impact = moderate impact would be caused to facility and community from hazard
- High impact = significant impact would be caused to facility and community from hazard

TABLE 6: CRITICAL FACILITIES MATRIX

Facility Name	Severe Winter Weather	Hazardous Materials Incidents	Traffic and Vehicular Accidents	Explosions/ Fire	Hurricanes	Dam Failure	Terrorism	Earthquakes/ Landslides	Wildfires	Flooding	Tornadoes/ Downbursts	Lightning
Police Station	M	M	M	H	H	L	M	L	L	L	M	M
Fire Station	M	M	M	H	H	L	M	L	L	L	M	M
Town Hall	M	L	L	H	H	L	M	L	L	L	M	H
Municipal Buildings	M	L	L	H	L	L	M	L	M	L	M	M
Schools	M	M	M	H	L	L	M	L	L	L	M	M
Child Care	L	L	M	M	L	L	M	L	M	L	L	L
Electrical Substations	M	M	L	H	H	L	M	L	H	L	M	H

Facility Name	Severe Winter Weather	Hazardous Materials Incidents	Traffic and Vehicular Accidents	Explosions/ Fire	Hurricanes	Dam Failure	Terrorism	Earthquakes/ Landslides	Wildfires	Flooding	Tornadoes/ Downbursts	Lightning
PSNH Powerlines	H	L	L	H	H	L	M	L	H	L	H	H
Commercial Centers	L	M	L	M	L	L	M	L	M	L	L	L
Office Buildings	L	M	L	M	L	L	M	L	M	L	L	L
Manufacturing Sites	L	H	L	M	L	L	M	L	M	L	L	M
Hazardous Materials Sites/Storage	L	H	L	H	M	L	M	L	H	L	M	H
Evacuation Routes	H	H	H	H	H	L	M	L	M	L	L	L
Bridges	H	H	H	H	H	L	M	L	L	M	H	L
Communications Towers	H	L	L	H	H	L	M	L	H	L	H	H
Playgrounds and Recreational Fields	L	M	L	L	L	L	M	L	L	L	L	H
Historic Structures	M	L	L	L	L	L	M	L	L	L	M	M
Conservation Land	L	L	L	L	L	L	M	L	H	L	L	L
Recurrent Flooding Areas	M	L	M	L	M	L	M	L	L	H	L	L
Churches	M	M	L	M	M	L	M	L	M	L	M	M
High Traffic Congestion Locations	H	H	H	H	H	L	M	L	M	L	L	L
Vehicular Accident Sites	H	M	H	H	H	L	M	L	H	L	L	L
Multi-Family Housing	M	M	L	H	M	L	M	L	H	L	L	L
Structures in the 100-Year Floodplain	M	L	L	L	M	L	M	M	L	H	M	M
Structures in the 500-Year Floodplain	M	L	L	L	L	L	M	M	L	M	M	M

Source: NRPC, 2011

D. Calculating the Potential Loss

The next step in completing the loss estimation involved assessing the level of damage from a hazard event as a percentage of the facility's structural value. The December 31, 2011 total assessed value of all structures in Hollis is $831,865,300 and is the basis for loss estimation calculations. The number of total parcels in Hollis is 3,742. The following discussion summarizes the potential loss estimates to structures (residential and non-residential) due to natural or manmade hazard events.

1. SEVERE WINTER WEATHER

High Risk

There are three types of winter events: 1) Snowstorms/Blizzards; 2) Ice Storms; and 3) Extreme Cold. All of these events are a threat to the community with subzero temperatures from extreme wind chill and storms causing low visibility for commuters. Snowstorms are known to collapse buildings. Ice storms disrupt power, communication services, and have caused severe damage to timberland. Extreme cold affects the elderly. None of these storms affect one area of Town more than others. Elevation and orientation of structures are just two factors that affect the level of risk. Hollis' recent history has not recorded any loss of life due to the extreme winter weather. Snow and ice have caused power lines to sag in parts of Town, forcing road crews to turn around. Mitigation efforts have corrected this problem. Assuming 1%-5% Town-wide building damage, severe winter weather could result in $8,318,653.00 to $41,593,265 in building damage.

2. HAZARDOUS MATERIAL INCIDENTS

Low Risk

These incidents can be separated into two categories: 1) Fixed Facilities, or 2) Transportation. Fixed facilities include companies that store hazardous waste at their facility and all hazardous waste sites. Several fixed facilities in Hollis handle hazardous materials (see Table 4), making it a high risk for the Town. Companies such as Lorden Oil, Hollis Auto, Suburban Propane, Draper Energy, Diamond Casting and Machine Company, and RMR Restoration store hazardous materials on site. Transportation incidents include deliveries along main routes (i.e., State routes 130, 122, 111, and 111A) as well as by air. It is important to note that a hazardous materials spill or leak on any Town road could create significant disruptions to the road network and pose a threat to humans and the environment.

A small leak stemming from a vehicle would have a low cost to the town, however the town is also home to a number of propane storage facilities and an explosion at one of these sites could be catastrophic. A large scale explosion could cost millions of dollars.

3. TRAFFIC CONGESTION AND VEHICULAR ACCIDENTS

Low Risk

Traffic congestion is seldom a problem in Hollis. It is only during cultural events or peak tourist days in the summer where this may pose a risk and lead to accidents. Vehicular accidents are a notable threat to the Town of Hollis. The road network in Hollis provides major east-west and north-south access to commuters throughout the region. State routes 111 and 111A in the Southeast corner of Hollis are heavily traveled. Accidents are recurrent at this intersection usually due to driver error, not to high levels of traffic. The two major commute route and evacuation routes for Hollis, State route 130 and 122 intersect at the Town's center referred to locally as the "Four Corners". This area has seen a number of accidents throughout the years, again usually due to driver error. Poor winter conditions are often the cause for vehicular accidents on any road. This is especially the case for Hollis. Proctor Hill Road (State route 130 West) and South Merrimack Road have been the locations for a sizable number of accidents due to poor driving conditions from the combined hazards of topography and winter weather.

Costs to the town typically include police staff time to control and divert traffic and fire and emergency response staff time to address injuries and accidents. Costs form such incidents would be covered by normal operating expenses.

