

Strategy for Reducing Risks from Natural Hazards in Exeter, Rhode Island

**A Multi-Hazard Mitigation Strategy
June, 2005**



Strategy for Reducing Risks From Natural Hazards in Exeter, Rhode Island: A Multi-Hazard Mitigation Strategy



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Adopted by the Town Council President

August 3, 2005

Approved by the Exeter Town Council

June 6, 2005

Approved by the Town of Exeter Planning Board

June 6, 2005

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August 3, 2005

To: ALL RECEIPIENTS

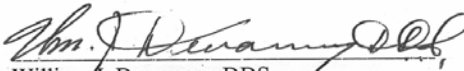
I hereby adopt and endorse the plan "Strategy for Reducing Risks from Natural Hazards in Exeter, Rhode Island."

This plan provides a framework for permanently reducing or eliminating long-term risk to people and their property from the effects of natural hazards.

The Plan, "Strategy for Reducing Risks from Natural Hazards in Exeter, Rhode Island," identifies risks, assesses the degree of vulnerability for those area "at risk" and examines possible impacts from natural disasters.

It is only with this type of planning that Exeter may become a disaster resistant community.

Sincerely,


William J. Devanney, DDS
Exeter Town Council President

TM/rs

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1.0 INTRODUCTION

1.1 WHAT IS HAZARD MITIGATION?

Hazard mitigation is an action taken to permanently reduce or eliminate long-term risk to people and their property from the effect of natural, technological, or man-made hazards.

Money spent today on preventative measures can significantly reduce the cost of tomorrow's post-disaster recovery. By planning ahead, Exeter minimizes the economic and social disruption that results from natural hazards including floods, severe weather and hurricanes which can result in the destruction of property, loss or interruption of jobs, loss of business and loss of life.

1.2 WHAT HAZARD MITIGATION CAN DO FOR EXETER

The purpose of this plan is to recommend actions and policies for the Town of Exeter to minimize the social and economic loss of hardships resulting from natural hazards. These hardships include the loss of life, destruction of property, damage to crucial infrastructure and critical facilities, loss/interruption of jobs, loss/damage to businesses, and loss/damage to significant historical structures. Hazardous events that affect Exeter include severe weather, hurricanes, conflagration and floods. To minimize the social and economic hardships, the Town of Exeter has considered the following general actions and policies:

- Revisions to the town's comprehensive plan
- Incorporation of hazard mitigation into the site plan review process
- Reviewing Building Codes
- Implementing public education/outreach
- Determining post-disaster recovery opportunities/strategies

The adoption and implementation of this hazard mitigation plan will assist Exeter in receiving assistance from the Federal Emergency Management Agency (FEMA) for pre- and post- disaster assistance such as:

- National Flood Insurance Program
- FEMA's Community Rating System
- FEMA's Pre-Disaster Flood Mitigation Assistance Program
- FEMA's Post-Disaster Hazard Mitigation Grant Program

Exeter participates in the National Flood Insurance Program (NFIP). The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. This insurance is designed to provide an insurance alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and replacing their contents.

Exeter is in the process of participating in the NFIP's Community Rating System (CRS). The CRS provides discounts on National Flood Insurance Program (NFIP) premiums in those communities that establish floodplain management programs that go beyond NFIP minimum requirements. Under the CRS, communities receive credit for more comprehensive regulations,

acquisition, relocation, or flood proofing of flood-prone buildings, preservation of open space, and other measures that reduce flood damages or protect the natural resources and functions of floodplains.

FEMA's Pre-Disaster Flood Mitigation Assistance Program makes grants available for communities to implement flood mitigation planning and activities such as acquisition, relocation, and retrofitting of structures. This program is only available for communities having a pre-existing approved hazard mitigation plan.

FEMA's Post-Disaster Hazard Mitigation Grant Program is only available for communities after a federally declared disaster. An approved mitigation plan expedites the application process for pre- and post- federal mitigation funding, as well as, assists in ensuring a funded project is eligible and technically feasible.

1.3 EXETER'S MISSION STATEMENT AND GOALS

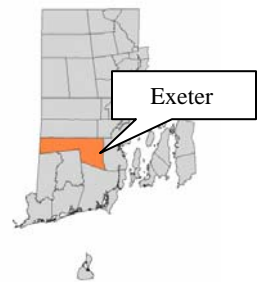
Develop a plan by which the Town of Exeter will act, within its limited means with all available assistance, to reduce the impact of natural hazards on its population and resources. Preserve and enhance the quality of life, property, and resources by identifying areas at risk from natural hazards and implementing priority hazard mitigation strategies to protect Exeter's infrastructure, population, and historical, cultural, and natural resources.

Exeter has established the following mitigation goals:

- Implement actions which protect the lives and property of Exeter's residents
- Implement actions which protect Exeter's critical facilities and infrastructure
- Implement actions which protect Exeter's cultural, historical, natural and economic resources
- Implement actions to achieve effective emergency communications

1.4 A LOOK AT EXETER

Exeter is an inland town in Washington County, located in the southern part of the state. Exeter is large in area with a small population. At its widest point the town is 14 miles wide from North Kingstown to the Connecticut border. State Highway 102 traverses the town from east to west and Route 2, 3 and Interstate 95 traverse the town from north to south. Almost all of Exeter west of Route 3 is heavily forested. A major portion of this land is State parks and includes the Arcadia Management Area. The limited commercial and retail activity in Exeter is along Routes 2 and 3. The public facilities are located on Route 102 and the DPW and Animal Shelter are located on Route 2 close to Route 102.



Exeter remains a thinly populated rural community whose current estimated population is 6,200. Exeter has no law enforcement organization, very limited public works resources, insubstantial government facilities and a heavy reliance on unpaid volunteers. The town's minimal government lacks the resources to protect property and mitigate the impact of hazards. Therefore, natural hazards could have an inordinate adverse impact in Exeter.

1.5 PLANNING PROCESS

After earlier work by a predecessor committee, Exeter resumed hazard mitigation planning in 2003, at the recommendation of the Rhode Island Emergency Management Agency (RIEMA). The current Local Hazard Mitigation Committee (LHMC) was organized under the authorization of the Town Council to create Exeter's Hazard Mitigation plan. The LHMC was chaired by the Assistant EMA Director and members included the Town Sergeant, the Chief of Exeter Rescue, the Chief of Fire Co. No. 1, a Representative of Fire Co. No. 1, the Town Council Vice-President, a Town Council member, a representative from the Planning Board, the Superintendent of the EWG School District and three public representatives.

Throughout the planning process the LHMC met regularly to discuss the plan and identify mitigation projects beneficial to Exeter. During the process the LHMC referenced the Town of Exeter Community Comprehensive Plan, emergency operations plan and town flood maps. As a result of LHMC meeting discussions, mitigation projects were chosen and prioritized based on an assessment of hazard probability, vulnerability risk levels, community needs and town budget constraints.

The plan was discussed and initially approved at a joint public hearing with the Planning Board and Town Council. After initial approval the plan was submitted to RIEMA for state review and FEMA Region 1 for conditional approval. Following FEMA conditional approval, the plan was formally approved by the Town Council and was presented to the Town Council President for adoption. Throughout the planning process the LHMC has encouraged the public to participate by advertising the public hearings and soliciting input during the sessions. Prior to the hearing, draft copies of the plan were made available to the public at the Town Hall, the library and the Post Office. The hearing was advertised in the Standard Times and the Providence Journal. Local notices were placed in the Town Hall, the Post Office, the Library and the Blueberry Hill Store. Copies of the plan were sent to the Exeter/West Greenwich School District, West Greenwich, North Kingstown, South Kingstown, Richmond, Hopkinton, Charlestown, East Greenwich, The Rhode Island DEM and the Job Corps Center for review.

The plan was formally approved by the Town Council on June 6, 2005 and was adopted by the Town Council President on August 3, 2005. After adoption, the plan was delivered to RIEMA and FEMA Region 1.

2.0 HAZARD RISK ASSESMENT

Risk includes the characteristics of the hazard and takes into account the magnitude, duration, distribution, area affected, frequency and probability of an event. This section focuses on assessing the community's risk to natural hazards by identifying which natural hazards affect Exeter, taking a look at Rhode Island's hazard history and taking a look at Exeter's hazard history. This section also takes a look at Exeter's capabilities and the mitigation efforts that the town currently has in place.

2.1 HAZARD PROBABILITY

Table 1 identifies the hazards posing the greatest threat to Exeter, including their probability over a five year period and potential estimate of monetary impact. The LHMC discussed other hazards such as drought and extreme heat and deemed them to be of negligible risk to the community based on historical data and a low probability of occurring within the next five years.

