

TOWN OF AUBURN, NEW HAMPSHIRE



Town of Auburn, New Hampshire, Town Offices

HAZARD MITIGATION PLAN 2011

TOWN OF AUBURN NEW HAMPSHIRE

HAZARD MITIGATION PLAN

_____, 2011

Prepared by the Southern New Hampshire Planning Commission

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2011 Auburn Hazard Mitigation Committee Members

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Bill Herman	-	Town Administrator, Town of Auburn
Kate Skoglund	-	Administrative Assistant, Auburn Board of Selectmen
Bruce Phillips	-	Fire Chief/LEDC, Town of Auburn
Denise Royce	-	Planning Board/ZBA
Mike Dross	-	Road Agent

Thanks also to:

- The New Hampshire Department of Safety, Homeland Security and Emergency Management (NH HSEM), which developed the *New Hampshire Natural Hazards Mitigation Plan*;
- The Southwest Region Planning Commission, which developed *Hazard Mitigation Planning for New Hampshire Communities*; and
- The Bedford, Derry, Goffstown, Hooksett, Manchester, and New Boston Hazard Mitigation Committees and their respective Hazard Mitigation Plans.

All the above publications served as models for this plan.

"We will of course be there to help after disaster strikes, but as you all know, there's no substitute for mitigation before it does....

As a poet once wrote, "the test of men lies in action." We as emergency managers and first responders cannot afford to wait for action....

Through planning, mitigation, education, and cooperation, we can make sure our at-risk communities are prepared before the first drop of rain or gust of wind ever threatens our shores."

—Joe Allbaugh, Director of FEMA,
addressing the 2002 National Hurricane Conference

Preface

Hazard mitigation planning is a relatively new field, spearheaded by the Federal Emergency Management Agency (FEMA) during the 1990s after Hurricane Andrew caused more than \$20 billion in damage across several southern states. That event resulted in 54 fatalities and the disruption of millions of lives. The Disaster Mitigation Act of 2000, developed by FEMA, was intended to help both communities and states prepare for, and deal with, such disasters. While New England normally does not have hurricanes of Andrew's magnitude, this area does experience many types of natural disasters that cost both lives and money.

These disasters and other natural hazards occur during all four seasons in the Northeast: winter ice, snow, and nor'easters; spring flooding; summer downbursts and thunderstorms; and fall hurricanes. Planning to make a community *disaster-resistant* before these events occur can help save lives as well as homes and infrastructure. FEMA has several programs designed to strengthen the nation's disaster resistance by reducing risks and changing conditions and behaviors before a disaster in order to protect lives and prevent the loss of property.

FEMA has also raised its budget to upgrade the existing Flood Insurance Rate Maps through the Map Modernization project. Many communities have outdated maps that do not reflect the true extent of flooding potential.

A community's eligibility for hazard mitigation funding depends upon its having adopted a hazard mitigation plan that addresses these issues. Mitigation measures contained within the *Auburn Hazard Mitigation Plan* may be sufficient to receive grant funding.

It is hoped that this document will be a good first step toward analyzing hazards in Auburn, forecasting where potential disasters might occur, and reducing their impact on people and the community.

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Town of Auburn, New Hampshire Hazard Mitigation Plan Executive Summary

The *Auburn Hazard Mitigation Plan* has been developed to help Auburn become a disaster-resistant community by taking measures to reduce future losses from natural or man-made hazardous events before they occur. The Auburn Hazard Mitigation Committee (AHMC), made up of community members and town officials, developed the plan.

Natural hazards are addressed as follows:

- | | | |
|-------------|------------------------|-------------------|
| A. Flooding | C. Fire | E. Seismic Events |
| B. Wind | D. Ice and Snow Events | F. Other Hazards |

The Auburn Hazard Mitigation Committee identified critical facilities, areas at risk, commercial economic impact areas, and hazardous materials facilities.

Critical Facilities:

- Town Offices
- Federal Facilities
- Post Offices
- Police and Fire Stations
- Emergency Operations Centers
- Military Stations
- Public Works Garages
- Emergency Fuel Facilities
- Emergency Shelters
- Airport and Related Facilities
- Wireless Communication Facilities and Radio Towers
- Public Water Systems, Pumps and Booster Stations
- Water Storage Tanks
- Sewer Systems and Pumps
- Electrical Power Substations
- Gas Pump Stations

Areas at Risk:

- Solid Waste and Recycling Facilities
- Telephone Facilities
- Media Communications
- Major Roads and Bridges
- Dams
- Historic Properties
- Libraries
- Schools
- Child Care Facilities
- Senior Housing and Nursing Homes
- Hotels
- Recreation Areas
- Commercial Resources
- Medical Facilities
- Religious Facilities

Existing Hazard Mitigation Strategies

The Auburn Hazard Mitigation Committee identified existing strategies related to hazard mitigation as follows:

- Emergency Operations Plan
- Floodplain Development Regulations
- Elevation Certificates
- Comprehensive Emergency Management Planning for Schools (CEMPS)
- Underground Storage Regulations
- Auburn Building Codes
- Excavation and Soil Removal Regulations
- Road Design Standards
- Snow Ordinance
- Fire Department Regulations
- Hazardous Materials Regulations
- Town Radio System
- Police Department
- State Dam Program
- NH Shoreland Protection Act
- Best Management Practices
- Lake Massabesic Watershed Protection Rules

New Mitigation Programs and Policies

The Auburn Hazard Mitigation Committee identified 22 *new* hazard mitigation strategies as follows:

- Maintain the most current building codes that set appropriate wind load design standards (no updates required at this time).
- Seek grant funding for an electronic sign that can be placed in front of town hall for emergency info during disasters or emergencies
- Include snow load design standards in the Construction Guideline Packet prepared by the building inspector for developers.
- Continue training for the building inspector on new technology, research, and design standards relating to wind loads, seismic design, and snow loads.
- Form a committed community network to check on the elderly populations during extreme heat or cold weather. The Massabesic Senior Citizens and Auburn's Senior Citizens already have a loose knit system to check on one another. Additionally, the Fire Department sends volunteers out to check on residents at critical points during the winter.
- Limit development on unmaintained private roads in isolated areas until the roads are brought into conformance with town road standards.
- Elevate Beaver Brook Road to above the floodplain in conjunction with the Town of Londonderry since it crosses the town line.
- Upsize culvert on Rockingham Road
- Require blasting of ledge on Dartmouth Drive before further development is allowed in order to mitigate ice and snow hazards
- Coordinate pre-construction meetings with a representative of the planning board, the building inspector, the road agent, and developers of

- new construction proposals to review potential hazards, existing ordinances, and opportunities to mitigate potential hazard impacts.
- Post a reminder notice regarding the snow ordinance and snow removal in the local publications at the beginning of winter each year.
 - Post a notice during heavy winters alerting residents to not let snow accumulate on roofs, thus reducing the risks of roof collapse due to heavy snow loads.
 - Adopt and implement new stormwater management regulations based on the new EPA requirements for MS-4 communities.
 - Upgrade culvert on Maple Farm Rd
 - Educate the public through newspaper and the town web site on the availability of National Flood Insurance Program information, DFIRMs and Flood Insurance Study at the Town Hall.
 - Upgrade culvert on Old Candia Rd just East of Tower Hill
 - Create a Hazard Mitigation and Emergency Preparedness page on the Town web site with links to valuable resources at both the FEMA, NH HSEM and SNHRCPP web sites.
 - Include a report of the Hazard Mitigation Committee in the Annual Town Report to alert town residents to the Plan's completion, intents, and contents.
 - Either pave/upgrade Hook Road and install a drainage system or install a bridge to elevate the road above the brook level to eliminate annual damages to the road and surrounding properties due to flooding and subsequent road wash outs.
 - Research the implementation of Code Red or a similar public outreach system
 - Provide water at the fire station for residents whose wells run dry.
 - Encourage the State of NH to address flooding issues at the intersection of Hooksett Road & McEvoy Drive
 - Encourage the State of NH to address flooding issues at the intersection of Hooksett Road & Rockingham Road

This plan is to be reviewed on an annual basis and updated every three to five years by the Auburn Planning Department in coordination with the Auburn Board of Selectmen. The next review will be during 2012 and the update prior to the summer of 2016.

SECTION I INTRODUCTION

"Plans are worthless. Planning is essential." –Dwight D. Eisenhower

Natural Hazards and Their Consequences

During the past decade, the United States has suffered a record number of natural disasters. In 1992, Hurricane Andrew caused an estimated \$25 billion in damage. The 1993 Midwest floods resulted in some \$12-\$16 billion in damage. The 1994 Northridge earthquake caused \$20 billion in damage, and the 2002 summer flooding in central Texas is expected to top \$1 billion in damage. In New England, more than 100 natural disasters during the past quarter century have been sufficiently catastrophic to be declared "disaster areas" by the president, making them eligible for federal disaster relief. That is about four major disasters per year. Nine out of ten of these disasters were the result of flooding. Much of this damage might have been averted with the implementation of foresighted hazard mitigation efforts.



Photo of four homes lost in Tennessee due to a mile-wide tornado during November 2002. Portions of the Midwest and South are assessing the damage from more than 70 tornadoes that touched down. The death toll stands at 35 throughout five states. President George W. Bush declared a major disaster for Tennessee, opening the way for the use of federal disaster funds to help meet the recovery needs of families and businesses devastated by the tornadoes. Mossy Grove, Tennessee, was among the hardest hit areas as 12 people were killed and the rural town was destroyed. (FEMA photo courtesy of Jason Pack)

Floods, tornadoes, winter storms, hurricanes, earthquakes, and wildfires - natural disasters - are part of the world around us. Their occurrence is

inevitable. These events can wreak havoc on the natural environment by uprooting trees, eroding riverbanks and shorelines, carving new inlets, and blackening forests. Yet the natural environment is amazingly resilient, often recuperating in a matter of days or weeks.

When these events strike the man-made environment, however, the result is often more devastating. Disasters occur when a natural hazard crosses paths with elements of the man-made environment, including buildings, roads, pipelines, or crops. When hurricanes tear roofs off houses, it is a disaster. When tornadoes ravage a town, it is a disaster. When floods invade low-lying homes, it is a disaster. If only undeveloped wetlands and floodplains are flooded, rather than homes and businesses, few take notice. The natural environment takes care of itself. The fabricated environment, in contrast, often needs some emergency assistance.

What Is Hazard Mitigation?

Hazard mitigation is the practice of reducing risks to people and property from natural hazards. FEMA's Federal Response Plan defines hazard mitigation as "activities designed to alleviate the effects of a major disaster or emergency or long-term activities to minimize the potentially adverse effects of future disaster in affected areas (A-5)." It includes both structural interventions, such as flood control devices, and nonstructural measures, such as avoiding construction in the most flood-prone areas. Mitigation includes not only avoiding the development of vulnerable sections of the community, but also making existing development in hazard-prone areas safer. For example, a community could identify areas that are susceptible to damage from natural disasters and take steps to make these areas less vulnerable. It could also steer growth to less risky areas. Keeping buildings and people out of harm's way is the essence of mitigation.

Mitigation should not be seen as an impediment to growth and development. On the contrary, incorporating mitigation into development decisions can result in a safer, more resilient community, one that is more attractive to new families and businesses.

Why Develop a Hazard Mitigation Plan?

The full cost of the damage resulting from natural hazards—personal suffering, loss of lives, disruption of the economy, loss of tax base—is difficult to measure. New Hampshire is subject to many types of natural disasters: floods, hurricanes, nor'easters, winter storms, earthquakes, tornadoes, and wildfires, all of which can have significant economic and social impacts. Some, such as hurricanes, are seasonal and often strike in predictable locations. Others, such as floods, can occur any time of the year and almost anywhere in the state.

Benefits of Hazard Mitigation

Hazard mitigation offers many benefits for a community. It can:

- **Save lives and property.** A community can save lives and reduce property damage from natural hazards through identifying risks and taking action, such as elevating structures in the floodplain.
- **Reduce vulnerability to future hazards.** By having a mitigation plan in place, a community is prepared to take steps that will permanently reduce the risk of future losses. This opportunity is often lost when communities are built without regard to natural hazards, or when they are rebuilt after a disaster "just like they were before." While it is natural to want to return things to the way they were, it is important to remember that, in many cases, the disaster would not have been as severe if a mitigation plan had been implemented.
- **Facilitate post-disaster funding.** By identifying and ranking recovery projects before the next disaster, a community will be in a better position to obtain post-disaster funding because much of the background work necessary for applying for federal funding will already be done.
- **Speed recovery.** By developing a mitigation strategy, a community can identify post-disaster mitigation opportunities in advance of a disaster and be ready to respond quickly after a disaster.

Background: Auburn Hazard Mitigation Planning

The Federal Emergency Management Agency (FEMA) has recommended that all communities establish local hazard mitigation plans as a means to reduce future losses from natural or man-made hazard events before they occur. Beginning November 1, 2004, FEMA has mandated an approved hazard mitigation plan be in place to receive specific disaster related grants. With a Pre-Disaster Mitigation Grant from FEMA, New Hampshire Homeland Security and Emergency Management (NH HSEM) provided funding to the Southern New Hampshire Planning Commission (SNHPC) to develop a local hazard mitigation plan for the Town of Auburn, which was adopted March 27, 2006. SNHPC began working with Auburn representatives during January 2011 to update this plan.

Purpose

The *Auburn Hazard Mitigation Plan* serves as a strategic planning tool for use by the Town of Auburn in its efforts to reduce future losses from natural or man-made hazard events before they occur. This *Plan* may constitute a new section of the Auburn Master Plan, in accordance with RSA 674:2.

Authority

This *Hazard Mitigation Plan* was prepared in accordance with the Town of Auburn's Emergency Operations Plan, effective June 2010, and under the authority of the Planning Mandate of Section 409 of Public Law 93-288 as

amended by Public Law 100-707, the Robert T. Stafford Act of 1988, and the Disaster Mitigation Act of 2000. The *Auburn Hazard Mitigation Plan* will be referred to as the "*Plan*." After a public hearing was held at the Auburn Town Offices on March 13, 2006 the Auburn Board of Selectmen formally adopted this *Plan* on March 27, 2006. Documentation of this *Plan's* adoption is provided in Appendix H. The most recent update was formally adopted

Scope of the *Plan*

The scope of the *Auburn Hazard Mitigation Plan* includes the identification of natural hazards affecting the Town, as identified by the Auburn Hazard Mitigation Committee. The committee reviewed hazards in the following categories as outlined in the *State of New Hampshire Natural Hazard Mitigation Plan* and identified by the Committee:

- A. Flooding - including riverine flood events, hurricanes, debris-impacted infrastructure, river ice jams, erosion, mudslides, rapid snowpack melt, and dam breach or failure.
- B. Wind - including hurricanes, tornadoes, nor'easters, downbursts, and lightning.
- C. Fire - including wild land fires, target hazards, and isolated areas.
- D. Ice and snow events - including heavy snowstorms, ice storms, and hailstorms.
- E. Seismic events - including earthquakes and landslides.
- F. Other events - including utility pipe failure, geomagnetism, drought, and extreme heat or cold.

Methodology

In February 2005, the Auburn Hazard Mitigation Committee (AHMC) was formed to begin the initial planning stages of the *Auburn Hazard Mitigation Plan*. The AHMC developed the contents of the *Plan* using the 10-step planning process set forth in the Southwest Regional Planning Commission's *Hazard Mitigation Planning for New Hampshire Communities* handbook, along with the FEMA *State and Local Mitigation Planning How-To Guides*. The SNHPC assisted the AHMC in the development of this *Plan*. The Committee consisted of representatives from various local agencies, including the Auburn Planning and Zoning Department, Fire Department, Building Department, and Board of Selectmen. The Committee held six meetings beginning in February 2005 and ending in August 2005 to collect information, compile, and review the *Plan*.

2011 Plan Update Methodology

In January 2011, the Auburn Hazard Mitigation Committee (LHMC) was formed to begin updating the plan. The Update Committee used the same ten-step planning process set forth in the *Hazard Mitigation Planning for New Hampshire Communities* handbook as did the original Committee. Each section of the plan was reviewed and updated according to new information and the events of the past 5 years. The Update Committee consisted of representatives from various local agencies, including the Planning Department, Fire Department, Planning Board / ZBA, Board of Selectmen Administration and Department of Public Works, among other citizens who attended the meetings. The Committee held a total of five public meetings beginning in January 2011 and ending in May 2011 to collect information, compile the plan update, and review the plan update.

2011 Public Committee Meetings

On the following dates, the Auburn Hazard Mitigation Committee held committee meetings at the Auburn Town Offices: January 19, February 16, March 21, April 19 and May 18, 2011 . Committee meetings were made public and posted in a minimum of two public places as required by New Hampshire state law for public meetings.

Minutes were kept for each meeting and each committee member received an e-mail that contained minutes of the previous meeting and an agenda. The minutes were available to the public. Copies of the meeting agendas, minutes, and attendance sheets are provided in Appendix F.

Coordination with Other Agencies and Individuals

The Hazard Mitigation Committee members and their respective town departments contributed the contents and reviewed the *Plan* drafts. Departments represented were:

- Board of Selectmen
- Planning Board
- Building Department
- Fire Department
- Planning and Zoning Department
- Town Administration

Committee member Bill Herman contacted neighboring communities, agencies, businesses, academia, nonprofits and other interested parties for their review and comment on the draft *Plan* during May 2011.

The *Plan* was distributed to all abutting communities, including Manchester, Hooksett, Candia, Chester, Derry, and Londonderry for their review and comments. Additionally, copies of the *Plan* were left at the Town Library, Town Planning Department, and SNHPC office, for public review and comment. Availability of the *Plan* and its locations were publicized by public notice in the Union Leader, the Nutfield News, and postings at the Town Hall and town web site. Comments received were reviewed at the May 18, 2011 Auburn Hazard Mitigation Committee meeting. Documentation of the public process and solicitation of comments from both the public and outside agencies may be found in Appendix G.

Existing Auburn Emergency Operations Plan

The Town of Auburn last updated the *Town of Auburn Emergency Operations Plan* in 2010. This *Plan* describes *preparedness* activities to improve the Town's ability to respond to an incident; *response* activities, including rescue operations, evacuation, emergency medical care, and emergency personnel training; and *recovery* activities that begin after the disaster. *Mitigation* activities help to reduce or eliminate the damages from future disaster events, and can occur before, during and after a disaster. The Auburn Emergency Management Director will ensure that the Hazard Mitigation Plan is incorporated into the Emergency Operations Plan as appropriate.

State of New Hampshire Legislation Related to Master Plans

During 2002, the State of New Hampshire adopted legislation related to master plans that requires municipalities to "provide more definitive guidance in planning and managing future growth." This new legislation allows a natural hazards section to be considered during the master planning process and incorporated into the master plan. The *Auburn Hazard Mitigation Plan* may serve as a new section of the existing or future *Auburn Master Plan*. This legislation, RSA 674:2 *Master Plan; Purpose and Description*, reads:

The Master Plan may also include the following sections:

...(e) A natural hazards section which documents the physical characteristics, severity, frequency, and extent of any potential natural hazards to the community. It should identify those elements of the built environment at risk from natural hazards as well as extent of current and future vulnerability that may result from current zoning and development policies.

The Town of Auburn will incorporate the Auburn Hazard Mitigation Plan into the Auburn Master Plan as appropriate and the Planning Board will ensure that it is included during the drafting and review of the Master Plan.

Plan Development Steps

To complete this *Plan*, the Auburn Hazard Mitigation Committee followed 10 planning steps during six committee meetings.

Step 1: Map the Hazards

Committee members identified areas where damage from natural disasters had previously occurred, areas of potential damage, and man-made facilities and other features that were at risk for loss of life, property damage, and other risk factors. Base maps provided by SNHPC were used in the process. A summary map illustrating hazard zones, as identified by the Auburn Hazard Mitigation Committee, is presented at the end of Section II.

Step 2: Determine Potential Damage

Committee members identified facilities that were considered to be of value to the town for emergency management purposes, for provision of utilities and services, and for historic, cultural, and social value. The assessed value was noted for each facility, as well as its proximity to the hazard zones. Summary tables of assets in each hazard zone are located in Section III.

Step 3: Identify Plans and Policies Already in Place

Using information and activities outlined in the handbook *Hazard Mitigation Planning for New Hampshire Communities*, the committee and SNHPC staff identified existing mitigation strategies and ordinances related to flood, wind, fire, ice and snow events, earthquakes, and other hazards that are already being implemented by the town. A summary chart is presented in Section IV.

Step 4: Identify the Gaps in Protection and Mitigation

Existing strategies were reviewed for coverage, effectiveness, and implementation, as well as need for improvement. A summary chart and the results of these activities are presented in Section IV. Additionally, the Committee brainstormed what past and potential hazards are not protected by existing mitigation efforts. A list of these future mitigation strategy objectives can be found at the beginning of Section V.

Step 5: Determine Actions To Be Taken

During a brainstorming session, the committee developed a list of other possible actions and strategies to improve Auburn's response to hazardous events. Ideas put forth included culvert replacements, public education programs, and road improvements, among many other programs. New strategies were developed to

respond to the mitigation gaps and identified future mitigation strategy objectives. These new strategies are shown in Section V.

Step 6: Evaluate Feasible Options

The Committee reviewed each of the 23 hazard mitigation actions and strategies that were identified in the brainstorming session using the evaluation charts from Chapter 2 of FEMA's *Developing the Mitigation Plan*. Fourteen evaluation factors (based on the STAPLEE criteria) were used to evaluate feasible actions. Each mitigation action was then scored individually by two committee members and scores were averaged and totaled for each strategy. The results of this analysis are shown in Section V's Preliminary Prioritization. A description of the STAPLEE criteria and the scores are found in Appendix E.

Step 7: Determine Priorities

The Committee reviewed the preliminary prioritization list in order to make changes and determine a final prioritization for hazard mitigation actions. The priorities can be found at the end of Section VI, in the Implementation Strategy.

Step 8: Develop Implementation Strategy

Using the chart provided under Step 9 in the handbook, the Committee created an implementation strategy that includes department(s) responsible for implementation, a schedule for completion, and a funding source or technical assistance source for each identified hazard mitigation action. Additionally, the Committee reviewed the estimated cost of each project. The implementation strategy can be found in Section VI.