4. EXPLOSIONS/FIRE

Low Risk

Explosions and fire can occur at utilities such as electrical substations, power lines or gas lines, hazardous materials sites, and all structures throughout the Town. Historically, two fires have occurred at the Hollis Congregational Church and a large brush fire during the early spring of 1900 destroyed a barn and fifty acres of surrounding fields and pasture. The block apartment complex has had two large fires.

Assuming 1%-5% Town-wide building damage, explosions and fires could result in $8,318,653.00 to $41,593,265 in building damage.

5. LIGHTNING

Medium Risk

Thunderstorms present the danger of lightning strikes and have the potential of starting fires and causing human harm. Lighting has previously struck the Town Hall and Police Station. Lightning strikes can occur in any given location. Remote areas are more vulnerable as they are less accessible to emergency vehicles. Lightening typically strikes a small area and thus would not likely cause Town-wide damage. If lightening impacted 1% of Hollis' buildings, it could result in $8,318,653.00 in building damage.

6. HURRICANES

High Risk

Hollis and Hillsborough Country have experienced high winds from some hurricane events but are at a more significant risk to flooding for the associated rainfall from hurricanes. Hollis is most at risk during the hurricane season of June through November. It is not uncommon for New England to be impacted by a hurricane more than once in a season.

Assuming 1%-5% Town-wide building damage, a hurricane could result in $8,318,653.00 to $41,593,265 in building damage.

7. TORNADOES/DOWNBURSTS

Low Risk

There are no known tornadic events that have occurred in Hollis. However, Hillsborough County has a higher risk of tornadic activity compared to the rest of the State. On average, six tornadoes touch down somewhere in New England. There are eighteen recorded tornadic events in Hillsborough County since 1956, of which seven were F2 events and one F3 event. It is a possibility that a tornado could occur again in Hillsborough County and even in Hollis. If a tornado impacted 1% of Hollis' buildings, it could result in $8,318,653.00 in building damage. The exact dollar amount of damage will vary depending on whether a tornado hits an inhabited area with a high density of buildings or whether it strikes a more rural area.

8. DAM FAILURE

Low Risk

There are 9 dams in Hollis with two recorded breaches in recent history. A breach of the Pepperell Dam upriver in Massachusetts is of great concern. A breach of the dam could potentially flood the Nashua River and with it, a sizable area in the Southeast corner of Hollis. This could be of concern especially for a recently developed subdivision off of Runnells Bridge Road in the Southeast corner. It is essential that Emergency Management staff become familiar with the Pepperell Dam Failure EAP plan which lists proper procedures for dealing with such a disaster. The dollar amount of damage in the event of a dam breach will vary according to the extent and severity of the breach as well as the classification of the dam. Hollis' assessing records should be consulted to ascertain the range of possible damage to buildings in the vicinity.

9. TERRORISM

Low Risk

This is a relatively new threat that must be addressed through training and equipping of local emergency response personnel in cooperation with State and Federal agencies. Hollis has recently annexed a Terrorism section to its Emergency Operations Plan. It is essential that staff thoroughly understand this section and the specific procedures to follow in the event of an attack. Considering the potential effects of terrorist activities on surrounding communities and Regional Mutual Aid Agreements specifically addressing terrorism are essential.

Potential impact areas:

- Municipal Buildings
- Bridges
- Electrical Substations
- Telecommunications Towers
- High Voltage Power Lines
- Wells
- Hazardous Materials Sites
- Terrorist attack on Boston – Population from Boston area and this region may need to evacuate North
- Biological Pathogens
- Schools
- Multi-Family Housing Developments
- Town Festivals/Activities

Assuming 1%-5% Town-wide building damage, terrorism could result in $8,318,653.00 to $41,593,265 in building damage.

10. EARTHQUAKES/LANDSLIDES

Low Risk

There are no recorded landslides or earthquakes in Hollis. However, land formations along the Nashua River could possibly lead to landslide activity. It is imperative that deforestation is prevented along the Nashua River to reduce the risk of landslides. Few significant slopes exist throughout the Town. There are two locations where the slopes are fairly significant along Wright Road and Hayden Road. Both of these locations are sparsely populated and are a low risk for the Town. The abundance of granite throughout Hollis also lessens the possibility of such a disaster from occurring. Assuming 1%-5% Town-wide building damage should an earthquake or landslide should occur, it could result in $8,318,653.00 to $41,593,265 in building damage.

11. WILDFIRES

Low Risk

No wildfires have been historically noted for the Town of Hollis. A majority of the sizable forested lands within Hollis such as the Gardner Memorial Forest and Spalding Park Town Forest are located near single family homes. These forested areas only pose a small threat due to availability of road access. Potential wildfire areas just outside the 1.5-mile fire station radius may pose a higher risk than those living closer to the center of Town. Response time to this area may be slightly delayed due to its distance from the existing fire stations. If a wildfire impacted 1% of Hollis' buildings, it could result in $8,318,653.00 in building damage.

12. FLOODING (RIVERINE)

FEMA has developed a process in which replacement values for structures located in the 100 and 500 year floodplain can be calculated according to the amount of damage suffered[4]. In Hollis, the assessed values were determined for every structure identified in the floodplain. The potential loss was then calculated by multiplying the assessed value of the structure by the percent of damage expected from a hazard event (i.e., 100-year, 4-foot flood, etc.).

High Risk

[4] For a complete description of FEMA's replacement values process for structures within the100 and 500 year floodplain, see Appendix D.

This considers eight-foot flooding in 100 and 500 year floodplain areas and assumes that on average, all structures receive 49% damage[5]. The costs for repairing or replacing bridges, railroads, power lines, telephone lines, natural gas pipelines, contents of structures, and the loss of cropland values are not included in this estimate.

Residential Damage: 28 structures x ($283,207 average assessed value[12] x 0.49) = $3,885,600

Non-Residential Damage: 2 structures x ($559,150 average assessed value[13] x 0.49) = $547,967

Medium Risk

Considers a four-foot flood in 100-year floodplain areas and assumes that, on average, all structures receive 28% damage[6].

Residential Damage:

11 structures x ($247,745 average assessed value[12] x 0.28) = $763,054

Non-Residential Damage:

1structures x ($940,400 average replacement value[13] x 0.28) = $263,312

Low Risk

Considers one foot flooding in 100-year floodplain areas and assumes that, on average, all structures receive 15% damage[7].

