

# Natural Hazards Mitigation Plan



A Multi-jurisdictional Plan for the Towns of  
Chaplin, Columbia, Coventry, Hampton,  
Lebanon, Mansfield, Scotland, Willington, and Windham

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Prepared by the Windham Region Council of Governments

May 2013 – DRAFT

Approved by FEMA date

## **Lebanon Mitigation:**

### Scope/Overview

The Risk and Vulnerability Assessment portion of this plan looked at the historical and potential impacts of the following hazards throughout the region: dam failures, droughts, earthquakes, floods, hurricanes, ice jams, severe winter weather, thunderstorms, tornadoes and wind damage, and wildfires. A review of the historical occurrences of each hazard provided valuable information used in assessing potential future risk. A review of each community's resources provided the basis for an analysis of the community's vulnerability to each hazard – the extent to which the community might suffer loss of human life, injuries, and/or property damage.

With an understanding of its risk and vulnerability to natural disasters, the community can take steps prior to such an event to reduce its impacts (loss of property and life). The Connecticut Department of Energy and Environmental Protection (DEEP) has provided guidance in the form of a comprehensive list of possible mitigation measures for each hazard (see Appendix III). In the context of the community's risk and vulnerability assessment, only some of these measures will be cost-effective. The purpose of the Natural Hazard Mitigation Plan (NHMP) is to identify reasonable and appropriate mitigation measures for each hazard.

Certain mitigation practices are beneficial for any disaster, and the following measures are recommended for all communities:

- Encourage all buildings to be improved to meet current building codes. Changes in building codes apply only to new constructions and renovations.
- Educate the public about disaster preparedness and the benefits of mitigation measures. Increasing the public's awareness of possible consequences of natural disasters and how they might better prepare to safeguard their lives and property is an important part of every community's mitigation plan.

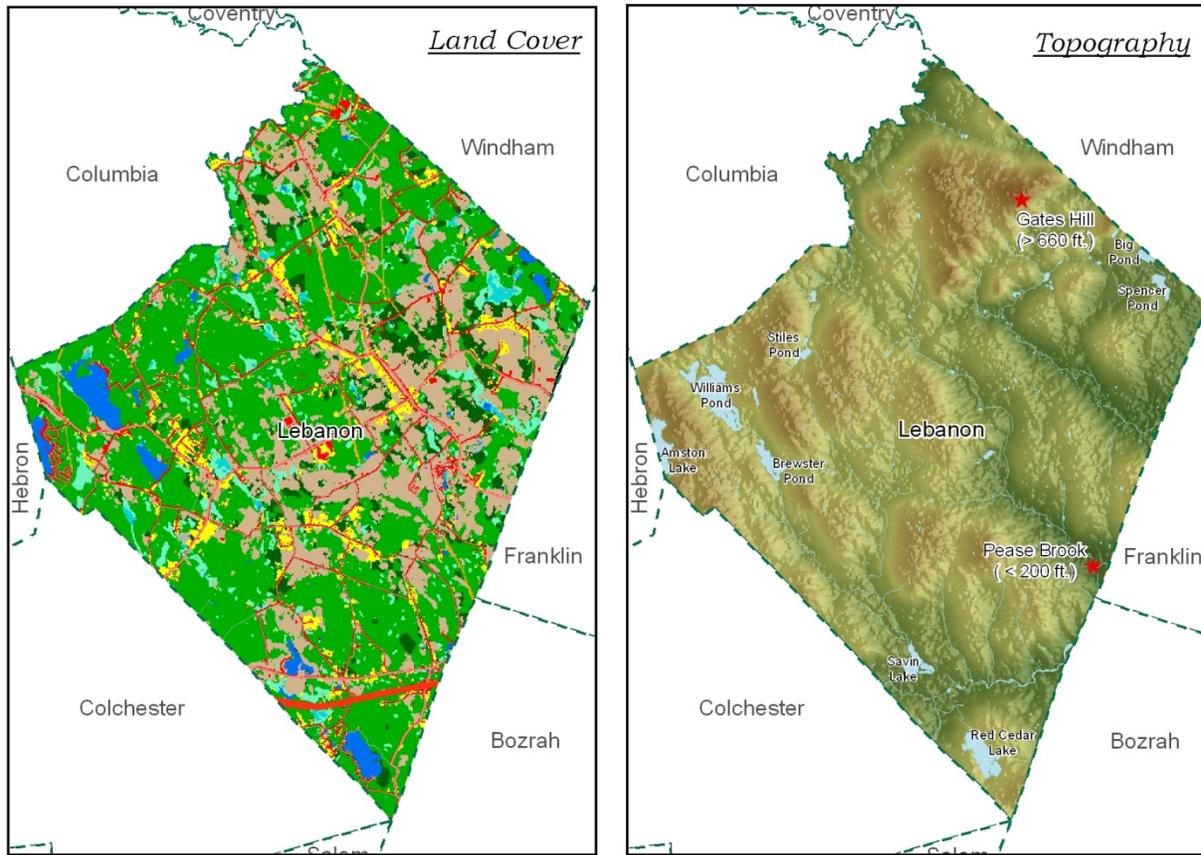
### General Town Description

Lebanon is located in New London County in southeastern Connecticut and is the southernmost town in the WINCOG Region. Lebanon has a total area of 55.2 square miles (35,308 acres) and is bounded on the east by Franklin and Bozrah, on the south by the tip of Salem, on the north by Windham and Columbia, and on the west by Hebron and Colchester. The 2010 Census population count was 7,308 persons, a 5.8% increase from 2000 (6,907). Lebanon is a rural/agricultural community. About 8% of Lebanon is developed (see Figure 26).

Lebanon has seasonal concentrations of people in the vicinity of Lake Williams, Amston Lake and Red Cedar Lake. This makes these areas more vulnerable to disasters which occur in the summer.