Step 9: Coordinate with Other Agencies/Entities

Bill Herman, Town Administrator contacted agencies with expertise in hazard mitigation or missions related to any of the mitigation strategies identified herein. A copy of the draft *Plan* was made available to these agencies for their review and comments. Additionally, the *Plan* was made available to the public at three locations for review. A listing of these agencies can be found in the previous pages of this section.

Step 10: Adopt and Monitor the Plan

SNHPC staff compiled the results of Steps 1 to 9 in a draft document, as well as helpful and informative materials from the *State of New Hampshire Natural Hazard Mitigation Plan*. The Auburn Hazard Mitigation Committee reviewed, revised, and approved a draft of the *Auburn Hazard Mitigation Plan*. A revised draft document was then submitted to the Auburn Board of Selectmen for its review. The *Plan* shall be reviewed on an annual basis to be certain the goals and objectives are being met, and that the policies are being adopted. Section VII of the *Plan* details the adoption and monitoring requirements.

"... [M]itigation works. The Seattle-Tacoma area did not suffer significant losses [following the February 28, 2001, earthquake] because 20 to 30 years ago local leaders invested in its future by passing building codes and issuing municipal bonds that implemented solid protective measures."

—Joe Allbaugh, Director of FEMA
Congressional testimony, May 16, 2001

Hazard Mitigation Goals of the Town of Auburn

The *Town of Auburn Hazard Mitigation Plan*, which was prepared by the Southern New Hampshire Planning Commission and the Auburn Hazard Mitigation Committee and is maintained by the Auburn Fire Chief and Emergency Management Director, sets forth the following hazard mitigation goals:

1. To improve upon the protection of the general population, citizens and guests of the State of New Hampshire, from all natural and Human-caused hazards.
2. To reduce the potential impact of natural and Human-caused disasters on the State's Critical Support Services, Critical Facilities and Infrastructure.
3. To improve the State's Emergency Preparedness, Disaster Response and Recovery Capability in all New Hampshire communities.
4. To reduce the potential impact of natural and Human-caused disasters on the State's Economy, Environment, Historical & Cultural Treasures and Private Property.
5. To identify, introduce and implement cost effective Hazard Mitigation measures in order to accomplish the State's Goals.
6. To reduce the State's liability with respect to natural and Human-caused hazards generally.
7. To address the challenges posed by climate change as they pertain to increasing risks in the State's infrastructure and natural environment.

The Auburn Hazard Mitigation Committee adopted the above goals, derived from the 2010 State of New Hampshire Hazard Mitigation Plan, for the Town of Auburn, New Hampshire, at the March 21, 2011 committee meeting.

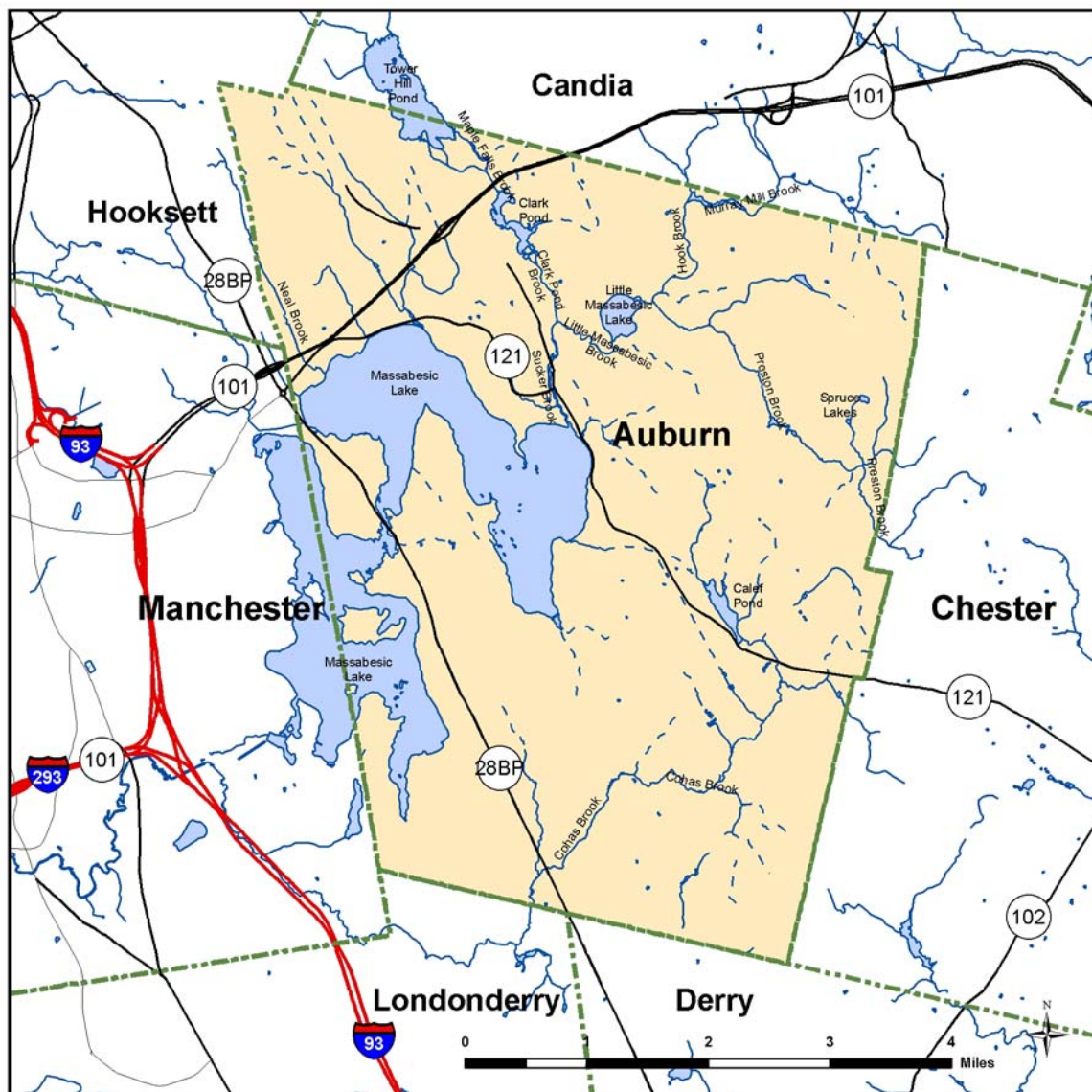
More specific objectives, established after the Committee's analysis of past and potential hazards and review of existing mitigation strategies, may be found at the beginning of Section V: Newly Identified Mitigation Strategies and Critical Evaluation.

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SECTION II HAZARD IDENTIFICATION

Location, Population, Topography, and Climate

The Town of Auburn is located in the south-central portion of the State of New Hampshire in Rockingham County. Auburn is bordered by the Town of Candia to the north; the Town of Chester to the east; the towns of Londonderry and Derry to the south; and the Town of Hooksett and City of Manchester to the west. It is located 23 miles southeast of the City of Concord and about 23 miles northeast of the City of Nashua. New Hampshire Routes 101, 121, and 28 Bypass provide primary highway access to the Town.



Location Map of Auburn, New Hampshire

Auburn encompasses a total of approximately 28.8 square miles, of which 25.4 square miles is land area. The 2000 U.S. Census population of Auburn was 4,682, and the most recent population estimate, 2009, for Auburn is 5,110. This is approximately 200 persons per square mile. (NHOEP)

Auburn has retained over time its natural and rural quality. Auburn's predominant land use is residential while commercial and industrial uses comprise a small amount of the Town's area. (Town of Auburn 2002 Master Plan I-1)

Auburn's topography is characterized by its hills, low mountains, broad valleys and multitude of large ponds and lakes. The area is typified by a combination of ice-carved bedrock geology and other surface areas with deep glacial deposits. The bedrock outcrops are composed of metamorphic rock, which pose a significant constraint on development, requiring blasting for foundation and footing construction and complicating septic design. Other upland areas of Auburn have a layer of unstratified drift or glacial till, typically composed of a mixture of sand, silt, clay and gravel, covering bedrock. The valleys and shorelines are characterized by stratified drift material, consisting of silt, sand and gravel deposited by the meltwaters of a retreating glacial ice sheet. Additionally, swampy areas, which serve as the headwaters for the many streams in the area, occur in low, poorly drained areas and are typically associated with Auburn's wetlands. (Ibid VIII-3)

The major water body in Auburn is Massabesic Lake, covering just over three square miles. Tower Hill Pond, Spruce Lakes, Little Massabesic Lake, Calef Pond and Clark Pond, all in Auburn, cover another .275 square miles, or 176 acres. Major watercourses in northern Auburn include Maple Falls Brook, Neal Brook, Clark Pond Brook, Hook Brook, Murray Mill Brook, Preston Brook, Sucker Brook, and Little Massabesic Brook. Cohas Brook runs from Londonderry, through the southern part of Auburn and into Chester at the east.

The climate of Auburn is typical of southern New Hampshire, with warm summers and cool winters. Temperatures during the month of July range from an average high of 82.1 degrees Fahrenheit to an average low of 54.6 degrees. January temperatures range from an average high of 32.3 degrees to an average low of 5.2 degrees. Prolonged periods of severe cold are rare. Annual average precipitation is 39.82 inches. (Golden Gate Weather Services)

Current Land Use Development Trends in Auburn

The total land area of Auburn is 18,437.8 acres. As of 2009, 8,454.9 acres, or 45.9 percent of land was developed. Of the total land area, 4,001 acres, or 21.7 percent, is public land, most of which includes lands owned by the Manchester Water Works. Lake Massabesic and its watershed area is mostly located in Auburn. The lake serves as the public water supply for Manchester and many of the surrounding towns. The next greatest amount of developed land is dedicated to residential use, accounting for 3,635.3 acres, or 43 percent of all developed land. Almost all residential acreage is in single-family use. Other residential acreage is relatively insignificant in quantity. In 2009, streets and utilities comprised 564.9 acres or 6.6 percent of developed land; industrial uses totaled 44.3 acres, or 0.5 percent of developed land; commercial land areas included 189.8 acres or 2.2 percent of developed land; and semi-public uses accounted for 19.7 acres or less than 0.3 percent of developed land.

Auburn continues to be the most rural of the five towns immediately surrounding Manchester. This characteristic is largely attributable to the 4,001 acres around Lake Massabesic in Manchester Water Works ownership, the small size of Auburn Village and the lack of direct highway access from most of the town to downtown Manchester.¹

Historically, the growth in town has been predominately single family residential development. This trend continued through the 1990s and into the present. Much of the recent residential development has been occurring in the northeastern and southeastern areas in town. Many of these new residential developments are occurring in previously undeveloped, rural areas and require the construction of new roads for access. Auburn's land use today can be described as follows:

1. Rural residential development dispersed throughout town consisting of single-family detached homes on individual lots and in new subdivisions and cluster residential developments.
2. Limited agriculture and forestry uses
3. Two industrial areas
4. A small, compact Village Center
5. Large land holdings owned by Manchester Water Works
6. Recreational uses around Massabesic Lake

The dispersion of new residential dwellings, traditional subdivisions and cluster

¹ Southern New Hampshire Planning Commission Land Use Report 2009

subdivisions throughout the rural areas of the community is a major land use trend facing Auburn. The Town has experienced continued steady growth over the past few years.² Existing and Future Land Use Maps follow this section on pages 16 and 17.

From 2000 to 2008 Auburn saw an increase of 218 new housing units, going from 1,622 to 1,840, a 13.4% increase. Single family residential makes up 94% of Auburn's housing stock, with duplex/multi-family at 5% and manufactured housing at 1%.³

The Town of Auburn's existing Zoning Ordinance, Floodplain Development Regulations, and Subdivision and Site Plan Regulations all work to minimize the impacts, if not eliminate any development in the flood hazard areas. Within the floodplain district, no new development is allowed without a variance, which would increase flood levels during the occurrence of a 100-year flood event. These programs are further outlined in Section IV "Existing Mitigation Strategies and Proposed Improvements."

The land outside of the special flood hazard areas and areas of steep slopes remain the preferred location of development in Auburn by the town and developers and extensive acreage of vacant developable land still exists outside these areas. Future development, beyond current rates of growth, may increase pressure to utilize these hazard areas, despite their inherent risks. Nonetheless, any proposed new developments or significant improvements in these zones would require variances from the Zoning Board of Authority and the Planning Board. The Town may assure low risk and low impact future development in the hazard zones given these review opportunities.

National Flood Insurance Program

Auburn has been participating in the National Flood Insurance Program (NFIP) since 1986. Currently, new countywide Digital Flood Insurance Rate Maps (DFIRMs), bearing the effective date of May 17, 2005, are used for flood insurance purposes, and are on file with the Auburn Planning and Building Departments. In addition the town has implemented the following actions related to continued compliance with NFIP:

- Establish mutual aid agreements with neighboring communities to address administering the NFIP following a major storm event.
- Address NFIP monitoring and compliance activities

² Auburn Master Plan 2007

³ Southern New Hampshire Planning Commission Housing Needs Assessment 2010

- Revise/adopt subdivision regulations, erosion control regulations, board of health regulations, etc. to improve floodplain management in the community
- Inspect foundations at time of completion before framing to determine if lowest floor is at or above Base Flood Elevation (BFE), if they are in the floodplain
- Require the use of elevation certificates
- Enhance local officials, builders, developers, local citizens and other stakeholders' knowledge of how to read and interpret the FIRM
- Work with elected officials, the state and FEMA to correct existing compliance issues and prevent any future NFIP compliance issues through continuous communications, training and education

According to Auburn's most recent NFIP Biennial Report, there were approximately 45 residential structures located in the FEMA designated special flood hazard areas (100-year floodplain), with an approximate population of 306.

The Town currently has 10 NFIP policies in force. Additionally, there has been 1 loss paid and there are no repetitive loss properties.

Existing Land Use

Town of Auburn

Existing Land Use

- Agriculture
- Residential
- Mixed Uses
- Commercial
- Industrial
- Public/Quasi Public
- Other
- Parcels
- Town Boundary
- Utility Lines
- Rivers and Streams

Waterbodies

- Lake/Pond
- Swamp/Marsh

Roads

- Highway
- Major Roads
- Minor Roads
- Class VI Roads
- Private Roads

0 0.375 0.75 1.5 Miles

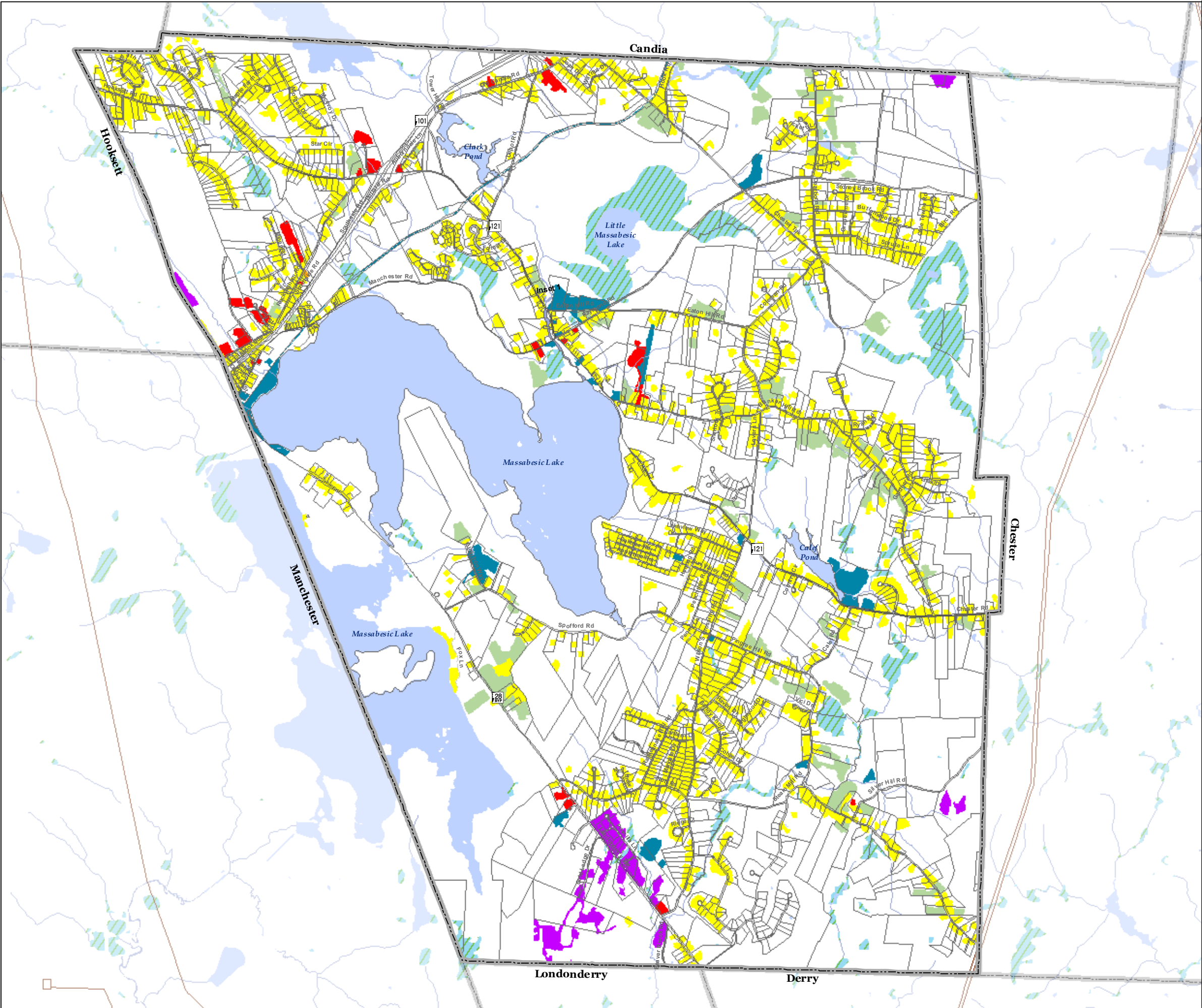
0 2,800 5,600 11,200 Feet

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
Town of Auburn

The Town of Auburn and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.

Map produced by SNHPC February 2011

This map is designed as part of the Towns Hazard Mitigation Plan and is for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.



Future Landuse

Town of Auburn

Future Land Use

- Village Center
- Commercial 1
- Commercial 2
- Industrial
- Residential 1
- Residential 2
- Rural

- Parcels
- Town Boundary
- Utility Lines

Rivers and Streams

Waterbodies

- Lake/Pond
- Swamp/Marsh

Roads

- Highway
- Major Roads
- Minor Roads
- Class VI Roads
- Private Roads

0 0.375 0.75 1.5 Miles

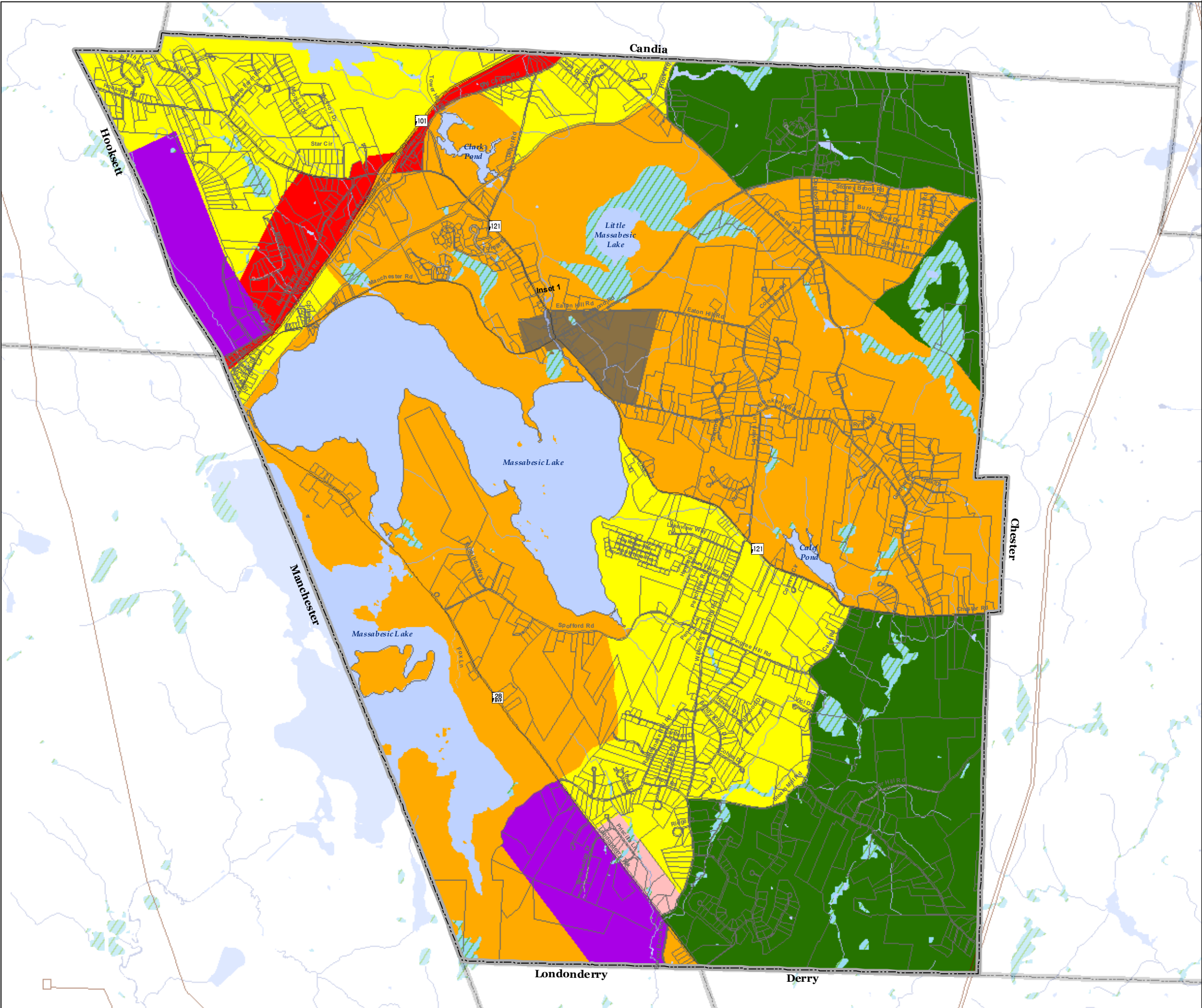
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Past and Potential Hazards

The Auburn Hazard Mitigation Committee identified past hazard events, which include flooding, wind, wildfire, ice, snow, and seismic events. Other hazards include geomagnetism, radon, drought, and extreme heat or cold. These hazards were identified in a brainstorming session with the Committee. The State of New Hampshire Hazard Mitigation Plan was consulted, as well as other supporting information derived from the resources listed in Appendix C. The Identified Hazard Zones Map at the end of this section reflects the impact areas for each hazard. The Committee reviewed background information, areas at risk, and the potential for each hazard to occur, pose a risk to, or cause damage to structures, infrastructure or human life.