Table 1 – Hazards Affecting Exeter

Hazard	Historical Dates	Probability (Next 5 Years) (H,M,L)	Potential \$ Impact**
Severe Weather *	1978, 1996, 1997, 2001, 2003, 2005	High	\$500K+
Hurricanes	1938, 1954, 1985, 1991	Medium	\$1M+
Flooding and Dam Failure	No History	Low	\$100K+
Conflagration	1944, 1960, 1966, 1970, 1975, 1981, 1988, 1993	High	\$500K+
Earthquake	1925, 1929, 1935, 1940, 1944, 1963, 1973, 2003	Very Low	\$500K+

* Severe Weather includes: Nor'easters, Winter Storms, Ice Storms, Severe Thunderstorms, and Tornadoes

** Amounts based on past disasters and repetitive losses

2.2 EXETER: GEOGRAPHY, HAZARDS AND HISTORY

Exeter is an inland town in Washington County, located in the southern part of the state. At its widest point the town is 14 miles wide from North Kingstown to the Connecticut border. East and West Greenwich, both in Kent County, border Exeter to the north. On the south the town borders South Kingstown, Richmond and Hopkinton. North Kingstown borders Exeter to the east and on the west the town borders Connecticut. The Queens River flows south through the east-central part of town. Most of Exeter west of Route 3 is heavily forested with State Parks and the Arcadia Management Area. The rest of Exeter is characterized by large properties and undeveloped land with significant tree growth. Hills and valleys with ledge rock and extremely rocky soil predominate; some farms remain in the flat land in the eastern portion of the town. Elevations are not significant. Former small farms with extensive stone walls are now overgrown with oak, maple, beech and other trees. Other than state routes, the local roads are narrow without ditching.

Severe weather and hurricanes are the primary hazards affecting Rhode Island. Severe weather includes nor'easters, winter storms, ice storms, severe thunderstorms, and tornadoes. These hazards can result in flooding and high winds causing damage to residential homes, businesses, historical buildings, dams, bridges and other critical infrastructure.

Severe Weather History

The majority of Rhode Island lies outside the heavy snow and ice regions of the northeast. Due to its maritime climate, Rhode Island generally experiences cooler summers and warmer winters than inland areas. However, snow and ice do occur and can result in more extensive damage than one would expect. The two major threats from these hazards are loss of power due to ice on electrical lines and snow loading on rooftops. One of the most memorable winter storms was the "Blizzard of '78" which stalled over Lincoln, RI. The storm delivered 24 to 38 inches of snow. Motorists abandoned their cars on Interstate Highways and local roads. The governor declared a state of emergency, closing highways and businesses for the week required to remove snow. Recent blizzards and major snowstorms occurred in 1993, 1996, 1997, 2001 and 2005 causing millions of dollars in damage, many collapsed roofs, the loss of power in some areas for days and the loss of life.

The Blizzard of '78 brought around 2 feet of snow to the area, closing schools and businesses for a week. Roads were blocked for days and there were power outages throughout the area. The Blizzard of '96 brought very heavy snow totaling 1 to 2 feet across the state, disrupting transportation systems and closing schools, stores and businesses. The April Fool's Day storm of

'97 brought heavy snow and strong winds which created blizzard conditions. Snowfall accumulations set all-time records for April across most of the state. Exeter received about a foot and a half of snow. Schools and some businesses were closed. Power outages left 55,000 customers state-wide in the dark. In December of 2003 a major winter storm brought heavy snow and strong winds to the area. Exeter received 12 inches of snow. Transportation was disrupted and visibility was poor. The Blizzard of '05 brought around 2 feet of snow to Exeter. High winds made travel and visibility difficult. The Governor declared a state of emergency, closing all state and town facilities.

Wind events are quite normal in Southern New England and happen regularly each year. In the winter months the area is susceptible to high winds from Nor'easters and winter storms. Spring and summer seasons usually bring a number of severe thunderstorms to the region. During the late summer and fall seasons the area is at risk from hurricane winds.

Severe weather and high wind events occur annually in Exeter due to winter snow storms and summer thunderstorms; however no specific cases of significant damage have been recorded. Isolated instances of power outages have occurred due to these events.

Hurricane History

Southern New England has been affected by 39 tropical weather systems since 1900; 25 hurricanes and 14 tropical storms. Nine of the 25 hurricanes made landfall along the southern coastline of Rhode Island and Massachusetts. In 1954, New England endured three hurricanes; Carol, Edna, and Hazel. Over the last seventy-five years Rhode Island was directly affected by six storms which had hurricane force winds at landfall. These included three Category 3 hurricanes directly impacting Rhode Island and causing millions of dollars in damage and hundreds of deaths. The most recent hurricane to directly impact Rhode Island was hurricane Bob in 1991, a Category 2 hurricane.

Table 2: Major Rhode Island Hurricanes

Hurricane	Category	Wind Speed at landfall	Damage to RI
Hurricane of 1938	3	Sustained to 91 mph, gusts to 121	Extensive - roofs, trees, crops. Storm surge 12 to 15 ft. destroyed costal buildings
Carol, 1954	3	Sustained to 100 mph, gusts to >125	Westerly to Narragansett coastal communities wiped out, Downtown Providence under 12 feet of water, 14 ft. storm surge in upper bay.
Edna, 1954	2	Sustained to 95 mph, gusts to 110	Inland flooding. Rivers rose several feet above flood stage. Knocked out electrical power.
Donna, 1960	3	Sustained to 95 mph, gusts to 130	Moderate storm surge, extensive beach erosion. Wind damage to trees and utility poles causing major power outages.
Gloria, 1985	2	Sustained to 81 mph, gusts to 100	Minor coastal flooding and erosion. Scattered power outages.

Bob, 1991	2	Sustained to 100 mph, gusts to >105	Storm surge of 5 to 8 feet, extensive beach erosion. Wind damage to trees & utility poles, 60% of South East RI lost power.
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Although wind damage did occur in the Hurricane of '38, specific data is not available. Exeter's inland location has, for the most part, protected it from direct hurricane strikes. Hurricane Gloria in 1985 and Hurricane Bob in 1991 resulted in power outages in Exeter that lasted up to 3 weeks. The outages disrupted farm, commercial and industrial activities and caused personal inconvenience and health risks. Exeter relies on wells for water so loss of power also means loss of water, unless the house or building has a generator.

Flooding and Dam Failure History

Historically, torrential rainfall, severe thunderstorms, large snowmelts, and hurricanes (rainfall and/or storm surge) are the primary causes of flooding in Exeter as well as the rest of Rhode Island. These hazards can result in urban street, basement, and riverine flooding. Since 1993, the National Climate Data Center has reported 48 floods in Rhode Island. There are also many dams throughout the state that are rated by the RI Department of Environmental Management as high hazard, significant hazard, and low hazard. The high hazard and significant hazard dams generally pose a risk of flooding in the event of failure.

Several low lying roads and intersections have been briefly flooded by heavy rains, particularly the entrance to the Ladd property now home to the Job Corps Academy. Exeter has no significant hazardous dams and twenty-two low hazard dams. Boone Lake and Dorset Mill Pond, located above roadways, are the only dammed bodies of water in Exeter that would affect the public. All of the other dams are located on undeveloped land and pose no hazard. No records of flood damage are known to be available and there are no known repetitive losses.

Tornado History

Tornadoes are generally produced by severe thunderstorms and occasionally by hurricanes; Rhode Island, however, ranks 49th out of 50 states for the occurrence of tornadoes. Based on data from 1950 through 1995, the State had 8 tornadoes; there were 23 injuries and no fatalities. The total cost of tornadoes between 1950 and 1995 was \$1,979,656.00. There were four reports of tornadoes as Hurricane Bob came ashore. A devastating tornado occurred across the border in Worcester, MA in 1953. More than 90 people were killed and over 1,300 injured. Damage estimates were over \$52 million.

Table 3 Major Rhode Island Tornadoes

YEAR	TORNADOES	INJURIES	ADJUSTED COST
1972	1	None	None
1985	1	None	None
1986	3	20	\$1,731,170
1989	1	3	\$127,511
1990	1	None	\$120,975
1994	1	None	None

No recorded tornado history or damage data is known to exist for Exeter.

