

## **Appendix A**

### Municipal Planning Process







# HAZARD MITIGATION PLAN UPDATE FOR THE NAUGATUCK VALLEY REGION

## Local Advisory Committee Meetings



Presented by:  
David Murphy, P.E., CFM  
Scott Bighinatti, CFM  
Milone & MacBroom, Inc.

September-November 2020



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## AGENDA

- Purpose and Need for Hazard Mitigation Plan
- Update on Hazard Mitigation Grant Programs
- Hazards to Include in the Plan
- Introduction to Hazard Mitigation Strategies and Actions
- Review Mitigation Successes
- Components of the Planning Process
- Data Collection and Discussion
- Consider New Statewide Requirements
- Consider Statewide Initiatives
- Update Mitigation Actions
- Next Steps

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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### Authority

- Disaster Mitigation Act of 2000 (amendments to Stafford Act of 1988)

### Goal of Disaster Mitigation Act

- Promote disaster *preparedness*
- Promote hazard mitigation *actions*

### Long Term Goals

- Reduce**
  - Injury and Loss of Life
  - Property and Infrastructure Damage
  - Costs to Residents and Businesses
  - Municipal Service Costs
- Educate**
  - Residents & Policy-makers
- Connect**
  - Hazard Mitigation Planning to other Community Planning
- Enhance**
  - Natural Resource Systems

### ***NVCOG's Goal:***

The NHMP will identify natural hazards and risks, existing capabilities, and activities that can be undertaken by a community to prevent loss of life and reduce property damages associated with the identified hazards. Public safety and property loss reduction are the driving forces behind this plan. Careful consideration will also be given to the preservation of history, culture and the natural environment of the region.

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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### What is a Natural Hazard?

- An extreme natural event that poses a risk to people, infrastructure, and resources.



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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### What is Hazard Mitigation?

- Actions we take now that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects.



New Elevated Construction



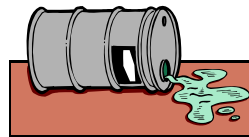
Removal of Structures from Floodplain

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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### Hazard Mitigation Plan does not *directly* address:

- Disaster Response and Recovery
- Terrorism and Sabotage
- Human Induced Emergencies  
(some fires, hazardous spills and contamination, disease, etc.)
- Pandemics



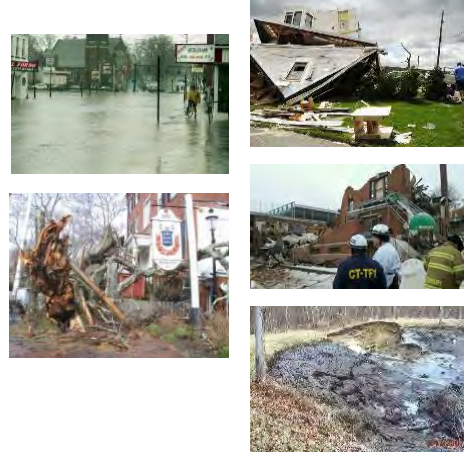
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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High Winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Ice Jams, Landslides, and Sinkholes (for some towns)

↑  
CLIMATE CHANGE



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## STATUS OF EXISTING PLANS

- Main goal is to submit plan to FEMA prior to availability of HMGP funds in 2021.
- The letters of interest for BRIC and FMA are due October 30, 2020. DEMHS is saying to submit a letter for a project if reasonably certain that the hazard mitigation plan will be in place before funds awarded in 2021.

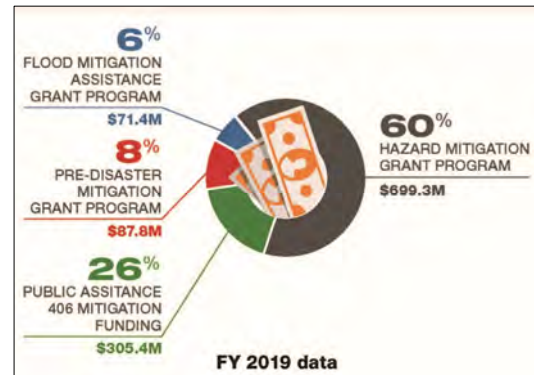
Municipality	Plan Expiration
Ansonia	2/12/2018
Derby	2/12/2018
Shelton	2/12/2018
Seymour	2/12/2018
Watertown	6/1/2019
Woodbury	6/2/2019
Oxford	8/18/2019
Cheshire	12/18/2019
Southbury	12/29/2019
Middlebury	12/29/2019
Thomaston	2/8/2020
Prospect	2/25/2020
Wolcott	2/25/2020
Waterbury	2/26/2020
Naugatuck	2/29/2020
Bethlehem	11/7/2020
Beacon Falls	1/3/2021
Plymouth	9/12/2021
Bristol	9/12/2021

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## UPDATE ON HAZARD MITIGATION GRANT PROGRAMS

- Must have a FEMA-approved HMP to receive Hazard Mitigation funding
  - HMGP (Hazard Mitigation Grant Program)
  - FMA (Flood Mitigation Assistance)
  - **BRIC (Building Resilient Infrastructure and Communities)**
    - Replaced the existing PDM (Pre-Disaster Mitigation) program
    - \$500 million available nationwide in 2020, application period 9/30/20 – 1/29/21



Graphics courtesy of FEMA

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## UPDATE ON HAZARD MITIGATION GRANT PROGRAMS

- Connecticut has allocated its HMGP funds from the winter storm of early 2015, the storms of May 2018, and the flood of September 2018
- **Presidential Disaster Declaration for COVID-19 (DR-4500) – we expect money will go into HMGP but we don't yet know implications for natural hazard mitigation**
- **Presidential Disaster Declaration for Tropical Storm Isaias (EM-3535) – Funds may become available for HMGP**



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## HOW CAN THE PLAN BE USED?

### Grants can be used for:

- Building acquisitions or elevations
- Culvert replacements
- Drainage projects
- Bank stabilization
- Landslide stabilization
- Wind retrofits
- Seismic retrofits
- Snow load retrofits
- Standby power supplies for critical facilities



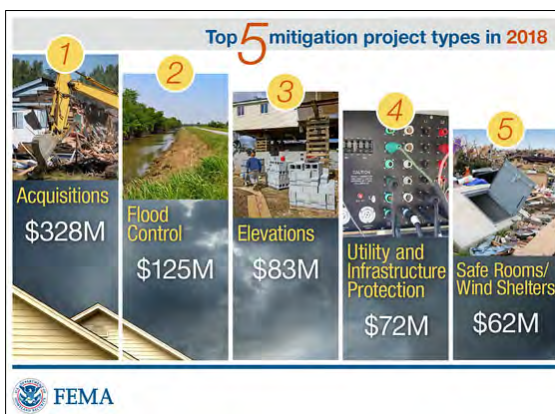
This home in Trumbull was acquired and demolished using a FEMA grant



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## HOW CAN THE PLAN BE USED?

- Local communities must have a FEMA-approved Hazard Mitigation Plan in place to receive Federal Grants for Hazard Mitigation Projects



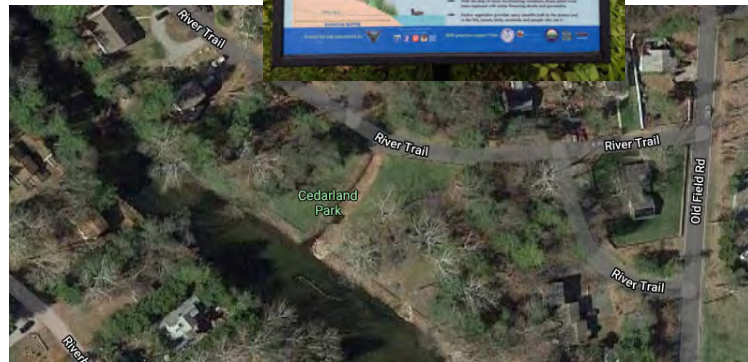
Graphics courtesy of FEMA

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## HOW CAN A PLAN BE USED?

PROPERTY ACQUISITIONS LIKE THOSE IN SOUTHBURY



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## HOW CAN A PLAN BE USED?

DRAINAGE PROJECT IN BROOKFIELD

- Brookfield
  - Meadowbrook Manor
  - \$1.3 M
  - New system to alleviate drainage and conveyance problems from Lime Kiln Brook. Flooding has led to flooded septic systems, wells, and homes.



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## HOW CAN THE PLAN BE USED?

CULVERT REPLACEMENT FUNDED BY HMGP IN BUCKLAND, MA



Floyd 1999

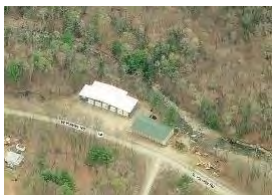


Irene 2011

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## HOW CAN THE PLAN BE USED?

RIVERBANK STABILIZATION FUNDED BY HMGP IN HAWLEY, MA



Irene 8/2011



Post-Irene 9/2011



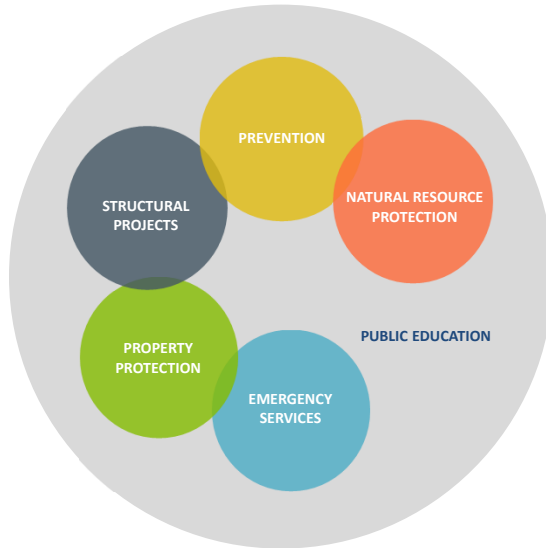
Construction  
August 2017



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## HAZARD MITIGATION STRATEGIES AND ACTIONS



Structural Project



Property Protection

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## FLOOD MITIGATION STRATEGIES



STRUCTURAL PROJECTS

- Replace Bridges and Culverts
- Remove In-Stream Dams
- Remove Obstructions
- Upstream Detention
- Install Stormwater Systems
- Create Floodways
- Enlarge Channels
- Reduce Flow Resistance
- Install Levees
- Install Flood Walls

### FLOOD MITIGATION

### PROPERTY PROTECTION

- Wet Floodproofing
- Dry Floodproofing
- Elevate Buildings
- Relocate Buildings
- Secure Utilities
- Anchor Floatables
- Remove Hazardous Materials
- Re-Grade Properties
- Purchase Flood Insurance
- Join the Community Rating System (CRS)



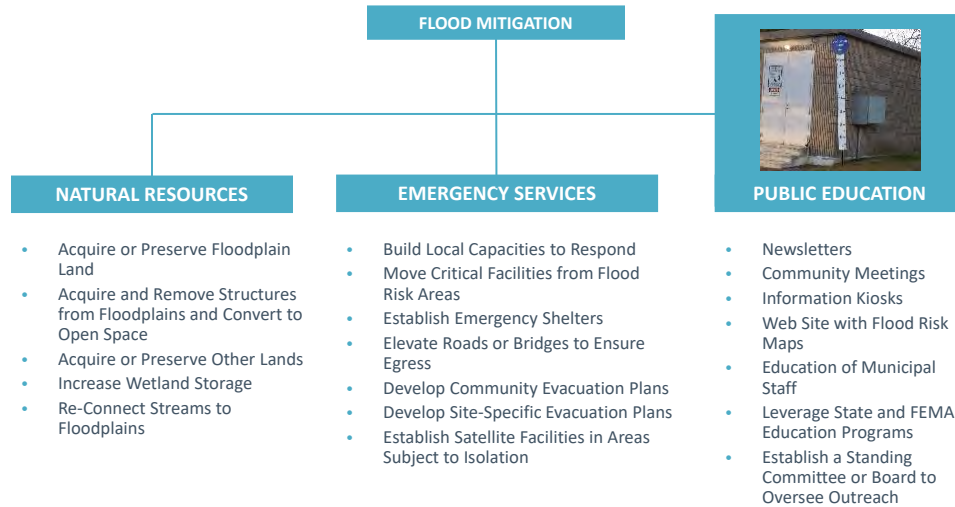
PREVENTION

- Modify Zoning
- Modify POCD
- Stormwater Management Regulations
- Increase Flood Damage Prevention Standards
- Freeboard
- Low Impact Development
- Minimize Impervious Cover

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## FLOOD MITIGATION STRATEGIES



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## OTHER HAZARD MITIGATION STRATEGIES

- Strengthen or reinforce shelters and critical facilities
- Create backup critical facilities
- Bury utilities
- Harden utilities
- Expand and fund tree maintenance programs
- Snow removal plans and programs
- Shutters, load path, and roof projects
- Enhance fire suppression capabilities with dry hydrants, cisterns, etc.
- Bracing for potential earthquake damage
- Public education programs and resources



Hurricane Shutters

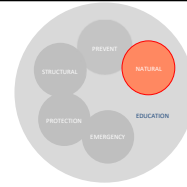


Dry Hydrants

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## REVIEW MITIGATION SUCCESSES



### I-84 Waterbury Project

- Partial realignment and restoration of Mad River
- Mitigation of flood risks near highway
- **Type: Natural Resource Protection**



Photo: CT DOT

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## REVIEW MITIGATION SUCCESSES



### Pequabuck River Flood Mitigation Study

- \$250,000 study performed by Bristol, Plainville, and Plymouth with \$200,000 in federal grant funding
- Evaluation of regional and site-specific flood mitigation measures
- Selection of 10 priority projects to reduce future flood losses
- **Type: Prevention**

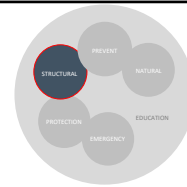


Photo: AECOM / City of Bristol

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## REVIEW MITIGATION SUCCESSES



### Naugatuck River Basin Flood Control Dams

- Thomaston, Hall Meadow Brook, East Branch, Northfield Brook, Black Rock, Hancock Brook, and Hop Brook Dams
- Unlikely to be repeated under current best practices, permitting, and funding environment



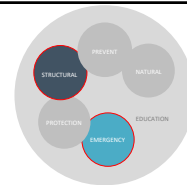
Photos: USACE



- **Type: Structural**

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## REVIEW MITIGATION SUCCESSES



### Heritage Village Water Company and Connecticut Water Company Interconnection

- State funding used to interconnect systems in Middlebury
- Upgrades to water system infrastructure & capacities can help mitigate wildfire hazards.



Photo: Google

- **Type: Structural & Emergency Services**

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## REVIEW MITIGATION SUCCESSES



Fire Pump



Suction Hose

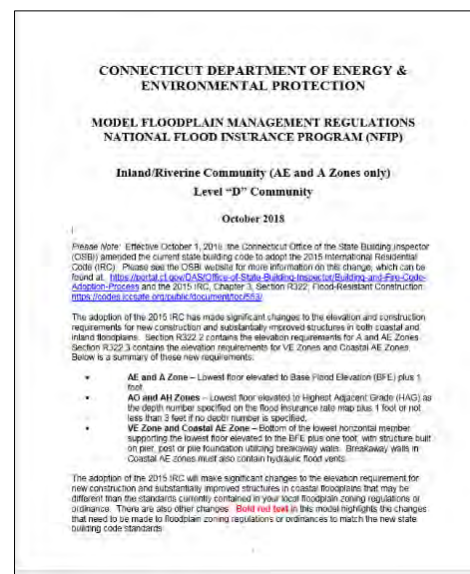
### Beacon Falls Emergency Response Capacity Improvements

- 3,500 feet of forestry hose
- 7 nozzles
- Special pumps and hoses to draft from wooded / rural ponds
- Professional Wildland Firefighter Training
- **Type: Emergency Services**

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## CONSIDER NEW STATEWIDE REQUIREMENTS

- Revised State Building Code (effective 10/1/18)
- Revised State Model Flood Regulations



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## CONSIDER STATEWIDE MITIGATION INITIATIVES

- Historic resources resiliency planning and best practices



Historic Resources at Risk?

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## CONSIDER STATEWIDE MITIGATION INITIATIVES

- Coastal and **inland** green infrastructure; living shorelines



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## CONSIDER STATEWIDE MITIGATION INITIATIVES

- Spills from small businesses during floods and other events



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## COMPONENTS OF THE PLANNING PROCESS

- Review and profile natural hazards that could occur
- Identify critical facilities and areas of concern
- Update the vulnerability and risk assessments for structures and populations
- HAZUS analysis for floods, hurricane winds, and earthquakes using current version of the program with Census 2010 data
- Loss estimates for all hazards, based on the State HMP at a minimum but supplemented by local sources of information and FEMA Public Assistance reimbursements
- Incorporate effects of the federally declared disasters that have occurred since the current HMP was adopted



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## COMPONENTS OF THE PLANNING PROCESS

- Review locations of repetitive loss properties
- Consider historic and cultural resources
- Public participation
- Outreach to neighboring communities
- Assess adequacy of mitigation measures currently in place
- Update mitigation goals, strategies, and actions
- Develop plan document
- State (DEMHS) and FEMA reviews
- Plan adoption



Woodbury  
(Jamie Cura, Patch.com)



Southbury Tornado  
(Lank & McKay WFSB 3)

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## DATA COLLECTION AND DISCUSSION

- Have critical facilities changed? Have any received new standby power?
  - *“Facility for which ANY threat of flooding is too great”*
  - *Potential critical facilities may include*
    - *Municipal offices*
    - *Hospitals and medical facilities*
    - *Designated primary and backup shelters*
    - *Other places where people may congregate during/following disasters (e.g. schools);*
    - *Facilities that are not easily evacuated (e.g. assisted living);*
    - *Power generation, communication, and transmission facilities;*
    - *Some infrastructure such as roads, bridges, water and wastewater facilities.*
- Need location data for exposure analysis
- Have shelters and evacuation routes changed?



Fire Engine Burning Following Brush Fire in Kent

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### DATA COLLECTION AND DISCUSSION

- Development and redevelopment trends
- Which bridges, culverts, and stormwater systems been replaced or upgraded?
- Discussion of recent storms
- Update on areas of flooding
- How are drainage and flooding complaints received and tracked?
- Who is the NFIP Coordinator?
- Repetitive loss properties (RLP)
- Any concerns about dams?

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### DATA COLLECTION AND DISCUSSION

- Update on areas prone to wind damage or increased wind damage risk
- Tree maintenance and tree warden budget
- Update on snow and ice removal routes and capabilities
- Update on areas prone to icing or snow drifts in winter
- Update on areas susceptible to brush / wildfires
- Update on areas susceptible to landslides

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## UPDATE MITIGATION ACTIONS

### Review prior actions

- “Ongoing” and “continue” are defined as “capabilities”
- Consolidate actions that are similar

### New mitigation actions

- Be judicious about which actions are carried forward
- The goal should be a somewhat achievable list of 20-25 actions
- Actions should be achievable within five years (i.e. “design” rather than “construct” – break up big projects into smaller steps)
- What one or two things can be done with current budgets?
- What one or two things would be done if funding was not a concern?

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## NEXT STEPS

- Confirm local coordinator
  - **Who will we remain in contact with?**
- Provide any information requested today
  - *Critical Facilities List*
  - *Loss Estimates from Previous Events*
  - *Status of Mitigation Actions*
- Internet-based survey
- Public information meeting
  - *Preferred local news outlets for public announcements?*

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<b>MEETING DATE:</b>	Oct. 29, 2020 10 to 11:45 AM	<b>ATTENDEES:</b>	Jared Heon, Emergency Mgmt. Dir.
<b>PROJECT:</b>	NVCOG NHMP Update		Bryan Tamburrino, Tangible Analytics
<b>MMI #:</b>	3211-29-01		Joanna Rogalski, NVCOG
<b>SUBJECT:</b>	City of Ansonia		Scott Bighinatti, Milone & MacBroom
<b>LOCATION</b>	Virtual/Remote (Zoom)		

Scott Bighinatti met with City of Ansonia representatives on October 29, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- The list of critical facilities from the 2012 plan was reviewed. Attendees had several updates as noted below in **Bold** text.

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Police Department	2 Elm Street	EOC	Yes	No	No	Remove from list in favor of new PD / EOC
Fountain Hose Co. No. 1	191 Howard St.	Fire Dept.	No	No	No	
Webster Hose Co. No. 3	67 Platt St.	Fire Dept.	<b>Yes</b>	No	No	
Charters Hose Co. No. 4	4 Murray St.	Fire Dept.	No	No	No	
Hilltop Hose Co. No. 5	80 Pulaski Hwy.	Fire Dept.	<b>Yes</b>	No	No	
Eagle Hose Co. No. 6	1 Main St.	Fire Dept.	No	No	No	
Public Works <b>and WPCA Complex</b>	<b>1 North Division St.</b>		<b>Yes</b>	No	No	Complex is behind the Riverwalk Dike
<b>City Hall</b>	<b>253 Main Street</b>		<b>No</b>	<b>No</b>	<b>No</b>	
Ansonia <b>Rescue Medical Services (ARMS)</b>	22 West Main Street	Ambulance, Supply Distribution Site	Yes	No	Yes	Behind levee
Armory	6 State Street		No	No	No	
WPCA Sewer Pump Stations	Multiple Locations	<b>14 Total Pump Stations</b>	Yes	No	Yes	
High School	20 Pulaski Hwy.	<b>Regional Shelter - ARC</b>	Yes	Yes	No	
John C. Mead School	75 Ford Street	<b>Animal Shelter</b>	Yes	Yes	No	
Middle School	115 Howard Ave.	<b>Backup Shelter</b>	Yes	Yes	No	
Prendergast School	59 Finney St.	<b>Communication Hub, State Police Radio Site</b>	<b>Yes</b>	No	No	
Hilltop Health Center	126 Ford Street	Nursing & Rehab	<b>Yes</b>	No	No	Now vacant – remove from list



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Julia Day Nursery & Kindergarten	76 Central Street	Daycare	No	No	Yes	This is behind the levee
Ansonia Community Action	4 Fourth Street	Daycare	No	No	No	
Valley YMCA	12 State Street	Daycare	No	No	No	
Boys & Girls Club of the Lower Naugatuck Valley	28 Howard Ave.	Daycare	No	No	No	
John J. Stevens Apts.	75 Central Street	Elderly housing	No	No	Yes	
Monsignor Hynes Apts.	70 Woodlawn Ave.	Elderly housing	No	No	No	
James J. O'Donnell Apts.	63 Woodlawn	Elderly housing	No	No	No	Has elevator
Riverside Housing Complex	36 Olsen Drive	Multi-lingual / limited translation	No	No	Yes	Remove from list
Riverview Apts.	15 West Main St.	Disabled and Elderly	No	No	Yes	
Capital <b>Apartment</b> s	290 Main Street	Disabled and Elderly	No	No	Yes	
<b>Beaver Brook Apartment</b> s	<b>445 Beaver Street, 110 Woodbridge Ave.</b>	Low income housing	No	No	No	
United Illuminating Co. Substation	Riverside Drive	Electrical	Yes	No	Yes	May not be behind levee

- The PD & EOC will be moving to a new location in March/April 2021 (65 Main Street). The building at this location was renovated to support the PD and EOC and will have a generator. There are currently no plans for old building which should be removed from the list.
- Generators have been installed at two fire stations. The other three still need permanent generators. At least one strategy for the City should discuss the need for generators.
- Public Works and the WPCA complex at 1 North Division Street shares a generator. This facility is also the refueling station for both Ansonia and the City of Derby.
- City Hall was added to the list of critical facilities. This facility needs a generator as it is home to critical records and departments, the City-wide phone system, and network servers.
- ARMS is behind the levee which was recertified. The facility reportedly no longer needs flood insurance (status is "protected by levee").
- The Armory is a gymnasium with a few associated offices. The facility is used for public programs, public meetings, youth sports, and as a polling location.
- There are 14 wastewater pump stations, and only two have permanent generators. The remaining 12 do not need permanent generators but do need to be pumped out every eight hours or so when the power is out. This was an issue during Tropical Storm Isaias. The City desires to have a standardized portable generator hookup at each sewer pump station and a dedicated portable generator that can be used to pump the chambers down on a rotating basis. This strategy should be added to the HMP.
- The City is very interested in connecting the pump stations to the WPCA through a SCADA system. Currently, the pump stations operate automatically but an operator needs to visit regularly to check



effluent stage in the chamber. Being able to track effluent stage from the WPCA would allow for better management and better prioritization during power outages.

- The High School is the regional, American Red Cross certified shelter. The generator has the capacity to power the entire building. However, not everything in the school is tied into the generator, just the shelter area and kitchen. Electrical upgrades are required to tie the entire building into the backup power supply.
- The generators at Mead School and the Middle School are small, old, and can only power approximately 25% of each building. The City wants to replace these with larger units. Mead School is the pet shelter, and the Middle School is the backup shelter.
- Prendergast School is the City's emergency communication hub and also has a tower for State Police communications. The facility is not used as a shelter. The onsite generator is equipped to run the boilers (for heat), the communication equipment, and can power approximately 50% of the building. An upgraded generator is not necessary at this location.
- The Hilltop Health Center has closed. The facility is presently vacant and has not been used since it flooded several years ago.
- The four daycare facilities listed above are still active. **Jared to check** if there are additional daycare facilities in the City that should be included on the list, such as a facility on Division Street.
- None of the apartment complexes that are considered to be critical facilities have emergency power. This is particularly a problem for the O'Donnell Apartments because there is an elevator in the building that cannot be used during outages.
- The Riverside Housing Complex should be removed from the list. The facility was torn down and the parcel is now vacant land.
- Beaver Brook Apartments is low-income housing and was added to the list as it has many older residents.
- **Jared will add** additional apartment complexes to the list as several renovation projects have occurred downtown. One is on 36-70 Main Street.
- Attendees were unsure if the United Illuminating substation was in the floodplain, this should be double checked for the report.

#### Development Trends

- **Attendees deferred to Sheila O'Malley** (who could not attend the meeting) to provide general information regarding development trends in the city such as new single-family homes, subdivisions, new commercial and industrial development, and redevelopment projects.
- There have been rehabilitation projects downtown where new apartments have been added that have elderly/disabled residents.
- The Naugatuck River Greenway recently completed a bridge over the railroad tracks that increased connectivity along this route. The greenway trail has seen extensive use during the pandemic.
- Developers have not submitted a concrete plan for a new facility at 36 Olsen Drive. Conceptual plans have included duplexes and a potential sports complex. Redevelopment is reportedly held up with HUD as it was previously low-income housing.

#### Recent Events

- Tropical Storm Isaias in August 2020 required City response but did not cause significant damage.
  - Trees fell on five or six homes causing minor to moderate damage.



- A large tree fell on the main transmission line leading to the electrical substation. Power was lost to the entire city until the tree could be removed and the electrical line repaired. The entire city was without power for one to two days, with full restoration occurring after four to five days.
- The City opened its EOC to coordinate event response. The electric utility had a dedicated liaison for the City EOC.
- The City opened a water / ice / cooling station at the ARMS building. Distribution included several thousand pounds of ice. Bottled water was also distributed to residents with private wells. The pandemic was an extra challenge for this effort as social distancing requirements needed to be followed and everything needed to be wiped down prior to distribution.
- Attendees could not recall any specific damages during the September 2018 rain event.
- The May 2018 tornado did not directly affect Ansonia. The City experienced other affects from the storm that was described as being similar to a microburst. Damage was widespread but electric power was quickly restored.
- The winter storm "Juno" in January 2015 did not result in damages. However, extra plowing efforts were needed to clear the snow.
- Winter Storm Nemo in February 2013 was the last major winter storm to affect the city. Ansonia received 38 inches of snow and the City needed to response quickly to remove snow from the roofs of public buildings such as schools. Private contractors were hired to assist with plowing and clearing.

#### RL Properties

- There are no repetitive loss properties in Ansonia.

#### Hazards Discussion

- Areas of flooding are similar to those in the last plan:
  - Unnamed tributary to Beaver Brook (Shortell Drive to Fairview Street) due to drainage capacity
  - Unnamed stream at Kielys Lane floods four residential properties
  - Unnamed stream at Ells Street (stream under homes)
  - Route 334 (Wakelee Avenue) due to flooding from unnamed stream north of Franklin Street and near Nolan Athletic Complex
  - Ponding in wetland area east of Route 8 between Jackson Street and Hull Street
- Attendees noted that flooding is also a problem on Division Street near the railroad tracks (poor drainage).
- Beavers have been building dams along Beaver Brook that flood the area between Father Salemi Drive and Central Street.
- A tributary to Beaver Brook is routed in culverts near Nelligan Park. High flows result in flooding behind houses in the vicinity of Prindle Avenue and Doyle Drive.
- The City owns the Fountain Lake Dam on the Seymour boundary. The dam is considered to be in good repair.
- The South Central Connecticut Regional Water Authority owns several dams in the area. The Quillinan Reservoir dam at 230 Beaver Street is considered to be in good repair. However, the dam between Peat Swamp Reservoir and Rimmon Road (near the intersection of Clinton Road) reportedly requires repair. The water utility has drained the impoundment low to prevent further deterioration. According to Town staff, a failure of this dam would be problematic for downstream areas.
- Tree damage during storms tends to be city-wide. There are no specific areas with dead or damaged trees. United Illuminating has aggressively removed damaged trees near their powerlines.



- Attendees did not have any concerns regarding icing or drifting snow.
- The City has fought a few brush fires over the past few years in the vicinity of Beaver Street.
- In addition to wildfire concerns in the northeastern corner of Ansonia (Naugatuck State Forest), attendees noted that there was limited access in the vicinity of the Ansonia Nature and Recreation Center (Schriber Park). However, it was noted that the State Forestry Division completed a thinning project in this area in 2018.
- Landslides continue to be an issue in Ansonia. Small slides have occurred on Platt Street, South Division Street, on the backside of Jewett Street, Tremont Street, and Williams Street. The slides are caused by a combination of steep slopes and groundwater emerging from the ground.
- The City demolished a former residence on Williams Street after it was undermined by a landslide.
- A retaining wall on Tremont Street near East Main Street has suffered damage from slides. Portions of the wall are deteriorated and have been overtopped by debris.

### Capabilities

- The Naugatuck River levee system in Ansonia has been certified by the USACE. The certification allowed FEMA to reclassify the floodplain protected by the levee as Zone X "Protected by Levee" which reportedly removed the requirement for flood insurance for many residents and businesses.
- The levee system is considered to be in good shape although many of its components are aging and must be manually operated. The City plans to seek funding to install a flood warning system and ideally to have automatic controls installed to reduce the manual effort needed to operate the levee.
- The City does not have set evacuation routes. Any evacuations are planned on a case-by-case basis.
- Flooding-related calls are routed to the Police Department during an emergency. The Police Department takes the report and contacts Public Works and the City Engineer who review the concern and develop a plan to address the flooding.
- Damage to individual properties from flooding or other hazards is currently tracked through filed police reports. There is no electronic database. The City has a new CFO and the EMD has been discussing the need for an electronic record system to record incidents, investigations, and resolutions.
- The City's NFIP Coordinator is believed to be the City Engineer (Fred D'Amico), although certain functions are shared with the Zoning Enforcement/Inland Wetland Officer (Dave Blackwell).
- The local electric utility, United Illuminating, has been aggressive with its tree trimming activities in the city.
- Public Works staff can clear trees that are not near power lines. During most event responses, United Illuminating tree contractors cut branches and trees near wires but leave the remains by the roadside for Public Works to clean up. The City has areas where Public Works and private citizens may bring tree debris where contractors will come and chip the material.
- The tree warden recently retired. The Director of Public Works is the interim tree warden until a replacement is hired.

### Goals, Objectives, and New Actions

- The Brownfield demolition of the former factory location near Liberty Street is the City's top priority over the next few years. Approximately 40 to 70 acres will be cleared. Part of the proposal will include a new connector into Ansonia from Route 8. This is not a true natural hazard mitigation project although direct connectivity to the highway is important.



- Other top projects for the City include mitigation of the flooding issue on Route 334, connecting the wastewater pump stations to SCADA, development of a flood warning system, and generator purchases and replacements.
- **Jared will host** an internal meeting to collect feedback from Planning and Public Works staff, ask Public Works about additional areas of flooding, and to review the previous strategies and actions. **The table on the next page has been started but will be completed by City staff.**

#### Next Steps

- The City has asked Bryan Tamburrino of Tangible Analytics to be the Local Coordinator during this process. He is the City's grant writer. Jared will be the backup and the long-term coordinator.
- Public announcements should be placed in the Valley Independent, New Haven Register, and the Connecticut Post in addition to social media and on the City's website. Announcements that may relate to Ansonia will be vetted through the Mayor's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the City's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series and make them available at the City and Town Halls	EMD	Completed	Pamphlets have been distributed, including CERT team information.
Disseminate informational pamphlets regarding natural hazards to public locations	EMD	Completed	Pamphlets have been distributed, including CERT team information.
Develop checklists for permittees that cross-references regulations and codes related to disaster resilience	PZC, B&E, EMD	Completed	There is an online permitting program now that guides applicants through the various regulations.
Require that utilities be placed underground in new developments	PZC	Discontinued	Not required yet, insufficient interest by commission
Pursue funding to place utilities underground in existing developments	BOS/BOA	Discontinue	Very expensive projects, would only occur with significant redevelopment projects.
Encourage residents to purchase and use NOAA weather radio with an alarm feature	EMD	Completed	This is a capability.
Review and update evacuation route maps at least annually	EMD	Completed	This is a capability and performed with the regular EOP update.
Install evacuation signs in SFHAs	EMD		
Consider establishing a back-up EOC as the ARMS building at 22 West Main Street is in the floodplain	EMD		



Action	Responsible Party	Status	Notes
Consider floodproofing measures for sewer pumping stations in SFHAs	PW		
Develop a site-specific evacuation plan for Riverside Housing Complex	EMD		
Develop a site-specific evacuation plan for John J. Stephens Apartments at 75 Central Street	EMD		
Develop a site-specific evacuation plan for Riverview Apartments	EMD		
Develop a site-specific evacuation plan for Capital Plaza at 290 Main Street	EMD		
Develop a site-specific evacuation plan for Julia Day Nursery & Kindergarten	EMD		
Continue to regulate activities within SFHAs to the greatest extent possible with the municipal codes and Zoning and Subdivision Regulations	PZC, B&E	Completed	This is a capability.
Consider requiring new buildings in floodprone areas to be protected to the highest recorded flood level regardless of SFHA status	PZC, B&E	Discontinue	Use of the elevations in the FIS (plus freeboard) is more appropriate for the City.
Ensure that new buildings be designed and graded to shunt drainage away from the building	PZC, B&E	Capability	This is a capability (building code).



Action	Responsible Party	Status	Notes
Require developers to demonstrate whether detention or retention of storm water is the best option for reducing peak flows downstream	PZC, B&E		
Provide technical assistance to owners of non-residential structures regarding floodproofing measures such as wet and dry floodproofing	EMD, B&E	Completed	This is a capability.
Pursue elevation of residential structures that suffer flood damage; RLPs should be prioritized.	EMD, BOS/BOA	Capability	<i>This is likely a capability, as it is something the City can help property owners pursue.</i>
Consider enrolling in the Community Rating System	EMD, B&E	Discontinue	This may no longer be desired with the levee recertification, as the number of properties needing flood insurance has been reduced.
Provide outreach regarding structure elevation, flood barriers, dry and wet floodproofing, and other improvement techniques	EMD, B&E	Completed	This is a capability.
Ensure that EMDs and other personnel attend DEEP and other training workshops such as the FEMA-sponsored training at EMI in Maryland	EMD, B&E	Completed	This is a capability.
Pursue acquisition/demolition of residential structures that suffer flood damage; RLPs should be prioritized.	EMD, BOS/BOA	Capability	There are no RLPs in Ansonia. Acquisition and demolition of floodprone properties can be conducted by the City provided that properties and funding are available. This is a capability.
Pursue the acquisition of additional municipal open space in SFHAs	BOS/BOA	Capability	Purchase of floodprone parcels can be conducted by the City provided that properties and funding are available. This is a capability. <i>Any recent open space acquisitions?</i>



Action	Responsible Party	Status	Notes
Selectively pursue conservation recommendations listed in the Plan of Conservation and Development and other studies and documents	BOS/BOA		
Continue to regulate development in protected and sensitive areas, including steep slopes, wetlands, and floodplains	PZC	Completed	This is a capability.
Develop a hydraulic/hydrologic model of floodprone river systems to prioritize mitigation such as bridge and culvert replacement, property acquisitions, etc.	EMD, PW		
Upgrade the Wakelee Avenue (Route 334) area drainage network to reduce flooding	PW, CT DOT	Carry Forward	A project is still needed in this area, although CT DOT may need to be the lead agency.
Upgrade and replace drainage along Prindle Avenue which carries a tributary to Beaver Brook which causes home flooding	PW		
Upgrade/replace the drainage network associated with the unnamed stream in the Ells Street area to reduce flooding	PW		



Action	Responsible Party	Status	Notes
Work with CT DOT to review drainage east of Route 8 where flooding occurs after rain events, and upgrade as needed to reduce potential for property damage	PW, CT DOT		
Pursue drainage/culvert improvements at Kielys Lane to reduce nuisance flooding	PW		
Consider localized flood walls or berms for the Olsen Drive area; or ensure that structures are flood damage resistant with dry land access available	PW		
Continue tree limb inspections and maintenance and outreach to private property owners regarding branches above powerlines	TW	Completed	This is a capability.
Increase funding for the Tree Warden to address a wider range of tree limb hazards than the current budget allows	TW, BOS/BOA		
Provide for the Building Department to make literature available during the permitting process regarding appropriate design standards for wind	B&E		



Action	Responsible Party	Status	Notes
Encourage the use of wind-mitigation structural techniques in new structures to protect new buildings to a greater level than the required standard	B&E		<i>Will the renovated Police Department / EOC be "code plus"?</i>
Conduct a study to identify municipal buildings, critical facilities, and commercial/industrial buildings that are vulnerable to roof damage or collapse	PW, B&E		
Develop a plan to prioritize snow removal from the roof of municipal buildings (especially critical facilities) and have funding available for clearing	PW, B&E		
Retrofit or modify critical facilities as needed to strengthen roofs and structures and make them more resilient to snow loading	PW, B&E		
Consider posting the snow plowing routes in municipal buildings and the municipal web sites	PW		
Identify areas that are difficult to access during winter storm events and develop contingency plans	PW		
Provide information for mitigating icing, insulating pipes, and retrofits for flat roofed buildings	PW, B&E		



Action	Responsible Party	Status	Notes
Consider preventing residential development in areas prone to collapse such as below steep slopes, or in areas prone to liquefaction	PZC		
Consider restricting construction on 15%, 20%, or 25% slopes and restricting excavation and clearing above and below such slopes	PZC		
Consider adopting or codifying USDA guidelines to regulate development in areas of steep slopes	PZC		
Consider preserving areas of steep slopes as protected open space through acquisitions or modified zoning	BOS/BOA		
Continue to require adherence to the state building codes	B&E	Completed	This is a capability.
Encourage through-streets instead of dead-end streets	PZC		<i>This may be a capability</i>
Ensure that utility providers are aware of landslide potentials and have responder teams available to repair damage caused by slides	EMD		
Make education materials available at Building and Engineering departments regarding identification of landslide risk areas	B&E		
Consider expanding and over-sizing drainage systems in the vicinity of steep slopes	PW		
Encourage property owners to have retaining walls inspected by structural engineers	EMD	Completed	This is a capability.



Action	Responsible Party	Status	Notes
Ensure that municipal departments and critical facilities have adequate backup facilities in case damage occurs	EMD		
Work with property owner to remove trees and reinforce the wall along South Main Street just to the north of Columbia Street	PW		
Work with the owners of the Platt Street landslide site to conduct maintenance and prevent future slides	PW		
Include dam failure areas in the Reverse 911 and CodeRed emergency contact database	EMD	Discontinue	Because CodeRED can specifically target calls into specific areas, a specific program is not necessary.
Work with DEEP to develop an EOP for Quillinan Reservoir Dam	EMD	Discontinue	This is owned by SCCRWA who is responsible for dam operations.
Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes from wildfires	FD	Capability	This is a capability
Ensure that provisions of Subdivision Regulations regarding fire protection facilities are being enforced	PZC	Capability	This is a capability
Pursue additional sources of fire-fighting water where adequate supplies do not exist	FD, BOS/BOA		
Patrol municipal-owned open space and parks to prevent campfires	FD, PD	Capability	This is a capability.
Continue to promote inter-municipal cooperation in fire-fighting efforts	FD	Capability	This is a capability.
When wildfire threats are high, monitor the northeast section of Ansonia	FD	Capability	This is a capability.



Action	Responsible Party	Status	Notes
Enforce regulations and permits for open burning	FD, PD	Capability	This is a capability.



**TABLE 2-5  
Critical Facilities**

Facility	Address or Location	Emergency Power Supply?	Shelter?	In Floodplain?
<b>ANSONIA</b>				
<b><i>Emergency Services</i></b>				
Police Department (EOC)	2 Elm Street	Yes	No	No
Fountain Hose Company No. 1	191 Howard Street	No	No	No
Webster Hose Company No. 3	67 Platt Street	No	No	No
Charters Hose Company No. 4	4 Murray Street	No	No	No
Hilltop Hose Company No. 5	80 Pulaski Highway	No	No	No
Eagle Hose Company No. 6	1 Main Street	No	No	No
<b><i>Municipal Facilities</i></b>				
High School	20 Pulaski Highway	Yes	Yes	No
John C. Mead School	75 Ford Street	Yes	Yes	No
Middle School (ARC-recognized Fall 2012)	115 Howard Avenue	Yes	Yes	No
Prendergast School	59 Finney Street	No	No	No
Ansonia Rescue Medical Services (ARMS)	22 West Main Street	Yes	No	Yes
Public Works	100 Division Street	No	No	No
Armory	6 State Street	No	No	No
Water Pollution Control Authority Sewage Pump Stations	Multiple Locations	Yes	No	Yes
<b><i>Health Care, Senior Living, Disabled, Elderly, Nursing, Multi-Lingual/Limited Transportation and Rehabilitation Facilities and Daycare Facilities</i></b>				
Hilltop Health Center (Nursing and Rehabilitation)	126 Ford Street	No	No	No
Julia Day Nursery and Kindergarten (Daycare)	76 Central Street	No	No	Yes
Ansonia Community Action (Daycare)	4 Fourth Street	No	No	No
Valley YMCA (Daycare)	12 State Street	No	No	No
Boys and Girls Club of the Lower Naugatuck Valley (Daycare)	28 Howard Avenue	No	No	No
John J. Stevens Apartments (Elderly)	75 Central Street	No	No	Yes
Monsignor Hynes Apartments (Elderly)	70 Woodlawn Avenue	No	No	No
James J. O'Donnell Apartments (Elderly)	63 Woodlawn Avenue	No	No	No
Riverside Housing Complex (Multi-Lingual/Limited Trans.)	36 Olsen Drive	No	No	Yes
Riverview Apartments (Disabled and Elderly)	15 West Main Street	No	No	Yes
Capital Plaza (Disabled and Elderly)	290 Main Street	No	No	Yes
<b><i>Other Facilities</i></b>				
United Illuminating Company Substation	Riverside Drive	Yes	No	Yes



<b>MEETING DATE:</b>	09/22/2020 10:00 to 11:45 AM	<b>ATTENDEES:</b>	Gerard Smith, First Selectman
<b>PROJECT:</b>	NVCOG NHMP Update		Kerry McAndrew, First Sel. Office Adm.
<b>MMI #:</b>	3211-29-01		Jeremy Rodorigo, EMD
<b>SUBJECT:</b>	Town of Beacon Falls		Natasha Nau, Finance Manager
<b>LOCATION</b>	Virtual/Remote (Zoom)		Keith Rosenfeld, Town Planner
			Robert Pruzinsky, Road Foreman
			Tom Carey, Wastewater Treatment
			Aaron Budris, NVCOG
			Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Beacon Falls representatives on September 22, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Powerpoint presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Beacon Falls Town Hall	10 Maple Avenue	Yes	Yes	No	Town Hall / Backup Shelter
Police Department	119 North Main Street			No	
Beacon Hose Company No. 1	35 North Main Street	Yes		No	Fire / EMT / Amb. / EOC
Public Works Garage	411 Lopus Road	Soon		No	Fueling station, gen. in 2021
Wastewater Treatment Plant	411 Lopus Road	Yes		No	
Sewage Pump Station	West Road	Yes		No	
Sewage Pump Station	111 Lopus Road	Yes		No	
Sewage Pump Station	123 Railroad Avenue	Yes		No	
Aquarion Water Company, Connecticut Water Company	(Infrastructure)			No	
Eversource	Cold Spring Road			No	
Beacon Falls Senior Center	57 North Main Street	Yes		No	
Laurel Ledge Elementary	30 Highland Avenue	Yes		No	
Woodland Regional High	135 Back Rimmon Road	Yes		No	
Old Auxiliary Building	52 Railroad Avenue			No (adjacent)	Fire Station No. 2
Radio Tower	61 Rice Lane			No	
Radio Tower	Rimmon Hill Road			No	
Debris Management Site	Breault Road				New since 2015

- No new critical facilities since 2015 other than the Debris Management Site.
- The Fire Department is the emergency operations center.



- Shelters are not ARC certified. The Town is interested in looking into the requirements.
- Generators are not located at the Police Department or the Old Auxiliary Building (Fire Station No. 2).
- The Public Works garage will have a generator installed in 2021 as it is in the capital budget.
- The Town is replacing water heaters at several critical facilities.

#### Development Trends

- Chatfield Farms continues to expand with new homes off Skokorat Road.
- Pond Springs Village off Route 8 (55+) continues to expand.
- Haley Ridge (31 homes) is under construction on Timberland Way / Fairfield Place. 15 lots are being developed.
- A large proposal (Hop Brook off Timber Ridge Lane) for 130 homes is presently before the Town's commissions.
- There are no drainage concerns regarding these developments.
- The Town has acquired more open space properties since 2015. One of these is Lantern Ridge. The 2013 Plan of Conservation and Development has a map of this and other desirable open space parcels. The Town is considering buying a property adjacent to the Police Station.

#### Recent Events

- The Town had heavy snow in January 2015 that was a challenge to plow, but no damage occurred. There was a small reimbursement from FEMA.
- The May 2018 tornado did significant damage to Beacon Falls. The reimbursement process was just finished, and they are closing out the process. The total reimbursement will be approximately \$400,000. There was significant tree damage and response time to address the damage. Public works performed tree removal for weeks. The roof of the fire station experienced minor damage, as did one Town vehicle. A town-owned retaining wall on Burton Road was also damaged. Power was out in the affected area for 7 to 10 days.
- The September 2018 rains did not cause any notable issues for Beacon Falls.
- Tropical Storm Isaias in August 2020 did minor damage. Power was lost in some areas for up to five days, including at the sewer pumping stations which operated on generators during that time. There was tree damage that required cleanup and one town-owned fence was damaged. Based on these past two wind events, the Town is considering placing a tree company on-call (currently the Town contracts specific jobs, such as those that require elevated work, through an RFP process).

#### RL Properties

- There are no repetitive loss properties in Beacon Falls

#### Hazards Discussion

- Beacon Falls, along with Naugatuck and Watertown, are participating in the Housatonic Valley Association's *Planning for Flood Resilient and Fish-Friendly Road-Stream Crossings* project [https://hvatoday.org/wp-content/uploads/2020/08/2020\\_03-RSCMP-Project-Fact-Sheet.pdf](https://hvatoday.org/wp-content/uploads/2020/08/2020_03-RSCMP-Project-Fact-Sheet.pdf).
- They plan to refurbish the Beacon Valley Road Bridge.
- The capital plan includes stormwater system upgrades to Skokorat Road and Burton Road.
- No new areas of flooding have come to the Town's attention.



- The buyout of the floodprone properties on Nancy Avenue is completed. A portion of Nancy Avenue was Town owned (Riverbend Park), and other adjacent pieces of property along the Naugatuck River owed back taxes. The Town took the properties over and forgave the taxes, allowing for expansion of Riverbend Park. Funding for the Park Development was through a \$100,000 US Fish & Wildlife Grant in 2014. The expanded park opened in 2017.
- The mobile home parks near Seymour continue to be vulnerable to multiple hazards such as flooding.
- The flooding of Route 42 at Hockanum Brook has been mitigated with an upgraded culvert beneath the roadway. More work needs to be done in this area to fully mitigate the issue.
- Basement flooding at Lopus Road, and the culvert washouts on Burton Road at Wolfe Avenue have not been mitigated.
- The beavers are no longer an issue. The Town works with trappers to remove the beavers as necessary to prevent flooding of the industrial park.
- The Town does not have any immediate concerns about dams. The majority of the dams in Town are small and privately owned. Large upstream dams on the Naugatuck River are maintained by the federal government.
- Areas susceptible to wind damage are the same as the previous plan.
- Icing is also an issue on Blackberry Hill Road and Skokorat Road. Snow drifts can reach 5 feet on Rimmon Hill Road.
- Ice jams, sinkholes, and landslides are generally not an issue in Beacon Falls. Small sinkholes have recently formed on Skokorat Road due to drainage pipes failing. A retaining wall on Burton Road has also been damaged by slumping.

#### Capabilities

- Drainage complains often go directly to Public Works but also reach the First Selectman's office.
- The Emergency Management Director is working on implementing a new system to track and analyze drainage complaints and other hazard issues reported to the Town.
- David Keating, Wetland Enforcement Officer, is the Town's NFIP Coordinator.
- The Road Foreman is also the Tree Warden. The budget is generally appropriate to perform cleanup and outreach.
- Plow routes are not posted publicly. They prioritize areas of steep hills.
- The Town primarily relies on public water supply to fight fires. There are a few dry hydrants in outlying areas. The Town also recently purchased new equipment using grants that allow them to draft water from ponds, and also received brush fire training.
- The Town has bonded \$5 million for road repairs, and \$1 million for upgrades at the WWTP. The road work will include improvements on Beacon Valley Road including some drainage upgrades. The WWTP is getting an electrical upgrade and a new generator, as well as a retaining wall to protect the secondary clarifier.
- A 5- to 10-year Capital Improvement Plan will soon be published with approximately \$20 million in potential projects. The Town intends to use it as a "wish list" for improvements.

#### Next Steps

- Kerry will be the Local Coordinator.
- Public announcements should be placed in the Citizens News and the Republican American in addition to on the Town's website.



- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Incorporate goals, strategies, and actions of the hazard mitigation plan to the Plan of Conservation and Development Update.	First Selectman	Carry Forward	This can be performed during the 2023 POCD update
Acquire standby power for the Public Works facility	Public Works	Complete	Budgeted for 2021.
Acquire standby power for Laurel Ledge Elementary School	Public Works	May be Complete	This may have occurred, but they need to double check.
Acquire standby power for the Woodland Regional High School pump station	Public Works	Discontinue	This is for a water pumping station. The school is R16, not under Town control.
Evaluate the cost of joining FEMA's Community Rating System and calculate the benefits to residents.	First Selectman	Complete/ Discontinue	Not a lot of structures in floodplain, unlikely to be cost-effective.
Perform a Town-wide inventory of drainage pipes during next stormwater management plan update	Public Works	Ongoing	MS4 filing done. Did street scan and have some GIS files. This is a work in progress. A formal study will not be performed.
Conduct a comprehensive drainage study along Main Street to determine appropriate mitigation measures.	Public Works	Ongoing	Drainage still a big issue on Main Street. This is being worked into various streetscape projects.
Improve emergency communications with the mobile home parks on South Main Street and provide outreach regarding evacuation procedures every two years to these residents.	EMS	Ongoing	Reverse 911 is used to contact this area. Outreach performed. Social media policy is in development for future outreach. This is a capability.