A. Flooding

The Auburn Hazard Mitigation Committee reviewed the following kinds of hazards related to flooding:

1. Riverine Flooding

"Typical riverine flooding involves the overflowing of the normal flood channels or rivers or streams, generally as a result of prolonged rainfall or rapid thawing of snow cover. The lateral spread of floodwater is largely a function of the terrain, becoming greater in wide, flat areas, and affecting narrower areas in steep terrain. In the latter cases, riparian hillsides, in combination with steep declines in riverbed elevation, often force waters downstream rapidly, sometimes resulting in flash floods." (Schwab 208)

"The goal of flood hazard mitigation planning is to eliminate or reduce the long-term risks to human life and property from flooding by reducing the cause of the hazard or reducing the effects through preparedness, response, and recovery measures. Hazard mitigation is the only phase of emergency management that can break the cycle of damage, reconstruction, and repeated damage (NHBEM 13)." Riverine flooding is the most common and significant hazard event in the State of New Hampshire as well as all of its municipalities.

Some of the more severe flooding in Auburn occurs during the spring, fall, and winter seasons. Spring floods are typically due to rapid snowmelt and heavy rains. Fall floods are frequently caused by heavy rainfall associated with tropical storms. However, Auburn is prone to flooding at all points in the year from heavy thunderstorms, causing rapid runoff and flooding.

From 1973 through 2010 there have been Nine flood-related FEMA declared disasters in Rockingham County and seventeen in the State of New Hampshire. (FEMA, "Federally Declared Disasters by Calendar Year").

In 2005, 2006, 2007 and recently in 2010 Manchester and much of Southern New Hampshire experienced significant flood events. The 2005, 2006, and 2007 events all exceeded 100 year flood recurrence intervals in some or all areas and the frequency of these events in the past 5 years is a major concern for the Town of Auburn along with the rest of the State.

The following areas in the Town of Auburn have had past recurring flood problems, including erosion and problem culverts:

Area	Type of Damage	Severity
Lake Massabesic	It has been approximately 15 years since the lake has surpassed its shorelines	Severe (although infrequent)
Hook Road – northern segment	Annual flooding causing road damage	Moderate
Bunker Hill Road	Annual flooding causing road damage	Mild
NH Route 121 at Severance Beach	Annual flooding causing road damage	Moderate
Beaver Brook	Annual flooding causing road damage due to a culvert issue in Londonderry	Severe
Pingree Hill Road	Annual flooding due to undersized culvert causing road damage	Moderate
Lovers Lane	Annual flooding due to runoff causing basement flooding in structures near the wetland	Mild
Rockingham Road (Approx ½ mile away)	Annual flooding due to undersized culvert causing road damage	Moderate

All Special Flood Hazard Areas (SFHAs) in the Town of Auburn are potentially at risk in the event of riverine flooding. The SFHAs are located on the Identified Hazard Zones Map at the end of this section.

High probability for riverine flooding to occur and cause damage in Auburn.

2. Hurricanes

"A hurricane is a heat engine that derives its energy from ocean water. These storms develop from tropical depressions which form off the coast of Africa in the warm Atlantic waters. When water vapor evaporates, it absorbs energy in the

form of heat. As the vapor rises, it cools within the tropical depression, and then condenses, releasing heat, which sustains the system... A tropical depression becomes a hurricane when its sustained recorded winds reach 74 mph." (NHBEM 56)

From 1938 to 1999 there were 10 hurricanes or tropical storms in New Hampshire (State of New Hampshire Natural Hazards Mitigation Plan 2007, p. III-30). The September 1938 hurricane was a more notable flooding event to strike Auburn and other municipalities in southern New Hampshire. Hurricanes Carol and Edna caused some damage in August and September 1954. Potential effects of a hurricane include flooding, runoff not handled adequately, and disrupted travel. The most recent hurricanes were: September 1985 – Gloria, August 1991 – Bob, and September 1999 – Floyd. During these events trees and power lines came down, and there was minimal structural damage.

All areas of the Town of Auburn are potentially at risk if a hurricane reaches Rockingham County, New Hampshire.

Moderate probability for hurricanes to occur and cause flood damage in Auburn.

3. Debris-impacted infrastructure and river ice jams

The potential effects of flooding are increased when infrastructure is obstructed either by debris or ice formations. These obstructions compromise the normal stormwater flow, creating an artificial dam or narrowing of the river channel causing a backup of water upstream and forcing water levels higher. Debris obstructions can be caused from vegetative debris, silt, soils, and other riparian structures that have been forced into the watercourse. Ice jams are caused by ice formations "in riverbeds and against structures." (NHBEM 13, 16) Bridges, culverts, and related roadways are most vulnerable to ice jams and debris-impacted infrastructure.

Historically, floods in Auburn have been due to snowmelt and heavy rains in conjunction with debris-impacted infrastructure. If flooding occurs in the Town of Auburn, there is the potential for debris-impacted infrastructure and ice jams to cause damage. Debris obstruction problems have occurred at the culvert on Hook Road. In 2003, flooding and debris obstruction caused the culvert to fail. Occasionally, beaver dams obstruct culverts and watercourses; however, they are removed as soon as they are discovered to avoid any potential associated flooding. Areas that have persistent beaver issues include Priscilla Road and Raymond Rd.

All Special Flood Hazard Areas in the Town of Auburn are potentially at risk if there is an ice jam or debris-impacted infrastructure. Particular concern should

be given to bridges along the many brooks in Auburn including Maple Falls, Clark Pond, Little Massabesic, Hook, Murray Mill, Preston, Neal and Cohas Brooks.

Moderate probability for debris-impacted infrastructure or ice jams to occur and cause damage in Auburn.

4. Erosion and mudslides

The New Hampshire Department of Environmental Services (NHDES) defines erosion as "the process in which a material is worn away by a stream of liquid (water) or air, often due to the presence of abrasive particles in the stream (NHDES Watershed Management Bureau)." As it relates to this *Plan*, erosion is the gradual or rapid wearing away of stream banks or shores, due to prevailing winds, natural water movement, and more catastrophic events. Additional causes of erosion are removal of vegetation and soil disturbance. Riparian construction sites are one non-natural contributor (NHDES Shoreland Protection). Stream bank erosion may eventually result in mudslides.

Land in Auburn which has at least a 15 percent slope, a vertical rise of 15 feet over a horizontal run of 100 feet, is scattered throughout the Town, usually occurring around the hills and stream banks. Areas of steep slopes in Auburn are shown on the Identified Hazard Zones GIS map at the end of this section. There have been no known past erosion or mudslide events in the Town of Auburn that the Hazard Mitigation Committee was aware of.

All areas of steep slopes, as mapped in this *Plan*, are potentially at risk in the case of potential erosion and mudslide events.

Moderate probability for erosion and mudslides to occur and cause damage in Auburn.

5. Rapid snowpack melt

Rapid snowpack melt, much as its name suggests, is a "seasonal rapid melting of the snowpack coupled with [warming] temperatures and moderate to heavy rains." These events typically occur during the spring as temperatures are rising. "The lower lying areas of the State may experience either flash flooding or inundation events accelerated by the rapid melting of the snowpack." (NHBEM 15)

Structures and improvements located on, along, or at the base of steep slopes are most vulnerable to rapid snowpack melt. These areas can be seen on the Identified Hazard Zones GIS map's depiction of steep slopes. There have been

no known past rapid snowpack melt events in the Town of Auburn that the Hazard Mitigation Committee was aware of.

All areas of steep slopes, as mapped in this *Plan*, are potentially at risk in the event of rapid snowpack melt.

Low to moderate probability for rapid snowpack melt to occur and cause damage in Auburn.

6. Dam breach or failure

The New Hampshire Department of Environmental Services indicates several failure modes for dams. Most typical include hydraulic failure or the uncontrolled overflowing of water, seepage or leaking at the dam's foundation or gate, structural failure or rupture, general deterioration, and gate inoperability. These modes vary among dams depending on their construction type. (NHDES Dam Bureau, Environmental Fact Sheets DB-4 through 7)

The State of New Hampshire uses a hazard potential classification based on the impact of dam breach or failure. All Class H and S dams have the potential to cause damage if they breach or fail. Auburn has eight Class NM dams (non-menace or no hazard potential), four Class L dams (low hazard potential), and one Class H dam (high hazard potential). There are no Class S dams (significant hazard potential). The dam classes are defined in Appendix B. (NHDES Dam Bureau, "Dams")

"The Department of Environmental Services (DES), through its Dam Bureau, is charged with the responsibility of ensuring the public safety as it relates to the regulation of dams (NHBEM 17)." Per RSA 482:2 and RSA 482:12, all owners of Class H and S dams are required to submit an Emergency Action Plan to NHDES as well as other applicable agencies in the State. (NHDES Dam Bureau, Environmental Fact Sheet DB-11)

Auburn's Class H dam, owned by Manchester Water Works, is located at Tower Hill Pond at Maple Falls Brook, along the northern limits of the Town. The inundation area spans from the dam itself at the northern limits to the Town Center and Raymond Road at the south, just east of Hooksett Road at the west, and crossing Chester Road at the east. The inundation area includes Clark Pond, Little Massabesic Lake, marshlands, and preserved undeveloped land owned by Manchester Water Works. The road network for the most part circumscribes this area with little development at risk. A portion of the Village School property (not structure) is located in the inundation area.

Floodwaters would instantaneously begin to rise at the dam taking only 30 minutes to reach a peak elevation of 305 feet. At the southern limit of the inundation area, it would take 1.5 hours for the water level to begin to rise and then an additional two hours to reach a peak level of 255 feet. The Emergency Action Plan should be consulted for detailed information and a map of the inundation area.

There have been no known past dam breach or failure events in the Town of Auburn that the Hazard Mitigation Committee was aware of.

The SFHAs in proximity to Auburn's dams as well as their designated floodways would be impacted by a dam breach.

Moderate probability for dam breach or failure to occur and cause damage in Auburn.

B. Wind

The Auburn Hazard Mitigation Committee reviewed the following kinds of hazards related to wind:

1. Hurricanes

Severe hurricanes reaching south-central New Hampshire in the late summer and early fall are the most dangerous of the coastal storms that pass through New England from the south. Tropical depressions are considered to be of hurricane force when winds reach 74 miles per hour (see the following table for hurricane categorization according to the Saffir-Simpson Scale). Substantial damage may result from winds of this force, especially considering the duration of the event, which may last for many hours. Potential effects of hurricane force winds include fallen trees, telephone poles, and power lines.

Saffir-Simpson Hurricane Scale		
Category	Winds (mph)	Potential Damage
1	74-95	Minimal
2	96-110	Moderate
3	111-130	Extensive
4	131-155	Extreme
5	>155	Catastrophic

Winds from the Hurricane of 1938, previously mentioned, reached a high of 186 miles per hour, a category 5 on the Saffir-Simpson Scale. (NHBEM 56)

All areas of Auburn are at risk if a hurricane reaches Rockingham County, NH.

Moderate probability for hurricane force winds to occur and cause damage in Auburn.

2. Tornadoes

"A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one mile wide and 50 miles long." Originating from hurricanes and thunderstorms, tornadoes are formed when cold air overrides warm air causing the warm air to rise rapidly. (FEMA, Understanding Your Risks, 2-20)

Tornadoes are measured using the Fujita Tornado Damage Scale, as seen in the following table (National Oceanic and Atmospheric Administration).

Fujita Tornado Damage Scale		
Category	Winds (mph)	Potential Damage
F0	<73	Light
F1	73-112	Moderate
F2	113-157	Considerable
F3	158-206	Severe
F4	207-260	Devastating
F5	261-318	Incredible

Between 1950 and 2010, there were ten known tornadoes in Rockingham County. Two of these were F0, two were F1, five were F2 (August 1951, July 1957, July 1961, May 2006 and July 2007), and one was a F3 (July 1953). (Tornado Project Online) These storms totaled approximately \$358,000 in damages across the county (NOAA National Climatic Data Center).

All areas of Auburn are potentially at risk if a tornado reaches the Town.

High probability for tornadoes to occur and cause damage in Auburn.

3. Nor'easters

A nor'easter, or winter extra-tropical storm, is "[a] large weather system traveling from south to north passing along or near the seacoast. As the storm approaches New England and its intensity becomes increasingly apparent, the resulting counterclockwise cyclonic winds impact the coast and inland areas from a northeasterly direction. The sustained winds may meet or exceed hurricane force, with larger bursts, and may exceed hurricane events by many hours in terms of duration (NHBEM 58)."

"Unlike the relatively infrequent hurricane, New Hampshire generally experiences at least one or two significant events each year... with varying degrees of severity. These storms have the potential to inflict more damage than many hurricanes because ... high winds can last from 12 hours to three days, while the duration of hurricanes ranges from six to 12 hours (Ibid)."

Nor'easters are measured on the Dolan- Davis Scale, as seen in the following table.

Dolan-Davis Nor'easter Classification Scale				
Storm Class	% of Nor'easters	Avg. Return Interval	Avg. Duration (hours)	Impact
1- WEAK	49.7	3 days	8	No property damage
2- MODERATE	25.2	1 month	18	Modest property damage
3- SIGNIFICANT	22.1	9 months	34	Local-scale damage and structural loss
4- SEVERE	2.4	11 years	63	Community scale damage and structural loss
5- EXTREME	0.1	100 years	95	Extensive regional-scale damage and structural loss

Source: State of NH Natural Hazards Mitigation Plan and NC Division of Emergency Management

All areas of Auburn are potentially at risk for property damage and loss of life due to nor'easters.

High probability for nor'easters to occur and cause wind damage in Auburn.

4. Downburst

"A downburst is a severe localized wind blasting down from a thunderstorm. These 'straight line' winds are distinguishable from tornadic activity by the pattern of destruction and debris. Depending on the size and location of these events, the destruction to property may be devastating. Downbursts fall into two categories. Microbursts cover an area less than 2.5 miles in diameter, and macrobursts cover an area at least 2.5 miles in diameter (NHBEM 59)"

The Hazard Mitigation Committee is aware of two past downburst events in February and March of 2010 in the Town of Auburn.

All locations in Auburn are at risk for property damage and loss of life due to downbursts.

Moderate probability for downbursts to occur and cause damage in Auburn.

5. Lightning

"During the development of a thunderstorm, the rapidly rising air within the cloud, combined with the movement of the precipitation within the cloud, causes electrical charges to build up within the cloud. Generally, positive charges build up near the top of the cloud, while negative charges build up near the bottom. Normally, the earth's surface has a slight negative charge. However, as the negative charges build up near the base of the cloud, the ground beneath the cloud and the area surrounding the cloud become positively charged. As the cloud moves, these induced positive charges on the ground follow the cloud like a shadow. Lightning is a giant spark of electricity that occurs between the

positive and negative charges within the atmosphere or between the atmosphere and the ground. In the initial stages of development, air acts as an insulator between the positive and negative charges. However, when the potential between the positive and negative charges becomes too great, there is a discharge of electricity that is known as lightning (NHBEM 63)."

There were three recorded lightning strikes in the Town of Auburn. The first occurred in June of 1999 when lightning struck a 50 by 75 foot shed, causing a fire that destroyed the building. Damages were estimated at \$30,000. The second event struck a tall pine tree, causing the top of the tree to fall on a house porch during August of 1999. Damages to the porch were estimated between \$5,000 and \$10,000. This second storm also caused damages in other Rockingham County communities. The third lightning strike damaged several structures in Auburn during a July of 2002 event that caused \$5,000 worth of damage throughout the county and into the surrounding towns of Merrimack and Strafford Counties. (NOAA National Climatic Data Center)

All areas of Auburn are potentially at risk for property damage and loss of life due to lightning.

Moderate probability for lightning to occur and cause damage in Auburn.

C. Fires

The Auburn Hazard Mitigation Committee reviewed the following kinds of hazards related to fires:

1. Wild Land Fires

"Historically, large New Hampshire wild land fires run in roughly 50-year cycles. The increased incidence of large wild land fire activity in the late 1940s and early 1950s is thought to be associated, in part, with debris from the hurricane of 1938. Significant woody 'fuel' was deposited in the forests during that event. Present concerns of the New Hampshire Department of Resources and Economic Development, Division of Forests and Lands, are that the ice storm of 1998 has left a significant amount of woody debris in the forests of the region and may fuel future wildfires (NHBEM 34)."

The Town of Auburn has two fire stations serving approximately 29 square miles. The Safety Complex also serves as the Emergency Operations Center and the Police Department. Its facilities include space for six apparatus, including one engine, two tankers, one rescue vehicle, one forestry truck and one boat, radio dispatch, tool room, meeting room, classroom, and offices. There is additional space to accommodate the future expansion of the fire department and emergency operation services.

Station One, located at the south end of Auburn, houses space for an additional six apparatus including one car, two engines, two forestry trucks, and the Gator. Like the Safety Complex, there is another meeting room, offices, secondary dispatch, and a tool room.

Data pertaining to fires can be found in the Auburn Annual Town Reports. There was a total of 202 fires from 2007-2010, including tree, brush, and grass fires, structure fires, vehicle fires, and other fire types including controlled burns, cooking, trash, or refuse fires, and other unauthorized burns. There was an average of 51 fires a year. A summary of data from 2007-2010 is provided as follows.

Fire Type	Number of Responses				Annual Average
	2007	2008	2009	2010	
Structure Fire	23	18	23	22	22
Tree, Brush, or Grass Fire	19	5	11	14	12
Vehicle Fire	4	4	2	6	4
Other Fires	13	15	14	9	13
Total Number of Fires	59	42	50	51	51
HazMat, Gas Leaks, and Downed Power Lines	27	25	22	50	31
EMS Responses	221	189	193	255	215
All Other Responses	244	217	265	182	227
Total All Fires and Responses	551	473	417	542	496
Total Estimated Property Loss	\$1,391,530	N/A	\$142,000	\$244,800	\$444,582.50

In the Town of Auburn, the following areas are susceptible to wild land fires:

- All new developments (when trees are cut, soil dries leaving dead grass)
- Pingree Hill Road and Silver Hill
- Dearborn Road near Chester Turnpike
- Lake Massabesic area and Manchester Water Works land
- 28 Bypass from Parker Farm to the Londonderry Town Line

These areas have been identified on the Identified Hazard Zones GIS map.

High probability for wild land fires to occur and cause damage in Auburn.

2. Target Hazards

Target Hazards are facilities or areas of town that require a greater amount of pre-fire tactical planning to address emergencies larger than the average fire event. In the Town of Auburn, a couple areas have high concentrations of either

combustible or hazardous materials which, were a fire to occur, could increase the severity of the fire and possibly have catastrophic results.

In the Town of Auburn, the following areas are susceptible to target hazard related fires:

- Explosive bunkers at Maine Drilling and Blasting and Green Mountain Explosives off of Goldedge Drive
- Propane bulk storage off 28 Bypass near Priscilla Lane

These areas have been identified on the Identified Hazard Zones GIS map.

Moderate probability for target hazard related fires to occur and cause damage in Auburn.

3. Isolated Homes

"New Hampshire is heavily forested and is therefore exposed to this hazard ... The proximity of many populated areas to the State's forested lands exposes these areas and their populations to the potential impact of wildfire (NHBEM 34)."

The Town of Auburn has several unpaved private roads with homes located along Lake Massabesic. Many of the roads are very narrow and poorly maintained. One home on Shore Drive had a fire in December of 2004 and because of the poor road conditions only one fire truck could access the home. Additional water had to be pumped into the area and personnel had to walk to the site.

In the Town of Auburn, the following areas have isolated residential developments:

- Shore Drive
- Fox Lane
- Deerneck Lane
- Deschenes Lane

These areas have been identified on the Identified Hazard Zones GIS map.

Low probability for isolated homes to be damaged in Auburn.

D. Ice and Snow Events

The Auburn Hazard Mitigation Committee reviewed the following kinds of hazards related to ice and snow events:

1. Heavy Snowstorms

"A heavy snowstorm is generally considered to be one which deposits four or more inches of snow in a 12-hour period (NHBEM 69-70)."

"A blizzard is a winter storm characterized by high winds, low temperatures, and driving snow, according to the official definition given in 1958 by the U.S. Weather Bureau. The winds must exceed 35 miles per hour and the temperatures must drop to 20°F (-7°C) or lower. Therefore, intense nor'easters, which occur in the winter months, are often referred to as blizzards. The definition includes conditions under which dry snow, which has previously fallen, is whipped into the air and creates a diminution of visual range. Such conditions, when extreme enough, are called 'white outs'. (Ibid 71)"

For the intents of this *Plan*, heavy snowstorms include all storms with four or more inches of snow in a 12-hour period, including all blizzards and nor'easters with large snow accumulation.

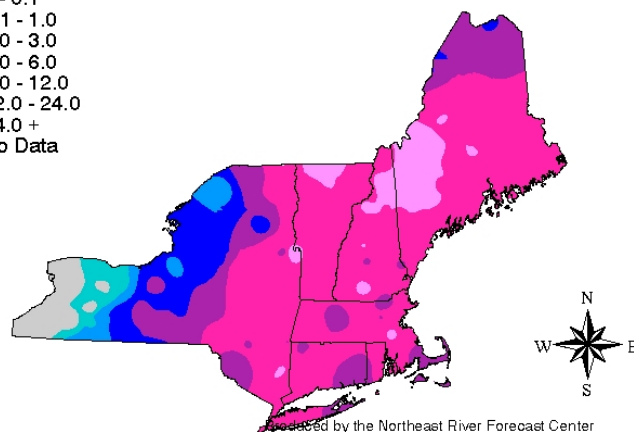
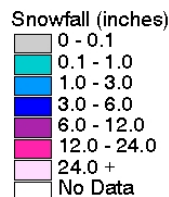
In the past 17 years, the Federal Emergency Management Agency declared six snowstorm-related Emergency Declarations for Rockingham County. The first was declared by FEMA in March of 1993 for statewide heavy snow. The second was for snowstorms during March of 2001 covering seven of the state's 10 counties. (FEMA, "Federally Declared Disasters by Calendar Year")

The third declared emergency was for a snowstorm on February 17-18, 2003. This storm accumulated approximately 11 inches of snow in Auburn by 9 am on February 18. (National Weather Service, "Winter Weather Summaries") This snow was added to an existing base of snow to create an approximate snow depth of 29 inches (National Weather Service, "Climate Data").