Conflagration History

In the past five years Rhode Island has experienced 100 to 215 wildfires a year. On average the fires consumed between one to two acres of land. The probability of a major fire is considered to be low; however Rhode Island has experienced some major fires in the past. The most devastating wildfire was the Coventry fire of 1941 which consumed 18,000 acres of forest. A wildfire in Exeter in 1951 consumed 5,000 acres. The most devastating urban fire, in terms of loss of life, took place in West Warwick when the Station Nightclub caught fire during a rock band's performance involving pyrotechnics. A fire in an empty mill complex in Pawtucket, fed by gale force winds, spread to 17 homes in the nearby area. In Woonsocket, a single electric wire spark destroyed an entire mill block. Recent wild and urban fire events in Rhode Island point out the necessity for considering conflagration in mitigation planning.

In addition to the 5,000 acre fire of 1951, numerous fires have burned in forest and residential areas. In 1974, 300 acres along the Exeter-North Kingstown line burned. In 1975, 500 acres along Slocum Road burned. In 1985, 200 acres along Sunderland Road burned and 75 acres at the Ladd Center burned. All of the fires occurred on open land and were fed by smaller fires. Exeter experiences several small fires a year. To date they have been contained, but population increase, increased activity in the forests and a lack of water supply leave the town very vulnerable to wildfires.

Earthquake History

Earthquakes in New England are a greater risk than most people realize. There have been 31 recorded earthquakes in this state over the last 220 years. Rhode Island can feel the effect of an earthquake occurring in the Northeast Region. Rhode Island has experienced several minor earthquakes in the last few years, but no extensive damage has occurred.

Two earthquakes are believed to have had their epicenters in Rhode Island:

- The February 1883, earthquake was felt from New London, Connecticut, to Fall River, Massachusetts. It was felt with an Intensity V from Bristol to Block Island.
- Another earthquake with a magnitude of 1.8 occurred in October 2003. The epicenter was determined to be 15 Miles SSW of Providence.

According to the RI Emergency Management Agency (RIEMA), experts believe that earthquakes are likely to strike the eastern half of the country within the next 50 years. The US Geological Survey (USGS) estimates that there is a 40 to 60 percent chance of experiencing an earthquake of magnitude 6.0 or greater on the Richter Scale (1 to 10) in the central or eastern United States within the next 30 years.

No recorded earthquake history or damage data is known to exist for Exeter.

2.3 CAPABILITY ASSESSMENT

Exeter has initiated many studies and activities over the years that have laid the foundation for the development of this mitigation strategy. In 1994 the town developed its first comprehensive plan. This plan outlines actions that can be taken to address increased development pressures, economic stability, open space and recreation issues, and public infrastructure and facilities. The comprehensive plan outlines goals, policies, issues, and actions to provide a framework for everyday operations within the town. The town recognized that incorporating mitigation initiatives (both pre-disaster and post-disaster) into the comprehensive plan would not only benefit the community by reducing human suffering, damages and the cost of recovery, but would also assist in building and maintaining the economic health of the town.

Exeter implements and enforces the state building code and is in the process of participating in the Community Rating System (CRS). Exeter is currently not rated. Exeter works regularly with neighboring communities to protect valuable natural resources and preserve open space through the Washington County Regional Planning Council.

Exeter revised its Emergency Operations Plan (EOP) in 2004. The plan details the town's responsibilities and actions in the event of an extraordinary emergency situation associated with natural, man-made and technological disasters. As part of the EOP update, the hazards identified have been reviewed, assessed, and prioritized so they may be linked to mitigation actions identified in this plan. Exeter's EOP offers pre- and post-disaster strategies and measures designed to utilize emergency response organizations for protection of Exeter's population and infrastructure, thus reducing the loss of life and limiting damage to private and public property.

The use of mass care facilities during an emergency is dependant on a variety of circumstances. These include warning time, public awareness, willingness to evacuate, the level of encouragement from public officials and the availability of mass care facilities. In addition to the Exeter-West Greenwich Jr/Sr High School, shared with West Greenwich, as an identified mass care facility, Exeter has identified 7 potential emergency mass care facilities throughout the town. Surveys of these facilities have been completed and they are awaiting Red Cross review and certification. Three of these potential mass care facilities have emergency electric power. The American Red Cross (ARC) requires 40 square feet of usable space per person in each mass care facility. According to FEMA, in the event of a natural disaster that requires mass care facilities, twenty percent of an evacuated population will seek public mass care facilities. The mass care facilities are free of flood risk and the total mass care facility capacity is greater than 2,000. In the event of overcrowding at the primary designated mass care facilities, Exeter will open secondary facilities.

ARC certified mass care facilities:

1. Exeter/West Greenwich Jr/Sr High School (Primary)

The mass care facilities in Exeter surveyed and awaiting ARC certification are:

1. Metcalf Middle School (Primary)
2. Conanicus Center (Primary)*
3. Delmyra Kennels (Primary)
4. Exeter Chapel (Secondary)
5. Wawaloam School (Secondary)
6. Fire Station 1 (Secondary)*
7. Fire Station 2 (Secondary)*

* Indicates emergency electric power

Exeter looks for opportunities to improve its other essential services and critical facilities. The town has recently established a fire district in order to stabilize adequate fire, rescue and dispatch funding and has acted to strengthen the budget of the trash/recyclables processing station.

Regular tree trimming is coordinated with the Narragansett Electric Company. Roadside and stream bed debris management is governed by limitations in the Public Works budget. Public education programs are to be identified and proposed as part of this Plan.

FEMA has recently developed a software package called HAZUS that is used to help assess the risk from earthquakes. Information in this database includes building materials, design levels, economic value, population and bridges. This software allows the user to input a scenario of, for example, a 5.0 on the Richter Scale and the model comes up with what damages can be expected based on the intensity and location inputted. The state is now working on compiling more state-specific datasets for use with this software program that would supplement the generic Northeast states information that is currently used. Without data specific on such things as transportation, utility systems inventory, hazardous materials, demographics, vehicles inventory, building stock and essential facilities, it is impossible to do an accurate risk assessment using this software.

Exeter has access to but does not currently use modeling tools such as HAZUS to assess risks associated with some of the most severe natural hazards. If needed, Exeter has access to the modeling tools through RIEMA.

3.0 ASSESSING VULNERABILITY

Vulnerability indicates what is likely to be damaged by the identified hazards and how severe that damage could be. This section focuses on Exeter's vulnerable areas in regards to the identified hazards, what is at risk in these areas (structures, population, natural resources) and what the impacts will be (loss of life, environmental damage, inconvenience to residents). The Risk Assessment Matrix (Table 6) summarizes the major vulnerable areas in Exeter. This section also takes a look at Exeter's population at risk, the potential economic losses and future development trends.

With help from the University of Rhode Island Environmental Data Center, Exeter mapped high risk areas in the town (see maps on pages 11 & 12). These maps indicate the flood zones, repetitive loss areas, areas of historic flooding (not marked on the FEMA Flood Insurance Rate Map), evacuation routes, dams, bridges, and American Red Cross-approved shelters.

Vulnerability – Severe Weather

Exeter rates its vulnerability to severe weather as high. Exeter is most vulnerable to heavy snowfall, ice storms, and high winds. Because most areas of Exeter are forested they are vulnerable to power outages due to any one of the three hazards. The majority of Exeter relies on wells for water, so any loss of power also means loss of water, unless the house or building has a generator. Population concentrations in the South Rd. area, properties surrounding Boone Lake and scattered subdivision clusters are located in cleared areas making them less vulnerable to damage from downed trees. The area west of Rt. 3 is heavily forested with very few residences, making it less vulnerable to property damage from downed trees. Many residences in Exeter are located in heavily wooded areas and are the most vulnerable to damage from falling trees. Ice and heavy snow could knock out power and water, create hazardous travel conditions, and isolate residents for extended periods due to the isolated local roads and limited capacity of the Public Works Department to keep roads clear. Records provide limited history of winter storm damage amounts.

Vulnerability – Hurricanes

Exeter rates its vulnerability to hurricanes as medium. Exeter is vulnerable to hurricanes from June through November. While storm surges and coastal flooding are not likely to affect Exeter, the town is very vulnerable to hurricane winds. Hurricane-force winds can cause power outages

resulting in the loss of well water use, blocked roads limiting emergency response, personal injury and property damage. Torrential rainfall, which often accompanies hurricanes, could result in localized flooding not normally seen from regular rainfall amounts. The same areas identified under severe weather are also vulnerable to hurricanes. Many areas could be isolated for extended periods by tree fall on remote roads and the limited capacity of the Public Works Department to keep roads clear.