Residential Damage:

11 structures x ($247,745 average assessed value x 0.15)[8] = $408,779

Non-Residential Damage:

1 structures x ($940,400 average replacement value x 0.15)[9] = $141,060

13. Drought

Low Risk

Drought causes the most significant impact to agricultural lands and assets. According to the Nashua Regional Planning Commission, 8.1% of Hollis' total land area is agriculture. The effects of damage at specific farms could be estimated using the Town's assessing database.

14. Vandalism

Low Risk

There has been no recorded vandalism in Hollis. If vandalism impacted 1% of Hollis' buildings, it could result in $8,318,653.00 in building damage.

TABLE 7: RISK PROBABILITY MATRIX

Hazard Type	Frequency	Potential Severity
Flooding	Medium	High
Dam Failure	Low	Medium

[5] "Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA, page 4-13.
[6] Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA, page 4-13.
[7] Understanding Your Risks, Identifying Hazards and Estimating Losses", FEMA, page 4-13.
[8] NRPC estimate, based on average assessed values for residential structures, 2010 Town of Hollis Assessing Data
[9] NRPC estimate, based on average assessed values for non-residential structures, 2010 Town of Hollis Assessing Data.

Hazard Type	Frequency	Potential Severity
Hurricanes	Low	High
Tornadoes	Low	High
Downburst	Medium	High
Lightning	Medium	Medium
Wildfires	Low	Medium
Severe Winter Weather	Medium	High
Earthquakes	Low	High
Landslides	Low	Medium
Radon	High	Medium
Drought	Medium	High
Fire / Explosions	Low	High
Traffic Congestion / Accidents	Medium	Medium
Hazardous Materials Incidents	Low	Medium
Terrorism / Vandalism	Low	High

Source: Hollis Hazard Mitigation Team; NRPC, 2011

Low, Medium, and High rankings were defined as follows:

- Low probability = hazard is not likely to occur within 50 years
- Medium probability = hazard is likely to occur within 25 years
- High probability = hazard is likely to occur within 10 years
- Low impact = little impact would be caused to facility and community from hazard
- Medium impact = moderate impact would be caused to facility and community from hazard
- High impact = significant impact would be caused to facility and community from hazard

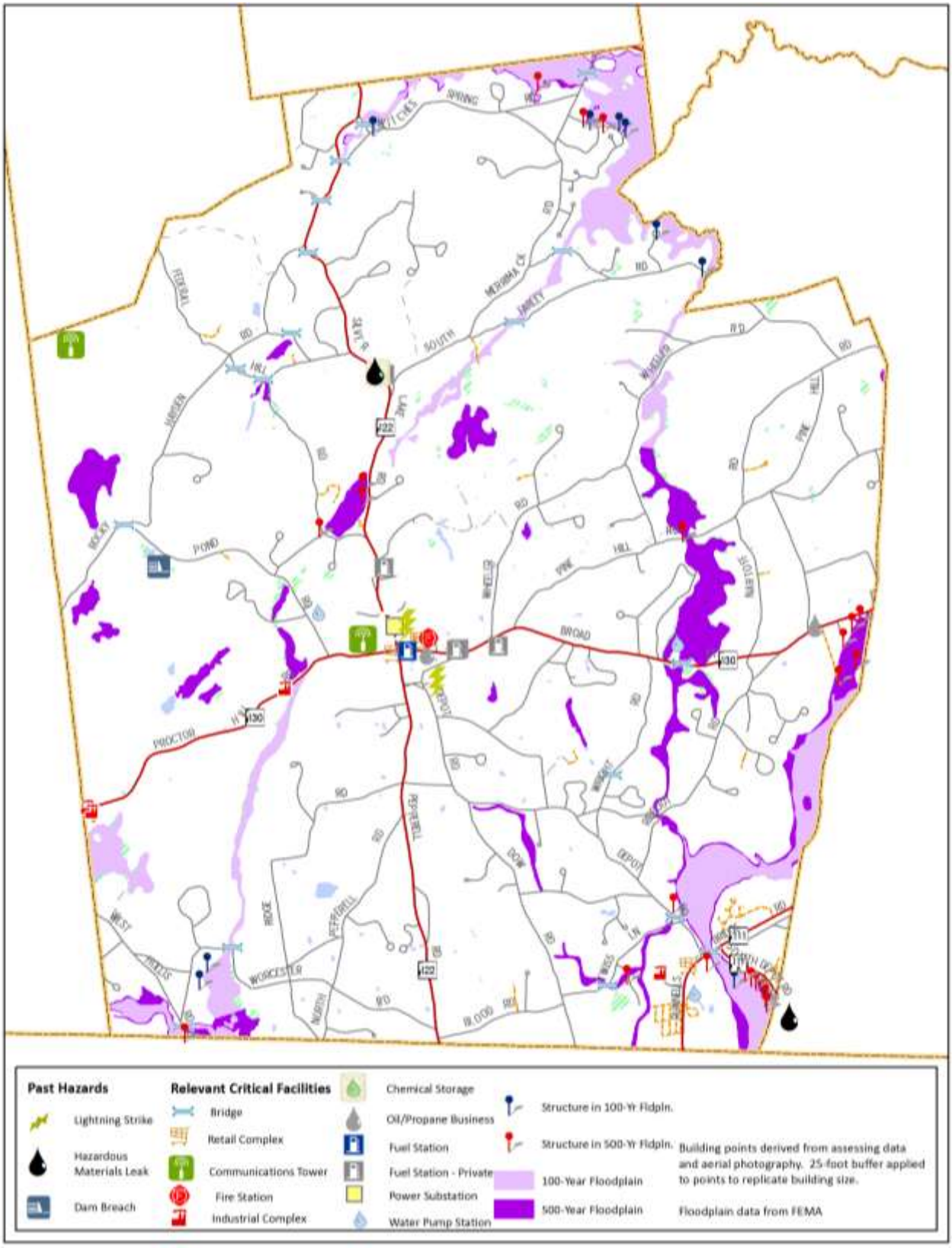
E. Assessment of Future Development Losses

The future use of land is dependent on a number of factors. First and foremost are the constraints of the land. Attempts to push against these constraints in order to develop a poorly suited parcel of land often leads to a higher potential risk of being impacted by a natural hazard. The second factor is what the local land use laws permit. The goals of a community's master plan, economic trends, remaining developable land, redevelopment of land, adequate infrastructure, and the local and regional transportation network are also important factors in determining future land use.