The fourth declared emergency was on December 6-7, 2003. This emergency was declared for eight of 10 New Hampshire counties. The storm accumulated approximately 20 inches of snow in the Auburn area and winds were measured at up to 39 miles per hour (National Weather Service, "Winter



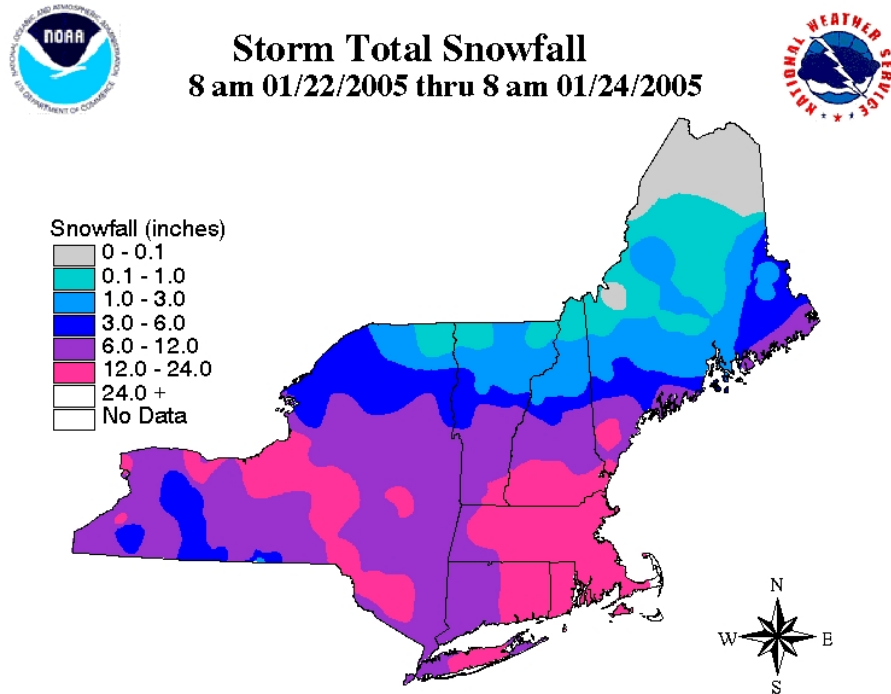
Storm Total Snowfall 8 am 12/05/2003 thru 8 am 12/08/2003



Source: National Weather Service Forecast Office,
http://www.erh.noaa.gov/er/gyx/storm_map_120503_120803.jpg

Weather Summaries"). Following is a map depicting snowfall during this storm.

The last declared emergency declared emergency was for January 22-23, 2005 and was declared for all New Hampshire counties, except Coos. The storm accumulated 19.5 inches of snow on top of an existing six-inch snow depth. (National Weather Service, "Winter Weather Summaries" and "Climate Data")



Produced by the Northeast River Forecast Center
Source: National Weather Service Forecast Office, http://www.erh.noaa.gov/er/gyx/storm_map_012405.jpg

All areas of Auburn are potentially at risk for property damage and loss of life due to heavy snows.

High probability for heavy snowstorms, blizzards, and nor'easters to occur and cause damage in Auburn.

2. Ice Storms

"When a mass of warm moist air collides with a mass of cold arctic air, the less dense warm air will rise and the moisture may precipitate in the form of rain. When this rain falls through the colder more dense air and encounters cold surfaces, the latent heat of fusion is removed by connective and/or evaporative cooling. Ice forms on these cold surfaces and may continue to form until the ice is quite deep, as much as several inches.

"This condition may strain branches of trees, power lines and even transmission towers to the breaking point and often creates treacherous conditions for highway travel and aviation.

"Notwithstanding the unique beauty of such events, the weight of formed ice (especially with a following wind) may cause power and phone lines to snap and the towers that support them to fail under the load of ice and/or bending or broken tree limbs.

"Debris impacted roads make emergency access, repair and cleanup extremely difficult.

"The ice storm of January 1998 was not unique in either its spatial scope or its devastating consequences. A similar event in 1929 is believed to have been comparable to this event." The 1998 ice storm was a Declared Disaster by FEMA for nine of the State's 10 counties; the sole exclusion was Rockingham County. (NHBEM 80)

Auburn, including the rest of New Hampshire and much of the Northeast, experienced an intense ice storm from December 11-12, 2008. A major disaster declaration was declared for 10 counties in New Hampshire, including Rockingham. The damage was widespread and approximately 400,000 residents of New Hampshire lost power from the storm. Restoring power to a majority of the State took approximately 14 days and in some extreme cases it took 17 days.

"It was absolutely unprecedented in devastation. Take the largest number of outages in any past storm, multiply that figure by three, and it still won't equal the outages in the 2008 ice storm." PSNH spokesman, Matt Chagnon, went on to say that, "the response was as unprecedented as the storm itself. PSNH put 2,400 linemen to work. On average, they restored power to 28,000 customers a day."⁴ The 2008 ice storm is believed to be the worst ice storm ever recorded in New Hampshire.

All areas of Auburn are potentially at risk for property damage and loss of life due to ice storms.

High probability for ice storms to occur and cause damage in Auburn.

3. Hailstorms

"Hailstones are balls of ice that grow as they are held up by winds, known as updrafts, that blow upwards in thunderstorms. The updrafts carry droplets of super cooled water (at a below freezing temperature) but not yet ice. The super

⁴ Sullivan, Margo. *State, power companies explore ice storm response*. 12/29/08.
http://www.eagletribune.com/punews/local_story_364030134.html

cooled water droplets hit the balls of ice and freeze instantly, making the hailstones grow. The faster the updraft, the bigger the stone can grow (NHBE 67)."

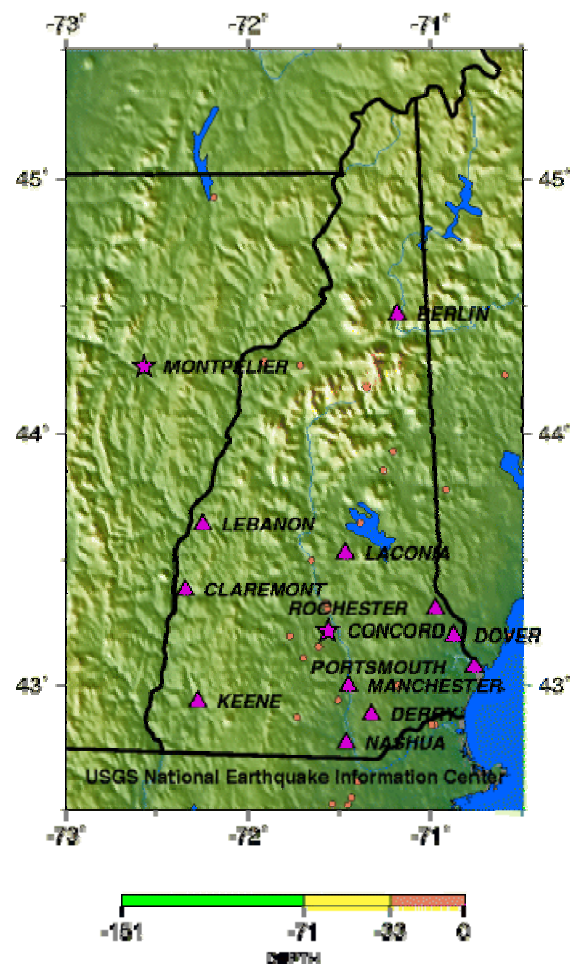
"Most hailstones are smaller in diameter than a dime, but stones weighing more than a pound have been recorded. Details of how hailstones grow are complicated but the results are irregular balls of ice that can be as large as baseballs, sometimes even bigger. While crops are the major victims, hail is also a hazard to vehicles and windows. Hail damage events can be severe to persons, property, livestock and agriculture (Ibid)."

Between 1963 and 1994 the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) online database has recorded 11 hail storms in Rockingham County. Storms occurred during the months of June, July, and August. Several isolated hailstones have occurred in surrounding communities since 1994. Hailstone diameters recorded ranged from .75 to 1.75 inches.

All areas of Auburn are potentially at risk from this hazard.

Moderate probability for hailstorms to occur and cause damage in Auburn.

Seismicity of New Hampshire 1990 - 2006



Depth is in kilometers.
Purple Triangles: Cities
Purple Star: Capital City
Circles: Earthquakes
(color represents depth range)

Earthquake locations are from the USGS/NEIC PDE catalog.

E. Seismic Events

The Auburn Hazard Mitigation Committee reviewed the following kinds of hazards related to seismic events:

1. Earthquakes

An earthquake is "[a] series of vibrations induced in the earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating (NHBEM 37)."

In the State of New Hampshire, earthquakes are due to intraplate seismic activity, opposed to interplate activity or shifting between tectonic plates as occurs in California. The causes of intraplate earthquakes have yet to be scientifically proved. One accepted explanation for the cause of intraplate "earthquakes in the Northeast is that ancient zones of weakness are being reactivated in the present-day stress field. In this model, pre-existing faults and/or other geological features formed during ancient geological episodes persist in the intraplate crust, and, by way of analogy with plate boundary seismicity, earthquakes occur when the present-day stress is released along these zones of weakness (Kafka)."

There are two scales that measure earthquakes, the Modified Mercalli (MM) and the Richter scales. The Richter scale is a measurement of magnitude of the quake as calculated by a seismograph and does not measure damage. The Modified Mercalli scale denotes the intensity of an earthquake as it is perceived by humans, their reactions, and damage created. It is not a mathematically based scale but a ranking of perception. (USGS) Refer to page 41 of the State of New Hampshire Natural Hazards Mitigation Plan for detailed descriptions of each.

One of New England's more notable seismic zones runs from the Ossipee Mountain area of New Hampshire, through the Auburn area, and continues south toward Boston, Massachusetts. This particular area has a mean return time of 408 years for a 6.0 Richter scale earthquake or a 39 percent probability of occurrence in 200 years. Additionally for a 6.5 Richter scale quake, there is a mean return time of 1,060 years or a 17 percent probability of occurrence in 200 years. (Pulli) When New England is generalized as a whole for earthquake probability estimation, the risk increases from the specific hazard zone noted above. For New England there is an estimated return time of every 10 years for an earthquake with a 4.6 Richter scale magnitude and 1000 years for 7.0 magnitude. (NHBEM 43)

From 1728 to 1989, there were 270 earthquakes in New Hampshire. This averages to approximately one quake per year. There were six quakes over 4.0 on the Richter scale during the 1900s. (Ibid 39-42) The most recent earthquake recorded in New Hampshire was on January 3, 2011, 20 miles NNW of Laconia, New Hampshire, with a magnitude of 2.5 on the Richter scale (USGS Earthquake Hazards Program).

All areas of Auburn are potentially at risk for property damage and loss of life due to earthquakes.

Moderate to high probability for earthquakes to occur and cause damage in Auburn.

2. Landslides

According to Webster's Dictionary a landslide is "[t]he sliding of a mass of soil, detritus or rock on or from a steep slope.' More specifically, a landslide is the downward movement of slope forming materials reacting under the force of gravity including: mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides and earth flows." Landslides typically occur due to the over-saturation of soil on a slope during heavy precipitation or melting or they occur during a seismic event such as an earthquake. (NHBEM 45)

There have been no known past landslide events in the Town of Auburn that the Hazard Mitigation Committee was aware of.

All areas of steep slopes in Auburn, as shown on the Identified Hazard Zones Map, are at risk for landslides.

Moderate probability for landslides to occur and cause damage in Auburn.

F. Other Hazards

The Auburn Hazard Mitigation Committee reviewed the following other kinds of hazards:

1. Utility pipe failure

Failure of utility pipe systems, including water, gas, and sewer, can be caused by joint leakage, contamination, pipe fracture or tuberculation. Pipe fractures are the most costly and potentially damaging of the failure modes. (Makar 2) Fractures can be caused by blunt force (e.g. construction digging) or ground shifting caused by the natural expansion and contraction of freezing and thawing soil during the winter months or from earthquakes. Pipe blocks in sewer systems can cause a buildup of harmful gasses and lead to explosions. (Suffolk County Water Authority)

Potential effects of water main failures can include immediate loss of water supply in the surrounding area, flooding, and road collapse. Sewer main failures can cause sewage backups, effluent leakage, and exposure to harmful bacteria. Leaks in gas mains can lead to fires or explosions if there is either an ignition source or pressure built up in the pipe. Explosions occurring in underground

pipes can create craters, and possibly result in death, injuries, and property damage. (National Transportation Safety Board, "Pipeline Accidents")

There are approximately 2.6 miles of water lines in Auburn. Water mains range in diameter from four to 16 inches. Manchester Water Works maintains 20 fire hydrants, nine fire services (6 to 8-inch diameter pipes), and 92 domestic services (¾ to 6-inch pipes) in Auburn. (Manchester Water Works)

During 2004, there were no leaks in the water mains. Manchester Water Works main breaks occur at an approximate frequency of .05 breaks per mile, compared to the national average of .20 breaks per mile.

The developed area immediately north of Lake Massabesic should be considered at risk for utility system failures.

Low probability for utility system failures to occur and cause damage in Auburn.

2. Geomagnetism

The State of New Hampshire Natural Hazards Mitigation Plan defines geomagnetism as "...of, or pertaining to, the earth's magnetic field and related phenomena. Large geomagnetic disturbances commonly known as magnetic storms, if global in scale, or as magnetic substorms, if localized in scale and limited to night time high altitude auroral regions, are of particular significance for electric power utilities, pipeline operations, radio communications, navigation, satellite operations, geophysical exploration and GPS (global positional system) use. (NHBEM 50)"

Geomagnetism includes both solar wind coupling and magnetic storms. Solar wind coupling is the relationship between solar events and winds with geomagnetic activity within the earth's magnetosphere. "Magnetic storms occur when the radiation belts become filled with energetic ions and electrons. The drift of these particles produces a doughnut shaped ring of electrical current around the earth...Magnetic storms are often initiated by the sudden arrival of a high-speed stream of solar wind, carrying high particle density and high magnetic field. (Ibid)"

High-tension lines and communications towers are at risk in Auburn.

Low probability for geomagnetism to occur and cause damage in Auburn.

3. Drought

"Hydrological drought is evidenced by extended periods of negative departures from normal rainfall (NHBEM 30)." New Hampshire has been under several drought warnings, including a drought emergency, since 1999. The most severe drought conditions occurred between 1960 and 1969; the event had a greater than 25 year recurrence interval (NHBEM 30). The Southern New Hampshire region experienced a 100-year drought event from 1964 to 1965 (Manchester Water Works Memo).

While a drought is not as devastating as some other hazards, low water levels can have a negative effect on existing and future home sites, especially those which depend on groundwater for water supply. Additionally, the dry conditions of a drought may lead to an increase wild fire risk. (Ibid 30-31)

All areas of Auburn would be affected by a drought.

Moderate probability for drought to occur and cause damage in Auburn.

4. Extreme Heat

"A heat wave is defined as a period of three consecutive days during which the air temperature reaches 90 degrees Fahrenheit or higher on each day. (NHBEM 33)" Extreme heat is an occasional and short-lived event in southern New Hampshire. While there have been no extended periods of extreme heat in Auburn, the State of New Hampshire Natural Hazards Mitigation Plan notes one of the hottest summers of record as 1999. There were 13 days above 90 degrees, five days over 95 degrees and two days over 97 degrees. From 1960-1994 there were 45 heat waves recorded in Concord, NH. This is an average of 1.3 heat waves per year. In 1988 there was a total of five heat waves. (NHBEM 32-3)

All areas of Auburn would be affected by extreme heat, in its event. Particular areas and populations at a greater risk are:

- elderly populations and day care centers;
- the power system that may become overburdened; and
- communications negatively affected by power burden.

Low probability for extreme heat to occur and cause damage in Auburn.

5. Extreme Cold

While most New Hampshire residents are rather habituated to the extreme cold situations in the State, and this is not a section identified by the State of New

Hampshire Natural Hazards Mitigation Plan, it was decided to include a statement in this *Plan*. For the purposes of this *Plan* extreme cold will be referred to in a general manner, without a scientific definition. Periods of extreme cold pose a life-threatening situation for Auburn's low-income populations. With the rising costs of heating fuel and electric heat, many low-income citizens are not able to adequately heat their homes, exposing themselves to cold related medical emergencies or death.

In Concord, New Hampshire there are on average 21 days below 32 degrees Fahrenheit in November, 29 days in December, 30 days in January, 27 days in February, and 26 days in March. The coldest temperatures recorded for each month were -5 degrees Fahrenheit in November, -22° in December, -33° in January, -37° in February, and -16° in March. (Northeast Regional Climate Center)

All areas of Auburn would be affected by extreme cold, in its event. Particular areas and populations at a greater risk are:

- elderly populations and day care centers;
- power system that may become overburdened; and
- low income populations.

Moderate to high probability for extreme cold to occur and cause damage in Auburn.

A GIS-generated map, following this page, was prepared to illustrate the Identified Hazard Zones.

Critical Facilities

Town of Auburn

Critical Facilities

- Bridge
- Emergency Operations Center
- Fire Station
- Police Station
- Public Works Garage
- Town Offices
- Transfer Station
- Town Boundary
- Parcels
- Utility Lines
- Lake/Pond
- Swamp/Marsh
- Rivers and Streams

Roads

- Highway
- Major Roads
- Minor Roads
- Class VI Roads
- Private Roads

0 0.4 0.8 1.6 Miles

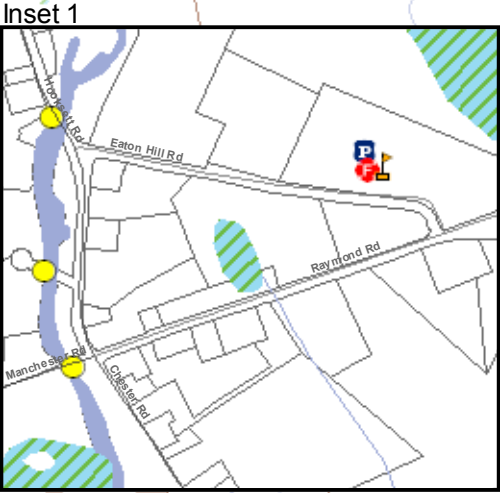
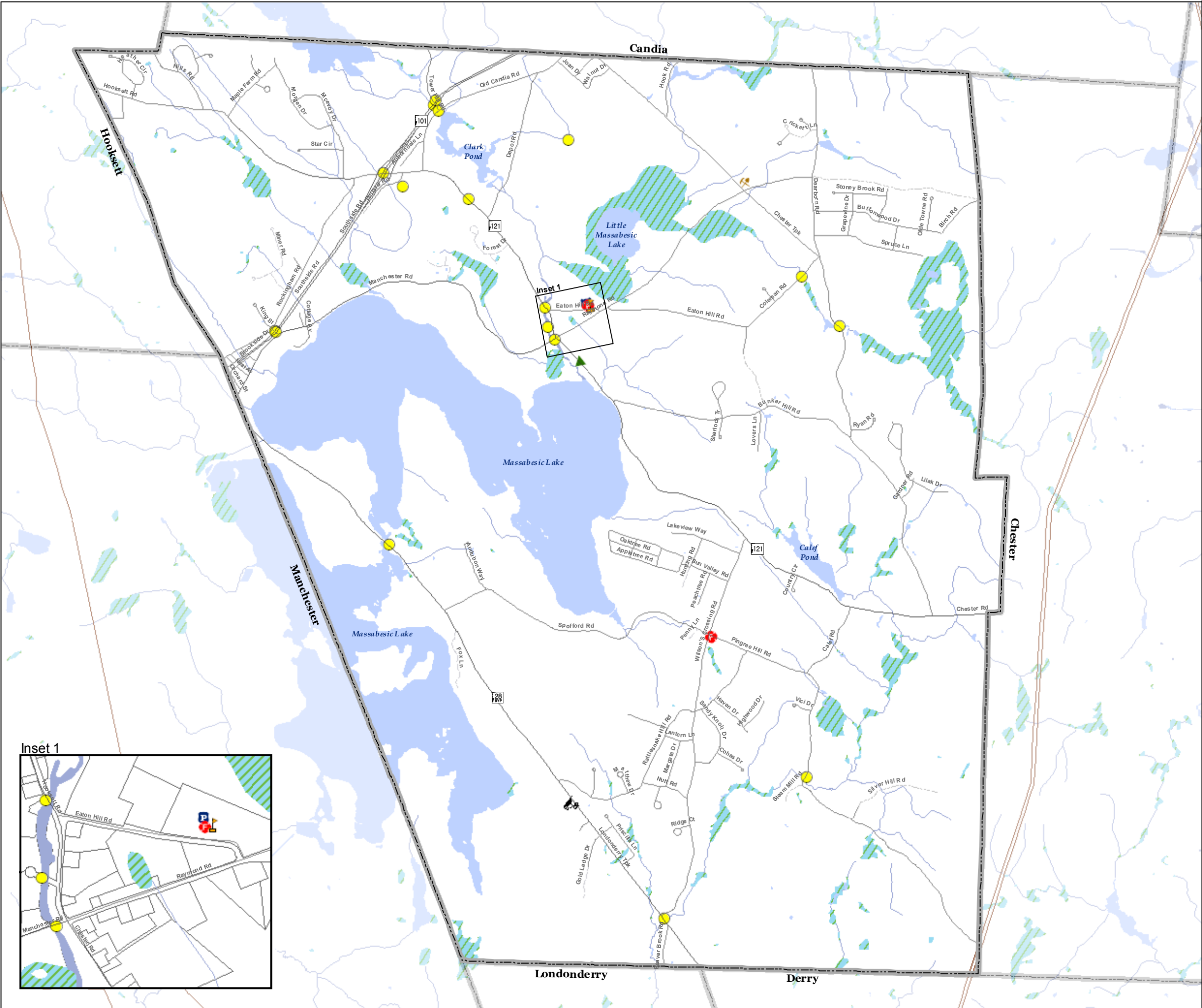
0 2,800 5,600 11,200 Feet

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
Town of Auburn

The Town of Auburn and the SNHPC make no representations or guarantees to the accuracy of the features and designations of this map.

