



## 9.14 TOWN OF GREENWICH

This section presents the jurisdictional annex for the Town of Greenwich.

### 9.14.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Kellie Blake, Clerk to the Supervisor and Highway Superintendent 2 Academy Street, Greenwich, NY 518-692-7137 x103 bookkeeper@nycap.rr.com	Sara S. Idleman, Supervisor 2 Academy Street, Greenwich, NY 518-727-1269 idleman@nycap.rr.com

### 9.14.2 Municipal Profile

The Town of Greenwich is on the southwest border of Washington County, with the Hudson River defining the Town’s western boundary with Saratoga County. The Village of Greenwich lies within the Town, sharing part of the south town line. The town has a total area of 44.4 square miles, 0.4 square miles of which is water. Significant waterways in the town include: Batten Kill, which defines the south town line; Cossayuna Lake, which lies mostly in the Town of Argyle but defines some of the Greenwich’s north boundary; Hartshorn Brook, a tributary to Batten Kill; and Slocum Creek, a tributary to the Hudson River.

According to the 2010 Census, the Town's population was 4,942.

### Growth/Development Trends

The following table summarizes recent residential/commercial development since 2010 to present and any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality.

**Table 9.14-1. Growth and Development**

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Parcel ID)	Known Hazard Zone(s)	Description/Status of Development
<b>Recent Development from 2010 to present</b>					
Tractor Supply Store	Commercial	One	1169 State Route 29	None	Finished
Capital Tractor	Commercial	One addition	1135 State Route 29	None	Finished
AutoZone	Commercial	New structure	1165 State Route 29	None	Finished
Fronhofer Tools	Industrial	New Structure	3329 State Route 29	None	Finished
<b>Known or Anticipated Development in the Next Five (5) Years</b>					
<b>None Identified.</b>					
<p>Note: When the Town Zoning Law was adopted, Major Subdivisions require 300 foot of road frontage, which in most cases would mean a new road being built to Town specifications. Also, the Town limited the number of building permits per year to 5 in a new development.</p>					

Note: Only location-specific hazard zones or vulnerabilities identified.





### 9.14.3 Natural Hazard Event History Specific to the Municipality

Washington County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities. For the purpose of this plan update, events that have occurred in the County from 2008 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in the table below. For details of these and additional events, refer to Volume I, Section 5.0 of this plan.

**Table 9.14-2. Hazard Event History**

Dates of Event	Event Type (FEMA Disaster Declaration if applicable)	Washington County Designated?	Summary of Damages/Losses
December 11-31, 2008	Severe Winter Storm DR-1827	Yes	Power outages were reported around Town, and the Town provided emergency preventive measures with sanding, salting and incidental tree removal. \$76,380.04 total cost for all.
August 26-September 5, 2011	Hurricane/T.S. Irene DR-4020	Yes	The Town beach located on the Batten Kill on State Route 29 had considerable washout requiring debris removal. A culvert and shoulders on North Road washed out. A house on lower Academy Street reportedly had flooding issues. Town-incurred costs from the incident included: Debris Removal from Roads - \$7,414.17 Beach cleanup and restoration - \$15,472.30 Culvert repair - \$1,006.99

Notes:

FEMA Federal Emergency Management Agency

DR Major Disaster Declaration (FEMA)

### 9.14.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this plan have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Town of Greenwich. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

#### Natural Hazard Risk/Vulnerability Risk Ranking

As discussed in Section 5.3 (Hazard Ranking), each participating town or village may have differing degrees of risk exposure and vulnerability compared to Washington County as a whole. Therefore, each municipality ranked the degree of risk to each hazard as it pertains to their community. The table below summarizes the hazard risk/vulnerability rankings of potential natural hazards for the Town of Greenwich. Table 9.14-12 provides proposed mitigation initiatives for the high ranked hazards. The Town has identified specific mitigation initiatives for flood and severe storm, while the other high-ranked hazards are addressed through the town’s ongoing capability of public education and outreach.

**Table 9.14-3. Hazard Risk/Vulnerability Risk Ranking**

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard <sup>a, c</sup>	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking <sup>b</sup>
Earthquake	100-Year GBS: \$0	Occasional	28	Medium





Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard <sup>a, c</sup>	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking <sup>b</sup>
	500-Year GBS: \$8,059,506 2,500-Year GBS: \$82,837,817			
Flood	Damage estimate not available.	Frequent	30	Medium
Severe Weather	100-Year MRP: \$146,281 500-year MRP: \$1,254,406 Annualized: \$9,379	Frequent	48	High
Severe Winter Weather	1% GBS: \$7,098,422 5% GBS: \$35,492,108	Frequent	51	High
Wildfire	Estimated Value in the WUI Hazard Areas: \$801,042,321	Frequent	48	High

Notes:

- a. Building damage ratio estimates based on FEMA 386-2 (August 2001)
- b. The valuation of general building stock and loss estimates was based on custom inventory for the municipality.  
High = Total hazard priority risk ranking score of 31 and above  
Medium = Total hazard priority risk ranking of 20-30+  
Low = Total hazard risk ranking below 20
- c. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the value of contents.
- d. Loss estimates for the flood and earthquake hazards represent both structure and contents.
- e. The HAZUS-MH earthquake model results are reported by Census Tract.
- f. Damage estimate for flood unavailable due to lack of digital floodplain data for Washington County.