Vulnerability – Flooding and Dam Failure

Exeter rates its vulnerability to flooding and dam failure as low. Exeter’s inland location and limited amount of water bodies, makes it less vulnerable to flooding. Limited flooding of roadways and intersections, including the entrance to the Ladd property, has occurred in the past. Torrential rainfalls from hurricanes pose the greatest threat to Exeter in terms of flooding. Exeter has twenty-two low hazard dams. Infrastructures vulnerable to a dam failure are East Shore Road and West Shore Road, which are located around Boone Lake, and Yawgoo Valley Road. There are no critical facilities, essential services, bridges or buildings vulnerable to flooding or dam failure.

Exeter’s flood zone maps date back to 1982 making them the second oldest maps in the state. The town needs to work with RIEMA and FEMA to update the maps to reflect new developments within the town.

As seen in Table 4, FEMA estimated that the value of property insured by the NFIP in Exeter is \$878,000.

Table 4: Summary of National Flood Insurance Program Activity in Exeter

Total Policies	Value of Property Covered	Policies in V-Zone*	Policies in A-Zone*	Claims Since 1978
6	878,000	0	3	0

* V-zone refers to the velocity zone, where waves greater than 2.9 feet are feasible during a 100-year flood. A-zone refers to other areas within the 100-year flood zone with less than 2.9-foot waves (FEMA, 1997).

Vulnerability – Conflagration

Exeter rates its vulnerability to conflagration as high. Wildfires could affect Exeter at any time; however the wildfire season begins in the spring and lasts through the fall. The town experiences several small wildfires each year. Exeter is particularly vulnerable to wildfires due to heavy forestation throughout many areas of the town. The Arcadia Management Area and Beach Pond State Park in the west are very vulnerable to conflagration due to limited prevention/containment activity by the state, increased activity within the forests, and the limited resources of the local volunteer fire companies. There is some fire suppression equipment located in Arcadia, but there are limited personnel available to operate it. The fire trails in Arcadia are overgrown. The few, scattered existing dry hydrants are insufficient for effective suppression of small fires.

Vulnerability – Earthquakes

Exeter rates its vulnerability to earthquakes as very low due to its rural setting and the minimal number of structures and infrastructure that would be affected. While Rhode Island has only experienced minor earthquakes, scientists believe that there is a 40 to 60 percent chance of

experiencing an earthquake of magnitude 6.0 or greater on the Richter Scale (1 to 10) in the central or eastern United States within the next 30 years. Some of the risks from earthquakes include building collapse, disruption of sewer and water lines, and disruption of land communication lines. Exeter is vulnerable to power loss, well damage and communication failure due to an earthquake.

Population at Risk

According to FEMA, in the event of a natural disaster that requires mass care facilities, twenty percent of an evacuated population will seek public mass care facilities. Currently Exeter is capable of providing mass care for over 2,000 people in the event of a natural disaster. According to the 2000 U.S. Census Exeter had a population of 6,061 people, which has since grown to an estimated 6,200 in 2005. Exeter will open secondary mass care facilities in the event of overcrowding at the primary mass care facilities. Municipal facilities along with most of the shelters, including primary ones, lack emergency generators, making them vulnerable to power outages. Exeter has established evacuation routes to shelters but has not posted evacuation signs yet. Evacuation out of town requires separate planning and has not been addressed.

It is important to note that Exeter has experienced a population increase of approximately 14% from 1990 to 2005. This plan recognizes that residential development is occurring and has proposed actions that not only address the current needs of the town in the event of a natural disaster but also the future needs of the town.

Potential Losses to the Local Economy

Since property taxes account for eighty six percent of Exeter's revenues and are heavily residential, it is imperative that the community and its residents take precautions to protect their investments. According to Exeter's Finance Department, the average budget for Exeter is 12 million dollars per year. As seen in table 4, FEMA estimated that the value of property insured by the NFIP in Exeter is \$878,000. Table 1 lists the potential monetary impact that severe weather, hurricanes, flooding, conflagration and earthquakes can have on Exeter. Any one of these hazards could also cause the loss of local business, furthering the community's loss.

Future Development Trends

Exeter has experienced an increase in population figures going from 5,461 in 1990 to an estimated 6,200 in 2005. Exeter is characterized by significant open space and public land intermixed with a limited amount of industrial, commercial, medium and low density residential and agricultural. Most residential development has been centered on the eastern third of the town while commercial development has been centered on Route 2 and Route 3. A proposed large residential project is currently the subject of legal and zoning issues. The project is proposed for land adjacent to Route 2 just south of the Veteran's Cemetery. Another residential development has been proposed for land adjacent to the library on Route 102. Neither of the proposed developments is located in a flood zone or other area considered especially vulnerable to Exeter specific hazards. Density control for both proposals is an issue as it impacts water supply and septic function in a town with no public water or sewer system. Future commercial development would likely occur on Route 2 and Route 3 in areas that are not vulnerable to flooding. The town continues to work with the Nature Conservancy and the State to preserve open space. The town, in collaboration with the Nature Conservancy, recently received a \$300,000 open space grant from the State.

Exeter has 13,183 acres (excluding farm, forest and open space) of buildable land left. These acres are zoned for residential development, but the amount of homes that could be built on this land depends on future zoning decisions and appeals.

Table 5 provides an overview of land use in Exeter for 2000.

Table 5, Summary of Exeter Land Use 2000

Land Use	Residential	Commercial	Public & Semi-Public	Railroad & Utility	Vacant Land	Agricultural	Total
2000 (acres)	3,130	820	5,650	141	13,183	12,565	35,489

Exeter Tax Assessor 2004

3.1 RISK ASSESSMENT MATRIX – VULNERABLE AREAS

The LHMC has met regularly to discuss the town’s vulnerability to natural hazards, select projects and develop actions that will help to meet Exeter’s mitigation goals. Organization of projects and actions was accomplished by thoroughly reviewing the hazards, identifying areas, essential services, critical facilities and infrastructure in Exeter which are at risk and identifying present dangerous situations to Exeter’s population which are susceptible to costly damage. The result of these efforts was the Risk Assessment Matrix (Table 6) that follows. Vulnerable areas have been prioritized and ordered as such. Due to Exeter’s very low vulnerability to earthquakes and the minimal number of structures and infrastructure that would be affected, the LHMC decided not to include any earthquake related actions and instead focus action efforts on the hazards that Exeter is more vulnerable to.

Table 6: Risk Assessment Matrix

	Vulnerable Areas (in order of priority)	Location	Ownership	Natural Hazard	Primary Problem/Effect	Mitigation Objective	Risk H - Historical P - Potential
1	Communications Center/Alternate EOC	Route 102	Public	Severe weather, hurricane, wind	- Downed power and communication lines - Structural damage - Outdated communications systems	Protect essential services and emergency operations	H, P
2	Fire Company 2 Response Facility/ EOC	Route 3	Public	Severe weather, hurricane, wind	- Downed communication and power lines - Outdated communications systems	Protect response, essential services and emergency operations	H, P
3	Essential Services	Town-wide	Town	Severe weather, conflagration, high winds, hurricane, flooding	- Downed communication and power lines - Blocked roads from tree limbs and snow - Damage from fire - Flooding caused by debris - Property damage	Protection of communication and power lines, roads, property and residents.	H, P

Table 6: Risk Assessment Matrix

	Vulnerable Areas (in order of priority)	Location	Ownership	Natural Hazard	Primary Problem/Effect	Mitigation Objective	Risk H - Historical P - Potential
4	Private buildings, homes and property	Town-wide	Private	Conflagration, severe weather, hurricane, wind	- Property damage/destruction - Downed communication and power lines - Loss of well water	- Fire prevention - Protection of life, health and safety of residents	H
5	Public Facilities	- Town Hall - Ten Rod Rd. - Public Works – Route 2 - Metcalf School – 30 Nooseneck Hill Rd.	Public	Severe weather, hurricane, wind	- Downed electrical/communication lines	Protect essential services	P
6	State Management Areas and interior roads	West of I-95	Public and private	Conflagration	- Fast spreading fire - Damage or destruction to homes	Fire prevention, increase response and rescue ability	H
7	Roads	Town-wide	Public	Flooding	- Interrupted traffic - Isolated residents - Property damage	Ensure travel, decrease cost of property damage and clean-up	H

Table 6: Risk Assessment Matrix

	Vulnerable Areas (in order of priority)	Location	Ownership	Natural Hazard	Primary Problem/Effect	Mitigation Objective	Risk H - Historical P - Potential
8	Rivers and streams	Town-wide	Public and private	Flooding	- Flooding - Environmental deterioration - Property damage	Protection of environment and property	P

4.0 MITIGATION ACTIONS

4.1 MITIGATION ACTIVITIES

Municipal officials in Exeter assessed the risks to the town and developed mitigation actions that address a mix of structural initiatives (building code enforcement, repair and retrofit of existing structures, and removal of vulnerable structures) and nonstructural initiatives (educational programs, preventing construction in high-hazard areas, enforcing regulations) to minimize the effect of future hazards. By creating this strategy and incorporating it into the town's comprehensive plan, Exeter has established an ongoing process that will make hazard mitigation a routine part of municipal government.

