

**HAZARD MITIGATION PLAN
ANNEX
FOR
NEW LONDON, CONNECTICUT**

**An Annex of the
Southeastern Connecticut
Regional Hazard Mitigation Plan**

PREPARED FOR:

**Southeastern Connecticut
Council of Governments**

DATE: June 2005



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I. INTRODUCTION

A. Setting

New London is a densely developed city of 25,671 people within an area of 7.3 square miles. New London is bordered by Waterford to the west and north, the Thames River to the east, and Long Island Sound to the south. There is substantial commercial and residential development in the low-lying coastal areas throughout the City.

The small bustling City of New London was founded in 1646. The City offers a diverse combination of commercial areas, residential neighborhoods, a busy downtown, and a revitalized waterfront. New London offers a variety of attractions for residents and visitors with several historical places of interest, a nationally recognized art museum, several beaches, the United States Coast Guard Academy, several colleges, as well as many shops and restaurants.

Many parks are found throughout New London for recreational use of fields for sports or picnics. These parks include Bates Woods Park, Caulkins Park, Mercer Field, Mitchell Park, and Ocean Beach Park. Ocean Beach Park offers a boardwalk that separates the beach and ocean from swimming pool facilities.

Several major employers in New London have helped boost the City's economic development. These employers include Lawrence & Memorial Hospital, The Day Publishing Co., Pfizer Global Development, Connecticut College, United States Coast Guard Academy, and Ortronics, a telecommunications company.

New London is bordered on the east by the Thames River. New London's State Pier is Connecticut's only major deepwater seaport within a multi-use Foreign Trade Zone. The Thames River directly accesses the major transatlantic and coastal sea lanes, which allows companies to utilize freight shipping and receiving from around the world. Immediately south of the State pier is the Cross Sound Ferry, which provides ferry service to Fishers Island, Orient Point, and Block Island. Several other ferry services also provide service to Block Island, Montauk, and Martha's Vineyard. Ferry service to Orient Point on Long Island is year round while service to other locations is seasonal. This terminal has become increasingly important to the transport of visitors to the New London area from Long Island, NY.

Other modes of transportation throughout New London include bus, car, and rail services. Rail services include the Amtrack & Providence/Worcester rail line and New England Central rail line. Major roads through New London include Interstate 95, Route 1, Route 638, Route 641, Route 639, Route 213, Route 85, and Route 32.

B. Purpose of Annex

The purpose of this annex is to provide hazard risk assessment, capability assessment, hazard mitigation measures, and a hazard mitigation project ranking for the City of New London. Hazards such as earthquakes and windstorms which affect the entire region are addressed in the Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan.

C. Plan Development Process and Public Involvement

The Regional Hazard Mitigation Plan and this annex were developed through a series of meetings and the completion of written questionnaires, personal interviews, and workshops. To provide oversight of the plan development process and maximize local involvement, all member communities in the region and the two tribal affiliate members were invited to appoint a representative to serve on the Hazard Mitigation Steering Committee. Committee members and chief elected officials received notices of all the committee meetings and were encouraged to attend. Meeting notices and agendas were also sent to area media and to town and city clerks for posting in each community. Steering committee meetings were held in public at the Southeastern Connecticut Council of Governments office in Norwich. Three steering committee meetings were held during the development of the hazard mitigation plan.

II. HAZARD RISK ASSESSMENT

A meeting was held with City officials from the City of New London on September 9, 2003 to develop a risk assessment for the City. Based on the results of this meeting and additional risk assessment research, it was determined that a significant hazard of concern in New London is flooding.

Tidal flooding affects parts of the City along Fishers Island Sound, as well as the Thames River and Alewife Cove. In addition to flooding, those areas facing Fishers Island Sound are exposed to damage by wind and waves generated on Fishers Island Sound.

Extensive flood damage was sustained as a result of the September 21, 1938, hurricane. Hurricane flooding to a height of 8.9 feet mean sea level also occurred as a result of a hurricane on August 31, 1954.