Action	Responsible Party	Status	Notes
Pursue an emergency access easement off the private drive on the east end of Andrasko Road leading down to private drive on Beacon Valley Road for use if the Borgnis Road bridge fails.	Public Works	Discontinue / Revise	Area still at risk, but this project will not be completed in next 5 years A study phase may be appropriate.
Pursue the acquisition of additional municipal open space properties inside SFHAs and set those aside as greenways and parks.	First Selectman	Ongoing	Generally adding to existing parks. Town looks at properties as they come available, looking at open space next to PD
Promote local floodproofing options for homes impacted by flooding along Beacon Hill Brook	First Selectman	Capability	Town looking at drainage improvements
Evaluate the possibility of acquiring or elevating residences or businesses that are prone to flooding, particularly within the Valley Mobile Home Park and the Beacon Falls Trailer Court. Pursue funding for home elevations should any residents become interested.	First Selectman	Capability	No interest in acquisitions at this time. The Town would consider new acquisitions in the future if requested.
Increase the conveyance capacity of the culvert for Hockanum Brook near Route 42 & Blackberry Hill Road	Public Works	Complete / Revise	Culvert upgraded but more work needs to be done in the area.
Evaluate the feasibility and effectiveness of increasing the capacity of the culverts located under Burton Road where washouts have occurred	Public Works	Carry forward	No progress due to funding and staff constraints.



Action	Responsible Party	Status	Notes
Evaluate the feasibility and effectiveness of increasing the capacity of the culverts located under Beacon Valley Road	Public Works	Ongoing	This is in progress.
Evaluate the feasibility and effectiveness of increasing the capacity of the culverts located under Lopus Road	Public Works	Discontinue	This will not be performed in the next five years. It is too low of a priority.
Upgrade the drainage system on Main Street to prevent drainage from backing up through the system when the Naugatuck River is high	Public Works	Ongoing	Drainage concerns in this area are worked on in smaller projects as opposed to one large project that would not be affordable.
Evaluate the feasibility and effectiveness of a flood wall or berm around the side of the Railroad Avenue pump station.	Public Works	Ongoing	Welded manhole covers to prevent water seepage. A floodwall or berm may still be needed. The water has come close to the fence in the past.
Evaluate the feasibility and effectiveness of a flood wall or berm around the side of the wastewater treatment plant.	Public Works	Complete	To be constructed in 2021.
Evaluate the feasibility of armoring the bridge on Beacon Valley Road to limit structural damage during storm events.	Public Works	Discontinue	Bridge will be rehabbed in place. Armoring may or may not be needed.



Action	Responsible Party	Status	Notes
Evaluate the feasibility of armoring the bridge on Pinesbridge Road (this bridge is owned by the State of Connecticut and the town would need to work with the State to determine if improvements could be made).	Public Works	Discontinue	State road.
Conduct outreach regarding dangerous trees on private property.	Public Works	Capability	The Tree Warden performs outreach as needed.
Provide for the Building Department to make literature available during the permitting process regarding appropriate design standards	Building official	Completed	This is a capability.
Develop a plan to address potential wind damage due to excessive pine trees located along Route 42 and Blackberry Hill Road.	Public Works	Discontinue	Not a concern, current response is sufficient in this area.
Upgrade utilities and place underground on Main Street to prevent future damage	Public Works	Discontinue	Wish list item that will not happen in 5 years. They are addressing this piecemeal through smaller projects.
Develop a plan to prioritize snow removal from the roof of critical facilities and other municipal buildings each winter. Ensure adequate funding is available in the Town budget for this purpose.	Public Works	Discontinue	They evaluate on a case-by-case basis following storms, a formal plan is not required



Action	Responsible Party	Status	Notes
Develop a plan to address snow drift in the vicinity of West Road, Hillside Drive, Skokrat Road and Blackberry Hill Road. Snow fencing and certain vegetation buffers may be helpful to reduce drifting.	Public Works	Complete	Snow fencing is erected on Rimmon Hill to mitigate drifts. A formal plan is not needed. The other areas are not concerning at present.
Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs	Public Works, EMS	Complete	The Town has adequate backup facilities without needing complete redundancy.
Evaluate the effectiveness of bracing systems and assets inside critical facilities. This could help protect IT systems, important records and files, libraries, and department-specific assets such as mechanical equipment in the wastewater treatment plant.	Public Works, EMS	Discontinue	These systems may be considered for new critical facilities in the future, but renovations of existing facilities are not believed necessary at this time.
Maintain copies of dam EAPs at the town hall.	EMS	Ongoing	The EMD has copies and reaches out to DEEP every few years to ensure they are up to date.
Include dam failure areas in the CodeRED contact database	EMS	Complete, Town wide	Currently evaluating if they want a new Reverse 911 system to replace CodeRed.
Form a Flood & Erosion Control Board to oversee problems with flooding and erosion	First Selectman	Carry forward	Not a lot of flooding issues that would require a separate board. The Town will look into this since funding is occasionally available to FECBs from the DEEP. They may designate inland wetlands as FECB.
Develop a long-term beaver dam management plan.	Public Works	Complete	Trappers are given permission to trap as needed, no longer an issue.



Action	Responsible Party	Status	Notes
If found feasible in the beaver dam management plan, utilize beaver deterrent devices such as beaver stops or beaver bafflers.	Public Works	Discontinue	Not necessary per above.
Provide technical assistance referrals to owners of Smith Dam regarding effective maintenance strategies if needed.	Public Works	Discontinue	This is the dam on Bethany Road. Town staff are not aware of any current issues or concerns with the dam.
Explore other fire protection solutions when water main extensions are not feasible, such as the use of fire ponds.	Fire Department	Completed	This is a capability.



<b>MEETING DATE:</b>	10/13/2020 1:30 to 3:00 PM	<b>ATTENDEES:</b>	Leonard Assard, First Selectman
<b>PROJECT:</b>	NVCOG NHMP Update		David Deakin, Selectman
<b>MMI #:</b>	3211-29-01		Michael Devine, Emer. Mgmt. Dir.
<b>SUBJECT:</b>	Town of Bethlehem		Paul Reid, Inland Wetlands Agency
<b>LOCATION</b>	Virtual/Remote (Zoom)		Aaron Budris, NVCOG
			Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Bethlehem representatives on October 13, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Ambulance Association	83 Main Street South			No	
North Purchase Elderly Home	11 Jackson Lane			No	
Arch Bridge School	21 Arch Bridge Road			No	Special Needs School / Residence
Angelus House	158 Flanders Road			No	Group Home
Newport Academy	64 Double Hill Road			No	Teen (Girls) Group Home
Newport Academy	98 Todd Hill Road			No	Teen (Boys) Group Home, added to list
Group Home	52 Arrowhead Lane			No	
Public Works / Backup EOC	36 Main Street South	Yes		No	Part of Municipal Complex
Town Hall	36 Main Street South	Yes		No	Part of Municipal Complex
Fire Department EOC	26 Main Street South	Yes	Yes	No	Part of Municipal Complex
Police Department	36 Main Street South	Yes		No	Part of Municipal Complex
Memorial Hall	Main Street	Yes		No	Community Center, warming and charging station
Bethlehem Elementary School	92 East Street			No	
The Woodhall School	58 Harrison Lane			No	Private School
Bethlehem Day Care	185 Main Street North			No	
Kids First (Day Care)	151 Main Street North			No	Added to list
Abbey of Regina Laudis	273 Flanders Road			No	Elderly population
Church of the Nativity	48 East Street		Yes	No	Temporary day shelter if school is evacuated
Horace Mann School – John Dorr Nature Laboratory	220 Nettleton Hollow Road, Washington Depot			No	Bethlehem is first responder to all emergencies at this facility, added to list
Various	Main Street South			No	Drug store, gas station



- Wellspring Foundation (84 Judge Lane) was removed from the list.
- All town buildings have generators.
- Bethlehem reportedly does not have the capacity to meet the typical standards for shelters or to have its shelters certified to American Red Cross requirements.
- Bethlehem continues to lack a true shelter space. Memorial Hall can be used for warming and charging, but people cannot sleep there for multiple days as there are no showers. The Fire Department has showers but lacks capacity to house more than a handful of people overnight.
- Bethlehem continues to work on securing access to a regional shelter facility. Recent work has been completed at Nonnewaug High School in Woodbury and the facility now has a generator, has capacity, and has showers. Town staff would like to work with Woodbury to come to an agreement to allow the facility to be shared space for Bethlehem residents to utilize. This will be a strategy that the Town will pursue over the next five years in order to secure a true shelter space for Town residents.
- Bethlehem continues to be the first responder for any emergencies at the Horace Mann School – John Dorr Nature Laboratory in Washington Depot. Access to the facility from Bethlehem is off Carmel Hill Road North along a 1.3-mile unpaved, steep gravel road. Town staff continue to be concerned about emergency access to this facility in the winter months.
- The Town does not maintain set evacuation routes. Any evacuations, if necessary, would be conducted on a case-by-case basis.

#### Development Trends

- Development in Bethlehem has been minimal over the last five years.
- Newport Academy constructed a new facility on Todd Hill Road.
- The Abbey of Regina Laudis completed renovations.
- Very few new homes have been built. There was only one two-lot subdivision that occurred.
- There has been no new commercial construction, although some buildings have been redeveloped into new businesses. Bethlehem does not have industrial development, although there have been a few new “cottage industries” operated out of residents’ homes.

#### Recent Events

- Tropical Storm Isaias in August 2020 caused significant tree damage throughout town.
  - There were many trees that fell blocking dead end roads and cutting off access for residents.
  - Power was lost for up to a week. Make safe crews from Eversource did not arrive in Bethlehem until four days following the storm. This meant that access to dead-end streets was not restored for several days in some cases.
  - The Town opened its warming / charging stations and distributed food and water from the fire house, as many private well owners were without power. Four pallets of water were distributed.
- Town staff did not recall any particular damage or concern with the September 25, 2018 rainstorm. This storm primarily impacted the southern portion of the NVCOG region.
- The May 2018 tornado did not affect Bethlehem.
- The January 2015 winter storm was a heavy snow event. The Town needed to hire additional contractors to complete plowing, which reportedly put the Town \$20,000 over its annual snow removal budget as of February 2015.



### RL Properties

- There are no repetitive loss properties in Bethlehem.

### Hazards Discussion

- The pipes conveying the outflow from Long Meadow Pond Dam to the Weekeepeemee River beneath Munger Lane continue to be undersized. The crossing is near March Farm. This is the most desirable flood mitigation project that Town staff would like to see completed in the next five years.
- A culvert conveying an unnamed tributary to the Nonnewaug River beneath Magnolia Hill Road was improperly extended using plastic piping surrounded by riprap. The riprap caused the plastic pipe to become unwound during a storm event, and the riprap now restricts flow through the culvert. Furthermore, the headwalls of the culvert need replacement. The Town would like to see this properly repaired in the next five years.
- The beavers along Double Hill Road were relocated by a wildlife relocation firm. There is no longer a flood concern in this area.
- The Town is not aware of any flooding concerns along Route 132 / Lakes Road near Long Horizon Road. The historic issue may have been related to a small pond in this area. This should be removed from the plan update.
- Crane Hollow Road last experienced flooding during Irene in 2011. This area is not typically a concern for flooding except during extreme events.
- The Town hired a contractor (Dayton) to install a box culvert and straighten Hickory Lane. This area is no longer a concern for flooding.
- Arrowhead Lane (homes), Hard Hill Road North (farms), and flooding of Route 132 / Kasson Road near the fire pond continue to be concerns.
- The Falls Road crossing over the Nonnewaug River is closed to through traffic, although nearby property owners still drive their tractors over it. This crossing provides emergency access to land trust parcels in the area. The culvert inverts have eroded away and need replacement. The Town would like to replace the culverts to ensure emergency access is maintained, but this is not a priority project.
- HRP completed a hydraulic study of Long Meadow Pond dam and the downstream area in 2015. The study reportedly did not recommend increasing the spillway capacity. The Town performs seasonal drawdown of the dam.
- The Town does not have any concern regarding the maintenance of Bronson Lockwood Dam.
- There is a significant amount of Ash trees in Bethlehem along roadways that have been affected by the Emerald Ash Borer. The damage is town wide. John Zarrella, Public Works Director, has been conducting roadway inspections to target areas for removal. The Town would like to obtain grant funding to remove the threat posed to power lines and structures in certain areas.
- There are no mobile home parks in town.
- There are a few areas of town where icing continues to be a concern:
  - Certain intersections with Route 132 (state road), namely Cabbage Lane and Woodcreek Road. As this is a state road, the Town does not have jurisdiction.
  - The emergency access road to Horace Mann / John Dorr Nature Laboratory continues to be a concern in winter due to its narrow width and the steep topography.
- Snow drifts continue to be a concern on Todd Hill Road and Hard Hill Road South. Another area of concern is the intersection of Double Hill Road and Munger Lane. Drifting snow also occurs on sections of Route 132 and Route 61. These are mitigated through local and state plowing efforts.



- The same areas of Bethlehem presented in the previous Plan continue to be concerns for wildfire. These include contiguous forest areas greater than 30 acres in size with limited access, and hay fields.
- There have not been any recent brush fires of note in Bethlehem. However, the Town responded through mutual aid to recent fires in Woodbury and Roxbury.
- Additional hazard areas are noted in the update of previous strategies and actions located at the end of these minutes.

#### Capabilities

- Ted Hart of MMI recently performed an inspection of Birds Pond Dam on Woodcreek Road. Scott will contact Ted for a copy of his report to see if he identified any concerns.
- The Town recently installed drainage along part of Woodcreek Road. This was a drainage project but not related to a flooding or icing issue.
- Public Works investigates flooding issues if they are related to Town infrastructure.
- The Building Official (Chris Ziebell) is the NFIP Coordinator who inspects development at risk of flood damage.
- The Public Works Director is the Tree Warden. They have increased their tree maintenance budget in recent years due to the Ash Borer. Public Works can cut, chip, and clear trees that are not near power lines, but they contract out larger jobs, jobs near power lines, and any jobs with elevated work.
- Public Works has set plowing routes for winter storms. The routes are not made public.

#### Next Steps

- Leonard Assard will be the Local Coordinator.
- Public announcements should be placed in the Voices in addition to social media and on the Town's website.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Add pages to Town website dedicated to citizen education and preparation for natural hazard events	EMD	Complete	Links were provided on the Town's home page to signup for the CT Alerts Emergency Notification System, as well as to a "Storm Safety Checklist" for preparing for severe storms.
Support regional efforts to make the High School available as a shelter for by installing a generator and making other needed improvements	EMD	Carry Forward	The Town of Bethlehem will work with the Town of Woodbury on making Nonnewaug High School a long-term regional shelter accessible to Bethlehem residents.
Designate an emergency shelter that can accommodate overnight evacuees	EMD	Discontinue	See above.
Consider constructing a community center that can serve as a shelter that can accommodate overnight evacuees	EMD	Capability	Town can accommodate short term overnights but not long term due to not having shower facilities and capacity in the same location. (In lieu of constructing a new Community Center (or adding on to the existing building), the Town will pursue sheltering at Nonnewaug High School.
Construct an animal shelter that serves Bethlehem	EMD	Discontinue	This is no longer needed. The goal will be to make pet sheltering possible at Nonnewaug High School.
Consider developing a microgrid for the Main Street South corridor, as the services on this road are critical for the town after weather emergencies	First Selectman	Carry Forward	This area continues to be considered a critical "facility". The potential for a microgrid needs further evaluation and buy-in from property owners.
Consider modifying the Plan of Conservation and Development to encourage two modes of egress into every neighborhood via through streets	First Selectman		Town POCD is in the final stages of being updated. There is a hearing later in Oct. 2020 to review the final draft plan. Attendees were unsure if this specific element is discussed in the POCD and will need to be reviewed at a later date. This will either be a capability or discontinued as the next POCD update will not be until 2030.
Incorporate additional elements of this hazard mitigation plan into the Plan of Conservation and Development	First Selectman		Same as above.



Action	Responsible Party	Status	Notes
Acquire open space properties within SFHAs and set aside as greenways, parks, or other non-residential, non-commercial, or non-industrial use	First Selectman	Capability	This is a capability that the Town can consider as properties become available. However, properties were not available over the last five years.
Consider limited acquisitions of homes along Arrowhead Lane depending on their elevations and flood risk	First Selectman	Discontinue	These properties have not flooded recently. As noted above, this can be considered should properties become available, or if property owners approach the Town.
Encourage the State DOT to elevate Route 132 between Lakes Road and Sky Meadow Lane, or to widen the stream and install a box culvert	First Selectman	Discontinue	Encouraging the DOT is a capability, but ultimately the Town does not have jurisdiction over the state roadway. Water runs down the state roadway near Swendsen Pond during heavy rains, resulting in road or lane closure.
Replace culverts throughout town and increase capacities where appropriate (CIP updated every year; in the middle of a needs assessment in 2015)	Public Works	Discontinue	In general, due to budgetary constraints culvert replacements are timed with roadway reconstruction or paving work. A separate strategy specific to culvert upgrades alone is not actionable for Bethlehem.
Harden utility lines that feed the Main Street area, as the services along Main Street South are critical for the town after weather emergencies	First Selectman	Discontinue	Main Street is a State highway (Route 61). The overhead wires are owned by Eversource, making it unlikely that the Town could lead on this project. It was noted that Eversource has installed the capability to isolate power near Route 132 / Route 61, allowing for a smaller area to be shutdown when repairs are needed. In addition, the action above about the potential for a microgrid would be a means to bring power redundancy to this area.
Post a list of Town sheltering facilities in the Town Hall and on the Town's website	EMD	Discontinue	Shelter locations are storm specific and announced through CT Alerts / social media. Town staff would prefer not to have the shelter locations posted on the website in order to discourage people from showing up to a potential location before a shelter is officially opened.
Encourage the Horace Mann Nature Center to widen and improve the access road from Bethlehem to facilitate emergency access	First Selectman	Capability	The Town has encouraged this. It was discussed with the facility during a recent renovation project, but ultimately the driveway was not improved or widened. However, an access gate was installed that allows for remote opening from Bethlehem's dispatch center.



Action	Responsible Party	Status	Notes
Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs	First Selectman	Complete	Backup facilities are considered adequate for Bethlehem's needs.
Consider bracing systems for assets and equipment inside critical facilities	Public Works	Discontinue	This may only be possible for Bethlehem for new critical facility construction (capability). Town staff noted that the library considered a bracing system for their shelves, but attendees did not know if a system was ultimately pursued.
Construct a properly sized spillway for Long Meadow Pond Dam (inspection will be in 2015, then this will be after the inspection)	Public Works	Discontinue	The existing spillway is reportedly considered to be adequate per Town staff based on the inspection that was conducted after the last edition of this hazard mitigation plan. This action will not be pursued.
Increase capacities of culverts downstream of Long Meadow Pond Dam to convey the same discharges as the spillway after it is constructed	Public Works	Carry Forward	The Town continues to be interested in upgrading the culverts beneath Munger Lane. The Town would like to try to get a grant for this upgrade.
Develop a written evacuation plan for Arrowhead Lane and Crane Hollow Road residents	EMD	Discontinue	A written plan is no longer considered to be necessary. Evacuations from this area will be conducted on a case-by-case basis.
File EAPs in the office of emergency management and ensure that they are current.	EMD	Capability	The EMD has copies of EAPs for Bronson Lockwood Dam and Long Meadow Pond Dam. He is not aware of other EAPs for dams in Bethlehem.
Explore other fire protection solutions such as the use of cisterns (two schools might put in tanks as they upgrade in the near future)	EMD	Capability	Newport Academy recently installed cisterns at both facilities to support sprinklers. The elementary school added domestic water tanks, although these are not used for fire suppression. Cisterns are typically installed as part of new construction per Fire Marshall review (capability). The Town budgets for new dry hydrants (e.g. one was installed on Flanders Road last year) and for dry hydrant maintenance each year. Staff noted that a 2,500-gallon tanker was recently purchased for Fire Department, increasing its capacity to carry water to fight fires.



## 2.9 Critical Facilities and Sheltering Capacity

The Town considers its police, fire, governmental, and major transportation arteries to be its most important critical facilities, for these are needed to ensure that emergencies are addressed while day-to-day management of Bethlehem continues. Elderly housing facilities and group homes are included with critical facilities, as these house populations of individuals that would require special assistance during an emergency. In addition, Town personnel consider its communication utilities to be a critical facility. A list of critical facilities is provided in Table 2-5.

**Table 2-5**  
**Critical Facilities in Bethlehem**

Type	Name	Address	Located in SFHA?
Emergency Medical	Ambulance Association	P.O. Box 401	No
Retirement Community	North Purchase Elderly Home	11 Jackson Lane	No
Group Home	Wellspring Foundation	84 Judge Lane	No
Group Home	Wellspring Foundation / Arch Bridge School	21 Arch Bridge Road	No
Group Home	Angelus House	158 Flanders Road	No
Group Home	Double Hill	Route 64	No
Group Home	52 Arrowhead Lane	52 Arrowhead Lane	No
Town Hall	Municipal Complex   Backup EOC	36 Main Street South	No
Public Works	Municipal Complex	36 Main Street South	No
Fire Department	Municipal Complex   Primary EOC	26 Main Street South	No
Police	Municipal Complex	36 Main Street South	No
Community Center; Day shelter for charging and warming	Memorial Hall	Main Street	No
School	Bethlehem Elementary	92 East Street	No
School (Private)	The Woodhall School	58 Harrison Lane	No
Day Care Center	Bethlehem Day Care	185 Main Street North	No
Other	Abbey Of Regina Laudis	273 Flanders Road	No
Temporary day shelter if the school is evacuated	Church of the Nativity	48 East Street	No
Commercial/Services	Various	Main Street South	No

*Source: Council of Governments Central Naugatuck Valley; Town of Bethlehem*

The town center, shelters, transportation, and communications are described in more detail below, along with a summary of the potential for these facilities to be impacted by natural hazards.

### **Town Center**

The businesses and services located along Main Street South are considered a critical “facility” by the town. There is a need to keep the Main Street South services open as long as possible after



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<b>MEETING DATE:</b>	10/16/2020 10 to 11:30 AM	<b>ATTENDEES:</b>	Ray Rogozinski, Dir. of Public Works
<b>PROJECT:</b>	NVCOG NHMP Update		Harley Graime, Emer. Mgmt. Dir.
<b>MMI #:</b>	3211-29-01		Aaron Budris, NVCOG
<b>SUBJECT:</b>	City of Bristol		Scott Bighinatti, Milone & MacBroom
<b>LOCATION</b>	Virtual/Remote (Zoom)		

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Scott Bighinatti met with City of Bristol representatives on October 16, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- A table of critical facilities was not included in the former CCRPA Plan. Instead, CCRPA geolocated many of the City's facilities on a map for the exposure analysis, and the report discussed specific critical facilities pertinent to the planning process. The NVCOG Plan will include a table and addresses will be used for the exposure analysis.
- The table of critical facilities below was compiled based on the mapped facilities in the former CCRPA Plan and the list of critical facilities used by Dewberry for the State Hazard Mitigation Plan. **City staff will review the list and make additions as appropriate**, such as adding addresses, identifying facilities with emergency power, adding facilities of concern such as group homes or elder care facilities, etc.

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Bristol Hospital	41 Brewster Road	Yes			
Bristol Hospital Emergency Medical Services	371 Terryville Avenue				
Bristol-Burlington Health Dept.	240 Stafford Avenue				
Bristol Communication Towers	Various	Yes			How many? Can we include locations?
Bristol Ham Radio Repeaters					
Bristol City Hall	111 North Main Street	Yes			Partial power to building
Bristol Fire Dept. – Eng. Co. 1 / Tower Co. 1	181 North Main Street	Yes			
Bristol Fire Dept. – Eng. Co. 2	151 Hill Street	Yes			
Bristol Fire Dept. – Eng. Co. 3	75 Church Avenue	Yes			
Bristol Fire Dept. – Eng. Co. 4	18 Vincent P. Kelly Road	Yes			
Bristol Fire Dept. – Eng. Co. 5	285 Mix Street	Yes			Minimal backup power



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Bristol Leaf Compost Facility	685 Lake Avenue				
Bristol Municipal Facility / Police Department / EOC	131 North Main Street	Yes			
Bristol Senior Community Center	240 Stafford Avenue	Yes	Yes		Primary Shelter
Bristol Transfer Station	Mount Vernon Road				
Bristol Water Pumping Stations	Various	Yes			Are these floodproofed? Should we include locations?
Bristol Wastewater Pumping Stations	Various	Yes			Are these floodproofed? Should we include locations?
Bristol Wastewater Treatment Plant	75 Battisto Road				
Covanta Power Plant / Resource Recovery Facility	170 Enterprise Drive				
Bristol Central High School	480 Wolcott Street				
Bristol Early Childhood Center	240 Stafford Avenue				
Bristol Eastern High School	632 King Street				
Bristol Technical Education Center	431 Minor Road				
Chippens Hill Middle School	551 Peacedale Street	Yes	Yes		Backup Shelter
Edgewood School	345 Mix Street				
Ellen P. Hubbell School	90 West Washington Street				
Greene-Hills School	718 Pine Street				
Ivy Drive School	160 Ivy Drive				
Mountain View School	71 Vera Road				
Northeast School	530 Stevens Street				
South Side School	21 Tuttle Road				
St. Joseph School	335 Center Street				
St. Matthew's School	33 Welch Drive				
St. Paul Catholic High School	1001 Stafford Avenue				
Stafford Elementary School	212 Louisiana Avenue				
Tunxis Community College – Bristol Campus	430 North Main Street				
West Bristol School	500 Clark Avenue				
Hess Station	34 Farmington Avenue	Yes			Gas Station with Generator
Mobil On the Run	330 Middle Street	Yes			Gas Station with Generator
Crown Oil Co. Inc.	347 Riverside Avenue	Yes			Gas Station with Generator

- It was requested that the ham radio repeaters be added to the critical facilities table. **City staff will provide more details on these facilities.**



- The generator at the Senior Center (primary shelter) powers approximately two-thirds to three-fourths of the building. This is sufficient to meet sheltering needs.
- Chippens Hill Middle School (backup shelter) now has two generators located on site. The second generator was added because the first one was not responding well as of 2015.
- The Board of Education maintains a plan if there is a need to evacuate a school. Each school has another school to which students can be relocated.
- The City does not have a formal evacuation plan for hazards such as flooding. Any evacuations are planned for on a case-by-case basis.

#### Development Trends

- Development continues in Bristol, although not at an accelerated pace.
  - A few 10-20 lot subdivisions have been constructed in recent years.
  - There have been lots of redevelopment projects, both residentially and commercially.
  - A new elderly housing development was constructed.
  - There is a new high-rise senior housing development that reportedly needs a generator.
  - An assisted living facility is under construction in the downtown area.
- The City has updated some of its regulations to help promote low-impact development. Specifically, its regulations were updated to ensure compliance with the MS4 program. More work is needed regarding low-impact development regulations.
- The City's floodplain management ordinance is consistent with DEEP's model ordinance and the State building code in that they require one foot of freeboard for new development or substantial improvement. The City is considering increasing the requirement to two feet of freeboard.

#### Recent Events

- Tropical Storm Isaias in August 2020 was the only recent storm of note for City staff.
  - Damage was widespread throughout Bristol although some areas were hit harder than others. **Ray will forward memoranda he prepared regarding the City's response to the event.**
  - The key post-event concern for City staff was the breakdown in Eversource's Make Safe program. Although City staff were trained on the importance of this program, the Eversource community liaisons reportedly were unaware of the program or its necessity for responding to downed power lines.
  - Due to the delay with Make Safe responders, the City lost 24-36 hours of clean up time during which they could only barricade roads and dangerous downed powerlines.
  - Once Eversource crews arrived in the city, the cleanup and response efforts were reportedly excellent. City staff noted that the cleanup crews went above and beyond to make restoration efforts. Ultimately, power was only out in Bristol for 3 to 4 days for most properties that were affected.
  - The key follow-up concern for City staff is how they track their response efforts. When an event occurs, City staff are not considering potential regional implications that could lead to a federal disaster or emergency declaration – they are focused on the response measures necessary to restore the city. While this is to the benefit of residents and businesses, it is difficult for City staff to try to piece together the documentation regarding specific cleanup actions a week after an event when an emergency declaration is realized.



- Bristol used GPS tags on photos and general recollections of work performed to try to piece together the Isaias response, but believe that some efforts were never formally tracked for federal reimbursement.
- City staff desire to improve their documentation process over the next five years such that they can transition more seamlessly to providing the required documentation for federal reimbursement programs when necessary.
- Although capital improvements such as GPS trackers for City vehicles could help with documentation, City staff do not believe that this would be a feasible expenditure solely to help with major events every few years.
- Another specific need identified following this storm was that City departments need more mobile emergency light towers. For example, Public Works needed to borrow several of such towers from the Water Department in order to perform nighttime cleanup work.
- The May 2018 tornado and the September 2018 rain event did not impact Bristol.
- The January 2015 winter storm produced significant snowfall in Bristol, but City staff could not recall any specific damage other than the need for additional plowing efforts.

#### RL Properties

- There are presently 32 repetitive loss properties in Bristol, down from 34 in 2015. It was not immediately clear to City staff which properties may have been removed from the list.
- The City is presently working with a repetitive loss property owner near the Pequabuck River who would like their property to be acquired.

#### Hazards Discussion

- The principal flood prone areas continue to be along Coppermine Brook and the Pequabuck River, particularly near the confluence of the two watercourses (Frederick Street), along Coppermine Brook near Farmington Avenue and Stevens Street, and along the Pequabuck River in Forestville and downtown. Broad Street also continues to be a recurring flooding area.
- The City has an ongoing capital improvement program aimed at replacing structurally obsolete bridges. New bridges were recently installed on Louisiana Avenue, Memorial Boulevard, Down Street, Jerome Avenue, Melon Street, and East Street. Due to topography and permitting constraints, it has been difficult for the City to increase flood conveyance. However, the City widens spans and removes central piers whenever possible during reconstruction projects.
- **Ray will forward a list of recent drainage, bridge, and culvert projects.** Some were installed or upsized to help address nuisance flooding issues.
- The bridge at Frederick Street was replaced with an increased opening size for the purposes of flood mitigation. MMI designed the project.
- The City is in the process of issuing a contract for sediment and obstruction removal of the Pequabuck River culvert in the downtown area. This will help increase capacity in the culvert.
- Following completion of the Coppermine Brook Study and the Pequabuck River Study, one of the biggest realizations for the City over the past few years has been the fact that there is no "magic bullet" project that will greatly reduce the frequency or intensity of flooding. There are simply too many topographical challenges to overcome. For example, modeled flood retention dams along Coppermine Brook were found to not have significant benefits to reducing peak flows and also carried high capital costs and a high permitting burden. Furthermore, some of the larger projects the



City has conceptualized or designed have encountered resistance from property owners or from regulatory agencies. The City's focus is now primarily on mitigating individual properties.

- The City does not have any concerns at present about any of the dams within or upstream of the City.
- Removal of the dam along the Pequabuck River near Middle Street / Route 72 is still planned. However, removal of this dam will not provide a significant benefit for flood mitigation.
- The potential for tree damage from high wind events is widespread throughout Bristol. Some Ash trees have been affected, but City staff believe that Bristol was less affected by the Emerald Ash Borer than other communities.
- There are two mobile parks in the city. Both are prone to flood damage and wind damage. One is Creekside Estates on Broad Street. The other is Riverside Park on Andrews Street. Both are adjacent to the Pequabuck River. The City does not consider these to be critical facilities.
- There are some areas in the City where icing is of minor concern. These are mitigated through municipal treatment efforts.
- Drifting snow is of concern in the higher elevations of the City. This includes the Chippens Hill area (Perkins Street and Hill Street) mentioned in the previous Plan, but also other areas. These are mitigated through municipal plowing efforts.
- Wildfire risk areas are generally the same as in the previous plan, with the most significant area of concern being the large contiguous forest areas adjacent to Willis Street.
- The City does not utilize cisterns or dry hydrants in outlying areas of the city away from the public water system. Ultimately, the City has experienced very few brush fires and when such fires occur, they can be accessed via pumper trucks.
- The area around Cedar Lake has water service but more hydrants are recommended for this area.
- City staff do not believe that they have any concerns regarding ice jams, sinkholes, or landslides. However, it was noted that it would be helpful to have a specific definition in the Plan regarding what constitutes a sinkhole that is a "natural hazard" as opposed to one that is caused, for example, by a collapsed drainage system.

### Capabilities

- FEMA is conducting remapping of the Pequabuck River to generate updated FIRMs. City staff do not believe that there will be significant changes to the AE zones. However, there will reportedly be a lot of additional A zones added to previously unmapped streams. The City has been conducting outreach regarding these changes and the potential need to purchase flood insurance.
- The City has extensive experience applying for the FEMA grant programs related to the HMP but has not been successful at obtaining grants. Many potential projects in the city simply do not generate the benefit-cost ratio above 1.0 that is required to receive grant funding. City staff believe that a detailed discussion of how to meet this requirement is necessary to inform the regional part of the plan.
- The City recently completed improvements along Stevens Street and Candy Lane to mitigate flooding along Copper Mine Brook. This was an MMI design project.
- The City has recently received copies of several EAPs for privately owned dams in the city. These EAPs have helped the City update its understanding of its potential vulnerabilities to dam failure.
- Flooding complaints are typically sent to the Mayor's office and then routed to Public Works for consideration.
- The City Engineer (Nancy Levesque) is the NFIP Coordinator with assistance from Carol Noble (Environmental Engineer).
- Public Works maintains set plowing routes that are not made public.



- Residents are encouraged to use CT Alerts for emergency notification. The City also has a signup page on its website for residents to be contacted by text or email regarding a variety of City programs including receiving emergency alerts.

#### Next Steps

- Ray Rogozinski will be the Local Coordinator.
- Public announcements should be placed in the Bristol Press in addition to social media and on the City's website. However, any announcements that may relate to Bristol must be vetted through the Mayor's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the City's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Acquire generators to increase backup power capability for critical facilities	Emergency Management	Partly Complete Carry forward, Revise	Significant progress has been made. For example, The Chippens Hill Middle School (backup shelter) generator was 20 years old in 2015 and failed to operate during a recent storm event. A second generator was added to this facility.  City Hall – The generator continues to only power the lowest floor of building.  Fire Stations – The generators at all of the Fire Stations need upgrades or replacements.  The City still desires to purchase a portable generator.
Install additional fire hydrants in areas with insufficient spacing	Emergency Management	Carry Forward	There continue to be certain outlying areas near the urban-wildland interface at risk of wildfires where additional hydrants are needed – Cedar Lake is one such area.
Revise the subdivision / zoning code to include policies for low-impact development	Planning	Partly Complete Carry Forward	The goal is to reduce stormwater runoff and therefore flood levels. This was a recommendation of the 2015 POCD and the Pequabuck River Study. Significant progress has been made. The City updated some of its regulations to comply with the MS4 regulations, but more revisions are necessary to adopt true low-impact development regulations.
Construct an elevated floodwall at the Pequabuck River Culvert inlet headwall and wing walls	Public Works	Discontinue	This was a recommendation of the Pequabuck River Study to reduce the flooding potential to 11 nearby buildings. This is at the downtown culvert (North Main Street / Main Street). The City no longer plans to pursue a floodwall in this area. Instead, the City is presently pursuing a sediment and obstruction removal project in the conduit to increase capacity and is focusing on mitigation at individual properties.
Develop a Pequabuck River flood response plan to provide dam operators guidance on how to manage dams to mitigate the effect of downstream flooding	Public Works, Water Dept.	Carry forward, revise	Several dams in the Pequabuck River Watershed have outlet structures that can be controlled. A coordinated plan to reduce peak flows could mitigate flood damage in downstream communities. City staff have met with Bristol Water Department and New Britain Water Department regarding pre-storm releases, but a written plan is still needed.
Perform a registration drive to encourage signups for CT Alerts Emergency Notification System	Emergency Management	Carry forward	This was to include targeted mailings, such as in particularly vulnerable areas such as floodplains and dam failure inundation areas. This still needs to be done, as there has been more focus in recent years on the City's notification system. The City would like more information on how this could be accomplished, such as specific steps that could be taken as part of the action.



Action	Responsible Party	Status	Notes
Increase outreach efforts regarding flood mitigation	Public Works	Complete	Members of the public requested more information regarding flood insurance, flood mitigation techniques, and ongoing City programs aimed at reducing flood damage in 2015. The Pequabuck River Study also identified the need for a floodproofing technical assistance program, including education regarding floodproofing, working with property owners to determine if they were eligible to apply for LOMAs to reduce insurance rates, identifying potential vendors, and coordinating grant funding. Presently, the City is doing outreach regarding these items related to the Pequabuck River remapping project, and more outreach is planned. There will be more A zones mapped in the city, although the AE zones are not expected to change significantly.
Implement a predictive flood warning program specific to Bristol	Public Works	Complete	This included having the USGS reactivate the Pequabuck River gaging station and coordinating with the National Weather Service to estimate potential flood elevations and inundation zones for a predicted storm event. The City presently pays approximately \$15,000 per year to operate the gaging station. The City is interested in other potential options that may be less expensive.
Incorporate updated hazard mitigation plan information into community plan updates	Planning	Complete	This was already done for the POCD in 2015. City staff were not immediately aware of any other community plans that incorporated information from the Hazard Mitigation Plan.
Participate in the Water Utility Coordinating Committee process	Water Dept.	Complete	This was related to potential drought impacts. Bristol Water Department was an active member of the Western WUCC during the Coordinated Water System Planning process.
Ensure local officials have the most updated version of the Connecticut Drought Management Plan	Water Dept.	Complete	The most recent State Drought Plan was adopted 2018. This plan differs from (is more general than) the Water Dept.'s drought response plan. According to attendees, local officials were all provided a copy of this plan.
Join FEMA's Community Rating System at Class 8	Public Works	Carry Forward	This would provide a 10% discount on flood insurance for all policy holders in Bristol but would require staff time and resources. The City is still considering this and believes there may be more desire for this program following completion of the Pequabuck River remapping project.



Action	Responsible Party	Status	Notes
Update the local floodplain management ordinance to meet current model ordinance requirements	City Council / Inland Wetlands	Complete	The State building code now requires freeboard, as does DEEP's model ordinance (both 2018). The Pequabuck River Study recommended increasing the freeboard requirement to two feet for new buildings and substantial improvements. City regulations are presently generally consistent with the model ordinance (one foot of freeboard), although two feet of freeboard is being considered. They also have a FECB that meets regularly.
Work with repetitive loss property owners to mitigate those properties upon request	Public Works	Capability	This is a capability because the City can work with property owners when requested within time and budget constraints. As an example, the City is presently working with one RLP owner on a potential acquisition project.



<b>MEETING DATE:</b>	10/19/2020 1:00 to 2:45 PM	<b>ATTENDEES:</b>	Suzanne Simone, Env. Planner
<b>PROJECT:</b>	NVCOG NHMP Update		Sean Kimball, Town Manager
<b>MMI #:</b>	3211-29-01		Arnett Talbot, Asst. Town Manager
<b>SUBJECT:</b>	Town of Cheshire		Jack Casner, Fire Chief
<b>LOCATION</b>	Virtual/Remote (Zoom)		Mark Cunningham, Highway Supt.
			Keith Darin, Building Official
			Aaron Budris, NVCOG
			Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Cheshire representatives on October 19, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- Critical facilities from the 2014 HMP were presented for review as shown in the table below.

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Elim Park Baptist Home	140 Cook Hill Road			No	Assisted Living
Marbridge Retirement Center/Fairwinds	665 West Main Street			No	Assisted Living
Highlands Health Care	745 Highland Avenue			No	Assisted Living
Cheshire Correctional Institution	900 Highland Avenue			No	Correctional Facility
Manson Youth Institution	42 Jarvis Road			No	Correctional Facility
Webster Correctional Institution	111 Jarvis Road			No	Correctional Facility
Chesprocott Health District	1247 Highland Avenue			No	
Cheshire Fire Dept Co. 2	1511 Byam Rd	No		No	
Cheshire Fire Dept HQ	250 Maple Ave	No		No	
Cheshire Fire Dept Station 3	1125 South Main St	No		No	
Cheshire Public Library	104 Main Street	No		No	
Cheshire Police Dept Headquarters	500 Highland Ave	No		No	EOC is in basement, but location is not ideal
Cheshire Youth Center	559 South Main Street	Yes	Yes	No	Primary Shelter
Cheshire Town Offices	84 South Main St	Yes		No	
Sewage Treatment Plant	Cheshire Street			Yes	
Public Works Garage	1286 Waterbury Rd	No		No	



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Chapman School	38 Country Club Road	No		No	
Cheshire Academy	10 Main St.			No	Private School
Cheshire High School	525 South Main Street	Yes	Yes	No	Secondary Shelter – Generator powers only the front half (50%) of the building
Darcey School	1686 Waterbury Road	No		No	
Dodd Junior High School	100 Park Place	No		No	
Doolittle School	735 Cornwall Avenue	No		No	
Highland School	490 Highland Avenue	No		No	Used as warming / charging center
Humiston School	30 Spring Street	No		No	
Legionaries of Christ Seminary	475 Oak Avenue			No	
Norton School	414 North Brooksvale Road	No		No	
St. Bridget Elementary School	171 Main Street			No	Private School

- The Town has a separate list that it maintains for priority power restoration which is provided to Eversource each year. That list includes facilities that are missing from the above list, including two daycare facilities, a low-income housing facility with medically compromised residents, and a small school and mental health facility on Jarvis Street. **Jack will either send the Eversource list to Scott for consolidation with the table above or update the table above with these additional facilities.**
- The Marbridge Retirement Center is presently replacing one of its buildings with a new, larger facility.
- The Town's Emergency Operation Center (EOC) is in the basement of the Police Department. This location is not ideal as it is distant from other Town buildings used for emergency response and lacks dedicated emergency power. A portable generator is used to provide power to the facility when necessary. The Town would like to apply for a grant to outfit a new EOC building or Annex to an existing building that has dedicated emergency power.
- The Town has concerns with anhydrous ammonia at three industrial facilities and the potential for airborne plume migration following a release. Scott explained that a detailed assessment of this type of hazard is not covered under the HMP process, as this planning process predominantly relies on existing mapping. Note that DEEP has been spearheading a statewide initiative aimed at reducing the potential for spills and releases from businesses, particularly small businesses, during natural disasters. Therefore, an acceptable strategy for the HMP from the State's perspective is for the Town to request that the three facilities model the potential plume migration area.
- The Town has a formal evacuation plan that was developed by the local police department in coordination with the State Police. It reportedly contains a variety of evacuation scenarios that can be referenced by Town staff.
- Cheshire has two portable generators that can be moved around town when necessary. All municipal buildings and schools have hookups installed to support the portable generators. A third portable generator is desired as the Town experienced two permanent generator failures during Isaias.



- A new strategy is for the Town, in coordination with the Board of Education, to outfit all of its schools with permanent generators in the next five years. Currently, only the High School has a generator, and that generator only powers 50% of the building.

#### Development Trends

- There has been a significant amount of development in Cheshire over the last few years.
  - Four residential subdivisions have been built.
  - Many single-family residential homes have been built.
  - There have been many residential home modifications. Generator hookups have been very popular, as have solar array installations.
  - Several large lot commercial developments, including 2 new buildings on Knotter Drive, new medical centers on West Johnson Avenue and South Main Street, and the new facility at Marbridge.
  - Several commercial buildings have constructed significant additions, including Viron Rondo Osteria on Route 10, the Whole Foods distribution center on East Johnson Avenue, and the nurseries on East Johnson Avenue.

#### Recent Events

- Tree damage was generally widespread throughout Cheshire following Tropical Storm Isaias in August 2020. The southern portion of town was generally hit harder than the northern portion. Many roads (or portions of roads) were closed for several days until power could be properly shut down and trees could be removed.
  - Power outages generally lasted 6 to 7 days.
  - Similar to other communities in the region, Cheshire had issues coordinating with Eversource regarding the timing of Make Safe crews versus restoration crews. The Town is currently holding meetings with Eversource to discuss necessary coordination improvements.
  - The intersection of Mount Sanford Road at South Brooksvale Road was closed for several days.
  - The generators at Town Hall and the Police Department both failed to operate. The Town needed to rent a portable generator to power the Town Hall. The Town's two portable generators were used at the Police Department (to power the EOC) and at Highland School to power a warming/charging station.
  - The primary and secondary shelters were not opened.
  - The Town is working to streamline its internal processes for disaster response.
- The September 2018 rain event caused minor flooding on a couple of roads in Cheshire.
- The May 2018 tornado primarily impacted southern Cheshire. Residents of approximately 11 or 12 homes were displaced due to damage. The majority of tree damage from high winds occurred in the vicinity of Mount Sanford Road and South Brooksvale Road, Sir Walter Drive, and Higgins Road. **Jack will provide a more complete list of damaged areas.**
- The January 2015 winter storm produced a lot of snow that required additional plowing efforts. No damage was recalled for this event.
- Attendees could not recall any other recent storms that resulted in flooding or structure damage. There are several microbursts and thunderstorms each year that cause minor tree damage but are not considered to be significant risks to the town.



### RL Properties

- The four repetitive loss properties in Cheshire were discussed. Attendees were not immediately aware of any recent flooding events impacting these properties.

### Hazards Discussion

- The Town Manager is currently in discussions with three private property owners whose homes lie on the far side of a brook from the street. The three driveways are overtopped by floodwaters on private property. The Town is interested in applying as a sponsor/sub-applicant to these property owners to offset the cost up upgrading the private culverts. The local match would be paid for by the property owners. As the current Town of Cheshire HMP is expired<sup>1</sup>, this could be a potential grant application for the September 2021 funding cycle.
- None of the recent developments have resulted in drainage concerns or issues. The Zoning regulations require no net increase in runoff from new developments and on-site detention of stormwater.
- The Meriden Water Department removed an abandoned water main that crossed underwater on the Quinnipiac River in the vicinity of Sindall Road. This main was reportedly an obstruction to river flow in the past.
- Areas at risk to flooding are generally similar to the previous HMP.
  - Town staff installed additional piping along Route 42 that is believed to have resolved the flooding issue involving the tributary to Willow Brook.
- Beavers were previously clogging a culvert along Roaring Brook in western Cheshire. Public Works responded multiple times to clear the dam and obstructions from the culverts. The beavers reportedly eventually moved elsewhere.
- The Town completed the necessary spillway repairs at Mixville Pond Dam.
- Improvements to Weeks Pond Dam are anticipated in the next few years. There is concern that once detailed onsite investigations begin it may be found that the entire dam needs replacement. A total of \$140,000 is earmarked in the fiscal year 2023-2024 Capital Improvement Plan for this work.
- Jack noted that he has not received EAPs from DEEP for privately owned dams whose failure would affect Cheshire.
- The potential for tree damage is town wide. An increased budget is desired over the next few years to continue clearing away ash trees damaged by the Emerald Ash Borer. The Town has budgeted approximately \$150,000 per year over the next several years in the Capital Improvement Plan for tree removal, but the tree removal funding often needs to be reduced to balance the annual budget.
- The City of Meriden performed significant cutting of dead ash trees on its lands draining to Broad Brook reservoir.
- Areas prone to icing are generally the same as in the previous plan. Town staff believe that the icing issue on Peachtree Court has been mitigated by the Connecticut DOT installing drainage in the area.

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<sup>1</sup> Following the meeting, it was discovered that DEMHS has been informing potential sub-applicants with expired HMPs such as Cheshire that the agency would accept grant applications in this funding cycle provided the updated HMP would be adopted prior to the grant award. This means that it is possible that Cheshire could apply during this funding cycle. Further discussion between the Town of Cheshire and DEMHS may be warranted.



- Drifting snow is an issue in several areas, including Barnhill Road, Highland Avenue near Richards Chevrolet, and Waterbury Road near the "S" curves. Connecticut DOT reportedly installed some drainage pipe to mitigate the icing on Waterbury Road.
- Wildfire risk areas are still the same as the previous HMP, namely areas of contiguous wooded areas of more than 50 acres in size without access to public water service. Attendees noted that the fire department responds to approximately 10 to 12 small brush fires each year. Additional fires occur along Interstate 691 and Interstate 84 that require response.
- **Jack will forward a list of approximately 10 outlying areas in Cheshire where expansion of public water service is desired to enhance emergency response.** The Town would likely need to fund these main extensions.
- There have not been any new occurrences of sinkholes in the past few years.

### Capabilities

- Cheshire's floodplain management regulations prohibit new residential development or substantial improvement from occurring in special flood hazard areas. It is possible for a property owner to get a variance, but they need to get approval from the Town Engineer. The process typically involves the property owner getting a Letter of Map Amendment from FEMA or going through a related FEMA process to demonstrate that the home is not affected by the 1% annual chance flood.
- The Town has not reviewed DEEP's model ordinance for floodplain management to determine if any specific elements would be beneficial to Cheshire. In many cases, the Town's regulations exceed the model ordinance such as by prohibiting new residential development or residential substantial improvements in the 1% annual chance floodplain. The Town has had residents in the floodplain apply for permits only 2 or 3 times in the past five years.
- The Town's regulations for non-residential construction or substantial improvement in the floodplain are consistent with the NFIP minimum standards and do not require freeboard. However, 1 foot of freeboard is now required by the State Building Code. Non-residential developers have not requested floodplain permits over the past five or six years and such development has been out of the 1% annual chance floodplain.
- The West Johnson Avenue Bridge over the Ten Mile River was upgraded by the Town in 2020. The flood conveyance capacity of the bridge was reportedly increased.
- The Town recently completed a reinforcement project on the bridge carrying Marion Road over Cuff Brook to protect the bridge from scour and flood damage.
- The Town Engineer (Walter Gancarz) is the NFIP Coordinator, although he is retiring.
- Public Works can perform some tree removal, but they contract out all elevated work.
- There are no mobile home parks in Cheshire. They are reportedly prohibited under current zoning.
- Areas of icing and drifting snow are mitigated through municipal plowing and sanding efforts. Specific mitigation actions are not necessary.
- The Town's sinkhole management policy continues to be to address issues on a case-by-case basis.

### Next Steps

- Suzanne Simone will be the Local Coordinator.
- Public announcements should be placed in the newspaper in addition to social media and on the Town's website. **Arnett will forward the list of appropriate newspapers for outreach.** Public announcements related to the plan will be vetted through the Town Manager's office prior to publication.



- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Increase the conveyance capacity of the bridge over Honeypot Brook at Blacks Road	Public Works	Complete	The bridge was replaced during summer 2014. The conveyance capacity was reportedly increased.
Ensure that the development project at I-691 and Route 10 is flood damage resistant and causes no adverse impacts upstream or downstream	Planning	Capability	This development has not yet been built. The permits are expired, and the zoning process for any new development would need to be reperformed. This is a capability as these items are evaluated as part of the review process.
Acquire standby power supplies for two critical facilities that do not have generators	Public Works	Complete	The 2014 plan does not identify the critical facilities where generators were to be pursued. Attendees indicated that these were for new generators at Youth Center and High School (the two shelters). The generators were installed.
Determine best course of action to make the town pool facility more resilient to severe storms	Public Works	Complete	This is now a solid structure and no longer the inflatable bubble. This facility also has a hookup for the Town's portable generators.
Consider adding earthquakes to the list of hazards specifically identified in the EOP	Police & Fire Dept.	Complete	The Town is in the final phase of EOP revisions. As Cheshire is using the State's EOP template, and earthquake hazards are in the State's EOP template, response to earthquakes will be in next year's EOP.
Ensure that municipal departments have adequate backup facilities in case earthquake damage occurs	Public Works	Complete	In general, the Town is in a far better place for redundancy than 5 years ago. For example, they have a backup plan if the primary fuel depot at Public Works is damaged. The Town also has 2 portable generators and would like another one. Furthermore, Cheshire has multiple data and server backups. IT-wise the Town has significant redundancy.
Consider bracing systems for assets and equipment inside critical facilities	Public Works	Discontinue	An evaluation was not performed. This is unlikely to be completed in the next five years as it is low priority given the redundant functions noted above.
Address each sinkhole incident or complaint on a case-by-case basis rather than making townwide policy	Town Manager	Capability	This is a capability and continues to be Town policy.