In completing the risk and vulnerability analysis, the LHMC considered projects and actions that would reduce Exeter's vulnerability to the identified hazards. The Risk Assessment Matrix is the basis for the mitigation actions presented in section 4.2. The LHMC considered the goals of this plan (section 1.3, page 2) and prioritized the matrix and the associated actions based on historical damage, safety of the population, property protection, and consistency with town-wide goals and objectives. Objectives were aligned to public health risks, evacuation and mass care considerations, disruption of essential services, and potential economic losses to Exeter.

The LHMC determined that the identified objectives could be met by considering actions aligned to the following:

- Planning and Regulations
- Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Public Information and Outreach, Incentive Programs
- Protection of Essential Services (including critical facilities)
- Post Disaster Opportunities

This committee has worked to set goals and objectives that are bounded by a time frame and are compatible and consistent with state hazard mitigation goals. Upon submittal of this plan to RIEMA, the State Hazard Mitigation Committee (SHMC) is expected to review and approve these goals and objectives to ensure consistency with statewide goals and objectives. The time frames used for these strategies are as follows:

- Short Term = 0 to 6 Months
- Medium Term = 6 to 18 Months
- Long Term = 18 Months to 5 Years

The following actions use the Risk Assessment Matrix (Table 6) to identify areas at risk, offer mitigation strategies and consider benefits. Each action offers a discussion of the project and if applicable, includes the options considered. Multiple actions associated with a vulnerable area reflect town priorities and are simply prioritized high, medium, or low. If known, the actions include cost estimations and assign responsible parties to lead the efforts to complete the action. Other relevant departments/agencies that can offer support to the project are also listed. Finally, possible finance options are offered.

4.2 ACTION PLAN

Vulnerable Area One

Communications Center/Alternate EOC

Action 1 – Aggressively trim trees to an adequate distance from all utility lines serving this critical facility. The Communications Center/Alternate EOC is the towns' dispatch and rescue facility and is the only town facility that is staffed around the clock. Tree trimming will help prevent damage from severe weather and high winds, keeping the facility operational.

- Action Type – Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Department of Public Works
- Supporting – Utility Companies
- Financing Options – Annual budget
- Cost Estimate – \$10,000/year
- Time Frame – Short term
- Benefit – Maintain communications systems at Communications Center/Alternate EOC during and after severe weather events, hurricanes and wind storms.

Action 2 – Improve the critical building by making structural modifications and retrofitting the building. The Communications Center/Alternate EOC is an old frame building which is vulnerable to high winds. The roof and walls should be reinforced and hurricane shutters need to be installed. The roof should be re-shingled. These modifications will increase the ability of the structure to withstand hurricane level winds.

- Action Type – Protection of Essential Services (including critical facilities), Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Town Council, Fire District, EMA
- Financing Options – Annual budget, FEMA Pre Disaster Mitigation Grant
- Cost Estimate – \$50,000
- Time Frame – Long term
- Benefit – Maintain a structurally sound building.

Action 3 – Evaluate the communication and computer (internet, fax, telephone and radio) equipment with RIEMA and upgrade any equipment as necessary. Evaluate the back-up generator to ensure its ability to power all of the systems. This is the only facility in town that that is staffed around the clock and will briefly serve as the EOC until the designated EOC (Fire Company 2) is operational.

- Action Type – Protection of Essential Services (including critical facilities)
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Town Council, Fire District, EMA
- Financing Options – DHS Grant
- Cost Estimate – \$25,000

- Time Frame – Medium term
- Benefit – Maintain essential service operational capability.

Vulnerable Area Two

Fire Company 2 Response Facility/EOC

Action 4 – Complete the wiring and controls of the back-up electrical generator and include auto-start capability. The facility has been designated as the EOC because it has adequate space for Emergency Response team operations. The EOC needs a generator with auto-start capabilities to ensure that there are no power interruptions.

- Action Type – Protection of Essential Services (including critical facilities)
- Pre or Post Disaster – Pre
- Priority – High
- Lead – EMA
- Supporting – Town Council, Fire Company
- Financing Options – DHS Grant
- Cost Estimate – \$40,000
- Time Frame – Medium term
- Benefit – Ensure continued emergency response operations and EOC capabilities in the event of a power outage.

Action 5 – Evaluate the EOC communications/computer systems with RIEMA and upgrade the equipment as necessary. The EOC facility needs reliable communications and computer equipment in order to function as the towns' EOC.

- Action Type – Protection of Essential Services (including critical facilities)
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Town Council
- Supporting – Fire District, EMA
- Financing Options – DHS Grant
- Cost Estimate – \$40,000
- Time Frame – Medium term
- Benefit – Maintain essential service operational capability

Action 6 – Aggressively trim trees to an adequate distance from all utility lines serving this critical facility. The building houses Fire Company 2 and the EOC and needs to be operational at all times, especially during hazard events. Tree trimming will help prevent damage from severe weather and high winds.

- Action Type – Protection of Essential Services (including critical facilities), Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Department of Public Works
- Supporting – Utility Companies
- Financing Options – Annual budget
- Cost Estimate – \$10,000
- Time Frame – Short term

- Benefit – Maintain communications systems at Fire Company 2 Response Facility/EOC during and after severe weather events, hurricanes and wind storms.

Vulnerable Area Three

Essential Services

Action 7 – Acquire a SUV or crew cab pickup for emergency responders to access disaster sites, blocked areas, response sites needing action, and stranded residents. The present town owned vehicles are the Town Sergeant’s car and several dump trucks in poor condition. A SUV or crew cab pickup would allow access to disaster areas and stranded residents that the current vehicles would not be able to access.

- Action Type – Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Public Works
- Supporting – Town Council
- Financing Options – Line 58:Annual budget
- Cost Estimate – \$35,000
- Time Frame – Short term
- Benefit – Protection of residents and access to isolated areas.

Action 8 – Develop and implement public education and outreach programs addressing preparedness, prevention and emergency response for wildland/urban interface fires. Residents need to be educated about preparedness, prevention and emergency response for wildland/urban interface fires including keeping the area around structures and houses clear and having adequate road and driveway width for fire and rescue apparatus. Implement planning requirements for all future development.

- Action Type – Public Information and Outreach, Incentive Programs, Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – Medium
- Lead – EMA and Fire District
- Financing Options – Annual budget
- Cost Estimate – \$1,000
- Time Frame – Medium term
- Benefit – Protection of property from wildfires and adequate access for emergency responders.

Action 9 – Expand the annual tree trimming program, beyond Narragansett Electric’s level, to more aggressively clear utility lines serving business and heavily populated areas. Aggressive tree trimming will reduce power and communications loss and road blockages from hurricane, severe weather and wind damage.

- Action Type – Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Department of Public Works

- Supporting – Utility companies
- Financing Options – Town budget
- Cost Estimate – \$25,000 annually
- Time Frame – Medium term
- Benefit – Prevention of power and communications loss to businesses and residents. Reduce the amount of road blocking debris after hurricane, severe weather and wind damage to enable emergency vehicle access throughout the town.

Action 10 – Replace unusable/inadequate road clearing equipment. Exeter currently has 6 trucks used to clear roadways during severe weather events. The age and condition of three of the trucks severely compromises Exeter’s response capability to severe weather events. Two International dump trucks from 1984 and 1991 and one GMC truck from 1989 need to be replaced. The 1984 and 1991 trucks are deteriorated and require constant, costly repairs to stay in service. The 1984 truck is the oldest and least reliable in the fleet. Their current condition could prevent them from passing inspection. The 1989 truck is out of service due to its condition. Often only three of the six trucks are operational. Exeter also owns one front loader which is in need of replacement due to deterioration. The front loader is a critical vehicle used for loading sand and salt into the dump trucks and clearing parking lots.

- Action Type – Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Town Council
- Supporting – Public Works
- Financing Options – DHS Grant
- Cost Estimate – \$80,000 each dump truck, \$40,000 front loader
- Time Frame – Short term
- Benefit – Improved ability to clear roads blocked by snow/ice.

Action 11 – Increase the towns’ ability to execute the debris management plan by acquiring a back hoe, portable generator and brush hog. Fallen debris and tree limbs resulting from windstorms, severe weather and hurricanes block roads, storm culverts and run-offs and collect under bridges, in dams and retention ponds. Prompt removal and proper disposal of this material will decrease the potential of road and property flooding.