**National Flood Insurance Program (NFIP) Summary**

The following table summarizes the NFIP statistics for the Town of Greenwich.

**Table 9.14-4. NFIP Summary**

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)
Greenwich, Town of	2	1	\$3,745.00	0	0

Source: FEMA, 2016

Note (1) Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA and are current as of April 30, 2016 and are summarized by Community Name. Please note the total number of repetitive loss properties excludes the severe repetitive loss properties. The number of claims represents claims closed by 4/30/2016.

Note (2) Total building and content losses from the claims file provided by FEMA Region 2.

Note (3) The policies inside and outside of the flood zones are unavailable due to lack of digital floodplain for Washington County.

Note (4) FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility.

**Critical Facilities**

At the time of this HMP Update, digitized flood maps for Washington County are unavailable. In order to provide some level of beneficial analysis, a desktop analysis was performed to identify critical facilities located within the floodplain (refer to Section 5.1 [Methodology and Tools] for details). The following table identifies critical facilities located within the municipality and their exposure, if any, to the possible floodplain. This information is a resource for the municipality to determine if flood mitigation actions are appropriate based on historical events and proximity of the facility to a water body. At the time of this 2018 HMP Update, the municipality did not identify any actions associated with these facilities.





The Town of Greenwich understands the limitation of the map data and once the updated maps are available, the municipality will work with Washington County to determine which critical facilities are located within the 1% and 0.2% annual chance flood zones. Once identified, the municipality will work with the property owners and develop mitigation actions for each of the critical facilities, ensuring they will be protected to the 500-year (or worst-case scenario) level.

**Table 9.14-5. Potential Flood Losses to Critical Facilities**

Name	Type	Potential Flood Exposure
Greenwich Family Health	Medical	X
Middle Falls Fire Department	Fire	X
Ondawa	Rail	X
Thomson	Rail	X
US Postal Service - Cossayuna	Post Office	X

Source: Washington County; NYS GIS Clearinghouse

**Other Vulnerabilities Identified**

The municipality has identified the following vulnerabilities within their community:

- Steep slopes are identified in the Town’s Comprehensive Plan. Other vulnerable areas include the 1% flood zone near the Hudson and Battenkill Rivers.

**9.14.5 Capability Assessment**

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- National Flood Insurance Program
- Integration of mitigation planning into existing and future planning mechanisms

**Planning and Regulatory Capability**

The table below summarizes the regulatory tools that are available to the Town of Greenwich.

**Table 9.14-6. Planning and Regulatory Tools**

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
<b>Planning Capability</b>				
Master Plan	Yes	Local	Town Board	Comprehensive Plan Updated In 2002
Capital Improvements Plan	No	-	-	-
Floodplain Management / Basin Plan	Yes	Local	Code Enforcement Officer (CEO)	Flood Damage Plan LL# 1-1992
Stormwater Management Plan	Yes	Local	Planning/Zoning CEO	In Zoning Law





Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Open Space Plan	Yes	Local	Planning, Zoning, CEO	In Zoning Law
Stream Corridor Management Plan	No	-	-	-
Watershed Management or Protection Plan	Partial	Local	Town Board	In Comprehensive Plan
Local Waterfront Revitalization Plan	No	-	-	-
Economic Development Plan	No	-	-	Economic development committee has been formed, as of 2016.
Comprehensive Emergency Management Plan	No	-	-	-
Emergency Operation Plan	Yes	Local	CEO	In Flood Damage Plan Chapter 122
Post-Disaster Recovery Plan	No	-	-	-
Transportation Plan	No	-	-	-
Strategic Recovery Planning Report	No	-	-	-
Other Plans:	No	-	-	-
<b>Regulatory Capability</b>				
Building Code	Yes	State & Local	Town CEO & County CEO	Building Code of New York State (NYS), Local Law #1
Zoning Ordinance	Yes	Local	Planning/Zoning	Local Law #1 Of 2007
Subdivision Ordinance	Yes	Local	Planning Board	Local Law #2 Of 1999
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	CEO	Local Law #1-1992
NFIP: Cumulative Substantial Damages	Yes	State & Local	Town CEO & County CEO	Local Law #1-1992
NFIP: Freeboard	Yes	State, Local	CEO	State mandated BFE+2 for single and two-family residential construction, BFE+1 for all other construction types
NFIP: Cumulative Substantial Damages	No	-	-	-
Growth Management Ordinances	Yes	Local	CEO, Planning	In Zoning 5 House Max Build Per Year in New Subdivisions
Site Plan Review Requirements	Yes	Local	Planning	Site Plan Review Law
Stormwater Management Ordinance	Yes	Local	Planning	In Zoning Law
Municipal Separate Storm Sewer System (MS4)	No	-	-	-
Natural Hazard Ordinance	No	-	-	-
Post-Disaster Recovery Ordinance	No	-	-	-
Real Estate Disclosure Requirement	Yes	State	NYS Department of State, Real Estate Agent	NYS mandate, Property Condition Disclosure Act, NY Code - Article 14 §460-467



Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Other (Special Purpose Ordinances [i.e., sensitive areas, steep slope])	No	-	-	-

**Administrative and Technical Capability**

The table below summarizes potential staff and personnel resources available to the Town of Greenwich.

**Table 9.14-7. Administrative and Technical Capabilities**

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
<b>Administrative Capability</b>		
Planning Board	Yes	Town Board
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	Yes	Town Supervisor
Maintenance programs to reduce risk	No	-
Mutual aid agreements	Yes	Between Fire Departments
<b>Technical/Staffing Capability</b>		
Planner(s) or engineer(s) with knowledge of land development and land management practices	Yes	Town Board, Planning Board. No planner on staff, but the town has an on-call engineer.
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	There is an on-call engineer for the planning board for any issues we would like looked at prior to approving plans.
Planners or engineers with an understanding of natural hazards	Yes	There is an on-call engineer for the planning board for any issues we would like looked at prior to approving plans.
NFIP Floodplain Administrator (FPA)	Yes	Code Enforcement Officer
Surveyor(s)	No	-
Personnel skilled or trained in GIS and/or Hazards United States (HAZUS) – Multi-Hazards (MH) applications	No	Washington County has this capability
Scientist familiar with natural hazards	No	-
Emergency Manager	No	-
Grant writer(s)	Yes	On-call with Town Board
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	No	-

**Fiscal Capability**

The table below summarizes financial resources available to the Town of Greenwich.





**Table 9.14-8. Fiscal Capabilities**

Financial Resources	Accessible or Eligible to Use (Yes/No)
Community development Block Grants (CDBG, CDBG-DR)	Yes, unknown
Capital improvements project funding	Yes, Town Board
Authority to levy taxes for specific purposes	Yes, Town Board
User fees for water, sewer, gas or electric service	Yes, Lighting Districts in Place Now
Impact fees for homebuyers or developers of new development/homes	Yes, if town board approved, have lot and recreation fee for each new lot
Stormwater utility fee	Unknown
Incur debt through general obligation bonds	Yes, Town Board
Incur debt through special tax bonds	Yes, Town Board
Incur debt through private activity bonds	B.A.N.S, Town Board
Withhold public expenditures in hazard-prone areas	Not applicable
Other federal or state Funding Programs	Unknown
Open Space Acquisition funding programs	Unknown
Other	-

**Community Classifications**

The table below summarizes classifications for community program available to the Town of Greenwich.

**Table 9.14-9. Community Classifications**

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	9 (Greenwich TPFD) 4/4X (Greenwich FPSA) 9 (Cossayuna FPD)	2/17/17 (Greenwich TPFD) 11/23/15 (Greenwich FPSA) 7/29/16 (Cossayuna FPD)
NYSDEC Climate Smart Community	No	-	-
Storm Ready	No	-	-
Firewise	No	-	-
Disaster/safety programs in/for schools	No	-	-
Organizations with mitigation focus (advocacy group, non-government)	No	-	-
Public education program/outreach (through website, social media)	No	-	-
Public-Private Partnerships	No	-	-

Note:

- N/A Not applicable
- NP Not participating
- Unavailable

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery and mitigation) and are





used as an underwriting parameter for determining the costs of various forms of insurance. The CRS class applies to flood insurance while the BCEGS and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10 with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classifications include a higher classification when the subject property is located beyond 1000 feet of a creditable fire hydrant and is within 5 road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule website at <https://www.isomitigation.com/bcegs/>
- The ISO Mitigation online ISO’s Public Protection website at <https://www.isomitigation.com/ppc/>
- The National Weather Service Storm Ready website at <https://www.weather.gov/stormready/>
- The National Firewise Communities website at <https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA>

### Self-Assessment of Capability

The table below provides an approximate measure of the Town of Greenwich’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.