# Town of Lebanon Overview

Figure 26



## Lebanon Land Cover Breakdown

### QUICK TOWN STATS:

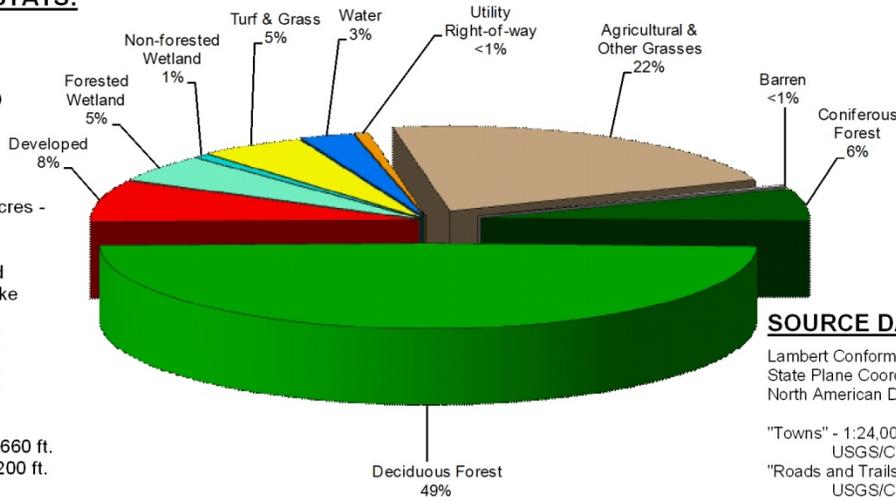
Town Area -  
55.2 sq. miles  
(35,301 acres)

Water body area -  
932 acres

Water bodies > 10 acres -  
Amston Lake  
Big Pond  
Brewster Pond  
Red Cedar Lake  
Savin Lake  
Spencer Pond  
Stiles Pond  
Williams Pond

Elevation -  
Maximum = > 660 ft.  
Minimum = < 200 ft.

Population -	2000	2010	Change
	6,907	7,308	5.8%



Scale: 1:192,000

### SOURCE DATA:

Lambert Conformal Conic,  
State Plane Coordinate System  
North American Datum of 1983 (NAD83)

"Towns" - 1:24,000, 1969-1984,  
USGS/CT DEP.

"Roads and Trails" - 1:24,000, 1969-1984,  
USGS/CT DEP.

"Hydrography" - 1:24,000, 1969-1984,  
USGS/CT DEP.

"National Elevation Dataset" - 30 meter  
(1 arc second).

"2006 Land Cover Greater Connecticut" -  
100 ft sq., 2006, UConn, CLEAR.

October 2012

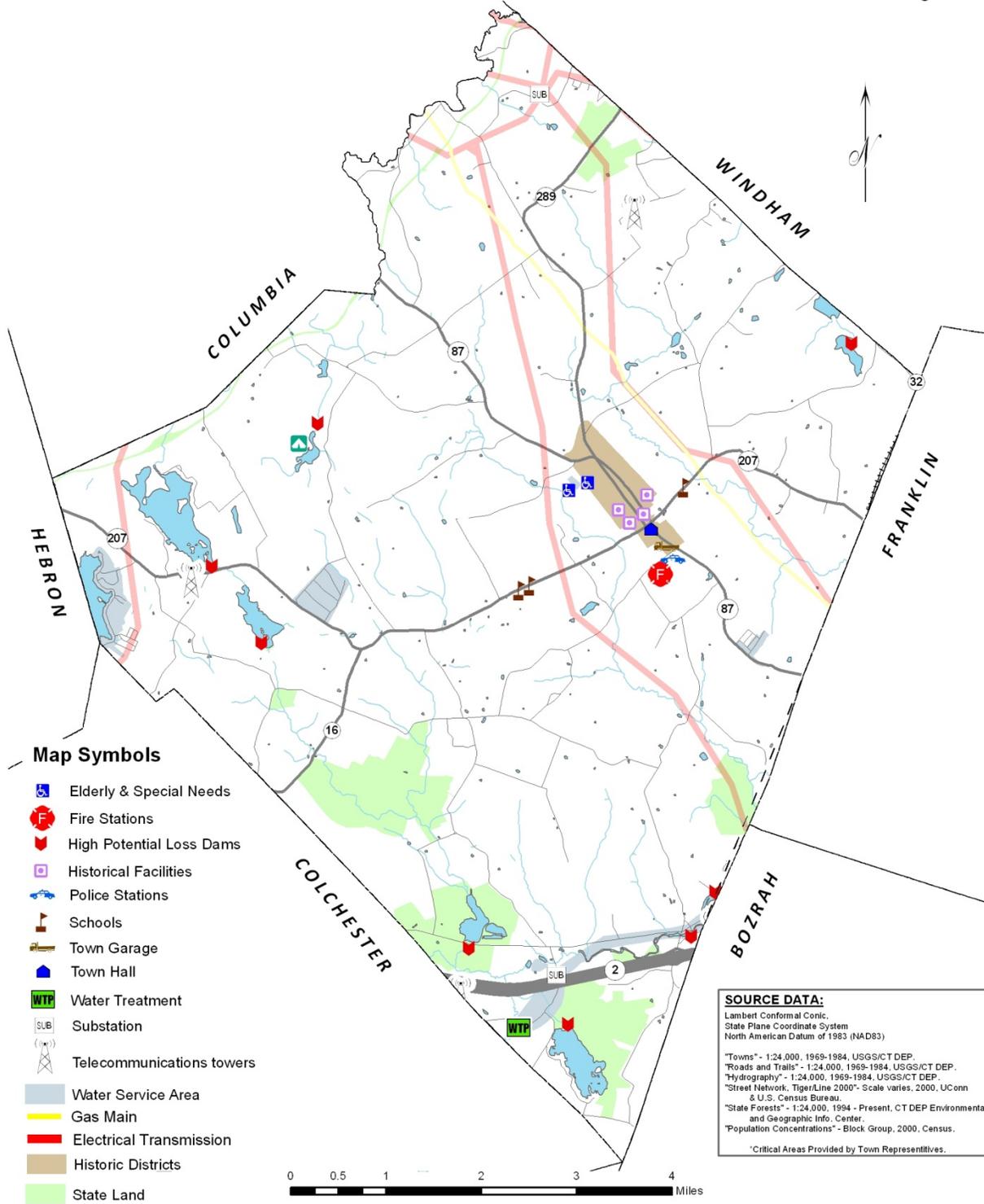
Critical facilities in Lebanon include: (see Figure 27)

- one volunteer fire department on Goshen Hill Road;
- one police department on Goshen Hill Road;
- three schools: one elementary school on Exeter Road, one middle school on Exeter Road and one high school on Exeter Road;
- one small industrial park off Route 207;
- a historic district in the center of Lebanon, which includes the Jonathan Trumbull home, the Jonathan Trumbull Jr. home, a town green which housed the French army during the Revolutionary War, the War Office which was used during the Revolutionary War, and several other structures dating back to the 1700's;
- one elderly housing facility off Dr. Manning Drive;
- one senior center on West Town Street;
- a water treatment plant on Reservoir Road;
- two transformer stations and several telephone towers throughout town;
- one Girl Scout camp off Clubhouse Road; and
- eight high potential loss dams.