To address tidal flooding and hurricane surge damage in the Shaw's Cove and downtown area, the United States Army Corps of Engineers constructed a hurricane barrier. The barrier protects the downtown area from tidal flooding. New London officials indicated that the Shaw's Cove barrier pumping system is routinely utilized to pump stormwater during heavy rainfall. Modifications to this system may be possible to increase the City's ability to pump stormwater from behind the barrier and thus further reduce the flood hazards in the downtown area.

Buildings located in flood hazard areas are primarily residential but also include some commercial, industrial, and critical facility structures. Most of the structures that are threatened by flooding are located within the 100-year floodplain, but some are also in the coastal velocity zone. Location in the velocity zone poses an increased threat to structures due to high wind and potential wave damage, as well as inundation by flood waters.

The City of New London has no formalized program currently in place to identify the location or the number of structures that are susceptible to flooding. Such information would be valuable in directing hazard mitigation efforts to locations with the greatest risk. A potential hazard mitigation project would involve the review of all existing available data regarding flood hazards and the preparation of an inventory and assessment of structures at risk in the coastal flood hazard areas.

Such an inventory program would be the first step in completing a Flood Audit which would serve to provide early flood warning, guidance and technical information regarding flood risks to property owners, as well as to prioritize future property protection projects. The completion of a Flood Audit would be an important step in the National Flood Insurance Program Community Rating System by which towns can qualify for a reduction in flood insurance rates.

A. Residential

Based on review of the City of New London's Flood Insurance Rate Maps and topographic maps, residential structures that are subject to flooding during significant flood events are located along the entire New London shoreline.

Most of New London's velocity zones are located along the immediate shoreline. Shorefront properties in the velocity zone are very susceptible to damage.

The New London shoreline is a year-round community which intensifies risks to life and property for those who live in the coastal area. Beachfront properties are very susceptible to damage, not only as a result of flooding but also because the dynamic nature of the beach system results in shoreline erosion in some locations.

Repetitive flood insurance claims have been filed at two properties in the City of New London as shown in Appendix B of this annex report.

Areas of potential residential flooding of roads and structures that border the Thames River include Water Street, Hamilton Street, East Street, Howard Street, Smith Street, Nameaug Street, Pequot Avenue, Shaw Street, the northern side of Trumbull Street, the southern part of the City, Rockbourne Lane, Parkway South and sections of Admiral Drive. Additionally, residential neighborhoods along Alewife Cove especially in the areas of Alewife Parkway are at risk of flooding.

B. Commercial/Industrial

There are several areas of commercial and industrial properties that have been identified as being located within the floodplain and are considered to be susceptible to damage. Many residential and commercial structures are mixed together throughout the City. As such, areas of concern listed for residential uses in Section A are also applicable for commercial uses. Additionally, many commercial buildings located along the Thames River and along the shoreline between Mitchell College and Alewife Cove are in flood zones.

The majority of the City's industry is located along the Thames River, which represents an exposure to storm hazards. One structure of importance in the Shaw Cove area is the Shaw's Cove pump station. The pump station is operated by the City of New London and is typically used to pump water from flooding streets and direct it back into the Thames River. The pump station has proven to be effective, however, the system may benefit from improvements.

City officials have stated that there remain significant combined sewer problems throughout the City. Though many improvements have been made to separate discharge sources, many residential roof drains are suspected to be connected to the sewer system. This also causes the additional problem when leaves from gutters are flushed into the sewer system with the potential to clog the sewers. City officials have expressed a desire to complete an audit of these sources in order to identify improper discharge sources.

C. Critical Facilities

The vast majority of the City's critical public facilities are not located in flood hazard areas. However, several areas of concern include structures located on Farnsworth Street and along the Thames River, near the northern city limits. This area includes parts of Connecticut College. Other areas are Ocean Beach Park, Osprey Beach, Guthrie Beach, and Green Harbor Beach. These beaches become flooded and attacked by wave velocity during storms. Stormwater drainage pipes from the majority of the City empty near Green Harbor Beach and Guthrie Beach. Contamination from stormwater frequently closes these beaches during the summer. Green Harbor Beach is the only free public beach in the City.