**Table 9.14-10. Self-Assessment Capability for the Municipality**

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)	Moderate	High
Planning and regulatory capability	Limited staff	-	-
Administrative and technical capability	Limited staff	-	-
Fiscal capability	Limited funds	-	-
Community political capability	Limited staff	-	-
Community resiliency capability	Limited staff	-	-
Capability to integrate mitigation into municipal processes and activities	Limited staff	-	-

### National Flood Insurance Program

#### NFIP Floodplain Administrator (FPA)

Dan O’Connor, Code Enforcement Officer

#### Flood Vulnerability Summary

The Town does not maintain lists/inventories of properties that have been flood damaged or make substantial damage estimates. The current FPA is not aware of any damages sustained in the Town from Floyd, Irene, or other events.

No Town residents have approached the FPA with interest in mitigation activities. The Town is unaware of any residents currently in the process of mitigation. Any mitigation underway is being funded by the town. The beach cleanup was conducted using FEMA/SEMO funding from Hurricane Irene.



## Resources

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The current FPA is the sole person assuming the responsibilities of floodplain administration for building permit review, but the Town planning board reviews all subdivisions development proposals during the site plan review and special use permits processes.

The primary responsibilities of the Village FPA/Town Supervisor are building permits review prior to submission to County Code Enforcement who completes site visit, inspections, etc. There are currently no education or outreach programs to the community regarding flood hazards/risk, and flood risk reduction through NFIP insurance, mitigation, etc.

The Town reports lack of funding and staff as the main barriers to running an effective floodplain management program. The FPA would consider attending continuing education and/or certification training on floodplain management if it were offered in the County for all local floodplain administrators.

## Compliance History

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According to the most recent FEMA Community Status Book Report, the Town of Greenwich is in good standing with the NFIP. However, information provided by NYS DHSES indicated that the Town has not had a compliance audit conducted.

## Regulatory

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The Town Flood Damage Prevention ordinance meets, but does not exceed the FEMA and State minimum requirements.

Other local ordinances, plans or programs (e.g. site plan review) that support floodplain management and meeting the NFIP requirements in the Town include planning board activities, site plan review, special use permits and subdivision process, as well as the variance process with the zoning board of appeals.

The FPA is unaware of whether the community has ever considered joining the Community Rating System (CRS) program to reduce flood insurance premiums for their insured, but would attend a CRS seminar if offered locally.

## Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

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For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In addition, the community identified specific integration activities that will be incorporated into municipal procedures.

## Planning

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**Land Use Planning:** The Town of Greenwich has a Planning Board and Zoning Board of Appeals (ZBA) which review all applications for development and consider natural hazard risk areas in their review. The planning board and ZBA utilize flood plain maps, County GIS mapping, and an engineer on call if needed to guide their decisions with respect to natural hazard risk management. Town zoning and subdivision regulations, and site plan review process, requires developers to take additional actions to mitigate natural hazard risk. During the application process, for either subdivision, site plan review, special use permit or variance the Planning Board looks to see if any of the areas are in the floodplain or Federal & State wetlands and that they meet our required 100-foot Hudson and Battenkill River setbacks. The planning board also



performs stormwater management functions during the permit review process, while the Code Enforcement Officer takes over during the building permit process.

Many development activities require additional levels of environmental review, specifically NYS SEQRA and Federal NEPA requirements. The Town Board adopted a Right to Farm ordinance (Chapter 153) in 2007.

**Town of Greenwich 2004 Comprehensive Plan:** The plan sets forth goals and implementation strategies to guide the physical development of the Town. The 2004 Plan replaces the previous plans from 1989 and 1971. While the plan does not refer to a local or Countywide Hazard Mitigation Plan, it does include maps delineating Open Space, Prime Farmland, Steep Slopes, various soil types, and water resources, all of which are critical tools to identifying natural hazards within the community. The plan also contains specific recommendations necessary to implement land use goals, and potential funding sources for each strategy. Some of the recommendations include:

- Adopt the Town's first zoning ordinance
- Support local agricultural preservation and development initiatives, including purchase of development right programs.

The Town is currently speaking about updating the Comprehensive Plan shortly as it is in the process of updating its Zoning Law. During the update of the Comprehensive Plan, the Town will include a flood overlay district. Additionally, the Town will integrate the risk assessment from the 2018 HMP Update and recommendations identified in the plan. This establishes resiliency as an overarching value of a community and provides the opportunity for the Town to continuously manage development in a way that does not lead to increased hazard vulnerability.

### Regulatory and Enforcement

**Code Enforcement:** Washington County provides code enforcement duties and responsibilities to the Town of Greenwich.

**Construction Codes, Uniform:** The building codes are strictly enforced to make new and renovated buildings as prepared as possible for hazard related incidents. The Town complies with New York State Uniform Fire Prevention and Building Code (the Uniform Code) and the State Energy Conservation Construction Code (the Energy Code).

**Flood Damage Prevention Plan, LL# 1-1992:** This chapter promotes the public health, safety, and general welfare of residents and seeks to minimize public and private losses due to flood conditions. The chapter regulates development to promote flood resistant structures and controls the alteration of floodplains to prevent increased vulnerability.