Largely forested, Lebanon is made up of approximately 49% deciduous forest, 6% coniferous forest and 5% forested wetlands. Other land cover in the town includes: agricultural and other grasses (22%), developed (8%), water (3%), turf and grass (5%), non-forested wetlands (1%), barren land (<1%), and utility rights-of-way (<1%). The approximate 894 acres of the town occupied by water bodies includes: Amston Lake, Big Pond, Brewster Pond, Red Cedar Lake, Savin Lake, Spencer Pond, Stiles Pond and Williams Pond. Lebanon's elevation ranges from about 200 feet in the southeastern section of town at the Pease Brook to about 660 feet at the peak of Gates Hill in the northeast section. In addition to all the natural hazards described previously in this plan on a regional level, Lebanon is also at risk of damage caused by flooding and dam failures.

# Lebanon Critical Areas of Concern

Figure 27



Prepared for: The Windham Region Council of Governments Hazard Mitigation Plan.

January 2013  
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## Evaluation of Risks & Vulnerability

### Dam Failure

#### *Risks & Vulnerability:*

Dam failure risk and vulnerability is discussed on a regional level on page 17, section II.B.

#### *Risks*

There are twenty-seven dams in Lebanon ranging from Hazard Class A (low hazard) to Hazard Class B (significant hazard). Nine dams in the town are classified as low hazard (Class A); failure of any of these dams would hardly be of concern. Five dams are classified as moderate hazard (Class BB) and their failure would cause some damage, but no major disruptions. The failure of any of the four significant hazard (Class B) dams could cause serious damage and these dams are of greatest concern in the town. There are also nine unassigned dams in the town, but the fact that close watch is kept over significant and high hazard dams suggests that these structures are either moderate, low, or negligible hazards.

#### *Vulnerability*

The failure of any Class B dam brings with it damages, economic loss and the potential of loss of life. One of these dams is located on the north end of Stiles Pond, another is located on the south end of Williams Pond, the next is located on the south end of Brewster Pond and the last dam is located on the north end of Red Cedar Lake. These dams being classified as significant hazards means that in the event of their failure, besides the definite loss of property and economic losses, the loss of life is possible. Figure 28 shows the placement of all twenty-eight dams in the town. A Class C dam, the Deep River Reservoir Dam, located near the southwest border of Lebanon in Colchester has the potential of causing damage within Lebanon if it were to fail.

#### *Mitigation Efforts*

Current state mitigation measures are described on a regional level on page 17, section II.B of the Natural Hazards Mitigation Plan. Among these mitigation measures are periodic dam inspections. Periodic inspections help to determine if dams are structurally sound. If a dam's structural integrity is questioned, recommendations made to ensure the safety of the structure may include:

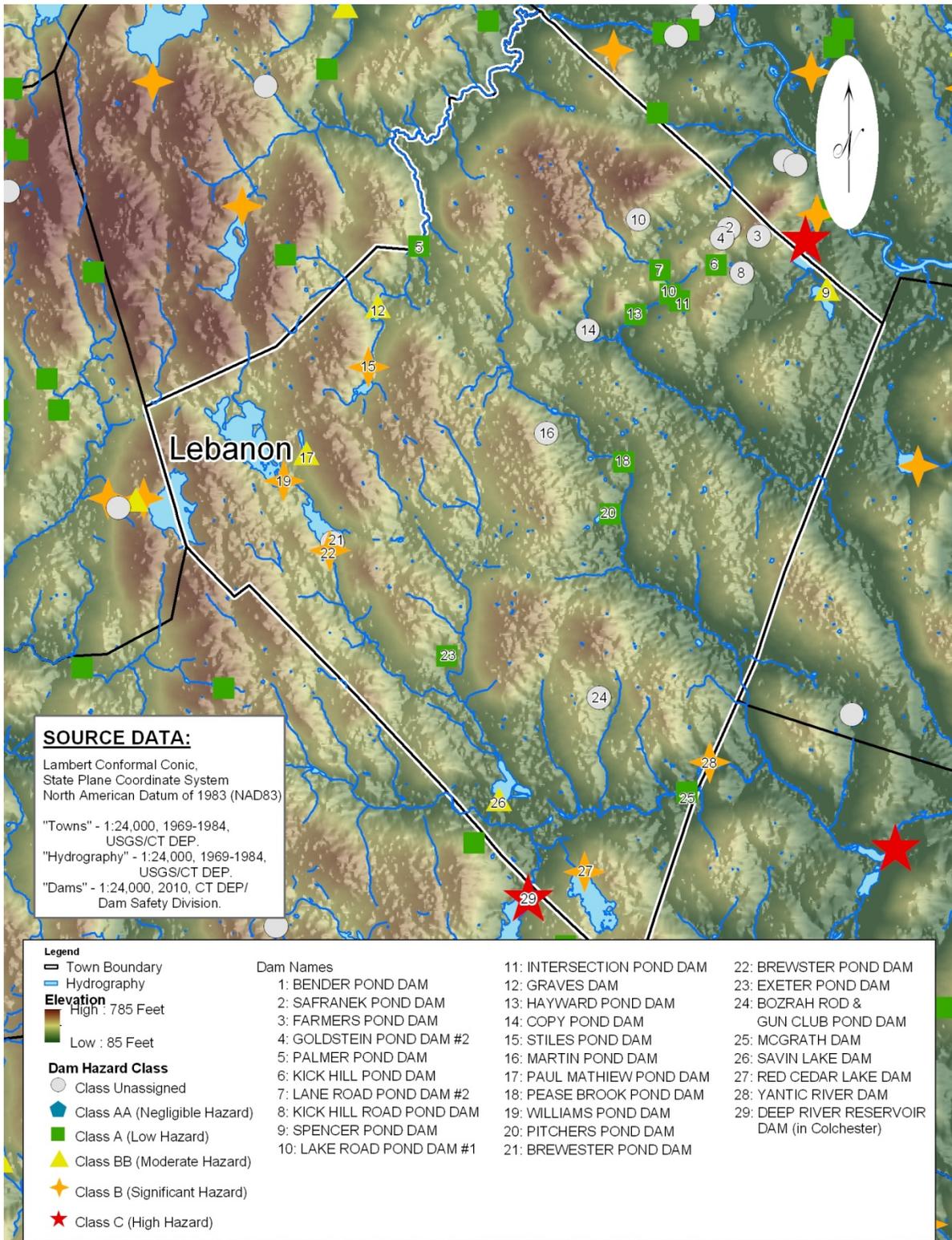
- any emergency measures or actions, if required to assure the immediate safety of the structure;

- remedial measures and actions related to design, construction, operation, maintenance and inspection of the structure; additional detailed studies, investigations and analyses; or
- recommendations for routine maintenance and inspection by the owner.