Action	Responsible Party	Status	Notes
Support CT DEEP in its requirement for inspections of all Class B and C dams and maintenance as needed	Public Works	Capability	This is a capability and is Town policy.
Support CT DEEP in its requirement that owners of Class B and C dams have up to date EAPs and Dam Failure Analyses	Public Works	Capability	This is a capability and is Town policy.
Complete the Mixville Pond dam mitigation report as per DEP request	Public Works	Complete	This was the recently completed spillway repair project.
Make copies of the Class B and C dam EAPs on file at the Town Hall	Public Works	Carry Forward	The EMD has not received copies of EAPs for dams within and upstream of Cheshire whose failure would affect Cheshire. This could be because new plans have not been developed. Outreach to DEEP should be performed regarding the status of EAPs.
Explore other fire protection solutions when water main extensions are not feasible, such as the use of cisterns	Fire Department	Capability	This is likely a capability and is performed as part of Fire Marshall review of a potential project. The Town also has a list of approximately 10 outlying areas where there would like to see water main extensions performed.
Pursue the acquisition of additional open space properties within SFHAs	Town Manager	Capability	This was not meant to be a specific project, but rather a policy to be included in the 2016 POCD update. Although purchase of additional open space properties is encouraged, purchase of open space within floodplains does not appear to be specifically discussed. Instead, the Plan recommends acquiring open space property to fulfill valid and identifiable public goals, which includes prevention of development in the floodplain. The Town considers protection of floodplains in the evaluation conducted when evaluating an open space purchase.
Acquire private land in SFHAs and set it aside as greenways and parks	Town Manager	Capability	This was not meant to be a specific project, but rather a policy to be included in the 2016 POCD update. Although purchase of additional open space properties is encouraged, purchase of open space within floodplains does not appear to be discussed. Instead, the Plan recommends acquiring open space property to fulfill valid and identifiable public goals, which includes prevention of development in the floodplain. The Town considers protection of floodplains in the evaluation conducted when evaluating an open space purchase.



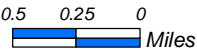
CHESHIRE

Critical Facilities

- Substation
- Police
- Fire
- Emergency Shelter
- Waste Water Treatment
- Public Water Supply
- Convalescent Home
- Other Facilities

Circuit / Substation

- 15Q6 / CANAL ST
- 12F46 / HANOVER ST
- 15Q7 / CANAL ST
- 12F47 / HANOVER ST
- 12F48 / HANOVER ST
- 4C16 / SOUTHTON
- 20H2 / SOUTH CHESHIRE
- 20H3 / SOUTH CHESHIRE
- 30L23 / TODD RD
- 16S2 / SCHOOL HOUSE RD
- 15Q1 / CANAL ST
- 30F2 / SANDBANK
- 30L28 / TODD RD
- 15Q4 / CANAL ST
- 15Q5 / CANAL ST



EVERSOURCE  
ENERGY



PROPRIETARY INFORMATION: The material contained on the Overhead Distribution Circuit Map shall be considered proprietary to Eversource and Users (which shall be defined as any person or entity who has received the Map through sale, purchase, exchange gift, or otherwise) shall keep it in confidence and shall not furnish or disclose it to any third party without the prior written permission of Eversource. The circuit and facility data is subject to change.

Date: 10/01/2019



Critical Facility	Name	Address	Town	State	Circuit	Substation Name/ Town Located	Date	Circuit / Cust. Count
Police/PSAP	Police Department	500 Highland Ave	Cheshire	CT	15Q5	Canal St / Manchester	03/01/2018	12F46 / 75
Fire	Station 3	1125 South Main Street	Cheshire	CT	20H3	South Cheshire / Cheshire	03/01/2018	12F47 / 2665
Fire	Company 2	1511 Byam Road	Cheshire	CT	30L28	Todd Rd / Wolcott	02/13/2019	12F48 / 3220
Fire	Fire Department	250 Maple Ave	Cheshire	CT	15Q6	Canal St / Manchester	03/01/2018	15Q1 / 1411
Emergency Shelter	Town Hall	84 S Main St	Cheshire	CT	12F48	Hanover St / Meriden	03/01/2018	15Q4 / 301
Emergency Shelter	High School (used As Primary Shelter)	525 S Main St	Cheshire	CT	12F48	Hanover St / Meriden	03/01/2018	15Q5 / 1282
Waste Water Treatment	E Johnson Ps	520 East Johnson Avenue	Cheshire	CT	15Q4	Canal St / Manchester	03/01/2018	15Q6 / 956
Waste Water Treatment	W. Johnson Ps	185 West Johnson Avenue	Cheshire	CT	15Q4	Canal St / Manchester	02/13/2019	16S2 / 42
Waste Water Treatment	Cook Hill Ps	109 Cook Hill Road	Cheshire	CT	12F48	Hanover St / Meriden	02/13/2019	20H2 / 580
Public Water Supply	North Cheshire Well Field	330 Blacks Road	Cheshire	CT	12F47	Hanover St / Meriden	03/01/2018	20H3 / 502
Public Water Supply	South Cheshire Well Field	1250 South Main Street	Cheshire	CT	20H3	South Cheshire / Cheshire	03/01/2018	30L23 / 98
Convalescent Home	The Highlands Healthcare Center	745 Highland Ave	Cheshire	CT	15Q5	Canal St / Manchester	03/01/2018	30L28 / 272
Convalescent Home	Elim Park Nursing Home/assisted Living	140 Cook Hill Rd	Cheshire	CT	12F48	Hanover St / Meriden	03/01/2018	4C16 / 171
Other Facilities	Webster Correctional/state Prison	111 Jarvis St	Cheshire	CT	12F47	Hanover St / Meriden	03/01/2018	
Other Facilities	Manson Correctional/state Prison	42 Jarvis St	Cheshire	CT	12F47	Hanover St / Meriden	03/01/2018	
Other Facilities	Cheshire Correctional Institution	900 Highland Ave	Cheshire	CT	15Q5	Canal St / Manchester	03/01/2018	



# WATER MAIN INSTALLATION

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## POLICY STATEMENT



Jack Casner  
Chief of Department







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## SCOPE

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The intent of this procedure/policy statement is to identify and clarify the desire for the installation of water mains from a town wide perspective. This statement will also indicate the priorities and benefits of the installation of water mains. Finally this statement will be a reference for public officials when allocating funding for the water main projects.

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## POLICY STATEMENT

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The installation of public water mains in Cheshire has been a priority for the Cheshire Fire Department for decades. The Town of Cheshire has, in the past allocated the requested amounts which have led to the installation of public water mains covering 80% of the town for the purposes of fire protection and delivering water to 23,121 residents in 6,625 locations.

Over the last 10 to 15 years this program has not been funded at the requested amounts and in fact we have made very little progress in this area. The budget requests have been submitted and they are either funded at a much lower amount or not funded at all. The Fire Department requests these funds to install/extend water mains for firefighting purposes there are other items of equal concern they include, The factors that should make development of an effective water supply network a high priority for any fire department are:

**Firefighter safety.** You cannot conduct fire suppression safely without timely delivery of adequate water supplies to the scene. A robust, well-planned water supply network greatly enhances the safety of firefighters engaged in operations.

**Public safety.** The availability of a robust water supply system enhances the fire department's ability to provide excellent fire protection to Cheshire resident. Minimizing the distance that mutual aid fire tankers must travel on rural roadways during water supply operations further enhances public safety by reducing opportunities for traffic accidents involving fire apparatus.

**Insurance rates.** The local fire department can leverage well-designed rural water supply networks to achieve better fire protection ratings from the Insurance Services Office (ISO) or similar state rating agencies. In turn, this can result in cost savings to residents and businesses that benefit from lower fire insurance rates.

Without a fire hydrant close the scene of a building fire, we would have to resort to other means of providing or getting the water to the scene of the fire. The other options that we would have



would be to call for mutual aid tankers from a neighboring town or if feasible lay supply lines from the closest reliable source to the fire. Both of these options require extensive manpower and equipment to be effective. As was indicated in the recently transmitted staffing survey **we do not have the adequate personnel in many instances to resort to these options.** We here in Cheshire have seen first-hand that a fire develops faster and it gains intensity an area that is not protected by public water hydrants due to the time it takes to establish a water supply, resulting in higher damage costs to the property owner.

There are many other reasons that are not a urgent to install water mains from a domestic standpoint which can improve the quality of life of residents, some of these include:

- Assurance of clean uncontaminated drinking water
- Inadequate supply of water available from a well
- Assurance of the continuation of water for households and businesses despite power outages
- Elimination of the need to maintain private wells and deal with replacement of pumps and tanks when problems arise
- Elimination of any need for individual filtration and treatment systems to reduce or remove contaminants
- Elimination of the risk of private well contamination
- Increase property values

The installation/extension of water mains is clearly is a priority for the Cheshire Fire Department and the means by which we have been funding these projects in the past several years is not working. We have tried to bundle these projects and do them piece by piece or piecemeal and this is having virtually no positive impact on the program overall.

We as a community should decide what it is that we want to do, is it install water mains and make a significant contribution to the infrastructure of the town as well as improve public safety to our residents. If the answer to the previous question is yes then we really need to make a commitment to getting this program moving.

If we, as a community don't want to install/extend water mains at all and are willing to accept the risks involved than that is a decision that we should make as a community after the community is educated on the risks.

Understanding the large costs of installing and maintaining water mains is totally understandable that there is apprehension when it comes to spending money to install water mains and there is also



a recurring cost on an annual basis. All these factors taken in to account, we as a community need to determine how we want to address the issue of water main installation. Attached on the next page the streets that have been identified and are in need of public water and the estimated costs to install the mains. If we decide to take this project on over several years we could budget and plan accordingly with a greater knowledge of the needs.







Priority	Street	# of Houses	Distance (miles)	Distance (ft)	Estimated Cost (\$150/FT)
1	Marion Road (South)	102	0.69	3,628	\$ 725,600.00
2	Wallingford Road (to town line)	86	0.94	4,974	\$ 994,800.00
3	Charter Oak	21	0.56	2,972	\$ 594,400.00
4	Harrison Road	66	0.25	1,320	\$ 264,000.00
5	Moss Farms Road	76	0.34	1,820	\$ 364,000.00
6	Percival Road	15	0.37	1,977	\$ 395,400.00
7	Cook Hill Road	63	0.32	1,688	\$ 337,600.00
8	Half Moon Road	9	0.41	2,171	\$ 434,200.00
9	Abrams, Mountaincrest	38	0.94	4,974	\$ 994,800.00
10	Reservoir Road	32	1.67	8,814	\$ 1,762,800.00
11	Huckins Road	19	0.31	1,616	\$ 323,200.00
12	Notch Road	55	0.63	3,328	\$ 665,600.00
13	Boulder Road	13	0.58	3,083	\$ 616,600.00
14	Old Waterbury Road	21	0.35	1,854	\$ 370,800.00
15	Hickory Road	10	0.13	690	\$ 138,000.00
16	Hilltop Road	15	0.34	1,772	\$ 354,400.00
17	Oregon Road	31	0.98	5,185	\$ 1,037,000.00
18	Terrell Farm Road	12	0.87	4,619	\$ 923,800.00
19	Sloper Lane	9	0.21	1,103	\$ 220,600.00
20	Wyndemere Court	13	0.34	1,795	\$ 359,000.00
	Totals	706	11.25	59,383	\$ 11,876,600.00
				Average per installation	\$ 593,830.00



<b>MEETING DATE:</b>	Sep. 24, 2020 10:30am - 12pm	<b>ATTENDEES:</b>	Mark Neuendorf, Emer. Mgmt. Dir.
<b>PROJECT:</b>	NVCOG NHMP Update		Andrew Baklik, Chief of Staff
<b>MMI #:</b>	3211-29-01		Phillip Hawks, Fire Marshall
<b>SUBJECT:</b>	City of Derby		David Lenart, 1 <sup>st</sup> Asst. Fire Chief
<b>LOCATION</b>	Virtual/Remote	(Left 11:00 am)	Thomas Biggs, 3 <sup>rd</sup> Asst. Fire Chief
	Zoom		Brian Mezzapelle, 1 <sup>st</sup> Asst. Chief, Amb.
		(Joined 11:30 am)	Edward Abel, WPCA Superintendent
			Ted Estwan, Planning & Zoning Chair
			Jack Walsh, WPCA Chair
			Joanna Rogalski, NVCOG
			Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with City of Derby representatives on September 24, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- Generators are a critical need for the city. Many critical facilities, including many of the firehouses (including the combined fire department / ambulance corps at Storm Engine Company No. 2) do not have backup power. Hotchkiss Hose Company No. 1 has a generator, but it is 45 years old.
- Marshall Lane Manor is no longer an assisted living facility. It now houses foreign students. It is still considered a critical facility because of the language barrier in responding to this facility.
- Birmingham Health Center (Assisted Living) is presently empty and should be removed from the list.
- St. Mary – St. Michael is a private elementary school with a cafeteria that could be used as a shelter.
- The Middle School is the primary shelter and has a generator.
- The Fire Alarm Tower is considered to be a critical facility. Backup power is available.
- Sewer and stormwater pumping stations have been refurbished but there are no new locations. All pumping stations have backup power.
- The telephone switching station is considered to be a critical facility.

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Police Department	125 Water Street	Yes	No	Yes (Parking Lot)	
Hotchkiss Hose Company No. 1	200 David Humphrey Road	Yes	Temporary	No	



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Storm Engine Company No. 2	151 Olivia Street	No	Temporary	No	
East End Hose Company No. 3	Derby Milford Road	No	Temporary	No	
Paugassett Hook & Ladder Company No. 4	57 Derby Avenue	No	Temporary	No	Believed to be in 500-year floodplain
City Hall (EOC)	1 Elizabeth Street	Yes	No	No	
Middle School	73 Chatfield Street	Yes	Yes	No	Corrected address, facility has generator
Bradley School	155 David Humphreys Road	No	Yes	No	
Public Works	65 Coon Hollow Road	No	No	No	
Wastewater Treatment Plant	South End of Factory Street	No	No	Yes	
WPCA Sewer Pump Stations	8 Locations: (2) Roosevelt Drive, (2) South Division Street, (2) Burtville Avenue, (2) Patty Ann Terrace	Yes	No	No	
WPCA Stormwater Pump Stations	6 Locations: Division Street (Derby), Ansonia City Line (Derby), Derby WWTF, Ansonia City Line (Ansonia), Maple Street (Ansonia), Riverside Drive (Ansonia)	Yes	No	Yes	
Marshall Lane Manor (Assisted Living)	101 Marshall Lane	Yes	No	No	Now a dormitory for foreign students – no assisted living
Birmingham Health Center (Assisted Living)	219 Chatfield Street	Yes	No	No	Currently empty, remove from list
Stygar Terrace (Elderly)	Stygar Terrace	No	No	No	
Guardino Terrace (Elderly)	Guardino Terrace	No	No	No	
Cicia Manor (Elderly)	West Fourth, Anson & Fifth Streets	No	No	No	
Old Derby High School (Hallock's Landing) (Elderly)	Minerva Street	No	No	No	
Griffin Hospital	130 Division Street	Yes	No	No	
Griffin Hospital Cancer Center	350 Seymour Avenue	Yes	No	No	
Lakeview Apartments (Elderly)	Roosevelt Drive (Route 34)	No	No	No	
Derby Dam (Owner: McCallum Enterprises)	Housatonic River Near Galiardi Street	No	No	Yes	
St. Mary – St. Michael (Private School)	14 Seymour Avenue	?	Yes	?	Added at meeting



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Fire Alarm Tower	74 Cottage Street	Yes	No	?	Added at meeting
Telephone Switching Station	?	?	No	?	Added at meeting

### Development Trends

- There have been many old buildings demolished over the last few years. Replacements are proposed (particularly in the downtown redevelopment area) but construction has not yet commenced. It is likely that there will be many new mixed-use buildings completed in the next 5 to 10 years.
- There have been no large-scale commercial or industrial developments over the last eight years.
- There have been no subdivisions over the last eight years. All residential development has been single family homes on previously vacant lots, demolish / rebuilds, or additions.

### Recent Events

- Tropical Storm Isaias in August 2020 was primarily a wind event for the city.
  - Flooding was not an issue.
  - Tree damage occurred throughout the city, but for the most part was minor. Power outages lasted up for 5 days in some areas, but the outages were generally due to single trees damaging main power lines leading into outer neighborhoods.
- The September 25, 2018 storm was very high intensity and several areas experienced flooding.
  - Route 34 was overtopped by flooding near Chapel Avenue, which had previously never been an issue. This may have been due to overwhelmed drainage systems as streams do not appear to be present in the area.
  - The detention pond on O'Sullivan Road overtopped and caused flooding downstream (see below).
  - Construction at the High School was occurring, and the heavy rains resulted in significant downstream runoff and siltation.
  - Flooding occurred at Pershing Drive and on Seymour Avenue near Summer and Winter Streets due to overwhelmed drainage systems. The drainage from these areas is directed to the Naugatuck River through the dike.
  - Route 34 also experienced flooding near A and B Streets near the Housatonic River.
- The May 2018 tornado mostly missed developed areas of Derby. There was significant tree damage near the city boundary with Ansonia and Seymour, but no widespread power outages in the city.
- The January 2015 winter storm was largely not an issue for the city. There was a significant plowing effort but no real damage. There was one multi-alarm structure fire during the night, but it occurred during a period with less intense snowfall.



### RL Properties

- The repetitive loss properties are believed mitigated. One was previously mitigated in the O'Sullivan Island area, and the other two were reportedly located south of Main Street in an area where many buildings have been demolished.

### Hazards Discussion

- The detention pond on O'Sullivan Road near Sodom Lane at the end of Lanzieri Court continues to be a drainage concern. The pond needs dredging to restore capacity. Overflows affect the Big Lots shopping center. Town staff believe that the frequency of flooding in this area has been increasing over the last few years. High intensity storms cause flooding of parking areas and basement flooding of businesses.
- The City bought out a few properties on Gilbert Street that had been affected by flooding from the unnamed stream leading from the Lower Ansonia Reservoir. The structures were demolished. Milone & MacBroom designed channel improvements from the Lower Ansonia Reservoir at Sentinel Hill Road downstream to the culvert at the bottom of the hill (MMI # 1565-19) which were constructed in 2013. The mitigation has helped reduce the flooding risk in this area.
- City staff believe that McConney Grove will always be an area of flood damage risk. There is virtually no interest from residents regarding buyouts. The Emergency Management Director performs direct door-to-door outreach each year, encouraging residents to sign up for the Reverse 911 system and advising of the flood risk.
- Many properties that used to routinely call regarding basement flooding have self-mitigated by installing curtain drains and sump pumps.
- Flooding also occurs on Great Hill Road from nearby wetlands.
- The City owns the Ansonia Reservoir dam which is undergoing a continued maintenance plan through Public Works. Engineers have been evaluating the necessary repairs and upgrades for the dam. It is reportedly difficult to drawdown the impoundment because the reservoir is strongly spring fed.
- The State owns several dams in Osbornedale State Park. The City does not have any information regarding these dams, but it is believed that they are in acceptable condition.
- The areas most prone to wind damage include some heavily wooded areas on Silver Hill and Great Hill.
- Trees at Osbornedale State Park have caused outages along Route 34. City staff noted that many of the trees appear to be rotting inside without external indicators. UI is aware of the problems in this area.
- In general, there is pretty good clearance throughout the city between trees and overhead electrical lines.
- The State forest continues to be a concern for brush fires and forest fires. Witek Park is less of an issue as sports fields have been installed in areas that were previously forest. The Two Mile Brook area has adequate access from adjacent neighborhoods and has not been a wildfire concern in recent years.
- The slumping issue at Commodore Commons has been mitigated by the property owner. The floor was jacked to stabilize the building.
- The potential for mudslides behind 233 Derby Avenue is still present. The top of the slope has large trees which could come down the slope if a heavy rainfall event causes a slide.
- The area behind Shop Rite is also a concern for landslides.
- Certain areas along Route 34 are concerns for falling rocks that enter the roadway.
- There have not been any ice jam issues along either of the major rivers.



### Capabilities

- The City does not have any set evacuation routes. These are determined on a case-by-case basis depending on the event type and level of impact.
- New culverts were installed on and along Gilbert Street.
- The City is proud to report that they have achieved an acceptable rating for the levee system. The final outstanding item was repair to a sluice gate. The most recent inspection was in September 2020 and the Mayor's office reports that USACE was pleased with the work the City has put in over the last few years to achieve certification.
- The local power company is United Illuminating (UI). The City participates in an annual training that has benefited both UI and the City by enhancing understanding between the two entities. There have been no surprises for the City during recent events regarding response times and restoration efforts.
- The City has set plowing routes, but they are not made public. Public Works listens to the emergency radio channel and knows when there is a call during a storm. They divert plow crews automatically to ensure road access to the area requiring emergency response.
- Flooding complaints typically go to the Fire Department during events, but longer-term problems are typically directed to the Mayor's office. The EMD often performs outreach to properties who contact the Mayor's office.
- The Fire Department has equipment to do basement pump outs, but they are not always performed depending on the neighborhood water levels.
- The NFIP coordinator was likely the Public Works Director in 2012. City staff need to confirm this.
- Tree services are contracted out. The Public Works Director is the Tree Warden.

### Next Steps

- Mark Neuendorf will be the Local Coordinator.
- The CT Post and the New Haven Register are the most read newspapers in Derby. However, both papers allow only limited access to online articles without a subscription. The Valley Independent Sentinel may be the best choice for posting public notices that will be seen electronically by a wide audience.
- The City will post public information materials and links on its website and social media as needed.
- City departments will review the 68 previous strategies and actions. MMI will parse these down by Department for distribution by Mark Neuendorf along with follow up questions.



<b>MEETING DATE:</b>	12/9/2020 10:00 to 11:00 AM	<b>ATTENDEES:</b>	Ed St. John, First Selectman
<b>PROJECT:</b>	NVCOG NHMP Update		Dan Norton, Director of Public Works
<b>MMI #:</b>	3211-29-01		David Murphy, PE, CFM, MMI
<b>SUBJECT:</b>	Town of Middlebury		
<b>LOCATION</b>	Virtual/Remote (Teams)		

David Murphy met with the Town on December 9, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held using the Zoom platform. Attendees followed an open discussion format. Discussion topics are grouped below.

### Critical Facilities

Critical facilities from the 2014 HMP were presented for review and update as shown in the table below.

Type	Name	Address	Located in SFHA?
Mixed-Use Development (Childcare Facility)	Middlebury Edge	Straits Turnpike/Park Road Intersection	No
Day Care Facility	The Nest Day Care	984 Southford Road	No
Convalescent Home	Middlebury Convalescent Home	Middlebury Road	No
Handicap Assistantship Facility	New Horizons Handicap Assistantship Home	Nutmeg Road	No
Age-Restricted Housing	Benson Woods	North Benson Road	No
Home for the Blind	Home for the Blind	George Street near Yale Avenue	No
Police Department	Middlebury Police Department	Middlebury Road	No
Fire Department & Backup Shelter	Middlebury Fire Department	65 Tucker Hill Road	Adjacent
Public Works Department	Middlebury Public Works	1 Service Road	No
Municipal & Backup Shelter	Shepardson Community Center	1172 Whittemore Road	No
Municipal	Middlebury Town Hall Offices	1212 Whittemore Road	No
Municipal	Middlebury Public Library	65 Crest Road	No
School, Primary Shelter	Pomperaug High School	234 Judd Road, Southbury	No
School, Backup Shelter (Private)	Westover School	1237 Whittemore Road	No
School Offices	Region 15 Board of Education	286 Whittemore Road	No
School	Middlebury Elementary School	550 Whittemore Road	No
School, Backup Shelter (No Generator)	Memorial Middle School	Memorial Drive	No
<del>Industry – Hazardous Chemicals</del>	<del>Chemtura Corporation HQ</del>	<del>Off of Benson Road</del>	<del>No</del>
Utility – Sewer	Sewage Pump Station 1	Shaddock Rd near Hop Br	Yes
Utility – Sewer	Sewage Pump Station 2	Long Meadow Road	Yes
Utility – Sewer	Sewage Pump Station 3	270 North Benson Road	Adjacent
Utility – Sewer	Sewage Pump Station 4	Southford Road	Yes
Utility – Sewer	Sewage Pump Station 5	Straits Turnpike	Adjacent



Type	Name	Address	Located in SFHA?
Utility – Sewer	Sewage Pump Station 6	Christian Lane – Triangle Hill Subdivision	No
Utility – Sewer	Sewage Pump Station 7	West end of Gleneagle Rd	No
Utility – Sewer	Sewage Pump Station 8	Somerset Drive	Adjacent
Utility – Sewer	Sewage Pump Station	1 Service Road	No
Utility – Sewer	Sewage Pump Station	1 Service Road	No
Utility – Water	Pumping Station	285 Kelly Road	No

- Chemtura has vacated the building on Benson Road in Middlebury and is now located in Shelton. This facility can be removed from the list of critical facilities in Middlebury.
- Westover School has retired its public water system and is now fully served by Connecticut Water Company. Water main replacements have been underway in the former Westover School system.

#### Development Trends

- The Toll Brothers housing project is 2/3 to 3/4 built out. The project (formally known as Ridgewood) is sometimes called “the City of Ridgewood.”
- Residential development is reportedly booming.
- The Route 63 corridor near Watertown is reportedly booming. New medical buildings are being developed in this area.
- 199 Benson Road, the former Chemtura facility, will eventually be redeveloped.

#### Recent Events

- The damage during Tropical Storm Isaias was significant. Town crews were busy with cleanup afterward, and the outage was about 5-6 days. Eversource was reportedly cooperative after the first 48 hours which were reportedly characterized by confusion.
- The May 2018 tornado “clipped” Middlebury. Trees were down and power outages occurred. The PA reimbursement for Middlebury was about \$100,000.
- Flood events have not occurred in the last five years.

#### Capabilities

- A 72-inch culvert at Biosky Road (Shattuck Brook) was replaced recently. Most of the bridge and culvert work precedes the last five years.
- The Town has continued working closely with Connecticut Water Company. As noted above, Westover School retired its water system and is now served by Connecticut Water Company. The interconnection with Heritage Village Water Company, located in Middlebury, is considered a great success. The interconnection was utilized during the drought of 2020 to move water to Heritage Village Water Company.
- Code Red is used.
- Winter storms are handled well by Town crews.
- The tree crews are adequate.
- All the prior, ongoing discussions with Greg Cyr about the potential re-study/re-mapping of the flood zone behind his house have ended. The Town did not undertake a new study, nor did Mr. Cyr. The re-study of the Housatonic River basin may address this delineate of flood zones near his house.



### Priorities Going Forward

- The Town does not have any priorities going forward.
- David asked about microgrids, given the proximity of the town hall to other critical facilities. Ed reported that the Town evaluated microgrids, but the study did not result in any action.
- The Town remains curious about the state of the Long Meadow Pond Dam. The dam is privately-owned, and the Town has declined accepting ownership in the past. The flood risk is downstream in Naugatuck.

### Next Steps

- Ed will be the local coordinator. Barbara should remain the contact person.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> should be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Obtain a grant to purchase a new generator for the Public Works facility.	Public Works	Complete	Complete
Consider joining FEMA's Community Rating System	Selectman's Office	Drop	The Town has too few flood insurance policies to justify CRS participation.
Identify potential areas that may be feasible for selective vegetation and debris removal in an effort to reduce flooding.	Public Works	Carry Forward	Still needed; permits are the issue, or potential adverse outcomes of the clearing.
Develop a plan to remove debris from Hop Brook to reduce the potential for flooding due to blocked culverts and/or bridges.	Public Works	Capability	The Town has not done anything in a while; some dead trees were removed as needed recently. This appears to be a capability, and no written plan is needed.
Encourage FEMA to update the Flood Insurance Study and SFHA mapping to reflect revised hydrology	Selectman's Office	Drop	FEMA re-study and new mapping is underway for the Housatonic River basin.
Work with homeowners on Regan Rd, Old Regan Rd, Ravenwood Dr, Porter Ave, Steinmann Ave, and Woodside Ave to pursue elevation of structures	Selectmans Office	Carry Forward	Nothing has been done. Revise to call for an annual letter to notify residents of options.
Increase the capacity of the Hop Brook culvert where it flows under Watertown Avenue to prevent future washouts like the one that occurred in 2006	Public Works	Complete	A new bridge was reportedly installed 4-5 years ago.
Increase the conveyance capacities of the culverts for the unnamed stream under the intersection of Cemetery Road and Middlebury Road	Public Works	Carry Forward	Not done



Action	Responsible Party	Status	Notes
Increase the conveyance capacities of the culvert beneath Middlebury Rd at the end of Steinmann Ave associated with Long Swamp Brook	Public Works	Carry Forward	The Town did some work with riprap, but did not increase conveyance capacity.
Increase the conveyance capacities of the culverts associated with the stream running along and beneath Woodside Avenue.	Public Works	Carry Forward	This is the stream that flows from Straw Pond. The State is re-doing the intersection with I-84 and may address this.
Increase the conveyance capacity of the culvert at Ravenwood Road	Public Works	Drop	They re-lined the culvert; same capacity.
Increase the conveyance capacity of the culvert at Biasci Road.	Public Works	Drop	They replaced the culvert; same capacity.
Develop a plan to address weak/unstable Ash Trees	Public Works	Capability	The Town is working on the ash trees.
Develop a plan to prioritize snow removal from the roof of critical facilities and other municipal buildings each winter. Ensure adequate funding is available in the Town budget for this purpose.	Public Works	Capability	Public Works is keeping up with this.
Consider bracing systems for assets and equipment inside critical facilities	Public Works	Drop	Data is backed up to the cloud. Other needs have not been identified.
EOPs/EAPs and Dam Failure Analyses should be developed for Class B and C dams	Public Works	Uncertain	Need to check; The Town may not have them; Fire Chief Kales is the EMD.



Action	Responsible Party	Status	Notes
Develop an EOP for Little Tracy's Pond Dam, as it would identify specific means of monitoring the dam and warning downstream residents of emergency situations.	Public Works	Uncertain	Not owned by the town; need to check on this.
The Towns of Woodbury, Oxford, and Southbury should cooperate with the Town of Middlebury's efforts to address repairs to Quassapaug Lake Dam if needed.	Public Works	Drop	Dam is owned by West Lake Association; no changes to the dam are likely.
Likewise, the Town of Oxford and the Borough of Naugatuck should cooperate with Middlebury's efforts to address repairs to Long Meadow Pond Dam if needed.	Public Works	Carry forward	The Town remains curious about the state of the Long Meadow Pond Dam. The dam is privately-owned, and the Town has declined accepting ownership in the past. The flood risk is downstream in Naugatuck.
Consider including dam failure areas in the CTAlert emergency notification system.	Public Works	Drop	CodeRed is used now; they moved over to that from CT Alert.
File EOPs/EAPs in a central location as they are received from dam owners.	Public Works	Uncertain	Need to check; The Town may not have them; Fire Chief Kales is the EMD.
Identify and develop sources of fire protection for the vicinity of Burr Hall Road and the north-central section of Middlebury including the north end of East Farms Road and locations along Artillery Road, North Farms Road, and Mirey Dam Road.	Fire Department	Carry forward	No progress.
Explore all possible means of improving accessibility for areas which currently do not have sufficient firefighting access, including the area south of I-84 near Wooster Road and east of Long Meadow Pond and the area north of Lake Quassapaug.	Fire Department	Carry forward	No progress.



Action	Responsible Party	Status	Notes
Explore other fire protection solutions when water main extensions are not feasible, such as the use of cisterns.	Fire Department	Capability	New development is taking place where new water mains are present. Large open areas haven't changed in Middlebury.
Pursue flood mitigation projects that protect the Fire Station and Public Works facility, both located in floodprone areas	Public Works	Carry forward	No progress.
If the Fire Station and/or Public Works Facility should become damaged by floods, ensure that backup facilities are available to ensure continuity of operations	EMD, Public Works, Fire Department	Carry forward	No progress. Middlebury does not have backup facilities.
Acquire open space properties within SFHAs and set aside as greenways, parks or other non-residential, non-commercial or non-industrial use.	Selectmans Office	Drop	Nothing recently acquired.
Connecticut Water Co. and Heritage Village Water Co. should continue to extend the public water supply systems into areas that require water for fire protection.	Fire Department working with the water companies	Some progress; Carry forward with revision	Westover School water system was finally taken over by CWC.
Connecticut Water Co. and Heritage Village Water Co. should continue to identify and upgrade those portions of the public water supply systems that are substandard for fire-fighting.	Fire Department working with the water companies	Capability	Some pipes in Westover School system were replaced; CWC is waiting for PURA approvals for some projects in Middlebury.



<b>MEETING DATE:</b>	11/10/2020 1:00 to 1:30 PM	<b>ATTENDEES:</b>	Jim Stewart, PE, Public Works Director
<b>PROJECT:</b>	NVCOG NHMP Update		David Murphy, PE, CFM, MMI
<b>MMI #:</b>	3211-29-01		
<b>SUBJECT:</b>	Borough of Naugatuck		
<b>LOCATION</b>	Virtual/Remote (Teams)		

David Murphy met with Jim Stewart on November 10, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held as a video conference using the Teams platform, allowing sharing of screens. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- Critical facilities from the 2015 HMP were presented for review and update as shown in the table below. Bold text indicates additions, changes, or commentary. Asterisks indicate buildings that currently have fixed-in place generators or temporary hookups.

Type	Name	Address	Located in SFHA?
Municipal Offices	Borough of Naugatuck Offices* (one of the two shelters)	229 Church Street	500-year
Police Station	Borough of Naugatuck Police Department*	211 Spring Street	No
Fire Department	Naugatuck Fire Headquarters	41 Maple Street	500-year
Fire Department	Eastside Fire Station	Intersection of May Street & Osborn Road	No
EMT – Ambulance	Borough of Naugatuck Ambulance Services*	246 Rubber Avenue	No
Public Works Office	Borough of Naugatuck Public Works Department*	246 Rubber Avenue	No
<b>Public Works Garage</b>	<b>Borough of Naugatuck Public Works Department**</b>	<b>510 Rubber Avenue</b>	<b>Uncertain</b>
<b>Municipal: Armory development</b>	<b>Recreation Center</b>	<b>607 Rubber Avenue</b>	<b>Uncertain</b>
<b>Municipal: Armory development</b>	<b>Parks Maintenance</b>	<b>607 Rubber Avenue</b>	<b>Uncertain</b>
<b>Municipal: Events Center</b>	<b>Naugatuck Events Center</b>	<b>6 Rubber Avenue</b>	<b>Uncertain</b>
Utility – Sewer	Wastewater Treatment Plant*	500 Cherry Street	500-year
Utility – Water	Connecticut Water Company	(Infrastructure)	Some
Utility – Phone	Southern New England Telephone	(Infrastructure)	Some



Type	Name	Address	Located in SFHA?
Utility – Electric	Connecticut Light & Power South Naugatuck Substation	Cherry Street	500-year
Utility – Gas	Algonquin Gas Pipeline	Northern Naugatuck	Some
Senior Center	Naugatuck Senior Center	300 Meadow Street	No
Food Bank	Ecumenical Food Bank	75 Spring Street	500-year
School	Borough of Naugatuck High School* (one of the two shelters)	543 Rubber Avenue	No
School	City Hill Middle School	441 City Hill Street	No
School	Hillside Middle School	51 Hillside Avenue	No
School	Cross Street Intermediate School	120 Cross Street	No
School	Hop Brook Intermediate School	75 Crown Street	500-year
School	Andrew Avenue Elementary School	140 Andrew Avenue	No
School	Central Avenue Elementary School	28 Central Avenue	No
School	Maple Hill Elementary School	641 Maple Hill Road	No
School	Prospect Elementary School	100 Prospect Street	No
School	Salem Elementary School	124 Meadow Street	No
School	Western Elementary School	100 Pine Street	No

\*Fixed-in place generator

\*\*Hookup in place for temporary generator

- The shelters are the high school and borough hall.
- Armory development at 607 Rubber Avenue, Recreational and Parks Maintenance, consists of two separate buildings; critical facility because Parks people can respond to emergencies.
- Naugatuck Events Center at 6 Rubber Avenue can be used for large scale events. The Borough owns it. This used to be General Data Comm buildings. Food can be distributed from this facility.

#### Development Trends

- The railroad signalization project is almost complete, which will allow the reopening of the commuter rail line. An RFP for development of downtown parcels will be going forward soon.
- Small subdivisions have been ongoing in recent years. Most of this land is not in areas of flood risk.
- Large subdivisions approved 10-15 years ago are being built out. Most of this land is not in areas of flood risk.

#### Recent Events

- Naugatuck had one of the few fatalities in Connecticut during Tropical Storm Isaias. A tree fell on the victim. The Borough waited six hours for Eversource to shut off power, so they could retrieve the deceased. The Borough stated that Eversource often did not show up when expected, and the Borough was unable to track the crews or determine where they were deployed. The outage was at least five days.
- Significant damage occurring during the May 2018 tornado and microburst event in Connecticut. The outage was 3-4 days.



- The Borough mentioned the extreme precipitation event that caused flash flooding, but we believe this event was described in the 2015 edition of the plan.

#### Capabilities

- Changes in most capabilities were not reported. Other departments should be contacted for information. Fran (the EMD) can provide input, as well.

#### Priorities Going Forward

- The Borough would like to move forward or make progress with flood mitigation and drainage projects involving Nettleton Road, Cherry Street, Highland Avenue, and Meadow/Church.

#### Next Steps

- Jim will be the local coordinator.
- A workshop is scheduled for November 18, 2020. The morning session is for local coordinators and the evening session is for the public.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> should be placed on the Borough's website.



Action	Responsible Party	Status	Notes
Add pages to the Borough website dedicated to citizen education and preparation for natural hazard events	EMS	Complete	Complete: <a href="http://www.naugatuck-ct.gov/content/113/123/125/355/default.aspx">http://www.naugatuck-ct.gov/content/113/123/125/355/default.aspx</a>
Upgrade at least one secondary shelter to a primary shelter, and attempt to have the resources to shelter 10% of population	EMS	Uncertain	Check with Fran Dambowsky, EMD
Include Condominium Associations into emergency management planning	PZ, EMS	Uncertain	Check with Fran Dambowsky, EMD
Streamline the permitting process and develop a checklist to ensure maximum education of developer or applicant	PZ	Complete	This is standard practice; floodplain management is in land use office.
Consider joining FEMA's Community Rating System	Mayor	Drop	The Borough likely does not have an interest in CRS at this point.
Obtain an HMGP grant to conduct drainage improvements along Nettleton Avenue and Cherry Street	PW	Partially Complete and Revise to Address Remaining Needs	Nettleton Ave is partially completed, but other sections are desired.



Action	Responsible Party	Status	Notes
Provide technical assistance regarding floodproofing measures to interested residents. Pursue funding for home elevations should any residents become interested.	PW	Capability	This is done as needed. The Borough has not supported home elevations in the past, but none have been requested by property owners.
Encourage property owners to purchase flood insurance under the NFIP and to report claims when flooding damage occurs.	PW	Drop	The Borough does not have sufficient reasons to conduct this.
Develop a plan to conduct routine catch basin maintenance.	PW	Complete and Capability	This is done.
Pursue the acquisition of additional municipal open space properties inside SFHAs and set those aside as greenways, parks, etc.	Mayor	Carry Forward	None in the last five years.
Consider a Borough-wide analysis to identify undersized and failing portions of drainage systems, and prioritize repairs as needed	PW	Revise to Address Ongoing Needs	This is done as needed, and a Borough-wide analysis is not necessary. The Borough is evaluating the Meadow Street/Church Street area now. Projects are coming out of the CIP and/or using in-house resources.
Pursue flood mitigation options along unnamed stream in Spencer Street corridor	PW	Drop	No progress. This is yard flooding only; first floors are not affected.
Upgrade the drainage systems in downtown areas to enhance drainage	PW	Capability	Nothing major has been needed recently. The Borough re-lined a pipe in last few years. As needs arise, they are addressed.



Action	Responsible Party	Status	Notes
Increase maintenance of drainage systems on Arch Street near Long Meadow Pond Brook	PW	Complete and Capability	This is ongoing. The Borough's departments are meeting this fall to finalize list of maintenance items, working with the GIS team.
If necessary, increase conveyance of Crown Spring Bridge over Hop Brook at Bridge Street	PW	Drop	Hop Brook flows under Rt 68 here, so this is a DOT problem.
Review critical facilities and ensure that each one has adequate standby power. For those facilities that do not, consider acquiring standby power supplies.	EMS	Complete; Revise for Additional Needs	A fixed-in place generator may be warranted for the PW garage. The Borough might also want to expand the capacity of the high school generator, so more can be done with the facility during an outage.
Continue to provide information on the dangers of cold-related hazards to people and property.	EMS	Capability	Capability
Consider posting the snow plowing routes in Town buildings each winter to increase public awareness.	EMS	Drop	They have the routes internally but do not publish them.
The Building Department should provide literature regarding appropriate design standards for mitigating icing, insulating pipes, and retrofits for flat-roofed buildings such as heating coils.	BD	Capability	The department has handouts.



Action	Responsible Party	Status	Notes
Evaluate critical facilities to determine if any interior systems should be braced.	PW	Drop	No current concerns.
Obtain EOPs/EAPs when they are completed	PW	Complete	Engineering has copies of these.
Keep abreast of changes in the requirements for Class A, AA, and unranked dams; and compile information for these dams as it becomes available	PW	Complete	Changes to requirements have not occurred since 2014.
Continue to have CTWC extend/upgrade the public water supply systems into areas requiring water for fire protection	Fire & EMS	Capability	The Borough is proceeding with an expansion of the water system on Crestwood Drive to address quantity and quality problems.
Revise and enhance the town's website concerning the local regulatory requirements concerning open burning.	Fire & EMS	Complete	<a href="http://www.naugatuck-ct.gov/filestorage/15604/Open_Burning.pdf">http://www.naugatuck-ct.gov/filestorage/15604/Open_Burning.pdf</a>
Explore other fire protection solutions when water main extensions are not feasible, such as the use of cisterns, fire ponds and dry hydrants.	Fire & EMS	Complete	These are required in new subdivisions.



<b>MEETING DATE:</b>	Sept. 23, 2020, 10 to 11:30 AM	<b>ATTENDEES:</b>	Scott Pelletier, Fire Chief
<b>PROJECT:</b>	NVCOG NHMP Update		Robert Boroski, Resident State Trooper
<b>MMI #:</b>	3211-29-01		Kristyn Rosa, Selectman's Office
<b>SUBJECT:</b>	Town of Oxford		Scott Flaherty, Grant Writer
<b>LOCATION</b>	Virtual/Remote		Aaron Budris, COGCNV
	Zoom		Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Oxford representatives on September 23, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- The new Middle School opened in Fall 2020. It is not considered a shelter but has a generator.
- The old Oxford Center School is currently not in use. The generator has been removed and it is no longer a shelter. The Town may repurpose this building into a community center or mixed use in the future, but there are no set plans at present.
- None of the shelters are American Red Cross certified. The Town staffs its own shelters, and pets are allowed.
- In addition to the shelters, warming/charging stations are setup at the Town Hall and Library if these facilities are open following an event. The Town Hall is scheduled to install a generator in 2021. The Library does not have a generator.
- All of the wastewater pumping stations have backup power. Additional pumping stations may be installed in the future.
- Quarry Walk is a new mixed-use development in Oxford Town Center that was constructed in a former stone quarry. There is a grocery store, pharmacy, bank, mixed retail, restaurants, and 150 rental units. This site is a good candidate for a microgrid so people can meet basic needs (pharmacy, food, etc.) should emergency power supply be available.

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Airport Runway Lighting	Woodruff Hill Road	Regional Airport	X			
FAA Facility	Airport Road	Regional Airport	X			
Oxford Center Fire House	484 Oxford Road	Emergency Response			500-Year	
Quaker Farms Fire House	403 Quaker Farms Road	Emergency Response				
Riverside Fire House	151 Coppermine Road	Emergency Response				
Police Department	429 Oxford Road	Emergency Response			X	Basement flooding
Oxford Town Hall	486 Oxford Road	Critical Records	Soon			



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Public Works Building*	21 Great Oak Road	Emergency Operations Center	X			
Housing Authority	100 Stakum Circle	Susceptible Population	X			
Oxford High School	61 Quaker Farms Road	Primary Shelter	X	X		
Oxford Center School	462 Oxford Road	Elementary School				Not in use
Quaker Farms School	30 Great Oak Road	Elementary School	X	X		
Oxford Middle School	40 Great Oak Road	Middle School	X			
Great Oak School	50 Great Oak Road	Elementary School	X	X		
Oxford Greens	Putting Green Lane	Elderly Population				
Gas Pumping Station (Spectra Energy)	40 Woodruff Hill Road	Natural Gas				
Wastewater Pump Stations	Towner Lane Christian Street 100 Oxford Road Perkins Road Long Meadow Rd 3 Oxford Road 58 Oxford Road	Wastewater System	Yes, to All		Maybe Maybe Yes No Maybe No Maybe	
Towantic Energy Center	Woodruff Hill Road	Power Plant				New since 2014
Oxford Commons	117 Hurley Road	Manufactured Housing				New since 2014, some elderly residents
Quarry Walk	300 Oxford Road	Dense Mixed-Use Development				

### Development Trends

- Commercial and industrial development has been brisk over the past 6 years. Several new buildings were added to the Industrial Park on Fox Hollow Road, four or five new facilities have been built on Patriot Way (mixed-use industrial), the Towantic Energy Center was constructed, and Northeast Steel opened a 100,000 square foot facility on Pheasant Run. Quarry Walk was also constructed.
- There are developers interested in additional industrial park properties near Towantic Energy Center that could be constructed in the next five years.
- Oxford Commons is a manufactured housing community that was recently built on Hurley Road. It has a population of elderly residents but is not age restricted.
- Canterbury Estates (corner of Christian Street and Jacks Hill Road) continues to add houses.
- Meadowbrook Estates (age-restricted housing) has fully built out.
- Oxford Greens is constructing its next phase of housing (Championship Drive, Saint Andrews Drive, Augusta Drive).
- According to Town staff, the airport is half public use and half private use. The airport is proposing to double or triple hanger space in the near future. Part of this space will be used to support U.S. Customs on a part time basis.
- A Main Street development project will include a new walking bridge over the Little River.



### Recent Events

- Tropical Storm Isaias in August 2020 caused widespread tree damage with power outages lasting up to one week.
  - Route 188 was blocked by fallen trees for two or three days, partially opened for two days, and then closed again to repair the overhead wires. In total, the major throughfare was impeded for about one week. Detours were difficult due to fallen trees on other roads.
  - Town staff provided a priority list of restorations to Eversource, but restoration was not conducted in accordance with the Town's list.
    - The Oxford Commons elderly community was out for several days and because this development does not have backup power, emergency personnel needed to find ways to ensure medical needs (e.g. breathing machines) were powered.
    - Meadowbrook Manor (age-restricted housing) should also have been a restoration priority, but they were without power for 6 days.
  - Shelters were opened and operated by Town staff.
  - There was generally minor damage to Town buildings – the Old Center School building had fallen trees and lost some shingles from the wind, and Public Works had a sheet metal roof damaged.
- The September 2018 rains produced flooding on the Housatonic River that affected Roosevelt Drive. Elevated homes did not have issues, but lower lying houses near the river were affected. One home had water on the first floor at window level.
- The May 2018 tornadoes caused lots of tree damage and resultant power outages. The entire town was affected and lost power for up to a week. Shelters were opened and operated by Town personnel.
- The January 2015 snowstorms were a challenge for Emergency Management due to the inability to respond through snow-covered roads. Many homes in town use natural gas, and in several cases the snow covered the exhaust vent leading to carbon monoxide backing up into the structures that required emergency response. Public works needed to be diverted from plowing streets to provide access for response vehicles. There was one building fire caused by the weight of the snow collapsing the supports on a pipe at a commercial building. The snowstorms also caused some power outages.

### RL Properties

- There are 16 RLPs in Oxford. The Town has attempted buyouts but many of the properties are expensive (they are riverfront) and the timing has not worked out between properties being available, the price point being acceptable, and grant funding being available. Often, people are interested immediately after a flood but then the Town cannot come to terms on cost or line up grant funding fast enough. The Town continues to be interested in buyouts but cannot guarantee a buyout will occur in the next five years.

### Hazards Discussion

- Larger culverts continue to be needed to convey the Little River at Route 67 near Old State Road, and just northwest at Route 67 (Oxford Road). A State Road is involved so the Town needs DOT to act.
- The Center Fire Department and Ambulance at 484 Oxford Road is affected by an undersized culvert that drains from Kirk's Pond to the Little River. The culvert is undersized, and the edge of the parking



lot has been scoured by overtopping flows. Water backs up through the drainage system into the Fire House. The Town has been applying for grants to upgrade the culvert to no avail. This is the most desirable project for the Town to complete.

- Flooding from the Little River occurs on Governor's Hill Road that affects the Police Department basement and one house. The sump pump in the Police Department basement runs constantly.
- Flooding on Riggs Street continues to pose risks.
- Wayne Watts (Public Works) could not attend the meeting but should be contacted about any drainage concerns from new development. There have been some concerns about runoff from the Oxford Greens golf course as the nearby culverts have needed lots of cleaning.
- Dams in Town are generally considered to be in good shape. Upstream dams are concerns because of their size but Town staff are well informed of the potential risk and have copies of the EAPs.
- Wind damage is widespread during events and no areas are at greater risk than any other.
- Drifting snow continues to be an issue on Jack's Hill Road. Wayne will have better information on areas susceptible to drifting or icing.
- Areas of moderate wildfire risk are unchanged from the previous plan (state forests).
- The Housatonic River is prone to ice jams.
- The Town does not have any concerns regarding landslides or sinkholes at this time.

#### Capabilities

- The Town has been focusing its tree removal efforts on Ash trees due to the effects of the Emerald Ash Borer. Public Works can clear low materials but contracts out elevated work to tree contractors. Eversource continues to address trees near power lines. Wayne Watts has more information on tree removal. Lenny in Public Works is the Tree Warden.
- Replacement of the Dutton Road Bridge over the Little River (near Route 67) will begin soon. The project has been bid.
- Design of a replacement for the Park Road Bridge over the Little River (near Route 67) is in design. The existing bridge is historic and is complicating the design.
- Wayne will have more information on recent work on bridges, culverts, and stormwater systems.
- Drainage and flooding complaints typically go directly to Public Works, although sometimes the Selectman's office receive them. Flooding emergencies typically come in through 9-1-1.
- Public Works has set plow routes, but they are not publicly posted.

#### Next Steps

- Chief Pelletier will be the local coordinator.
- Need to reach out to Wayne (Public Works) for additional information and other departments to discuss certain previous actions (below).
- News outlets for the public information meetings later this winter should include the Patch, Voices, and Republican-American.
- Housatonic Valley Association should be contacted regarding the culvert inventory undertaken a few years ago.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Incorporate suggested actions into other local planning activities	EMD, BoS	Completed	Discussion in 2018 POCD of acquiring land in floodplains to encourage public access and ensure use of these areas for flood storage
Identify and outfit a new EOC facility with adjacent storage center	EMD	Carry forward revised	A storage area was created for the current EOC. There is a need to increase the size of the EOC and this project is in the planning phase.
Utilize aerial photography and parcel mapping to identify addresses within the 1% annual chance floodplain	ZEO	Carry forward	Has not happened. The Town would prefer that this be completed regionally.
Continue to pursue home elevations along the Housatonic River	ZEO, GW	Capability	Will pursue when property and funding sources are available
Pursue acquisition of homes in the floodplain of the Housatonic River for demolition and conversion to permanent open space	ZEO, GW	Capability	Will pursue when property and funding sources are available
Pursue acquisition of undeveloped land in floodplains to permanently protect such land from development	BoS, ZEO	Capability	Will pursue when property and funding sources are available
Encourage residents within the 1% annual chance floodplain to purchase flood insurance under the NFIP and complete elevation certificates	ZEO		The Town encourages residents to purchase flood insurance. Ask building department about ECs
Join FEMA's Community Rating System to reduce the cost of flood insurance for residents	BoS, ZEO		Status not known during meeting, check with ZEO.