Map produced by SNHPC February 2011

This map is designed as part of the Towns Hazard Mitigation Plan and is for planning purposes only. It is not to be used for legal boundary determinations or for regulatory purposes.



Map #4

Areas at Risk

Town of Auburn

Areas at Risk

- Above Ground Storage Tanks
- Child Care
- Commercial Economic Impact Area
- Commercial Resources
- Dam
- Hazardous Waste Generators
- Hazardous Waste Generators/Explosives Present
- Historic Facilities
- Library
- Post Office
- Public Water System
- Recreation - Outdoor
- Religious Facility
- School
- Telephone Facilities
- Transfer Station
- Underground Storage Tanks

- | | |
|--------------------|----------------|
| Parcels | Roads |
| Town Boundary | Highway |
| Utility Lines | Major Roads |
| Rivers and Streams | Minor Roads |
| Waterbodies | Class VI Roads |
| Lake/Pond | Private Roads |
| Swamp/Marsh | |

0 0.375 0.75 1.5 Miles

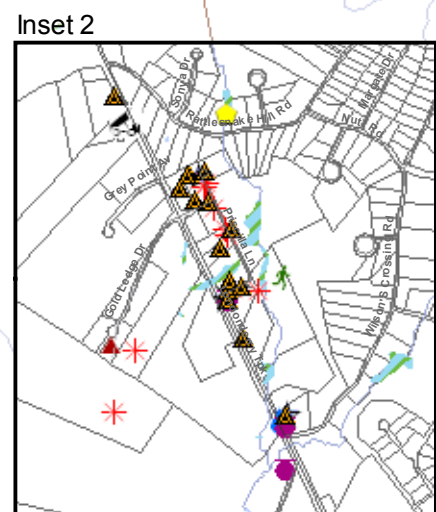
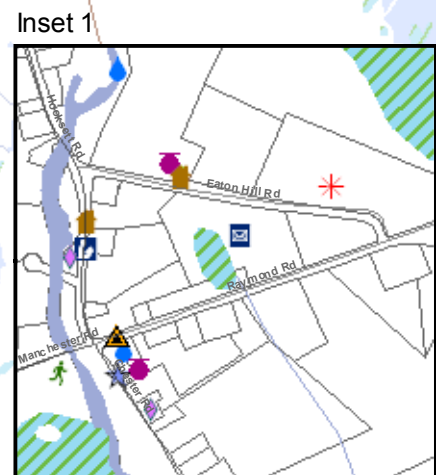
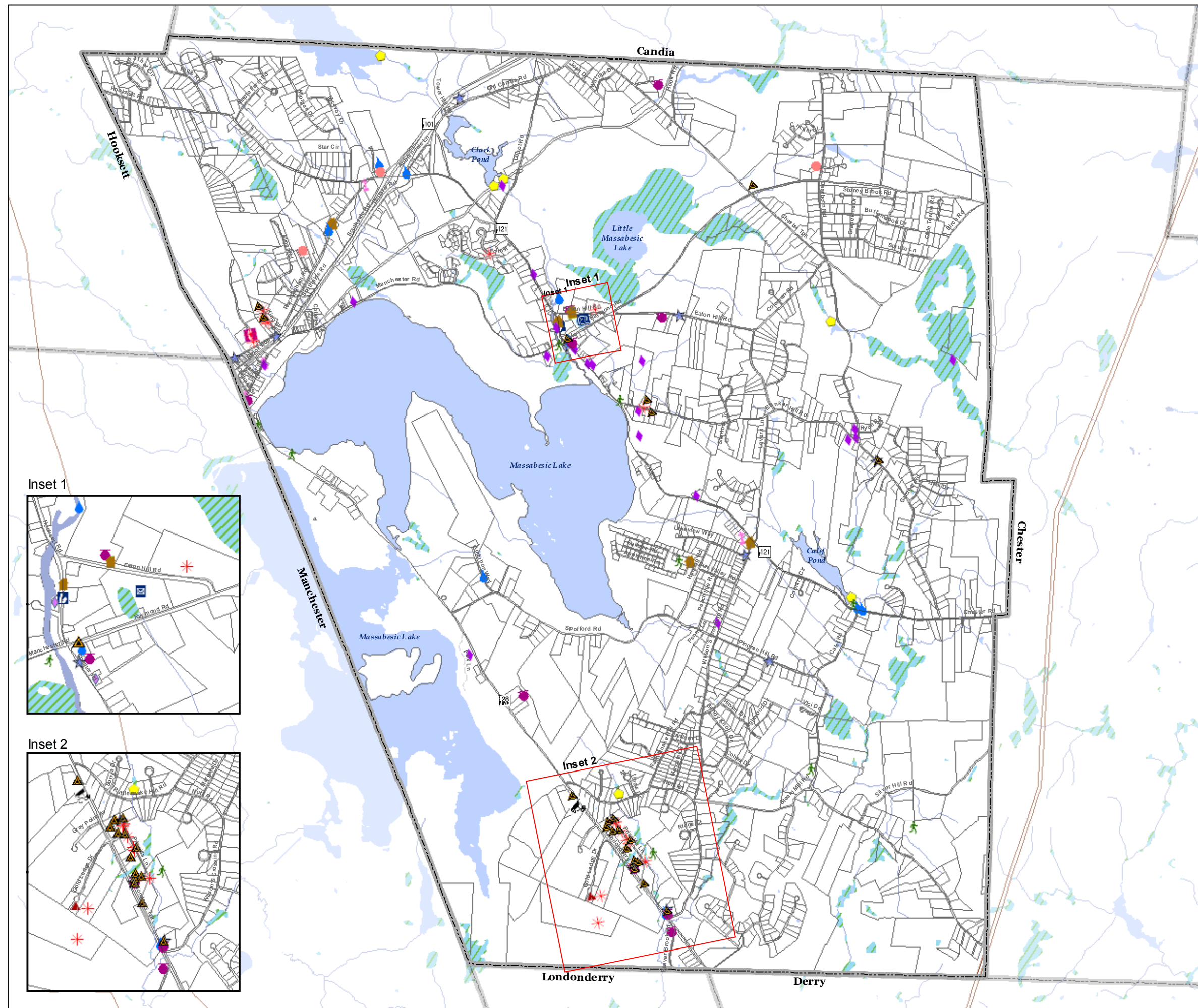
0 2,700 5,400 10,800 Feet

Data Sources:
Granit Digital Data (1:24,000)
NH Department of Transportation
Town of Auburn

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Map #5

Identified Hazard Zones

Town of Auburn

Past and Potential Hazards

- Target Hazards
- Wildfire
- Wind and Snow
- Flooding
- Isolated Homes
- Downburst

Steep Slopes

- with a maximum 25% gradient
- with a maximum 35% gradient
- with a maximum 60% gradient

Utility Lines

100 Year Floodplain

Lake/Pond

Swamp/Marsh

Rivers and Streams

Roads

- Highway
- Major Roads
- Minor Roads
- Class VI Roads
- Private Roads

0 0.4 0.8 1.6 Miles

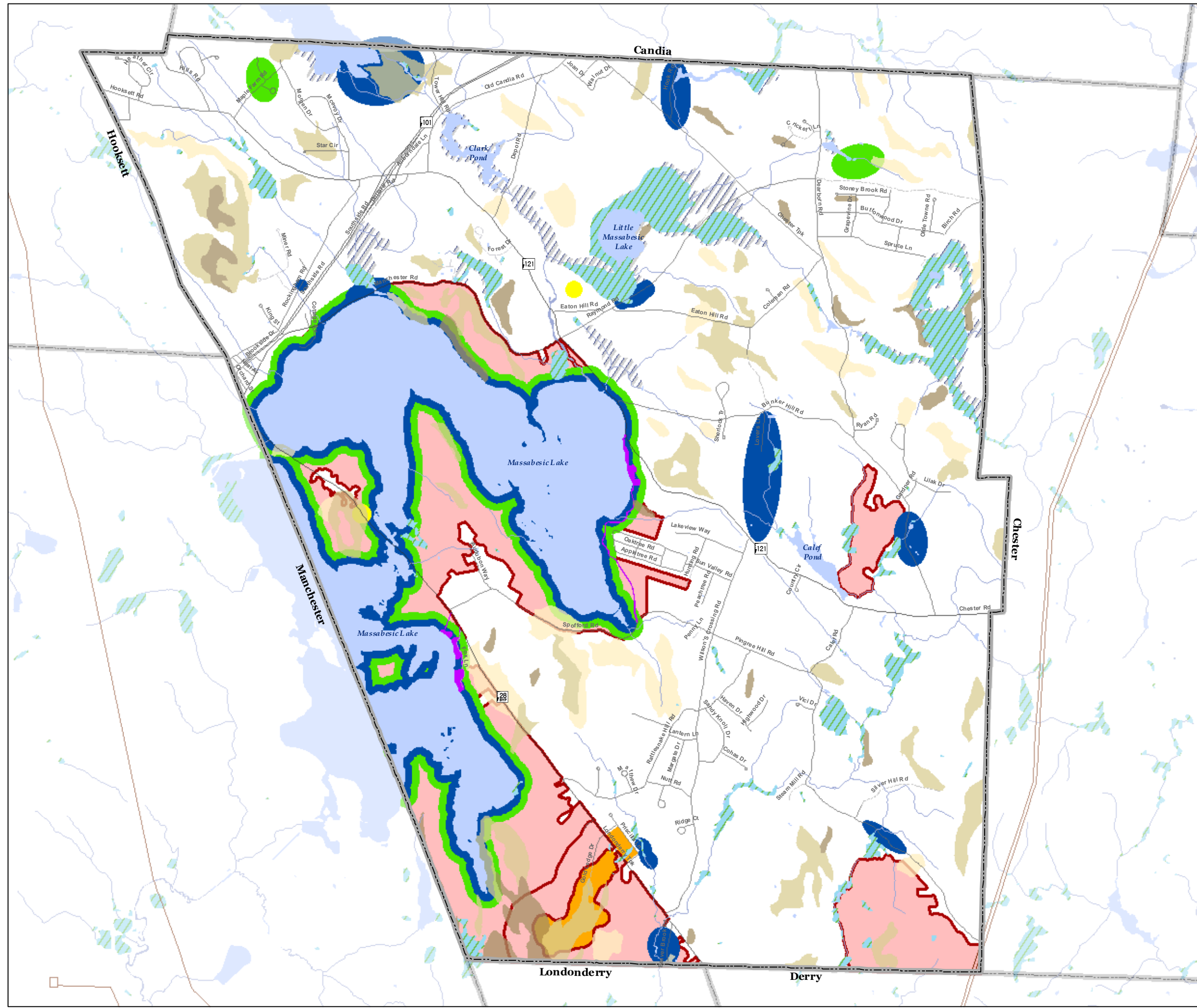
0 2,800 5,600 11,200 Feet

Data Sources:
 Granit Digital Data (1:24,000)
 NH Department of Transportation
 SNHPC
 Tow of Auburn
 DFIRM 2010

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Map produced by SNHPC February 2011

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SECTION III

VULNERABILITY ASSESSMENT

Disaster Risk and Vulnerability Assessment

Based on the hazards outlined in Section II, the following is an estimate of damage, in dollars, that may result if a natural hazard occurs in the Town. These estimates were calculated using FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses*, August 2001. The publication's methodology was modified for this *Plan* based on the data available. The vulnerability estimates utilize available NFIP data, 2009 town valuation, and identified essential facilities. Data is not yet available in a format (i.e. assessing data linked to a GIS layer of tax maps and building footprints) to locate property specific information in a given hazard zone other than as produced expressly for this *Plan*. The following calculations used available current or historical data and "Worksheet 4" in the Estimating Losses section of *Understanding Your Risks: Identifying Hazards and Estimating Losses*. Background, historical information, associated risks, and summary of assets considered in the estimation process are described in the following estimates.

Human losses were not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. The estimates typically represent only structural loss, unless sufficient data was available to incorporate contents, structure use, or function loss. The most current town valuation is:⁵

Land Use Classification	2009 Assessed Valuation		
	Land	Buildings	Total
Current Use	\$418,088	-	\$418,088
Residential	\$ 268,633,700	\$ 275,223,114	\$543,856,814
Manufactured Housing	-	\$1,199,600	\$1,199,600
Commercial/Industrial	\$19,790,300	\$ 27,890,600	\$ 47,680,900
Disc Pres Easement	2,600	31,866	34,466
Utilities**	-	-	\$7,524,700
Total Assessed Valuation			\$ 600,296,480

** The NHPUC only provides assessed value as a combination of land and structure value.

Disaster assistance totals from 2006-2010 were \$1,184,705 (75% Federal and 12.5% State). Disasters included floods in 2006, 2007 and 2010, an icestorm in 2008 and a windstorm in 2010.

⁵ From the NH Department of Revenue Administration, "2009 Tables by County"

Flooding

\$0.9 – 3.2 million

As of the most recent FEMA biennial report, the Town of Auburn had 45 residential structures located in the floodplain, with an estimated population of 306. The average residential house sale price is \$285,000 (NHHFA). Two scenarios were considered with a low estimate assuming damage to 25 percent of the structures with a one-foot flood depth and a high estimate assuming damage to 50 percent of the structures with a four-foot flood depth. These estimates also assume the residential structures are one- or two-story homes with basements and the non-residential structures are two-story without basements. Standard values for percent damage, functional downtime and displacement time were used from FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses* and its "Worksheet 4- Estimate Losses" was used to determine the actual estimates.

The low estimate was \$480,938 in structural damages, \$360,703 in contents loss, and \$28,454 in structure use and function loss. The total low estimate loss was \$870,094. The high estimate was \$1,795,500 in structural damages, \$1,346,625 in contents loss, and \$70,727 in structure use and function loss. The total high estimate loss was \$3,212,852.

Infrastructure damage could also be extensive, including roads, bridges, utilities, towers, etc. If a devastating flood were to occur, the damage to properties located within the floodplain could exceed this estimated amount. It is clear that Auburn could benefit greatly from any flood mitigation measures that would help reduce typical losses that occur during a major flood event.

Hurricanes

up to \$6 million

Most of the damage from hurricanes is caused by high water and strong winds. While Auburn is less vulnerable to hurricanes than coastal areas, significant damage could be expected, particularly in areas with manufactured homes. Assuming a community-wide assessed structural valuation, adjusted to market value, of approximately \$600 million, damaging 1 percent of these structures could result in losses of up to \$6 million. This does not include other damages expected to occur on public property within the community.

Debris-Impacted Infrastructure and River Ice Jams

\$10,000 to \$1 million

Damage from these two hazards could be expected to occur not only to privately owned structures, but also to infrastructure such as roads, bridges, and culverts. An estimate of damage, in dollars, from this type of hazard can range widely, depending on the nature and severity of the hazard. Past debris-impacted infrastructure, in Auburn, has been minimal. Therefore, it is difficult to separate actual damages to represent this type of hazard. A small-to-medium-sized event could be expected to produce a loss from \$10,000 to \$1 million.

Erosion, Mudslides and Rapid Snowpack Melt **\$41,682 to \$208,410**

Erosion, mudslide, and rapid snowpack melt damage usually affects infrastructure such as roads and bridges, but can also affect individual structures and businesses. The inventory of essential facilities located in the areas of steep slopes was used to prepare an estimate of this type of damage, since a complete inventory was not available. There are no value estimates for the one dam that would be vulnerable to these hazards. However, data is available for the remaining structures in the hazard zone. For a moderate event, assuming from 1 percent to 5 percent structural damages, and from .5 percent to 2.5 percent content loss, damages could be expected between \$41,682 and \$208,410. Since this hazard has not been widespread in Auburn, damages from this hazard should be minimal.

Dam Breach or Failure **\$0.75 million to \$2.3 million**

Auburn has one Class H dam that could cause serious failure damage. The four Class L dams and eight Class NM dams have a low to very low potential for causing damage in the surrounding areas. Damage estimates could be expected to be about 25-75 percent of the flooding estimate, or \$0.75 to \$2.3 million.

Tornadoes **\$500,000 to \$15 million**

The Fujita Scale is used to determine the intensity of tornadoes. Most tornadoes are in the F0 to F2 Class, in a range that extends to F5 Class. Building to modern wind standards provides significant property protection from tornadoes. The design wind speed in Auburn is 95 miles per hour, Exposure Category B, in accordance with the 2009 International Building Code. While it is difficult to assess the monetary impact a tornado may have on a community, as there are no existing standard loss estimation models, the dollar range shown above indicates an approximation of what might be expected. Tornadoes rarely occur in this part of the country, so damage from this hazard would be uncommon.

Heavy Snowstorms, Nor'easters, Ice Storms **\$10,000 to \$3 million**

Damage from heavy snowstorms, nor'easters and ice storms vary greatly depending on the amount of snow and ice that accumulates during the storm. The ice storm of 2008 caused much damage to power lines, structures, and the agricultural economy in northern New England and southeastern Canada. These types of storms in Auburn could be expected to cause damage ranging from several thousand dollars to several million, depending on the severity of the storm.

Lightning **\$1,000 - \$30,000**

Damage from lightning is typically minimal and occurs in isolated events without record of actual costs incurred. Within the Town of Auburn there are

three recorded lightning strikes with damage estimates ranging from \$5,000 to \$30,000. Other incidences throughout the region, occurring to municipal facilities in Manchester, have incurred damages ranging between \$1,000 and \$15,000.

Wild Land Fires

\$0.43 million to \$8.5 million

A fire can strike at any time, but may be expected to occur during years of drought and particularly in the spring and fall months. From 2007 through 2010 there were 202 fires encompassing small isolated events, car fires, building and structural fires, and wild land fires.

Grass or wild land fires can spread more rapidly between structures due to the increased intensity and size of the fire. Presuming a small-to-medium-sized fire that destroys from one to 20 homes, damage from this hazard could be expected to range from \$427,500 to \$8.5 million. Other damage (such as to utilities) was not included in this estimate.

Earthquakes

up to \$10.9 - \$22.4 million

Assuming a moderate earthquake occurs in Auburn, where structures are not built to a high seismic design level and are mostly of wood frame construction, there could be both partial and total substantial damage to the community's structures.

This estimate used "Worksheet 4" and the town-wide assessed valuation of residential, commercial, and industrial structures. Auburn's actual peak ground acceleration (PGA) is .063g. This represents the average strength of an earthquake with a 10 percent probability of reoccurring in 50 years. FEMA's *Understanding Your Risks: Identifying Hazards and Estimating Losses* provides data to conduct damage estimates for PGAs of .05g or .07g. The following estimate uses these two PGA levels, assumes low seismic design for all structures, and estimates the upper limits of expected damages if an earthquake were to impact Auburn. The first calculation (.05 PGA) yields \$423,387 in structural damages, \$119,792 in content damages, and \$10,301,645 in structure use loss for a total estimate of \$10,844,825 in damages. The second calculation (.07 PGA) yields \$1,35,043 in structural damages, \$370,367 in content damages, and \$20,739,204 in structure use loss for a total estimate of \$22,444,614 in damages.

Utility Pipe Failure

\$200 to \$40,000

No information on water or gas main failures is available for specific properties in Auburn. Other communities in the SNHPC region have incurred damages of \$200 to \$40,000 from water and sewer main leaks or breaks.

Downbursts, Hailstorms, Landslides, Geomagnetism, Drought, Extreme Heat/Cold

No major damage is known to have occurred in the Town of Auburn related to these types of events. Therefore, no potential loss estimates have been prepared for these categories.

Note: The aforementioned figures are estimates only. The amount of damage from any hazard will vary from these figures depending on the time of occurrence, severity of impact, weather conditions, population density, building construction at the exact event local, and the triggering of secondary events.

Critical Facilities

The following are summary tables of the critical facilities located in each of the five identified hazard zones within the Town. For the purposes of this *Plan* a critical facility is defined as a building, structure or location which:

- is vital to the hazard response effort;
- maintains an existing level of protection from hazards for the Town; and
- would create a secondary disaster if a hazard were to impact it.

These summaries were queried from a database of all essential facilities created for this *Plan*.⁶ The Hazard Mitigation Committee, based on its knowledge of the Town and the SNHPC, using various directories, were the primary sources for the Critical Facilities listing. The assessed values presented are the total building values and do not include the cost of land or building contents. Assessments were conducted during 2009 and at the time of this *Plan* are assumed to be 100 percent of the full market value.

The five identified hazard zones are:

- **Town Wide Hazards** - includes hurricanes, tornadoes, nor'easters, downbursts, lightning, heavy snow, ice storms, hailstorms, earthquakes, geomagnetism, utility pipe failure, drought, or extreme heat/cold.
- **Special Flood Hazard Areas** - includes riverine flooding, hurricanes, debris-impacted infrastructure, ice jams, rapid snowpack melt, or dam breach.
- **Steep Slopes** - includes erosion, mudslides, or landslides.
- **Wild Land Fires** - includes wild land fire hazards.
- **Target Hazards**- includes target hazards.