As mentioned previously in the Town Overview, the Town of Hollis encompasses 32.3 square miles. Elevations range from 160 feet above mean sea level on the eastern border to approximately 850 feet MSL in the northwest corner of Town adjacent to Brookline and Milford. Regions of high elevations and steep slopes exceeding 25% are primarily found in the western portion of Town. Prime agricultural soils are found primarily in the southern and central part of Town along the brooks which flow east into the Nashua River. This presents the Town with a continuing concern of existing farmland being sold to developers for land uses not pertaining to agriculture such as residential or commercial. There are currently 4,649 acres of forest in Hollis, with approximately 80% contained in blocks larger than 500 acres in size. Finally, roughly 20,668 acres are taken up by watershed, with about 357 acres of lakes and ponds.

As developable land becomes scarce, there is pressure to increase densities, utilize flood-prone agricultural land along the southern and central parts of Hollis. Maintaining zoning standards to protect watersheds and their floodplains from development and maintaining existing controls for new construction on poor soils or steep slopes is important. To mitigate potential future hazard damage, adequate waters and pressure must be maintained for fire protection and the critical facilities map must be updated as new facilities are built or relocated. The transportation network will also need to grow with development to allow for emergency vehicles to operate within necessary response times or if necessary, to provide for orderly evacuations. Updating flood maps will ensure accuracy that is important in locating developments on the remaining land in Hollis.

MAP 7: FACILITIES IN HOLLIS IDENTIFED IN POTENTIAL LOSS ANAYSIS



Source: NRPC GIS, 2011

CHAPTER V. EXISTING AND PROPOSED HAZARD MITIGATION STRATEGIES

The next step involves identifying existing mitigation strategies for the hazards likely to affect the Town and evaluate their effectiveness. This section outlines those programs and recommends improvements and changes to these programs to ensure the highest quality emergency service possible.

Mitigation Goals

- Remain compliant with the NFIP.
- Preserve and protect assets and basic services.
- Educate and inform the public for better preparedness and response to hazard events.
- Increase effectiveness of vehicular access during hazard events through increased traffic control.

Existing hazard mitigation strategies were obtained during a brainstorming session with the Team, as well as from the Town of Hollis Emergency Management Plan and the Town of Hollis Zoning Bylaw. Table 8 below provides a comprehensive list of all existing mitigation strategies currently in place.

A. Existing Mitigation Strategies

TABLE 8: EXISTING MITIGATION STRATEGIES

Hazard Type	Existing Protection Program or Activity Description	Area of Town Covered	Enforcement Department	Effective-ness	Improvements or Changes Needed
All Hazards	Mutual Aid Agreements with neighboring communities for all hazards.	All	Police Chief, Fire Chief, Public Works Director, Emergency Management Director, and Communications Advisory Board	High	Periodic Review and Update Mutual Aid Contracts
All Hazards	Emergency Management Manual which outlines appropriate responses to specific hazards.	All	Emergency Management Director	High	Updated as required
All Hazards	Emergency Power provided for Town Hall by use of a generator to sustain the furnace and limited utilities. Emergency lighting – all checked often.	Town Hall	Town Administrator and/or Board of Selectmen	Low	New generator to allow for extended use of power in Town Hall. CO fumes currently a problem.
All Hazards	Communication system to help in the coordination of Public Works, Fire, and Police.	All	Communications Advisory Board, Fire and Police Chiefs, and Public Works Director	High	Continue to facilitate communication and reduce response time
All Hazards	Installed communications back up phone systems at different locations.	All	Communications Advisory Board, Fire and Police Chiefs, and Public Works Director	High	Continue to evaluate need for additional backup locations.
All Hazards	Regional communication system with radio interoperability on the same frequency	All	Emergency Management Director and Communications Advisory Board	High	Include in emergency preparedness guide
All Hazards	Established a reserve Emergency Operations Center	All	Emergency Management Director	Medium	Reevaluate to ensure capacity is adequate
All Hazards	Installed a generator at Hollis/Brookline Cooperative High School, Fire Department, Police Station, Town Hall, and Public	Hollis/Brookline Cooperative High School, Fire Department,	Emergency Management	High	Identify convenient fuel sources with backup power

Hazard Type	Existing Protection Program or Activity Description	Area of Town Covered	Enforcement Department	Effective-ness	Improvements or Changes Needed
	Works Garage	Police Station, and Public Works Garage			
All Hazards	Reverse 911 system in existence	All	Emergency Management	High	Continue outreach to public.
All Hazards	Distributed Community Preparedness information at Town events	All	Emergency Management	High	Continue outreach to citizens to ensure they are aware of preparedness information.
Traffic Congestion and Vehicular Accidents	Respond to accidents and traffic control for snow and tree removal operations.	All	Police Chief, Fire Chief, Public Works Director, Emergency Management Director, and Communications Advisory Board	Medium	Traffic Directing Equipment
Traffic Congestion and Vehicular Accidents	Work with local contractors and police for traffic rerouting and road rebuilding.	Roadways	Public Works Director	Low	Acquiring a sign detour package
Poor Road Conditions due to All Hazards	Road Maintenance -full and part-time personnel available 24/7 during event. Snow plow routes are established.	Roadways	Public Works Director	High	As storm frequencies increase, determine if storm drains are adequately sized.
Flooding	Police/Communications building (which has low flood risk) provides information and direction in helping to redirect traffic around any areas of flooding.	All	Police Chief, Fire Chief, Public Works Director, Emergency Management Director, and Communications Advisory Board	Low	Acquiring a sign detour package and traffic directing equipment
Flooding	Make sure roadways are open. Possible rescue and bringing residents or stranded motorists to shelters.	Roadways	Public Works Director	High	Maintain culverts and catch basins
Dam Failure	Pepperell Dam Failure EAP Plan which outlines procedures for dealing with such a disaster.	Southeast corner	Emergency Management Director	High	Update as required
Severe Winter Weather Events	Shelter provision to aid people who are in need of shelter protection due to extreme cold.	All	Police Chief, Fire Chief, Public Works Director, Emergency Management Director, and Communications Advisory Board	High	Identify additional or "pet friendly" shelters
Severe Winter Weather Events	Road Salting, Sanding and Plowing-Public Works Department treat with sand and salt (Both dependent upon weather conditions)	All	Public Works Director	High	Purchase of new trucks and equipment