Action	Responsible Party	Status	Notes
Consider requiring additional freeboard beyond one foot for new development or substantial improvement	PZ		The current floodplain ordinance is for 1 foot of freeboard. Status not known during meeting, check with ZEO.
Formally require the use of the FEMA elevation certificate to record all elevation submissions	PZ		Status not known during meeting, check with ZEO.
Install signage depicting flood elevations along the Housatonic River as a deterrent to development	DPW	Carry forward	Would like to do if funding available
Utilize the list of structures within the 1% annual chance floodplain to target warnings through the CodeRED system	EMD	Capability	Still using CodeRED, and they remind folks to register, as calls can be directed to entire town. The Town has a targeted call list specific to Housatonic River flooding.
Pursue the acquisition of additional portable pumps and an additional rescue boat	EMD, GW	Capability	Rescue boats were acquired. The Town is constantly replacing pumps as they burn out quickly due to heavy use.
Consider installation of a low flood wall to protect the Police Department	EMD, DPW		The Town is discussing moving the police department. Status not known during meeting, check with Selectman's office.
Consider floodproofing measures for the north side of the Oxford Center Fire House	EMD, DPW	Discontinue	Upgrading the drainage pipe is best option to mitigate the flooding issue.
Pursue funding to complete flood mitigation projects along the Little River	DPW, GW	Capability	Looking for funding to help complete the projects



Action	Responsible Party	Status	Notes
Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	DPW		Status not known during meeting, ask Wayne. HVA did an inventory of road-stream crossings a few years ago.
Evaluate existing drainage systems utilizing current rainfall statistics and the need for additional drainage systems	DPW		Status not known during meeting, ask Wayne.
Review the existing tree maintenance budget and make improvements if necessary	DPW, BoS		Using contractors as needed, the Tree Warden can be approached about outreach
Pursue acquisition of a boom truck and appropriate employee training so the town may perform elevated tree work	DPW, GW		Status not known during meeting, ask Wayne as this used to be a goal for Public Works
Work with other communities to improve communications with Connecticut Light & Power	BoS, EMD	Capability	This is ongoing and needs improvement but is a capability.
Develop response plans to remove excessive snow from critical facilities and schools	EMD		Case by case basis, formal plan likely not needed. Confirm with Wayne if anything was written up.
Ensure that adequate backup plans and supplies are available for continued functionality following an earthquake	EMD	Capability	Fuel, MREs, water in storage
Utilize dam failure inundation mapping to identify properties for inclusion in the emergency notification system	EMD	Capability	CodeRED is used, and also have a special group for Housatonic River homes



Action	Responsible Party	Status	Notes
Pursue improved communications with the Town of Newtown and First Light regarding emergency response along Lake Zoar	BoS, EMD	Capability	Good communications with these entities
Encourage owners of Class C and Class B dams to have current EAPs on file at Connecticut DEEP and with the town	EMD	Capability	This is complete and updated plans are acquired as they become available.
Work with private dam owners to coordinate pre-storm releases from dams in order to mitigate peak flooding downstream	EMD	Capability	Pre-storm releases from small private dams not needed, large dams have this in their EAPs
Encourage homeowners and private communities to widen access for emergency vehicles where applicable	EMD, ZEO	Capability	



<b>MEETING DATE:</b>	1/20/21 2:00 to 3:15 PM	<b>ATTENDEES:</b>	Margus Laan, Town Planner
<b>PROJECT:</b>	NVCOG NHMP Update		Charles Wiegert, Assistant EMD and Public Works Director
<b>MMI #:</b>	3211-29-01		David Murphy, PE, CFM, MMI
<b>SUBJECT:</b>	Town of Plymouth		
<b>LOCATION</b>	Virtual/Remote (Zoom)		

David Murphy met with the Town to advance the local planning process for the hazard mitigation plan (HMP) update. The meeting was held using the Zoom platform. Attendees followed an open discussion format.

During the meeting, in response to the slide about the Pequabuck River study, Charlie noted that the study recommended a number of specific projects. He then posed the question that the Town had not identified a compelling reason to help elevate individual buildings.

Data collection discussion topics are grouped below.

#### Critical Facilities

Critical facilities were not available from the previous plan, as the CCRPA Hazard Mitigation Plan did not list them individually in the narrative or in table format. Charlie indicated that the Eversource list of critical and essential facilities may be appropriate, and he would provide it. He also explained that the Town has been acquiring generators over the last few years.

#### Development Trends

Margus stated that he will provide some information about development and redevelopment.

#### Recent Events

- The damage during Tropical Storm Isaias was not as bad as other towns reported. Power was 99% restored, town-wide, after three days. The maximum span of outages was about 60% of customers in Plymouth.
- However, power was lost along Route 6 as a result of Tropical Storm Isaias, and the Town ran out of spare stop signs to place at intersections. Power was restored to the Route 6 corridor within 48 hours. The Town submitted about \$20,000 for PA reimbursement, and the disaster declaration was approved last week.
- Many trees have come down due to smaller storms. Trees and tree limbs are getting caught in streams and rivers, and there is concern that they will clog downstream bridges.
- Flood events have not occurred in the last five years.

#### Capabilities

- Charlie stated that he will provide a list of bridge, culvert, and drainage projects (recent and planned).



- Neither Charlie nor Margus is the designated NFIP coordinator for the Town.
- Charlie is the tree warden. Services are contracted, and the budget for trees is about \$25,000 per year out of a total public works budget of \$100,000 per year (this does not include snow removal).
- The Town has struggled somewhat with dry hydrants and cisterns, as responsible parties cannot be identified.

### Risks

- As noted above, many trees have come down due to smaller storms. Trees and tree limbs are getting caught in streams and rivers, and there is concern that they will clog downstream bridges. The slowly-developing risk is worrisome to the Town. The Pequabuck River has experienced significant sedimentation in some areas, as well. The Town uses sand for some de-icing, but the State's change to salt has helped reduce sedimentation. The Pequabuck River study demonstrated that dredging is not cost-effective as a flood risk reduction method.
- General changes in dam risks were not noted.
- However, the Town reportedly experienced a "close call" this winter at the Mill Pond. A whirlpool developed, and the Town worked with Terryville Fish & Game (the pond owner) to plug the hole. The Town and the owner are working on a plan for the dam. Charlie did not believe that an emergency action plan (EAP) was on file for this dam.
- Small wildfires sometimes occur.
- Regarding the new FEMA studies (Naugatuck and Farmington Rivers), Charlie believes that the Pequabuck River study might have better, more detailed information. He would like to coordinate with DEEP and FEMA.

### Priorities Going Forward

- AT this time, the Town does not have any priorities going forward.

### Next Steps

- Charlie will be the local coordinator.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> should be placed on the Town's website.



Status of Previous Actions

Action	Status	Notes
Install drainage systems and reconstruct Todd Hollow Road and Beach Avenue	Complete and Carry Forward	Todd Hollow Road done, Beach Avenue not done
Improve Bemis Street to reduce flooding damage	Complete	Two projects are done; reconstructed the road (added more drainage) and changed the geometry
Determine other methods to protect Bemis Street from flooding	Complete	See above; the geometry changes, specifically; the road was flatter and now provides less head for floodwaters
Certify the High School, Middle School, and Plymouth Center School as Red Cross Shelters	Complete	All are ARC shelters; will confirm
Construct a new fire station in the Fall Mountain area	Carry Forward	A new station was constructed in Plymouth Center; this one is not done
Acquire generators to provide adequate backup power to critical facilities	Complete and Carry Forward	Some progress; more may be desired
Develop a Community Emergency Response Team (CERT)	Carry Forward	Not done; keep this one, but it may not happen
Prepare dam Emergency Action Plans for Town-owned dams	Complete and Carry Forward	Some are done
Develop a Town Evacuation Plan	Carry Forward	Not done
Develop a Town-wide drainage/flooding study	Carry Forward	They have good mapping of structures for MS4; carry forward



Action	Status	Notes
Better define drainage easements	Drop	This might have been a project desired by the prior Public Works Director, but is not needed at this time
Revise the Town Emergency Operations Plan to include procedures for new propane facility	Complete	Done
Update the local floodplain management ordinance to meet current model ordinance requirements	Uncertain; Carry Forward if Needed	Will need to check this; not sure
Develop a Pequabuck River flood response plan for dams	Drop	The Middle and Upper Pond Dam, and Horseshoe Falls Dam have no flood mitigation ability
Develop a formal snow load evaluation plan for buildings with roof-mounted solar panels	Drop	No formal plan written out; they have done some removal and been reimbursed
Review areas for potential wildfire risk by considering debris accumulation and access issues	Carry forward	Carry forward / re-word
Develop regulations for dry hydrants and cisterns to ensure that maintenance is performed	Carry Forward if Needed	Not done; need to think about this
Incorporate updated hazard mitigation information into community plan updates	Carry forward	POCD was adopted in 2015; next edition will be 2025, so we can modify this action for the next edition.
Participate in the statewide Water Utility Coordinating Committee process	Complete	Complete
Ensure local officials have most updated version of the Connecticut Drought Management Plan	Complete	Probably done



Action	Status	Notes
Encourage preparedness workshops in schools	Uncertain; Carry Forward if Needed	Not sure
Encourage sign-ups for the Everbridge emergency notification system	Capability	Still used
Develop watershed-wide low-impact development regulations with incentives	Carry forward	Links back to MS4 - carry forward
Encourage the City of Bristol to perform repairs/upgrades to Bristol Reservoir #3	Uncertain; Carry Forward if Needed	David to check
Work with FEMA to update FIRMs as necessary	Carry forward	Underway
Increase capacity of secondary driveway bridge serving Plymouth Village Apartments	Carry forward	Secondary driveway - this is the one we were talking about - not done yet
Remove house at 150 Main Street and conduct channel clearing	Partially Complete; Carry Forward	House is gone but channel not done yet
Assist property owners with floodproofing of commercial and industrial structures	Carry forward with revision	Hasn't been done
Assist property owners with modifying private driveways to reduce the impact of flooding	Drop	Will need to check this - not sure, but the need does not seem to exist



Action	Status	Notes
Pursue site-specific mitigation measures for residential properties that regularly flood	Carry forward with revision	Hasn't been done



# PLYMOUTH

## Critical Facilities

- Substation
- Police
- Fire
- PSAP
- Emergency Shelter
- Waste Water Treatment
- Convalescent Home
- Other Facilities

## Circuit / Substation

- 11K45 / BRISTOL
- 21Q1 / TERRYVILLE
- 21Q2 / TERRYVILLE
- 2B5 / THOMASTON
- 15U1 / CHIPPEN HILL
- 2B7 / THOMASTON
- 15U3 / CHIPPEN HILL
- 15U5 / CHIPPEN HILL

0.5 0.25 0 Miles

**EVERSOURCE**  
ENERGY



PROPRIETARY INFORMATION: The material contained on the Overhead Distribution Circuit Map shall be considered proprietary to Eversource and Users (which shall be defined as any person or entity who has received the Map through sale, purchase, exchange gift, or otherwise) shall keep it in confidence and shall not furnish or disclose it to any third party without the prior written permission of Eversource. The circuit and facility data is subject to change.

Date: 08/03/2020



Critical Facility	Name	Address	Town	State	Circuit	Substation Name/ Town Located	Date	Circuit / Cust. Count
Police/PSAP	Town Hall And Police	80 Main Street	Plymouth	CT	15U5	Chippen Hill / Bristol	03/01/2018	15U1 / 150
Police	Plymouth Emergency Management	7 North Main St	Plymouth	CT	21Q2	Terryville / Plymouth	03/01/2018	15U3 / 1106
Fire	Plymouth Fire Station	691 Main St	Plymouth	CT	2B5	Thomaston / Thomaston	02/13/2019	15U5 / 320
Fire	Fall Mountain Fire House	1 Allentown Road	Plymouth	CT	15U3	Chippen Hill / Bristol	03/01/2018	21Q1 / 1336
Fire	Plymouth Fire Headquarters	21 Harwinton Ave	Plymouth	CT	21Q1	Terryville / Plymouth	03/01/2018	21Q2 / 862
PSAP	Plymouth	297 North St	Plymouth	CT	2B5	Thomaston / Thomaston	03/01/2018	2B5 / 1669
Emergency Shelter	Eli Terry Middle School (shelter)	21 N Main St	Plymouth	CT	21Q2	Terryville / Plymouth	03/01/2018	2B7 / 330
Emergency Shelter	Terryville High School	33 N Harwinton Avenue	Plymouth	CT	2B5	Thomaston / Thomaston	03/01/2018	
Waste Water Treatment	Ps 3	783 Main Street	Plymouth	CT	2B7	Thomaston / Thomaston	03/01/2018	
Waste Water Treatment	Main Treatment Plant	35 Canal Street	Plymouth	CT	15U3	Chippen Hill / Bristol	03/01/2018	
Waste Water Treatment	Ps 4	553 Main Street	Plymouth	CT	2B5	Thomaston / Thomaston	03/01/2018	
Convalescent Home	Cook-willow Convalescent Hospital, Inc.	81 Hillside Ave	Plymouth	CT	2B7	Thomaston / Thomaston	03/01/2018	
Other Facilities	Highway Garage	42 Hillside Avenue	Plymouth	CT	2B7	Thomaston / Thomaston	03/01/2018	
Other Facilities	Plymouth Volunteer Ambulance	191 Main St	Plymouth	CT	21Q1	Terryville / Plymouth	02/13/2019	



<b>MEETING DATE:</b>	12/2/2020 10:00 to 11:00 AM	<b>ATTENDEES:</b>	Bob Chatfield, Mayor
<b>PROJECT:</b>	NVCOG NHMP Update		Mary Barton, Land Use
<b>MMI #:</b>	3211-29-01		Public Works
<b>SUBJECT:</b>	Town of Prospect		David Murphy, PE, CFM, MMI
<b>LOCATION</b>	Virtual/Remote (Teams)		

David Murphy met with the Town on December 2, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held in person at the Town Hall. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

Critical facilities from the 2014 HMP were presented for review and update as shown in the table below. Significant changes have occurred.

Type	Name	Address	Located in SFHA?	Generator?
Fire Dept	Prospect Fire Dept ( <del>designated shelter</del> )	26 New Haven Rd	No	Yes
Library	Prospect Library	17 Center St	No	
Mobile Home Park	Harmony Acres	Cook Road	No	
<del>Nursing Home</del>	<del>Marathon Health Center</del>	<del>25 Royal Crest Drive</del>	<del>No</del>	
Police Station	Prospect Police Dept	8 Center St	No	Yes
School	<del>Algonquin School</del> <b>Region 16 Business Office</b>	30 Coer Road	No	Yes
<b>School</b>	<b>Elementary School</b>	<b>75 New Haven Road</b>	<b>No</b>	<b>Yes</b>
School	Long River Middle School	38 Columbia Ave	No	Yes
School	<del>Prospect Community Elementary School</del> <b>Community Center (shelter) (EOC)</b>	12 Center St	No	Yes
Town Office	Prospect Town Offices	36 Center St	No	Yes
Town Office	Prospect Senior Center ( <del>designated shelter</del> ) <b>(warming center)</b>	6 Center Street	No	Yes
Public Works	Town Garage	221 Cheshire Road	No	Yes
<b>Public Works</b>	<b>Town Garage rear building</b>	<b>221 Cheshire Road</b>	<b>No</b>	<b>Yes</b>

- Marathon Health Center is closed and vacant and can be removed from the list.
- The elementary school was constructed in 2014-2015 and is at 75 New Haven Road.
- The Region 16 business office is now at 30 Coer Road, and the Community Center is now located at 12 Center Street.



- The Community Center will become the official shelter in 2021, and the Senior Center will become a warming center instead of a shelter.
- The EOC will be moving from the Fire Department to the basement of the Community Center in 2021.

#### Development Trends

- The Town will provide information.

#### Recent Events

- The residential damage during Tropical Storm Isaias was significant. Town crews were busy with cleanup afterward, and the outage was about seven days. Eversource's Make Safe crews did not respond quickly.
- Damaging events occurred on August 4 (Isaias) and August 27.
- Damage did not occur during the May 2018 tornado and microburst event in Connecticut, but the schools were closed because of the damage in Beacon Falls.
- Winter storms are handled well by Town crews.
- Flood events have not occurred in the last five years.

#### Capabilities

- The Town has significant capabilities, making progress since the flood in the 1980s spurred them to begin installing box culverts. The following recent projects are related to stormwater and drainage:
  - On Putting Green Lane, twin 36-inch culverts were installed to replace smaller culverts.
  - Every year, 4-5 miles of roadway are upgraded, and this includes drainage upgrades as needed
  - Pre-cast catch basins are now installed where catch basins are needed
  - A metal culvert on Lee Road collapsed and was replaced to be more resilient
  - Nancy May Avenue had a culvert replaced
  - On Bronson Road, 1200 feet of 12-inch pipe was installed as a new drainage system
  - New drainage was installed along Pine Crest Drive
  - A few hundred feet of new drainage was installed on Plank Road (also, Plank Road was rebuilt six or seven years ago)
  - A new leaf blowing apparatus is being used to keep drainage systems clear.
- The following projects are upcoming:
  - Williams Drive – new cross pipe and storm drains
  - Sherwood Drive – similar
- Regarding trees, the Town has increased inspections and maintenance, given their early experience with the Emerald Ash Borer. The Town has its own crews and trucks for this, and also has access to contractors. They are "raising the canopy" as needed.
- The Town has been working closely with Connecticut Water Company and participates in a new advisory committee. A mile of water main along Straitsville Road was replaced and changed in size to help enhance tank turnover. Aside from work in that area, no major main replacements or extensions have occurred in the last five years.
- The Town has 8,000 gallons "out the gate" for firefighting including two trucks at 3,000 gallons and two at 1,000 gallons.



- Waterbury has been working on the dams that the City owns, and Regional Water Authority has permanently lowered the water level in its dam off Route 68.
- Code Red is used, as the Town prefers its robustness. The Mayor can send 11,000 messages to 9,700 residents.
- The Town has recent low impact development regulations that Mary will provide.
- The Aria Banquet Hall on Murphy Road utilizes underground detention for stormwater management.

#### Priorities Going Forward

- The Town does not have any priorities going forward.
- About 1/3 of catch basins are cleaned per year, and the Town would do more if possible.
- Coordination with MS4 stormwater management would be helpful.

#### Next Steps

- Mary will be the local coordinator.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> should be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Acquire standby power for critical facilities, such as the Public Works garage		Complete	Numerous critical facilities have been fitted with standby power, and none are needed at this time.
Fund the purchase of an emergency power generator at the Boulder Brook Court sewer pumping station		Drop	This pumping station is privately-owned and problems have been resolved. The action can be dropped.
Continue to work with CT DEEP and the Connecticut Agricultural Experiment Station in order to manage the Emerald Ash Borer		Complete	The Town has removed all affected trees from parks and rights-of-way. Additional work is not needed at this time.
Pursue the acquisition of additional open space properties within SFHAs		Drop	The Town does not plan to acquire additional open space. The most recent purchase was along a ridgeline off Route 42. It is important to note that wetlands and detention basins are often deeded to the Town as open space associated with developments.
Continue to restrict vehicular access to Town property to prevent ATV use		Capability	The Zoning Regulations prohibit ATV use on residential properties. Enforcement occurs as needed.
Continue oversizing culverts and drainage structures		Capability	See notes above. Numerous projects have been completed.
Increase the size of the Plank Road culvert to prevent the flooding of nearby septic fields		Drop	Plank Road was reconstructed six or seven years ago, and a few hundred feet of new drainage was installed more recently. This project is no longer needed.



Action	Responsible Party	Status	Notes
Increase the size of the culvert for Roaring brook on Roaring Brook road. If necessary, raise the level of the road to accommodate		Drop	A subdivision was draining to this area but may not be any longer.
Petition the state to increase the size of the culvert under Route 68 near the former Public Works garage to reduce flooding/icing		Complete/Drop	The State reconstructed Route 68 in 2019-2020, and many of the improvements may have addressed problems with icing. Drainage improvements were completed, and riprap was added to slow the flow of stormwater to protect several cross culverts.
Petition the state to increase the size of the 36-inch culvert under Route 68 near Spring Road to pass a greater than 100-year storm event		Drop	Problems at this culvert were related to clogging/blocking. The Town works to keep the opening clear.
Improve drainage from Route 68 to reduce flooding of Oxford General Industries at the corner of Gramar Road and Route 68		Complete	A new subdivision has been developed upstream and a new 40,000 sf warehouse is being developed in the industrial park. Drainage improvements associated with these projects will address this past problem.
Replace and increase the capacity of the undersized culverts at Putting Green Lane		Complete	This was completed.
Increase tree limb inspections and maintenance, especially along evacuation routes		Complete/ Capability	The Town has increased inspections and maintenance, given their early experience with the Emerald Ash Borer. They are "raising the canopy" as needed.
Continue outreach regarding dangerous trees on private property		Complete/ Capability	Significant work has been done in this area, given their early experience with the Emerald Ash Borer.



Action	Responsible Party	Status	Notes
Compile and post a final list of plowing routes, prioritizing egress to shelters and critical facilities		Drop	The entire town can be cleared in three hours. Town does not intend to distribute a public version of plowing routes, as residents would object to the handling of their streets.
Complete and disseminate evacuation plan to ensure timely evacuation of shelterees from all areas of Prospect		Drop	Because the shelter is changing in 2021, internal plans will change, but the Town does not intend to distribute a public version of evacuation plans.
Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs		Complete	The Town has made significant progress in this regard, with the addition of many generators to critical facilities and the relocation of the EOC to the basement of the Community Center.
Consider adding braces to at-risk facilities inside municipal buildings, such as shelves in the library		Drop	The Town is using the Cloud as backup which protects files and documents.
Work with the Connecticut DEEP to ensure that each Class C dam has an up to date EOP/EAP, O&M Manual, and Dam Failure Analyses		Complete	This was completed.
Place copies of the Class C dam EOPs/EAPs and Dam Failure Analyses on file at the Town Hall for public viewing		Complete	This was completed.
Consider identifying elevated wildfire risk areas and ensure that the appropriate methods are in place to reduce this risk		Capability	The Town participates on a committee formed by Connecticut Water Company to keep abreast of water system projects and changes, and requires dry hydrants or cisterns where public water is not available. Approximately 30 new PWS hydrants were installed for the Toll project, Regency at Prospect. A new cistern was installed for Giovanni Drive.



Action	Responsible Party	Status	Notes
Continue to assist Connecticut Water Company in identifying and upgrading portions of the public water supply system		Capability	As noted above, the Town participates on a committee formed by Connecticut Water Company to keep abreast of water system projects and changes.
Encourage the Connecticut Water Company extend/upgrade the public water supply systems into areas requiring water for fire protection		Capability	As noted above, the Town participates on a committee formed by Connecticut Water Company to keep abreast of water system projects and changes.



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**MEMORANDUM**

**PROJECT:** NVCOG NHMP Update  
**MMI #:** 3211-29-01  
**SUBJECT:** Town of Seymour Municipal Input

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The consultant reached out to the Seymour HMP local coordinator, Thomas Eighmie (Seymour Emergency Management Director), for input regarding the plan update. A meeting was declined in favor of direct communication of input with the consultant.

Additional input was provided at the two regional municipal staff workshops, held on November 18, 2020, and February 3, 2021.





## MEETING MINUTES

**MEETING DATE:** Nov. 5, 2020 10:00 to 11:45 AM **ATTENDEES:** Michael Maglione, Dir. of Public Safety  
**PROJECT:** NVCOG NHMP Update Francis Jones, Fire Chief  
**MMI #:** 3211-29-01 Joseph Ballaro, Building Official  
**SUBJECT:** City of Shelton Brian Nalfi, Highways  
**LOCATION:** Virtual/Remote (Zoom) Alexander Rosetti, P&Z Administrator  
Brian Roach, Public Works Supt.  
\_\_\_\_\_, Building Department  
Rimas Balsys, City Engineer  
Aaron Budris, NVCOG  
Scott Bighinatti, Milone & MacBroom

**Commented [A1]:** Mike, the attendee names came fast and I did the best I could, please correct as needed

Scott Bighinatti met with City of Shelton representatives on November 5, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

### Critical Facilities

- The list of critical facilities from the 2012 plan was reviewed. Attendees had several updates as noted below in **Bold** text.

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Police Department	85 Wheeler St.	Backup EOC	Yes		No	
Echo Hose Hook & Ladder Company No. 1	379 Coram Street		Yes		No	
Huntington Fire Company No. 3	44 Church Street		Yes		No	
Pine Rock Fire Company No. 4	722 Long Hill Avenue		Yes		No	
White Hills Fire Company No. 5	2 School Street		Yes		No	
<b>Echo Hose Ambulance Corps</b>	<b>100 Meadow Street</b>					Added to list
Shelton High School	120 Meadow St.	Backup Shelter	<b>Fuel Cell</b>	Yes		New generator is still needed
Community Center	41 Church Street	<b>Primary</b> Shelter	Yes	Yes		
Animal Shelter	<b>11 Brewster St.</b>	Pet Shelter	Yes	Yes		
City Hall	54 Hill Street	EOC	Yes			<b>Limited backup power</b>
Public Works	41 Myrtle Street		No			



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Water Pollution Control Facility <b>Sewer Pumping Stations</b>	10 Riverdale Avenue		Yes <b>Yes</b>		Yes	Added to list
<b>Senior Center</b>	<b>81 Wheeler St.</b>					Added to list
Sinsabaugh Heights	187 Meadow St.	Elderly Housing				
Wesley Village	580 Long Hill Avenue	Elderly Housing				
The Ripton	423 Howe Avenue	Elderly Housing				
Helen DeVeaux House	Howe Avenue	Elderly Housing				
Crosby Commons	580 Long Hill Avenue	Assisted Living				
Shelton Lakes	5 Lake Road	Convalescent Home				
Bishop Wicke Health Center	580 Long Hill Avenue	Convalescent Home				
Gardner Heights	172 Rocky Rest Road	Convalescent Home				
Hewitt Memorial Hospital	45 Maltby Street	Convalescent Home				
Apple Tree Daycare	117 Long Hill Cross Road	Daycare				
A Child's Garden	20 Ivy Brook Rd.	Daycare				
Bright Horizons	3 Corporate Dr.	Daycare				
Happy Day	41 Church Street	Daycare				
Kidstop	215 Bridgeport Avenue	Daycare				
Little Academy	250 River Road	Daycare				
Pumpkin Preschool	100 Beard Saw Mill Road	Daycare				
Wonder Years	188 Rock Rest Road	Daycare				
Woodland Park	515 Bridgeport Avenue	Mobile Home Park				
Fairchild Heights	804 Bridgeport Avenue	Mobile Home Park				
Sunnyside	South Main St.	Mobile Home Park				

- Generators were installed at the Police Department and Fire Departments two years ago.
- Shelton High School is the backup shelter. Partial backup power is provided by a fuel cell, and a small generator is available to run the IT system. A new generator with more capacity is still needed for this facility.
- City Hall (EOC) has a generator, but it is reportedly very limited in capacity and needs to be upgraded.



- **Mike will update the list of critical facilities with additional facilities**, including but not limited to the five sewer pumping stations, the Senior Center, and the EMS facility.
- All evacuations in the city are conducted on a case-by-case basis.

#### Development Trends

- Significant development is underway in Shelton:
  - Seven new projects are presently under construction downtown. In total, these will have 500 new apartments on public utilities.
  - A few new subdivisions are in development that will total approximately 100 new residences.
  - A variety of commercial structures are being built, including professional office buildings and a warehouse.
  - A new commercial retail shopping center is being built on Bridgeport Avenue.
  - A new hotel and restaurant are being built on Bridgeport Avenue.
- In total, there is approximately \$1 billion in new development underway in Shelton. Some of this development is occurring near the Housatonic River.
- The Shelter Ridge project is in the planning stages. This is a proposed 2,000,000 square foot mixed-use development to be located on several hundred acres. Much of the proposed development lies within wetlands and floodplains. The developer needs to demonstrate that peak flows leaving the site will not impact downstream properties. City staff are closely monitoring this application as it would potentially alter the hydrology of the Far Mill River all the way downstream to the Housatonic River.
- **Mike will provide a copy of the recent updates to the City's Plan of Conservation and Development.**

#### Recent Events

- Tropical Storm Isaias in August 2020 caused widespread tree and limb damage in the city.
  - Two homes were destroyed, and several other homes were damaged by falling trees and limbs.
  - Trees fell across many roads and downed wires in many areas.
  - The City and United Illuminating (UI) had reportedly excellent coordination and Make Safe crews were quickly dispatched to areas with downed power lines.
  - All power was restored within four days. Most residents were without power for less time.
  - City staff cleared debris and conducted trimming away from power lines and cleaned up after restoration was completed.
- Attendees noted that the September 2018 rain event resulted in minor flooding along Burying Ground Brook at Bridgeport Avenue. Several driveway culverts were washed out, and some basement and backyard flooding reported.
- The May 2018 tornadoes did not impact Shelton.
- The January 2015 winter storm was reportedly not a problem for Shelton. Attendees could not recall any specific response needs.
- Winter Storm Nemo in February 2013 dropped 40 inches of snow on the City. Snow fell so quickly that plows could not keep up with the accumulation. It was reportedly difficult to find locations to store the plowed snow. Backhoes and other heavy equipment were brought in to move snow around following the storm.



#### RL Properties

- There are 18 repetitive loss properties in Shelton, with some being severe repetitive loss properties. The majority are located in the Maples neighborhood. Several have reportedly been mitigated using federal grant programs.

#### Hazards Discussion

- There have not been any recent flooding problems in the Maples neighborhood. Five home elevations were completed in 2013-2014 using grant funding available following Storm Sandy. The elevated homes were reportedly repetitive loss properties.
- Indian Well Road continues to flood during heavy rain events, cutting off access to the Maples neighborhood. One reported issue is that there is significant drainage that accumulates in the area of the railroad track.
- Drainage from the hillside is causing an erosion issue near Birch Bank Road.
- The same areas continue to be concerns in the watershed of Means Brook. In general, these areas are only problematic during severe rain events:
  - The culvert passing an unnamed tributary to Means Brook at Brookwood Lane near Walnut Tree Hill Road is undersized.
  - Unnamed tributary to Means Brook causes flooding at Beardsley Road and along Jonathan Lane. A RLP is located in this area.
  - The Route 108 bridge over Means Brook and a nearby culvert for Pole Brook have insufficient capacity. Overtopping of the culverts results in flooding of nearby commercial parking lots.
- The RLP along Marks Brook is immediately next to a culvert.
- There has reportedly not been recent flooding damage along the Far Mill River. However, both Walnut Hill Road (undersized culvert) and Yatuka Lane (low road elevation) continue to be concerns.
- Burying Ground Brook continues to be a flooding concern near Long Hill Avenue.
- The private culverts near the intersection of Brook Street and Wooster Street are still concerns. This is upstream of the Boys & Girls Club which is adjacent to Curtiss Brook.
- The storm drainage system on Congress Avenue and Oak Avenue continue to be undersized. Repairs are ongoing as damage occurs, with the most recent repair work in 2020.
- The Water Pollution Control Facility is in the 1% annual chance floodplain but flood risk was reduced following completion of a recent project to floodproof a wall facing the river.
- Ice jams continue to be a concern along the Housatonic River. The Maples neighborhood is particularly at risk.
- There are no specific areas more susceptible to potential wind damage other than the mobile home parks. Wind damage is typically widespread.
- Attendees noted that there are several areas where icing and drifting snow are concerns. Drifting snow occurs on Shelton Avenue near Brownson Country Club, and on Booth Hill Road, for example. **Mike will provide more information regarding areas prone to drifting snow and icing.** These are mitigated through municipal plowing and sanding efforts.
- The City has not had to fight any recent brush fires.
- Several steep areas continue to be concerns for landslides, although structures are not presently at risk. Recent slides have primarily occurred on railroad company property, and rockfalls continue to be an issue along Route 8.



### Capabilities

- Two bridges were recently replaced in 2020. Both projects were primarily due to age but also included minimal widening improvements to increase conveyance capacity.
  - A bridge on Waverly Road was replaced over [redacted] brook.
  - A bridge on Lane Street was replaced over an unnamed tributary to Means Brook.
- Drainage and flooding complaints are routed to Public Works who handle outreach and any response measures necessary. The Engineering division is typically involved in investigations. The City does not use a tracking system for processing complaints.
- The NFIP Coordinator responsibilities are shared between Planning & Zoning and the Building Official.
- The City has been receiving many recent phone calls regarding dams. DEEP has reportedly been removing debris near dams in the city.
- The City regularly inspects its dams on the schedule mandated by DEEP.
- City staff are routinely involved in the update process for EAPs related to privately owned dams in the city. In general, EAPs are up to date for those dams that require EAPs.
- The tree maintenance budget has only seen a minimal increase in recent years. This is because UI has been very aggressive in trimming trees near power lines back 8 feet from the line.
- UI's current tree trimming program has been active for four years. 46% percent of the city has been trimmed back. Another 20% of the city is expected to be trimmed back in 2021.
- The City Tree Warden remains under Parks and Recreation.
- The City has set plow routes which are not publicly available.
- The City has wildfire fighting equipment including off-road vehicles. Although the same areas noted in the 2012 Plan are considered potentially susceptible to wildfires, the City believes it has the necessary equipment and good access (along trails, for example) to fight wildfires.

**Commented [A2]:** Mike, was this Hazelton Brook or the Farmill River?

### Goals, Objectives, and New Actions

- Replacing the culvert on Walnut Tree Hill Road is the highest priority mitigation project for the City that they would like to see progress on in the next five years. The strategy should be aimed at completing design for this project.
- Daylighting and/or widening Burying Ground Brook and reducing flood levels in this area is the second highest priority. This area will likely need a flood study before a design can be performed.
- The Public Works garage needs a generator, as does City Hall.
- The City wants to encourage Aquarion Water Company to create a water main loop on Ripton Road. There are no hydrants in this area at present. The water main would also be available to connect to future residential development in this area.
- Several sewer pump stations need upgrades or maintenance. In particular, the sewer pump station on Bridgeport Avenue is undersized and runs constantly. The lack of downtime is a concern for maintaining emergency power supply during outages.
- It is often difficult to access the northern section of Canal Street East during flood events due to the railroad crossing needing upgrades. The crossing blocks access to nearly 800 residences in Avalon Shelton. The City has needed to make temporary bridges to access this area in the past. A more permanent solution is needed here as this is an evacuation concern.

### Next Steps

- Michael Maglione will be the Local Coordinator for this process.



- Public announcements should be placed in Shelton Herald and the Connecticut Post in addition to social media and on the City's website. Announcements that may relate to Shelton will be vetted through the Mayor's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the City's website.





Status of Previous Actions

Action	Responsible Party	Status	Notes
Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series and make them available at the City and Town Halls	EMD	Completed	Yes
Disseminate informational pamphlets regarding natural hazards to public locations	EMD	Completed	Yes
Develop checklists for permittees that cross-references regulations and codes related to disaster resilience	PZC, B&E, EMD	Complete, Revise into New Action	Checklists and flow charts have been added to the department websites to guide applicants through various permitting processes. New software for all departments has also been installed that should help to ensure compliance and improve information sharing between departments – this record keeping system is now in place that can be used by a couple departments. More departments will connect to improve coordination in the near future. About 20% of departments have this software at this time, so a strategy should be carried forward regarding this effort.
Require that utilities be placed underground in new developments	PZC	Completed	This is required for all subdivisions of five or more single units on a new street. For example, the new developments downtown have been required to install underground utilities. This is not required (but is encouraged) for single lot developments.
Pursue funding to place utilities underground in existing developments	MO	Discontinue	This may not be feasible from a financial standpoint, and nothing is planned in the next five years.
Encourage residents to purchase and use NOAA weather radio with an alarm feature	EMD	Capability	This is a capability.
Review and update evacuation route maps at least annually	EMD	Capability	This is a capability and performed with the regular EOP update.
Install evacuation signs in SFHAs	EMD	Discontinue	These are no longer desired.



Action	Responsible Party	Status	Notes
Consider floodproofing measures at the WPCF at 10 Riverdale Avenue	EMD, PW	Completed	A project was recently completed that removed a door and sealed the wall that was open to the river.
Install an emergency generator for Public Works Garage at 41 Myrtle Street	EMD, PW	Carry Forward	A small generator was installed to provide power to the fuel dispensing pumps. However, a larger generator is needed for this facility.
Install an emergency generator for Shelton High School	EMD	Completed	A fuel cell was installed at the High School to provide power. There is also a generator on site which provides power to the IT systems.
Develop an evacuation plan for residents of Indian Well Road that can be isolated during flooding	EMD	Discontinue	This is better evaluated on a case-by-case basis. The City's Code Red system would be used to notify the residents to evacuate. There is only one road in and out of the area.
Develop an evacuation plan for residents of northern Shelton that can be isolated during flooding	EMD	Discontinue	This is better evaluated on a case-by-case basis. The City's Code Red system would be used to notify the residents.
Continue to regulate activities within SFHAs to the greatest extent possible with the municipal codes and Zoning and Subdivision Regulations	PZC, B&E	Capability	This is a capability.
Consider requiring new buildings in flood prone areas to be protected to the highest recorded flood level regardless of SFHA status	PZC, B&E	Discontinue	This would likely be difficult to enact because it vastly exceeds the NFIP standard (BFE) and the State of Connecticut building code standard (BFE+1 foot). Note that the flood damage prevention ordinance for the City is consistent with the NFIP standard but not the current building code standard.
Ensure that new buildings be designed and graded to shunt drainage away from the building	PZC, B&E	Completed	This is provided for in the State Building Code.



Action	Responsible Party	Status	Notes
Require developers to demonstrate whether detention or retention of storm water is the best option for reducing peak flows downstream	PZC, B&E	Capability	The zoning regulations require no increase in overland flow of storm drainage as certified by a qualified engineer.
Provide technical assistance to owners of non-residential structures regarding floodproofing measures such as wet and dry floodproofing	EMD, B&E	Capability	This is a capability, as City staff routinely provide examples for property owners of potential mitigation methods.
Pursue elevation of residential structures that suffer flood damage; repetitive loss properties should be prioritized.	EMD, MO	Capability	Several residents of the Maples took advantage of a federal (likely HMA) program to elevate their homes several years ago. As other programs become available, they will be offered to the residents.
Consider enrolling in the Community Rating System	EMD, B&E	Carry Forward with Revision	It would reduce the cost of flood insurance for property owners in Shelton but would require staff time to maintain the program. City staff need time to consider this program in more detail.
Provide outreach regarding structure elevation, flood barriers, dry and wet floodproofing, and other improvement techniques	EMD, B&E	Capability	This is a capability, as City staff routinely provide examples for property owners of potential mitigation methods.
Ensure that EMDs and other personnel attend DEEP and other training workshops such as the FEMA-sponsored training at EMI in Maryland	EMD, B&E	Capability	First responders have attended and continue to attend FEMA classes.
Pursue acquisition/demolition of residential structures that suffer flood damage; RLPs should be prioritized.	EMD, BOS/BOA	Capability	This is likely a capability, as it could be advanced whenever properties become available. No purchases have been made recently, as property owners have historically been more interested in elevations.
Pursue the acquisition of additional municipal open space in SFHAs	MO	Capability	This is likely a capability, as it could be advanced whenever properties become available.



Action	Responsible Party	Status	Notes
Selectively pursue conservation recommendations listed in the Plan of Conservation and Development and other studies and documents	MO	Capability	The Plan of Conservation and Development was updated in 2016 but is not available online. The City has purchased and accepted donated properties to expand open space areas.
Continue to regulate development in protected and sensitive areas, including steep slopes, wetlands, and floodplains	PZC	Capability	This is being done.
Develop a hydraulic/hydrologic model of flood prone river systems to prioritize mitigation such as bridge and culvert replacement, property acquisitions, etc.	EMD, PW	Discontinue	It is unlikely that the City would perform a large-scale model as targeted studies may be more appropriate, and flooding along the Housatonic River is well understood.
Upgrade Walnut Tree Hill culvert to reduce flooding along the Farmill River	PW	Carry Forward	Engineering plans need to be developed. This is a priority project for the City.
Upgrade the Long Hill Avenue stone masonry arch culvert conveying Burying Ground Brook to reduce flooding	PW	Carry Forward	Engineering plans need to be developed. This (and possible daylighting or widening of sections of this brook) are also priority projects.
Upgrade and replace the Brookwood Lane culvert to reduce flooding	PW	Carry Forward	The outlet side was reconstructed. The inlet side needs to be done.
Upgrade and replace the Oak Avenue drainage system to reduce nuisance flooding	PW	Carry Forward	Minor work was done, primarily repairs. Engineering plans need to be developed.
Work with CT DOT to assess and replace culverts along Shelton Avenue (Route 108) conveying Means Brook and Pole Brook if needed	PW, CT DOT	Carry Forward	This is ultimately DOT's jurisdiction. No work has been done.



Action	Responsible Party	Status	Notes
Continue tree limb inspections and maintenance and outreach to private property owners regarding branches above powerlines	TW	Capability	This is a capability.
Increase funding for the Tree Warden to address a wider range of tree limb hazards than the current budget allows	TW, MO	Carry Forward	There has been a minor increase in the tree budget. More funding will be needed once UI completes its trimming project.
Provide for the Building Department to make literature available during the permitting process regarding appropriate design standards for wind	B&E	Carry Forward	Nothing is available in the department at this time, but there is interest in providing such materials to permittees.
Encourage the use of wind-mitigation structural techniques in new structures to protect new buildings to a greater level than the required standard	B&E	Capability	Potential code-plus additions may be considered whenever new City facilities are constructed.
Conduct a study to identify municipal buildings, critical facilities, and commercial/industrial buildings that are vulnerable to roof damage or collapse	PW, B&E	Discontinue	Clearing is performed on a case-by-case basis.
Develop a plan to prioritize snow removal from the roof of municipal buildings (especially critical facilities) and have funding available for clearing	PW, B&E	Discontinue	Clearing is performed on a case-by-case basis as a general City capability.
Retrofit or modify critical facilities as needed to strengthen roofs and structures and make them more resilient to snow loading	PW, B&E	Capability	Retrofits are performed on a case-by-case basis as part of other projects.



Action	Responsible Party	Status	Notes
Consider posting the snow plowing routes in municipal buildings and the municipal web sites	PW	Discontinue	No need to post routes.
Identify areas that are difficult to access during winter storm events and develop contingency plans	PW	Capability	This is reviewed each year as part of the annual EOP update.
Provide information for mitigating icing, insulating pipes, and retrofits for flat roofed buildings	PW, B&E	Carry Forward	Nothing is available at City hall, but there is interest in providing such materials to the public.
Consider preventing residential development in areas prone to collapse such as below steep slopes, or in areas prone to liquefaction	PZC	Discontinue	Steep slope areas must be shown on the plans and are omitted from the buildable area of a lot. There is presently nothing in the regs regarding liquefaction. Section 32 of the Zoning regulations requires the commission to prevent the creation of or exacerbation of safety hazards such as unstable slopes.
Consider restricting construction on 25% slopes* and restricting excavation and clearing above and below such slopes	PZC	Completed	Per Section 5.25 of the Zoning Regulations, steep slope areas (25% or more) are omitted from the buildable area calculation of a lot. These areas are required to be shown on the plans. The regs have requirements for maximum grade of new slopes.
Consider adopting or codifying USDA guidelines to regulate development in areas of steep slopes	PZC	Discontinue, as intent has been met	Section 32 of the Zoning regulations requires the commission to prevent the creation of or exacerbation of safety hazards such as unstable slopes. The USDA guidelines may not be needed.
Consider preserving areas of steep slopes as protected open space through acquisitions or modified zoning	MO	Discontinue, as intent has been met	Modified zoning has not occurred. No open space acquisitions of steep slope areas occurred since 2012. Nothing is projected for the next five years. However, steep slopes are set aside as non-buildable land during the site plan review process as noted above.
Continue to require adherence to the state building codes	B&E	Completed	This is a capability. All new construction must adhere to the State Building Code through the permit process.



Action	Responsible Party	Status	Notes
Encourage through-streets instead of dead-end streets	PZC	Discontinue, as intent has been met	Section 33.13.10 of the Zoning regulations state that "street planning...should provide for through street connections when necessary for overall City and neighborhood circulation purposes. Section 4.4.9 of the Subdivision regs indicate that "local streets...shall be planned where appropriate for continuation of existing streets in adjoining areas and for projections into adjoining properties when subdivided." A specific strategy is not necessary.
Ensure that utility providers are aware of landslide potentials and have responder teams available to repair damage caused by slides	EMD	Completed	Areas of concern have been discussed with the local utilities.
Make education materials available at Building and Engineering departments regarding identification of landslide risk areas	B&E	Discontinue	Nothing is available and there is no interest in providing education materials for landslide risk at this time.
Consider expanding and over-sizing drainage systems in the vicinity of steep slopes	PW	Capability	This is a capability, as this can be considered by Public Works whenever a project is designed.
Encourage property owners to have retaining walls inspected by structural engineers	EMD	Capability	The City can recommend this at any time.
Ensure that municipal departments and critical facilities have adequate backup facilities in case damage occurs	EMD	Carry Forward	While backups are considered during the regular EOP update process, the City wishes to consider this in more detail over the next five years.
Provide support as necessary to Riverdale Apartments on Shelton Avenue to decrease chances of future slides	PW	Completed	No further work needs to be done.
Monitor the slope below North Oak Avenue	PW	Capability	This area is monitored and does not appear to be at risk at this time.
Include dam failure areas in the Reverse 911 and CodeRed emergency contact database	EMD	Completed	The Reverse 9-1-1 system has the capability of targeting phone calls into specific areas.



Action	Responsible Party	Status	Notes
Work with T. and E. Bombero to develop EOP and maintenance plan for the Far Mill River dam	EMD	Completed	An EAP has been developed and revised in 2019. The owner of the dam is now the Aquarion Water Company. The company meets with the City on an annual basis.
Develop or update the EOP for Shelton Reservoir Dam #2	EMD	Completed	EAP was developed and last updated in 2017.
Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes from wildfires	FD	Capability	This is a capability.
Ensure that provisions of Subdivision Regulations regarding fire protection facilities are being enforced	PZC	Capability	This is a capability.
Pursue additional sources of fire-fighting water where adequate supplies do not exist	FD, MO	Capability Carry forward for one area	This is constantly evaluated, and new sources are pursued as the budget allows. No specific projects (other than the looping project on Ripton Road) have been immediately identified for the next five years.
Patrol municipal-owned open space and parks to prevent campfires	FD, PD	Capability	This is a capability.
Continue to promote inter-municipal cooperation in fire-fighting efforts	FD	Capability	This is done on a daily basis.
Continue to monitor the Nells Rock Road area in Shelton which has a history of fires	FD	Capability	This is a capability.
Enforce regulations and permits for open burning	FD, PD	Capability	This is done on a daily basis.



<b>MEETING DATE:</b>	Nov. 2, 2020 1:00 to 3:00 PM	<b>ATTENDEES:</b>	Steve Schnell, Emer. Mgmt. Dir.
<b>PROJECT:</b>	NVCOG NHMP Update		Jeff Manville, First Selectman
<b>MMI #:</b>	3211-29-01		Claire Morris, Asst. to First Selectman
<b>SUBJECT:</b>	Town of Southbury		John Cottell Jr., Dir. of Public Works
<b>LOCATION</b>	Virtual/Remote (Zoom)		Jessica Townsend, Land Use Enf. Officer
			Daniel Tomacsak, Fire Marshall
			Deb Zachariewicz, Land Use / GIS Coord.
			Darcel Peters, Assessor
			Aaron Budris, NVCOG
			Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Southbury representatives on November 2, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- The list of critical facilities from the 2014 plan was reviewed. Attendees had several updates as noted below in **Bold** text.

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Heritage Village	Heritage Village	Active Adult Condominiums				
Traditions	Route 172	Clustered Housing				
Southbury Training School	1461 S Britain Road	Special Needs Population				
<b>The Hearth</b>	655 Main St. South	Assisted Living				New Name, formerly Kensington Green
Grace Meadows	Route 67	Disabled / Low Income Housing				
The Watermark	611 East Hill Road	Life Care Community				
Pomperaug Woods	80 Heritage Road	Life Care Community				
River Glen Health Care Center	162 South Britain Road	<b>Nursing home</b>				
<b>Lutheran Home of Southbury</b>	<b>990 Main Street North</b>	<b>Nursing home</b>				Added to list



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Southbury Training School sewer pumping station	Whale Pass/S. Britain Road	Sewer			Yes	This may have been replaced
Heritage Village WWTP	Heritage Village	Sewer				
IBM (Southbury) WWTP	150 Kettletown Road	Sewer				
Heritage Village Water Co.	Heritage Village	Public Water Wells			Yes (Wells)	
Southbury Fire Dept.	461 Main Street South					
Southbury Police Dept.	421 Main Street South		Yes			
Purchase Firehouse	100 Stillson Road					
Southbury Ambulance Association	68 George Hill Road					
<b>Town Hall</b>	<b>501 Main Street South</b>		Yes			Added to list
<b>Public Works Garage</b>	<b>60 &amp; 66 Peter Road</b>		Yes			Added to list
<b>Comsat Satellite Services Facility</b>	2120 River Road	National Defense & Communications			No	In 500-Year Floodplain, new name
Southbury Senior Center	561 Main Street South	Primary Shelter	Yes	Yes		
Pomperaug High School	234 Judd Road	Regional Shelter	Yes	Yes		

- The Town Hall and the Public Works garage were added to the list of critical facilities. Both facilities have generators.
- The Public Works garage generator is old and the automatic shut-off does not function properly. The generator needs repair and possible replacement.
- The Southbury Training School may have changed their sewer system such that this pump station may have moved.
- The "Southbury Green" plaza at 775 Main Street South installed a package treatment plant for its septic system. The Shop-Rite in the plaza has generator hookups and a contract for them to be delivered and installed whenever there is an outage. The generator can power the entire supermarket. This was very helpful for maintaining service in this area when power was out during Isaias and the May 2018 tornado. This could be considered a critical facility as it provides an essential service for the town.
- Stop & Shop also has a generator, but it is reportedly only sufficient to power the freezers and coolers and not the entire supermarket.
- The Police Department generator was overheating during Isaias and could not be used. The generator needs repair.
- A microgrid was ultimately not installed along Main Street South and will not be pursued. This was to cover the municipal buildings in the area. Attendees were concerned that installing a microgrid



powered by a generator would result in a backup system with a single point of failure (the microgrid power supply) similar to how certain standby generators were not functioning properly during Isaías. A strategy is needed to address standby and portable generator needs including having redundant hookups available if permanent installations are not functioning properly.

- The shelters have not changed since the 2014 Plan.
- Evacuations continue to be on a case-by-case basis.

#### Development Trends

- Southbury is predominantly built out. There is not a lot of vacant, buildable land remaining in town due to the significant amount of preserved open space.
- There have not been any large subdivisions for several years. There have been a few 2 or 3 lot subdivisions over the past few years.
- There has not been significant commercial or industrial development. Redevelopment is far more prevalent.
- There are still no mobile home parks in Southbury.
- One notable project has been the expansion of the Comsat satellite facility on River Road. This facility has essentially doubled in size over the past few years.

#### Recent Events

- Tropical Storm Isaías in early August 2020 primarily affected the southern portions of Southbury along with the northeastern corner (Bucks Hill area). The northwestern portion of town was generally less affected.
  - Coordination with Eversource was reportedly poor during the event. Town staff could not coordinate with Make Safe crews and therefore could not remove downed trees in many areas.
  - Most residents experienced approximately one week of power outages, with some isolated cases taking longer for restoration.
  - There were several areas where fallen trees and wires blocked the single mode of egress into a neighborhood. Community House Road was an example where fallen trees and wires isolated a section of road and residents could not drive out for four days.
- Attendees could not recall any problems resulting from the September 2018 rain event.
- The May 2018 tornado caused significant damage in Southbury.
  - 99% of all town residents lost power for 5 to 7 days.
  - The Town processed approximately 3,000 to 4,000 cubic yards of tree debris.
  - Mutual aid was called in from surrounding communities to help open roads and process tree debris.
  - The response to this event was very strong. Despite the damage occurring on a Tuesday, schools were able to open for class the following Monday.
  - First Light reportedly lost contact with the dam due to damage from the event. A SCADA system is used to remotely operate the dam and track water levels. This reinforced the need to ensure that access is maintained along River Road to the dam, as First Light would need to be able to manually operate the dam on-site following a combined wind and flood event (such as a hurricane).
  - The Town recently completed the FEMA report that discusses areas of damage. **Steve will obtain a copy of the FEMA report and provide to MMI.**



- Attendees could not recall any damage resulting from the January 2015 winter storm. Extra plowing efforts were needed to clear the snow.
- Attendees could not recall any other storms of note over the past six years.