Summary of Critical Facilities by Hazard Zones		
Hazard Zone	No. of Facilities	Total Assessed Building Value
Town Wide (all facilities)	23	\$1,544,500
Flood Hazard Zones	1	NA
Past/Potential Flooding Areas	1	NA
Past/Potential Wind/Snow Damage Areas	1	NA
Steep Slopes	0	\$0
Wild Land Fires	3	NA
Target Hazards	0	\$0
Downburst Areas	0	\$0
Isolated Homes	0	\$0

⁶All facilities' proximity to the various hazard zones was identified using GIS as follows:

- Special Flood Hazard Areas and Steep Slopes - intersecting or within the mapped area
- Wild Land Fires and Target Hazards - intersecting or within the mapped area

Town Wide Hazards (Summary of all Critical Facilities)		
Facility Type	No. of Facilities	Assessed Building Value
Bridges	16	NA
Government Facilities		
Town Offices	1	\$264,100
Public Works Garage	1	\$385,100
Solid Waste Treatment Plant	1	NA
Emergency Response Facilities		
Fire Station	2	\$895,300
Police Station	1	\$690,500
Emergency Operations Center*	1	\$690,500

Special Flood Hazard Areas		
Facility Type	No. of Facilities	Assessed Building Value
Bridges	1	NA

Steep Slopes Hazard Areas		
Facility Type	No. of Facilities	Assessed Building Value
No critical facilities near steep slopes		

Wild Land Fires Hazard Areas		
Facility Type	No. of Facilities	Assessed Building Value
Solid Waste Treatment Plant	1	NA
Bridges	2	NA

*The Safety Complex includes the Emergency Operations Center, the Police Station and one of the two fire stations.

Areas at Risk

The following are summary tables of the areas at risk located in each of the four identified hazard zones within the Town. For the purposes of this *Plan* an area at risk is defined as emergency equipment or areas not needed to respond at the time of a natural disaster, but which could still be threatened if a natural disaster were to occur. These include:

- critical facilities not utilized for emergency response;
- people and facilities to be protected in the event of a disaster; and/or
- potential resources for services or supplies in the event of a disaster.

These summaries were queried from a database of all essential facilities created for this *Plan*.⁷ Resources for the Areas at Risk database entries included the Committee, SNHPC, NH Department of Environmental Services GIS data, NH Office of Energy and Planning GIS data, UNH GRANIT GIS data, and the National Register of Historic Places. The assessed values presented are the total building values and do not include the cost of land or building contents. Assessments were conducted during 2009 and at the time of this *Plan* are assumed to be 100 percent of the full market value. The five identified hazard zones are:

- **Town Wide Hazards** - includes hurricanes, tornadoes, nor'easters, downbursts, lightning, heavy snow, ice storms, hailstorms, earthquakes, geomagnetism, utility pipe failure, drought, or extreme heat/cold.
- **Special Flood Hazard Areas** - includes riverine flooding, hurricanes, debris-impacted infrastructure, ice jams, rapid snowpack melt, or dam breach.
- **Steep Slopes** - includes erosion, mudslides, or landslides.
- **Wild Land Fires** - includes wild land fire hazards.
- **Target Hazards**- includes target hazards.

Summary of Areas at Risk by Hazard Zones		
Hazard Zone	No. of Facilities	Total Assessed Building Value
Town Wide (all facilities)	122	\$62,425,777
Flood Hazard Zones	4	\$1,195,900
Past/Potential Flooding Areas	7	\$1,173,000
Past/Potential Wind/Snow Damage Areas	6	\$2,298,900
Steep Slopes	9	\$2,778,800

⁷All facilities' proximity to various hazard zones was identified using GIS as follows:

- Special Flood Hazard Areas and Steep Slopes - intersecting or within the mapped area
- Wild Land Fires and Target Hazards – intersecting or within the mapped area

Town Wide Hazards (Summary of all Areas at Risk)		
Facility Type	No. of Facilities	Assessed Building Value
Utility Systems		
Public Water System	9	\$9,406,500
Solid Waste Treatment Plant	1	NA
Transfer Station	1	\$738,100
Hazardous Sites		
Aboveground Storage Tanks	4	\$1,293,300
Hazardous Waste Generators	24	\$5,031,800
Underground Storage Tanks	9	\$2,934,500
Special Consideration		
Dams	6	NA
Historical Facilities	19	\$7,246,500
Vulnerable Populations		
Schools	1	\$5,787,500
Child Care Facilities	5	\$1,483,500
Other Resources		
Post Office	1	\$322,700
Library	1	\$368,000
Recreation Areas	9	\$681,777
Commercial Resources	11	\$5,888,200
Commercial Economic Impact Areas	16	\$15,704,600
Religious Facilities	4	\$2,466,000
Telephone Facilities	1	\$2,272,100

Special Flood Hazard Areas		
Facility Type	No. of Facilities	Assessed Building Value
Utility Systems		
Public Water System	0	\$0
Solid Waste Treatment Plant	0	\$0
Transfer Station	0	\$0
Hazardous Sites		
Aboveground Storage Tanks	0	\$0
Hazardous Waste Generators	0	\$0
Underground Storage Tanks	0	\$0
Special Consideration		
Dams	0	\$0
Historical Facilities	2	\$480,000

Vulnerable Populations		
Schools	0	\$0
Child Care Facilities	0	\$0
Other Resources		
Post Office	0	\$0
Library	0	\$0
Recreation Areas	1	\$448,200
Commercial Resources	1	\$267,700
Commercial Economic Impact Areas	0	\$0
Religious Facilities	0	\$0
Telephone Facilities	0	\$0

Steep Slopes		
Facility Type	No. of Facilities	Assessed Building Value
Special Consideration		
Dams	1	NA
Historical Facilities	4	\$2,264,300
Other Resources		
Recreation Areas	3	\$448,200
Commercial Economic Impact Areas	1	\$66,300

Wild Land Fires		
Facility Type	No. of Facilities	Assessed Building Value
Utility Systems		
Solid Waste Treatment Plant	1	NA
Other Resources		
Recreation Areas	2	\$448,200

Target Hazard Zones		
Facility Type	No. of Facilities	Assessed Building Value
Hazardous Sites		
Hazardous Waste Generators	3	\$822,000
Other Resources		
Commercial Economic Impact Areas	2	\$492,700

Commercial Economic Impact Areas

The following is a summary table of the commercial-economic impact areas located in each of the four identified hazard zones within the Town. For the purposes of this *Plan*, a commercial economic impact area includes organizations and businesses with more than 15 employees. These are facilities that are vital to the community's economic well-being.

This summary was queried from a database of all essential facilities created for this *Plan*.⁸

The five identified hazard zones are:

- **Town Wide Hazards-** includes hurricanes, tornadoes, nor'easters, downbursts, lightning, heavy snow, ice storms, hailstorms, earthquakes, geomagnetism, utility pipe failure, drought, or extreme heat/cold.
- **Special flood hazard areas-** includes riverine flooding, hurricanes, debris-impacted infrastructure, ice jams, rapid snowpack melt, or dam breach.
- **Steep Slopes-** includes erosion, mudslides, or landslides.
- **Wild Land Fires-** includes wild land fire hazards.
- **Target Hazards-** includes target hazards.

Commercial Economic Impact Areas		
Hazard Zone	Number of Employers	Number of Employees
Town Wide (all facilities)	16	N/A
Flood Hazard Zones	0	N/A
Past/Potential Flood Zones	1	N/A
Snow/Wind Damage Areas	0	N/A
Steep Slopes	1	N/A

⁸All facilities' proximity to various hazard zones was identified using GIS as follows:

- Special Flood Hazard Areas and Steep Slopes - intersecting or within the mapped area
- Wild Land Fires and Target Hazards - intersecting or within the mapped area

Hazardous Materials Facilities

The following is a summary table of the hazardous materials facilities located in each of the four identified hazard zones within the Town. For the purposes of this *Plan*, hazardous materials facilities include active hazardous waste generators, underground storage tanks, and above-ground storage tanks. As defined by the NH Department of Environmental Services, active hazardous waste generators may include businesses that produce household hazardous waste, or treat, store or dispose of hazardous waste, or be a waste handler or used oil marketer.

This summary was queried from a database of all essential facilities created for this *Plan*.⁹ The listing of Hazardous Materials Facilities was created from the NH Department of Environmental Services GIS data layers for hazardous waste generators, above ground, and underground storage tanks.

The five identified hazard zones are:

- **Town Wide Hazards-** includes hurricanes, tornadoes, nor'easters, downbursts, lightning, heavy snow, ice storms, hailstorms, earthquakes, geomagnetism, utility pipe failure, drought, or extreme heat/cold.
- **Special flood hazard areas-** includes riverine flooding, hurricanes, debris-impacted infrastructure, ice jams, rapid snowpack melt, or dam breach.
- **Steep Slopes-** includes erosion, mudslides, or landslides.
- **Wild Land Fires-** includes wild land fire hazards.
- **Target Hazards-** includes target hazards.

Number of Hazardous Material Facilities within the Hazard Zones			
Hazard Zone	Hazardous Waste Generators	Above Ground Storage Tank Sites	Underground Storage Tank Sites
Town Wide	24	4	9
Flood Hazard Zones	0	0	0
Past/Potential Flooding Areas	0	0	0
Steep Slopes	0	0	0
Wild Land Fires	0	0	0

⁹All facilities' proximity to the various hazard zones was identified using GIS as follows:

- Special Flood Hazard Areas and Steep Slopes - intersecting or within the mapped area
- Wild Land Fires and Target Hazards - intersecting or within the mapped area

SECTION IV

EXISTING MITIGATION STRATEGIES AND PROPOSED IMPROVEMENTS

Description of Existing Programs

The Town of Auburn has adopted several programs and ordinances for hazard mitigation. Below are brief descriptions of these programs and how they aid in hazard mitigation.

Emergency Operations Plan

Auburn maintains an Emergency Operations Plan, last updated in 2010. The plan coordinates the town departments' actions and responses before, during, and after a disaster. Events planned for range from multiple vehicle accidents and hazardous materials incidents to flooding and snowstorms. The plan was prepared to conform to guidelines by the Federal Emergency Management Agency, US Nuclear Regulatory Commission, Federal Energy Regulatory Commission, New Hampshire Homeland Security and Emergency Management and the NH Emergency Operations Plan. The plan establishes the Emergency Operations Center (at the Safety Complex). The Emergency Operations Plan identifies or addresses shelters, evacuation procedures, emergency notification, and health and medical services.

Floodplain Development Regulations (Zoning Ordinance)

Floodplain district regulations apply to all lands designated as special flood hazard areas by FEMA on the Digital Flood Insurance Rate Maps (DFIRMs), dated May 17, 2005. Encroachments, including fill, new construction, substantial improvements to existing structures, and other development, are prohibited unless certification by a registered professional engineer is provided by the applicant demonstrating that such encroachment will not result in any increase in flood levels during the occurrence of the 100-year base flood. Additionally, the Zoning Ordinance specifies that there shall be no development permitted in the floodway. The building inspector shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding.

Elevation Certificates

An Elevation Certificate is required when a structure is built or substantially improved within a known flood zone, or if the flood map shows a part of the lot within the flood zone and the certified foundation plan shows the house is located within the flood zone. The land surveyor must supply the footing elevation.

Watershed Protection Ordinance (Zoning Ordinance)

The Watershed Protection Ordinance, contained within the Zoning Ordinance, regulates the area within 125 feet from the edge of bodies of water, brooks, streams, and wetlands. The primary objectives of this ordinance are to mitigate any development that may negatively interfere with these water systems' natural functions and reduce any potential financial impacts that may be caused by the inappropriate use of these lands.

Excavation and Soil Removal Regulations

Earth removal regulations minimize safety hazards created by open excavations, safeguard the public health and welfare, preserve the natural assets of soil, water, forests and wildlife, maintain aesthetic features of the environment, prevent land and water pollution, and promote soil stabilization. The Town of Auburn maintains two sets of excavation regulations, one in the Zoning Ordinance and the second in a separate Excavation Regulations document.

Sanitary Protection (Zoning Ordinance)

The Sanitary Protection section of the Zoning Ordinance establishes provisions to assure that sewage disposal does not negatively impact public health. Design standards are set for septic systems to meet or exceed standards enforced by the NH Department of Environmental Services.

Underground Storage Regulation (Zoning Ordinance)

The Underground Storage Regulations are established to protect Auburn's groundwater from potential contamination due to the storage and handling of hazardous materials, motor fuels, heating oils, and other oils. The regulation set standards for storage tanks equal to or larger than 100 gallons, including construction materials and leak detection.

Sewage, Sludge, and Septage (Zoning Ordinance)

This section of the Zoning Ordinance establishes more stringent regulations for the land application and surface disposal of sewage sludge than are set forth in 40 CFR 503.11 et seq. This is in the interest of promoting the public health and safety of Auburn's residents.

Travel Trailer Park/Travel Trailer (Zoning Ordinance)

Travel trailer regulations prohibit using these vehicles for permanent living. Additionally, it establishes that the trailers must be stored in a way that is not be detrimental to the neighborhood or surrounding property and creates density requirements for trailer parks.

Manufactured Housing (Zoning Ordinance)

Regulations are established to provide suitable and affordable living environments on individual lots in Rural, Residential-One, and Residential-Two districts. Minimum standards are set regulating construction and safety standards in order to protect the occupants and reduce the homes' vulnerability to natural disasters.

Stormwater Management and Erosion and Sediment Control (Site Plan Regulations)

The Town of Auburn has had extensive stormwater regulations in place to address runoff, soil erosion, and sedimentation from development sites. Efforts must be taken to minimize any impacts from stormwater runoff and erosion. Additionally, the post-development peak runoff rate must not exceed pre-development rates for a 25-year storm.

Drainage Requirements (Subdivision Regulations)

Auburn's Subdivision Regulations set engineering design standards to minimize any adverse impacts from stormwater drainage.

Road Design Standards (Subdivision and Site Plan Regulations)

Auburn maintains road design regulations as part of the Town's Subdivision and Site Plan Regulations. The Subdivision Regulations establish construction standards to ensure the safe flow of travel on all new roads and improvements to existing roads.

Auburn Building Codes

The Auburn Building Department enforces the State of New Hampshire Building Code as authorized in RSA 155-A. Building codes set minimum safety standards for occupants utilizing structural, fire and life safety provisions, wind loads and design, seismic design, flood proofing, and egress design.

Fire Department Regulations

The Town of Auburn Fire Department enforces the *National Fire Protection Association (NFPA) Standards* to protect residents from fire hazards in residential and non-residential facilities. The regulations establish protection requirements for fire alarm systems and smoke detectors for single family residential, multi-family residential, commercial and industrial facilities and occupants.

Hazardous Materials Regulations

The Town of Auburn enforces state regulations regarding hazardous materials. Auburn's Fire Department participates in the Southeastern New Hampshire Hazardous Materials Mutual Aid District (SNHHMMAD). SNHHMMAD provides technical expertise, during an emergency, on decontamination, rescue and control, as well as hazardous materials mitigation. The district is composed

of 15 member communities incorporating over 140,000 residents and 400 square miles.

Snow Ordinance

The Snow Ordinance allows the Town to enforce parking bans to expedite the flow of traffic and snow removal. Additionally, the ordinance prohibits shoveling snow into roads.

Town Radio System

The Fire and Police Departments maintain separate, but interoperable, radio networks for day-to-day operations. The systems can also interface with regional mutual aid and State agencies. Additionally, the Town of Derry Fire Department provides fire, 911, and ambulance dispatch service for the Town of Auburn.

Police

The Chief of Police is charged with preserving public peace, preventing riots and disorder, and receiving and issuing emergency warnings. During fires the police are to prevent theft and further unwarranted destruction of property.

Comprehensive Emergency Management Planning for Schools (CEMPS)

Comprehensive Emergency Management Planning for Schools is available from the NH Bureau of Emergency Management. CEMPS outlines training for school teachers, administrators, and students on actions to be taken during an emergency at school. The school district will continue to implement this program.

Manchester Water Works Emergency Operations Manual

This manual establishes an action plan for the department and its employees in the event of a natural or man-made disaster. Specific response plans are outlined for each hazard type as it pertains to the individual Water Works divisions. The manual also includes emergency contact lists, a list of Manchester Water Works' buildings and structures, emergency action and notification forms, and additional information on the hazards.

Lake Massabesic Watershed Protection Rules

These rules (ENV-WS 386.47) were established and adopted by the New Hampshire Department of Environmental Services under RSA 485:24 to protect the purity of the water supply and watershed land. Limits are placed on acceptable recreation activities, development, and use of land in the designated watershed area. These regulations are enforced by the Manchester Water Works and a staff of watershed patrol officers who focus on public education and outreach.

State Dam Program

There is one class H dam, four class L dams and eight class NM dams in Auburn that are maintained in compliance with the State Dam Program. Town staff inspects the dams on a regular basis. Inspections look for seepage, erosion, animal burrows, spalling, cracking, vegetation growth, and security issues. Preventive maintenance is conducted as needed.

New Hampshire Shoreland Protection Act

The Shoreland Protection Act, adopted during 1994 and last updated in 2008, establishes minimum standards for the future subdivision, use, and development of all shore lands within 250 feet of the ordinary high water mark. When repairs, improvements, or expansions are proposed to existing development, the law requires these alterations to be consistent with the intent of the Act. The NH Department of Environmental Services is responsible for enforcing the standards within the protected shoreland, unless a community adopts an ordinance or shoreland provisions that are equal to or more stringent than the Act.

Best Management Practices

The State has established Best Management Practices (BMPs) for erosion and sediment control. These BMPs are methods, measures or practices to prevent or reduce water pollution, including, but not limited to, structural and nonstructural controls, operation and maintenance procedures, and other requirements and scheduling and distribution of activities. Usually, BMPs are applied as a system of practices rather than a single practice. BMPs are selected because of site-specific conditions that reflect natural background conditions.

Existing Protection Matrix

The Auburn Hazard Mitigation Committee has developed a summary matrix of existing strategies that support hazard mitigation efforts, which is presented on the following pages. This matrix, a summary of the preceding information, includes the existing protection program (column 1), a description of the existing protection (column 2), the area of town affected (column 3), the enforcing department or agency (column 4), and the identified improvements or changes needed and funding sources (column 5).

Existing Protection Policies, Programs and Proposed Improvements for the Town of Auburn

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
Emergency Operations Plan	Describes town department and personnel duties and equipment available during an emergency; evacuation and notification. Last updated in 2010.	Town-wide	<ul style="list-style-type: none"> Emergency Management Director/Fire Chief 	No changes needed at this time.	Continuously being implemented
Floodplain Development Ordinance (Zoning Ordinance)	Guides development in the floodplain to prevent increased risk to existing buildings in the SFHAs	Special Flood Hazard Areas as mapped on DFIRMs	<ul style="list-style-type: none"> Planning Board Building Department 	Implement new DFIRM and FIS effective May 17, 2005	Continuously being implemented
Elevation Certificates	Records building 1 st floor elevations for new construction /substantial improvements in SFHA	Special Flood Hazard Areas as mapped on DFIRMs	<ul style="list-style-type: none"> Building Department 	No changes needed at this time.	Continuously being implemented
Watershed Protection Ordinance (Zoning Ordinance)	Protects water bodies, brooks, streams and wetlands through the creation of buffer zones.	All water bodies, wetlands and streams and the land within 125 of their edges	<ul style="list-style-type: none"> Planning Board Building Department Conservation Commission 	Update to include list of identified wetlands and buffer following prime wetland mapping	Proposed to voters and rejected (delete)
Excavation and Soil removal Regulations	Minimize safety hazards created by open excavations	Town-wide	<ul style="list-style-type: none"> Planning Board Building Department 	No changes needed at this time.	Continuously being implemented

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
Sanitary Protection (Zoning Ordinance)	Provisions to assure that sewage disposal does not negatively impact public health	Town-wide	<ul style="list-style-type: none"> • Planning Board • Building Department • Health Officer 	No changes needed at this time.	Continuously being implemented
Underground Storage Regulation (Zoning Ordinance)	Protects Auburn's ground water from contamination by stored hazardous materials, heating oils, etc.	Town-wide	<ul style="list-style-type: none"> • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented
Sewage, Sludge, and Septage (Zoning Ordinance)	Establishes more stringent regulations than the federal standards for sewage, sludge, and septage	Town-wide	<ul style="list-style-type: none"> • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented
Travel Trailers (Zoning Ordinance)	Regulations that prohibit the use of travel trailers as permanent residences and mandate safe storage	Town-wide	<ul style="list-style-type: none"> • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented
Manufactured Housing (Zoning Ordinance)	Sets minimum standards for construction and safety standards	The Rural, Residential-One, and Residential-Two zones	<ul style="list-style-type: none"> • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
Stormwater Management and Erosion and Sediment Control (Site Plan Regulations)	Minimizes runoff and erosion related impacts of development; runoff rates may not exceed predevelopment rates for a 25-year event	Town-wide	<ul style="list-style-type: none"> • Planning Board • Engineering Consultants • Building Department 	No changes needed at this time.	Continuously being implemented
Drainage Requirements (Subdivision Regulations)	Engineering standards for the design and construction of stormwater drainage systems	Town-wide	<ul style="list-style-type: none"> • Planning Board • Engineering Consultants 	No changes needed at this time.	Continuously being implemented
Road Design Standards (Subdivision and Site Plan Regulations)	Standards for engineering and construction to ensure safety	All new improvements and developments	<ul style="list-style-type: none"> • Planning Board • Engineering Consultants 	No changes needed at this time.	Continuously being implemented
Auburn Building Codes	Regulates construction of buildings and fire protection; sets a minimum standard of protection to building occupants	Town-wide	<ul style="list-style-type: none"> • Building Department 	Adopt the new state-wide National Electric Code 2005 edition	State Building Codes adopted and continuously being implemented

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
Auburn Fire Department Regulations	Adopts the NFPA, International Building Code and International Residential Code; protection for building occupants from fire hazards including, design suppressant and alarm systems.	Town-wide	<ul style="list-style-type: none"> • Fire Department 	No changes needed at this time.	Continuously being implemented
Hazardous Materials Regulations	State hazardous materials regulations are enforced; Auburn participates in the Southeastern NH HazMat Mutual Aid District	Town-wide	<ul style="list-style-type: none"> • Fire Department 	No changes needed at this time.	Continuously being implemented
Snow Ordinance	Provisions regulating parking during winter months to preserve traffic flow and ease of snow removal	Town-wide	<ul style="list-style-type: none"> • Board of Selectmen • Police Department • Road Agent 	No changes needed at this time.	Continuously being implemented
Town Radio System	Mobile radio and dispatch system for fire and police personnel	Town-wide	<ul style="list-style-type: none"> • Fire Department • Police Department 	No changes needed at this time.	Update needed for Narrow Band Pagers

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
Police	Police to preserve public peace, prevent riots and disorder, during fires prevent destruction of property, and investigate criminal acts	Town-wide	<ul style="list-style-type: none"> Police Department 	No changes needed at this time.	Continuously being implemented
Comprehensive Emergency Management Planning for Schools	Education for school teachers, administrators and children for emergency situations	Auburn Village School	<ul style="list-style-type: none"> School Department Fire Department Police Department 	No changes needed at this time.	Continuously being implemented
Manchester Water Works Emergency Operations Manual	Manual of emergency response plans for each MWW division based on hazard types	Town-wide	<ul style="list-style-type: none"> Manchester Water Works 	No changes needed at this time.	Continuously being implemented
Lake Massabesic Watershed Protection Rules	Regulations limiting activity within the watershed to protect the water supply quality	Lake Massabesic watershed	<ul style="list-style-type: none"> Manchester Water Works NHDES 	No changes needed at this time.	Continuously being implemented
NH State Dam Program	Maintenance of dams in coordination with the State Dam Program.	All Class H and S dams in Auburn	<ul style="list-style-type: none"> NHDES Manchester Water Works 	No changes needed at this time.	Continuously being implemented

Existing Protection Program	Description	Effective Area	Implementing Department or Agency	Improvements or Changes Needed (Funding Sources)	2011 Update
NH Shoreland Protection Act	Standards for all protected shorelands within 250 feet of the ordinary high water mark of state public waters	All property within 250 feet of public waters	<ul style="list-style-type: none"> • NHDES • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented
Best Management Practices (BMPs)	State guidelines for sediment and erosion control; protection of natural environment and prevention of potential damage due to poor construction methods	Town-wide	<ul style="list-style-type: none"> • State of NH • Planning Board • Building Department 	No changes needed at this time.	Continuously being implemented

Summary of Recommended Improvements to Existing Programs

Improvements to existing programs were reviewed, and keyed below, for their ability to reduce hazard impacts to both existing (E) and future (F) buildings and infrastructure, as well as the Town's ability to respond (R) to disasters. The Auburn Hazard Mitigation Committee recommends the following three improvements to existing mitigation programs¹⁰:

- Update needed for Narrow Band Pagers – Town Radio System

¹⁰ More specific details on each recommended improvement can be found in Section V "Prioritized Implementation Schedule and Funding Sources."