**Sewers:** The Town abides by the County-wide Sanitary Code, which protects and regulates its sewage collection and treatment facilities as a matter of public health and environmental safety. It seeks to prohibit the introduction of stormwater, surface, or sub-surface waters into sanitary sewers and to control the quantity and quality of wastes in the sewage system.

**Site Plan Review, Chapter 190, Article IV:** The purpose of site plan review, which is the responsibility of the Town Planning Board, is to provide for the review and approval of development plans to ensure that land development occurs in harmony with surrounding uses, without adversely impacting neighboring parcels, property values, public facilities, infrastructure or the natural environment, including agricultural and open space resources.



**Subdivision of Land, Chapter 167:** Adopted by the Town Board of the Town of Greenwich 5-11-1999. The Town's Planning Board is tasked with reviewing subdivision proposals. The Planning Board pays special attention to ensure that developments meet the requirements of the stormwater management and erosion and sediment control provisions set by NYS DEC, and mitigate the issues associated natural hazards.

**Zoning Chapter 190:** The Town of Greenwich zoning code includes specific districts or standards pertaining to natural hazard mitigation, including the flood hazard area. Environmental design standards written into the zoning code deal with flood hazard areas, state-and federally- designated freshwater wetlands, stormwater management, and erosion and sediment control. The zoning code includes standards for growth, open space, and watershed or stream corridor management. The zoning map also shows the area of the Hudson River and Batten Kill Critical Environmental Area, which can help decision makers divert development away from sensitive and critical areas in the floodplain. As the zoning ordinance is updated, zoning regulations will incorporate hazard mitigation. This will promote development and redevelopment patterns (location, type, density) that are at less risk from known hazards. It will also help reduce potential for damages caused by negligent permitting or land use decisions.

### Fiscal

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**Operating Budget:** While the Town's operating budget does not include specific line items for mitigation projects/activities, it does contain a Highway Fund with minimal provisions for expected expenses like snow removal, brush and weeds cleanup, and bridge repair including infrastructure repair after a storm or natural disaster. The Town's capital fund covers facilities improvement and highway equipment. The Town also allots funding for contractual expenses related to environmental control which may reduce flood vulnerability, including weed harvesting and nutrient study/removal.

**Grants:** The Town contracts with a firm with experience in preparing grant applications for mitigation projects, as needed.

### Education and Outreach

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**Outreach:** The Town relies on the County MyEM App Reverse 911 System, a phone service to alert residents who have registered for the service of emergencies. The Town will work on development and implementing a multi-hazard public awareness program to increase knowledge of its residents. Additionally, the program will increase the usage of the County MyEM app. The Town will develop and handout educational materials to the public as well.

The Town is served by four fire departments - the Cossayuna Volunteer Fire Department, Greenwich Fire Department, Middle Falls Volunteer Fire Department, and Schuylerville Fire Department. As part of their services, the Cossayuna and middle Falls Fire Departments maintain Facebook pages which include real-time severe weather warnings and other safety messages.

Town staff does not currently get training or continuing professional education which supports natural hazard risk reduction, but notes that such training would be helpful for all parts of the permitting process. In the future, the local floodplain administrator will attend continuing education classes and training to ensure code enforcement and proper inspections are conducted. Additionally, the Town will send staff to county and state trainings as offered. Staff from various departments (such as public works and code enforcement) will also complete certification, as needed, with respect to hazard risk management in Benefit Cost Analysis (BCA), recovery planning, damage estimates, and debris management.



### **9.14.6 Mitigation Strategy and Prioritization**

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This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

#### **Past Mitigation Initiative Status**

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The following table indicates progress on the community’s mitigation strategy identified in the 2010 Plan. It should be noted that during the 2010 planning process, only general, countywide actions were identified for each municipality. The Town of Greenwich reviewed the previous actions and selected actions they chose to carry forward as part of this plan update. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under ‘Capability Assessment’ presented previously in this annex.



**Table 9.14-11. Status of Previous Mitigation Actions**

2010 Mitigation Action	Responsible Party	Status (In progress, No progress, Complete)	Describe Status	Next Step (Include in 2018 HMP or Discontinue)	Describe Next Step
Improve drainage at sites where roads have washed out due to natural hazards in the past	County and NYS DHSES	In Progress	Ongoing operational capability - replacing culverts as needed yearly after inspection.	Include in 2018 HMP	Replacing two major culverts
Purchase equipment to provide for local personnel to conduct the drainage improvement	County and NYS DHSES	No Progress	0 % complete.	Discontinue	The town will not purchase equipment for this item. It is more cost effective to rent or subcontract as this equipment isn't used in the day to day operations of the Town.
Engineering assessment to determine feasibility of each site improvement	County and NYS DHSES	In Progress	Ongoing operational capability - This year we have used the County Highway Engineer to help with two culvert replacements and a possible bridge replacement.	Discontinue	
Improve dams to prevent flooding causing roads to wash out.	County and NYS DHSES	No Progress	0% complete	Discontinue	Town of Greenwich does not own any dams
Improve identified sites where slope stability is subject to land subsidence and where excavation or planting could mitigate future damage.	County and NYS DHSES	No Progress	0% complete	Discontinue	Unaware of any such areas at this time.