Hazard Type	Existing Protection Program or Activity Description	Area of Town Covered	Enforcement Department	Effective-ness	Improvements or Changes Needed
Extreme Heat	Aid people who are in need to be brought to shelter due to extreme heat.	All	Police Chief, Fire Chief, Public Works Director, Emergency Management Director, and Communications Advisory Board	Medium	Large groups of people can utilize regional and municipal facilities.
Fire and Lightning	Town Hall Fire Protection- has been struck previously – high steeple. Smoke and fire alarms, emergency lighting, no sprinklers, exits clearly marked.	Town Hall	Town Administrator and/or Board of Selectmen	Medium	Reconstruction of Town Offices – install sprinkler system in upstairs and tower
Hurricanes, Tornadoes, Severe Winter Weather, and Severe Storms	Weather station and anemometer located in Town	All	Emergency Management	High	Incorporate weather data into hazard mitigation planning process.
Hurricanes, Tornadoes, Severe Winter Weather, Lightning, Flooding.	Tree Removal for Potential Hazards- Work with contractors – emergency tree removal.	Roadways	Public Works Director	High	Establish a tree removal maintenance plan.
Terrorism, Flooding, Hazardous Material Incident, Dam Failure, Severe Winter Weather	Provide Emergency Water Supply with the distribution of bottled water.	All	Police Chief, Public Works Director, Town Administrator, and Communications Advisory Board	High	Negotiate a MOU with a bottled water company to provide temporary emergency drinking water.

Source: Hollis Hazard Mitigation Team; NRPC, 2011

B. Completed or Implemented Mitigation Measure

Since the last plan was adopted the Town of Hollis has completed or implemented the following measures. These measures reflect progress in local mitigation efforts.

- Regional communication system with radio interoperability on the same frequency
- Established a reserve Emergency Operations Center
- Installed a generator at Hollis/Brookline Cooperative High School, Fire Department, Police Department, and Public Works Garage
- Weather station and anemometer located in Town
- Reverse 911 system in existence
- Distributed Community Preparedness information at Town events

Newly added measures to Table 9 include:

- Distribute emergency management public outreach material at Town events and post links to Federal emergency management information on Town website
- Acquire detour/sign package
- Obtain electric board/sign
- Acquire roadway barricades
- Convert dry hydrants to cisterns
- Consider participating in statewide Mutual Aid Agreement Program for Public Works
- Identify a potential cooling station
- Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.
- Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.

Several measures were completely removed from Tables 8 and 9 to reflect changes in the Town's priorities.

- Mutual Aid Agreements with Town for all natural hazards

- Town Hall Emergency Heat, Water & Shelter- steep roofed structure that can take a snow load. Generator to keep furnace and essentials running. Town well. Town Clerk's Office – Under Condo Association
- Power Outage Communication system to help in coordination of Public Works Department, Fire, and Police. Direct elderly to shelters
- Water Distribution Communication, pick-up and delivery - Communicate and help in the coordination of Public Works Department, Fire, Police, and Town Administration. Distribution of water. Pick up and deliver to key locations for distribution
- Hurricane Response-Standby, maintain contact with Communications Center and respond as needed
- Develop measures to prevent drinking water contamination
- Compile a Lightning Evacuation Plan

C. Proposed Mitigation Strategies

In addition to the programs and activities that Hollis is currently undertaking to protect its residents and property from natural and manmade disasters, a number of additional strategies were identified by the Team for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the Town helped the Team to identify gaps in the existing coverage and improvements which could be made to the existing strategies. These types of actions were considered when determining new projects, programs, and activities which the Town of Hollis can develop:

- Prevention
- Property Protection
- Structural Protection
- Emergency Services
- Public Education and Involvement

Prevention measures include: planning, zoning, open space preservation, floodplain and wetland development regulations, storm water management, best management practices, communication systems with rail companies, and communication with landowners regarding hazardous materials.

Property Protection includes: utility relocation/burying or flood proofing, lightning protection for elevated structures, identifying all water sources in recreational facilities, sewer backup protection, insurance, and minimization actions.

Structural Protection includes: placement of anemometers, evacuation plans for each building, enclosing hazardous facilities, detention/retention basins, larger culverts, and higher flood standards for construction projects.

Emergency Services include: SCADA intrusion systems, regional mutual aid agreements, protection of critical facilities, health and safety maintenance, and an inventory of all assets in Town.

Public Education and Involvement measures include: providing map information, informational mailings or workshops, real estate disclosure of flood hazards, environmental education, and public announcements on cable access channels which provides instantaneous updates on emergency situations in Town.

Several actions that could be taken to mitigate future hazards can be referenced in Table 9.

TABLE 9: PROPOSED MITIGATION STRATEGIES

Hazard Type	Potential Program or Activity	Description of Proposed Strategy	Type of Activity
All	Distribute emergency management public outreach material at Town events and post links to Federal emergency management information on Town website	Provide information in a booklet for the public, outlining preventative measures and what to do in an emergency. Include measure for property and structural protection, as well as emergency contact information.	Prevention, Public Education, and Awareness
All	Update of Town building codes	Town codes will be updated to be compliant with BOCA code standards	Structural Protection
All	Acquire detour/sign package	Effectively direct traffic along an alternative traffic route in the event of a major event through proper detour signage	Emergency Services/ Traffic Congestion Management

Hazard Type	Potential Program or Activity	Description of Proposed Strategy	Type of Activity
All	Obtain electric board/sign	Display written messages along roadway to advise passing drivers about an important particular event or subject matter	Emergency Services/ Traffic Congestion Management
All	Acquire roadway barricades	Prevent traffic from entering a specific roadway during an important event and requiring them to seek other routes	Emergency Services
All	Culvert and bridge evaluations and rehabilitation projects	Protect conditions of roads proposed for evacuation by minimizing/eliminating hazardous culverts and bridges on evacuation routes to enhance evacuation capabilities in the event of an emergency	Emergency Services/ Structural Protection
All	Consider participating in statewide Mutual Aid Agreement Program for Public Works	Increase the availability of critical equipment needed to sustain infrastructure amongst towns	Emergency Services/ Traffic Congestion Management
Extreme Heat	Identify a potential cooling station	Will provide residents experiencing adverse heat related symptoms a temporary location to cool themselves	Emergency Services
Explosions/Fire Wildfire/ Lightning	Convert dry hydrants to cisterns	Provide a more reliable water storage system within areas of Town where water is scarce as a means to prevent uncontrolled fire	Emergency Services
Flooding	Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	NFIP training information available at http://www.nfipiservice.com/training/index.html	Emergency Services/ Prevention
Flooding	Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Include measures for property and structural protection. Include an outline of where to go and who to contact in an emergency situation. Develop 2 guides; 1 for staff and 1 for the general public, builders, and developers	Prevention, Public Education, and Awareness