D. Transportation Corridors

New London has several major transportation routes including Interstate 95 and 395, Route 1, Route 32 and Route 156. The Providence and Worcester Railroad travels through New London as well. A series of crossings of the highway and railroad tracks have been constructed to allow passage of roadways under and over the highway and railroad tracks. Also, ferry service to Orient Point in Long Island, Fishers Island, Martha's Vineyard, and Block Island operates from the New London ferry terminal.

Several roadways are potentially subject to flooding. Roadway flooding could result in delays in emergency response. Roads near Shaw Cove such as Hamilton Street, East Street, and Howard Street, and the Glenwood Avenue Bridge that crosses Alewife Cove are in potential flood zones which may impede emergency egress as well as emergency response. Pequot Avenue is affected by potential flood zones in several areas mostly due to inadequate drainage.

Stormwater drainage systems along many roads in New London are inadequate. Heavy rains exceed stormwater drainage and infiltration capabilities thus creating public health hazards related to mosquitoes. City officials have begun the design phase for correcting many stormwater drainage problems, such as the drainage improvements along Admiral Drive.

City officials have also expressed concern with increased thru-traffic in New London. Specifically, the City is concerned with the risks posed by the transportation of hazardous materials over their roadways including the Goldstar Memorial Bridge on I-95 and their ability to respond to a major incident regarding a release of such materials.

III. HAZARD MITIGATION MEASURES

The following sections provide a brief description of the types of hazard mitigation measures and programs that are available to address the natural hazards that exist in the City of New London.

A. Prevention

Hazard prevention includes identification of risks and the use of land-use regulatory and other available management tools to prevent future damage. New London has planning and zoning tools in place that incorporate floodplain management. The City's planning and zoning regulations, inland wetlands and watercourses regulations, harbor management regulations, and the building department's enforcement of the Connecticut Basic Building Code are all important existing regulatory mechanisms that address hazard prevention and incorporate floodplain management.

The following are examples of how hazard prevention can be accomplished through existing programs:

1. Planning and Zoning

Planning and Zoning Regulations can be tailored to be consistent with hazard mitigation planning. Establishment of Flood Prone Conservancy Districts, Coastal Resource Zones, and River Corridor Preservation Zones are all techniques that can potentially be employed to limit additional development in hazardous locations.

2. Open Space Preservation

Community planning that includes open space acquisition and preservation sections can be established or revised in a manner that is consistent with hazard mitigation planning. Acquisition of floodplain and river corridor properties should be encouraged as a municipal priority.

3. Floodplain Development Regulations

The modification of floodplain management regulations to include more restrictive development standards is consistent with hazard mitigation planning. The National Flood Insurance Program Community Rating System gives credit to communities that exceed the minimum floodplain management requirements of the National Flood Insurance Program. Requirements include elevating structures higher than the 100-year base flood elevation, which is an example of a more stringent standard.

4. Stormwater Management

Stormwater management regulations that limit any potential increase in the state of discharge of stormwater and that preserve floodplain storage are examples of the use of stormwater management in a manner consistent with hazard mitigation planning.

5. Wetlands Protection

Wetlands areas are generally also critical flood storage areas. By limiting wetlands development not only are important natural resource areas protected but additional floodplain development is also limited.

6. Erosion and Sediment Control Regulation

Effective implementation of sediment and erosion controls include utilization of detention basins and use of other Best Management Practices to slow the velocity and limit increase in runoff. Strict adherence to these requirements are effective hazard mitigation tools.

B. Property Protection

Property protection measures can address hazards at a single structure or can include multiple structures.

The following list identifies common property protection measures:

1. Relocation
2. Acquisition
3. Building Elevation
4. Utility Protection
5. Flood Proofing

Additional descriptions of property protection measures are provided in Appendix A in the Regional Hazard Mitigation Plan.

C. Emergency Services

Emergency communication is a critical aspect of the hazard response programs currently in place in New London. Emergency Services hazard mitigation measures can be combined with other types of measures to form successful projects, or remain as stand-alone projects. The central communications hub is the City of New London's Police Department dispatch office.

The major utilities that provide service to the city follow similar procedures. The Connecticut Light and Power Company has emergency operation centers which become operational in the event of any emergency that could impact the utilities.