Out of the 164 dams in the WINCOG Region 112 are privately owned, of which 16 are in Lebanon. Private owners of dams are generally reluctant to make repairs, which tend to be costly. In these instances, needed repairs may not be done in a timely manner.

# Town of Lebanon Dams

Figure 28



0 0.5 1 2 3 4 Miles  
 Scale: 1:120,000

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Whether it is a structurally sound dam or a weak dam, Emergency Operation Plans (EOPs)/Emergency Action Plans (EAPs) are very important mitigation measures. There are currently no statutory mandates for EOPs. However, the DEEP works with owners of dams at greatest risk to make certain EOPs are in place and up-to-date. Hurricanes, flooding, ice jams and tornadoes may breach even a well-built dam, given a destructive enough event. Having a plan that lays out how to respond to a disaster, prior to the disaster occurring, is a very important tool in reducing loss of property and life. Mitigation measures for flooding (see below), which is a risk commonly associated with a dam failure, should also be encouraged.

While the state assumes responsibility for inspecting dams and recommending measures to lessen the risk of dam failure, the municipality can take the following mitigation actions:

- for municipally-owned dams, make sure that EOPs are in place and current, and implement recommendations resulting from state inspections; and
- for privately-owned dams, encourage each dam owner to have an EOP in place and current, and implement recommendations resulting from state inspections; monitor compliance.

### Drought

#### *Risk & Vulnerability:*

Drought risk and vulnerability is discussed on pages 17-18, section II.B.

#### *Mitigation Efforts*

As with any rural community that depends on aquifers and local well systems, Lebanon's vulnerability to drought increases with population growth and the accompanying increased demands for water. Good land use planning and helping the community to understand the importance of water conservation can reduce the threat of drought.

The State's Automated Flood Warning System and the "Connecticut Drought Preparedness and Response Plan" (see page 18) are statewide mitigation efforts already in place. Other specific measures that should be considered include:

- completing a town-wide groundwater study, including recharge into existing aquifers to develop recommendations for future land use patterns;
- implementing site design techniques and criteria such as strict regulation of vegetative buffers for stream and river corridors, rain gardens for site drainage, and prohibition of wetlands alteration;

- studying effectiveness of conservation measures; and
- implementing water conservation awareness programs.

### Earthquake

#### *Risk & Vulnerability:*

Earthquake risk and vulnerability is discussed on pages 18-22, section II.B.

#### *Mitigation Efforts*

Occurrences of large earthquakes in the region are infrequent. While many mitigation measures may not be cost-effective, the community should consider the following:

- enforcing effective building codes and local ordinances;
- encouraging emergency facilities such as hospitals to be constructed to withstand seismic events; and
- encouraging a low-cost earthquake rider for homeowners and businesses.

### Flooding

#### *Risks*

The Town of Lebanon is at risk of flooding because of a number of streams, brooks and ponds in the town. According to the 1988 Federal Emergency Management Agency's (FEMA's) updated Flood Insurance Study (FIS) for the town:

"Floods in Lebanon have occurred in every season of the year. Spring floods are common and are caused by rainfall combined with snowmelt. Floods in late summer and fall are usually the result of hurricanes or other storms moving northeast along the Atlantic coast. Winter floods result from occasional thaws, particularly in years of heavy snow cover.

Major floods of the past 50 years in Lebanon occurred in March 1936, September 1938, and August 1955. Of these, the flood of September 1938, caused by a hurricane, was the most severe. Stream-flow records at USGS gaging station No. 01193500 on the Salmon River at East Hampton and No. 01127500 on the Yantic River at Yantic, which are in the vicinity of Lebanon, indicate that the September 1938 flood has a recurrence interval of approximately 100 years (4)."

The Flood Insurance Study for New London County was updated July 18, 2011.

### *Vulnerability*

Areas studied for vulnerability, as noted in FEMA's 1988 FIS for the town, are as follows:

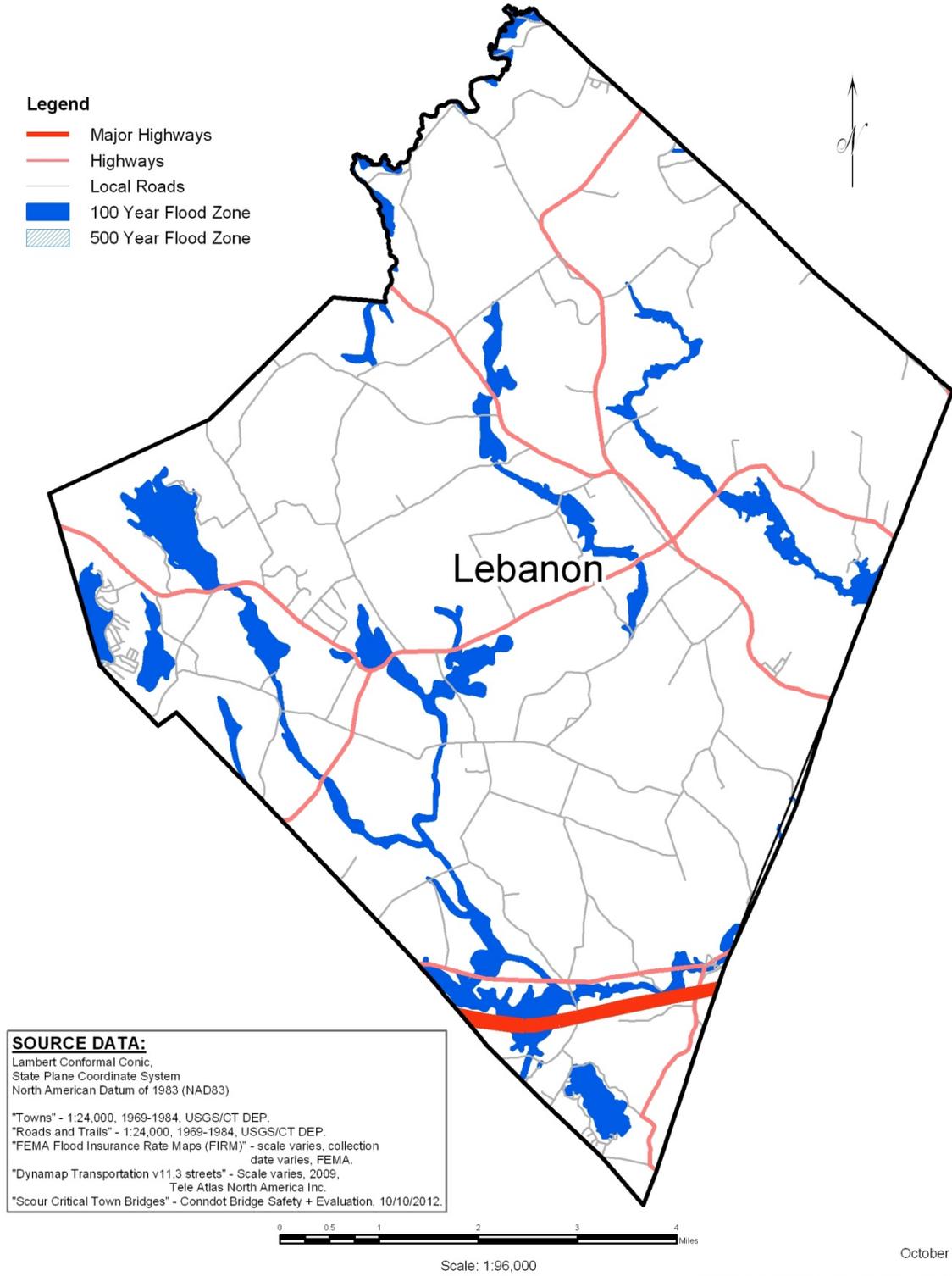
"The following streams were studied by detailed methods: Susquetonscut Brook, from the downstream corporate limits to Bender Road; the Tenmile River, from its confluence with the Willimantic River upstream to Palmer Pond; and the Yantic River, from the downstream corporate limits to Sisson Road. Williams Pond, Amston Lake, and Red Cedar Lake were also studied by detailed methods. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through December 1991.

All or portions of the following flooding sources were studied by approximate methods: Sherman Brook, the Deep River, Hall Brook, Brewster Pond, Exeter Brook, Bartlett Brook, Savin Lake, Pease Brook, Jordan Brook, Spinning Mill Brook, the Tenmile River, and the Yantic River. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Town of Lebanon (2)."

A map of the flood risk areas is provided on Figure 29.

# Flood Risk Zones of Lebanon

Figure 29



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## Mitigation Efforts

The Town of Lebanon has participated in the National Flood Insurance Program (NFIP) since May 27, 1976.

The Town of Lebanon updated their zoning regulations on June 16, 2011 in a manner consistent with the updated 2011 Flood Insurance Study for New London County. The Lebanon Special Flood Hazard Area District (Sec. 4.9-10 of the Lebanon Zoning Regulations) includes, but is not limited to, the following limitations in the flood zone<sup>φ</sup>:

- Residential structures shall have the lowest floor elevation, including the basement, elevated above the base flood elevation,
- Non-residential structures shall have the lowest floor elevation, including basement, elevated as above or flood proofed to a point above the base flood elevation, as below,
- Non-residential structures located in all A-Zones may be flood-proofed in lieu of being elevated provided that together with all attendant utilities and sanitary facilities the areas of the structure below the required elevation are watertight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy,
- New construction or substantial improvements of elevated buildings that include fully enclosed areas formed by foundation and other exterior walls below the base flood elevation shall be designed to preclude finished living space and designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood forces on exterior walls,
- In AE-Zones where base flood elevations have been determined, but before a floodway is designated, no new construction, substantial improvement, or other development (including fill) shall be permitted which would increase base flood elevations more than one (1) foot at any point within the community when all anticipated development is considered cumulatively with the proposed development,
- In areas where floodways have been determined, encroachments, including fill, new construction, substantial improvements and other developments shall be prohibited unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating that encroachment shall not result in any (0.00) increase in flood levels during occurrence of the base flood discharge. When utilizing data other than that provided by the Federal Emergency Management Agency, the following standard applies: the Commission shall utilize a regulatory floodway based on the principal that the area

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<sup>φ</sup> The flood zone being the Special Flood Hazard Area District, designated as the Zone A (areas of the 100-year flood), AE as shown on the Flood Insurance Rate Map(s).

chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any one point,

- All new construction or substantial improvements shall be:
  - (a) Designed and anchored to prevent flotation, collapse, or lateral movement; constructed with materials and utility equipment resistant to flood damage; and be constructed by methods and practices which minimize flood damage, and
  - (b) Consistent with the need to minimize flood damage within floodprone areas; serviced by utilities such as gas, sewers, electric, heating, ventilation, plumbing, air conditioning equipment, HVAC ductwork, and water systems located and constructed to minimize or eliminate flood damage, and provide with adequate drainage to reduce exposure to flood hazards,
- New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.
- New and replacement sanitary sewer systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharges from the systems into the floodwaters; on site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
- Manufactured homes (including a recreational vehicle placed on a site for 180 consecutive days or longer) and manufactured home parks and subdivisions are prohibited in the Special Flood Hazard Area District.
- If any portion of a structure lies within the Special Flood Hazard Area (SFHA), the entire structure is considered to be in the SFHA. The entire structure must meet the construction requirements of the flood zone. The structure includes any attached additions, garages, decks, sunrooms, or any other structure attached to the main structure. Decks or porches that extend into a more restrictive flood zone will require the entire structure to meet the standards of the more restrictive zone.
- If a structure lies within two or more flood zones, the construction standards of the most restrictive zone apply to the entire structure (i.e., V zone is more restrictive than A zone; structure must be built to the highest BFE). The structure includes any attached additions, garages, decks, sunrooms, or any other structure attached to the main structure.
- New construction, substantial improvements and repair to structures that have sustained substantial damage cannot be constructed or located entirely or partially over water unless it is a functionally dependent use or facility.
- Above-ground storage tanks (oil, propane, etc.) which are located outside or inside of the structure must either be elevated above the base flood elevation (BFE) on a concrete pad, or be securely anchored with tie-down straps to prevent flotation or lateral movement, have the top of the fill

pipe extended above the BFE, and have a screw fill cap that does not allow for the infiltration of flood water.