Source: Hollis Hazard Mitigation Team; NRPC, 2011

D. Prioritization of Proposed Mitigation Strategies

The goal of each strategy is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each proposed strategy. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic, and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. The following questions were asked about the proposed mitigation strategies and discussed in Table 10:

- **Social:** Is the proposed strategy socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical:** Will the proposed strategy work? Will it create more problems than it solves?
- **Administrative:** Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political:** Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal:** Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- **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?
- **Environmental:** How will the strategy impact the environment? Will the strategy need environmental regulatory approvals?

The cost and benefit of each proposed mitigation strategy was evaluated and assigned a score (Very Beneficial = 3, Beneficial = 2, Somewhat Beneficial = 1, Not Beneficial = 0) based on the above criteria. An evaluation chart with total score and priority for each strategy can be found in the collection of individual tables under Table 10.

Each strategy was evaluated and prioritized according to the total score. The highest scoring strategies were determined to be of more importance, economically, socially, environmentally, and politically. Therefore these strategies were prioritized over those that were scored lower. All of the strategies are included in Table 11 in order of priority.

TABLE 10: STAPLEE ANALYSES OF PROPOSED MITIGATION STRATEGIES

Definition of rating scale: 3 = Very Beneficial; 2 = Beneficial; 1 = Somewhat Beneficial; 0 = Not Beneficial

Mitigation Action: Participate in NFIP training offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits everyone equally.	0	3
Is it Technically feasible and potentially successful?	Yes.	0	3
Is it Administratively workable?	Yes. Requires Hollis staff time.	0	3
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. Primary cost is staff time. Benefits include improved emergency services and preparedness.	0	3
Is it Environmentally beneficial?	No environmental impact.	0	3
SUB-TOTAL OF COST/BENEFIT		**0**	**21**
TOTAL SCORE	**21-0=21 (BENEFIT MINUS COST)**	**21**	
PRIORITY		**NO. 1**	

Mitigation Action: Acquire Detour/Sign Package

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits anyone utilizing the road network.	0	3
Is it Technically feasible and potentially successful?	Yes. It is feasible and would be easy to install.	0	3
Is it Administratively workable?	Yes. It would be coordinated by the Police, Fire, Emergency Management, and Public Works Department.	0	3
Is it Politically acceptable?	Yes. Pending budgetary appropriations.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs include purchasing the detour signs. The benefits include providing an effective means to direct traffic toward an alternative route during a major Town event.	0	3
Is it Environmentally beneficial?	No environmental impacts	1	2
SUB-TOTAL OF COST/BENEFIT		**1**	**20**
TOTAL SCORE	**20-1=19 (BENEFIT MINUS COST)**	**19**	
PRIORITY		**NO. 2**	

Mitigation Action: Obtain Electric Board/Sign

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits anyone utilizing the road network.	0	3
Is it Technically feasible and potentially successful?	Yes. It is feasible and would be easy to install.	0	3
Is it Administratively workable?	Yes. It would be coordinated by the Police, Fire, Emergency Management, and Public Works Department.	0	3
Is it Politically acceptable?	Yes. Pending budgetary appropriations.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs include purchasing the electric signs. The benefits include advising drivers about important events or other subject matters along the roadway.	0	3
Is it Environmentally beneficial?	No environmental impacts	1	2
SUB-TOTAL OF COST/BENEFIT		**1**	**20**
TOTAL SCORE	**20-1=19 (BENEFIT MINUS COST)**	**19**	
PRIORITY		**NO. 2**	

Mitigation Action: Acquire Roadway Barricades

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits anyone utilizing the road network.	0	3
Is it Technically feasible and potentially successful?	Yes. It is feasible and would be easy to install.	0	3
Is it Administratively workable?	Yes. It would be coordinated by the Police, Fire, Emergency Management, and Public Works Department.	0	3
Is it Politically acceptable?	Yes. Pending budgetary appropriations.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs include purchasing the roadway barricades. The benefits include preventing drivers from entering an unauthorized area.	0	3
Is it Environmentally beneficial?	No environmental impacts	1	2
SUB-TOTAL OF COST/BENEFIT		**1**	**20**
TOTAL SCORE	**20-1=19 (BENEFIT MINUS COST)**	**19**	
PRIORITY		**NO. 2**	

Mitigation Action: Prepare and distribute NFIP, insurance, and building codes explanatory pamphlets or booklets.

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits everyone equally.	0	3
Is it Technically feasible and potentially successful?	Yes.	1	2
Is it Administratively workable?	Yes. Hollis staff will need to distribute the booklets.	0	3
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs include staff time, printing costs, and distributing the booklets. Benefits include reduced property and structural damage.	1	2
Is it Environmentally beneficial?	No environmental impact.	0	3
SUB-TOTAL OF COST/BENEFIT		**2**	**19**
TOTAL SCORE	**19-2=17 (BENEFIT MINUS COST)**	**17**	
PRIORITY		**NO. 3**	

Mitigation Action: Distribute Emergency Management Public Outreach Material at Town Events and Post Links to Federal Emergency Management Information on Town Website

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits everyone equally.	0	3
Is it Technically feasible and potentially successful?	Yes. It is feasible and would be easy to create and distribute the outreach material and provide links on the Town website.	1	2
Is it Administratively workable?	Yes. Hollis staff will need to develop and distribute the outreach material as well as posting the links on the Town website.	0	3
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs include staff time, software, and developing and distributing outreach materials and posting links on the Town website. Benefits include a comprehensive public guide on how to handle emergency situations.	1	2
Is it Environmentally beneficial?	No environmental impacts	1	2
SUB-TOTAL OF COST/BENEFIT		**3**	**18**
TOTAL SCORE	**18-3=15 (BENEFIT MINUS COST)**	**15**	
PRIORITY		**NO. 4**	