### Completed Mitigation Initiatives Not Identified in the Previous Mitigation Strategy

The Town of Greenwich has identified the following mitigation projects/activities that have also been completed but were not identified in the previous mitigation strategy in the 2010 Plan:

- None identified

### Proposed Hazard Mitigation Initiatives for the Plan Update

The Town of Greenwich participated in a mitigation action workshop in September 2016 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.14-12 summarizes the comprehensive-range of specific mitigation initiatives the Town of Greenwich would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.14-13 provides a summary of the prioritization of all proposed mitigation initiatives for the Plan update.



**Table 9.14-12. Proposed Hazard Mitigation Initiatives**

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
T. Greenwich-1 (previous action)	Upgrade and/or install culverts along East Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	Existing	Flood, severe storm	1, 4	Town Public Works / Highway, with support from the County	Medium	Medium	FEMA (HMGP, FMA, PDM), Local Budget	Short	Medium	SIP	PP
T. Greenwich-2 (previous action)	Upgrade and/or install culverts along Black Horse Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	Existing	Flood, severe storm	1, 4	Town Public Works / Highway, with support from the County	Medium	Medium	FEMA (HMGP, FMA, PDM), Local Budget	Short	Medium	SIP	PP
T. Greenwich-3 (previous action)	Upgrade and/or install culverts along Patterson Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	Existing	Flood, severe storm	1, 4	Town Public Works / Highway, with support from the County	Medium	Medium	FEMA (HMGP, FMA, PDM), Local Budget	Short	Medium	SIP	PP

Notes:

Not all acronyms and abbreviations defined below are included in the table.

\*Does this mitigation initiative reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

CAV Community Assistance Visit  
 CRS Community Rating System  
 DPW Department of Public Works  
 FEMA Federal Emergency Management Agency  
 FPA Floodplain Administrator  
 HMA Hazard Mitigation Assistance  
 N/A Not applicable  
 NFIP National Flood Insurance Program  
 OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

FMA Flood Mitigation Assistance Grant Program  
 HMGP Hazard Mitigation Grant Program  
 PDM Pre-Disaster Mitigation Grant Program  
 RFC Repetitive Flood Claims Grant Program (discontinued in 2015)  
 SRL Severe Repetitive Loss Grant Program (discontinued in 2015)

Timeline:

Short 1 to 5 years  
 Long Term 5 years or greater  
 OG On-going program  
 DOF Depending on funding

Costs:

Where actual project costs have been reasonably estimated:

Low < \$10,000  
 Medium \$10,000 to \$100,000

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

Low= < \$10,000





Costs:

High > \$100,000

Where actual project costs cannot reasonably be established at this time:

- Low Possible to fund under existing budget. Project is part of, or can be part of an existing on-going program.
- Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

Benefits:

Medium \$10,000 to \$100,000  
High > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

- Low Long-term benefits of the project are difficult to quantify in the short term.
- Medium Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
- High Project will have an immediate impact on the reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP) - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- Natural Resource Protection (NR) - Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities





**Table 9.14-13. Summary of Prioritization of Actions**

Mitigation Action / Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
T. Greenwich-1 (previous action)	Upgrade and/or install culverts along East Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	1	0	1	1	0	1	0	0	0	1	1	1	0	0	7	Medium
T. Greenwich-2 (previous action)	Upgrade and/or install culverts along Black Horse Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	1	0	1	1	0	1	0	0	0	1	1	1	0	0	7	Medium
T. Greenwich-3 (previous action)	Upgrade and/or install culverts along Patterson Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.	1	0	1	1	0	1	0	0	0	1	1	1	0	0	7	Medium

Note: Refer to Section 6, which conveys guidance on prioritizing mitigation actions.





### **9.14.7 Future Needs to Better Understand Risk/Vulnerability**

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None at this time.

### **9.14.8 Hazard Area Extent and Location**

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Hazard area extent and location maps have been generated for the Town of Greenwich that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the Town of Greenwich has significant exposure. These maps are illustrated in the hazard profiles within Section 5.4, Volume I of this Plan.