The interagency communication between the City and independent utilities requires continued coordination to assure the critical communications link between the City operations and the utilities is effectively maintained. A need for improved and continued coordination has been identified during this study.

Aspects of emergency services typically addressed in hazard mitigation include the following:

1. Emergency Communication
2. Flood Warning
3. Flood Response
4. Critical Facilities Protection

City officials have expressed interest in updating several emergency systems. The City would like to utilize a reverse 9-1-1 emergency communication system to use during emergencies. The City is concerned that during emergencies when it opens the emergency operations center, police and ambulance communication abilities are lost. City officials are working on a plan that would remove land and cell phone lines from emergency communications.

The City has several shelters for use during emergencies and one future consideration would be to evaluate the Martin Center as a shelter as well. The Martin Center currently houses the health and water departments as well as a senior center and gym. City officials have expressed that the Martin Center would make an ideal shelter during emergencies but would first need to be outfitted with emergency power.

D. Structural Projects

Structural projects include utilization of the flood control strategies that have been and continue to be applied throughout Connecticut. The potential environmental impacts of structural projects are often a concern.

City officials have also expressed concern regarding a retaining wall that was built near Alewife Cove on Highland Avenue. The retaining wall is experiencing erosion problems and city officials have shown interest in repairing this retaining wall.

Structural projects that can be included in hazard mitigation planning include the following:

1. Levees/Floodwalls
2. Bridge & Culvert Replacement
3. Channel Modifications
4. Storm Sewer Improvements
5. Structural Project Maintenance and Repair

Any prospective projects which were identified during the course of assembling this plan are included in the hazard mitigation matrix in Appendix A of this annex report. Additional information on some types of structural projects is provided in Appendix A in the Regional Hazard Mitigation Plan.

E. Public Information

Public information is another type of hazard mitigation measure which, like prevention and resource protection, can be most effectively implemented in conjunction with other hazard mitigation projects.

The Hazard Mitigation Committee has identified the need for a continued and expanded program of public information. Such a program could include providing educational information to the homeowners and business owners in the flood hazard areas. A public education and information component should be included in all hazard mitigation projects undertaken by the City of New London.

The following list includes some common types of public information measures:

1. Map Information

Development of hazard maps for public distribution or posting in public locations. This type of information is easily understood and assists in raising the public's awareness of the natural hazards that exist in their community.

2. Flood Audits

For additional information regarding flood audits refer to Appendix F of the Regional Hazard Mitigation Plan.

3. Real Estate Disclosure

This is a procedure where buyers and sellers of real estate are compelled to provide notice of known hazards affecting the property to be conveyed.

4. Public Library

Libraries can be an effective location of a hazard information center. Town Halls and other public facilities can also serve as information centers. A wide range of hazard mitigation documentation should be compiled for review.

5. Technical Assistance

Local governments can provide technical assistance to homeowners and contractors regarding hazard resistant construction. An appropriate time for such assistance can be at the time of a building permit application.

6. Environmental Education

Private and public schools and adult education programs can offer environmental education classes that include hazard identification and hazard mitigation components.

IV. HAZARD MITIGATION PROJECT RANKING

Based on the hazard risk assessment analysis, the Hazard Mitigation Committee has developed a matrix of several hazard mitigation projects recommended to reduce the City of New London's vulnerability to natural hazards. The matrix depicting potential hazard mitigation projects and a prioritized ranking is included in Appendix A.

Projects identified in the attached matrix have been prioritized based on the following criteria:

- Safety of the population
- Historical damage
- New development in high risk areas
- Value of property at risk
- Consistency with city goals and objectives

The projects were also considered on how they relate to potential health risks, structural damage, access/egress for evacuation, protection of structures that house people with special needs and residential areas housing a large portion of the city's population. For additional information on projects listed in the matrix and for a complete list of criteria used in the prioritization process, please refer to the text and attachments of the Regional Hazard Mitigation Plan.