Mitigation Action: Culvert and Bridge Evaluations and Rehabilitation Projects

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes.	1	2
Is it Technically feasible and potentially successful?	Yes. The projects will work to improve road conditions to help ensure safe and reliable evacuation routes. The Town has the capacity and has been evaluating bridges.	0	3
Is it Administratively workable?	Yes. The Public Works Department will be in charge of planning staff and work hours towards the project.	0	3
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes.	0	3
Is it Economically beneficial?	Yes. The costs are related to staff time. The benefits are uninterrupted travel on safe roads in the event of an emergency.	1	2
Is it Environmentally beneficial?	Maybe. Impacts may differ by location.	1	2
SUB-TOTAL OF COST/BENEFIT		**3**	**18**
TOTAL SCORE	**18-3=15 (BENEFIT MINUS COST)**	**15**	
PRIORITY		**No. 4**	

Mitigation Action: Consider Participating in Statewide Mutual Aid Agreement Program for Public Works

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. It benefits everyone equally.	0	3
Is it Technically feasible and potentially successful?	Yes. Many towns have public works mutual aid agreements.	0	3
Is it Administratively workable?	Yes. The Board of Selectmen needs to authorize the contract.	0	3
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes. The Selectmen can approve the contract.	1	2
Is it Economically beneficial?	Yes. The costs include allowing other municipalities to borrow Hollis's Public Works equipment. The benefit is increasing the availability of public works equipment to help maintain the infrastructure of the Town.	1	2
Is it Environmentally beneficial?	No environmental impacts.	1	2
SUB-TOTAL OF COST/BENEFIT		**3**	**18**
TOTAL SCORE	**18-3=15 (BENEFIT MINUS COST)**	**15**	
PRIORITY		**No. 4**	

Mitigation Action: Update of Town Building Codes

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Yes. Town approved.	0	3
Is it Technically feasible and potentially successful?	Yes.	1	2
Is it Administratively workable?	Yes. Building Inspector enforces.	0	3
Is it Politically acceptable?	Yes. Town approved.	1	2
Is there Legal authority to implement?	Yes. RSA and Town Meeting.	1	2
Is it Economically beneficial?	Yes. Keeps structures.	1	2
Is it Environmentally beneficial?	Yes. Best Management Practices to withstand hazards.	0	3
SUB-TOTAL OF COST/BENEFIT		**4**	**17**
TOTAL SCORE	**17-4=13 (BENEFIT MINUS COST)**	**13**	
PRIORITY		**No. 5**	

Mitigation Action: Identify a Potential Cooling Station

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Maybe. May only benefit people lacking access to household cooling units.	1	2
Is it Technically feasible and potentially successful?	Yes. Many towns contain cooling stations.	1	2
Is it Administratively workable?	Yes. The Board of Selectmen needs to authorize the purchase.	1	2
Is it Politically acceptable?	Yes.	0	3
Is there Legal authority to implement?	Yes. The Selectmen can approve funding.	0	3
Is it Economically beneficial?	Maybe. The costs include designating a cooling station as well as furnishing it with the proper cooling equipment. The benefit is providing residents with a temporary location to cool themselves	1	2
Is it Environmentally beneficial?	No environmental impacts.	1	2
SUB-TOTAL OF COST/BENEFIT		**5**	**16**
TOTAL SCORE	**16-5=11 (BENEFIT MINUS COST)**	**11**	
PRIORITY		**No. 6**	

Mitigation Action: Convert Dry Hydrants to Cisterns

Criteria	Evaluation	Cost	Benefit
Is it Socially acceptable?	Only benefits homeowners	1	2
Is it Technically feasible and potentially successful?	Maybe. Installation could take a considerable amount of time and resources.	1	2
Is it Administratively workable?	Yes. It would be coordinated by the Police, Fire, Emergency Management, and Public Works Department.	0	3
Is it Politically acceptable?	Maybe. Pending budgetary appropriations.	1	2
Is there Legal authority to implement?	Yes. Upon Approval of the Selectmen.	1	2
Is it Economically beneficial?	Very costly. The costs include converting the dry hydrants to cisterns. The benefits include providing a more permanent water supply to prevent uncontrolled fires.	1	2
Is it Environmentally beneficial?	Maybe. Impacts may differ by location.	1	2
SUB-TOTAL OF COST/BENEFIT		**6**	**15**
TOTAL SCORE	**15-6=9 (BENEFIT MINUS COST)**	**9**	
PRIORITY		**No. 7**	

Source: Hollis Hazard Mitigation Team; NRPC, 2011

CHAPTER VI. IMPLEMENTATION SCHEDULE

This step involves developing an action plan that outlines who is responsible for implementing each of the prioritized strategies determined in the previous step, as well as when and how the actions will be implemented. The following questions were asked 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?

Table 11 is the Action Plan. In addition to the prioritized mitigation projects, Table 11 includes the responsible party (WHO), how the project will be supported (HOW), and what the timeframe is for implementation of the project (WHEN).

TABLE 11: PRIORITIZED MITIGATION PROJECTS AND ACTION PLAN

PROJECT	RESPONSIBILITY/ OVERSIGHT	Estimated Cost	FUNDING/SUPPORT*	TIMEFRAME
Participate in NFIP training	Police, Fire, Emergency Management, and Public Works Department	Staff time only (low cost)	Local	1 Year (2013)
Acquire Detour/Sign Package	Police, Fire, Emergency Management, and Public Works Department	$1,000	Local/FEMA's Hazard Mitigation Assistance Program	1 Year (2013)
Obtain Electric Board/Sign	Police, Fire, Emergency Management, and Public Works Department	$10,000	Local/FEMA's Hazard Mitigation Assistance Program	2 Years (2014)
Acquire Roadway Barricades	Police, Fire, Emergency Management, and Public Works Department	$2,000	Local/FEMA's Hazard Mitigation Assistance Program	2 Years (2014)
Prepare, distribute, or make available NFIP, insurance, and building codes explanatory pamphlets or booklets.	Emergency Management	Staff time only (low cost)	Local/Emergency Management Performance Grant (EMGP)	2 Years (2014)
Consider Participating in Statewide Mutual Aid Agreement Program for Public Works	Public Works Department	Staff time only (low cost)	Local Public Works Departments	1 – 2 Years (2013 -2014)
Culvert and Bridge Evaluations and Rehabilitation Projects	Public Works Department	Establishing a cost estimate is beyond the scope of this Plan	Local/FEMA's Hazard Mitigation Assistance Program, New Hampshire Department of Transportation's Bridge Aid Program	1 - 5 Years (2013 -2017)
Distribute Emergency Management Public Outreach Material at Town Events and Post Links to Federal Emergency Management Information on Town Website	Emergency Management Department and Town Administrator	Staff time only (low cost)	Local/FEMA's Hazard Mitigation Assistance Program	1 - 5 Years (2013-2017)