- Action Type – Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – Medium
- Lead – Planning Board, Town Council, Public Works Department
- Financing Options – Annual budget, FEMA Pre Disaster Mitigation Grant
- Cost Estimate – \$40,000 back hoe, \$10,000 generator and brush hog
- Time Frame – Short term
- Benefit – Reduce the amount of debris and flooding caused by debris build-up.

Vulnerable Area Four

Private Buildings, Homes and Property

Action 12 – Create a town-wide education program to ensure that all properties are visibly numbered. Many homes and properties are in heavily wooded areas with dense tree and shrub growth surrounding the structure, making them very vulnerable to wildfires. Many of these properties are set back from the road and are hard for emergency responders to locate.

- Action Type – Public Information and Outreach, Incentive Programs
- Pre or Post Disaster – Pre
- Priority – High
- Lead – EMA
- Supporting – Fire District
- Financing Options – EMA grants
- Cost Estimate – \$5,000
- Time Frame – Short term
- Benefit – Ensuring that all properties are visibly numbered would greatly benefit emergency responders.

Vulnerable Area Five

Public Facilities

Action 13 – Equip key government and essential service facilities with back-up generators. The Town Hall, public works facility, and the Metcalf School do not currently have back-up generators. Exeter’s law enforcement is provided by the State Police, who operate a small post in the Exeter Town Hall. The Town Hall requires power to continue State Police operations and critical government functions. The public works facility requires power to operate the garage and maintenance functions. The Metcalf School is a primary mass care facility for the town. The back-up generator would be used for mass care purposes only. All of these facilities need to function in the event of a power outage.

- Action Type – Protection of Essential Services (including critical facilities)
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Town Council
- Supporting – EMA, Metcalf School
- Financing Options – Annual budget, DHS Grant
- Cost Estimate – \$50,000 for Town Hall, \$30,000 for public works facility and \$75,000 for Metcalf School
- Time Frame – Short term
- Benefit – Ensure that a primary shelter, Town Hall, and the public works facility can all function in the event of a power outage.

Vulnerable Area Six

State Management Areas and Interior Roads

Action 14 – Coordinate with DEM to explore effective measures to prevent and suppress fires in forested State Management areas. Evaluate water sources, storage, access routes and education. Explore state programs for dry hydrants, controlled burning and the cutting of fire trails. State forests are a major section of Exeter. In the event of a fire, state resources are limited requiring Exeter authorities to be the primary responders.

- Action Type – Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – High
- Lead – State DEM, Fire District, Town Council
- Financing Options – Town budget
- Cost Estimate – Staff time
- Time Frame – Medium term
- Benefit –Town responsibilities and measures applicable to fire prevention and containment within state properties are defined.

Vulnerable Area Seven

Roads

Action 15 – Install a culvert and a dry hydrant on Yawgoo Road. The culvert will replace a failing pipe currently located under the road. The existing pipe no longer adequately carries drain water. A pipe collapse would wash out the road and could possibly isolate four homes. Clearing, excavating, ditching and placing an adequately sized culvert is needed. The dry hydrant will provide a source of water in the event of a fire. A dry hydrant is a 6 inch diameter pipe sunk vertically into the ground deep enough to reach the underground water source.

- Action Type – Property Protection (including acquisition and elevation), Structural Projects, Maintenance, and Repair
- Pre or Post Disaster – Pre
- Priority – Medium
- Lead – Public Works Department
- Financing Options – Annual budget, FEMA Grant
- Cost Estimate – \$65,000
- Time Frame – Medium term
- Benefit – Minimize flooding of roads and property and provide a water source for firefighting needs.

Action 16 – Review the town’s comprehensive plan along with State and Federal stormwater management requirements. Ensure that the construction and maintenance program for storm drains minimizes flooding from storm water run-off.

- Action Type – Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – Medium
- Lead – Planning Board
- Supporting – Town Council
- Financing Options – Annual budget

- Cost Estimate – Staff time
- Time Frame – Medium term
- Benefit – Assure compliance with drainage requirements of comprehensive plan. Ensure that flooding of roads and property is minimized.

Vulnerable Area Eight

Rivers and Streams

Action 17 – Protect aquifers, wetlands, marshes and other fragile environmental areas along rivers and streams by enforcing critical environmental criteria for building and land use, cleaning up areas as necessary, and restoring wetlands where needed to minimize flood risk and ensure water quality.

- Action Type – Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – Medium
- Lead – Planning Board
- Supporting – Town Council
- Financing Options – Annual budget
- Cost Estimate – Staff time
- Time Frame – Medium term
- Benefit – Maintain and protect critical environmental areas from flooding due to over development. Preservation of water quality.

Action 18 – Update Exeter’s flood zone maps. The current flood zone maps date back to 1982, making them the second oldest in the state. Work with RIEMA and FEMA to update the maps to reflect new developments.

- Action Type – Planning and Regulations
- Pre or Post Disaster – Pre
- Priority – High
- Lead – Exeter Emergency Management Agency
- Supporting – FEMA, RIEMA
- Financing Options – FEMA Grant for Flood Maps
- Cost Estimate – \$5,000
- Time Frame – Short term
- Benefit – Updated flood zones maps.

5.0 PLAN MAINTENANCE

“The success of the hazard mitigation plan is measured by the degree to which actions are accomplished. Without the implementation and maintenance of the plan, the previous components have merely been an effort in research void of any practical application.” - Tennessee Emergency Management Agency

The Town of Exeter and the Hazard Mitigation Committee realize that successful hazard mitigation is an ongoing process that requires implementation, evaluation, and updated revisions to this plan. Also realized is the importance of integrating appropriate sections of the plan into the Town of Exeter Community Comprehensive Plan, Emergency Operations Plan, and site plan review process. It is intended that this plan and the ongoing efforts of the Hazard Mitigation

Committee will preserve and enhance the quality of life, property, and resources for the Town of Exeter.

The plan was formally approved by the Town Council on June 6, 2005 and was formally adopted by the Town Council President on August 3, 2005. Formal adoption of this hazard mitigation strategy gains Exeter credit points under the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS) which provides discounts on National Flood Insurance premiums. Adoption of this mitigation strategy also increases Exeter's eligibility for federal hazard mitigation grants. These grants originate from FEMA's Pre-Disaster Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM) and post-disaster Hazard Mitigation Grant (HMGP) Programs. (Refer to Appendix B for further information.)

5.1 IMPLEMENTATION

The LHMC realized that assigning a time frame to each recommended mitigation action is important so that actions can be coordinated with other important governmental functions, such as committee meetings and budget hearings. Assigned time frames also provide input to a project plan used for tracking the progress of all activities.

In order to establish the authority and accountability for implementation, Exeter does include amendments to its comprehensive plan that incorporate the theme of hazard mitigation. Following formal adoption of Exeter's Hazard Mitigation Plan, it will be officially incorporated into Exeter's Comprehensive Plan by reference and the full legal weight of the comprehensive plan will support the hazard mitigation plan. Once the hazard mitigation plan is adopted, the actions will be assigned to the responsible agencies for review and planning.

5.2 EVALUATION

The Town of Exeter, through the Local Hazard Mitigation Committee, will meet annually to evaluate the plan. The LHMC will base its evaluation on whether or not the plan has met the following criteria: increased public awareness/education, reduction in hazard damage, actions being implemented in the designated time frames and actions staying within the cost estimate. The committee will document and report its findings to the Planning Board and Town Council. The LHMC will involve the public in the plan evaluation process by holding an annual advertised public meeting.

5.3 REVISION

The local strategy will also be evaluated and updated annually, after a disaster, as funding opportunities arise for the actions and projects identified in the plan, or as actions are completed in order to re-prioritize. Any updates to the plan will be reviewed and submitted to RIEMA upon local approval. The LHMC and Town Council will involve the public in the plan revision process by holding an annual advertised public meeting. Updated plans will be sent to the Exeter/West Greenwich School District, West Greenwich, North Kingstown, South Kingstown, Richmond, Hopkinton, Charlestown, East Greenwich, The Rhode Island DEM and the Job Corps Center.