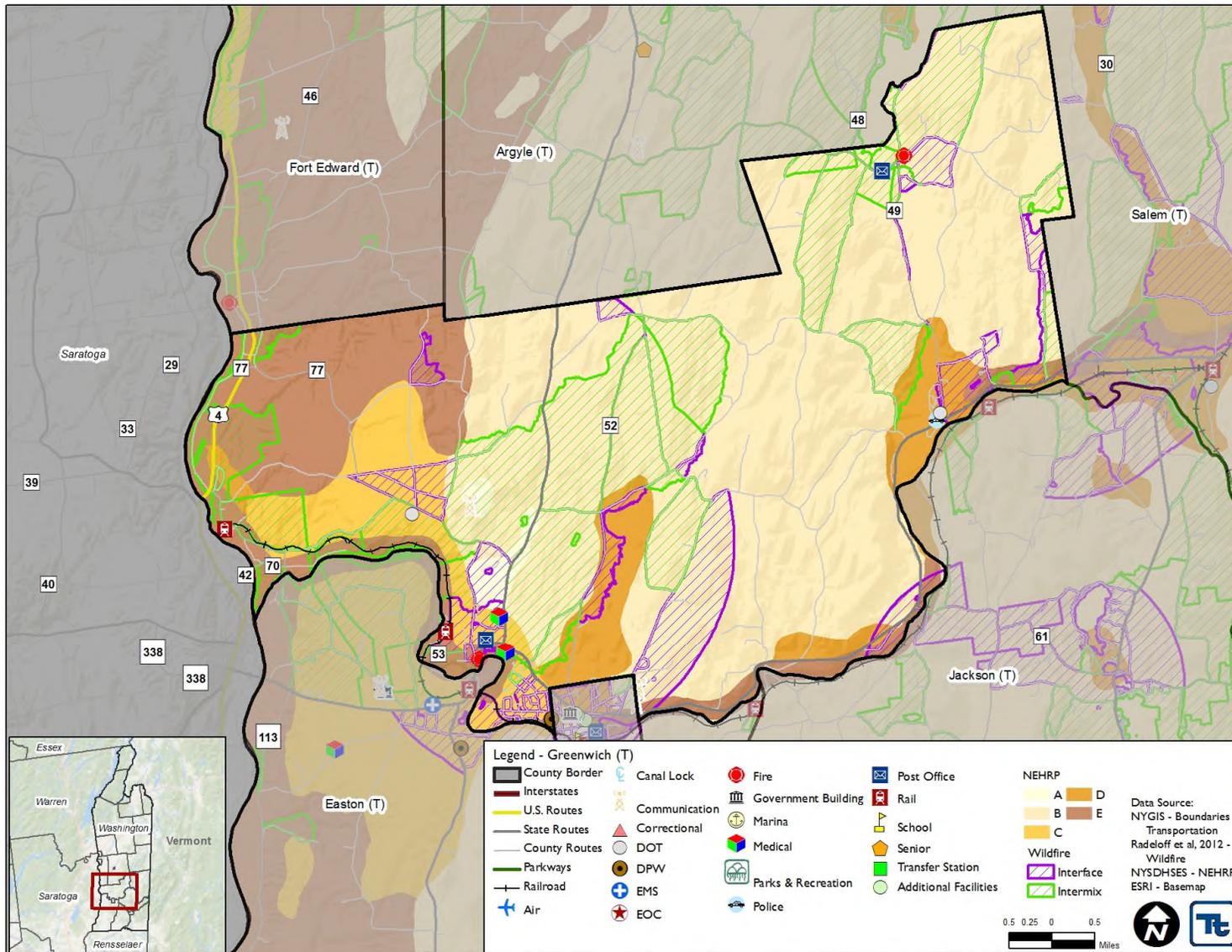
### **9.14.9 Additional Comments**

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None at this time.



Figure 9.14-1. Town of Greenwich Hazard Area Extent and Location





Action Number:

T. Greenwich - 1

Mitigation Action Name:

Upgrade and install culverts along East Road

Assessing the Risk	
<b>Hazard(s) addressed:</b>	Flood, severe storm
<b>Specific problem being mitigated:</b>	Past hazard events have washed out East Road.
Evaluation of Potential Actions/Projects	
<b>Actions/Projects Considered (name of project and reason for not selecting):</b>	No action - Current problem persists. Relocate roadways where washout has occurred – not feasible. Elevate roadways – costly.
Action/Project Intended for Implementation	
<b>Description of Selected Action/Project</b>	Upgrade and install culverts along East Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.
<b>Mitigation Action Type</b>	Structure and Infrastructure Project (SIP)
<b>Goals Met</b>	Goal 1: Protect Life and Property Goal 4: Provide for Emergency Services
<b>Applies to existing and or new development, or not applicable</b>	Existing
<b>Benefits (losses avoided)</b>	Medium
<b>Estimated Cost</b>	Medium
<b>Priority*</b>	Medium
Plan for Implementation	
<b>Responsible Organization</b>	Town Public Works / Highway, with support from the County
<b>Local Planning Mechanism</b>	Hazard Mitigation, Capital Improvement
<b>Potential Funding Sources</b>	FEMA (HMGP, FMA, PDM), County, Local Budget
<b>Timeline for Completion</b>	Short
Reporting on Progress	
<b>Date of Status Report/ Report of Progress</b>	No progress; new project



Action Number:

T. Greenwich - 1

Mitigation Action Name:

Upgrade and install culverts along East Road.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	This action is technically feasible
Political	0	
Legal	1	
Fiscal	0	Municipal budget / staff time
Environmental	0	No known environmental impacts
Social	0	No known social impacts
Administrative	1	The Town has the administrative capabilities to implement this action
Multi-Hazard	1	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
<b>Total</b>	7	
<b>Priority (H/M/L)</b>	Medium	



Action Number:

T. Greenwich - 2

Mitigation Action Name:

Upgrade and install culverts along Black Horse Road.