PROJECT	RESPONSIBILITY/ OVERSIGHT	Estimated Cost	FUNDING/SUPPORT*	TIMEFRAME
Update of Town Building Codes	Planning Board and Code Enforcement	Staff time only (low cost)	Local	1 - 5 Years (2013 - 2017)
Identify a Potential Cooling Station	Police, Fire, and Emergency Management Department	Staff time only (low cost)	Local	3 Years (2015)
Convert Dry Hydrants to Cisterns	Police, Fire, and Emergency Management Department	$30,000 per cistern	Emergency Management Performance Grant	3-5 years (2015-2017)

* Note: For descriptions of above mentioned funding sources, please see Appendix D.
Source: Hollis Hazard Mitigation Team; NRPC, 2011

CHAPTER VII. UPDATING THE PLAN AND CONTINUED PUBLIC INVOLVEMENT

The completion of a planning document is merely the first step in its life as an evolving tool. The Plan is a dynamic document which must be reviewed on a regular basis as to its relevancy and usefulness and to add new tasks as old tasks are completed. Recognizing that many mitigation projects are ongoing, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the Plan where necessary.

A. Maintenance and Update of the Hazard Mitigation Plan

It is required that the Town update the Plan at least every five years. In order to track progress and update the Mitigation Strategies identified in the Action Plan (Table 11), it is recommended that the Town of Hollis revisit the Plan annually. In addition, it is especially important to incorporate updates within one year after a Presidential Disaster Declaration. The Emergency Management Director is responsible for initiating this review and needs to consult with members of the Team and the community.

Changes should 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, and funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, should be reviewed as well during the monitoring and update of this Plan to determine feasibility of future implementation. New mitigation actions or plans proposed upon adoption of the Plan must follow the STAPLEE analysis method previously utilized for the Plan. This will not only ensure consistency with the adopted Plan, but more importantly will guide the members to evaluate its feasibility, public and political approval, and overall potential for success.

B. Utilization of Existing Municipal Plans, Regulations and Programs

As Town plans and regulations are updated careful consideration and review of the Hazard Mitigation Plan should be undertaken to provide opportunities for incorporating key elements of the mitigation plan. Such opportunities will present themselves as the following plans are updated:

MASTER PLAN
It is important that updates of the Town's Master Plan be coordinated with updates to the Hazard Mitigation Plan. As each chapter of the Master Plan is updated or new sections are developed relevant strategies and recommendations from the Hazard Mitigation Plan need to be incorporated into the Master Plan. As the Development Trends section contains historical information from the current Master Plan, it is necessary for the Team to include any new updates from the development analysis into this section. The Planning Board and / or Master Plan Committee should address this in future updates.

BUILDING CODES
As building codes are changed or updated the Building Inspector and Planning staff should consider and incorporate relevant information from the Hazard Mitigation Plan.

EMERGENCY MANAGEMENT PLAN
The Town of Hollis adopted an Emergency Management Plan on December 8th, 2005. The Communications Advisory Board is responsible for updating the Emergency Management Plan and an Annual Concurrence is signed by the Board of Selectmen. The Emergency Management Director and the Fire Chief are involved in the update of both the Emergency Management Plan and the Hazard Mitigation Plan and during this annual process will ensure that relevant elements of the Hazard Mitigation Plan are incorporated and the information and recommendations are consistent between both plans.

ZONING ORDINANCE AND REGULATIONS
It is important for the Team to meet with the Planning staff and Planning Board to discuss the Zoning Ordinances and Regulations to ensure that any existing and proposed changes do not conflict with the proposed Mitigation Actions/Objectives from this Plan. One of the proposed mitigation actions is to update existing building codes as necessary in order to ensure the protection of critical facility structural integrity and well as for new proposed critical facilities. Zoning ordinances and regulations are typically reviewed and updated annually and can address consistency with the Hazard Mitigation Plan at this time.

C. Continued Public Involvement

In keeping with the process of adopting the Plan, the Assistant Town Administrator will be responsible for ensuring that the Town Departments and the public have an opportunity to participate in the maintenance and update of the Plan. A public hearing will be held to receive public comment during the annual review period and the final product adopted by the Board of Selectmen appropriately.

During the maintenance and update process of the Plan, the following techniques may be used to ensure continued public involvement:

- Provide personal invitations to the Board of Selectmen;
- Provide personal invitations to the Budget and CIP Committees;
- Provide personal invitations to the Town Department heads;
- Post notices of meetings at the Town Hall, Library, the Public Access Television Channel, and the Town website;
- Submit public service announcements and community event announcements to the Hollis/Brookline Journal and Nashua Telegraph.

These techniques are just examples of what the Team can utilize. It may be necessary for the Team to form a new group upon adoption of the Plan dedicated to implementation, update, and education/outreach of the Plan. As noted below in Table 12, this is noted as the Hazard Mitigation Implementation Team. This will also allow new members to join from other municipal departments and the public. The Emergency Management Director and/or Team members must try to adhere to the following agenda, tasks, and responsibilities in order to ensure that the mitigation actions and plans are implemented.

TABLE 12: ANNUAL PLAN UPDATE AND PUBLIC INVOLVEMENT AGENDA

MEETING SCHEDULE	TASK	RESPONSIBILITY
Every 3 months upon date of plan adoption	Assess current status of funding for mitigation projects. Discuss any new projects/plans that should be obtained for Hollis.	Department heads or any municipal officials interested in working with the Team to find new sources of funding. The original Team may decide to form a new Team to implement the proposed strategies/plans from the Plan.
Twice a year or as needed (Dates to be determined)	Meet to discuss the Plan content and any updates needed for the Plan.	The Team
Twice a year or as needed (Dates to be determined)	Discussion and evaluation of Training Programs and public outreach efforts. New public outreach methods discussed.	The Team and other interested municipal officials.

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