SECTION V

NEWLY IDENTIFIED MITIGATION STRATEGIES AND CRITICAL EVALUATION

Hazard Mitigation Objectives of the Town of Auburn

The Committee identified the following objectives for future mitigation actions to resolve existing problems or mitigation gaps in the Town:

- Reduce or eliminate the Town's risks associated with annual flooding at the locations identified in Section II
- Reduce potential future damages to those structures located in the floodplain as is politically, environmentally and economically feasible over the next five to 20 years
- Continue preservation of Manchester Water Works land
- Maintain the most current building codes available
- Supplement current Manchester Water Works' efforts to minimize wild land fire risks in adjacent land
- Reduce the risks associated with target hazards to buildings surrounding the target hazard sources
- Improve access to isolated areas and prevent continued development in these areas
- Improve public awareness of risks associated with heavy snow loads on roofs and other structures and reduce risks of roof collapse to property owners
- Reinforce the existing snow ordinance to reduce snow removal costs to the Town
- Continue promoting construction standards that minimize seismic risks
- Ensure residents' safety and health during hazard events

The Committee generated this list following its review of the past and potential hazards within the community, potential risks to the community from each, and a thorough review of all existing programs or regulations that help mitigate potential future damage.

Summary of New Strategies

Initial selection of mitigation projects was based on meeting the above objectives or filling in the perceived gaps in hazard protection within the Town. The Auburn Hazard Mitigation Committee then brainstormed additional actions of benefit to the Town and its residents with the potential to reduce future damages. Projects were reviewed, and keyed below, for their ability to reduce hazard impacts to both existing (E) and future (F) buildings and infrastructure, as

well as improve the Town's ability to respond (R) to disasters. The Auburn Hazard Mitigation Committee identified the following 22 mitigation strategies¹¹:

- Maintain the most current building codes that set appropriate wind load design standards - no updates required at this time (F)
- Seek grant funding for an electronic sign that can be placed in front of town hall for emergency info during disasters or emergencies (E, F, R)
- Include snow load design standards in the Construction Guideline Packet prepared by the building inspector for developers (F)
- Continue training for the building inspector on new technology, research and design standards relating to wind loads, seismic design, and snow loads (F)
- Form a community network to check on elderly populations during extreme heat or cold weather (E, R)
- Limit development on un-maintained private roads in isolated areas until the roads are brought into conformance with town road standards (F, R)
- Elevate Beaver Brook Road to above the floodplain in conjunction with the Town of Londonderry since it crosses the town line (E, F)
- Upsize culvert on Rockingham Rd (E,F)
- Require blasting of ledge on Dartmouth Drive before further development is allowed in order to mitigate ice and snow hazards (E, F)
- Coordinate pre-construction meetings with a representative of the planning board, the building inspector, the road agent, and developers of new construction proposals to review potential hazards, existing ordinances, and opportunities to mitigate potential hazard impacts (F)
- Post a reminder notice regarding the snow ordinance and snow removal in the local publications at the beginning of winter each year (E, R)
- Post a notice in local publications during heavy winters alerting residents to not let snow accumulate on roofs, thus reducing the risks of roof collapse due to heavy snow loads (E, R)
- Adopt and implement new stormwater management regulations based on the new EPA requirements for MS-4 communities (E, F)
- Upgrade culvert on Maple Farm Rd (E, F)
- Public education through newspaper and the town web site publicizing availability of National Flood Insurance Program information, DFIRMs and Flood Insurance Study at the Town Hall (E, F)
- Upgrade culvert on Old Candia Rd just East of Tower Hill

¹¹ More specific details on each new hazard mitigation strategy can be found in Section V "Prioritized Implementation Schedule and Funding Sources."

- Create a Hazard Mitigation and Emergency Preparedness page on the town web site with links to valuable resources at both the FEMA and NH Bureau of Emergency Management web sites (E, F, R)
- Include a report of the Hazard Mitigation Committee in the Annual Town Report to alert town residents to the *Plan's* completion, intents, and contents (E)
- Either pave/upgrade Hook Road and install a drainage system or install a bridge to elevate the road above the brook level to eliminate annual damages to the road and surrounding properties due to flooding and subsequent road wash outs (E, F)
- Research the implementation of Code Red or a similar public outreach system
- Provide water at the fire station for residents whose wells run dry during droughts (R)
- Encourage the State of NH to address flooding issues on Hooksett Rd at the intersection of McEvoy Dr and also Rockingham Rd.

Summary of Critical Evaluation

Committee members reviewed each of the identified mitigation actions and the recommended improvements to Existing Protection Programs (Section IV) using the following 14 STAPLEE derived criteria¹². Rating scores were assigned to each criterion based on (1) for Poor, (2) for Average, and (3) for Good. Total scores can range from a minimum of 14 to a maximum of 42. Each Committee member individually scored all projects and then all scores were averaged to obtain the results presented in this plan. The fourteen criteria were:

- *Social* - Is the project socially acceptable?
- *Social* - Is there any effect on segment of population?
- *Technical* - Is the project technically feasible/potentially successful?
- *Technical* - Is it a long-term solution?
- *Administrative* - Are there staffing and maintenance provisions?
- *Administrative* - Is there funding allocated for this project?
- *Political* - Does the project have support of the governing body?
- *Political* - Does it help achieve other community objectives?
- *Legal* - Does the project conform to state and local laws?
- *Legal* - Is there a chance the project will be legally challenged?
- *Economic* - Is it economically beneficial, do the benefits outweigh the costs?
- *Economic* - Does the project reduce future disaster damages?
- *Environmental* - What are the impacts on land, water, animals and plants?
- *Environmental* - Does the project conform to state and local regulations?

¹² Explanation of STAPLEE is provided in Appendix F along with the individual scoring for each project.

Preliminary Prioritization

The Manchester Hazard Mitigation Committee assigned the following scores to each of the 22 programs for effectiveness related to the critical evaluation factors listed above. The following lists the strategies by the type of protection offered, in order of highest to lowest priority score:

<u>Avg. Action Score</u>	<u>Hazard(s)</u>
-------------------------------------	-------------------------

Preventative

2.76	Maintain the most current wind load design building codes	<i>Wind</i>
2.55	Continue training for the building inspector	<i>All</i>
2.50	Limit development on unmaintained private roads	<i>Fire/ Isolated Homes</i>
2.38	Coordinate pre-construction meetings with developers and town representatives	<i>All</i>
2.24	Adopt and implement the new EPA stormwater management regulations	<i>Flood</i>

Property Protection

2.45	Upsize culvert on Rockingham Rd	<i>Flood</i>
2.40	Require blasting of ledge on Dartmouth Dr	<i>Ice/Snow</i>
2.24	Upgrade culvert on Maple Farm Rd	<i>Flood</i>
2.24	Upgrade culvert on Old Candia Rd just E of Tower Hill	<i>Flood</i>
1.57	Encourage the State of NH to address flooding on Hooksett Rd	<i>Flood</i>

Structural Projects

2.48	Elevate Beaver Brook Road	<i>Flood</i>
2.05	Pave Hook Road and install a drainage system or install a bridge to raise the road above flood levels	<i>Flood</i>

Emergency Services

2.52	Form a community network to check on elderly populations	<i>Extreme Heat and Cold</i>
2.00	Water provision for residents at the fire house during droughts	<i>Drought</i>

Public Information

2.64	Seek grant funding for an electronic sign in front of town hall For emergency info	<i>All</i>
2.60	Include snow load design standards in the Construction Guideline Packet prepared by the building inspector	<i>Snow</i>
2.29	Post snow ordinance reminder notice in local publications	<i>Snow</i>
2.29	Post a notice in local publications alerting residents to the	

	dangers of snow accumulation on roofs	<i>Snow</i>
2.24	Research the implementation of Code Red or similar	<i>All</i>
2.14	Create a hazard mitigation and emergency preparedness page on the town web site	<i>All</i>
2.07	Include a report of the Hazard Mitigation Committee in the Annual Town Report	<i>All</i>

Environmental Protection

2.24	Adopt and implement the new EPA stormwater management regulations	<i>Flood</i>
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SECTION VI

PRIORITIZED IMPLEMENTATION SCHEDULE AND FUNDING SOURCES

Implementation Strategy for Priority Mitigation Actions

The Auburn Hazard Mitigation Committee created the following prioritized implementation schedule for the 22 newly identified strategies and six improvements. All agency and grant source acronyms are listed at the end of this section.

Rank	Action
	<div>Leadership</div> <div>Time Frame</div> <div>Funding</div>
	Statement of Benefits and Costs
1	<p>Maintain the most current building codes that set appropriate wind load design standards</p> <div> <div>Building Department</div> <div>Continuous implementation</div> <div>Town Operating Budget</div> </div> <p>Maintenance of the most up-to-date codes is a low cost way to ensure design at the highest known appropriate standards and prevent property damage or loss of life.</p>
2	<p>Seek grant funding for an electronic sign that can be placed in front of town hall for emergency info during disasters or emergencies</p> <div> <div>EMD, Board of Selectmen</div> <div>2011</div> <div>Emerg. Mgt. Grant</div> </div> <p>This is a simple, yet effective means of communication during and prior to natural disasters for getting emergency information to the citizens of Auburn</p>
3	<p>Include snow load design standards in the Construction Guideline Packet prepared by the building inspector for developers.</p> <div> <div>Building Inspector</div> <div>1-2 years</div> <div>Town Operating Budget</div> </div> <p>Inclusion of a one-page information sheet in the existing Construction Guideline Packets is a low cost way to educate building permit applicants on appropriate snow load design standards and prevent building damage or collapse.</p>
4	<p>Continue training for the building inspector on new technology, research, and design standards relating to wind loads, seismic design, and snow loads.</p> <div> <div>Building Inspector</div> <div>Continuously take advantage of training opportunities</div> <div>Town Operating Budget</div> </div> <p>The building inspector is key in assuring low risk construction in the Town of Auburn. Training is relatively inexpensive and ensures that the building inspector has access to the most current information to protect the Town and its new development.</p>
5	<p>Form a committed community network to check on the elderly populations during extreme heat or cold weather. The Massabesic Senior Citizens and Auburn's Senior Citizens already have a loose knit system to check on one another. Additionally, the Fire Department sends volunteers out to check on residents at critical points during the winter.</p> <div> <div>Fire Department</div> <div>Continuously implement as needed</div> <div>Town Operating Budget</div> </div> <p>Development of a phone tree or other similar mechanism is a low cost method of ensuring all residents are safe, cared for, and also quickly identifies those in need of emergency services.</p>

Rank	Action		
	Leadership	Time Frame	Funding
Statement of Benefits and Costs			
6	Limit development on unmaintained private roads in isolated areas until the roads are brought into conformance with town road standards.		
	Planning and Zoning Department, Building Department	Continuously implement as needed	Town Operating Budget
	Limiting development would come at no cost to the Town and would assure that no future development is at risk for reduced availability to emergency services due to inadequate roads and lack of access points.		
7	Elevate Beaver Brook Road to above the floodplain in conjunction with the Town of Londonderry since it crosses the town line.		
	Road Agent, Highway Safety Committee and Board of Selectmen	5 Years	Town Operating Budget, PDM
	This upgrade will eliminate repetitive flooding and damages to the roadway and adjacent properties.		
8	Upsize Culvert on Rockingham Rd		
	Road Agent	2011	HMGP
	This upgrade will eliminate repetitive flooding and damages to the roadway and adjacent properties.		
9	Require blasting of ledge on Dartmouth Drive before further development is allowed in order to mitigate ice and snow hazards		
	Planning Board	5-10 Years	Private Developers
	The ledge produces ice and snow hazards for development beyond on Dartmouth Drive and blasting should mitigate this hazard for future development in the area		
10	Coordinate pre-construction meetings with a representative of the planning board, the building inspector, the road agent, and developers of new construction proposals to review potential hazards, existing ordinances, and opportunities to mitigate potential hazard impacts.		
	Planning Department, Building Department, Road Agent, Town Engineering firm	Continuously implement as needed	Town Operating Budget offset by developer's escrow account
	This is a low cost method of hazard identification for all new development requiring site plan or subdivision review where potential hazards can be identified and solutions established prior to construction.		
11	Post a reminder notice regarding the snow ordinance and snow removal in the local publications at the beginning of winter each year.		
	Board of Selectmen, Building Department	Annually (October or November)	Town Operating Budget
	Reminder notices in local publications are a low cost way to keep citizens informed about snow removal policies and reduce snow removal costs to the Town associated with citizen's non-compliance.		

Rank	Action		
	<i>Leadership</i>	<i>Time Frame</i>	<i>Funding</i>
	Statement of Benefits and Costs		
12	Post a notice in local publications during heavy winters alerting residents to not let snow accumulate on roofs, thus reducing the risks of roof collapse due to heavy snow loads.		
	<i>Building Department</i>	<i>Annually (October or November)</i>	<i>Town Operating Budget</i>
	Advertisements in local publications are a low cost way to keep citizens informed about the risks associated with heavy snow accumulation and can potentially reduce the risk of property damage and loss of life from roof or structural collapse.		
13	Adopt and implement new stormwater management regulations based on the new EPA requirements for MS-4 communities.		
	<i>Planning Department and Stormwater Committee</i>	<i>Continuously implemented as the town is developed</i>	<i>Town Operating Budget</i>
	Maintenance of the most up-to-date codes and standards is a low cost way to ensure development at the highest known appropriate standards and prevent property damage or loss of life.		
14	Upgrade culvert on Maple Farm Rd		
	<i>Road Agent</i>	<i>1-2 Years</i>	<i>Town Operating Budget, HMGP</i>
	This upgrade will eliminate repetitive flooding and damages to the roadway and adjacent properties.		
15	Educate the public through newspaper and the town web site on the availability of National Flood Insurance Program information, DFIRMs and Flood Insurance Study at the Town Hall.		
	<i>Planning Department, Building Department</i>	<i>2011</i>	<i>Town Operating Budget</i>
	Advertising through the local newspaper is a low cost method of information dissemination to all households in the Town and would alert residents to the availability of NFIP materials and promote greater awareness of the floodplain, its extents, and associated risks of development.		
16	Upgrade culvert on Old Candia Rd just East of Tower Hill		
	<i>Road Agent</i>	<i>1-2 Years</i>	<i>Town Operating Budget, HMGP</i>
	This upgrade will eliminate repetitive flooding and damages to the roadway and adjacent properties.		
17	Create a Hazard Mitigation and Emergency Preparedness page on the Town web site with links to valuable resources at both the FEMA and NH Bureau of Emergency Management web sites.		
	<i>Hazard Mitigation Committee</i>	<i>2011</i>	<i>Town Operating Budget</i>
	The Town maintains its own web site in house and could at little cost add a page of information related to hazard mitigation and emergency management that would rely on links to existing , Southern New Hampshire Region Community Preparedness Program, NH Homeland Security and Emergency Management and FEMA sites.		

Rank	Action		
	<i>Leadership</i>	<i>Time Frame</i>	<i>Funding</i>
	Statement of Benefits and Costs		
18	Include a report of the Hazard Mitigation Committee in the Annual Town Report to alert town residents to the <i>Plan's</i> completion, intents, and contents.		
	<i>Hazard Mitigation Committee Chair</i>	<i>Annually (January)</i>	<i>Town Operating Budget</i>
	Each spring the Town distributes its Annual Report to all residents. Inclusion of a one-page report on the Hazard Mitigation Committee's activities would come at little cost to the Town and advertise the efforts taken by the Committee.		
19	Either pave/upgrade Hook Road and install a drainage system to elevate the road above the brook level to eliminate annual damages to the road and surrounding properties due to flooding and subsequent road wash outs.		
	<i>Road Agent, Highway Safety Committee and Board of Selectmen</i>	<i>2011</i>	<i>Town Operating Budget, HMGP</i>
	This upgrade will eliminate repetitive flooding and damages to the roadway and adjacent properties.		
20	Research the implementation of Code Red or a similar public outreach system		
	<i>EMD</i>	<i>2011</i>	<i>Town Operating Budget</i>
	This is a simple and cost effective way to get information to citizens of the town in an emergency		
21	Provide water at the fire station for residents whose wells run dry.		
	<i>Fire Department</i>	<i>Continuously implemented as needed</i>	<i>Town Operating Budget</i>
	The cost of water provision at the fire stations would be outweighed by the potential impacts to the Town's residents were their wells to run dry during droughts.		
22	Encourage the State of NH to address flooding issues on Hooksett Rd at the intersection of McEvoy Drive and also at Rockingham Road		
	<i>Road Agent, Board of Selectmen</i>	<i>2011 and continuously until issue is resolved</i>	<i>NH DOT</i>
	Upgrades will eliminate repetitive flooding and damages to the roadway and adjacent properties.		

Additional funding sources will be researched by the Town of Auburn as required to successfully implement the prior mitigation actions. Grants will be particularly researched on a project-by-project basis to search out the best grant match.

Summary of Agency Acronyms

NHBEM= New Hampshire Bureau of Emergency Management

NH DOT= New Hampshire Department of Transportation

Summary of Grant Acronyms

EMPG= Emergency Management Preparedness Grant

FMAGP= Fire Management Assistance Grant Program

HMGP= Hazard Mitigation Grant Program

MM= Map Modernization

PDM= Pre-Disaster Mitigation Program

Additional grant related information is in Appendix D.

Cost of Implementation

The following table compares rough estimated costs of implementing each of the prioritized mitigation actions. The actual final project budgets may exceed or be lower than the estimated range. Nonetheless, these figures are assumed to represent a generic project of its type. These estimates are to serve as a comparative tool for project selection and planning purposes. Costs were derived from personal knowledge of the Auburn Hazard Mitigation Committee, past project costs in the Southern New Hampshire region, and Internet searches for project costs from either town requests for proposals or manufacturers' specifications.

Project	Cost Range				
	< \$10,000	\$10,000-\$25,000	\$25,000-\$50,000	\$50,000-\$100,000	>\$100,000
1. Maintain current building codes	X				
2. Electronic sign		X			
3. Snow load design standards	X				
4. Training for building inspector	X				
5. Community network to check on elderly population	X				
6. Limit development on unmaintained private roads	X				
7. Elevate Beaver Brook Rd					X
8. Upsize culvert on Rockingham Rd				X	
9. Require blasting of ledge on Dartmouth Dr					X
10. Coordinate pre-construction meetings	X				
11. Post a reminder notice regarding snow ordinance	X				
12. Post a notice on snow accumulation	X				

Project	Cost Range				
	< \$10,000	\$10,000-\$25,000	\$25,000-\$50,000	\$50,000-\$100,000	>\$100,000
13. Adopt and implement stormwater mgt regs based on EPA Reqs for MS-4 communities	X				
14. Upgrade culvert on Maple Farm rd		X			
15. Education through newspaper and town website	X				
16. Upgrade culvert on Old Candia Rd		X			
17. Hazard Mit/Em Prep info on town website	X				
18. Report of the Hazmit Committee in Annual Town Report	X				
19. Pave/upgrade Hook Rd and install drainage				X	
20. Code Red or similar Public outreach system	X				
21. Provide water when wells run dry	X				
22. Encourage State to address flooding issues on Hooksett Rd	X				

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SECTION VII

ADMINISTRATIVE PROCEDURES REGARDING ADOPTION, EVALUATION AND MONITORING OF THE PLAN

"Incorporating hazard mitigation considerations into the thought processes and decision making that comprise local planning reinforces community sustainability and strengthens community planning programs. It ensures that the community survives natural disasters so that it can grow and develop as it was envisioned."

– Michael J. Armstrong, Associate Director for Mitigation, FEMA

Adoption

Upon notification that FEMA has conditionally approved this *Plan*, a public hearing will be held and the Auburn Board of Selectmen will formally adopt the ***Auburn Hazard Mitigation Plan*** as an official statement of town policy. In the future, this *Plan* may constitute a new section of the Auburn Master Plan, in accordance with RSA 674:2. The public hearing shall be properly posted and advertised by the Town in accordance with New Hampshire state law. Documentation that the Auburn Board of Selectmen have formally adopted the *Plan* will be included in the Appendix H.