#### RL Properties

- The Town of Southbury has 19 repetitive loss properties, with 5 being categorized as severe repetitive loss properties. All are single family homes located along the Pomperaug River. Some of the homes have been mitigated through acquisitions (and conversion to open space) or elevations.
- Several of the repetitive loss properties continue to be flood prone. Property owners did not take advantage of previous grant cycles to support mitigation projects.
- The Town will continue to support pursuing grant funding to support mitigation projects for repetitive loss properties when properties become available. There are no ongoing projects related to repetitive loss properties at this time.

#### Hazards Discussion

- Old Waterbury Road is a primary bypass route when traffic on I-84 is congested between Exits 16 and 15. There are multiple crossings of Bullet Hill Brook along this road as well as the crossing of a tributary. When flooding occurs, a partial or full closing of the road is problematic for traffic. In particular, the tributary crossing (near the west end of Old Waterbury Road) has multiple private crossings just upstream of the bridge. Additional conveyance capacity is needed in this area to mitigate flooding and maintain access to private properties. The Town has priced out the potential cost of this project as being \$1 million.
- River Road is a critical roadway artery along Lake Zoar / Housatonic River. Sections of the road are deteriorating and need to be stabilized, particularly along the section of road adjacent to the water. Part of the issue is that First Light reportedly makes high volume releases in order to minimize sedimentation behind the dam, and the releases can exacerbate scour along the riverbanks. A project is needed to stabilize the road in certain areas. Another big concern for this project is that the road is of substandard width. The cost to widen the road to the standard 26 feet may make the project too costly to perform. The Town would rather the project be conducted at the current width as "narrow access to the Shepaug Dam is better than no access".
- Attendees reported that River Road has not needed to be closed over the past few years.
- Ice jam flooding in the Manor Road area last occurred in the winter of 2017 or 2018. The Town can provide pictures of this event. **Steve will work with Jeff to send the pictures to MMI.** The Fire Department evacuated the neighborhood and conducted a few shallow water rescues during this event.
- Community House Road has flooded only during severe rain events. There has not been flooding in this area for several years.
- The flooding on Route 172 is ultimately under DOT's jurisdiction.
- Nuisance flooding still occurs on Little Fox Lane.
- The flooding on Flag Swamp Road is reportedly in the northern unpaved section near the unnamed watercourse separated from a nearby pond by the road. This is a relatively minor flooding issue.
- Attendees did not have any concerns regarding the condition of the various dams within or upstream of Southbury.
- It was noted that Heritage Village recently rebuilt a dam.
- The Town owns a couple of dams.



- The Town is seeking to elevate the Hidden Pond Dam (in Hidden Pond Park) a couple of feet because water levels are too low in the impoundment and encourages plant growth.
- Maintenance was recently completed on Jenny Pierce dam. This is a detention basin dam east of Colonial Drive.
- The emerald ash borer, combined with recent strong wind events, have caused significant damage to trees in Southbury. More than 1,000 trees have been affected by the ash borer. Removal is ongoing.
- The tree maintenance budget is reportedly very high. Public Works has a 3 to 4-man crew working on tree removal and processing each day except during storms or when plowing is needed. The crew conducts full tree removal but does not perform elevated work near power lines. A bucket truck is available for elevated work in other areas with a 75-foot maximum height. The Town also has a chipper.
- East Flat Hill Road is an area where drifting snow occurs. This is mitigated through municipal plowing efforts.
- Icing is a concern in several areas.
  - Icing is still a concern on Berkshire Road and Pascoe Drive (high elevations)
  - Icing occurs on the higher elevations of Old Waterbury Road.
  - Icing due to poor drainage still occurs along Pomperaug Trail.
- Wildfire risk areas are the same as in the previous plan. The Town recently fought a 1-acre brush fire in Little York Park in July 2020. According to Town staff, this fire would have been much larger if it had occurred on a windy day.
- Southbury does not have current concerns about landslides, although they are concerned about the erosion occurring at the toe of the slopes along River Road.
- Erosion issues along the Pomperaug River have generally been mitigated. This included a bank stabilization project behind the basketball court at Ballantine Park (project area visible on Google Maps), and erosion repair at George Bennett Park.

### Capabilities

- Public Works has completed many recent bridge and culvert projects.
  - Culvert capacity was increased in 2020 to better convey the unnamed tributary to Eightmile Brook passing beneath Plaster House Road.
  - Improvements were constructed in 2019 at East Flat Hill Brook to mitigate flooding of Transylvania Brook.
  - The intersection of Hulls Hill Road and Jeremy Swamp Road passes Jeremy Brook and was prone to flooding. The intersection was elevated, and additional culverts were installed in 2018 to increase conveyance and mitigate the flooding.
  - The River Road bridge over the Pomperaug River was replaced in 2016-2017. MMI provided design and construction inspection services. This project was to replace an aging structure and not to increase flood conveyance, although scour concerns with the abutments were reportedly addressed as part of the project.
  - The Spruce Brook Road bridge was replaced and increased conveyance capacity for Transylvania Brook. An overflow bypass structure was also installed to provide more high-flow conveyance capacity.
- When residents have concerns about flooding, any phone calls to emergency services dispatch are routed to Public Works for response.
- Jessica Townsend is the NFIP Coordinator responsible for ensuring flood prone development meets all applicable standards.



- The Town plows approximately 135 miles of road, including approximately 7 to 9 miles that are unpaved. Public Works has set plow routes, but these are not posted publicly.



### Goals, Objectives, and New Actions

- The top mitigation project for the next five years is to conduct flood mitigation along Old Waterbury Road. The Town hopes to secure grant funding to support this work.
- The second top mitigation project is to repair River Road.

### Next Steps

- Steve Schnell will be the Local Coordinator for this process. Jeff Manville will be the backup.
- Public announcements should be placed in Voices and the Waterbury Republican-American in addition to social media and on the Town's website. Announcements that may relate to Southbury will be vetted through the First Selectman's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the Town's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Support efforts to make the Heritage Village Activity Center/Community Center into a third shelter for the town	Selectman's Office	Discontinue	This shelter would be only for people from Heritage Village, but a true shelter must support entire community, not just specific populations. Therefore, Pomperaug High School (regional shelter) is a better choice to maintain as a large-scale shelter as it has a generator and sufficient capacity.
Pursue microgrid for the municipal buildings on Main Street South	Public Works	Some Progress, Revise into New Action	Standby power supplies for certain facilities, with portable generator hookups as a backup, are a better option than a standalone microgrid and they would offer more flexibility. A microgrid with a single point of failure is a concern. A strategy is needed to standardize generator hookups for portable generator connections.
Acquire standby power for the town hall if the microgrid is not developed	Public Works	Complete	There is a now a generator at the Town Hall.
Identify ways to reduce confusion about duties of the Zoning Commission vs. the Zoning Board of Appeals	Planning	Capability	There is information on the Town website explaining commission duties.
Consider acquiring residences along Flood Bridge Road, River Hill Road, River Trail, Manor Drive, and Pomperaug Trail	Selectman's Office	Capability	This is a long-term capability that the Town can accomplish as properties and funding are available. Considerable progress has been made in the past. No specific acquisitions are in progress at this time.
Increase the conveyance capacity for the culvert at Jeremy Brook under Hull Hills Road at the intersection of Jeremy Swamp Road	Public Works	Complete	
Increase in the elevation and replace the bridge over Transylvania Brook at Spruce Brook Road.	Public Works	Complete	



Action	Responsible Party	Status	Notes
Work toward development of an inventory and multi-year plan for addressing trees.	Public Works	Complete	The Town understands where problem areas are and track resident concerns with a work order management system. Tree management is ongoing and will never truly be finished. The Town retains an arborist to conduct inspections and identify areas of concern.
Provide educational materials to property owners regarding using shutters, storm windows, pipe insulators, and removing snow from flat roofs	Public Works	Discontinue	The Town notifies the public during heavy snow events to inform public about snow load concerns. Social media can be used for much of this outreach. Developers and property owners need to comply with the building code, and as some of these actions may require permits, education is best done through conversations with the Building Department.
Obtain EOPs/EAPs when they are completed	Public Works	Complete	The Town has copies for most dams.
Keep abreast of changes in the requirements for Class A, AA, and unranked dams; and compile information for these dams as it becomes available	Public Works	Capability	The Town corresponds with DEEP about dams.
Consider specifically including dam failure areas in the CodeRED emergency notification system.	Fire & EMD	Capability	CodeRED has the capability to target phone calls into specific areas of a community.
With regard to Long Meadow Pond Dam, support the Town of Bethlehem's efforts to address repairs to Long Meadow Pond Dam.	Public Works	Complete	The Town of Bethlehem has reportedly completed all planned projects to address the dam and downstream culverts, and has no further upgrades planned.
Pursue the acquisition of additional municipal open space properties inside SFHAs and set those aside as greenways, parks, etc.	Selectman's Office	Capability	This is a long-term capability that the Town can accomplish as properties and funding are available.



Action	Responsible Party	Status	Notes
Develop greenways along rivers as homes are acquired and removed	Selectman's Office	Capability	This is a long-term capability that the Town can accomplish as properties and funding are available.
Oakdale Manor Road drainage system should be upgraded	Public Works	Complete	This road was repaved recently. A collapsed pipe was fixed, so that may have been the concern. There is also a pump station nearby, but no flooding concerns associated with that structure.
Install and repair storm drains and drainage systems on Lakeside Road and Lee Farm Road.	Public Works	Possibly Complete	Town needs to look into this more. Repairs may have been completed. These areas have not been recent concerns for flooding.
Consider purchasing residences along Manor Dr and Pomperaug Tr that may be at risk from ice jams, and work with owners to educate about the benefits of floodproofing.	Selectman's Office	Capability	This is a long-term capability that the Town can accomplish as properties and funding are available.
When funds are available, place utilities underground along Main Street South (prior estimate was \$4 million)	Public Works	Discontinue	This area is of concern when the power goes out as it includes many municipal facilities and essential services. There are design concerns about how the connection will occur from the electrical substation near Route 6. Town staff noted that they have done some major tree cutting to try to reduce vulnerability in this area. This is a long-term wish list item that will not occur over the next five years.
Ensure that municipal departments have adequate backup facilities in case earthquake damage occurs to municipal buildings.	Public Works	Capability, New Action Needed	In general, the Town has adequate backup facilities but is not necessarily 100% redundant for all services. The Town's primary concern is maintaining backup communications (many cell towers are on battery backups) and the logistics of operating backup systems – the Town would like a strategy in the Plan to address communications concerns.
Evaluate critical facilities to determine if any interior systems should be braced.	Public Works	Possible New Action	Town will look into this (the IT racks may be secured already). An action may be needed upon further review.



Action	Responsible Party	Status	Notes
Heritage Village Water Company should continue to extend the public water supply systems into areas that require water for fire protection.	Fire & EMD	Capability	Ultimately, the public water supply system is privately owned, and the Town can only encourage extensions short of directly funding them. If there are any specific water main extension projects the Town would be willing to fund, they could be listed as projects for the next five years.
Heritage Village Water Company & Southbury Training School should continue to identify and upgrade portions of the systems that are substandard for firefighting.	Fire & EMD	Capability	These systems are not owned by the Town. The EMD and FD regularly meet with these systems to identify substandard fire pressures. This is a capability.





## Tornado - 15 May 2018

99.6% of town without power for over 24hrs (9,923 of the 9,98 metered locations)  
Town Offices were on Generator power for approx. 72 hours  
135 Road blockages  
Dispatch in a 24 hour period received 978 calls (over 40 per hour)  
2 Home raised, 35 with Major damage over 100 with minor damage

Over 35,934 cubic yards of debris  
Approx. 1000 trees fell  
Contractors removed additional  
326 trees  
2,039 hanging limbs



































Summary of Submitted Costs to FEMA					
Ed the Treeman				\$ 824,932.64	
Tetra Tech				\$ 176,536.00	
Labor				\$ 77,163.00	
Mutual Aid				\$ 43,839.03	
Equipment				\$ 94,910.09	
Materials				\$ 23,364.80	
Overtime				\$ 67,280.65	
Guardrails				\$ 78,562.64	
Emergency Protective Measures				\$ 37,547.10	
			Total	1,424,135.95	
		75% reimbursable		1,068,101.96	



I wish to extend a much appreciated thank you to the CEO's, Public Work Directors, and men who came to Southbury's aid with equipment and/or staff from:

Town of Avon

Town of Bethlehem

Town of Easton

Town of Fairfield

Town of Monroe

Town of Redding

Town of Simsbury

Town of Washington

Town of Watertown

Town of West Hartford

Town of Westport

Town of Wolcott and

Oxford Airport

I would also like to recognize that Southbury was not the only town to receive help from our fellow Public Work Departments. The Town of Bloomfield assisted the Town of Oxford; the Town of Hebron assisted the Town of Newtown; and the City of Norwalk assisted the Town of Brookfield. This list may not be complete, as other towns, i.e. South Windsor and Bristol, offered assistance but to the best of my knowledge, neither their equipment nor personnel were used.





Town of  
*Southbury*  
Connecticut

*May 15, 2018 Tornado*

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Thank you for your time today





# STATE OF CONNECTICUT



## Department of Emergency Services & Public Protection Division of Emergency Management & Homeland Security

### DAMAGE PRE-ASSESSMENT SUMMARY FORM

#### PART I - APPLICANT INSPECTION INFORMATION

COUNTY	APPLICANT	POINT OF CONTACT
New Haven	Town of Southbury	William Sarosky

Title	Controller/Treasurer	DATE OF EVENT
Phone	203-262-0663	
Alt Phone	203-262-0647	
E-Mail	onefiscal@southbury-ct.gov	
		5/15/2018

#### PART II - DAMAGE ESTIMATE SUMMARY

DAMAGE CATEGORY	No. SITES	TYPES OF DAMAGE	TOTAL CATEGORY ESTIMATE
A	100+	DEBRIS REMOVAL	1,300,000.00
B		PROTECTIVE MEASURES	61,000.00
C		ROAD SYSTEMS	100,000.00
D		WATER CONTROL FACILITIES	0.00
E		PUBLIC BUILDINGS & EQUIPMENT	20,000.00
F		PUBLIC UTILITIES	0.00
G	10+	PARKS/OTHER	50,000.00
Total estimate (less anticipated insurance)			\$1,531,000.00

#### PART III - OVERALL DISASTER IMPACT

##### A. GENERAL IMPACT:

###### 1. Identify and describe the damages that constitute a health and/or safety hazard to the general public.

Immediately following the tornado there were hundreds of trees on homes, power lines, cars, and roads.

Nearly 100% of the town was without power.

Emergency vehicles were unable to access many roads and homes due to downed wires and trees.

###### 2. Describe the population adversely affected directly or indirectly by the loss of, or the damage to, these public facilities.

The entire town was affected by the tornado. Power outages for multiple days, roads blocked, businesses and gas stations closed. Schools were closed, activities and sporting events canceled.

###### 3. What economic activities are adversely affected by the loss of the public facilities or the damage to the facilities?

Most facilities in town were closed or only opened on a limited basis. Schools, parks, senior services, library, recreation activities, stores, gas stations, and

##### B. RESPONSE CAPABILITY:

###### 1. Describe how the applicant intends to repair the damage and the schedule to accomplish the work.

The town intends to continue with debris removal, however it is apparent that the scope of the work is so large that outside contractors will be needed to remove debris from the town right-of-way.

###### 2. Describe the source and availability of funds to accomplish the repairs.



The Board of Selectmen has authorized the expenditure of funds from the towns reserve funds to begin the process of cleaning the debris.

**3. How quickly can the damages be repaired without degradation of public services?**

It will take several months to clear the debris from the right-of-way. Trees that are precarious and in the town right-of-way are being cleared immediately. The town is doing its best to continue with the normal course of business while handling the many issues surrounding the tornado.

**C. IMPACT ON PUBLIC SERVICES IF A DECLARATION IS NOT MADE: (e.g., Defer permanent repairs, impact ongoing services, improvements, etc.)**

The impact will include the deferment of other previously scheduled projects since funding this emergency and the management of debris will be the top priority for the coming months.



<b>MEETING DATE:</b>	Nov. 16, 2020 1:00 to 2:45 PM	<b>ATTENDEES:</b>	Glenn Clark, Supt. of Highways
<b>PROJECT:</b>	NVCOG NHMP Update		Ed Mone, First Selectman
<b>MMI #:</b>	3211-29-01		Skip Gelati, Emergency Mgmt. Dir.
<b>SUBJECT:</b>	Town of Thomaston		Stacey Sefcik, Land Use Administrator
<b>LOCATION</b>	Virtual/Remote (Zoom)		Scott Bighinatti, Milone & MacBroom

Scott Bighinatti met with Town of Thomaston representatives on November 16, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- The list of critical facilities from the 2015 plan was reviewed. Attendees had several updates as noted below in **Bold** text.

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Thomaston Valley Village	200 Reynolds Bridge Road	Elderly Rental Units	No			<b>Private Enterprise</b>
Green Manor	63 Green Manor	Elderly Rental Units	No			<b>Housing Authority</b>
Grove Manor	11 Grove Street	Elderly Rental Units	No			<b>Housing Authority</b>
Municipal Building & Police Department	158 Main Street	EOC	Yes			Generator <b>needs additional capacity</b>
Fire Department	245 South Main St.	Backup Shelter	Yes	Yes		<b>Has New Generator</b>
Ambulance	237 South Main St.	<b>Primary Shelter</b>	<b>Yes</b>	<b>Yes</b>		<b>25-person capacity</b>
Highway Dept.	32 Reynolds Bridge Road		<b>Yes</b>			<b>Generator needs replacement</b>
Communications Building	Chapel Street					<b>Remove from list</b>
<b>Communication Tower</b>	297 North Street, Plymouth		<b>Yes</b>			
<b>Communication Tower</b>	170 Mount Tobe Road, Plymouth		<b>Yes</b>			
<b>Communication Tower</b>	Turner Road		<b>Yes</b>			
<b>Communication Tower</b>	Chapel Street		<b>Yes</b>			
Sewage Treatment Plant	Old Waterbury Road		<b>Yes</b>		Yes	
Electric Avenue Pump Station	North Main Street		<b>Yes</b>			



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Woodbridge Pump Station	Woodbridge Lane		Yes			Generator <b>needs additional capacity</b>
Highwood Farms Pump Station	Julie Lane		<b>Yes</b>			
Kennedy Pump Station	Kennedy Drive		<b>Yes</b>			
Hickory Hill Pump Station	Hickory Hill Road		<b>Yes</b>			
Center School	1 Thomas Avenue					
Thomaston High School	185 Branch Rd (Route 109)	<b>Secondary Shelter</b>	Yes	Yes		
Black Rock Elementary	57 Branch Rd (Route 109)					
Connecticut Water Company Wellfield	Maple Avenue					
Telephone Switching Station	High Street					
Eversource Substation	Electric Avenue				Yes	
DOT District 4 Headquarters	South Main Street					<b>Remove from list</b>
DOT Garage	Prospect Street					<b>Remove from list</b>

- Green Manor and Grove Manor are both Housing Authority properties. Neither facility has a generator. This is a concern for the Town because many residents are on medical equipment and oxygen machines with limited (24-hours) backup power. The Town wants to install generators at these facilities.
- Thomaston Valley Village is privately owned and lacks a generator. Many residents are on medical equipment similar to the Housing Authority facilities. The Town would like for this facility to install a generator and is interested in supporting a grant effort if the property owner is willing to provide the local match.
- The Municipal Building and Police Department has an aging, 1970s-era generator that has sufficient capacity to run the Police Station, EOC, and accounting department. Very limited power is available for the remainder of the building. An upgraded generator is necessary. Note that this project will require electrical upgrades as the current generator circuit is restricted to the parts of the building noted above.
- The Ambulance facility has an aging generator that needs replacement.
- The Public Works garage has an aging 1970s-era generator that needs replacement. The automatic transfer switch no longer works, and Public Works staff need to manually operate the generator.
- Communications are provided by four radio towers, including two in Plymouth. Each tower has a battery backup as well as a generator for backup power. The Town owns the Tower Road property and leases the property at the other three sites. However, the towers and each associated building are owned by the Town.



- Each of the sewer pumping stations has a generator. The pump station on Hickory Hill Road was replaced recently. The Woodbridge pump station continues to be undersized. Pump station upgrades at Woodbridge are underway but there was not sufficient funding to replace the generator.
- Shelter and disaster response equipment are stored at many locations throughout Thomaston, including the Ambulance Facility, the Municipal Building, and the Fire House. A centralized storage facility or trailer is needed for these materials and equipment.
- The Ambulance facility is now the primary shelter. There is sufficient space to bed, feed, and shower 25 people. This space is opened first when needed and is operated as a short-term shelter.
- The High School is now the secondary shelter. This facility is only opened after 24 hours has passed following an event and there is a need for additional, longer-term shelter space.
- The Fire Station is available as a backup shelter. Space is limited but the generator was recently installed.
- The Communications Building should be removed from the list. That space is now leased out by the Town and is not used as a critical facility.
- The DOT facilities should be removed from the list as they are state operated.
- The Town does not have set evacuation routes. Evacuations are planned on a case by case basis.

#### Development Trends

- Development continues to be relatively slow in Thomaston.
- Several single-family homes have been built over the last five years.
- One large active adult residential development (Whispering Pines Grove) is being developed on South Main Street at Steven's Boulevard. 23 completed units are presently visible on the 2020 Google aerial, with more under construction.
- Some commercial redevelopment is occurring. The Seth Thomas Industrial Park has been redeveloped and is seeking new tenants. The Clockwork Brewery was placed into a building near the Naugatuck River, and more tenants are sought for that building.
- There have been a couple of industrial building expansions on River Street.
- Two other industrial buildings with four businesses each have been built. One is the Fletcher Building.
- No brownfield redevelopment projects are presently underway.

#### Recent Events

- Tropical Storm Isaias in early August 2020 left some areas out of power for a week.
  - Damage was widespread, but there was slightly more tree damage in the higher elevations.
  - Approximately four or five streets were cut off due to the falling trees.
  - The Town is still cleaning up trees from the August event.
  - The biggest initial hurdle was the lack of informed coordination with Eversource. The database Eversource was relying upon was faulty and reporting that work was completed when it was not. The EMD provided an example where he was standing on a street on the phone with Eversource and they told him it was repaired, but the wires were down in front of him. Thomaston also had similar Make Safe issues as other communities where they could not get confirmation that power was cut so they could begin debris removal. The Town has addressed these issues with Eversource in its follow-up meetings.
  - Once the Eversource trucks were in Town, the response was very proactive.
- The September 25, 2018 rain event did not affect Thomaston.
- The May 2018 tornado bypassed Thomaston to the north and south and did not affect the town.



- The January 2015 winter storm required additional plowing efforts but did not cause any damage.
- Attendees could not recall any other storms of note in the past five years. Winter Storm Alfred in October 2011 is the most damaging storm in memory.

#### RL Properties

- Thomaston has 1 RLP which is new since the last plan. It is not located in a SFHA. Attendees were not sure of the exact location. In checking the RLP list following the meeting, the RL property is a single-family home located adjacent to Nibbling Brook.
- Attendees were concerned that one of the buildings at the Country View Estates condominiums on Branch Road adjacent to the Sunoco gas station and Chapman Lumber could become an RLP. This area receives drainage from Leigh Avenue and Edgewood Avenue, but the stream was reportedly diverted to support the construction of the condominiums many years ago. During heavy rain events, water will run through the condominiums (returning to its natural watercourse) and turn one of the buildings (the building closest to the wetland) into an island. There is reportedly a low grass berm that provides minimal flood protection that is overtopped during heavy rainfall. The Land Use Administrator has received several calls about this area in recent years. Ultimately, any solution will need to be worked out between the property owners that share the stream. It is possible that culvert upgrades at Route 6 could help, but the diverted water is the real issue.

#### Hazards Discussion

- Hickory Hill Road (FHWA connector road) is being upgraded in 2021 using a LOTCIP grant. Once completed it should no longer present a significant flooding concern.
- The flooding issue in the previous HMP on High Street Extension is on private property. No action is believed to be needed at this time.
- New storm drainage is in the process of being installed on Hillside Avenue and Gilbert Street. This is expected to alleviate the flooding issue.
- A drainage system was installed on Leigh Avenue that appropriately directs drainage into the pond at the end of the road. This area is considered to be mitigated.
- The Park Street at Main Street flooding was specifically tied to the culvert clog. This area is not typically a flooding concern and should be removed from the HMP.
- The DOT culvert at Watertown Road / Route 6 has historically overtopped due to the undersized culvert becoming choked with vegetation. This area has not flooded recently. DOT has not upgraded the culvert, but attendees reported seeing DOT performing maintenance at the culvert recently.
- The unnamed tributary to Branch Brook at the base of Babbitt Road is eroding the bank supporting Old Northfield Road. A stabilization project is needed here before the roadway is undermined.
- Drainage from the ponds near Hillside Cemetery are causing nuisance flooding along Cables Lane. A mitigation project may be needed here.
- The Nystrom Pond Dam and Dike are owned by the Town. Both are Class BB (moderate) hazard structures. Failure of this dam would flood approximately six properties in the Northfield area. DEEP recently changed the dam to a more hazardous classification and the Town needs to perform upgrades. These will be performed in fiscal year 2021-2022 at a cost of approximately \$1 million. The Town needs to identify a funding source to help complete this work.
- The three dams identified in the previous plan (Chamberlain Dam, Southerly Pond Dam, and Plymouth Reservoir Dam) are not owned by the Town.



- The Leigh Avenue dam is still unclassified by the DEEP. The recent drainage improvements have reduced the Town's concerns in this area.
- The Town removed sediment from the Southerly Pond Dam east of Twin Pond Road several years ago, as it was designed to be a sedimentation basin. The Town expects that it will need to remove sediment from this basin again in the future.
- The Plymouth Reservoir Dam is now owned by the Town of Plymouth. Repairs to Altair Avenue have been completed and there are no current flooding concerns downstream of this dam.
- There is one mobile home park in Thomaston at 1402 Waterbury Road. It includes 7 manufactured homes and one garage. The Zoning Regulations do not allow for new mobile home parks to be developed.
- Wind damage is most prevalent along hilltops.
- The emerald ash borer has damaged trees throughout Thomaston. Public Works removes approximately 10 trees per month, but hundreds more need to be removed.
- Icing occurs on hillier sections of roadway such as on Blakeman Road, the condominium access at 143 Pine Hill Road, and along Hickory Hill Road near Nystrom Pond.
- Falling ice is an issue along Route 254 at the road cuts north of the center of town, and also an issue on the southern part of Jackson Street. The Jackson Street area also experiences rockfalls during other parts of the year.
- Snow drifts occasionally occur in higher elevations with cleared areas such as Hickory Hill Road and the Cedar Mountain area. This is mitigated with additional plowing efforts.
- Wildfire risk areas are the same as the previous HMP. The Town has not had to fight any wildfires or brush fires in recent years.

#### Capabilities

- The Town has installed new catch basins in several areas around town.
- Drainage complaints are ultimately routed to Public Works for resolution.
- The Building Official is the NFIP coordinator per ordinance, but the position is part-time. The Land Use Administrator shares many of the responsibilities. The ordinance needs to be updated to reflect the current roles and responsibilities.
- The Superintendent of Highways is also the Tree Warden.
- The tree maintenance budget has increased slightly in recent years. A large increase is requested for next year in order to increase tree removal activities.
- Tree debris are chipped and delivered to a local landscaping company. A debris maintenance area is not believed necessary.
- The Town follows set plowing routes for snow removal. These are not posted publicly.

#### Goals, Objectives, and New Actions

- The top mitigation project for the next five years is to install generators. A strategy is needed to install generators at several critical facilities, particularly the Housing Authority buildings. The strategy needs to include any necessary electrical upgrades to support expanded capacity for the municipal building.
- The top mitigation project for Emergency Management is to secure a centralized storage location or trailer for the Town's emergency management supplies.
- The top mitigation project for Public Works is to stabilize the bank erosion occurring along Old Northfield Road.



- The top mitigation strategy for the Land Use Office is to strengthen the stormwater management requirements in the Zoning Regulations.

#### Next Steps

- Glenn Clark will be the Local Coordinator for this process. Ed Mone will be the backup.
- Public announcements should be placed in the Waterbury-Republican in addition to social media and on the Town's website. Announcements that may relate to Thomaston will be vetted through the First Selectman's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the Town's website.
- A regional municipal staff meeting to discuss the hazard assessment will occur on November 18 as well as a regional public information meeting later that evening.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Add pages to the town website dedicated to citizen education and preparation for natural hazard events	EMS	Carry Forward	These types of notifications have been done via press releases posted on the website. A permanent page regarding event preparedness is still needed.
Obtain a grant to purchase new generators for the Town Hall and the Woodbridge Pump Station	Public Works	Revise	No progress. Revise into a new generator strategy for multiple critical facilities.
Encourage residents to purchase and use NOAA weather radio with an alarm feature	EMS	Capability	This is a capability; the Town can do this at any time.
Acquire open space properties within SFHAs and set aside as greenways, parks, or other non-residential, non-commercial, or non-industrial use	Selectman's Office	Capability	This can be done when property and funding are available. No properties have been purchased by the Town in floodplains over the last five years.
Install drainage systems on Hillside Avenue and Gilbert Street	Public Works	Completed	This is in progress and will be completed by the end of 2020.
Coordinate with the State DOT regarding maintenance of vegetated swale near culvert under Route 6 upstream of Stumpf Avenue	Public Works	Discontinue	This area has not been an issue recently. A specific action is no longer needed.
Pursue funding to implement stormwater improvements along Hotchkiss Avenue in the vicinity of Crystal Lake.	Public Works	Completed	This was completed in 2018 as part of the Tracy Street drainage project.



Action	Responsible Party	Status	Notes
Continue to work with the State of Connecticut, Local Bridge Program on the replacement of a bridge along Walnut Hill Road. Pursue funding for the town's required 20% contribution.	Selectman's Office	Completed	The Walnut Hill Road bridge was replaced in 2019-2020. A second bridge is in progress right now for Carter Road and will be completed soon.
Ensure that any development within the Brownfields sites is consistent with local floodplain management regulations.	Public Works, P&Z	Capability	This is a capability as any development needs to be compliant with local flood regulations. Brownfields redevelopment is not presently ongoing.
Conduct an evaluation of Northfield Brook to determine if maintenance is required to prevent potential flooding impacts.	Public Works	Discontinue	This culvert was replaced (see Walnut Hill Road bridge above). This area is mitigated, and an evaluation is no longer needed.
Review potential evacuation plans to ensure timely migration of people seeking shelter in all areas of Thomaston, and post evacuation and shelter information on the Town website and in municipal buildings.	EMS	Capability / Discontinue	There are potential evacuation plans and procedures in the EOP. The Town does not wish to post shelter locations prior to them being opened.
Encourage the use of structural techniques related to mitigation of wind damage in new residential and commercial structures to protect new buildings to a standard greater than the minimum building code requirements. Require such improvements for new municipal critical facilities.	Public Works	Capability	This may have been a more appropriate strategy for the Building Department. Regardless, this is likely a capability as buildings must be built to the 2018 building code that includes many of these techniques that were not required under the 2012 code.



Action	Responsible Party	Status	Notes
Provide educational materials to property owners regarding using shutters, storm windows, pipe insulators, and removing snow from flat roofs	EMS	Capability / Discontinue	This direct outreach originally envisioned is no longer considered to be needed as heavy wind and snowfall events have not been frequent in recent years. The current method of issuing press releases is believed sufficient for distributing this information.
Provide educational materials with safety tips and reminders regarding cold weather	EMS	Capability	Seasonal announcements and press releases are provided on the Town website. The Town encourages elderly residents to contact social services for assistance during very hot and very cold weather. They also check on elderly housing developments to make sure people are ok during power outages.
Develop a plan to prioritize snow removal from the roof of critical facilities and other municipal buildings each winter. Ensure adequate funding is available in the Town budget for this purpose.	Public Works	Discontinue	No progress. A strategy is not believed to be needed at this time. The snow loads have not been as challenging in recent years.
Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs	Public Works	Capability	This is a capability. Generators are the biggest need for municipal departments at this time. Shelters have adequate backup power supplies.
Consider bracing systems for assets and equipment inside critical facilities	Public Works	Carry Forward, Revise	The Town will investigate if sensitive components such as IT server racks, above ground fuel tanks, etc. are braced to mitigate potential wind or earthquake damage.
Include dam failure inundation areas in the CT Alert database.	Public Works	Capability	This is a general broadcast to those who signed up, which means that specific areas are included. The Town also uses the Everbridge emergency notification system which can send to specific areas. However, the Town prefers to send messages to all residents as opposed to targeted areas.
Petition the DEEP to investigate the hazard potential of the dam above Leigh Avenue and require registration	Public Works	Discontinue	Chamberlain Pond Dam is still listed as "unclassified" by DEEP. However, the hazard potential appears to be low, and the completion of a recent drainage project on Leigh Avenue has reduced potential flooding concerns in the area.



Action	Responsible Party	Status	Notes
Make copies of the Class C dam EOP's and Dam Failure Analysis on file at the Town Hall	EMS	Carry Forward, Revise	Town has not received any recent EAPs. A strategy is needed to receive updated EAPs from dam owners where the failure of the dam could impact Thomaston.
Continue to encourage the Connecticut Water Company to extend/upgrade the public water supply systems into areas requiring water for fire protection	Fire Department	Carry Forward	The water system has not been extended, although there are certain areas where this is desired.
The Connecticut Water Company should continue to identify and upgrade those portions of the public water supply systems that are substandard from the standpoint of adequate pressure and volume for fire-fighting purposes.	Fire Department	Carry Forward	No changes. Some fire hydrants have been replaced but certain areas have substandard pressure requiring upgrades, particularly in areas with older 2.5-inch connection hydrants. The water company wanted to install a tank on Smith Road many years ago to enhance fire pressure, but residents were opposed to the plan. The Town has to pump out of hydrants in this area to fight fires.
The Town of Thomaston should consider the construction of dry hydrants, cisterns, fire ponds, and sprinkler systems throughout the Town to provide a more reliable supply of firefighting water in areas without public water supply.	Fire Department	Capability, Revise into New Action	This is a capability performed during regular review of fire protection needs. None have been installed recently. They need to install one on Waterbury Road, but they have yet to find a suitable location. The Town plans to apply for a DEEP grant for this work.
Explore other fire protection solutions when water main extensions are not feasible, such as the use of cisterns, hydrants, or fire ponds.	Fire Department	Capability	This is a capability performed during regular review of fire protection needs.



<b>MEETING DATE:</b>	10/23/2020 10:00 to 11:30 AM	<b>ATTENDEES:</b>	Desira Blanchard, Mayor's Office
<b>PROJECT:</b>	NVCOG NHMP Update		Denis Cuevas, WPCA
<b>MMI #:</b>	3211-29-01		Gil Graveline, Building Official
<b>SUBJECT:</b>	City of Waterbury		Rob Langenauer, Water Bureau
<b>LOCATION</b>	Virtual/Remote (Zoom)		Mark Lombardo, Public Works
			Robert Nerny, City Planner
			Adam Rinko, EMD
			Aaron Budris, NVCOG
			David Murphy, PE, CFM, MMI

David Murphy met with City of Waterbury representatives on October 23, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- Critical facilities from the 2014 HMP were presented for review and update as shown in the table below. Bold text indicates changes or commentary.

Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Abbott Terrace	44 Abbott Terrace			No	Assisted Living
Health Center of Greater Waterbury	177 Whitewood Road			No	Assisted Living
Mattatuck Health Care Facility	9 Cliff Street			No	Assisted Living
Office of Emer. Mgmt.	236 Grand Street			No	
Engine 1, Engine 9, & Truck 2	1979 North Main Street			No	
Engine 10, Truck 1	26 Field Street			No	
Engine 11	740 Highland Avenue			No	
Engine 2, Truck 3	519 East Main Street			No	
Engine 4	823 Baldwin Street			No	
Engine 5	1956 East Main Street			No	
Engine 6	431 Willow Street			No	
Engine 7	315 Walnut Street			No	
Engine 8	197 Bunker Hill Avenue			No	



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Waterbury Fire Dept. HQ	235 Grand Street			No	
Saint Mary's Hospital	56 Franklin Street			No	
Waterbury Hospital	64 Robbins Street			No	
Silas Bronson Library	267 Grand Street			No	
Waterbury Police Dept.	255 E Main Street			No	
Waterbury Police Dept. Annex	240 Bank Street			No	
Highway Garage	51 East Aurora Street			No	<b>The City has a new highway garage that should be listed</b>
Central vehicle maintenance	500 Captain Neville Dr.			No	<b>REMOVE</b>
Refuse Transfer facility	Mark Lane			No	
<b>DPW Facility</b>	<b>526 Huntingdon Ave</b>	<b>Y</b>			<b>Merges, DPW Streets, Refuse, Traffic Engineering, Trades Staff, Central Vehicle Maintenance and Fire Department, Bureau of Apparatus/Maintenance/Repairs Fueling Station</b>
B. W. Tinker Elementary Sch.	809 Highland Avenue			No	
Barnard School	11 Draher Street			No	
Brooklyn School	29 John Street			No	
Bucks Hill Elementary School	330 Bucks Hill Road			No	
Bunker Hill School	170 Bunker Hill Avenue			No	
Carrington Elementary School	24 Kenmore Avenue			No	
Crosby High School	300 Pierpont Rd		Yes	No	Shelter – 150 beds
Driggs Elementary School	77 Woodlawn Terrace			No	
F. J. Kingsbury School	220 Columbia Blvd.			No	
Gilmartin Elementary School	107 Wyoming Avenue			No	
H. S. Chase School	40 Woodtick Road			No	
Hopeville Elementary School	2 Cypress Street			No	
Kaynor Technical School	43 Tompkins Street			No	
Kennedy High School	422 Highland Ave.		Yes	No	Shelter – 150 beds
Maloney Magnet School	233 South Elm Street			No	
Margaret M. Generali School	3196 East Main Street			No	
Michael F. Wallace Mid. Sch.	3465 East Main Street			No	
Naugatuck Valley Com. Coll.	750 Chase Parkway			No	
North End Middle School	534 Bucks Hill Rd.			No	
Post University	800 Country Club Road			No	



Facility	Address or Location	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Regan Elementary School	2780 North Main Street			No	
Rotella School	380 Pierpont Road			No	
Sprague Elementary School	1443 Thomaston Ave.			No	
State Street School	35 State Street			No	
UConn Waterbury Campus	99 East Main Street			No	
Walsh Elementary School	55 Dikeman Street			No	
Washington Elementary Sch.	685 Baldwin Street			No	
Waterbury Arts Magnet Sch.	16 South Elm Street			No	
Wendell L. Cross Elem. School	1255 Hamilton Avenue			No	
West Side Middle School	483 Chase Pkwy.			No	
Wilby High School	568 Bucks Hill Rd.		Yes	No	Shelter – 150 beds
Woodrow Wilson Elem. Sch.	235 Birch Street			No	
City Hall	235 Grand Street			No	
City Offices (Chase Building)	236 Grand Street			No	EOC, IT system, basement flooding concerns; <b>The Chase Building flooding has been resolved by more frequent cleaning of the drainage structures.</b>
City Offices (Jefferson Square)	185 South Main Street			No	
Public Water System	Various				<b>Individual facilities should be listed</b>
Public Sewer System	Various				<b>Individual facilities should be listed</b>
<b>(City will provide name)</b>	<b>Recreation center</b>				<b>Can be used as field hospital</b>
<b>(City will provide name)</b>	<b>Recreation center</b>				<b>Can be used as field hospital</b>
<b>(City will provide name)</b>	<b>Recreation center</b>				<b>Can be used as field hospital</b>
<b>(City will provide name)</b>	<b>Recreation center</b>				<b>Can be used as shelter</b>
<b>Location of Recreation Centers can be provided by Mark Lombardo, DD Public Works</b>					

- DPW has moved to a new facility.
- Some individual water bureau facilities should be listed. David will determine which make sense to be listed.
- Some individual sewer facilities should be listed. David will work with Devin to determine which make sense to be listed.



- Four recreation centers should be added to the list of critical facilities. Three can be used as field hospitals during the ongoing pandemic, and one can be used as a shelter.
- The Board of Education is moving to a new location that can be listed in the plan.

#### Development Trends

- Brownfield redevelopment continues in the city.
- Several parcels in the south end of pending development.
- Numerous defunct subdivisions from 10-15 years ago may be poised for development. In some cases, permits will need to be renewed.
- Attendees believe the flood damage prevention regulations need to be updated.
- Challenges related to paper streets are generally handled on a case-by-case basis.

#### Recent Events

- The sewer line that crosses Trumpet Brook was washed out sometime after the last plan was adopted and needed to be repaired.
- The entire city was impacted by Tropical Storm Isaias, although the Town Plot area may have had slightly worse impacts. Numerous wires were down, and Eversource was not timely with shut-offs which resulted in many fires. However, the City was able to remove debris and they have sufficient locations to store and dispose of debris. Asplundh was available for help with the largest limbs. The City's opinion is that Eversource was responsible for much of the response but lacked the manpower.
- David asked about generator usage after Tropical Storm Isaias. Six fire stations were using their generators, but the generator for Station #4 failed due to gas line problems that have been resolved. Denis noted that the treatment plant lost power.
- Denis elaborated on power outages that affect the plant. He said power has gone out four times in 2020, and the City cannot get a clear answer regarding what the problem may be.
- David asked if a microgrid could be a solution for outages at the sewer plant. Denis explained that fuel cells are already located there, but they cannot supply 100% of the plant's power needs and therefore cannot be considered a microgrid. They probably have about 75% power available but the actual supply can be as low as 40%. The City is working with the vendor to determine what could be the cause.
- Major damage did not occur in the May 2018 tornados/microbursts, the September 2018 flood, and the January 2015 snow disaster.
- David reminded the City that significant damage has occurred during severe rain events that are not experienced statewide, such as the washouts of 2005 or 2006. Attendees did not recall any similar events.

#### Hazards Discussion

- Areas that flood include Platts Mill, Washington Avenue, Robin Street in front of the hospital, and Robin Street at the Route 8 underpass.
- The Chase Building flooding has been resolved by more frequent cleaning of the drainage structures.
- Some work has been done in the Trumpet Brook watershed. Attendees will check with David Simpson and get back to MMI.
- Changes in risk were not noted for dams.



### RL Properties

- No changes to report.

### Capabilities

- Sewer re-lining is underway, including Freight Street.
- I&I separations are planned. The study report was completed in fall 2020.
- As noted above, the sewer line that crosses Trumpet Brook was washed out and needed to be repaired.
- Gil is likely to floodplain manager (NFIP coordinator) for the City.
- Q-Alert is still used for tracking.
- Notwithstanding the poor response to Tropical Storm Isaias, Eversource is reportedly keeping up with clearing each year and has been responsive.
- Mark is the tree warden. Tree maintenance comes from the Parks budget. They work closely with Eversource. The City and Eversource drive the intended project routes together and the City signs off on Eversource maintenance projects.
- Snow and ice removal capabilities are the same as the last few years. Some outside contractors are used.
- The new public works facility has helped significantly. The City has achieved more efficient operations.

### Next Steps

- Adam needed to leave the meeting early due to increasing challenges associated with the COVID-19 pandemic. David Simpson was not able to attend. Both of them should be contacted to help resolve some of the remaining questions.
- A workshop is scheduled for November 18, 2020. The morning session is for local coordinators and the evening session is for the public.
- Public announcements should be placed in the Rep-Am in addition to social media and on the City's website. Public announcements related to the plan will be vetted through the Mayor's office prior to publication.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> will be placed on the City's website.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Consolidate Public Works facilities in one location	Public Works	Complete	This has been completed and public works capabilities have reportedly become more efficient.
Develop intermunicipal agreements with other public works departments	Public Works	Carry Forward	Progress has not been made.
Add pages to City website regarding emergency planning, shelter locations, and general emergency preparedness	OEM	Check and possibly carry forward	The Public Safety page has links to the CT Alerts signup page and the Ready.gov site to prepare for disasters.
Acquire and install additional standby power supplies (generators)	Public Works	Check and possibly carry forward	At least one needs to be replaced. Additional may be needed.
Consider becoming a member of FEMA's Community Rating System	Mayor	Drop	Progress has not been made.
Seek methods of requiring watershed-based engineering studies for large developments	Public Works	Drop	Changes to the Zoning Regulations and Subdivision Regulations in the last few years may have addressed the intent of this action. It can likely be dropped.
Selectively pursue conservation objectives listed in the Plan of Conservation and Development, including the creation of greenways such as the Naugatuck River Greenway	Mayor	Capability	The City has been making progress with the greenway. A portion of the greenway is out to bid now, and will be constructed in the near future.
Clear brush and growth in the floodplain of the Mad River that could possibly inhibit flood flows at least every three years	Public Works	Uncertain	Need to follow up



Action	Responsible Party	Status	Notes
Consider property acquisitions in the area of flooding near Pritchard's Pond	Mayor	Uncertain	Need to follow up
Commission a City-wide Stormwater Management System Study containing drainage models useful to developers, and update every five years	Public Works	Carry Forward	This is POCD policy 21-4. Progress has not been made.
Continue to investigate reports of localized flooding problems to determine cause and appropriate solution, and set goals for eliminating recurrences	Public Works	Capability	This is a capability and can be removed.
Perform a drainage study of Great Brook, including a structural analysis of the box culvert running under the Palace Theatre, and repair as needed	Public Works	Complete	The study phase is reportedly done. Construction in the area is underway. They will check on the status.
Perform engineering studies for the Mark Lane Landfill and the Highland Metro North Railroad areas outlining how to better protect these areas	Public Works	Uncertain	Need to follow up
Conduct Clough Brook watershed mitigation projects.	Public Works	Uncertain	Need to follow up
Conduct a study to prioritize areas for separation of sanitary and stormwater systems.	Public Works	Capability	This is POCD policy 21-3. Studies are partly complete but ongoing. The City is identifying areas of focus.
Consider installation and repair of curbing (ref. Table 3-4)	Public Works	Uncertain	Need to follow up using list.



Action	Responsible Party	Status	Notes
Consider installation of stormwater systems for (ref. Table 3-5)	Public Works	Uncertain	Need to follow up using list.
Repair stormwater and drainage systems (ref. Table 3-6)	Public Works	Uncertain	Need to follow up using list.
Improve drainage at the municipal Chase Building	Public Works	Complete	More frequent drain clearing has reduced the incidence and severity of flooding.
Develop early warning system for lightning at municipally owned parks and golf courses	OEM	Carry Forward	Progress has not been made.
Construct improvements for reducing road icing	Public Works	Capability	This is a capability and can be removed.
Construct a new sand/salt storage facility at a new Public Works facility	Public Works	Complete	This is complete.
Purchase GPS units for City vehicles and subcontracted plowing vehicles	Mayor	Partially complete	City vehicles have GPS units, but City contractor vehicles do not. The City needs about 20 more units for ancillary vehicles.
Consider preventing residential development in areas on or below steep slopes (slopes exceeding 30%)	City Planning	Drop	These are POCD policies 20-1 and 20-2. The Zoning Regulations define steep slopes as being 20% or greater, but construction is still allowed on such slopes. The Zoning and Subdivision Regulations do not address private properties directly, but they address road grades and this likely helps meet the intent of the action, which is to ensure public safety.,
Consider adding earthquakes to the list of hazards specifically identified in the EOP	OEM	Complete	Earthquakes are now included in the State's EOP template. If the City uses the State's template then this is complete.
Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs	Public Works	Complete	
Consider bracing systems and assets inside critical facilities	Public Works	Drop	Critical facilities are believed sufficient.



Action	Responsible Party	Status	Notes
Reconstruct Waterville Street and restore a proper angle to the slope to prevent future landslides	Public Works	Carry forward	Progress has not been made, and the road is still one-way.
Secure mitigation funds for replacing and possibly relocating the 24-inch and 16-inch water mains in the eastern part of the City	Water Department	Uncertain	Need to follow up.
Consider preserving municipal areas of steep slopes as protected open space	City Planning	Capability	The City owns some land with steep slopes. Private properties occasionally approach the City about giving land with steep slopes to the City, but the City is cautious about accepting these parcels. They are addressed on a case-by-case basis.
Ensure local utility providers are aware of landslide potential and have responder teams on call to repair damage caused by landslides	City Planning	Carry forward	Progress has not been made, but the City works with Eversource (the gas company) and can make progress going forward.
Continue expanding and over-sizing the drainage network in the vicinity of steep slopes	Public Works	Uncertain	Need to follow up.
Inspect Class B and BB dams	Mayor	Capability	Based on new DEEP regulations in 2015, the City must inspect all of its dams on a schedule set forth in the regulations.
Petition FEMA to commission a new study of the Mad River to reestablish 100-year flood heights.	Public Works	Drop	A new FEMA study is underway for the Naugatuck River basin, and this will be accomplished.
Depending on the results of the updated Dam Failure Analyses, request DEEP reclassify the hazard potential of Ridson Pond and Scovill Pond Dams	Mayor	Uncertain	Need to follow up.



Action	Responsible Party	Status	Notes
Assist CT DEEP in performing a levee failure analysis outlining in detail the area of impact should the levee fail at the level of the 100- and 500-year flood	Public Works	Uncertain	Need to follow up.
Encourage owner to commission engineering study considering the removal of Frost Road Pond Dam	Public Works	Uncertain	Need to follow up.
Acquire ATV/UTV for fighting wildfires in outlying areas of the city	Fire Dept.	Carry forward	This is needed. The City may apply for an Assistance to Firefighter Grant. Consider adding to this action that the City would like water rescue equipment based on the drowning at East Mountain Reservoir last year.
Pursue acquisitions of properties along "paper streets" and retire these streets from use	Public Works	Carry forward	This strategy was deferred to a future HMP following incorporation into the City's 2015-2025 POCD. However, it was not incorporated into the POCD. The City may be involved with legal action associated with a delayed response to an overdose after a call to 911 from a paper street. Therefore, some progress is needed in addressing paper streets.
Consider property acquisitions along Connecticut & Ohio Avenues to reduce number of people affected by the limited plowing & emergency services	Mayor	Carry forward	This strategy was deferred to a future HMP following incorporation into the City's 2015-2025 POCD. However, it was not incorporated into the POCD.
Pursue the acquisition of additional open space properties located within or partly within SFHAs	Mayor	Capability	This strategy was deferred to a future HMP following incorporation into the City's POCD. POCD policy #21-5 states that the City should "Implement flood prevention strategies from the Hazard Mitigation Plan." This is likely a capability that can be accomplished when property and funding are available.



## Dave Murphy

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**From:** Dave Simpson <dsimpson@waterburyct.org>  
**Sent:** Tuesday, November 17, 2020 8:23 PM  
**To:** Dave Murphy; Aaron Budris; Adam Rinko; Robert Langenauer; Robert Nerney; Denis Cuevas; Desira Blanchard; mlombardo@waterburyct.org; ggraveline@waterburyct.gov  
**Subject:** RE: Waterbury Natural Hazard Mitigation Plan Meeting Notes for Review  
**Attachments:** 11-17-18 WaterburyLACnotes.docx

## EXTERNAL

Dave,  
Sorry for the delayed response.  
Attached is the chart provided as a result of the October meeting.  
I have included my comments in Red. I expect Mark Lombardo to represent DPW on 11/18/20.