References

Town of Exeter Community Comprehensive Plan, 1994

Town of Exeter Emergency Operations Plan, June 2004

Town of Exeter Flood Maps, 1982

Federal Register Part II, FEMA 44 CFR Parts 201 and 206

Strategy for Reducing Risks from Natural Hazards in Providence, Rhode Island, City of Providence, March 23, 2000

Town of Warren Rhode Island Hazard Mitigation Plan, Town of Warren, Drafted 2004

National Hazard Mitigation Strategy For Reducing Risks From Multi-Hazards In Woonsocket, Rhode Island August, 2000, City of Woonsocket, August, 2000

National Flood Insurance Program, Program Description. Federal Emergency Management Agency, 2002

Natural Hazard Risk Assessment & Mitigation Strategy, Town of Westerly, Rhode Island, July 2004

State and Local Mitigation Planning how –to guide
Getting Started - building support for mitigation planning, September 2002 FEMA 386-1

State and Local Mitigation Planning how –to guide
Understanding Yours Risks - Identifying Hazards and Estimating Losses, August 2001
FEMA 386-2

State and Local Mitigation Planning how –to guide
Developing the Mitigation Plan - identifying mitigation action and implementation strategies, April 2003 FEMA 386-3

Web references

NESEC – Northeast States Emergency Consortium
<http://www.serve.com/NESEC>

NOAA Satellite and Information Service, National Climatic Data Center
<http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~storms>

Town of Exeter Website
<http://www.town.exeter.ri.us>

Red Cross
<http://www.redcross.org>

Appendices

A. Technical and Financial Assistance for Mitigation

B. Existing Protection Systems – Federal and State

C. Public Information and Outreach

Appendix A: Technical and Financial Assistance for Mitigation

State Resources

Rhode Island Emergency Management Agency
645 New London Avenue
Cranston, RI 02920
(401) 946-9996

Coastal Resources Center
University of Rhode Island
Narragansett Bay Campus
Narragansett, RI 02882
(401) 874-6224

Coastal Resources Management Council
Stedman Government Center
4808 Tower Hill Road
Wakefield, RI 02879
(401) 222-2476

Department of Administration/Division of Planning
One Capitol Hill
Providence, RI 02908
(401) 222-6478

State of Rhode Island Building Committee Office
Building Commissioner's Office
One Capitol Hill
Providence, RI 02903
(401) 222-3529

Rhode Island Builders Association
The Terry Lane Corporation
Terry Lane
Gloucester, RI 02814
(401) 568-8006

Department of Transportation-Design
Section/Bridges
2 Capitol Hill, Room 231D
Providence, RI 02903
(401) 222-2053

Rhode Island Department of Business Regulations
233 Richmond Street Providence, RI 02903
(401) 222-2246

State Fire Marshal's Office
272 West Exchange Street
Providence, RI 02903
(401) 222-2335

Rhode Island Banking Commission/ Associate
Director
233 Richmond Street
Providence, RI 02903
(401) 222-2405

Public Utilities Commission
100 Orange Street
Providence, RI 02903
(401) 222-3500 Ext. 153

Department of Environmental Management
Division of Parks and Recreation
2321 Hartford Avenue
Johnston, RI 02919
(401) 222-2635

Federal Resources

Federal Emergency Management Agency
Mitigation Division
Region I Office
J.W. McCormack POCH, Room 462
Boston, MA 02109
(617) 223-9561

U.S. Army Corps of Engineers
New England District
424 Trapelo Road
Waltham, MA 02254
(617) 647-8505

U.S. Department of Agriculture
Natural Resources Conservation Service
(formerly Soil Conservation Service)
451 West Street
Amherst, MA 01002
(413) 253-4362

U.S. Department of Commerce
National Weather Service
Forecast Office
445 Myles Standish Boulevard
Taunton, MA 02780
(508) 823-2262

Economic Development Administration
143 North Main Street, Suite 209
Concord, NH 03301
(603) 225-1624

U.S. Department of the Interior
National Park Service
Rivers and Trails Conservation Program Regional
Office
15 State Street
Boston, MA 02109
(617) 223-5203

U.S. Fish and Wildlife Service
New England Field Office
22 Bridge Street, Unit #1
Concord, NH 03301-4986

U.S. Department of Housing and Urban Development
Community Development Block Grants
Region I - O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
(617) 565-5354

Small Business Administration
360 Rainbow Boulevard South, 3rd Floor
Niagara Falls, NY 14303
(716) 282-4612 or (800) 659-2955

U.S. Environmental Protection Agency
Region I - JFK Federal Building
Government Center
Boston, MA 02203
(617) 565 3400

Other Resources

The Association of State Floodplain Managers (ASFPM)

Professional association with a membership of almost 1,000 state employees that assists communities with the NFIP. ASFPM has developed a series of technical and topical research papers and a series of proceedings from their annual conferences. Many mitigation “success stories” have been documented through these resources and provide a good starting point for planning.

Floodplain Management Resources Center

Free library and referral service of the ASFPM for floodplain management publications. Co-located with the Natural Hazards Center at the University of Colorado in Boulder, staff can use keywords to identify useful publications from the more than 900 flood-related documents in the library.

Institute for Business and Home Safety (IBHS)(formerly Insurance Institute for Property Loss Reduction)

An insurance industry–sponsored, nonprofit organization dedicated to reducing losses—deaths, injuries, and property damage—resulting from natural hazards. IBHS efforts are directed at five specific hazards: flood, windstorm, hail, earthquake, and wildfire. Through its public education efforts and information center, IBHS communicates the results of its research and statistical gathering, as well as mitigation information, to a broad audience.

Volunteer Organizations

Organizations, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith, and the Mennonite Disaster Service, are often available to help after disasters. Service organizations, such as the Lions, Elks, and VFW are also available. These organizations have helped others with food, shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuild damaged buildings incorporating mitigation or floodproofing concepts. The offices of individual organizations can be contacted directly, or the FEMA Regional Office may be able to assist.

Flood Relief Funds

After a disaster, local businesses, residents, and out-of-town groups often donate money to local relief funds. They may be managed by the local government, one or more local churches, or an ad hoc committee. No government disaster declaration is needed. Local officials should recommend that the funds be held until an applicant exhausts all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

New England States Emergency Consortium (NESEC)

Lakeside Office Park

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videotapes are available on such topics as earthquake preparedness, mitigation, and hurricane safety tips. NESEC maintains a WWW home page that is accessible at <http://www.serve.com/NESEC>.

The New England Floodplain and Stormwater Managers Association (NEFSMA)

Professional organization for New England floodplain and stormwater managers. Provides workshops, conferences, and a newsletter to membership and interested individuals and companies. Contact: Nicholas Winter, chairman, at (617) 727-0488 or the NEFSMA home page on the Web at <http://www.seacoast.com/~nefsma>.

Appendix B: Existing Protection Systems -State and Federal

State

Earthquakes and Hurricanes

A certain amount of funding is allotted to each state per year based on a risk formula for earthquakes. Coastal states are allocated funds based on a risk formula for hurricanes. Each state receiving such funds has the ability to grant project funds to a community. There is not a match requirement on the part of the community, but the funds are limited, and are generally only available once a year. The projects or products proposed for such funding must demonstrate that earthquake or hurricane risk will be reduced or eliminated, and that the proposed project or product is a cost-effective measure (a stringent cost/benefit analysis need not be performed). Information about the amount of funding available per year and the state requirements for eligibility and performance may be obtained from RIEMA at (401) 946-9996.

Economic/Community Development

There may be programs existing to help flood-proof homes using Community Development Block Grant funds. There may be housing assistance programs in the community that can be used following a major flood, achieving both the objectives of reducing flood damage and improving the community's housing stock (see Appendix A, Federal Resources, for more information).

Evacuation Plans and Systems

Your community's emergency operations center should have evacuation plans in place. For communities near a nuclear power plant, evacuation plans are required, and may also be used for flood evacuation. RIEMA may have additional evacuation plan information.

Land Use Restrictions

There are several federal and state regulations that serve to restrict land use in certain areas that may help reduce flood hazard vulnerability. If your community has open land owned by the state or federal government, examine what restrictions are placed on its development. In addition, the state Wetlands Protection Act regulates the development of all lands identified as significant to the protection of resources identified in the act.

Septic Systems

If there are areas in the community not served by a public sewer system, state septic system regulations influence development and may be a consideration for mitigation alternatives that include rebuilding and elevation of structures. Specific design requirements must be met for any construction in coastal velocity zones or river floodways. Generally, an inspection of a septic system is required if there is a change in use of the structure, an increase in flow, or a failed system. Limited inspections are required if the footprint of the structure is being changed. Upgrades are required by the state if an inspection reveals a failed system. However, local regulations may be more restrictive than state requirements, requiring inspections or upgrades in other cases.