Lebanon's regulations require that proposed structures meet elevation requirements and strict construction demands. Structures may be required to be constructed with certain materials, elevated, flood proofed, watertight or anchored. It must be shown with not only proposed structures, but with any activity in the 100-year flood plain that encroachment will not alter the flood levels in the floodway. These types of regulations help to keep structures out of areas at risk of flooding. Structures that are allowed in the flood plain must meet requirements put in place to greatly reduce the risk of damage to property and the loss of life, should a flood occur.

Additional mitigation measures recommended for all towns in the region include:

- educating the public on
  - risks of flooding,
  - risks of building in hazard-prone areas,
  - Federal Emergency Management Agency (FEMA) floodplain maps (and making these maps easily available to the public);
- implementing a maintenance program to clear debris from storm water drainage areas;
- developing sediment control to prevent clogged drainage systems, such as street sweeping, curb and gutter cleaning, paving dirt roads, and planting vegetation on bare ground;
- investigating the use of flood-prone areas as open spaces;
- encouraging individuals in flood-prone areas to purchase flood insurance;
- elevating structures above the 100-year flood level; and
- considering the conservation of open space by acquisition of repetitive loss structures.

### Stormwater

Stormwater runoff can significantly exacerbate flooding; therefore, managing stormwater runoff is a priority mitigation measure. Residential and commercial development increases impervious land area, reduces the infiltration of stormwater runoff into the ground, and increases the volume and velocity of stormwater runoff causing flooding. Enforcing appropriate maintenance programs for stormwater facilities will therefore help reduce the impact of these events and subsequently reduce the damage caused by flooding. A good stormwater management system promotes groundwater recharge and controls peak flows, while reducing local flooding and maintaining stream bank integrity. An example of a good stormwater management system would be one that calls for removing sediment accumulation from catch basins yearly. This may make the difference in whether or not flooding occurs. Lebanon is encouraged to

develop a municipal stormwater management plan. All towns within the region are also encouraged to consider the effects of proposed future development on stormwater runoff.

### Hurricanes

#### *Risk & Vulnerability:*

Hurricane risk and vulnerability is discussed on pages 23-27, section II.B.

#### *Mitigation Efforts*

Some of the greatest damage from hurricanes is caused by flooding, high winds and tornadoes. Mitigation measures for these events are looked at separately in the flooding and tornado/wind damage sections. Other mitigation efforts that should be considered include:

- providing emergency shelters;
- implementing a tree hazard management program, which would encourage responsible planting practices and minimize future storm damage to buildings, utilities, and streets;
- practicing a tree trimming maintenance program; and
- relandscaping with native species.

### Ice Jams

#### *Risk & Vulnerability:*

Ice jam risk and vulnerability is discussed on page 28, section II.B.

#### *Mitigation Efforts*

During ice jams the biggest concern is the risk of flooding. See mitigation measures under flooding (above).

### Severe Winter Storms

#### *Risk & Vulnerability:*

Severe winter storm risk and vulnerability is discussed on pages 29-30, section II.B. Key risks are the relative isolation of the rural communities from emergency services; loss of electrical power to large areas from ice accumulation or high winds, and fire from improper use of alternative heating sources, candles and gas stoves. The leading cause of death is from automobile and other transportation accidents.

Property damage can also occur from frozen water pipes and falling trees or branches from ice accumulation and/or wind.

*Mitigation Efforts (see also flooding and tornado/wind damage)*

Some of the greatest damage from winter storms is caused by flooding and high winds, and mitigation measures for such hazards are discussed under those headings.

It is particularly important to encourage people to stay indoors and out of harm's way when severe winter weather threatens. Such conditions increase the frequency of traffic accidents and emergency responders take longer to reach accident scenes because of vehicles unnecessarily on the roads.

Power outages can cause a number of problems, from loss of heat and the risk of frozen pipes to fire hazards. Tree-trimming programs can lessen the risk of power outages to some extent. Putting utility wires underground can lessen the risk even further. In any event, the municipality should develop a plan to restore power as quickly as possible.

The National Weather Service's Early Warning System is an important mitigation measure for winter storms. Other hazard-specific mitigation efforts that should be considered include:

- educating the public on
  - the risks of hypothermia,
  - the risks of carbon monoxide poisoning in motor vehicles and from portable heaters and power generators in homes,
  - the risk of fires from portable heaters and candles,
  - the importance of staying off the roads,
  - landscaping practices that encourage the planting of species that are less susceptible to damage from ice storms to reduce the risk of damage to structures;
- implementing a tree trimming maintenance program;
- encouraging underground utility wires; and
- providing emergency shelters before, during, and after the event.

### Thunderstorms

*Risk & Vulnerability:*

Thunderstorm risk and vulnerability is discussed on pages 30-31, section II.B.

*Mitigation Efforts (see also wildfires, flooding and tornado/wind damage)*

Some of the greatest damage from thunderstorms is caused by fires, flooding, high winds, and (on occasion) tornadoes. Mitigation measures for such hazards are discussed under those headings.

The National Weather Service's Early Warning System is an important mitigation measure for thunderstorms. Other hazard-specific mitigation efforts that should be considered include:

- educating the public on how to minimize risk of injury both indoors and outdoors (more specific);
  - when to turn off gas, electricity, and water; and
  - when and how to avoid contact with water and metal.
- clearing dead or rotting tree branches;
- securing outdoor objects that could become projectiles; and
- installing lightning rods.

### Tornado/Wind Damage

#### *Risk & Vulnerability:*

Tornado/Wind Damage risk and vulnerability is discussed on pages 31-34, section II.B.

#### *Mitigation Efforts*

While the region has a very low risk of experiencing a tornado with great destructive potential, basic measures to minimize damage from high winds can be implemented and public education efforts can help to prepare residents. Owners of older mobile homes should be particularly aware of mitigation measures that could protect their homes from damage.