Assessing the Risk	
<b>Hazard(s) addressed:</b>	Flood, severe storm
<b>Specific problem being mitigated:</b>	Past hazard events have led to multiple washouts along Black Horse Road. This area of road has undersized culverts which leads to water on the road and erosion along the slopes of the roadway.
Evaluation of Potential Actions/Projects	
<b>Actions/Projects Considered (name of project and reason for not selecting):</b>	No action - Current problem persists. Relocate roadways where washout has occurred – not feasible. Elevate roadways – costly.
Action/Project Intended for Implementation	
<b>Description of Selected Action/Project</b>	Upgrade and install culverts along Black Horse Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.
<b>Mitigation Action Type</b>	Structure and Infrastructure Project (SIP)
<b>Goals Met</b>	Goal 1: Protect Life and Property Goal 4: Provide for Emergency Services
<b>Applies to existing and or new development, or not applicable</b>	Existing
<b>Benefits (losses avoided)</b>	Medium
<b>Estimated Cost</b>	Medium
<b>Priority*</b>	Medium
Plan for Implementation	
<b>Responsible Organization</b>	Town Public Works / Highway, with support from the County
<b>Local Planning Mechanism</b>	Hazard Mitigation, Capital Improvement
<b>Potential Funding Sources</b>	FEMA (HMGP, FMA, PDM), County, Local Budget
<b>Timeline for Completion</b>	Short
Reporting on Progress	
<b>Date of Status Report/ Report of Progress</b>	No progress; new project



Action Number:

T. Greenwich - 2

Mitigation Action Name:

Upgrade and install culverts along Black Horse Road.

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	This action is technically feasible
Political	0	
Legal	1	
Fiscal	0	Municipal budget / staff time
Environmental	0	No known environmental impacts
Social	0	No known social impacts
Administrative	1	The Town has the administrative capabilities to implement this action
Multi-Hazard	1	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
<b>Total</b>	7	
<b>Priority (H/M/L)</b>	Medium	



Action Number:

T. Greenwich - 3

Mitigation Action Name:

Upgrade and install culverts along Patterson Road.

Assessing the Risk	
<b>Hazard(s) addressed:</b>	Flood, severe storm
<b>Specific problem being mitigated:</b>	Past hazard events have washed out Patterson Road.
Evaluation of Potential Actions/Projects	
<b>Actions/Projects Considered (name of project and reason for not selecting):</b>	No action - Current problem persists. Relocate roadways where washout has occurred – not feasible. Elevate roadways – costly.
Action/Project Intended for Implementation	
<b>Description of Selected Action/Project</b>	Upgrade and install culverts along Patterson Road to improve drainage of roadway. Additionally, remove debris from existing culverts and ditches to improve water movement.
<b>Mitigation Action Type</b>	Structure and Infrastructure Project (SIP)
<b>Goals Met</b>	Goal 1: Protect Life and Property Goal 4: Provide for Emergency Services
<b>Applies to existing and or new development, or not applicable</b>	Existing
<b>Benefits (losses avoided)</b>	Medium
<b>Estimated Cost</b>	Medium
<b>Priority*</b>	Medium
Plan for Implementation	
<b>Responsible Organization</b>	Town Public Works / Highway, with support from the County
<b>Local Planning Mechanism</b>	Hazard Mitigation, Capital Improvement
<b>Potential Funding Sources</b>	FEMA (HMGP, FMA, PDM), County, Local Budget
<b>Timeline for Completion</b>	Short
Reporting on Progress	
<b>Date of Status Report/ Report of Progress</b>	No progress; new project



Action Number:

T. Greenwich - 3

Mitigation Action Name:

Upgrade and/or install culverts along Patterson Road

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	
Property Protection	0	
Cost-Effectiveness	1	
Technical	1	This action is technically feasible
Political	0	
Legal	1	
Fiscal	0	Municipal budget / staff time
Environmental	0	No known environmental impacts
Social	0	No known social impacts
Administrative	1	The Town has the administrative capabilities to implement this action
Multi-Hazard	1	
Timeline	1	
Agency Champion	0	
Other Community Objectives	0	
<b>Total</b>	7	
<b>Priority (H/M/L)</b>	Medium	