## David Simpson

Director of Public Works  
City of Waterbury

185 South Main St  
Waterbury, CT 06702  
dsimpson@waterburyct.org  
T: 203.574.6851 x7187



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**From:** Dave Murphy [mailto:DMurphy@mminc.com]  
**Sent:** Monday, October 26, 2020 2:57 PM  
**To:** Aaron Budris <ABudris@nvcogct.gov>; Adam Rinko <arinko@waterburyct.org>; Robert Langenauer <rlangenauer@waterburyct.org>; Robert Nerney <rnerney@waterburyct.org>; Denis Cuevas <Denis.Cuevas@jacobs.com>; Desira Blanchard <dblanchard@waterburyct.org>; Mark Lombardo <mlombardo@waterburyct.org>; ggraveline@waterburyct.gov  
**Cc:** Dave Simpson <dsimpson@waterburyct.org>  
**Subject:** Waterbury Natural Hazard Mitigation Plan Meeting Notes for Review

Hi All

Thanks for the meeting on Friday. Meeting notes are attached. Please review the table of prior mitigation actions and let me know if you have any edits, or can help fill in missing information. David Simpson, we all believed that you may be able to help with a few.

Thanks,



**David Murphy, P.E., CFM**  
Manager of Water Resources Planning



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View our Coastal Resilience Planning e-book [here](#).  
View our Flood Hazard Mitigation e-book [here](#).



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<b>MEETING DATE:</b>	October 2, 2020	<b>ATTENDEES:</b>	Mark Massoud, Land Use Administrator
<b>PROJECT:</b>	NVCOG NHMP Update		Roy Cavanaugh, Dir. of Public Works
<b>MMI #:</b>	3211-29-01		David Bromley, Fire Chief
<b>SUBJECT:</b>	Town of Watertown		Joshua Bernegger, Deputy Police Chief
<b>LOCATION</b>	Virtual/Remote		Kim Calabrese, Fire Marshall
	Zoom		Paul Bunevich, Town Engineer
			Cameron Natusch, Planning Intern
			Aaron Budris, NVCOG
			Scott Bighinatti, Milone & MacBroom

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Scott Bighinatti met with Town of Watertown representatives on October 2, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

- The Town departments at the former Deforest Street and Main Street municipal buildings have been consolidated into the Echo Lake Road municipal building. A generator is available to provide partial emergency power to the building.
- The Senior Center (secondary shelter) does not have a generator.
- The Board of Education will soon move to the municipal building at Echo Lake Road. The DeForest Street building should be removed from the list.
- The Ivy at Watertown (Assisted Senior Living) opened in March at 655 Straits Turnpike. It has approximately 70 beds. This should be added to the critical facility list.
- St. John the Evangelist School (Pre-K to Grade 8) and St. Mary Magdalen School (private schools) should be added as critical facilities.
- Communication Towers should be added to the list. The main repeater is located on Buckingham Street. Other towers are located at Stop & Shop on Straits Turnpike, at John Trumbull School, and on Judd Farm Road (note that this tower is planned for relocation in the near future). John Trumbull School also maintains backup radios. Taft School also has a tower with a generator.
- All of the Town's water and sewer pump stations have backup power. Watertown Fire District's water pumping stations are also believed to have backup power. Mark will provide a list of the water and sewer pump station locations for inclusion on the critical facility list.
- The Town's primary fuel depot is at the public works garage.
- The Town does not have set evacuation routes for any areas. All evacuations are planned on a case-by-case basis.
- The City of Waterbury has developed a bus maintenance and storage facility on Route 262 (Frost Bridge Road) that should be added to the list of critical facilities.



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
AT&T Switching Station		Telephone	✓			Location?
Elderly Housing	Various	Three Public and One Privately owned				
Fire Department Headquarters	935 Main Street	Emergency Operations Center / Tertiary Shelter	✓	✓		
Fire Company No. 2	532 Buckingham Street	Emergency Response	✓			
Police Department	195 French Street	Backup Emergency Operations Center	✓			
Municipal Building	61 Echo Lake Road	Critical Records, Town Management	Partial			All functions now at Echo Lake Road.
Primary Highway Garage	91 Burton Street	Emergency Response / Maintenance; Primary Fuel Depot	✓			Added Primary Fuel Depot
Secondary Highway Garage	682 Thomaston Road	Emergency Response / Maintenance				
Senior Center	311 Falls Avenue	Secondary Shelter		✓	✓	
Watertown Water and Sewer Authority Office and Infrastructure	747 French Street, Various	Records, Infrastructure includes Booster Pumping Stations, Towers, Tanks for Public Water Supply	✓			
Watertown Fire District Offices and Infrastructure	24 DeForest Street; Various	Records, Infrastructure includes Booster Pumping Stations, Towers, Tanks for Public Water Supply	✓			
Waterbury Water Dept. Treatment Plant	Gilbert Road	Public Water Supply	✓			
CL&P Substation	262 Frost Bridge Road	Distributes Electricity to Wide Area				
Taft School	110 Woodbury Road	Private Co-Educational Boarding School; 260 Residents, partial emergency power, possible backup shelter	✓			
Apple Rehab	35 Bunker Hill Road	Assisted Living / Managed Care	✓			
Watertown Convallarium	560 Woodbury Road	Assisted Living / Managed Care	✓			
Watertown Food Bank	20 Main Street	FEMA storage facility				



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Watertown High School	324 French Street	Primary Shelter, partial emergency power (for shelter)	✓	✓		
Board of Education	10 DeForest Street	Information Technology Systems				Remove from list
Trumbull School	779 Buckingham Street	Emergency Distribution Center, partial emergency power	✓			
Polk Elementary School	435 Buckingham Street		✓			
Judson Elementary School	124 Hamilton Lane		✓			
Swift Middle School	250 Colonial Street		✓		✓	
The Ivy at Watertown	655 Straits Turnpike	Assisted Living / Managed Care	?			Added to list. Is there a backup generator?
St. John the Evangelist School	760 Main Street	Private School (Pre-K to Grade 8)				Added to list.
St. Mary Magdalen School	140 Buckingham Street	Private School (Pre-K to Grade 8)				Added to list.
Communication Towers	Buckingham Street Straits Turnpike John Trumbull School Taft School	(Repeater)  (Stop & Shop)  (Backup Radios)  (Private School)	✓			Added to list.
Waterbury Bus Maintenance and Storage Facility	Frost Bridge Road	Public Transit				Added to list

### Development Trends

- New development has been nominal in Watertown over the past few years.
- The majority of new residential development has been related to the buildout and infill of existing subdivisions.
- A new subdivision for approximately 15 lots was recently approved off of Bunker Hill Road.
- There has been a lot of commercial redevelopment along Straits Turnpike, but no new construction recently.
- The Ivy at Watertown, an assisted living / senior housing facility, was recently completed on Straits Turnpike.



- New construction has not occurred in the industrial park area. Many buildings have been repurposed or redeveloped over the past few years.

#### Recent Events

- Tropical Storm Isaias was forecast as being a combined flood and wind event, but Watertown received relatively little rain. It was primarily a heavy wind event for the Town. The majority of the damage occurred from 3 pm to 6 pm.
  - There was significant, widespread tree damage that damaged power lines and closed roads.
  - Power was out in most areas for three to four days.
  - Coordination with Eversource was reportedly poor. Make Safe crews did not arrive for 36 hours following the event such that there were live wires on the ground for a long time.
- Town staff could not recall any difficulty with the September 25, 2018 heavy rain event.
- The May 2018 tornadoes did not impact Watertown.
- The January 2015 snowstorm required extensive plowing but did not cause any damage.

#### RL Properties

- Town staff are not presently certain of the exact addresses of the repetitive loss properties. Two are located along Steele Brook according to the previous Plan. The Town does not believe that any have been mitigated.

#### Hazards Discussion

- The Town does not have any drainage concerns related to recent developments.
- Beavers are a significant problem, primarily throughout northern part of town. The beaver activity is affecting hiking trails, walkways, roads, and yards on private property. The Town needs to determine a potential solution. Specific areas identified by Town staff as being affected by beaver activity include:
  - Smith Pond Road
  - Echo Lake Road
  - The Steele Brook corridor (the beavers reportedly appear to be migrating upstream)
  - Jericho Road
- The parking lot of the Senior Center is in the 1% annual chance floodplain and occasionally floods. The building is typically not impacted by flooding.
- No progress has been made to find a secondary mode of egress to the two houses on Sand Bank Road that can become isolated when Hop Brook floods.
- Town staff do not have any concern about lower hazard dams other than beaver dams.
- Wind damage occurs town-wide and there are no particular areas that receive repeated damage.
- The tree maintenance budget has increased by 50% over the past five years. All elevated work is contracted out, and Public Works clears low lying debris.
- The Public Works Director is the Tree Warden.
- Public Works has set snow plowing routes that are not publicly distributed.
- Icing and snow drifts are occasionally problems in the northern part of Watertown. These areas are mitigated through municipal sanding and plowing efforts, and a mitigation project is not necessary.
- There has been no change to the wildfire risk areas presented in the previous Plan.



- A 2-acre brush fire occurred off of Sylvan Lake Road that took three days to extinguish. The ground was so dry that the fire burned into the ground. DEEP and mutual aid helped to extinguish the blaze. The Fire Chief estimates that it cost approximately \$2,000 to fight the fire.
- While there are no concerns regarding ice jams, sinkholes, and landslides in the traditional sense, the presence of the beaver dams has resulted in the buildup of ice dams in certain areas.
- Potential projects the Town would like to complete include:
  - Removal or other mitigation of the beavers
  - Flood mitigation along Steele Brook, particularly in the vicinity of Knight Street and Riverside Street. Buyouts would likely be most appropriate in these areas.
  - Although this is primarily an inflow/infiltration issue, the sanitary sewer main off Falls Avenue occasionally overflows due to heavy rainfall and/or flood stages in Turkey Brook. Raw sewage has backed up into the street. Correcting this condition is highly desired.
  - One long term project the Town needs to begin considering is the maintenance on the outlet valves for Town owned dams. The condition of many of these valves is unknown and it is likely that maintenance is needed.

### Capabilities

- Public Works has been working steadily on a variety of bridge and culvert replacement projects.
  - Sylvan Lake Road improvements are being completed. The project will increase the capacity to pass Turkey Brook. This project was related to Turkey Brook Flood Study.
  - Drainage upgrades on Sunset Avenue will be completed by the end of 2020. This is a maintenance project (not flood related, no upsizing).
  - Drainage upgrades on Vaill Road will be completed in 2021. This is a maintenance project (not flood related, no upsizing).
  - Drainage upgrades on Wilson Drive are scheduled for 2021. This is a maintenance project (not flood related, no upsizing).
  - A new crossing for a tributary to Turkey Brook will be installed in the vicinity of 142 and 152 Falls Avenue in 2021. This project was related to Turkey Brook Flood Study.
  - The Town has been conducting clearing and maintenance activities along the Turkey Brook corridor from Sylvan Lake Park to the Waterbury city line.
- Heminway Pond Dam (Steele Brook upstream of Echo Lake Road) was removed by the Town in 2018. This was done to improve surface water quality and restore fish passage. Connecticut DEEP funded the removal with federal Clean Water Act 319 nonpoint source grant funding and State Supplemental Project funds.
- The Steele Brook Flood Study (WMC Engineers) was completed in late 2019. Town staff do not believe that there are any actionable projects other than preventing development and acquiring property in the floodplain. They were hoping for results that could lead to a wider variety of projects.
- Drainage and flooding complaints are ultimately routed to Public Works.
- Attendees were not immediately clear on who was the NFIP Coordinator. This person typically inspects construction with flood risk and ensures compliance with all of the flood regulations. The Building Official may have been the NFIP coordinator, but that position is currently vacant. Some functions may also be completed by the ZEO. Mark will look into this.
- The Plan of Conservation and Development was updated in 2017 and should include discussion of natural hazards.



### Next Steps

- Mark Massoud will be the local coordinator.
- Press releases should be published in the Town Times, Republican-American, social media (Facebook – Town Talks page), and the Town website.
- Mark will provide additional information related to critical facilities and the NFIP coordinator.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Incorporate suggested actions into other local planning activities	TE	Complete	Watertown completed its POCD update in 2017. Objective 2-5 specifically incorporates certain strategies from the HMP as strategies for the POCD.
Identify and outfit additional shelter space for the community	TC & EM	Complete	Sheltering space at the High School is now considered sufficient.
Evaluate post-disaster response logistics including organization of volunteers	EM, BOE	Capability	This is done as part of the annual EOP update, and during "Lessons Learned" discussions following a disaster
Develop a policy and schedule for how volunteers and workers will be fed and have access to showers during response	EM	Discontinue	A formal policy is not needed. Volunteers have been fed without issue over the past few disasters, and facilities are available.
Secure additional emergency response supplies such as lights, barricades, barriers, etc.	EM, FD, DPW	Complete / Capability	Watertown receives supplies through state assets and can request mutual aid when additional supplies are needed. They have budgeted for more in the 2020-2021 fiscal year.
Perform improvements to the siren system	FD	Complete	Siren improvements to the Litchfield Road siren are underway. The Sylvan Lake Road siren will be replaced once the road project is done.
Evaluate potential outreach strategies including a post-disaster communications strategy and distribution of information via schools	EM	Complete / Capability	This is all considered as part of the annual EOP update process.
Evaluate critical facilities for snow load and wind-resistance capacity	BL, TE, BOE	Complete	This evaluation is underway and near completion.
Complete evaluation of emergency power needs at critical facilities and other locations and potential solutions	TE	Complete	This evaluation is complete. The Town does not have any pressing generator needs.



Action	Responsible Party	Status	Notes
Consider evaluation of emergency power needs at non-critical but important locations and potential solutions	TE	Capability	This is an ongoing process. The Town has not identified any pressing generator needs.
Ensure contractual agreements or other arrangements are in place to ensure fuel supplies are delivered for emergency power needs	TC	Capability	These are in place.
Consider revising subdivision regulations to mitigate potential hazards associated with dead-end streets	PZ	Complete	Section 5.3.11 of the subdivision regulations do not allow dead end streets to exceed 1,000 feet or serve more than 15 building lots.
Encourage FEMA to update the FIS for Watertown and provide detailed study of additional areas	TC	Carry Forward	No outreach has been performed to the knowledge of attendees, but the flood risk areas need to be restudied. Some mapping work is being performed by the USGS in the Housatonic River basin, which includes the Naugatuck River valley. It is not immediately clear if this project will study flood prone streams in Watertown. More information may be available from the State NFIP Coordinator later on in this process.
Encourage residents within the 1% annual chance floodplain to purchase flood insurance and complete elevation certificates	LU & TE	Discontinue	The Town does not conduct this type of outreach. Banks require flood insurance for mortgagees.
Devise specific mitigation strategies to improve floodplain management regulations, such as freeboard requirements etc.	TE & LU	Carry Forward, Revise	Watertown is evaluating DEEP's model flood ordinance. Freeboard of one foot is already required per Section 53.10 of the Zoning Regulations and the State Building Code.



Action	Responsible Party	Status	Notes
Identify structures in the 1% annual chance floodplain and add contact information into the emergency notification system	TE & EM	Complete	This is not needed as the entire Town can be contacted via Everbridge and the Town can also send targeted messages into certain areas.
Review ability to enforce stream cleanups on private property	LU	Carry Forward	The Town is still evaluating this topic.
Encourage cleanups of stream dumping on private property	TE	Discontinue	No outreach is conducted at present. This has not been an issue in recent years.
Consider adopting regulations that would reduce peak flows downstream of a development site	PZ	Discontinue	Although this was in the previous HMP and carried over into the POCD, the Town is generally satisfied with ensuring that peak flows do not increase downstream of development sites consistent with existing regulations.
Complete culvert upgrade project on Wattles Brook at Colonial Avenue	DPW	Complete	This was completed.
Complete the Steele Brook Flood Study and implement the recommendations as appropriate	TE, TC	Complete	This was completed, but according to Town staff there do not appear to be any actionable items that do not involve property owner involvement. New strategies will be related to buying out properties along the floodplain of the brook.
Pursue funding and complete projects to mitigate flood hazards along Turkey Brook	DPW	Carry Forward, Revise	The Town has completed several projects in this area in the past few years. However, the Town wants to consider additional projects for this area.
Mitigate loss of access to homes on Sandbank Road when Hop Brook floods	DPW	Carry Forward	Evaluation of potential solutions is ongoing.
Identify and acquire land in flood hazard areas to preserve as open space	LU & PZ	Revise	Town intends to focus on the Steele Brook corridor and will consider other opportunities as they arise. They acquired a property on Sylvan Lake Road as part of a related project.



Action	Responsible Party	Status	Notes
Check the sizing of all culverts against current rainfall statistics and resize structures to meet current zoning requirements	TE	Carry Forward	Evaluation of culverts is ongoing, but not sufficiently advanced to be considered complete.
Evaluate drainage systems, floodplains, and infrastructure to identify projects to mitigate flooding	DPW	Carry Forward	Evaluation of drainage systems and floodplains and related infrastructure is ongoing, but not sufficiently advanced to be considered complete. This action should be consolidated with the one above.
Prepare and implement a stormwater management plan specific to Watertown	TE	Carry Forward	Preparation of a Stormwater Management Plan did not get funded. There is interest in having a plan done if funding is available.
Evaluate and consider expanding the tree-clearing program to protect power lines from potential tree damage	TE	Complete / Capability	Tree clearing is ongoing. The tree maintenance budget has increased by 50% over the last few years.
Identify a space where tree debris may be stored and processed following a severe storm event	TC, DPW	Carry Forward	The Town still wants to find a dedicated area for processing and storage.
Consider pursuing the creation of a micro-grid in the Straits Turnpike area	TC, BL	Discontinue	Stop & Shop on Straits Turnpike and the gas station at the intersection of Bunker Hill Road and Straits Turnpike both reportedly have generators, so the need has been addressed and the Town may not need to pursue a microgrid.
Develop response plans to remove excessive snow from critical facilities and schools	TE & DPW	Discontinue	This is evaluated on a case-by-case basis following storms.
Ensure that adequate backup plans and supplies are available for continued functionality following an earthquake	EM	Complete	Current backup plans and supplies are adequate.



Action	Responsible Party	Status	Notes
Complete review of lower hazard dams and town-owned detention basins to determine potential failure hazards and address deficiencies	DPW	Discontinue	As of 2015, dam owners are responsible for inspections of their dams on a schedule based on the hazard classification. The Town does not have any interest in reviewing privately owned dams. Town-owned detention basins are generally in good condition.
Utilize dam failure inundation mapping to identify properties for inclusion in the emergency notification system	TE, EM, BOE	Complete	This is not needed as the entire Town can be contacted via Everbridge and the Town can also send targeted messages into certain areas.
Encourage homeowners and private communities to widen access for emergency vehicles where applicable	EM	Capability	This is typically performed as part of the site plan review process, but occasionally occurs via direct outreach.



## MEETING MINUTES

<b>MEETING DATE:</b>	11/11/2020 1:00 to 1:30 PM	<b>ATTENDEES:</b>	Mark Garrigus, IWC Chair
<b>PROJECT:</b>	NVCOG NHMP Update		David Murphy, PE, CFM, MMI
<b>MMI #:</b>	3211-29-01		
<b>SUBJECT:</b>	Town of Wolcott		
<b>LOCATION</b>	Virtual/Remote (Teams)		

David Murphy met with Mark Garrigus on November 11, 2020 to begin the local planning process for the hazard mitigation plan (HMP) update. The meeting was held as a video conference using the Teams platform, allowing sharing of screens. Attendees followed an open discussion format. Discussion topics are grouped below.

### Critical Facilities

Critical facilities from the 2014 HMP were presented for review and update as shown in the table below. Mark will review the list and return any changes.

Type	Name	Address	Located in SFHA?
Convalescent Home	Wolcott View Manor	50 Beach Rd	No
Public Works	Public Works, Water Dept.	48 Todd Road	No
Fire Dept	Fire Department Company #1	395 Central Ave	No
Fire Dept	Fire Department Company #2	North St	No
Fire Dept	Fire Department Company #3	Lyman Rd	No
Fire Dept	Wolcott Fire Dept	225 Nichols Rd	No
Police Sta.	Wolcott Police Dept	225 Nichols Rd	No
School	Alcott School	1490 Woodtick Rd	No
School	Frisbie School (tertiary shelter)	24 Todd Rd	No
School	Tyrrell School (primary shelter)	500 Todd Rd	No
School	Wakelee School (secondary shelter)	12 Hemple Dr	No
School	Wolcott High School	457 Bound Line Rd	No
Town Office	Wolcott Town Offices	10 Kenea Ave	No

### Development Trends

- Major residential development is not present in Wolcott.
- Subdivisions approved 10-15 years ago are coming back in for renewals of approvals.
- Non-residential property owners are adding fill in the SFHA near Town Line Road to make new space for equipment, trailers, and laydown. Mark is aware that this is a problem.

**Commented [A1]:** What about the volunteer ambulatory facility?. Not sure if the public works and/or ambulatory facility are actually located outside a FEMA designated flood zone. For mapping purposes they are but a formal FEMA study has not been completed on Lily Pond Brook, which is directly adjacent to these two facilities and the transfer station.



### Recent Events

- The residential damage during Tropical Storm Isaias was significant. However, the power outage was only a few days. Town crews were busy with cleanup afterward.
- Damage did not occur during the May 2018 tornado and microburst event in Connecticut.
- Winter storms are handled well by Town crews.
- Flood events have not occurred in the last five years.

### Capabilities

- Changes in most capabilities were not reported. Town crews are handling wind debris and winter storms. Mark noted that the Town has been doing alright with utilities.
- DOT is planning to ~~change-replace~~ the bridge at Route 69 near Hillside Drive. This project is out to bid.
- ~~The In 2013 the Town DOT may have replaced the Center Street (Rte 322) bridge over Lindley Brook at the bottom of Center Street (Route 322) in the last few years<sup>1</sup>.~~
- ~~The Frisbie-Todd Road bridge was supposed to be replaced but this was not funding for regulatory permitting, final design, bidding assistance and construction inspectioned.~~
- 

**Commented [A2]:** You should ask Mark if the Town has made any repairs to dams (Scovilles, Cedar, and/or Chestnut Hill). I thought the Town may have upgraded the gate valve at Chestnut Hill Reservoir 3 or 4 years ago.

### Priorities Going Forward

- Mark would like to see the Town maintain its current land use profile. Risks are minimized and this should continue.
- Develop formal flood zone mapping for watercourses currently designated with only FEMA letter A zones. Establish base flood elevation information for these letter A zone areas.

### Next Steps

- Mark will be the local coordinator.
- A workshop is scheduled for November 18, 2020. The morning session is for local coordinators and the evening session is for the public.
- A link to the NVCOG planning process page <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/> should be placed on the Borough's website.

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<sup>1</sup>The date "2013" is visible on the bridge on google maps





**MILONE &  
MACBROOM**

## MEETING MINUTES

### Status of Previous Actions

Action	Responsible Party	Status	Notes
Acquire standby power for Wolcott High School	LEPC	Uncertain	Mark will check
Conduct drainage studies in specific areas as needed	DPW	Carry Forward	Carry forward and potentially revise to be more specific.
Consider joining FEMA's Community Rating System	IWC	Drop	The Town does not have capacity for this.
Encourage residents to move personal property out of the 100-year flood plain, especially in the Woodtick Road area south of Garthwait Road	ZEO	Partially Complete and Carry Forward	Some progress made; this needs more attention. The blight ordinance might help with enforcement.
Use two-foot contour maps or LiDAR topo to develop more exact regulatory flood maps as needed	DPW	Drop	Drop; they are using current flyovers (i.e. LiDAR) as needed.
Acquire open space properties within SFHAs and set aside as greenways, parks, or other non-residential, non-commercial, or non-industrial use	Mayor	Capability	Nothing has come up recently. The dog park was the last SFHA open space acquisition.
Address flooding in the Town Line Road area by working with building owners as needed	DPW, IWC	Carry Forward with Revision	Filling has occurred. A new action may be needed to help address this ongoing problem.
Enlarge the culvert passing the Mad River under Mad River Road near Route 69 and elevate the road if necessary	DPW	Carry Forward	No progress
Increase the size of the culverts near Grove Street & Maple Avenue	DPW	Carry Forward	No progress



Action	Responsible Party	Status	Notes
Enlarge the culvert passing Lily Brook under Woodtick Road and elevate the road if necessary		Carry Forward	This was part of the study that MMI provided a cost for. Mayor did not fund this.
Petition the state to restore the 24-inch culvert on Route 322 near Grove Street & Maple Avenue	Mayor, DPW	Carry Forward	No progress
Pass an ordinance to require standby power for group homes and assisted living facilities	LEPC, Mayor	Uncertain	Mark will check
Preserve or convert areas of inactive faults into municipal open space in the western part of the town	PZC	Drop	Drop; the risk does not justify focus in this area.
Extend water main to Wolcott High School and install standby power at the school	W&SD	Complete	Water main complete
Consider bracing systems for assets and equipment inside critical facilities	LEPC, DPW	Drop	Ongoing. Shelters are within schools, so this is hard to know.
Continue to require or conduct regular inspections of all Class C dams and perform or require upkeep and maintenance as needed	DPW	Capability	The Mayor is utilizing the Town Engineer for dam inspections, even when they are on privately-owned. This is believed to be addressed.
Work with the Connecticut DEP to ensure that the owners of Class C dams have up to date EOPs and Dam Failure Analyses for each dam	DPW, LEPC	Complete	HRP may have developed the new EAP for Hitchcock Lake.



Action	Responsible Party	Status	Notes
Have copies of the Class C dam EOPs and Dam Failure Analyses on file at the Town Hall for public viewing	LEPC	Uncertain	Mark will check
Wolcott Water Department to extend/upgrade the public water supply systems into areas requiring water for fire protection	W&SD	Uncertain	Mark will check
Install fire ponds or cisterns to facilitate firefighting in areas without public water supply	LEPC	Capability	They ask for this on a case-by-case basis.



<b>MEETING DATE:</b>	Sep. 28, 2020 10:00 to 11:45am	<b>ATTENDEES:</b>	David Lampart, Emer. Mgmt. Dir. Barbara Perkinson, First Selectman Maryellen Edwards, Town Planner Janet Morgan, Fire Marshall Rich Lamothe, Public Works Gary Testa, Building Official Aaron Budris, NVCOG Scott Bighinatti, Milone & MacBroom
<b>PROJECT:</b>	NVCOG NHMP Update		
<b>MMI #:</b>	3211-29-01		
<b>SUBJECT:</b>	Town of Woodbury		
<b>LOCATION</b>	Virtual/Remote Zoom		

Scott Bighinatti met with Town of Woodbury representatives on September 28, 2020 to begin the local planning process for the hazard mitigation plan update. The meeting was held as a video conference using the Zoom platform. A Power Point presentation was used to explain the planning process and guide the meeting. Attendees followed an open discussion format. Discussion topics are grouped below.

#### Critical Facilities

Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Emergency Services Building / Orenaug Fire Company	25 Quassuk Road	Fire department / Emergency Operations Center / Secondary shelter	Yes	Yes	Yes	
Hotchkissville Fire Company	238 Quassuk Road	Fire department				
Police Department	271 Main Street South	Emergency response	Yes			Now has generator
Police Radio Tower	202 Great Hollow Road	Communication				
Public Works	82 White Deer Rock Road	Critical records, Heavy equipment for emergency response	Limited			
Town Offices	281 Main Street South	Critical records	Yes			Now has generator
Community / Senior Center	265 Main Street South	Primary shelter	Yes	Yes		
Public Water Supply Pump Stations	118 South Pomperaug Avenue; 96 Washington Road; 112 Bethlehem Road	Public Water Supply	Yes		Yes	



Facility	Address or Location	Comment	Emergency Power?	Shelter?	In 1% Annual Chance Floodplain?	Notes / Changes
Convalescent Homes	823 Main Street South; 19 Judson Avenue	Managed Care				
Woodlake Condominiums / Community center	101 Woodlake Road	One-third of Town Population / Tertiary shelter	Yes	Yes		
Nonnewaug High School	5 Minortown Road	School	Yes			Now has generator, could become shelter

- The High School just installed a generator. It is not currently a shelter, but it could become one in the future. The LEPC is planning to meet and decide if this facility should supplement or replace the existing shelter facilities.
- The Town Government campus now has a generator. The generator can power the Police Department and Town Hall.
- Public Works has a generator that was repurposed. There is disagreement among Town Staff about how much it can power public works functions. They believe that they will have a new generator that can fully power all Public Works functions in the next five years.
- The Town does not have any set evacuation routes. These would be determined on a case-by-case basis if needed for an event.

#### Development Trends

- There has not been any major development in Woodbury since 2014.
- Some single-family homes have been built, and these have been increasing each year.
- A 12-unit, 24-lot subdivision is under construction.
- There have not been any recent subdivision approvals. Many previous subdivision approvals have expired without being built or with being only partially built
- An apartment complex was completed near Emergency Services (Quassuk Road) a few years ago.
- There are no drainage concerns with any of the recent developments.

#### Recent Events

- During Tropical Storm Isaias, the entire Town was without power for 5 to 6 days. Many areas were out longer.
  - There was tremendous tree damage throughout the community, with the area near Southbury hit the hardest.
  - There is concern that the privately owned cellular towers have limited on-site backup power. The Town relies on cellular communications for event response. Following Isaias, Town staff recognized the need to coordinate better with Verizon, Frontier, etc. in order to ensure that vehicle access to these facilities is prioritized. This will prevent delays in the owners setting up portable generators once the battery backups run out.



- The Eversource response was poor and hindered by a lack of communication from the utility. There was no coordination with Public Works or the EOC during and following the event.
- The September 2018 rainstorm cause only minor flooding in Woodbury. There were no major concerns with this event.
- The May 2018 tornadoes missed Woodbury but struck nearby Southbury.
- There was limited recollection of the January 2015 snow event. Town staff believe that it may have been the event where staff stayed up all night waiting for heavy snow and blizzard conditions that largely did not materialize. No major issues were recalled other than the plowing effort.

#### RL Properties

- There is one RLP in Woodbury. Town staff are unsure of its exact address but do not believe that it is an area of flood damage except during extreme events.

#### Hazards Discussion

- Areas of flooding along the Pomperaug River are unchanged from the previous Plan.
- DEEP supervised the clearing of a large tree from the Pomperaug River that was blocking the Judson Road bridge. This helped restore the capacity of the bridge.
- There is another tree on Route 317 (Sycamore Avenue) that needs to be removed before it falls into the Pomperaug River and causes a blockage. The Town plans to investigate.
- The same flooding risks are present along the Weekepeemee River, Sprain Brook, and Nonewaug River. These are generally minor except during extreme events.
- The flooding on Minortown Road is considered to be minor as major flooding has not occurred here in the past 20 years.
- Water levels continue to be high along Hesseky Brook near Transylvania Road. The road subsurface was upgraded with riprap to allow for water to pass through without washing out the road surface. Although the water level is still a concern for overtopping, the road washing out is not.
- Beaver Dams are still a concern along Hesseky Brook near Transylvania Road. One dam is 8 to 10 feet tall and needs to be removed or breached.
- Judson Avenue near the "three rivers" is still one of the primary areas of flooding.
- Gates were not installed at Jack's Bridge Road and Judson Road to close off egress during flooding. Temporary measures continue to be used.
- The Pomperaug Mill Hydroelectric Dam on Pomperaug Road (Pomperaug River) has been approved by FERC. No in-water work has commenced. The Town will be refurbishing the bridge here next year.
- Long Meadow Pond Dam in Bethlehem had an issue many years ago. A targeted CodeRed call was placed into the downstream inundation area along the Weekepeemee River. Direct door-to-door outreach was also performed.
- There is a beaver concern on the downstream side of Reichenbach Pond Dam on Pond Valley Road. Beavers have impounded the downstream side of the dam and water is now higher on the downstream side of the dam than usual. It is unclear if this will affect the dam. The road over the dam is the only point of egress to 16 homes.
- Beaver dams were also causing concern off of Route 64. Water levels were high enough to almost overtop the roadway. This beaver dam was reportedly breached, and the water level has receded.
- During the past two windstorms, the tree types most affected were hickory, maple, and oak. This is likely because the Ash trees were without leaves and were therefore less affected by the wind.



- Drifting snow is still a challenge on Grassy Hill Road, but the problem is not significant enough to require mitigation. Artillery Road is another area where drifts can accumulate. However, these areas are adequately addressed by plowing.
- Icing was historically a concern along Park Road, but drainage was installed that mitigated the issue.
- The wildfire risk areas are unchanged from 2014.
- Ice jams, sinkholes, and landslides are not risks of concern in Woodbury.
- The key concern for natural hazards is access. There are too many areas of Woodbury with a single point of egress.
- The project believed to be most necessary is the existing public works project to refurbish the four major bridges in town. This is underway.
- The Pomperaug River is meandering in the vicinity of Orton Lane (south of Judson Avenue). There is concern that nearby homes could be undermined. The Town is talking to the Pomperaug River Watershed Coalition about this area. The Town is hoping to get a grant to protect this area. Maryellen can provide more information about it. It is possible that project design could be completed in the next five years.

### Capabilities

- Public Works recently replaced two bridges due to age and not flooding concerns. One was the Hazel Plain Road bridge over Sprain Brook near Route 47. The second bridge was on Middle Quarter Road over South Brook. The latter bridge was upgraded to two lanes wide and provides Public Works with a new route to detour traffic (such as to bypass traffic around Main Street South).
- Public Works has increased the frequency of clearing debris from streams and culvert crossings which has helped to reduce the frequency of roadway overtopping and nuisance flooding.
- Public Works receives and responds to flooding complaints.
- The tree removal budget has steadily increased over the last several years. Public Works has been working steadily to remove all of the dead Ash trees. 90% of the Ash trees in Woodbury have been affected by the Emerald Ash Borer.
- Public Works has a line item for a Tree Warden in its budget. This function is contracted out to Neal Tree Service, LLC (Bud Neal).
- The Town has set plowing routes, but they are not publicized. Public Works has access to the emergency response radio frequencies and can divert plow trucks to assist with emergency response during storms.
- The Town has a 25-year plan to evaluate and install new dry hydrants and cisterns. They have separate development requirements for developments of more than 3 structures requiring installation of certain sized cisterns or dry hydrants.
- The Town was recently bronze certified under the Sustainable CT program. The Nature Conservancy assisted the Town by facilitating a Community Resilience Building Workshop in July 2019. Maryellen provided a copy of this document which addresses the risk of Woodbury to various natural hazards and climate change.

### Next Steps

- Dave Lampart, Emergency Management Director will be the local coordinator. Maryellen Edwards will be the backup point of contact.
- Maryellen will provide more information about Orton Lane.
- Public notices should be placed in Voices and the Republican-American.



Status of Previous Actions

Action	Responsible Party	Status	Notes
Incorporate suggested actions into other local planning activities	EMD	Complete	POCD discusses flooding and has references to the 2014 HMP planning process. A POCD update is underway and will continue to refer to the HMP.
Acquire a generator and additional supplies for the high school to improve sheltering capacity	BoS, EMD	Complete	Generator was installed and accepted by the town. The LEPC needs to meet to determine if and when it will be shelter.
Consider developing a list of seniors and vulnerable residents who need special assistance during power outages or other emergencies	EMD	Capability	Senior Center maintains this list and provides updates to emergency responders as necessary.
Develop a recruitment program for the Community Emergency Response Team	EMD	Complete	No formal recruitment program, but they have increased membership to 12-14 people including several from neighboring towns. There have been conceptual discussions about regionalizing the CERT with other communities.
Determine if the EOC is completely stormproof and perform improvements if necessary	EMD, TE, BL	Capability	The EOC is reasonably stormproof and is not a concern for continued operation during a natural hazard event.
Investigate and develop a second mode of egress into the Woodlake development	BoS, TE, PW	Carry Forward	Have not been able to complete this action because it would have to go through Southbury, and property owners are not interested in a new road. If this is to occur, it needs to be a secondary emergency access instead of an active egress.
Consider additional outreach to residents, businesses, and organizations regarding the risks of natural hazards and potential mitigation	EMD	Capability	The Town performs outreach as staff time and budgets allow.
Consider a streamlined local permit process for certain private mitigation activities	PC, ZC, BL	Discontinue	This may not be possible under current statutes. However, certain Town commissions (such as Wetlands) have the ability to allow permission for an emergency project to move forward and allow for permitting after the fact.



Action	Responsible Party	Status	Notes
Adopt regulations requiring that two modes of egress be provided for all new subdivisions	BoS, PC	Revise	Fire Department/PW would like this. The requirement should address all developments over a certain size. The Town would need to decide what threshold is appropriate.
Consider adopting regulations requiring all new utilities to be buried underground whenever possible	BoS, PC, ZC	Revise	No requirement at present, as this would be tough to get passed through the commissions. It is recognized that this would greatly help emergency services and Public Works but is an expensive requirement for developers. Having it be added to the regulations as a strong recommendation may make it adoptable.
Encourage residents in the 1% annual chance floodplain to purchase flood insurance under the NFIP and complete elevation certificates	TE	Capability	
Consider requiring the completion of an elevation certificate for any structure covered under a Flood Plain Permit	PC, ZC	Carry forward	The Zoning Regulations require elevation data to be provided, but not on a FEMA Elevation Certificate. Town staff were generally in favor of a potential EC requirement. The EC requires a surveyor to sign the form, which could increase the permitting burden and would need to be considered by the commission.
Consider requiring freeboard of at least one foot and/or other structural mitigation measures for new/improved structures in floodplains	PC, ZC, BL	Complete	Freeboard is already required by the State Building Code. Woodbury is in the process of adopting DEEP's model floodplain regs into their Zoning regulation with the goal of adoption in 2021. This will make the regulations consistent with the State Building Code.
Identify structures within the 1% annual chance floodplain to target warnings through the CodeRED system	TE, EMD	Complete	The Town has the capability to narrow calls into affected areas. Signup for CodeRED is on the Town website and Emergency Management Facebook page.
Consider potential mitigation projects to protect homes in the vicinity of Minortown Road from flooding of the Nonnewaug River	TE, PW	Discontinue	This area is not believed to be a significant issue that warrants attention in the next five years.



Action	Responsible Party	Status	Notes
Work with the Connecticut DOT to determine if bridges could be elevated to improve access to western Woodbury during floods	TE, BoS	Discontinue	Town staff believe that this is likely related to Route 47. Route 317 was raised by DOT but was not a flooding problem. The Town is unsure if elevating the bridges (to prevent overtopping) would exacerbate flooding issues further downstream. Ultimately, this would be a DOT project.
Investigate the presence of fallen trees and debris in the Weekepeemee River near Three Rivers Park and remove if necessary	PW	Complete/ Capability	The Town removed the trees and continues to monitor the area.
Seek funding sources and commission the elevation and reconstruction of Transylvania Road to mitigate flooding near Woodlake	BoS, PW, TE	Complete	The road has been modified to pass water and this strategy is no longer needed.
Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	TE, PW	Complete	
Consider developing a hydrologic and hydraulic model of the Pomperaug River watershed	BoS	Discontinue	The USGS constructed a model around 2005, but it was too large scale to help with localized flooding issues. As most of the flooding issues are typically minor or related to nuisance flooding, the expense of such a modeling effort is not justified over the next five years.
Ensure that projects in the floodway of watercourses do not result in any increase in flood elevations	PC, ZC	Complete	This is currently part of the Zoning Regulations. Woodbury is in the process of adopting DEEP's model floodplain regs into their Zoning regulation with the goal of adoption in 2021.
Consider methods to mitigate the nuisance flooding in the vicinity of 55 Westwood Road	PW, TE	Complete/ Capability	This area still has the potential to flood. There is a 36-inch drainage pipe that can become clogged if it is not maintained. Public Works has been regularly clearing the inlet to prevent flooding.
Investigate dangerous trees along several roads and prioritize areas for tree-trimming and/or tree removal	PW	Complete/ Capability	This is a capability and part of the Tree Warden's normal responsibilities.



Action	Responsible Party	Status	Notes
Consider increasing outreach to private property owners regarding dangerous trees on private property	PW	Complete/ Capability	This is a capability and part of the Tree Warden/Public Works' normal responsibilities.
Work with other communities to improve the emergency communications coming from the local electric utility	BoS, EMD	Capability	They have an Eversource community liaison. Communication over the past year has been poor, and they need to have a follow-up meeting regarding Tropical Storm Isaias.
Consider increasing the budget for tree-trimming and removal	BoS	Complete	This was done over the past 5 years
Consider burying power lines along Route 6 and in other areas where power lines are very vulnerable to tree damage	BoS, TE	Discontinue	This could be a very expensive project. Unlikely to occur in next five years.
Consider installing a buffer of trees to prevent the formation of snow drifts along Grassy Hill Road	PW	Discontinue	Has not been an issue that needs mitigation in the past few years.
Ensure that tree-trimming activities provide sufficient clearance for tall vehicles to pass beneath snow-laden branches	PW	Capability	They elevate cutting as needed and when possible.
Evaluate critical facilities for the design snow load of each structure	TE, BL	Discontinue	Roofs of critical facilities are generally not a concern for snow load. For facilities with flat roofs, Public Works monitors the accumulation and removes snow before there is too much build up. A formal engineering evaluation is not necessary.
Develop response plans to remove excessive snow from critical facilities and schools	EMD, PW	Discontinue	Snow removal occurs on a case by case basis. A formal plan is not necessary.



Action	Responsible Party	Status	Notes
Ensure that adequate backup plans and supplies are available for continued functionality following an earthquake	EMD	Capability	They have adequate backup plans to the extent feasible under existing capabilities and budgets.
Work with the Woodlake Association to perform inspections of the dams along Transylvania Road and consider improvements	TE, EMD	Discontinue	Not really needed anymore as Transylvania Road has been rebuilt to convey water beneath road surface.
Discuss the condition of the Reichenbach Pond Dam with the Connecticut DEEP Dam Safety Division	EMD, TE	Complete	This is a Class BB dam on Pond Valley Road; the dam structure was reportedly enlarged many years ago without adhering to dam construction standards. They have talked to DEEP in the past about it, meeting the intent of the action. The more recent concern has been related to a beaver dam immediately downstream of the dam. However, the pond dam and downstream beaver dam have not been concerns in 2020.
Work with the local homeowner's association to perform inspections of the dam along Pond Valley Road and consider improvements	TE, EMD	Capability	The Town owns the dam and inspects it on the schedule required by DEEP.
Utilize dam failure inundation mapping to identify vulnerable properties and include contact information in CodeRED database	TE, EMD	Capability	The Town can target CodeRed to vulnerable areas of the community without the specific inundation areas being programmed into the system.
Pursue purchase of off-road firefighting equipment to increase ability to access and contain wildfires	BoS, EMD	Capability	The Town has a brush truck and is in the process of replacing the gator with a UTV. The Town does not have issues getting into isolated areas. The Town is part of the regional forest fire task force for mutual aid.
Encourage homeowners and private communities to widen access for emergency vehicles where applicable	EMD, ZC	Capability	This is already performed and is a capability. The Town asks for larger access than they typically get. There is some interest for a specific regulation (such as 22 feet minimum) in new developments above a certain size to ensure access. Town staff will need to determine the appropriate development size (or access length) to place such a requirement into the regulations.



## **Appendix B**

### Regional Workshops







# Update of Hazard Mitigation Plan for the Naugatuck Valley Region



Workshop:  
Hazard Identification and Risk Assessment



Victoria Brudz, CFM  
David Murphy, PE, CFM  
Noah Slovin, CFM



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## WORKSHOP LOGISTICS

- 9:00 – Welcome & Logistics
- 9:05 – Main Presentation
- 9:50 to 10:05 – Breakout Sessions
  - Riverine and dam flood risks
  - Wind, snow, and power outages
  - Geologic hazards (landslides, earthquakes, Cheshire sinkholes)
  - Please comment in the chat back box which group you would like to be placed in
- 10:05 to 10:15 – Report from Sessions & Wrap Up

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# Agenda

- Purpose and Need for Hazard Mitigation Planning
- Review of Hazards to be Addressed
- Effects of Climate Change
- Report from Municipal Meetings- What Did We Hear?
- Characterizing Hazard Loss Estimates
- FEMA Map Updates (Diane Ifkovic, CT DEEP)
- Next Steps

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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### Authority

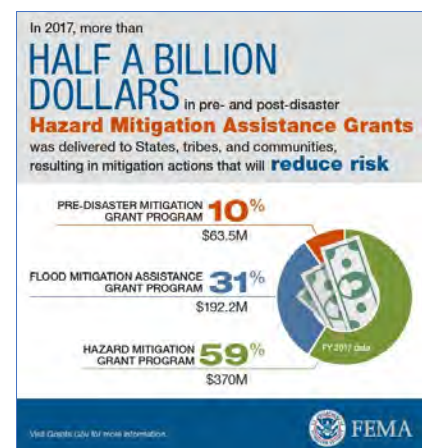
- Disaster Mitigation Act of 2000 (amendments to Stafford Act of 1988)

### Goal of Disaster Mitigation Act

- Promote disaster *preparedness*
- Promote hazard mitigation *actions* to reduce losses

### Mitigation Grant Programs

- Flood Mitigation Assistance (FMA)
- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC)
  - Replaces Pre-Disaster Mitigation (PDM)
  - Shift from pre-disaster spending to research-supported investment

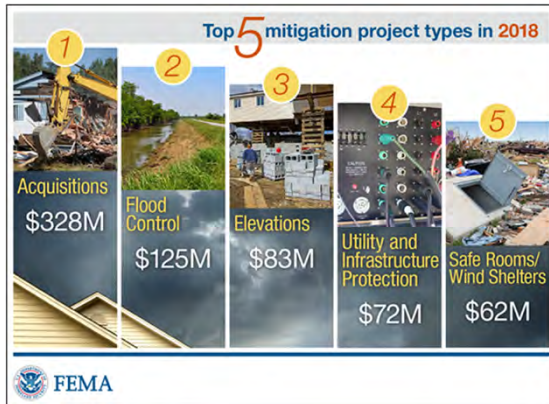


Graphic courtesy of FEMA

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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN



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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### Status of Plans in Connecticut

- Most initial plans developed 2005-2011
- Local plans updated every five years

### Status of NVCOG Plans

- Most initial plans developed 2005-2011 under contracts to COGCNV, VCOG, CCRPA
- The most recent plans were adopted between December 2012 and July 2016
- FEMA approvals between February 2013 and September 2016
- Plans expired starting in February 2018 and running through September 2021



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## PURPOSE AND NEED FOR HAZARD MITIGATION PLAN

### What is a Natural Hazard?

- An extreme natural event that poses a risk to people, infrastructure, and resources.



### What is Hazard Mitigation?

- Actions we take now that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects.



New Elevated Construction



Removal of Structures from Floodplain

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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High Winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes

**Breakout Rooms:**  
Riverine & Dam Flood Risks  
Wind, Snow, and Power Outage  
Geologic Hazards

↑  
CLIMATE CHANGE



- Landslides and Sinkholes (for some towns)

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## HAZARDS TO INCLUDE IN THE PLAN

- **Floods – Riverine**
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Housatonic River, 2011



Pequabuck River, 2011

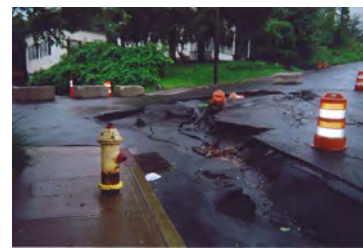


Pomperaug River, 2007

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## HAZARDS TO INCLUDE IN THE PLAN

- **Floods – Flash Floods During Intense Rain**
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Waterbury Flood Damage After June 2006 Storms



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## HAZARDS TO INCLUDE IN THE PLAN

- **Floods – Ice Jams**
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)

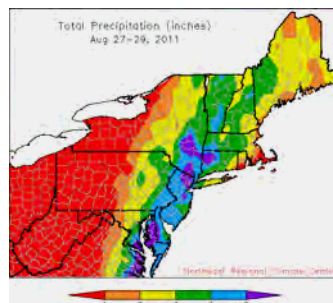


Southbury ice jam damage

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## HAZARDS TO INCLUDE IN THE PLAN

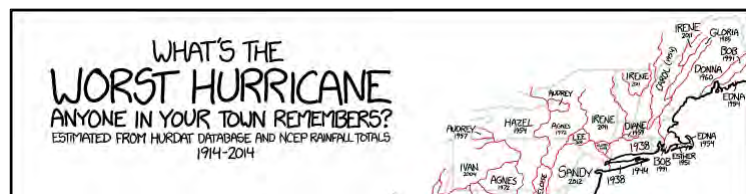
- Floods
- **Hurricanes and Tropical Storms**
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Courtesy of  
Northeast  
Climate Data  
Center



Downed Power Lines from Tropical Storm Isaias in Cheshire, 2020



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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- **Summer Storms**
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- **Tornadoes and High winds**
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Funnel Cloud in Woodbury, 2011  
New Haven Register

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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- **Severe Winter Storms**
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- **Dam Failure**
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Little River  
Photo by David Murphy



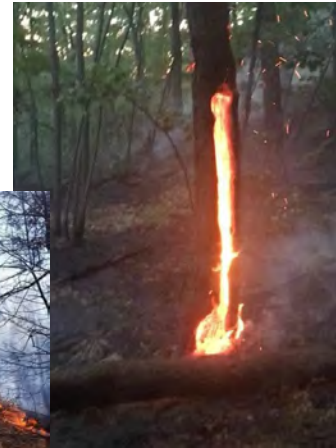
Great Hill Reservoir Dam, Seymour  
New Haven Register

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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- **Wildfire**
- Earthquakes
- Landslides and Sinkholes (for some towns)

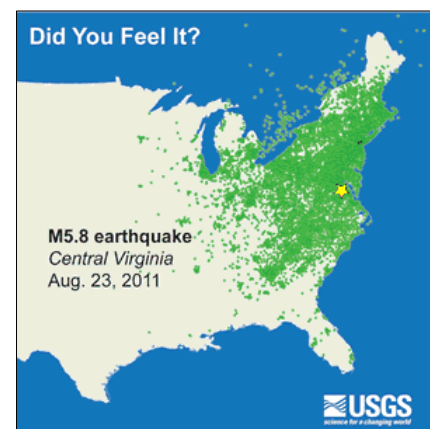


Beacon Falls (left)  
Watertown (right)  
Republican American

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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- **Earthquakes**
- Landslides and Sinkholes (for some towns)



Courtesy of USGS

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## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



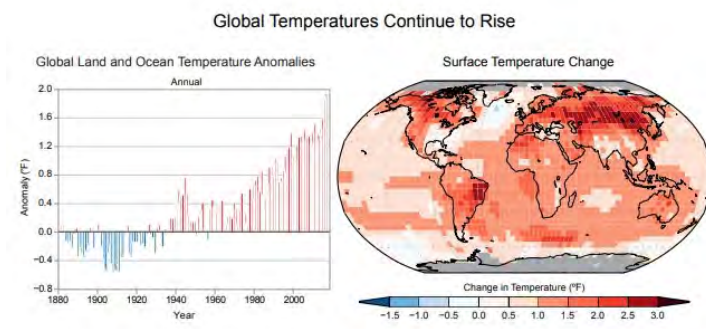
Photos courtesy of New Haven Register

Photo courtesy of Waterbury Rep-Am

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## EFFECTS OF CLIMATE CHANGE

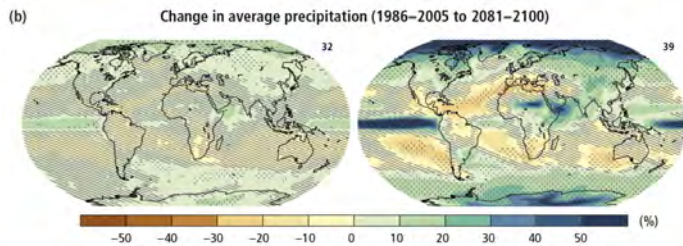
- Global average temperatures are increasing
- Growing seasons may fluctuate
- Extreme heat episodes may increase



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## EFFECTS OF CLIMATE CHANGE



- Precipitation is expected to increase throughout the higher latitude regions
- Winter precipitation may increase, but may not always be snow
- Drought occurrences may increase

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## REPORT FROM MUNICIPAL MEETINGS

### Topics Discussed

- Critical facilities and standby power
- Changes in capabilities
- Changes in risk
- Events of note in the last 4-5 years
- Repetitive loss properties
- Review of prior mitigation actions
- Potential new mitigation actions
- Designation of the local coordinator

### So far...

15 Municipalities

1 Scheduled  
Let's focus on these

Prospect 11/25

3 Meetings still need to be complete

**Middlebury**

**Plymouth**

**Seymour**

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## REPORT FROM MUNICIPAL MEETINGS

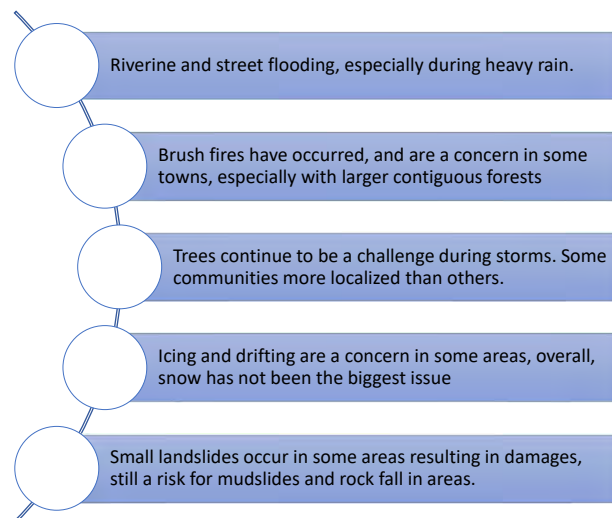
### Changes in Capabilities

- Upgrading backup power at municipal and critical facilities
- Improving drainage, including streetscape projects
- Increasing tree maintenance budget
- Advancing storm response and recovery documentation
- Updating stormwater regulations
- Increasing municipal operation redundancies – IT and facilities
- Education continues to increase for all hazard types

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## REPORT FROM MUNICIPAL MEETINGS

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Ice Jams, Landslides, and Sinkholes (for some towns)



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## VULNERABILITIES, RISKS, AND LOSS ESTIMATES

### Methods of Characterizing Risk

- State Hazard Mitigation Plan
- FEMA maps
- National Climate Data Center, or NCDC (now National Centers for Environmental Information, or NCEI)
- FEMA Public Assistance (PA) reimbursements after disasters
- National Flood Insurance Program (NFIP) claims
- Repetitive Loss property lists
- Meetings with local planning teams!