The National Weather Service's Early Warning System is an important mitigation measure for tornado/wind damage events. Other hazard-specific mitigation efforts that should be considered include:

- being aware of, and educating the public through pamphlets and web-based information on
  - the warning signs for a tornado,
  - the importance of securing outdoor objects that could become projectiles,
  - what kinds of buildings are most vulnerable to damage from tornadoes or high winds (such as manufacture housing),
  - structural alterations to protect against wind damage,
  - when and where to seek shelter;

- encouraging upgrading of existing buildings to meet current building codes;
- enforcing and updating building code standards for light frame construction, especially wind resistant roofs. FEMA articles on bracing for gable trussed roofs and bracing for doors and windows are available for review. Information is also available on placement of HVAC systems and electrical utilities to resist both wind and flood damage; and
- encouraging underground utility wires.

### Wildfire Hazards

#### *Risk & Vulnerability:*

Wildfire Hazard risk and vulnerability is discussed on pages 35-36, section II.B.

#### *Mitigation Efforts*

Long periods of drought are one of the primary natural causes of wildfires. Mitigation measures for drought are discussed under that heading.

The State's Automated Flood Warning System (which monitors precipitation levels to determine both flood and drought potential) is a mitigation measure already in place. Other mitigation efforts that should be considered include:

- educating the public on safe fire practices;
- using fire-resistant material when renovating, building, and retrofitting structures;
- moving shrubs and other landscaping away from structures;
- periodically clearing brush and dead grass from property; and
- acquiring land susceptible to wildfires to maintain it as open space.

### Mitigation Strategies

The Town of Lebanon has reviewed the “Risk and Vulnerability Assessment,” the strengths and weaknesses of its existing mitigation strategies, and developed proposed mitigation strategies. Based upon internal resources, discussions and meetings with local officials and the general public, this section presents goals, objectives and proposed mitigation strategies. These mitigation strategies guide future efforts to reduce the loss of life and property as a result of natural disasters and attempt to break the expensive cycle of repeated damage and reconstruction. The proposed mitigation strategies are further prioritized to help guide the implementation schedule.

Lebanon gave a “High” priority rating to seventeen mitigation projects as listed on the following page. These projects mitigate the most significant natural hazards that affect the town or multiple natural hazards, are considered feasible, would be effective in avoiding or reducing future losses, seem reasonable for the size of the problem and likely benefits, have political and public support, and improve upon existing programs or support other municipal priorities. All other supporting tasks were assigned a “Medium” or “Low” priority rating based on the same criteria.

**Goal: To reduce the loss of life and property and economic consequences as a result of natural disasters.**

Objective 1: To reduce the likelihood of flooding by improving existing natural and artificial drainage systems.

<u>Task</u>	<u>Who</u>	<u>When</u>	<u>Priority</u>
Rent or contract for giant vac-all or similar equipment to assist public works in keeping up to date with the removal of silt and leaves from the town’s waterways along all town roads.	Public Works	Annually	High
Contract for vehicle mounted catch basin cleaning equipment to assist public works in keeping up to date with the removal of silt and leaves from catch basins.	Public Works	Annually	High
Inventory all culverts and catch basins and prioritize, schedule, and provide funding for their upgrade.	Public Works	2017	High

Objective 2: To reduce the likelihood of flooding and natural disaster related damages by improving bridge conditions.

Task	Who	When	Priority
Replace or repair McGrath Lane #2 Bridge crossing the Yantic River; ConnDOT's 2004 inspection report rated this structure as "poor".	Contract out	2015-2017	Low
Repair Chappell Road Bridge crossing Susquetonscut Brook.	Contract out	2013-2014	High
To improve bridge stability, eliminate or replace wooden deck on Randall Road bridge.	Contract out	2014-2016	Medium

Objective 3: To reduce the likelihood of flooding and icy conditions by improving existing road conditions.

Task	Who	When	Priority
Improve Route 87 from Waterman Road to the Franklin town line, where drainage problems form puddles of water and ice resulting in many serious motor vehicle accidents.	ConnDOT	2013-2016	High
Replace culvert on Route 207 between North Street and Mack Road.	ConnDOT	2013-2016	High

Objective 4: Reduce costs associated with providing emergency services and other public services in the event of a natural disaster.

Task	Who	When	Priority
Install generator at Senior Center to provide secondary or small capacity shelter (High School is current primary, high capacity shelter).	Contract Out	2013-2018	High

Objective 5: Reduce the amount of debris from severe storms through preventive tree maintenance.

Task	Who	When	Priority
Budget appropriate money necessary to maintain and remove dead, dying, dangerous or diseased trees.	Public Works	Annually	High

Objective 6: Expand activities related to emergency preparedness and improve natural hazard response capabilities.

Task	Who	When	Priority
Install generator at Senior Center to provide secondary or small capacity shelter (High School is current primary, high capacity shelter).	Contract Out	2013-2018	High
Develop a strategy and obtain the necessary equipment to provide adequate heat at emergency shelters.	EMD, Selectmen	2013-2018	High
Obtain additional cots and bedding adequate to serve the emergency shelters in the event of an emergency or natural disaster.	EMD, Selectmen	2013-2018	High
Ensure that the emergency shelters have adequate supplies to respond to natural emergencies.	EMD, Selectmen	2013-2018	High

Objective 7: Whenever practical, incorporate natural hazard mitigation strategies into existing town projects.

Task	Who	When	Priority
Identify location for secondary access to Lake Shore Drive and prepare and file map of proposed street in the office of the town clerk in accordance with CT General Statute Section 8-29.	Planning and Zoning	2012-2018	High
Identify projects that may be eligible for FEMA natural hazard mitigation grants.	Selectmen, Contracted Planners	Annually	Medium

Objective 8: Continue to educate the public in the areas of natural disasters, mitigation activities and preparedness.

Task	Who	When	Priority
Make available literature on natural disasters and preparedness at Lebanon Town Hall, Public Library, Senior Center and web site.	EMD, Selectmen	Annually	High
Use the town website to inform the Lebanon public about how to prepare and respond to hazards and emergencies and to encourage residents to be prepared to help others in need.	EMD, Selectmen	Annually	High
Publish all town ordinances and regulations on the town's website including those that mitigate natural hazards.	Selectmen, Planning and Zoning	Annually	High
Mail emergency preparedness informational materials to every residence.	EMD, Selectmen	Repeat in 2017	High

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Objective 9: Reduce the frequency and severity of power outages and road closures as a result of wind and ice storm events.