State Barrier Beaches

Your community may have barrier beaches, as defined by the state's Coastal Resources Management Program. The regulations applying to these areas are enforced by CRMC. These regulations restrict alteration of the beach and/or dunes and the construction of coastal engineering structures. New or substantially reconstructed buildings generally must be elevated to a minimum of 1 foot above base flood elevation. No new commercial development is allowed on barrier beaches. If a structure is damaged more than 50 percent, it cannot be rebuilt.

Warning Systems and Emergency Operations Plans

Your community may have a flood warning system in place and should have a plan for response to flooding. In addition, RIEMA has offices throughout the state that maintain area-wide plans for flood events.

Federal

Coastal Barrier Resource Act

Administered by the U.S. Fish and Wildlife Service, this program has mapped public and private land identified as undeveloped coastal barrier areas. These areas may be denoted as “Otherwise Protected Areas” if they are owned by public entities. In the coastal barrier areas shown on FEMA’s flood insurance rate maps, structures newly built or substantially improved after the date shown on the maps are ineligible for federal flood insurance. This serves to restrict new development in these areas because the purchase of flood insurance is required to obtain federally backed mortgages and improvement loans for structures located in special flood hazard areas.

Community Rating System (CRS)

A voluntary initiative of the NFIP, the CRS was developed to encourage communities to perform activities that exceed the minimum NFIP floodplain management standards. If a community participating in the CRS performs activities that include maintaining records for floodplain development, publicizing the flood hazard, improving flood data, and conducting floodplain management planning, then the flood insurance premiums paid by policy holders in the community will be reduced by 5 to 45 percent. Developing a flood mitigation plan will help communities gain additional credit under the CRS.

Hazard Mitigation Grant Program

Also known as the 404 Program or HMGP, this program is available only after a federally declared disaster occurs. It represents an additional 15 percent of all the infrastructure and individual assistance funds that are provided to states to repair damages and recover from losses, and is administered by the state in partnership with FEMA. Having a plan or completed mitigation action matrix prior to a disaster event is extremely helpful in meeting the state’s deadlines for applications and ensuring the project is eligible and technically feasible. It provides 75/25 matching grants on a competitive basis to state, local, and tribal governments, as well as to certain nonprofit organizations that can be matched by either cash or in-kind services. The grants are specifically directed toward reducing future hazard losses, and can be used for projects protecting property and resources against the damaging effects of floods, earthquakes, wind, and other hazards. Specific activities encouraged under the HMGP include acquiring damaged structures to turn the land over to the community for open space or recreational use, relocating damaged or damage-prone structures out of the hazard area, and retrofitting properties to resist the damaging effects of disasters. Retrofitting can include wet- or dry-flood-proofing, elevation of the structure above flood level, elevation of utilities, or proper anchoring of the structure.

Two programs that have been authorized under the National Flood Insurance Reform Act of 1994 include the Flood Mitigation Assistance (FMA) program and a provision for increased cost of compliance (ICC) coverage. FMA makes grants available on a pre-disaster basis for flood mitigation planning and activities, including acquisition, relocation, and retrofitting of structures. FMA grants for mitigation projects will be available only to those communities with approved hazard mitigation plans. ICC coverage has recently been implemented for all new NFIP policies and renewals and is intended to be “mitigation insurance” to allow homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$15,000. A certain amount of funding is allotted to each state per year based on a risk formula for floods. Each state has the discretion to award funds to communities or to state government agencies. States may use whatever criteria or method they choose to award the funds as long as the applicant and the proposal are eligible. The program may fund up to 75 percent of the total cost of the proposed project, with a minimum of 25 percent of the cost coming from the community. A minimum of half the community share must be cash or “hard match.” Funds can also be granted to communities to help them prepare local flood mitigation plans. The same match requirements apply. Once a community receives a planning grant, however, it is not eligible to receive additional planning grants for another five years. For further information on the FMA program or ICC coverage contact RIEMA at (401) 946-9996.

National Flood Insurance Program (NFIP)

All of Rhode Island's 39 municipalities participate in the NFIP. This program is a direct agreement between the federal government and the local community that flood insurance will be made available to residents in exchange for community compliance with minimum floodplain management regulations. Communities participating in the NFIP must:

- Adopt the flood insurance rate maps as an overlay regulatory district
- Require that all new construction or substantial improvement to existing structures in the flood hazard area be elevated or (if nonresidential) flood-proofed to the identified flood level on the maps
- Require design techniques to minimize flood damage for structures being built in high hazard areas, such as floodways or velocity zones

In return for community adoption of these standards, any structure in that community is eligible for protection by flood insurance, which covers property owners from losses due to inundation from surface water of any source. Coverage for land subsidence, sewer backup, and water seepage is also available subject to the conditions outlined in the NFIP standard policy (see Appendix A, Federal Resources, for contacts regarding insurance coverage and purchase). Since homeowners insurance does not cover flooding, a community's participation in the NFIP is vital to protecting property in the floodplain as well as being essential to ensure that federally backed mortgages and loans can be used to finance flood-prone property.

Appendix C: Public Information and Outreach



Town of Exeter, Rhode Island

675 Ten Rod Road
Exeter, R.I. 02822
Phone: 401-295-7500
Fax: 401-295-1248
E-mail: town council@town.exeter.ri.us

TOWN COUNCIL

William J. Devanney, DDS, *President*
Diane B. Allen, *Vice President*
Ross L. Aker
Wayne E. Cross
Robert E. Johnson, Jr.

June 13, 2005

To All Interested Parties:

A Public Hearing was held during the regular meeting of the Exeter Town Council on Monday, June 6, 2005 at 7:15 p.m. in the Town Council Chambers of the Exeter Town Hall, 675 Ten Rod Road, Exeter, RI 02822 for the approval of the Exeter Hazard Mitigation Plan.

During the Public Hearing, the Exeter Planning Board made its recommendation to the Town Council to approve the Exeter Hazard Mitigation Plan. By unanimous vote the Exeter Town Council approved the Exeter Hazard Mitigation Plan. The Town Council directed that the Plan be submitted to RIEMA and FEMA Region 1 for conditional approval.

Thank you.

Sincerely,

William J. Devanney, DDS
President

WJD:cc



Town of Exeter, Rhode Island

Cheryl A. Chorney, CMC

Town Clerk
Council Clerk
Probate Clerk

675 Ten Rod Road
Exeter, R.I. 02822

1-401-294-3891
1-401-884-4740
Fax: 1-401-295-1248

May 11, 2005

SUBJECT: Exeter Hazard Mitigation Plan

Enclosed is a draft of the Exeter Hazard Mitigation Plan to be considered for approval at a joint meeting of the Exeter Town Council and Exeter Planning Board on June 6, 2005. The meeting is open to the public, which will be notified by newspaper advertisement and postings in public places.

Abutting communities and organizations within Exeter are invited to review the draft plan, which has been prepared in accordance with FEMA/RIEMA guidelines, and furnish comment if desired. We request any comment be forwarded to the Exeter Town Clerk prior to our scheduled meeting. Upon approval by the Exeter Town Council, the Hazard Mitigation Plan will be incorporated into the Exeter Comprehensive Community Plan and forwarded to RIEMA for review prior to submission and approval by FEMA.

Thank you.

Sincerely,

Cheryl A. Chorney, CMC
Town Clerk

Enclosure

**TOWN OF EXETER
NOTICE OF PUBLIC HEARING
EXETER HAZARD MITIGATION PLAN
JUNE 6, 2005 • 7:15 PM**

Notice is hereby given by the Town Council and Planning Board of the Town of Exeter that Joint Public Hearing will be held on **Monday, June 6, 2005 at 7:15 p.m.** in the Town Council Chambers of the Exeter Town Hall, 675 Ten Rod Road, Exeter, RI 02822 during the regular meeting of the Exeter Town Council. The purpose of the Public Hearing is to consider adoption of the **EXETER HAZARD MITIGATION PLAN**, which will also be adopted as Appendix B in the Exeter Comprehensive Plan. A draft version of the Plan is available for review at the Exeter Town Clerk's Office during normal business hours. All persons wishing to comment on the above, including agencies, businesses, academia and non-profits, should be present at the time and place to be heard thereon. A forty-eight (48) hour notice is required for persons with sensory impairments requiring auxiliary aids by calling 295-7500. The Exeter Town Hall is handicapped accessible.

*Per Order of the Exeter Town Council
Cheryl A. Chorney, CMC
Town Clerk*

The Standard-Times • Thursday, May 26, 2005 • Page 13-A

**TOWN OF EXETER
NOTICE OF PUBLIC HEARING
EXETER HAZARD MITIGATION PLAN
JUNE 6, 2005 • 7:15 p.m.**

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Per order of the Exeter Town Council

Cheryl A. Chorney, CMC
Town Clerk