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## VULNERABILITIES, RISKS, AND LOSS ESTIMATES

### Methods of Quantifying Losses

- NCEI
- FEMA PA reimbursements after disasters
- NFIP claims
- Downscaling from countywide losses in the State Hazard Mitigation Plan
- HAZUS-MH
- Asking local planning teams for typical losses from:
  - Severe Winter Storms
  - Severe Thunderstorm
  - Typical Wildfire



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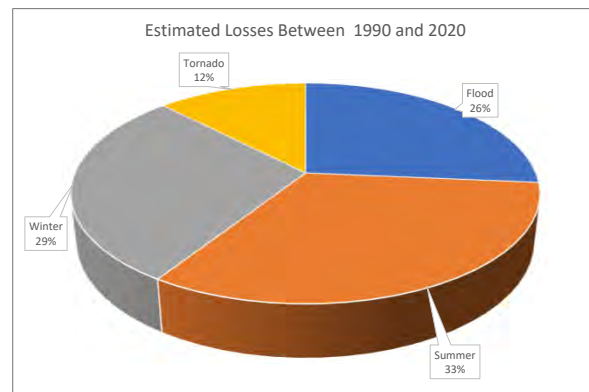
## LOSSES FROM NATURAL HAZARDS (NCEI)

	Events Since 2013	Costs Since 2013	Average Annual Cost (2013-2019)	Injuries Since 2013	Deaths Since 2013	Episodes
<b>Flood</b>	137	\$18,706	\$2,672	0	0	Flood: 34 Flash Flood: 89
<b>Summer Storms &amp; Thunderstorms</b>	490	\$1,135,659	\$162,237	7	4	Drought: 3 Extreme Heat: 46 High Winds: 371 Hail: 44 Lightning: 24
<b>Winter Storm</b>	419	\$366,925	\$52,418	6	3	Blizzard: 15 Drought: 5 Extreme Cold/Wind Chill: 38 Frost/Freeze: 3 Hail: 2 Heavy Snow: 76 High Winds: 84 Ice Storm: 1 Winter Storm: 60 Winter Weather: 135
<b>Tornado</b>	11	\$425,754	\$60,822	0	0	Tornado: 10 Funnel Cloud: 1

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## LOSSES FROM NATURAL HAZARDS (NCEI)

	Total losses 1990 – 2020	Average Annual Cost
Flood	\$135,000	\$61,123
Summer Storms & Thunderstorms	\$9,175,300	\$69,354
Winter Storm	\$2,543,300	\$42,011
Tornado	\$5,315,000	\$13,429



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## LOSSES FROM NATURAL HAZARDS (NCEI)

### In summary – based on 2013 to 2020:

- Flash floods occur about 12 times a year and other flood events about 4 to 5 times a year
- High wind events during summer occur about 53 days a year, with wintertime high wind and storm events occurring about 12 days a year
- Heavy snow episodes occur about 10 to 11 days a year
- Extreme heat is a concern about 6 days a year, and extreme cold about 5 days a year
- A tornado may occur about 1 to 2 times per year

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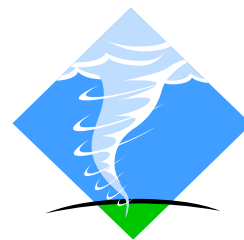
## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

### Declared Natural Disasters in Connecticut (2014-2020)

- 2015 Snow Storm
- 2018 Tornadoes
- 2018 Flooding
- 2020 Tropical Storm Isaias (Emergency, not Disaster)

Also...

- 2020 COVID-19

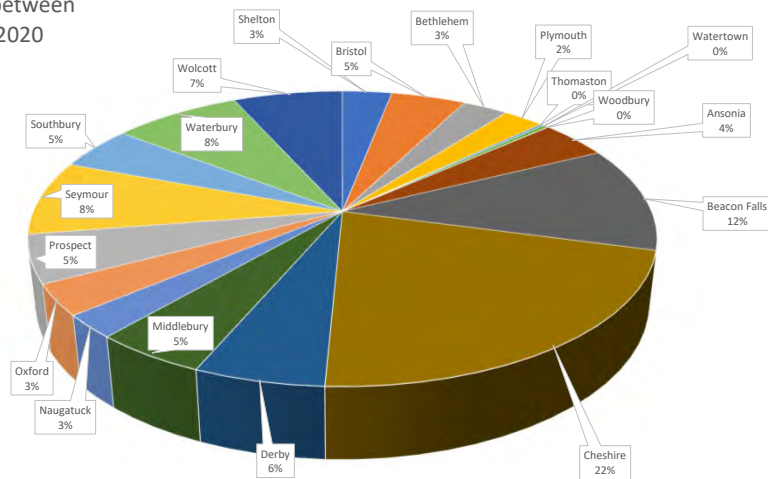


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## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

PA Received between  
2013 and 2020

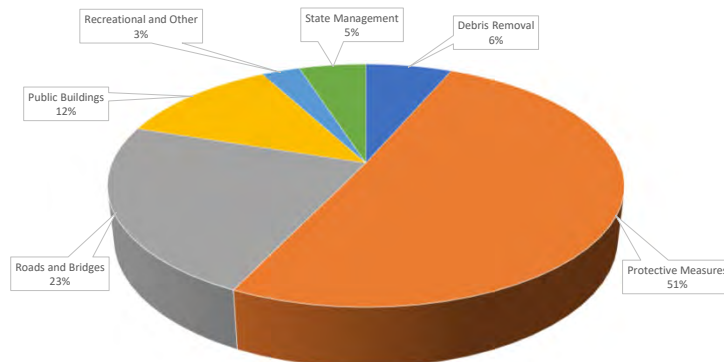


Most PA attributed to winter storms, then tornadoes. Little flood and wind.

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## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

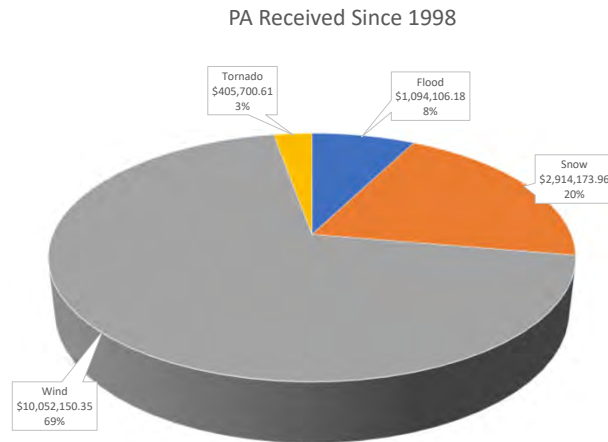
Types of PA Received between 2013 and 2020



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## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS



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## HAZUS LOSS ESTIMATES FROM STATE HMP

- Used for emergency response planning, shelter planning, and utility company preparedness
- Insurance companies may use these models
- Estimated county-wide losses
- Flooding does not include flash flood
- Estimates are typically synonymous with actual losses

### 100-year flood loss estimations

County	Actual Replacement Value	Building Loss	Contents Loss	Business Interruption	Total Loss	Regional Losses
Fairfield	\$22,118,675	\$1,727,377	\$2,458,298	\$110,802	\$4,274,167	<b>\$299,192</b>
Hartford	\$202,087,968	\$635,753	\$781,849	\$39,849	\$1,447,299	<b>\$57,892</b>
Litchfield	\$46,324,195	\$576,982	\$792,744	\$47,610	\$1,408,816	<b>\$450,821</b>
New Haven	\$195,569,109	\$1,044,654	\$1,369,465	\$60,380	\$2,461,474	<b>\$836,901</b>

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## HAZUS LOSS ESTIMATES FROM STATE HMP

Estimated total losses for hurricane return periods

County	10-yr	20-yr	50-yr	100-yr	200-yr	500-yr	1,000-yr	Regional Losses for 100-yr
Fairfield	\$0	\$5,381	\$0	\$494,016	\$795,624	\$3,511,912	\$1,998,138	\$19,760
Hartford	\$0	\$14,055	\$11,685	\$558,773	\$950,393	\$1,497,097	\$7,287,319	\$39,114
Litchfield	\$0	\$862	\$0	\$70,962	\$56,906	\$168,713	\$678,390	\$22,708
New Haven	\$0	\$9,844	\$12,063	\$583,958	\$1,269,932	\$3,983,949	\$3,312,166	\$198,546

Estimated building damages per storm scenario statewide

Storm Scenario	None	Minor	Moderate	Severe	Destruction
1938 Unnamed	961,438	201,970	48,961	4,502	2,091
1944 Unnamed	1,218,434	507	27	1	0
Carol	1,217,357	1,503	104	4	1
Donna	1,211,128	7,142	668	26	5
Gloria	1,002,924	17,521	800	38	5

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NFIP  
POLICIES

Municipality	Policies in Force	Total Coverage (\$)
Ansonia	18	4,865,900
Beacon Falls	19	5,727,100
Bethlehem	11	2,451,500
Bristol	194	41,452,200
Cheshire	88	26,492,300
Derby	26	6,694,500
Middlebury	36	8,884,700
Naugatuck	93	15,037,300
Oxford	45	11,298,900
Plymouth	26	6,952,700
Prospect	7	2,350,000
Seymour	58	12,340,200
Shelton	244	57,801,200
Southbury	64	15,484,100
Thomaston	8	3,269,900
Waterbury	207	34,647,800
Watertown	83	22,198,500
Wolcott	26	5,702,800
Woodbury	45	10,714,600

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## NFIP POLICIES AND LOSSES PAID



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## WHAT IS AT RISK?

- Repetitive Loss (RL) properties and properties near them
- Historic and Cultural Resources
- Critical Facilities
- *As well as the built environment and people at large*

Overall – infrastructure, residential and commercial properties, utilities

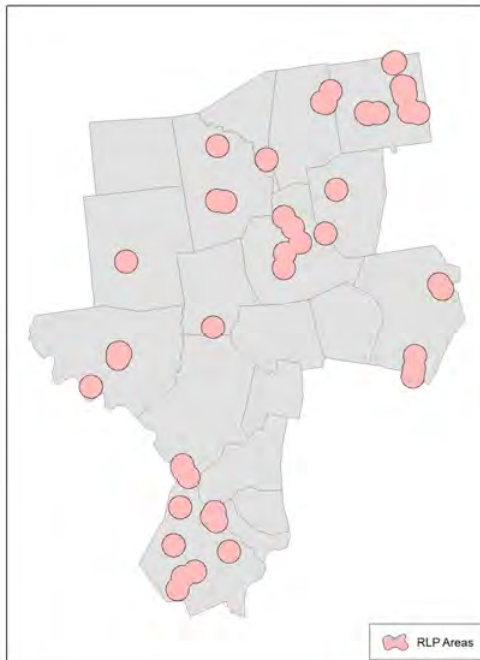


Source: FEMA, Local Hazard Mitigation Handbook

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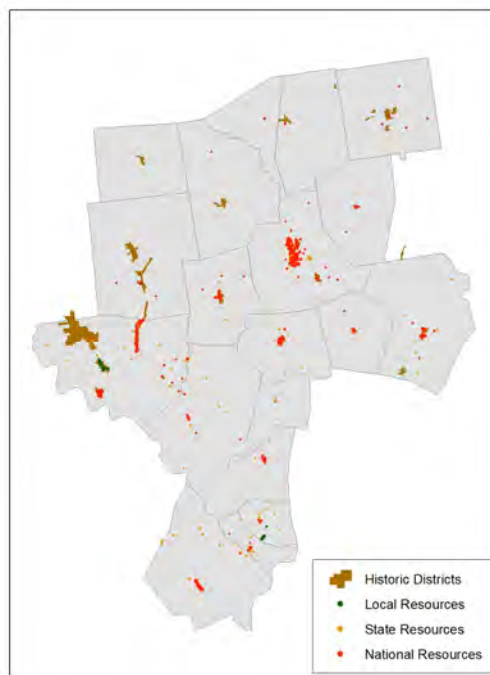


## REPETITIVE LOSS PROPERTIES



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## HISTORIC RESOURCES



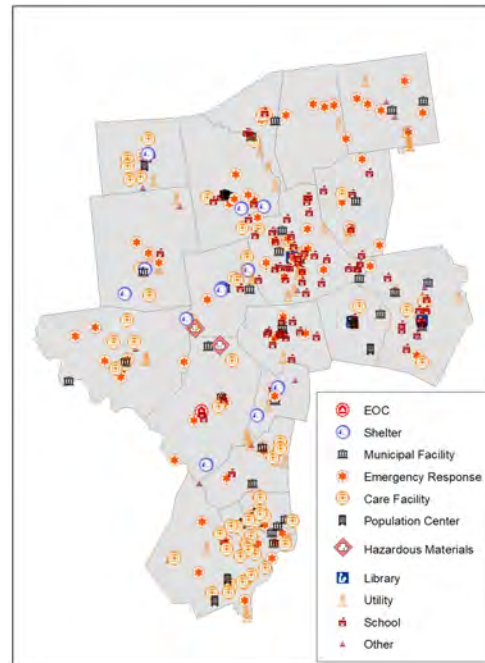
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## CRITICAL FACILITIES

Critical facility updates and changes are made based on feedback during municipal meetings. These include

- EOC
- Police
- Fire
- Shelters
- Municipal buildings
- Care facilities
- Hospitals
- Schools
- Other facilities that are critical to emergency response



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## Naugatuck Valley Council of Government (NVCOG)

### Regional Natural Hazard Mitigation Plan Update - Mapping Projects

November 18, 2020 (9:00-10:30am, municipal)

Diane Ifkovic, State NFIP Coordinator



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- NVCOG is comprised of 19 communities
- Four Connecticut Counties – New Haven, Litchfield, Fairfield, Hartford
- Four Major Watersheds – Quinnipiac, Saugatuck, Farmington, Housatonic Rivers



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## Evolution of FEMA Flood Maps

- Individual Community Maps (joined NFIP 1978 to 1990)
- Countywide Maps (2008-2010)
  - New Haven County – December 17, 2010
  - Hartford County (Bristol) – September 26, 2008
  - Fairfield County (Shelton) – June 18, 2010
  - Litchfield County – No countywide update  
Bethlehem, Plymouth, Thomaston, Watertown, Woodbury
- Levee Updates (July & October 2013) Ansonia, Derby
- Watershed (2015 to present)
  - Quinnipiac River Watershed – May 16, 2017  
Ansonia, Bristol, Cheshire, Derby



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## Flood Map Updates in the NVCOG Region

1. Saugatuck River Watershed
2. Farmington River Watershed
3. Housatonic River Watershed



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## Saugatuck River Watershed (20 communities)

- NVCOG 1 Community Included:  
**Shelton**
- FEMA Mapping Contractor: U.S. Geological Survey (USGS)



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## Saugatuck River Watershed

- Discovery meetings were held June 7, 2016
- Field surveying was completed in summer 2018
- Enhanced hydraulics completed
- Floodplain mapping nearing completion
- Work maps will be issued soon to communities
- **Work Map meetings (webinars) January/February 2021**



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## Farmington River Watershed (24 communities)

- NVCOG 3 Communities Included:  
Bristol, Plymouth, Wolcott
- FEMA Mapping Contractor: Compass



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## Farmington River Watershed

- Discovery meetings were held September 25, 2018
- Field surveying was completed in summer 2019
- Discovery Report was issued end of May 2020
- Work Map meetings (webinars) held July 21 & 22, 2020
- One-on-one community meetings held Aug. 3 & 11, 2020
- Comment period for work maps ended August 22, 2020
- Preliminary flood maps and study early summer 2021
- Letter of Final Determination (LFD) December 2022
- Towns update local floodplain regs/ordinance early 2023
- Final effective maps and studies projected summer 2023



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## Housatonic River Watershed (54 communities)

- All NVCOG 19 Communities Included:  
Ansonia, Beacon Falls, Bethlehem, Bristol,  
Cheshire, Derby, Middlebury, Naugatuck,  
Oxford, Plymouth, Prospect, Seymour,  
Shelton, Southbury, Thomaston, Waterbury,  
Watertown, Wolcott, Woodbury
- FEMA Mapping Contractor:  
U.S. Geological Survey (USGS)



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## Housatonic River Watershed

- Discovery meetings held May 2017
- Field surveying has begun
- Selection of priority stream reaches is complete and includes Torrington levee project
- There will be a 30-day comment period for stakeholders on the model used for this map project but this had been delayed due to the pandemic



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What should you be aware of with these projects?

1. Pay attention to correspondence from FEMA/mapping contractors and important dates/milestones.
2. Provide feedback when asked, this is your chance to make changes to the map and get FEMA to pay for it.
3. When final maps go effective, town is required to update local floodplain zoning regulations or ordinance or be suspended from the NFIP (hinders home sales)



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## Ice Jams and Climate Change

- FEMA flood maps do not contain flood risk information on ice jam flooding or climate change
- Ice jams were a problem in January 2018 on Housatonic River, especially in Kent
- Inland areas seeing effects of climate change with “rain bombs”, extreme precipitation events
- This type of changing rain pattern can have more adverse effects in hilly areas due to increased flash flooding or new areas experiencing flooding (urban/rural)
- CTDOT using Northeast Regional Climate Center (Cornell) extreme precipitation analyses and data



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Questions?

Diane Ifkovic

Email: [diane.ifkovic@ct.gov](mailto:diane.ifkovic@ct.gov)


(860) 424-3537




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## BREAKOUT ROOMS



Riverine and  
Dam Flood  
Risks



Wind, Snow,  
and Power  
Outages



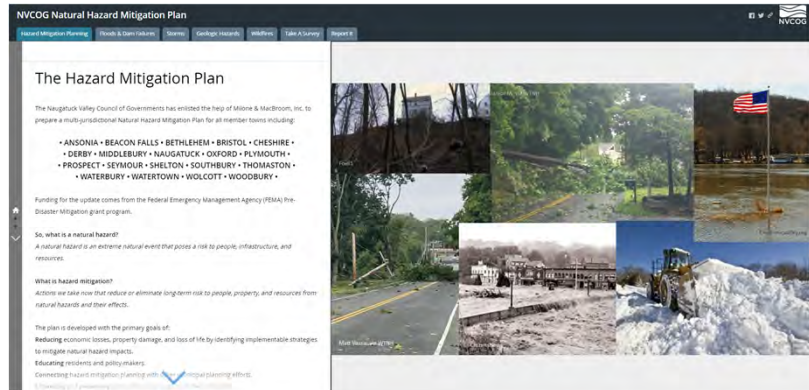
Geologic  
Hazards  
(Landslides,  
Earthquakes,  
and  
Sinkholes)

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## NEXT STEPS

- Complete any outstanding municipal planning meeting or coordination
- Review meeting notes as they have been distributed and provide edits to notes, previous actions or critical facilities list
- Outreach and public involvement
  - **Online Survey is OPEN**
  - **Conduct public meetings**
- Workshop to discuss mitigation strategies and actions






















## Attendees:

<b>NS</b>	Noah Slovin (Co-host, me)	 
<b>VB</b>	Victoria Brudz (Host)	
<b>DM</b>	David Murphy	
<b>AB</b>	Aaron Budris (NVCOG)	
	Brian Mezzapelle	
<b>B</b>	Bryan Tamburrino	
<b>D</b>	Diane	
<b>G</b>	Garrigus	
<b>GS</b>	Gerry Smith	
<b>GC</b>	Glenn Clark (Town Of Thomaston)	
<b>H</b>	HarleyGraime	
<b>JM</b>	Janet Morgan	
<b>JR</b>	Jeremy Rodorigo Beacon Falls EMD	
<b>JB</b>	Joshua Bernegger	
<b>J</b>	jstewart	
<b>KM</b>	Kerry McAndrew	
<b>LA</b>	Leonard Assard	
<b>M</b>	mark	
<b>ML</b>	Mark Lombardo	
<b>MM</b>	mark massoud	
<b>M</b>	MEdwards	
<b>M</b>	mhealy	



-  Michael Devine
-  Michael Krenesky
-  Mike Maglione
-  Natasha Nau
-  Planning Staff
-  PublicWorks
-  RaymondRogozinski
-  ssimone
-  Stephen Schnell
-  Ted Estwan
-  Thomas Eighmie
-  Tom
-  12035748251
-  12037207006
-  Planning Staff
-  Rob Langenauer
-  Wayne Zirolli

Planning Staff = Waterbury Planning (Bob Nerney)



## Room Choices

From ssimone to Everyone: 09:05 AM

Cheshire sinkholes

From Wayne Zirolli to Everyone: 09:05 AM

I would like to join the riverine and dam flood risks.

From Leonard Assard to Everyone: 09:05 AM

Wind & Snow

From Glenn Clark (Town Of Thomaston) to Everyone: 09:05 AM

wind snow and power outages

From Aaron Budris (NVCOG) to Everyone: 09:06 AM

Flooding

From Planning Staff to Everyone: 09:06 AM

Waterbury Planning (Bob Nerney) -Flooding

From mark to Everyone: 09:07 AM

flooding

From Mike Maglione to Everyone: 09:07 AM

Flooding

From Mark Lombardo to Everyone: 09:08 AM

wind/snow

From mark massoud to Everyone: 09:08 AM

Flooding

From Stephen Schnell to Everyone: 09:08 AM

Stephen Schnell - wind, snow & power

From Kerry McAndrew to Everyone: 09:08 AM

wind/snow

From Rob Langenauer to Everyone: 09:08 AM

riverine and dam

From Brian Mezzapelle to Everyone: 09:09 AM

flooding



From Joshua Bernegger to Everyone: 09:09 AM

wind/snow

From Gerry Smith to Everyone: 09:11 AM

wind snow

From Bryan Tamburrino to Everyone: 09:12 AM

wind, snow, power



## Wind, Snow, and Power Breakout Room

- Noah asked people to raise hands if they were primarily concerned about wind or about snow
  - Most people gave thumbs up about wind. Only 2 or 3 thumbed-up snow
- Noah asked about whether power outages, blocked roads, or debris were the primary concerns:
  - Power outages are the main concern, road blockages not as much.
- Noah asked about recent wind events:
  - Leonard Assard, Bethlehem
    - High wind the last two nights has cause power outages. A fairly big line went down, and roads were blocked for a couple of days before Eversource arrived to Make Safe the scene. Also, a problem in Watertown created power outages for Bethlehem residents this morning.
    - Cable and phone companies don't seem to respond very quickly to outages.
    - Eversource owns some utility poles, phone company owns others. This creates a situation where power restoration and pole switching is not very efficient because of communication and coordination challenges. This is likely an issue for PURA to address.
    - Town DPW can't take down trees that are near wires, so they rely on the utility companies to manage trees. The utility companies don't necessarily trim or take down trees near wires ahead of time, and then trees fall and take out power.
    - Waiting for Eversource to "make safe" a downed line site is a challenge.
  - Janet Morgan, Woodbury
    - Woodbury has also had power outages in the last couple days. 1,500 people without power.
    - Power loss has become a recurring problem in Woodbury.
  - Gerry Smith, Beacon Falls
    - Beacon Falls has lost power in the last couple of storms.
- Noah asked about impacts of power outages on at-risk populations, individuals with medical power needs (such as oxygen)
  - Glenn Clark, Thomaston
    - There are senior centers in Thomaston without generators, and medically assisted residents who rely on power for their equipment. The equipment often only has enough battery to last for 24 hours without power, and this becomes an issue.
- Noah asked about the ability of Towns to manage tree limbs and debris
  - Jack Casner, Cheshire
    - Eversource has done quite a bit of tree cutting on main lines, and we've installed backup power on some main buildings. This has reduced the impacts of power outages.
  - Stephen Schnell, Southbury
    - Southbury Public Works is out trimming trees every day. A challenges is that they can only get so close to the power lines anyways.



- John, Southbury Public Works
  - It's hard to get Eversource to go out with Public Works crews to "make safe" and allow the crews to start cleaning up. Waiting for power company is the biggest challenge. Once they come, the Town can handle clearing without a problem.
    - Other attendees indicated agreement
- Gerry Smith, Beacon Falls
  - In areas where there are no power lines, the Town can handle debris clearing. When they have to wait for Eversource it slows everything down. The Town is able to assign priority levels for roads (which should affect how quickly Eversource responds) but it's still a waiting game.
- Jack Casner, Cheshire
  - Waiting for Eversource to respond is a problem across the region.
- David Lenart
  - The problem with Eversource is a lack of communication (which may stem from a lack of trust?). During recent storms and gas line issues, they have seen Eversource running on their own schedule without telling towns what's going on. Residents are asking the town staff about what's going on, but the towns can't answer because Eversource won't tell them.
- Janet Morgan
  - Agrees that lack of communication is an issue with Eversource.

## Flood Breakout Room

- Mark Garrigus from Wolcott noted that Diane's presentation about the FEMA map updates was helpful. He was not aware of the updates and plans to reach out to her.
- Bob Nerny noted that Diane has always been an excellent resource based on his experience in other municipalities.
- David reminded attendees that FEMA's consultant may be addressing unnumbered A zones, and everyone should contact Diane and FEMA if they have comments about this.
- David asked about attendees' experience working with people who live in areas of flood risk. Are people generally receptive to elevating or acquisitions? Scott Pelletier explained that people living along the Housatonic River do not want to move. This is the case in other communities as well.
- David asked about critical facilities. Scott Pelletier noted that the Center Fire Station in Oxford has some flood risk and the Town had applied for a mitigation grant to replace/upsized a culvert, but the project was ultimately not funded. David noted that this project should be mentioned in the plan.
- Bob Nerny addressed all attendees in the breakout room and asked what other towns have been doing (regulations or ordinances) to require stormwater retention/detention and control runoff from development projects. Mark Garrigus explained that Wolcott requires retention of 100% of certain storm events.



## Return to Main Room

- David explained that public participation may be shifted from public information meetings to local planning, planning & zoning, and inland wetland commission meetings
- Mark Garrigus from Wolcott explained that the town is going back to doing Zoom meetings. Town council meetings are televised in Wolcott, and this might be a good option.



# Update of Hazard Mitigation Plan for the Naugatuck Valley Region



Workshop: Mitigation Strategies and Actions  
February 3, 2021



Victoria Brudz, CFM  
David Murphy, PE, CFM  
Noah Slovin, CFM



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## Agenda



- Risk Assessment Update
- Public Comments Received to Date
- Hazard Mitigation Goals, Objectives, and Strategies
- Guest Presentation
  - *Sustainable CT*
- Regional and Statewide Initiatives
- Wrap Up and Next Steps

2





## Workshop Logistics

- Breakout Sessions at 9:50 AM:  
*Groups will be Hazard Mitigation Actions for:*
  1. *Riverine flood risks, repetitive loss properties, and dams*
  2. *Actions for other hazards such as wind events and winter storms*
  3. *Resilient Connecticut program*
- Please comment in the chat back box which group you would like to be placed in.

3

# Risk Assessment Update

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## Risk Assessment Update

- Hazards were profiled and losses were described in our workshop of November 18, 2020
- Public meeting on November 18, 2020 and survey responses did not result in changes to loss estimates or the risk assessment in general
- HAZUS-estimated losses for floods, hurricanes, and earthquakes have been completed

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## Public Comments

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## Public Input Opportunities

- **Public Survey:** 11 Responses
- **Public Outreach:** Planning Commission and Planning & Zoning Commission Meetings
- **Story Map:** Approximately 40 views

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## Priority Actions



RESILIENT POWER GRID



UPGRADE INFRASTRUCTURE



IDENTIFY RISK AREAS



ASSIST VULNERABLE RESIDENTS



COORDINATE STATE &amp; LOCAL RESPONSE



EDUCATION &amp; OUTREACH

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# Hazard Mitigation Goals, Objectives, and Strategies

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## What are We Talking About?



### Goal

Broad, intangible, abstract: what do you want to achieve to reduce losses from hazards?



### Objective

Specific, tangible, measurable targets that reduce losses from hazards



### Strategy/Action

Steps toward achieving the objective to reduce losses from hazards; a Strategy could be a set of similar actions that help reduce losses from hazards

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- Trim trees near power lines
- Install backup power
- Build microgrids
- Coordinate with utility provider









## NEW ACTIONS IDENTIFIED TO DATE



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## Guest Presentation: Sustainable CT

A program that promotes sustainability and may provide credit for some hazard mitigation actions

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# Regional and State Mitigation Initiatives

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## REGIONAL AND STATE INITIATIVES

- Historic & Cultural Resources
- Repetitive Loss Properties
- State Building Code & Flood Regulations
- Small Businesses Chemical Management
- “Sustainable CT”
- Resilient Connecticut
- Low Impact Development (LID) Handbook for Rural Communities

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## STATE INITIATIVE

### Historic & Cultural Resources



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## REGIONAL AND STATE INITIATIVES

### Historic & Cultural Resources

#### Historic & Cultural Resources Action 1

Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to support the preparation of resiliency plans across the state.

All towns

#### Historic & Cultural Resources Action 2

Coordinate with CT SHPO to conduct outreach to owners of historic properties to educate them on methods of retrofitting historic properties to be more hazard-resilient while maintaining historic character.


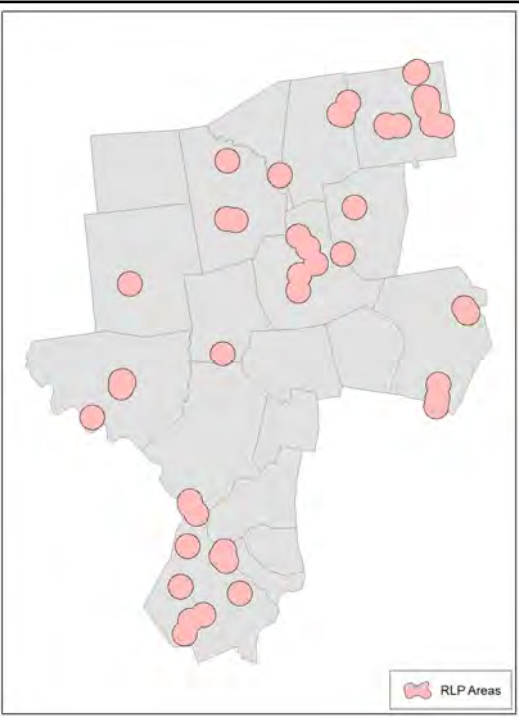
Towns with known, listed historic resources in flood zones

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## STATE INITIATIVE

### Repetitive Loss Properties

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## REGIONAL AND STATE INITIATIVES

### Repetitive Loss Properties

**Repetitive Loss Properties Action 1**

Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.

**Repetitive Loss Properties Action 2**

Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.

**Any Municipality with at least 1 RL property**

**Towns with 2 or more RL properties**

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## STATE INITIATIVE

### State Building Code & Flood Regulations

**CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION**

**MODEL FLOODPLAIN MANAGEMENT REGULATIONS**  
**NATIONAL FLOOD INSURANCE PROGRAM (NFIP)**

**Inland/Riverine Community (AE and A Zones only)**  
**Level "D" Community**

**October 2015**

Effective October 1, 2015, the Connecticut Office of the State Building Inspector amended the current state building code to adopt the 2015 International Residential Code. Please see the CSBI website for more information on this change, which can be found at <https://portal.ct.gov/DAS/Office-of-State-Building-Inspector/Building-and-Fire-Code/2015-IRC> and the 2015 IRC, Chapter 3, Section R322, Flood-Resistant Construction. <https://portal.ct.gov/DAS/Office-of-State-Building-Inspector/Building-and-Fire-Code/2015-IRC>


The 2015 IRC has made significant changes to the elevation and construction requirements for new construction and substantially improved structures in both coastal and inland floodplains. Section R322.2 contains the elevation requirements for A and AE Zones. Section R322.3 contains the elevation requirements for VE Zones and Coastal AE Zones. A summary of these new requirements:

**AE and A Zone** – Lowest floor elevated to Base Flood Elevation (BFE) plus 1 foot.

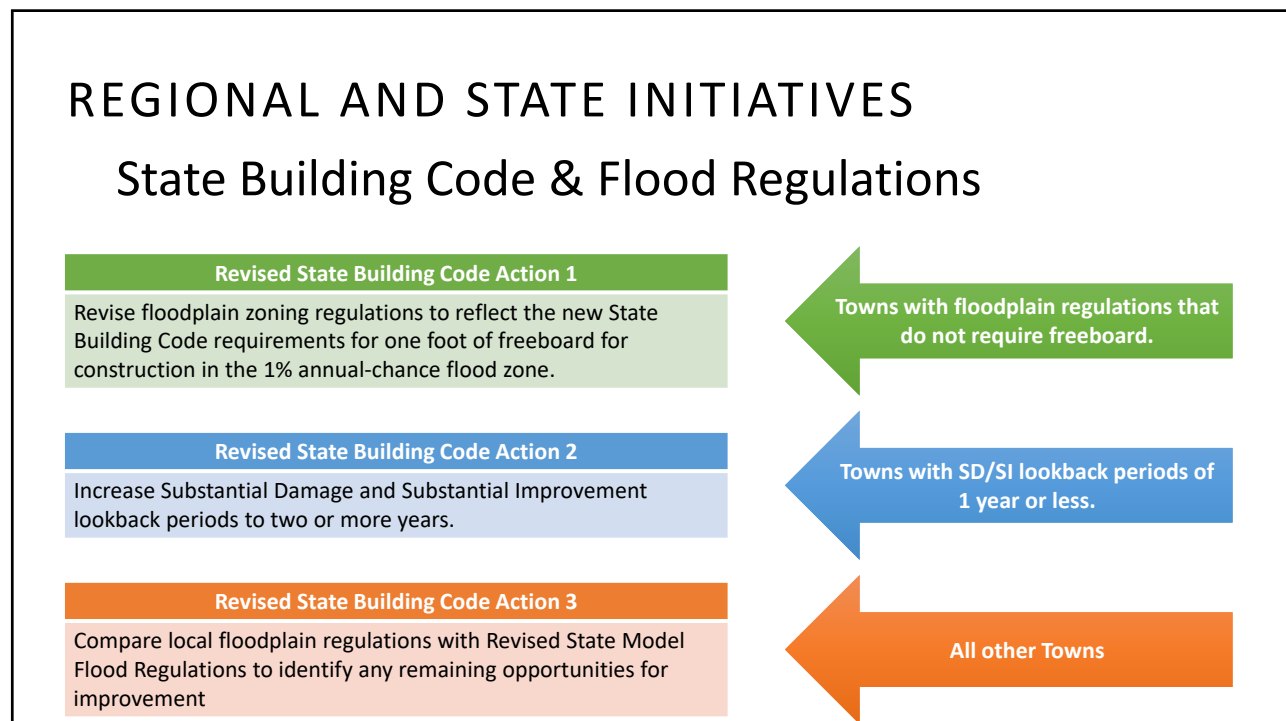
**AO and AH Zones** – Lowest floor elevated to Highest Adjacent Grade (HAG) as the depth number specified on the flood insurance rate map plus 1 foot or not less than 3 feet if no depth number is specified.

**VE Zone and Coastal AE Zone** – Bottom of the lowest horizontal member supporting the lowest floor elevated to the BFE plus one foot, with structure built on pier, post or pile foundation utilizing breakaway walls. Breakaway walls in Coastal AE zones must also contain hydraulic flood vents.

Adoption of the 2015 IRC will make significant changes to the elevation requirement for construction and substantially improved structures in coastal floodplains that may be more stringent than the standards currently contained in your local floodplain zoning regulations or ordinance. There are also other changes. **Bold red text** in this model highlights the changes that need to be made to floodplain zoning regulations or ordinances to match the new state building code standards.



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## STATE INITIATIVE

### Small Business Chemical Management



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## REGIONAL AND STATE INITIATIVES

### Small Business Chemical Management

#### Small Business Chemical Management Action 1

Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.

#### Small Business Chemical Management Action 2

Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.

#### Small Business Chemical Management Action 3

Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.

26



**STATE INITIATIVE**

---

Sustainable CT

27

## REGIONAL AND STATE INITIATIVES

### Sustainable CT

**Sustainable CT Action 1**

Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.

**Sustainable CT Action 2**

Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives:

1. Disseminate a toolkit for pre-disaster business preparedness.
2. Revise regulations to promote Low Impact Development.
3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.

**Towns not currently in the program**

**Registered and Certified Towns**

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### *Resilient Connecticut Vision*

- Adapt **structures and critical infrastructure in flood zones** to withstand flooding
- Protect communities through healthy buffering ecosystems where critical services, infrastructure, and transportation hubs are located on **safer high ground**
- Develop **energy, economic, and social resilience**
- Increase **transit connectivity**
- Create corridors resilient to climate change: **Resilient Corridors**
- Focus community development around transit: **Resilient Transit Oriented Development (TOD)**
- Create opportunities for affordable housing, preserving and enhancing the quality of life for existing **affordable communities**

UConn



30



## Resilient Connecticut Tasks



- Assess regional infrastructure challenges and opportunities
- Identify resilience corridors & resilient TOD opportunities
- Identify projects that towns can't address alone
- Develop implementable plans and pilot projects with broad co-benefits

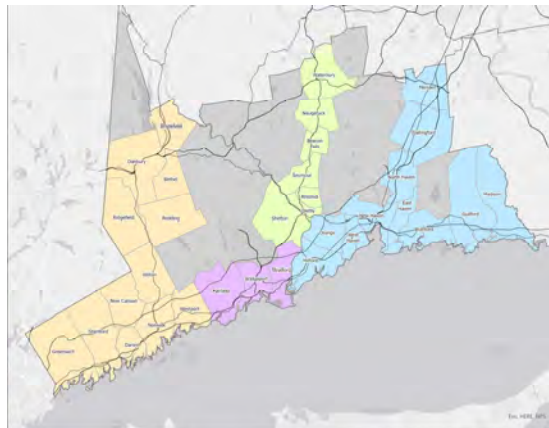
UConn



31

## Resilient Connecticut Target Communities

- Communities with major highways and passenger rail lines
- Communities with transit-oriented development (TOD) potential
- Therefore able to accommodate the resilient corridor concept linking "zones of shared risk" with resilient hubs



32





## STATE INITIATIVE

---

### Low Impact Development

Effective Date: January 1, 2018

# MORRIS

## Low Impact Sustainable Development and Stormwater Management Design Manual



**LOW IMPACT + SUSTAINABLE**  
**LID**  
**DESIGN MANUAL**  
**TRINKAUS ENGINEERING**

Trinkaus Engineering, LLC  
 114 Hunters Ridge Road  
 Southbury, Connecticut 06488  
 (203) 264-4558 (office/fax)  
 Email: [info@trinkausedesign.com](mailto:info@trinkausedesign.com)  
[www.trinkausedesign.com](http://www.trinkausedesign.com)


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## REGIONAL AND STATE INITIATIVES

Building Municipal Resilience and Climate Adaptation through Low Impact Development

LID Action 1


Refer to the manual in your guidance or regulations



Towns With LID Guidance or Requirements

LID Action 2

Evaluate whether LID should be incorporated into practices



Towns Without LID Guidance or Requirements

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# Breakout Rooms

- Riverine flood risks, repetitive loss properties, and dams
- Actions for other hazards such as wind events and winter storms
- *Resilient Connecticut* program

35

# Wrap Up

36





## Next Steps

- Contact Noah and Victoria if you have any comments about mitigation actions
  - *What do you like? This will work for us...*
  - *What do you dislike? This won't work for us...*
- Individual annexes will be provided for review by the end of the winter
- Multi-jurisdiction document can be reviewed before or after your annex
- Post a link for public comments after the reviews (we will provide the link)



## **Attendance**

- Noah
- Victoria
- David
- Aaron Budris
- Jessica LeClaire, Sustainable CT
- Andrew Baklik
- Bob Nerney
- B Perkinson
- Brian Mezzapelle
- Bryan Tamburrinno - Ansonia
- Denis Cuevas
- Derby Public Library
- Garrigus
- Harley Graime
- iPad - George Noewatne - Cheshire
- Jack Casner
- James Stewart
- Jeremy Rodorigo
- Kerry M
- Leonard Assard
- Lori Rotella
- Mark Cunningham
- Mark Neuendorf
- Maryellen Edwards
- Michael Devine
- Mike Maglione
- Nancy Levesque – City Engineer, Bristol
- Natasha Nau
- Pbunevich
- Rob Langenauer
- Southbury Fire Marshal
- Ssefcik
- Ssimone
- Stephen Schnell
- Thomas's iPhone
- Town of Woodbury
- 2039090612







## River

- Harley Graime – we have a river that runs right through town. – both sides of town. One of the reasons. Other brooks. Subject to a couple dams
  - → Microphone issues. Tried to fix and then disappeared. Send an email.
- Mark Garrigus – Wolcott inland wetlands – people want to develop along mad river, in floodplains. A few areas where housing was built 50-60 ya, no flood mapping done. Trying to get that redone through diane with USGS surveys coming up. Want to understand whether they're in or out. Plus some general commercial areas where floodplain is getting filled in, it seems.
- Stephen Schnell – EMD Southbury – have had historical losses from Pomperaug. Trying to wrap head around all of that. Get some plans in place
- Rob Langenauer – Waterbury – River flooding & water mains that are strapped to bridges, scouring. Riverbeds misaligned to bridges, will eventually affect water main. Dams in Thomaston and Warren upstream. Local dams that are not used, but not decommissioned. We want to remove those.
- Denis. Jacobs. We have a main carrier that runs along and in the river itself – when the river rises is problem. Combined system – in December we had to use stormwater bypass. Facility is designed for 70 MGD, but we get higher than that, and can't handle.
- Mark Nuendorf. Derby EMD. Housatonic and Naugatuck converge. Historically quite a bit of flooding. Commercial buisnesses in historic floodplains that are now protected by USACE structures. Concerned about future failure. Right now investigating a couple neighborhoods.

Commented [NS1]: Follow up

## Actions:

- Rob: maintenance on rivers and streams. Who is responsible for removing debris from river? Couches. Trees. How often is it done? Who does resident call if they notice something that comes down. Waterbury DPW resources are limited – has to be a plan in place. We have a plan for snow clearing, for eg – but not for river debris.
- Mark: undefined flood elevations for some areas. Areas that have been imfilled. Conduct studies to see what impacts have been. Bridge replacements.
- Denis: identifying critical facilities in floodplains. Knowing elevations. Survey done a couple years ago by UConn that tried to compile that information, making that available would be helpful. Eg in Waterbury pump station in mad river. When 84 was redone we were able to move that pump station. New pump station can handle more

## Natural approaches

- Garrigus – any development outside floodzone, just want to direct flow downstream during storm. Everyone wants to go the easy way.
- Rob – swales – great when they're installed, but who is going to maintain them? Ends up falling to town or utility who doesn't have resources. Only happens after the fact. Maintenance issues.



- Garrigus – going through that now. When schools were added onto, they were going to have detention basins, but they are located in a wooded area that is not maintained, and now we have major trees growing out of embankment. Now developing plan to go back in and deal with it.
- Rob – issue at Bradley (I work for MDC?) – 2 detention ponds, not maintained, washed out, and then MDC had to go repair washed out trunk sewer.
- Garrigus – sewer water does yearly walk now to inspect.
- Rob – MDC study estimated cost to build roads to access all right of ways – \$70 million
  - Firm believer – always account for WHO will maintain it, and what that will cost. How often? Who will take over when current person leaves?
- Garrigus – yearly inspection should be more like quarterly inspection of generators for critical facilities
-



### **Breakout room #3: Resilient Connecticut**

Victoria Vetre: Facilitator

Michael Krenesky – Beacon Falls

Nicole Cignoli – Derby

Abrew Baklik – Derby

Lori Rotella – Naugatuck

Natasha Nau – Beacon Falls

Thomas

#### **Derby**

- Looking to develop TOD Main Street district.
- Water and wind are concerns for the town.
- East side of Town there are retention ponds that are continuously a problem, some are privately owned and not properly maintained.
- Ansonia/Derby reservoir requires a lot of upkeep and maintenance. The town has been looking at how to rebuild earthen dam but requires extensive funding.
- Derby is a “host” community for radio infrastructure. Surrounding towns antennae are located on a very old Derby build. The town EMD maintains those personally, but one question is, what happens during a high windstorm? It is a concern of how the other towns might be impacted and because there is only one person to maintain.
- McConney Grove, downstream of Stevens dam, continuously floods out.
- Town has pretty good drainage systems.
- Nicole from Derby noted the importance of balancing open space with development. Derby is working to have market driven housing, but important to keep open space intermixed with development.

#### **Beacon Falls**

- All of Main Street is in a flood zone – one question asked was, where do we start? There is no mitigation plan for that particular area.
  - o It was noted to get this information into the Beacon Falls HMP, and to include as many details as possible.
  - o This was also a good example of a Zone of Shared Risk, so ensuring that these types of areas are identified in the Resilient Connecticut.
- The town is really looking to develop this area more. They recently went for a Connectivity Grant but did not receive funding.
- Many of the old structures along Main Street are old structures, but not inventoried in SHPO files.
- The town is also working with the HVA on culverts and stream crossings.

#### **Naugatuck**

- Looking to develop a large parcel along the river with TOD focus.
- Lori was asked if there were any flooding issues at this parcel – there were not.



All participants noted that generators are also a concern.

- Beacon Falls has no generator at their Public Works Facility, 40 – 50k generator for the facility, and the WWTP is very old and needs to be upgraded, and the town is investing around 1 million into this upgrade.
- Derby is looking for backup power for fire departments and warming centers.



## Wind and Other Hazards

### Breakout Room Notes

*Note: the phone number in the breakout room is the Beacon Falls First Selectman*

- Mike Maglione from Shelton noted that UI has conducted significant tree trimming which has directly contributed to less extensive damage in Shelton as compared to Eversource towns.
- David asked about microgrids for redundancy. The group did not appear to have interest.
- Bob Nerny from Waterbury explained that the private sector has an important role to play in redundancies. For example, gasoline service stations should have generators. David concurred and noted that this is why some hazard mitigation plans will list gasoline service stations, food, and retail establishments as critical facilities.
- Bob explained that utility liaisons need to be continuously in touch with municipalities, and that everyone needs to know who to contact before, during, and after wind and snow events.
- David asked the group to comment on other hazards. Bob noted that Waterbury has challenges with landslides, and the City needs to work with retaining wall owners to ensure that they are kept in good condition.
- Lenny Assard from Bethlehem noted that the Town continues to have culvert replacement and upgrade needs as always. He recognizes that Eversource has continued to work on coordination but believes more is needed. He stated that the Town has not been able to catch up with dying ash trees, and noted that town crews could work for weeks and still not complete ash tree removal and maintenance.



## **Appendix C**

### Public Outreach







# NVCOG preparing hazard mitigation plan

By **mycitizensnews** - November 4, 2020

WATERBURY — The Naugatuck Valley Council of Governments is seeking public input on a project to update the plan for natural hazard mitigation.

NVCOG recently received a grant from the Federal Emergency Management Agency to prepare a regional, multi-jurisdiction natural hazard mitigation plan that will update plans in all 19 municipalities in its planning region, including Beacon Falls, Naugatuck and Prospect.

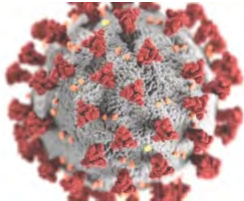
NVCOG representatives will hold virtual public workshops for people to learn about hazard mitigation planning, possible risks they face from a natural hazard, and speak with the consultants developing the plan update. The first workshop is scheduled for Nov. 18 at 5:30 p.m.

For information and details of how to participate in the workshop, visit [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP).

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Advisory committee to assist state on COVID vaccination plan  
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In "Beacon Falls"



Athletic directors cram to put together fall schedules  
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October 12, 2020  
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2020 ELECTION UPDATE » Biden COVID-19 Response Begins; McConnell Says Trump '100%' Right

[Community Corner](#)

## Naugatuck Valley Council Seeks Input On Hazard Mitigation Plan

A virtual workshop is scheduled for Nov. 18.

By Press Release Desk, News Partner  
Oct 26, 2020 10:27 pm ET

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Press release from Naugatuck Valley Council of Governments:

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Oct. 26, 2020

The Naugatuck Valley Council of Governments (NVCOG) recently received a Pre-disaster Hazard Mitigation Planning grant from the Federal Emergency Management Agency (FEMA) to prepare a regional, multi-jurisdiction Natural Hazard Mitigation Plan that will update plans in all 19 municipalities in its planning region. The project team

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planning, possible risks they face from a natural hazard, and speak directly with the consultants developing the HMP update. The study team also wants to hear from residents about their concerns and opinions. The first public workshop is scheduled for November 18, 2020 at 5:30 PM.

Subscribe >

A Natural Hazard Mitigation Plan (HMP) is a tool that helps a community to understand risk and to take specific steps to reduce property damage, injury, and loss of life from natural disasters, such as Tropical Storm Isaias. The November 18 workshop will provide details on the hazards being addressed in the plan, the risks they pose, and the types of losses that can occur to life and property in the Naugatuck Valley region. Details of how to participate in the workshop are available at [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP).

Public engagement is critical to the planning process, and a short online survey is also available for members of the public to provide information to project staff. The survey should take less than 10 minutes to complete and can be found on the project webpage. While the ongoing pandemic will limit typical public engagement forums, such as public meetings and in-person workshops, the webpage, survey and workshop provide key opportunities for residents to learn about the project and provide feedback.

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A FEMA-approved Hazard Mitigation Plan is required for a municipality to be eligible for

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a community to be eligible for relief funding after an event has occurred. The HMP helps public officials and residents understand vulnerabilities and will identify actions that communities can take to prevent or minimize future risk.

NVCOG and project consultant Milone & MacBroom, Inc. of Cheshire will be working with all 19 regional municipalities over the next year to develop the multi-jurisdictional HMP. Developing a multi-jurisdictional plan is a more cost-effective approach than each community creating its own HMP. However, understanding that each community is unique and has its own specific risks, hazards specific to each municipality will be addressed in separate municipal sections in the regional plan. The plan will take recent major events into account and will investigate risks from floods, winter storms, tornadoes, hurricanes, wildfires, earthquakes, and dam failure, among others. The HMP will also identify activities that can be undertaken by each community to prevent loss of life and reduce property damages associated with the identified hazards. Public safety and property loss reduction are the driving forces behind this plan, but careful consideration will also be given to the preservation of history, culture and the natural environment of the region.

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Future virtual public meetings will focus on specific communities in the region. Stay tuned for dates and times!