V. IMPLEMENTATION, MONITORING, AND EVALUATION

The Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan and this associated community annex report were prepared with the understanding that potential funding sources may not be available within the time frame necessary to implement the recommended actions on a specific schedule. It is therefore necessary to incorporate into the plan a system of monitoring its progress and making necessary adjustments. In addition, the goals and objectives may need to be modified over time in order to meet the demands of a changing community. Accomplished activities will be eliminated, and new ones added.

The staff of the Southeastern Connecticut Council of Governments (SCCOG) serves as coordinator of the Hazard Mitigation Committee that provided oversight of the plan preparations. In accordance with § 201.6 (c)(4)(i) of the Interim Final Rule, it is recommended that the Committee meet on or before the fifth anniversary of the adoption of the plan to review the implementation progress as well as the goals, objectives, and actions outlined in the plan. With input from the Committee, SCCOG staff should prepare a report on the status of plan implementation. The report should include the following: a review of the goals and objectives of the original plan; a review of any disasters or hazards that occurred during the period; a review of each element or objective of the original plan, including what was accomplished the previous year; and recommendations for new projects or revised objectives.

FEMA also recommends that each of the local communities name a person as a local coordinator for the implementation and monitoring of the progress of the plan. This person would act as a contact for the Southeastern Connecticut Council of Governments and the State of Connecticut National Flood Insurance Program Coordinators during the grant application and cost-benefit analysis process.

The City of New London Hazard Mitigation Projects

Hazard	Vulnerable Location	Mitigation Project	Priority
All Hazards	City Wide	Evaluate the Hazard Resistant Nature of All Critical Facilities	High
All Hazards	City Wide	Comprehensive Evaluation of Emergency Communication Capabilities Throughout City	High
Flooding	City Wide	Develop a Flood Audit Program	High
Flooding	Downtown / Shaw's Cove	Improvements to Shaw's Cove Hurricane Barrier Pumping Station	High - Medium
Flooding	Pequot Avenue	Drainage Improvements	Medium

The City of New London Hazard Mitigation Projects

Emergency Shelter	Martin Center	Assess Suitability as Emergency Shelter	Medium
Hazard	Vulnerable Location	Mitigation Project	Priority
All Hazards	City Wide	Review of City Transportation Facilities to Identify Critical Risks	Medium
Hazardous Materials Spills on Roadways	State Roads	Identify Appropriate Improvements to Traffic Infrastructure and Emergency Response Training and Equipment	Medium
All Hazards	City Wide	Implement a Reverse 9-1-1 System to Automatically Call Telephones Throughout City, Relaying Important Information During an Emergency	Low

The City of New London Hazard Mitigation Projects

All Hazards	City Wide	Distribute or Post Public Information Regarding Hazards in the City	Low
All Hazards	City Wide	Evaluate Emergency Shelters, Update Supplies and Check Communication Equipment	Low
All Hazards	City Wide	Maintain Emergency Personnel Training as well as Maintaining and Updating Emergency Equipment and Response Protocols	Low
Hazard	Vulnerable Location	Mitigation Project	Priority
Wind Hazards	City Wide	Evaluate and Consider Burying Power Lines Underground and Away From Possible Tree Damage	Low
Earthquake Hazards	City Wide	Complete an Earthquake Survey of all Critical Facilities and Infrastructures	Low

The City of New London Hazard Mitigation Projects

Flooding	City Wide	<p>1) Complete Catch Basin Surveys to Identify Catch Basins in need of Maintenance and/or Replacement</p> <p>2) Complete Culvert Survey to Determine Priority for Maintenance and/or Replacement Plan</p>	Low
Fire Hazards	City Wide	<p>Complete a Survey of Fire Hydrants to Assess Vulnerabilities and Capabilities for Fire Protection</p> <p>Dry Hydrants should be Considered as a means for Emergency Equipment</p>	Low
Hazard	Vulnerable Location	Mitigation Project	Priority

The City of New London Hazard Mitigation Projects

Coastal Hazards	Coastal Areas	Improve Property Protection with Storm Shutters and when Possible Elevate Property above the Base Flood Elevation. City should Consider Acquisition of Properties that are Repeatedly Flooded A Fireboat should be Considered as a Means of Emergency Equipment	Low
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