Adoption of the ***Auburn Hazard Mitigation Plan*** demonstrates the Town's commitment to hazard mitigation. It also qualifies the municipality for federal, state, and local funding and prepares the public for what the community can be expected to do both before and after a natural hazard disaster occurs.

Following adoption, the Hazard Mitigation Committee and the Board of Selectmen shall seek to incorporate the mitigation actions identified in the Prioritized Implementation Schedule of Section VI of the *Plan* into other planning mechanisms, including the Town's Master Plan.

Monitoring, Evaluating and Updates

The ***Auburn Hazard Mitigation Plan*** shall be monitored and evaluated annually to track progress in implementing the mitigation strategies and actions as well as updating the goals and objectives of the *Plan*. The Auburn Board of Selectmen's administrative assistant shall be responsible for initiating this review and scheduling an annual meeting of the Hazard Mitigation Committee. The Auburn Emergency Management Director shall be responsible for ensuring that the *Plan* is updated for FEMA approval at least every 5 years. In addition to reviewing Hazard Mitigation Committee members' progress on projects, the strategy for

the following year will be reviewed and new projects will be selected for implementation at the annual meeting.

The Auburn Board of Selectmen's administrative assistant will conduct updates in coordination with the Hazard Mitigation Committee and Auburn Board of Selectmen. Updates should be made to the *Plan* every three to five years¹³ to accommodate actions 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. Also, at that time any other items identified during the annual meetings will be updated in the *Plan*, including, but not limited to, goals, objectives, identification of past hazard events, and the inventory of town assets vulnerable to hazards.

Keeping with the process of adopting the *Auburn Hazard Mitigation Plan*, a public hearing to receive comment on the *Plan* maintenance and updating shall be held during the review period, and the Board of Selectmen will adopt the final product.

During the budget process each year, department heads shall be responsible for considering hazard mitigation actions that need to be implemented as well as forwarding new actions that might be necessary to the Board of Selectmen's administrative assistant for inclusion in the annual plan review.

Continued Public Involvement

The public will continue to be invited and encouraged to be involved during this process at monitoring, evaluation and update meetings. All meetings involving implementation or updates of the *Plan* shall be open to the public as is required by RSA 91-A and notices of the meetings will be posted at least 24 hours in advance in a minimum of two locations, such as the town offices and library. The meetings may also be publicized in the local newspaper. To gain additional public involvement, draft copies of the amended *Hazard Mitigation Plan* will be made available at two public locations for review and comment. The document should be left for a minimum of two weeks and then all comments will be considered in drafting final revisions.

¹³ FEMA Disaster Mitigation Act of 2000 44 CFR Part 201.6(d)(3) mandates "Plans must be reviewed, revised if appropriate, and resubmitted for approval within five years to continue to be eligible for HMGP project grant funding." (Federal Register Vol. 36, No. 38, Feb 26, 2002, Rules and Regulations, p8852)

APPENDICES

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APPENDIX A

DEFINITIONS

Areas at Risk: Emergency equipment or areas not needed to respond at the time of a natural disaster, but which could still be threatened if a natural disaster were to occur. These include critical facilities not utilized for emergency response, people and facilities to be protected in the event of a disaster, and/or potential resources for services or supplies in the event of a disaster. Examples include schools, parks, commercial resources, day care facilities, and senior housing.

Critical Facilities: Any building, structure or location that is vital to the hazard response effort, maintains an existing level of protection from hazards for the municipality, and would create a secondary disaster if a hazard were to impact it. Examples include emergency medical services, law enforcement, electric generators, and emergency shelters.

Commercial Economic Impact Areas: These areas include organizations and businesses with more than 25 employees. These are facilities that are vital to the community's economic well-being.

Emergency Operations Plan: A jurisdiction's emergency operations plan is typically designed to establish the procedures that will take place during an emergency and designate who will be responsible to perform those procedures.

Essential Facilities: All critical facilities, areas at risk, commercial economic impact areas, and hazardous material locations.

GIS: Geographic Information Systems includes a form of mapping that enables users to easily locate physical attributes of a community such as dams, bridges, wetlands, steep slopes, etc. Much of the data for these maps is maintained by Complex Systems Research Center in Durham, NH.

Hazard Mitigation: The practice of reducing risks to people and property from natural hazards. FEMA defines hazard mitigation as "any action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazardous Materials Facilities: These facilities include active hazardous waste generators, underground storage tanks, and above-ground storage tanks.

Hazardous Waste Generators: Defined by the NH Department of Environmental Services, these are businesses that produce household hazardous waste, or treat and store or dispose of hazardous waste, or be a waste handler or used oil marketer.

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APPENDIX B

NEW HAMPSHIRE DAM CLASSIFICATION SCHEDULE

Non Menace (NM) structure means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is:

- Less than six feet in height if it has a storage capacity greater than 50 acre-feet; or
- Less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

Low Hazard (L) structure means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:

- No possible loss of life.
- Low economic loss to structures or property.
- Structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupt public safety services.
- The release of liquid industrial, agricultural, or commercial wastes, septage, Or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course.
- Reversible environmental losses to environmentally-sensitive sites.

Significant Hazard (S) structure means a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following:

- No probable loss of lives.
- Major economic loss to structures or property.
- Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services.
- Major environmental or public health losses, including one or more of the following:
- Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair.
- The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more.
- Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.

High Hazard (H) means a dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of:

- Water levels and velocities causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions.
- Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot.
- Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services.
- The release of a quantity and concentration of material, which qualify as “hazardous waste” as defined by RSA 471-A:2 VI.
- Any other circumstance that would more likely than not cause one or more deaths.

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APPENDIX C

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II. AGENCIES

New Hampshire Homeland Security and Emergency Management		271-2231
Federal Emergency Management Agency		617-223-4175
NH Regional Planning Commissions:		
	Central NH Regional Planning Commission	796-2129
	Lakes Region Planning Commission	279-8171
	Nashua Regional Planning Commission	883-0366
	North Country Council	444-6303
	Rockingham Planning Commission	778-0885
	Southern New Hampshire Planning Commission	669-4664
	Southwest Region Planning Commission	357-0557
	Strafford Regional Planning Commission	742-2523
	Upper Valley Lake Sunapee Regional Planning Commission	448-1680
NH Executive Department:		
	Governor's Office of Energy and Community Services	271-2611
	New Hampshire Office of State Planning	271-2155
NH Department of Cultural Affairs		271-2540
	Division of Historical Resources	271-3483
NH Department of Environmental Services		271-3503
	Air Resources	271-1370
	Waste Management	271-2900
	Water Resources	271-3406
	Water Supply and Pollution Control	271-3504
	Rivers Management and Protection Program	271-1152
	Bureau of Dams	271-3503
NH Fish and Game Department		271-3421
NH Department of Resources and Economic Development		271-2411
	Natural Heritage Inventory	271-3623
	Division of Forests and Lands	271-2214
	Division of Parks and Recreation	271-3255
NH Department of Transportation		271-3734
US Department of Commerce		
	National Oceanic and Atmospheric Administration	
	National Weather Service; Gray, Maine	207-688-3216
US Department of the Interior		
	US Fish and Wildlife Service	225-1411
	US Geological Survey	225-4681
US Department of Agriculture		
	Natural Resource Conservation Service	868-7581

III. WEB SITES

<i>Sponsor</i>	<i>Internet Address</i>	<i>Summary of Contents</i>
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related web sites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/disaster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State and Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/geog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.htm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/otd.html	Space-based sensor of lightning strikes
LLNL Geologic and Atmospheric Hazards	http://www-ep.es.llnl.gov/www-ep/ghp.html	General hazard information developed for the Deptment of Energy.
The Tornado Project Online	http://www.tornadoobject.com/	Information on Tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu	Information about and tracking of severe storms.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/lan	Information on forest fires and land management.

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APPENDIX D

Technical and Financial Assistance for Hazard Mitigation

This matrix provides information about key all-hazards grant programs from the Departments of Homeland Security, Justice, Transportation, Health and Human Services, and Education, under which state, local, and tribal governments, first responders, and the public are eligible to receive preparedness, response, recovery, mitigation, and prevention assistance.

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
Programs to prepare the Nation to address the consequences of natural and man-made disasters and emergencies.				
Department of Homeland Security	<i>Border and Transportation Security Directorate</i>	State Homeland Security Grant Program www.ojp.usdoj.gov	This core assistance program provides funds to build capabilities at the state and local levels and to implement the goals and objectives included in state homeland security strategies and initiatives in the State Preparedness Report.	State governments
	<i>Emergency Preparedness and Response Directorate</i>	Emergency Management Performance Grants www.fema.gov http://www.fema.gov/government/grant/index.shtm	To assist State and local governments in enhancing and sustaining all-hazards emergency management capabilities.	States with pass through to local emergency management organizations
	<i>Emergency Preparedness and Response Directorate</i>	Assistance to Firefighters Grant Program www.usfa.fema.gov/grants http://www.firegrantsupport.com/afg/	The primary goal of the Assistance to Firefighters Grants (AFG) is to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical services organizations.	Local, State, and Regional Fire Departments and agencies.
	<i>Emergency Preparedness and Response Directorate</i>	State and Local Emergency Operation Centers (EOCs) www.fema.gov http://www.fema.gov/government/grant/index.shtm	To improve emergency management and preparedness capabilities by supporting flexible, sustainable, secure, and interoperable Emergency Operations Centers (EOCs) with a focus on addressing identified deficiencies and needs.	States; local governments may be sub-grantees of the State
	<i>Emergency Preparedness and Response Directorate</i>	Citizen Corps www.citizen corps.gov	To bring community and government leaders together to coordinate community involvement in emergency preparedness, planning, mitigation, response and recovery.	States with a pass through to local governments

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
Department of Homeland Security	<i>Emergency Preparedness and Response Directorate</i>	National Fire Academy Training Grants www.fema.gov	To provide financial assistance to State Fire Training Systems for the delivery of a variety of National Fire Academy courses/programs.	State fire training organizations
	<i>Emergency Preparedness and Response Directorate</i>	Emergency Management Institute Training Assistance www.fema.gov	To defray travel and per diem expenses of State, local and tribal emergency management personnel who attend training courses conducted by the Emergency Management Institute, at the Emmitsburg, Maryland facility; Bluemont, Virginia facility; and selected off-site locations. Its purpose is to improve emergency management practices among State, local and tribal government managers, in response to emergencies and disasters. Programs embody the Comprehensive Emergency Management System by unifying the elements of management common to all emergencies: planning, preparedness, mitigation, response, and recovery.	State, local, and tribal emergency managers
	<i>Emergency Preparedness and Response Directorate</i>	Hazardous Materials Assistance Program (CERCLA Implementation)	Provide technical and financial assistance through the States to support State, local and tribal governments in oil and hazardous materials emergency planning and exercising. To support the Comprehensive Hazardous Materials (HAZMAT) Emergency Response – Capability Assessment Program (CHER-CAP) activities.	State, local, and tribal governments, state emergency response committees, local emergency planning commissions
	<i>Emergency Preparedness and Response Directorate</i>	Interoperable Communications Equipment Grant http://www.fema.gov/government/grant/index.shtm	To provide governance, planning, training and exercise, and equipment funding to States, Territories, and local and tribal governments to carry out initiatives to improve interoperable emergency communications, including communications in collective response to natural disasters, acts of terrorism, and other man-made disasters.	N/A

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
Department of Homeland Security	<i>Emergency Preparedness and Response Directorate</i>	Chemical Stockpile Emergency Preparedness Program www.fema.gov	A cooperative agreement to enhance emergency preparedness capabilities of the States and local communities at each of the eight chemical agent stockpile storage facilities. The purpose of the program is to assist States and local communities in efforts to improve their capacity to plan for and respond to accidents associated with the storage of chemical warfare materials.	State and local governments and the general public in the vicinity of the eight chemical agent stockpile storage facilities.
	<i>National Preparedness Directorate</i>	Metropolitan Medical Response System http://www.fema.gov/mmrs	To provide contractual funding to the 124 largest metropolitan jurisdictions to sustain and enhance the integrated medical response plans to a WMD terrorist attack.	Local governments
Department of Justice	<i>Office of Domestic Preparedness</i>	State Domestic Preparedness Equipment Support Program http://www.ojp.usdoj.gov/odp/equipment.htm	Funding will be provided to enhance first responder capabilities, and to provide for equipment purchases and exercise planning activities for response to Weapons of Mass Destruction (WMD) domestic terrorist incidents.	State and local governments
	<i>Office of Community Oriented Police Services (COPS)</i>	COPS Interoperable Communications Technology Program www.cops.usdoj.gov	To facilitate communications interoperability public safety responders at the state and local level.	Tribal, State, and local law enforcement agencies
Department of Health and Human Services		Public Health and Social Services Emergency Fund www.hhs.gov	To continue to prepare our nation's public health system and hospitals for possible mass casualty events, and to accelerate research into new treatments and diagnostic tools to cope with possible bioterrorism incidents.	Individuals, families, Federal, State, and local government agencies and emergency health care providers

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
	<i>Health Resources and Services Administration</i>	State Rural Hospital Flexibility Program www.ruralhealth.hrsa.gov	To help States work with rural communities and hospitals to develop and implement a rural health plan, designate critical access hospitals (CAHs), develop integrated networks of care, improve emergency medical services and improve quality, service and organizational performance.	States with at least one hospital in a non-metropolitan region
Department of Health and Human Services	<i>Health Resources and Services Administration</i>	EMS for Children www.hrsa.gov	To support demonstration projects for the expansion and improvement of emergency medical services for children who need treatment for trauma or critical care. It is expected that maximum distribution of projects among the States will be made and that priority will be given to projects targeted toward populations with special needs, including Native Americans, minorities, and the disabled.	State governments and schools of medicine
	<i>National Institute of Health</i>	Superfund Hazardous Substances Basic Research and Education www.nih.gov	To establish and support an innovative program of basic research and training consisting of multi-project, interdisciplinary efforts that may include each of the following: (1) Methods and technologies to detect hazardous substances in the environment; (2) advance techniques for the detection, assessment, and evaluation of the effects of hazardous substances on humans; (3) methods to assess the risks to human health presented by hazardous substances; and (4) and basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances.	Any public or private entity involved in the detection, assessment, evaluation, and treatment of hazardous substances; and State and local governments
	<i>Centers for Disease Control</i>	Immunization Research, Demonstration, Public Information and Education www.cdc.gov	To assist States, political subdivisions of States, and other public and private nonprofit entities to conduct research, demonstrations, projects, and provide public information on vaccine-preventable diseases and conditions.	States and nonprofits organizations

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
	<i>Centers for Disease Control</i>	Surveillance of Hazardous Substance Emergency Events www.atsdr.cdc.gov	To assist State health departments in developing a State-based surveillance system for monitoring hazardous substance emergency events. This surveillance system will allow the State health department to better understand the public health impact of hazardous substance emergencies by developing, implementing, and evaluating a State-based surveillance system.	State, local, territorial, and tribal public health departments
Department of Health and Human Services	<i>Centers for Disease Control</i>	Human Health Studies, Applied Research and Development www.atsdr.cdc.gov	To solicit scientific proposals designed to answer public health questions arising from situations commonly encountered at hazardous waste sites. The objective of this research program is to fill gaps in knowledge regarding human health effects of hazardous substances identified during the conduct of ATSDR's health assessments, consultations, toxicological profiles, and health studies, including but not limited to those health conditions prioritized by ATSDR.	State health departments
Department of Education	Office of Safe and Drug free Schools (OSDFS)	Readiness and Emergency Management for Schools http://www.ed.gov/programs/dvpemergencyresponse/index.html/	This grant program supports efforts by LEAs to improve and strengthen their school emergency management plans, including training school personnel and students in emergency management procedures; communicating with parents about emergency plans and procedures; and coordinating with local law enforcement, public safety, public health, and mental health agencies.	School Districts
Department of Transportation	<i>Pipeline and Hazardous Materials Safety Administration (PHMSA)</i>	Hazardous Materials Emergency Preparedness Training and Planning Grants http://phmsa.dot.gov/hazmat/grants	Increase state, local, territorial, and Native American tribal effectiveness to safely and efficiently handle HazMat accidents and incidents; enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986; and encourage a comprehensive approach to emergency planning and training by incorporating response to transportation standards.	States, local, territorial, tribal governments.
Programs to coordinate Federal response efforts and to assist states, localities, and tribes in responding to disasters and emergencies.				

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
Department of Homeland Security	Emergency Preparedness and Response Directorate	Urban Search and Rescue www.fema.gov	To expand the capabilities of existing Urban Search and Rescue Task Forces.	28 existing US&R Task Forces
Programs to provide assistance to States, localities, tribes, and the public to alleviate suffering and hardship resulting from Presidentially declared disasters and emergencies caused by all types of hazards.				
Department of Homeland Security	Emergency Preparedness and Response Directorate	Individuals and Households Program http://www.fema.gov/assistance/process/guide.shtm	To provide assistance to individuals and families who have been affected by natural or man-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund.	Individuals and Families
	Emergency Preparedness and Response Directorate	Public Assistance http://www.fema.gov/government/grant/pa/index.shtm	To provide assistance to states, localities, tribes, and certain non-profit organizations affected by natural or man-made Presidentially declared disasters. Funding provided from the Disaster Relief Fund	State, local and tribal governments; private non-profit organizations
	Emergency Preparedness and Response Directorate	Fire Management Assistance Grant Program http://www.fema.gov/government/grant/fmagp/index.shtm	Provide funds to States, local, and tribal governments for the mitigation, management, and control of wildland fires posing serious threats to improved property.	State, local and tribal governments
Small Business Administration	Office of Disaster Assistance	Disaster Loan Program http://www.sba.gov/services/disasterassistance/	To offer financial assistance to those who are trying to rebuild their homes and businesses in the aftermath of a disaster.	Individuals, families, private sector
Department of Justice	Office for Victims of Crime	Antiterrorism and Emergency Assistance Program http://www.ojp.usdoj.gov/ovc/publications/infores/terrorism/	To provide assistance programs for victims of mass violence and terrorism occurring within and outside the United States and a compensation program for victims of international terrorism.	Public and private nonprofit victim assistance agencies
Programs to reduce or eliminate future risk to lives and property from disasters.				

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
Department of Homeland Security	<i>Emergency Preparedness and Response Directorate</i>	Hazard Mitigation Grant Program http://www.fema.gov/government/grant/hmgp/index.shtm	To provide assistance to states, localities, and tribes to fund projects that will reduce the loss of lives and property in future disasters. Funding is provided from the Disaster Relief Fund and administered by the states according to their own priorities.	State, local, and tribal governments
	<i>Emergency Preparedness and Response Directorate</i>	Pre-Disaster Mitigation Program http://www.fema.gov/government/grant/pdm/index.shtm	This program provides funding for mitigation activities before disaster strikes. In recent years it has provided assistance for mitigation planning. In FY03, Congress passes a competitive pre-disaster mitigation grant program that will include project funding.	State, local, and tribal governments
Department of Homeland Security	<i>Emergency Preparedness and Response Directorate</i>	Flood Mitigation Assistance Program (FMA) http://www.fema.gov/government/grant/fma/index.shtm	The FMA program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the <u>National Flood Insurance Program</u> (NFIP). FEMA provides FMA funds to assist States and communities implement measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.	State, local and tribal governments
	<i>Emergency Preparedness and Response Directorate</i>	Repetitive Flood Claims Program (RFC) http://www.fema.gov/government/grant/rfc/index.shtm	The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Up to \$10 million is available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP).	State, local and tribal governments

Agency	Office/ Directorate	Program	Purpose	Funding Beneficiaries
	<i>Emergency Preparedness and Response Directorate</i>	Severe Repetitive Loss Program (SRL) http://www.fema.gov/government/grant/srl/index.shtm	The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP).	State, local and tribal governments
	<i>Emergency Preparedness and Response Directorate</i>	Map Modernization http://www.fema.gov/plan/prevent/fhm/mm_main.shtm	This funding provides assistance to develop digital flood maps, support flood-mapping activities and expand the Cooperating Technical Partners Program to communities and regional entities.	State, local and tribal governments
Programs to interdict potentially hazardous events from occurring				
Department of Health and Human Services	<i>Centers for Disease Control</i>	Immunization Grants www.cdc.gov	To assist States and communities in establishing and maintaining preventive health service programs to immunize individuals against vaccine-preventable diseases.	States
Other				
Department of Housing and Urban Development	<i>NH Office of Energy and Planning</i>	Community Development Block Grant (CDBG) Program http://www.hud.gov/offices/cpd/communitydevelopment/programs/	HUD provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.	State, local and tribal governments

Mitigation Programs of Other NH State Agencies

The following State of New Hampshire agencies are directly or indirectly involved in activities that include Hazard Mitigation Planning and/or program implementation:

- *NH Department of Transportation Bureau of Repair and Maintenance*
- *NH OSP/NFIP Program*
- *NH OSP Coastal Program*
- *NH DRED Division of Forests and Lands*
- *NHDES Water Resources Division – Dam Safety Program*
- *NHDES Wetlands Program*
- *NHDES Shoreline Protection*

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APPENDIX E

STAPLEE AND PROJECT EVALUATION

STAPLEE is an acronym for a general set of criteria common to public administration officials and planners. It stands for the Social, Technical, Administrative, Political, Legal, Economic, and Environmental criteria for making planning decisions. Questions to ask about suggested actions include:

- ***Social:*** Is the proposed action socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- ***Technical:*** Is the proposed action technically feasible and will it work? Is it a long term solution?
- ***Administrative:*** Can the community implement the action? Is there someone to coordinate and lead the effort? Are there funding sources already allocated or available for this project?
- ***Political:*** Is the action politically acceptable? Does the project help to achieve other community objectives?
- ***Legal:*** Is the community authorized to implement the proposed action? Is there a clear legal basis of precedent for this project or is there chance of legal challenge?
- ***Economic:*** What are the costs and benefits of this action? Does the cost seem reasonable for the size of the problem and the likely benefits? Does the project reduce potential future damages from disasters?
- ***Environmental:*** How will the action impact the environment, i.e. land, water, animals, plants? Will the action need and meet environmental regulatory approvals?

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APPENDIX F

AHMC MEETING AGENDAS, MINUTES AND ATTENDANCE SHEETS

APPENDIX G

PUBLIC AND OTHER AGENCY PARTICIPATION

APPENDIX H

DOCUMENTATION OF PLAN ADOPTION