Task	Who	When	Priority
Develop regulations to bury power lines in new development.	Planning and Zoning	2013-2018	Medium

Completed Mitigation Strategies

The following mitigation strategies for Lebanon were included in the Pre-Disaster Natural Hazards Mitigation for WINCOG Towns, a multijurisdictional, multihazard mitigation plan that was approved by FEMA on December 20, 2007. These mitigation strategies have been completed. Mitigation strategies that were not included in the 2007 Plan but that were completed since that plan was effective are also included.

Objective 2: To reduce the likelihood of flooding and natural disaster related damages by improving bridge conditions.

Task	Who	Priority	Completed
Replace or repair Waterman Road Bridge crossing the Pease Brook; ConnDOT's 2004 inspection report rated this structure as "poor".	Contracted out	High	2011
Replace or repair Taylor Bridge crossing the Bartlett Brook; ConnDOT's 2004 inspection report rated this structure as "poor".	Contracted out	High	2012
Replace or repair Mack Road Bridge crossing the Pease Brook; ConnDOT's 2004 inspection report rated this structure as "poor".	Contracted out	High	2011
Repair Tobacco Street Bridge crossing the Ten Mile Brook.	Contracted out	High	2011
Repair Goshen Hill Road Bridge crossing the Exeter Brook; this structure is eligible for funding under the Local Bridge Program FY'06 for structures under 20 feet.	Contracted out	High	2004
To improve bridge stability, eliminate or replace wooden deck on Sisson Road bridge.	Contracted out, Public Works	High	2009
To improve bridge stability, eliminate or replace wooden deck on Tobacco Street bridge.	Contracted out, Public Works	High	2012
To improve bridge stability, eliminate or replace wooden deck on Hoxie Road bridge.	Contracted out, Public Works	High	2006

Objective 3: To reduce the likelihood of flooding and icy conditions by improving existing road conditions.

Task	Who	Priority	Completed
Improve Route 207 from Seabury Road to Briggs Drive where there are drainage problems.	ConnDOT	High	2012
Reclaim and resurface Route 207 at Industrial Park Road where there are drainage problems.	ConnDOT	High	2012
Repair Lake Williams Dr., just before Lakeshore Rd., where there are drainage problems.	Public Works	High	2008
Improve Card Street where there are numerous drainage problems.	Public Works	High	2012
Improve Goshen Hill Rd., at the top of the hill, where there are drainage problems.	Public Works	High	2006
Improve Lake Williams Drive where there are drainage problems.	Public Works	High	2008
Improve Waterman Road from the intersection of Norwich Ave to Fowler Road, where there are drainage problems.	Public Works	High	2011
Improve Leonard Bridge Road, from Rt. 207 to Tobacco St. to correct flooding, drainage problems and site lines.	Public Works	High	2010
Improve Smith Road in the vicinity of Goshen Hill Road to correct approximately 300 feet of flooding and drainage problems.	Public Works	High	2010

Objective 6: Expand activities related to, emergency preparedness and improve natural hazard response capabilities.

Task	Who	Priority	Completed
Implement a program that autodials emergency personnel.	CT DEMHS implemented statewide.	High	2010

Objective 8: Educate the public in the areas of natural disasters, mitigation activities and preparedness.

Task	Who	Priority	Completed
Make available literature on natural disasters and preparedness at Lebanon Town Hall, Public Library, Senior Center, and web site.	EMD, Selectmen	High	2012
Use the town website to inform the Lebanon public about how to prepare and respond to hazards and emergencies and to encourage residents to be prepared to help others in need.	EMD, Selectmen,	High	2012
Publish all town ordinances and regulations on the town's website including those that mitigate natural hazards.	Selectmen, Planning and Zoning	High	2012
Mail emergency preparedness informational materials to every residence.	EMD, Selectmen	High	2012

Objective 10: Reduce the impact runoff and flooding have on the Amston Lake community.

Task	Who	Priority	Completed
Analyze and prepare an impact study of water runoff and flooding at Amston Lake as it pertains to potable water and sewage.	Contracted Out	High	2007

Deleted Mitigation Strategies

The following mitigation strategies were included in the Pre-Disaster Natural Hazards Mitigation for WINCOG Towns, a multijurisdictional, multihazard mitigation plan that was approved by FEMA on December 20, 2007. These mitigation strategies have been deleted. Reasons for the deletion of individual strategies are given below.

Objective 2: To reduce the likelihood of flooding and natural disaster related damages by improving bridge conditions.

Task	Who	Deleted	Reason
Improve road stability by adding a road bridge on Old Meeting House Road at the dam spillway.	CTDEP, Public Works	2013	Not critical for access. Minimal benefit for cost.
To improve bridge stability, eliminate or replace wooden deck on Simon Road bridge.	CTDEP, Public Works	2013	Road closed.

Objective 3: To reduce the likelihood of flooding and icy conditions by improving existing road conditions.

Task	Who	Deleted	Reason
Improve Route 16 from the Colchester town line easterly for 0.5 miles where there are drainage problems.	ConnDOT	2013	No known drainage issues.
Improve Mack Road, from the 90 degree corner to Rt. 207 to correct flooding and drainage problems.	Public Works	2013	No known drainage issues.
Upgrade some of the town's plows with liquid spreaders.	Selectmen, Public Works	2013	Liquid spreaders thought to be unreliable.

Objective 6: Expand activities related to, emergency preparedness and improve natural hazard response capabilities.

Task	Who	Deleted	Reason
Develop a GIS application to assist town personnel in the event of an emergency or natural disaster.	Selectmen, Contracted Planners	2013	No interest.

Objective 7: Whenever practical, incorporate natural hazard mitigation strategies into existing town projects.

Task	Who	Deleted	Reason
Use the Government Access Channel to inform the Lebanon public about how to prepare and respond to hazards and emergencies and to encourage residents to be prepared to help others in need.	Contract Out	2013	Lebanon has multiple cable services providers making this impracticable.
Review plans that fulfill DEEP Storm Water Management Phase II requirements.	Selectmen, Contracted Planners	2013	Lebanon has no urbanized areas that qualify under Phase II.

Objective 9: Reduce the frequency and severity of power outages and road closures as a result of wind and ice storm events.

Task	Who	Deleted	Reason
Develop a long-term plan to bury power lines in existing development.	Planning and Zoning	2013	Underground power lines thought to be problematic.