Please visit [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP) for more details.



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*This press release was produced by Naugatuck Valley Council of Governments. The views expressed here are the author's own.*

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## Naugatuck Valley: Council of Governments Seeks Input on Natural Hazard Mitigation Plan

Nov 5, 2020

WATERBURY — The Naugatuck Valley Council of Governments is seeking input regarding a regional, multi-jurisdiction natural Hazard Mitigation Plan at 5:30 p.m. Wednesday, November 18, in a virtual environment.

NVCOG recently received a pre-disaster hazard mitigation planning grant from the Federal Emergency Management Agency to prepare a HMP and will update plans in all 19 municipalities in the council's planning region.

The project team will hold virtual public workshops where attendees can learn about hazard mitigation planning, possible risks they face from a natural hazard, and speak directly with the consultants developing the HMP update.

A natural HMP is a tool that helps a community to understand risk and take specific steps to reduce property damage, injury, and loss of life from natural disasters such as Tropical Storm Isaias.

The November 18 workshop will provide details on the hazards being addressed in the plan, the risks they pose, and the types of losses that can occur to life and property in the Naugatuck Valley region.

Details of how to participate in the workshop are available at [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP).

Public engagement is critical to the planning process, and a short online survey is also available for members of the public to provide information to project staff.

The survey should take less than 10 minutes to complete and can be found on the project webpage. While the ongoing pandemic will limit typical public engagement forums, such as public meetings and in-person workshops, the webpage, survey and workshop provide key



opportunities for residents to learn about the project and provide feedback.

A FEMA-approved HMP is required for a municipality to be eligible for certain hazard mitigation grant funding.

An approved HMP is not required, however, for a community to be eligible for relief funding after an event has occurred.

The HMP helps public officials and residents understand vulnerabilities and will identify actions that communities can take to prevent or minimize future risk.

NVCOG and project consultant Milone & MacBroom, Inc. of Cheshire will be working with all 19 regional municipalities over the next year to develop the multi-jurisdictional HMP.

Developing a multi-jurisdictional plan is a more cost-effective approach than each community creating its own HMP.

However, understanding that each community is unique and has its own specific risks, hazards specific to each municipality will be addressed in separate municipal sections in the regional plan.

The plan will take recent major events into account and will investigate risks from floods, winter storms, tornadoes, hurricanes, wildfires, earthquakes, and dam failure, among others.

The HMP will also identify activities that can be undertaken by each community to prevent loss of life and reduce property damages associated with the identified hazards.

Public safety and property loss reduction are the driving forces behind this plan, but careful consideration will also be given to the preservation of history, culture, and the natural environment of the region.

Future virtual public meetings will focus on specific communities in the region.



**SHELTONHERALD**<https://www.sheltonherald.com/news/article/NVOCG-seeking-input-on-regional-hazard-mitigation-15678899.php>

## NVOCG seeking input on regional hazard mitigation plan

Published 12:00 am EDT, Thursday, October 29, 2020

The Naugatuck Valley Council of Governments (NVOCG) recently received a Pre-disaster Hazard Mitigation Planning grant from the Federal Emergency Management Agency (FEMA) to prepare a regional, multi-jurisdiction Natural Hazard Mitigation Plan (HMP) that will update plans in all 19 municipalities in its planning region.

The project team will hold virtual public workshops where attendees can learn about hazard mitigation planning, possible risks they face from a natural hazard, and speak directly with the consultants developing the HMP update. The study team also wants to hear from residents about their concerns and opinions.

The first public workshop is scheduled for Nov. 18 at 5:30 p.m.

Trump returns to White House after golf outing





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A Natural Hazard Mitigation Plan (HMP) is a tool that helps a community to understand risk and to take specific steps to reduce property damage, injury, and loss of life from natural disasters, such as Tropical Storm Isaias. The workshop will provide details on the hazards being addressed in the plan, the risks they pose, and the types of losses that can occur to life and property in the Naugatuck Valley region. Details of how to participate in the workshop are available at [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP).

Public engagement is critical to the planning process, and a short online survey is also available for members of the public to provide information to project staff. The survey should take less than 10 minutes to complete and can be found on the project webpage. While the ongoing pandemic will limit typical public engagement forums, such as public meetings and in-person workshops, the webpage, survey and workshop provide key opportunities for residents to learn about the project and provide feedback.

A FEMA-approved Hazard Mitigation Plan is required for a municipality to be eligible for certain hazard mitigation grant funding. An approved HMP is not required, however, for a community to be eligible for relief funding after an event has occurred. The HMP helps public officials and residents understand vulnerabilities and will identify actions that communities can take to prevent or minimize future risk.

NVCOG and project consultant Milone & MacBroom, Inc. of Cheshire will be working with all 19 regional municipalities over the next year to develop the multi-jurisdictional HMP. Developing a multi-jurisdictional plan is a more cost-effective approach than each community creating its own HMP. However, understanding that each community is unique and has its own specific risks, hazards specific to each municipality will be addressed in separate municipal sections in the regional plan.

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Future virtual public meetings will focus on specific communities in the region. For more details, visit [www.nvcogct.gov/HMP](http://www.nvcogct.gov/HMP).

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**H E A R S T**



# Update of Hazard Mitigation Plan for the Naugatuck Valley Region



Public Workshop:  
Hazard Identification and Risk Assessment



Victoria Brudz, CFM  
David Murphy, PE, CFM  
Noah Slovin, CFM



## WORKSHOP LOGISTICS

- Meeting will be recorded
- Meeting is accessible by phone or Zoom application
- Please comment in the chat box if you have any technical questions
- Please use the Q&A features to ask questions
- Participation Opportunities:
  - Zoom Poll feature
  - Q&A and Chat Box
  - Discussion opportunity at the end of the presentation



# Agenda

- Purpose and Need for Hazard Mitigation Planning
- Review of Hazards to be Addressed
- Effects of Climate Change
- Characterizing Hazard Losses
- FEMA Map Updates (Diane Ifkovic, CT Department of Energy and Environmental Protection)
- Next Steps

*Test Poll*  
*(to make sure it is working for you)*



## *Poll #1: Tell us a little about you*

## PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

### Authority

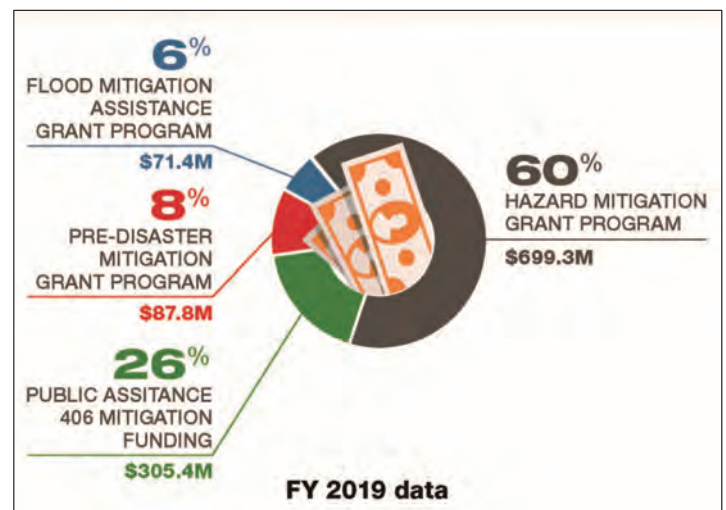
- Disaster Mitigation Act of 2000 (amendments to Stafford Act of 1988)

### Goal of Disaster Mitigation Act

- Promote disaster *preparedness*
- Promote hazard mitigation *actions* to reduce losses

### Mitigation Grant Programs

- Flood Mitigation Assistance (FMA)
- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC)
  - Replaces Pre-Disaster Mitigation (PDM)
  - Shift from pre-disaster spending to research-supported investment



Graphic courtesy of FEMA



# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## What is a Natural Hazard?

- An extreme natural event that poses a risk to people, infrastructure, and resources.



## What is Hazard Mitigation?

- Actions we take now that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects.



New Elevated Construction



Removal of Structures from Floodplain

# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## LONG-TERM GOALS OF HAZARD MITIGATION

### Reduce

- Loss of life
- Damage to property and infrastructure
- Costs to residents and businesses (taxes, insurance, repair costs, etc.)
- Municipal service costs (long-term, e.g. emergency response, infrastructure maintenance)



### Educate

- Residents
- Policy-makers



### Connect

- Hazard mitigation planning to other community planning efforts



### Enhance

- And preserve natural resource systems in the community





# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## Status of Plans in Connecticut

- Most initial plans developed 2005-2011
- Local plans updated every five years

## Status of NVCOG Plans

- Most initial plans developed 2005-2011 for individual towns and cities
- The most recent plans were adopted between December 2012 and July 2016
- Plans expired starting in February 2018 and running through September 2021
- All towns and cities will be part of ONE new plan



# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## After Adopting a Plan, mitigation grants can be used for:

- Building acquisitions or elevations
- Culvert replacements
- Drainage projects
- Bank stabilization
- Landslide stabilization
- Wind retrofits
- Seismic retrofits
- Snow load retrofits
- Standby power supplies for critical facilities



This home in Trumbull was acquired and demolished using a FEMA grant





# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## CULVERT REPLACEMENT FUNDED BY HMGP IN BUCKLAND, MA



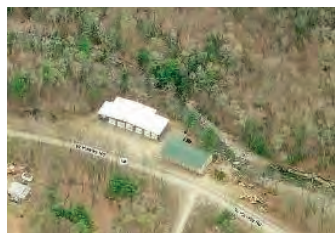
Floyd 1999



Irene 2011

# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## RIVERBANK STABILIZATION FUNDED BY HMGP IN HAWLEY, MA



Irene 8/2011



Post-Irene 9/2011

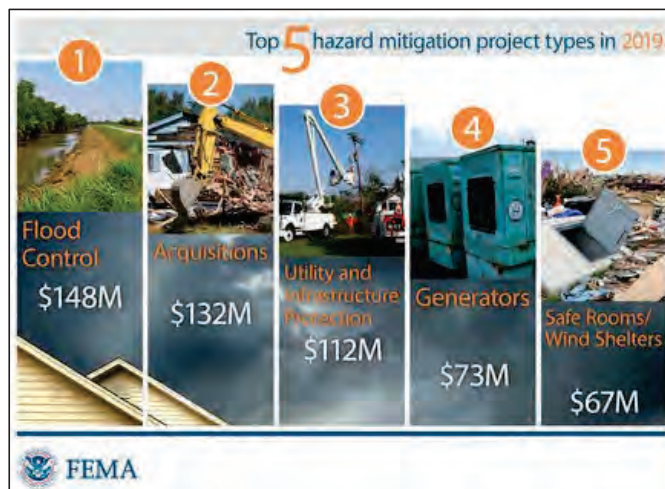
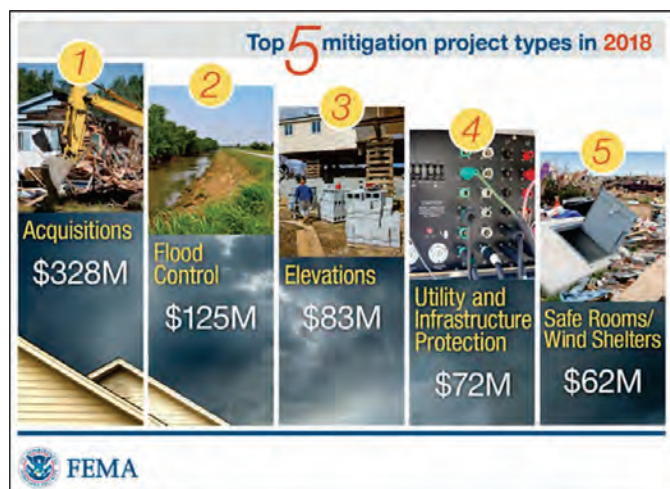


Construction  
August 2017



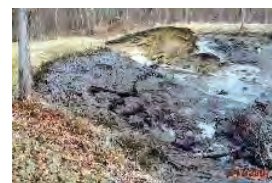


# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING



## HAZARDS TO INCLUDE IN THE PLAN

- Floods
  - Hurricanes and Tropical Storms
  - Summer Storms
  - Tornadoes and High Winds
  - Severe Winter Storms
  - Dam Failure
  - Wildfire
  - Earthquakes
  - Landslides and Sinkholes (for some towns)
- ↑  
CLIMATE CHANGE





## HAZARDS TO INCLUDE IN THE PLAN

- Floods – Riverine
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Housatonic River, 2011



Pequabuck River, 2011



Pomperaug River, 2007

## HAZARDS TO INCLUDE IN THE PLAN

- Floods – Flash Floods During Intense Rain
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Waterbury Flood Damage After June 2006 Storms





## HAZARDS TO INCLUDE IN THE PLAN

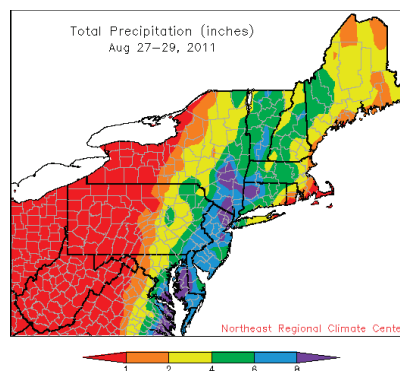
- Floods – Ice Jams
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Southbury ice jam damage

## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Courtesy of  
Northeast  
Climate Data  
Center



Downed Power Lines from Tropical  
Storm Isaias in Cheshire, 2020





## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- **Summer Storms**
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- **Tornadoes and High winds**
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Funnel Cloud in Woodbury, 2011  
New Haven Register



## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- **Severe Winter Storms**
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Photos from Waterbury Rep-Am and others



## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- **Dam Failure**
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



Little River  
Photo by David Murphy

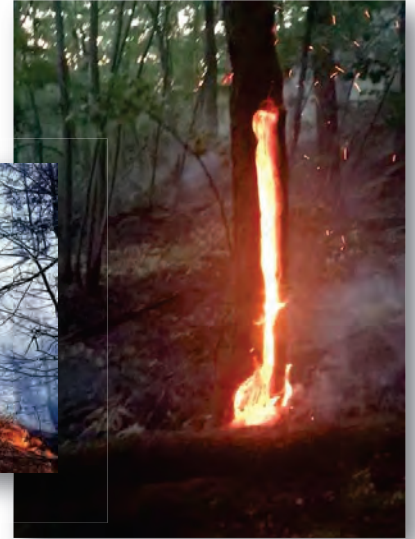


Great Hill Reservoir Dam, Seymour  
New Haven Register



## HAZARDS TO INCLUDE IN THE PLAN

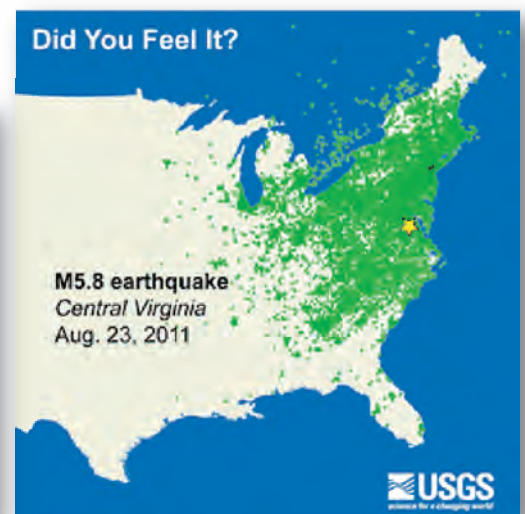
- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- **Wildfire**
- Earthquakes
- Landslides and Sinkholes (for some towns)



Beacon Falls (left)  
Watertown (right)  
Republican American

## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- **Earthquakes**
- Landslides and Sinkholes (for some towns)



Courtesy of USGS



## HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)



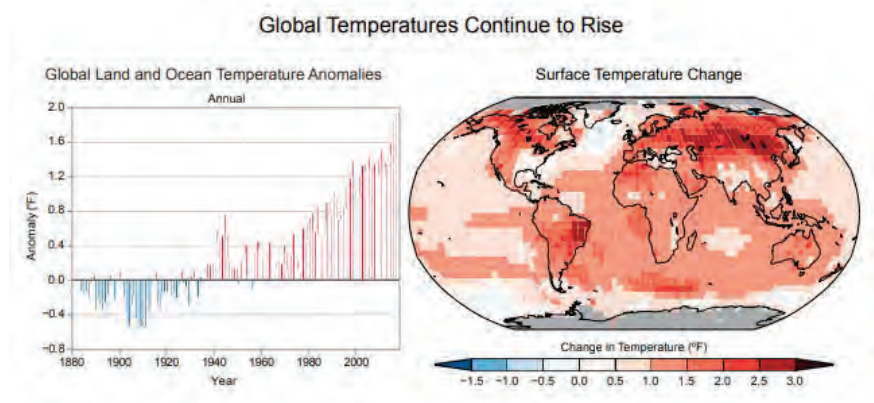
Photos courtesy of New Haven Register

Photo courtesy of Waterbury Rep-Am

## HAZARDS TO INCLUDE IN THE PLAN

### EFFECTS OF CLIMATE CHANGE

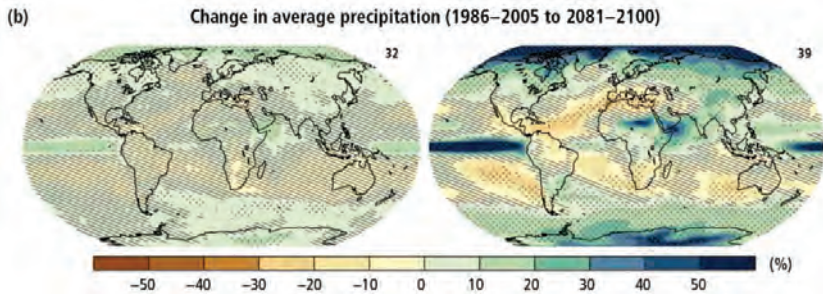
- Global average temperatures are increasing
- Growing seasons may fluctuate
- Extreme heat episodes may increase





# HAZARDS TO INCLUDE IN THE PLAN

## EFFECTS OF CLIMATE CHANGE

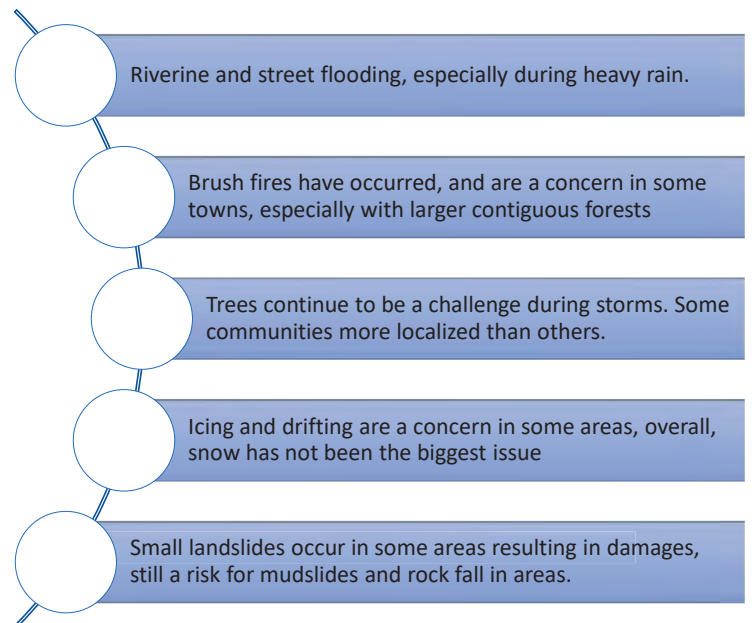


- Precipitation is expected to increase throughout the higher latitude regions
- Winter precipitation may increase, but may not always be snow
- Drought occurrences may increase

# HAZARDS TO INCLUDE IN THE PLAN

## REPORT FROM MUNICIPAL MEETINGS

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Ice Jams, Landslides, and Sinkholes (for some towns)





## *Poll #2: Hazards of Concern*

### VULNERABILITIES, RISKS, AND LOSS ESTIMATES

#### Methods of Characterizing Risk

- State Hazard Mitigation Plan
- FEMA maps
- National Centers for Environmental Information (NCEI)
- FEMA Public Assistance (PA) reimbursements after disasters
- HAZUS-MH
- National Flood Insurance Program (NFIP) claims
- Repetitive Loss property lists
- Meetings with local planning teams
- Public Input





# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

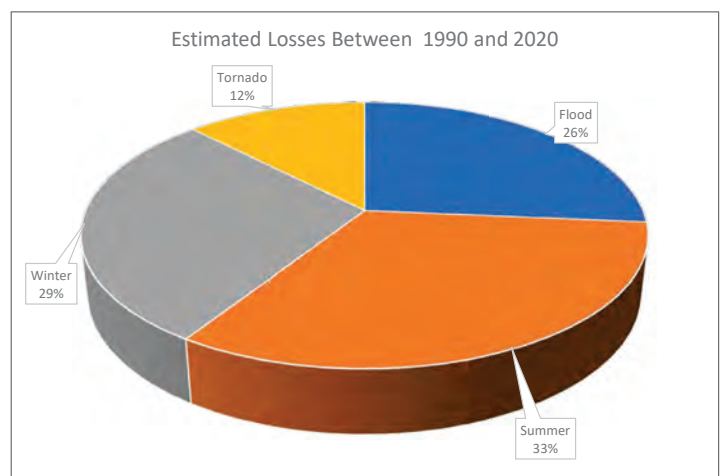
## LOSSES FROM NATURAL HAZARDS (NCEI)

	Events Since 2013	Costs Since 2013	Average Annual Cost (2013-2019)	Injuries Since 2013	Deaths Since 2013	Episodes
<b>Flood</b>	137	\$18,706	\$2,672	0	0	Flood: 34 Flash Flood: 89
<b>Summer Storms &amp; Thunderstorms</b>	490	\$1,135,659	\$162,237	7	4	Drought: 3 Extreme Heat: 46 High Winds: 371 Hail: 44 Lightning: 24
<b>Winter Storm</b>	419	\$366,925	\$52,418	6	3	Blizzard: 15 Drought: 5 Extreme Cold/Wind Chill: 38 Frost/Freeze: 3 Hail: 2 Heavy Snow: 76 High Winds: 84 Ice Storm: 1 Winter Storm: 60 Winter Weather: 135
<b>Tornado</b>	11	\$425,754	\$60,822	0	0	Tornado: 10 Funnel Cloud: 1

# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## LOSSES FROM NATURAL HAZARDS (NCEI)

	Total losses 1990 – 2020	Average Annual Cost
<b>Flood</b>	\$135,000	\$61,123
<b>Summer Storms &amp; Thunderstorms</b>	\$9,175,300	\$69,354
<b>Winter Storm</b>	\$2,543,300	\$42,011
<b>Tornado</b>	\$5,315,000	\$13,429





# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## LOSSES FROM NATURAL HAZARDS (NCEI)

### Based on 2013 to 2020:

- Flash floods: 12 per year
- Other flood events: 4 to 5 per year
- Summer high wind events: 53 days a year
- Wintertime high wind events: 12 days a year
- Heavy snow: 10 to 11 days a year
- Extreme heat: 6 days a year
- Extreme cold: 5 days a year
- Tornado: 1 to 2 per year

# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

- These are the reimbursements to towns and cities for cleaning up after disasters.
- Declared natural disasters in Connecticut (2014-2020)
  - 2015 Snow Storm
  - 2018 Tornadoes
  - 2018 Flooding
  - 2020 Tropical Storm Isaias (Emergency, not Disaster)

Also...

- 2020 COVID-19

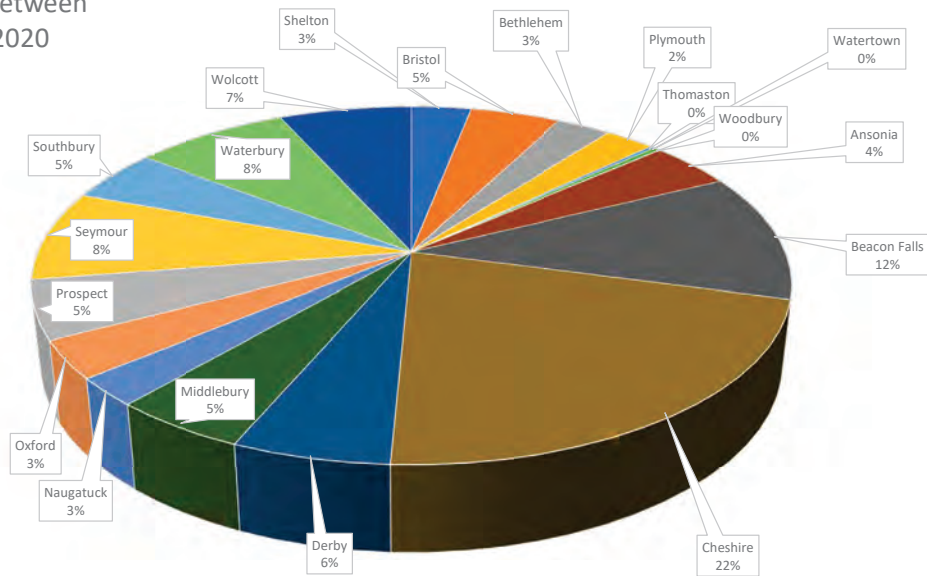




# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

PA Received between  
2013 and 2020

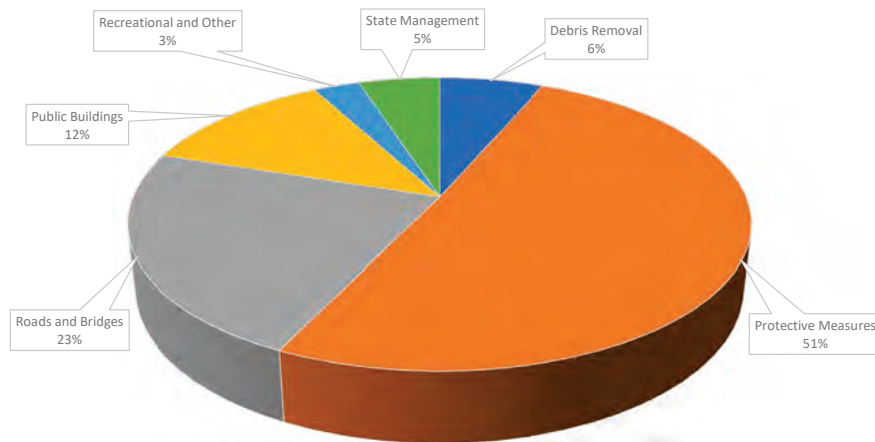


Most PA attributed to winter storms, then tornadoes. Little flood and wind.

# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

Types of PA Received between 2013 and 2020

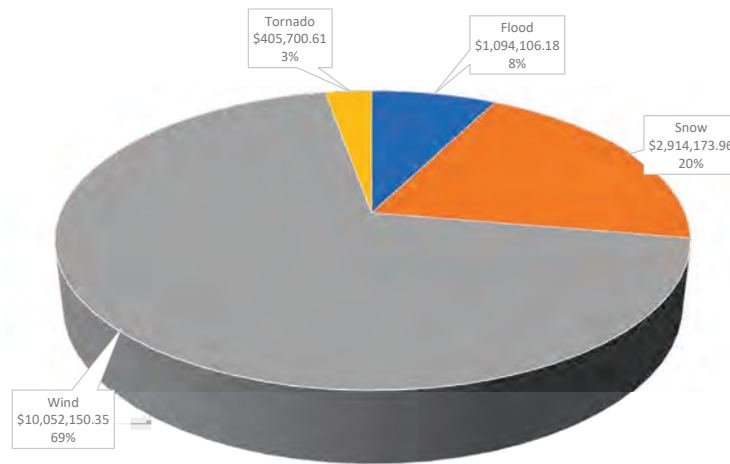




# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## FEMA PUBLIC ASSISTANCE (PA) REIMBURSEMENTS

PA Received Since 1998



### National flood insurance programs (NFIP) Policies



Municipality	Policies in Force	Total Coverage (\$)
Ansonia	18	4,865,900
Beacon Falls	19	5,727,100
Bethlehem	11	2,451,500
Bristol	194	41,452,200
Cheshire	88	26,492,300
Derby	26	6,694,500
Middlebury	36	8,884,700
Naugatuck	93	15,037,300
Oxford	45	11,298,900
Plymouth	26	6,952,700
Prospect	7	2,350,000
Seymour	58	12,340,200
Shelton	244	57,801,200
Southbury	64	15,484,100
Thomaston	8	3,269,900
Waterbury	207	34,647,800
Watertown	83	22,198,500
Wolcott	26	5,702,800
Woodbury	45	10,714,600



# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## NFIP POLICIES AND LOSSES PAID



# VULNERABILITIES, RISKS, AND LOSS ESTIMATES

## WHAT IS AT RISK?

- Repetitive Loss (RL) properties and properties near them
- Historic and Cultural Resources
- Critical Facilities
- *As well as the built environment and people at large*

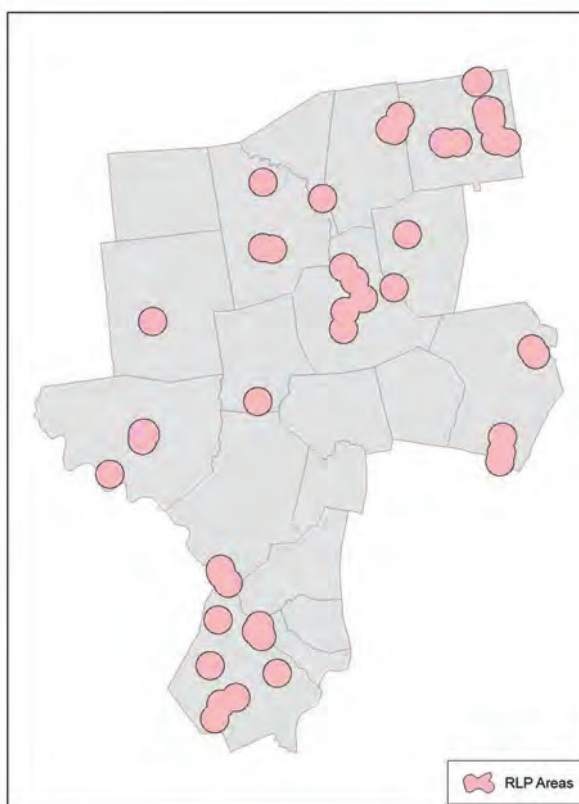
Overall – infrastructure, residential and commercial properties, utilities



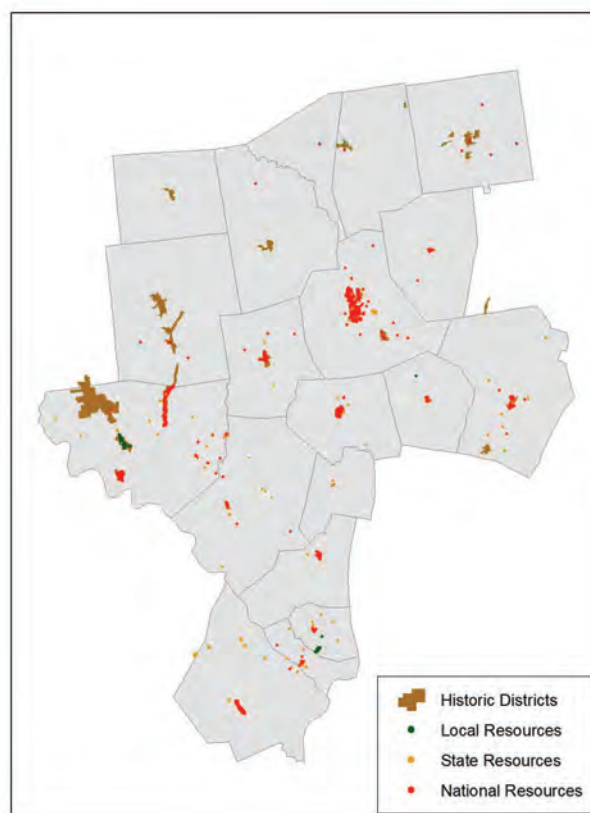
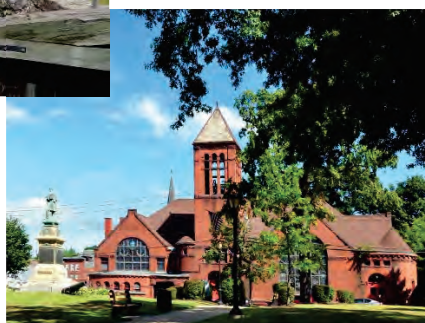
Source: FEMA, Local Hazard Mitigation Handbook



## Repetitive Loss Properties (more than one flood insurance payment)



## Historic and Cultural Resources

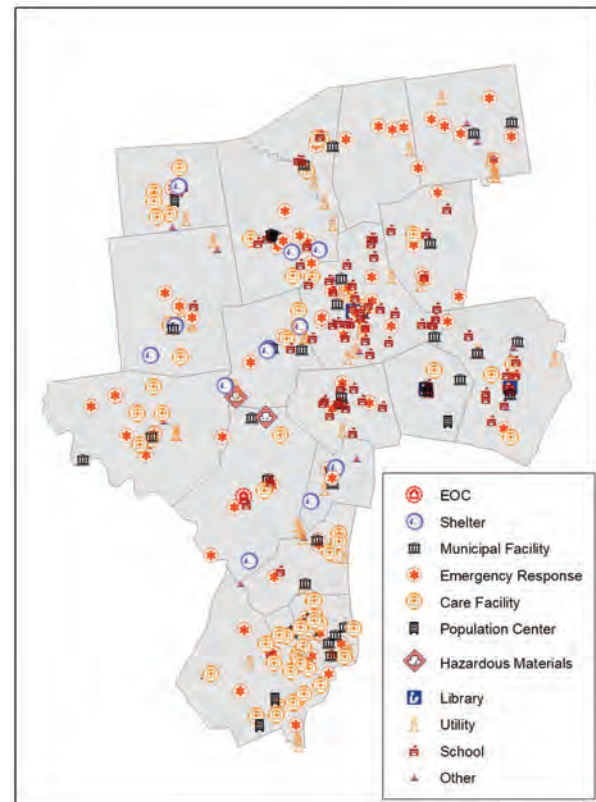




## Critical Facilities

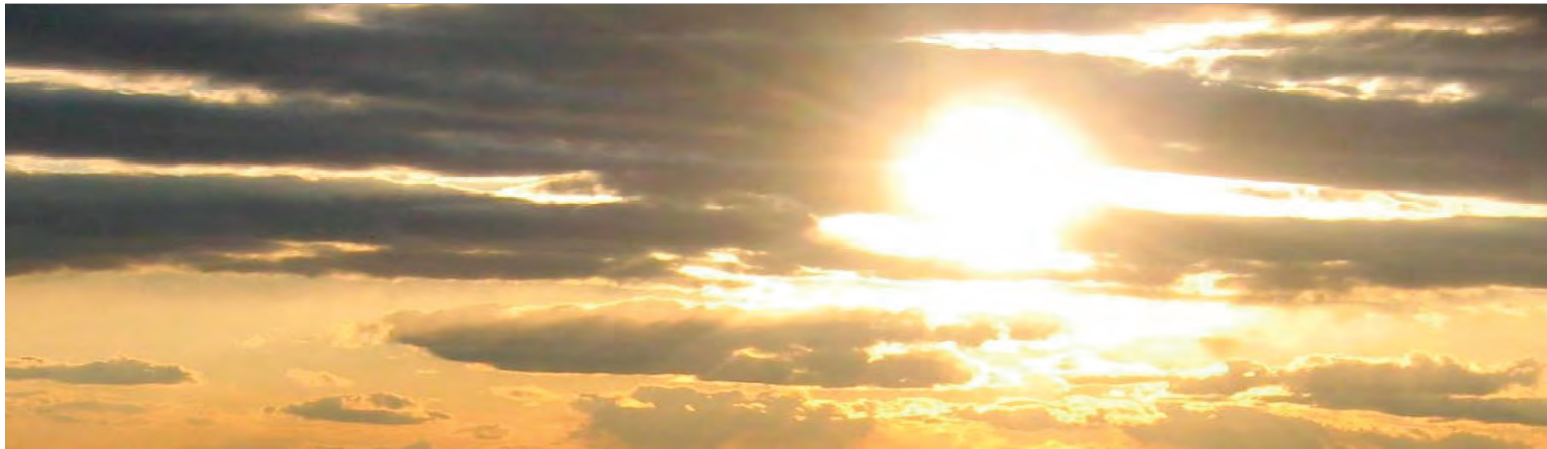
Critical facility updates and changes are made based on feedback during municipal meetings. These include

- EOC
- Police
- Fire
- Shelters
- Municipal buildings
- Care facilities
- Hospitals
- Schools
- Other facilities that are critical to emergency response



## *Poll #3: Vulnerabilities and Risk*





## Connecticut Department of Energy and Environmental Protection



## **Naugatuck Valley Council of Government (NVCOG)**

## **Regional Natural Hazard Mitigation Plan Update - Mapping Projects**

**November 18, 2020 (5:30-6:30pm, Public)**

**Diane Ifkovic, State NFIP Coordinator**



Connecticut Department of Energy and Environmental Protection



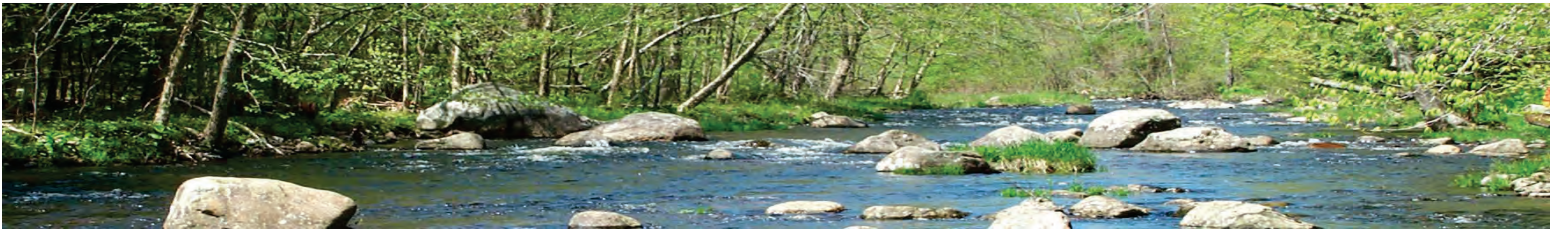


## NVCOG communities participate in NFIP National Flood Insurance Program (NFIP)

- Flood Maps
- Flood Insurance
- Flood Regulations



Connecticut Department of Energy and Environmental Protection



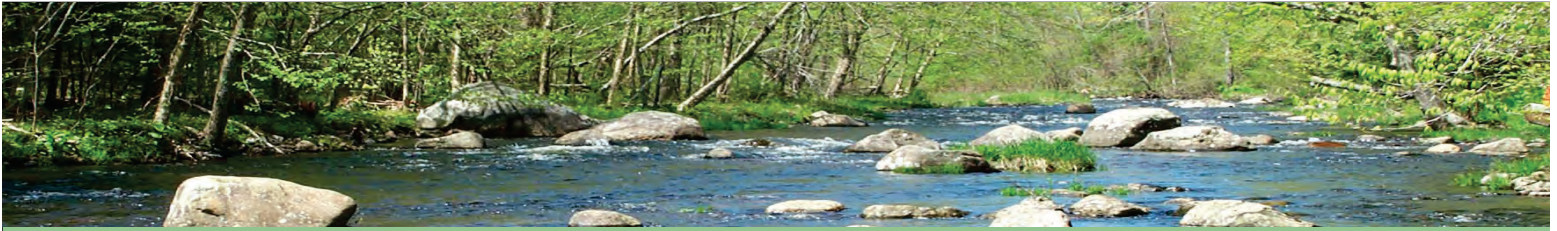
## FEMA Flood Mapping Process (3-5 years)

- Funding from Congress
- Discovery (meetings, report)
- Field Surveying
- Work Map issued to town officials
- Work Map meeting with town officials
- FEMA resolves problems, appeals
- Preliminary map issued to town officials, resolves appeals
- Meeting with public before map is effective/final



Connecticut Department of Energy and Environmental Protection





- NVCOG is comprised of 19 communities
- Four Connecticut Counties – New Haven, Litchfield, Fairfield, Hartford
- Four Major Watersheds – Quinnipiac, Saugatuck, Farmington, Housatonic Rivers



Connecticut Department of Energy and Environmental Protection

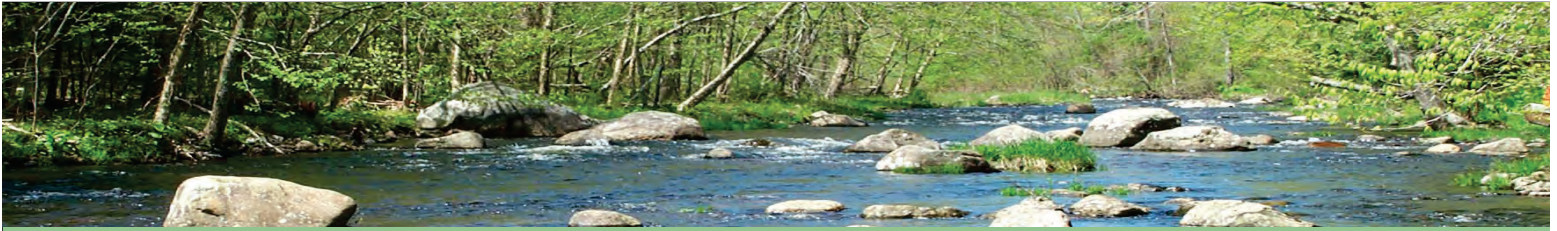
## Evolution of FEMA Flood Maps

- Individual Community Maps (joined NFIP 1978 to 1990)
- Countywide Maps (2008-2010)
  - New Haven County – December 17, 2010
  - Hartford County (Bristol) – September 26, 2008
  - Fairfield County (Shelton) – June 18, 2010
  - Litchfield County – No countywide update  
Bethlehem, Plymouth, Thomaston, Watertown, Woodbury
- Levee Updates (July & October 2013) Ansonia, Derby
- Watershed Map Updates (2015 to present)
  - Quinnipiac River Watershed – May 16, 2017  
Ansonia, Bristol, Cheshire, Derby



Connecticut Department of Energy and Environmental Protection





## Flood Map Updates in the NVCOG Region

1. Saugatuck River Watershed
2. Farmington River Watershed
3. Housatonic River Watershed



Connecticut Department of Energy and Environmental Protection

## Saugatuck River Watershed (20 communities)

- NVCOG 1 Community Included:  
Shelton
- FEMA Mapping Contractor:  
U.S. Geological Survey (USGS)



Connecticut Department of Energy and Environmental Protection



# Saugatuck River Watershed

- Discovery meetings were held June 7, 2016
- Discovery report issued in 2017
- Field surveying was completed in summer 2018
- Work maps will be issued soon to community officials
- Work Map meetings (webinars) January/February 2021



Connecticut Department of Energy and Environmental Protection

# Farmington River Watershed (24 communities)

- NVCOG 3 Communities Included:  
Bristol, Plymouth, Wolcott
- FEMA Mapping Contractor: Compass



Connecticut Department of Energy and Environmental Protection



## Farmington River Watershed

- Discovery meetings were held September 25, 2018
- Field surveying was completed in summer 2019
- Work Map meetings (webinars) held July 21 & 22, 2020
- One-on-one community meetings held Aug. 3 & 11, 2020
- Preliminary flood maps projected summer 2021
- Final effective maps projected summer 2023



Connecticut Department of Energy and Environmental Protection

## Housatonic River Watershed (54 communities)

- All NVCOG 19 Communities Included:  
Ansonia, Beacon Falls, Bethlehem, Bristol,  
Cheshire, Derby, Middlebury, Naugatuck,  
Oxford, Plymouth, Prospect, Seymour,  
Shelton, Southbury, Thomaston, Waterbury,  
Watertown, Wolcott, Woodbury
- FEMA Mapping Contractor:  
U.S. Geological Survey (USGS)



Connecticut Department of Energy and Environmental Protection

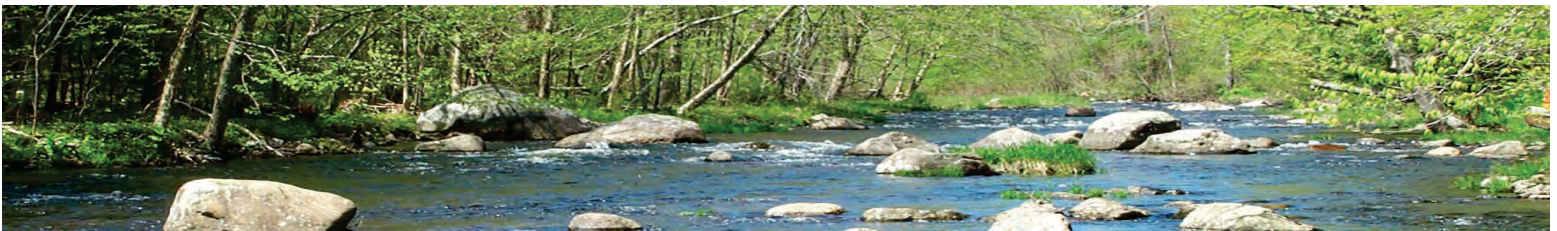


# Housatonic River Watershed

- Discovery meetings held May 2017
- Field surveying has begun
- Selection of priority stream reaches is complete



Connecticut Department of Energy and Environmental Protection



What should public be aware of with these projects?

1. Review updated flood maps
2. Review flood insurance coverage
3. When final maps go effective, town is required to update local floodplain zoning regulations or ordinance or be suspended from the NFIP (hinders home sales)



Connecticut Department of Energy and Environmental Protection



## Ice Jams and Climate Change

- FEMA flood maps do not contain flood risk information on ice jam flooding or climate change
- Ice jams were a problem in January 2018 on Housatonic River, especially in Kent
- Inland areas seeing effects of climate change with “rain bombs”, extreme precipitation events
- This type of changing rain pattern can have more adverse effects in hilly areas due to increased flash flooding or new areas experiencing flooding (urban/rural)



Connecticut Department of Energy and Environmental Protection

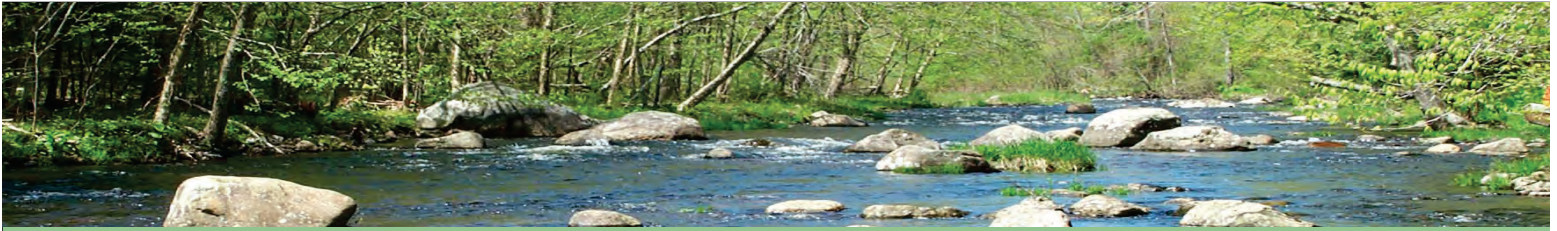
## Be Informed, Protect Yourself

- Lines on a map are not walls
  - Water will go where it wants to and causes damage
  - Maps are made to a certain design storm event, we can experience stronger storm events
  - Development over the years can change drainage patterns
  - Maps cannot account for every nuance at property level
- 
- FEMA Map Service Center: [www.msc.fema.gov](http://www.msc.fema.gov)
  - Flood Factor: [www.firststreet.org](http://www.firststreet.org)



Connecticut Department of Energy and Environmental Protection





# Questions?

Diane Ifkovic

Email: [diane.ifkovic@ct.gov](mailto:diane.ifkovic@ct.gov)

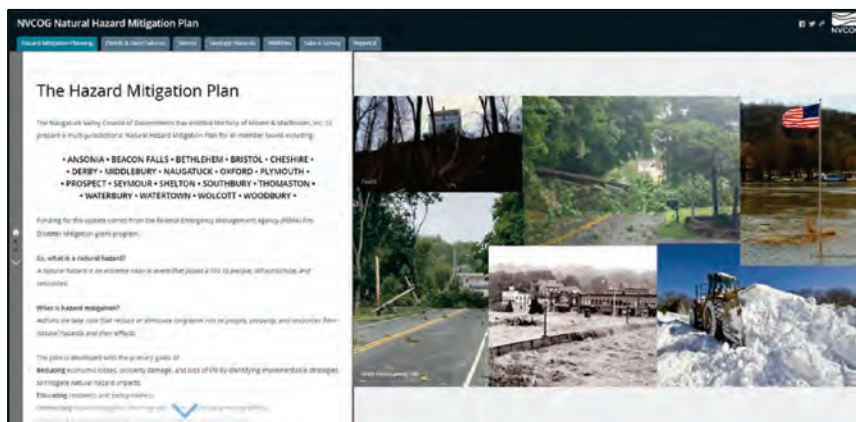
(860) 424-3537



Connecticut Department of Energy and Environmental Protection

## NEXT STEPS

- Online Survey is OPEN – can access through <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/>
- View Story Map (clip below) from the same link
- Additional public meetings hosted by each town's planning, zoning, or wetlands commission
- One more workshop like this one to discuss mitigation strategies





## REPORT FROM MUNICIPAL MEETINGS

### Topics Discussed

- Critical facilities and standby power
- Changes in capabilities
- Changes in risk
- Events of note in the last 4-5 years
- Repetitive loss properties
- Review of prior mitigation actions
- Potential new mitigation actions
- Designation of the local coordinator

### So far...

15 Municipalities

1 Scheduled

Prospect 11/25

3 Meetings still need to be complete

**Middlebury**

**Plymouth**

**Seymour**

← Let's focus on these



## REPORT FROM MUNICIPAL MEETINGS

### Changes in Capabilities

- Upgrading backup power at municipal and critical facilities
- Improving drainage, including streetscape projects
- Increasing tree maintenance budget
- Advancing storm response and recovery documentation
- Updating stormwater regulations
- Increasing municipal operation redundancies – IT and facilities
- Education continues to increase for all hazard types



**Agenda**  
**Presentation and Workshop About Hazards and Risks**  
**November 18, 2020**  
**5:30 PM to 6:30 PM**

---

NVCOG and its consultant, Milone & MacBroom, Inc. will conduct a 1-hour presentation and workshop to review the profiles of natural hazards and the associated risks posed by these hazards. Topics to be covered include findings from the local planning team meetings conducted in fall 2020, updates to the risk profiles and estimated losses attributed to hazard events and disasters, and a presentation from CT DEEP about ongoing flood map updates in the region.

<b>Segment</b>	<b>Time</b>	<b>Presenters</b>
Logins and Personal Set-up	5:30 PM	--
Welcome and Logistics	5:33 PM	David Murphy
Main Presentation	5:35 PM	Victoria Brudz, David Murphy, and Noah Slovin
DEEP Presentation about FEMA map updates in the region	6:00 PM	Diane Ifkovic
Breakout Sessions	6:10 PM	--
Riverine and dam flood risks		Noah Slovin
Wind, snow, and power outages		Victoria Brudz
Geologic hazards (landslides, earthquakes, Cheshire sinkholes)		David Murphy
Report from Sessions and Wrap Up	6:25 PM	Victoria Brudz, David Murphy, and Noah Slovin
Adjourn	6:30 PM	David Murphy



# Update of Hazard Mitigation Plan for the Naugatuck Valley Region



Public Workshop:  
Hazard Mitigation Strategies and Actions

David Murphy, PE, CFM  
Victoria Vetre, CFM



## LOGISTICS

- Meeting will be recorded
- How to proceed if we have technical or other problems
- **Please comment in the chat box if you have any technical questions**
- **Please use the Q&A features to ask questions**





# AGENDA

- Purpose and Need for Hazard Mitigation Planning
- Review of Hazards to be Addressed
- Types of Hazard Mitigation Actions
- Examples of Hazard Mitigation Actions
- New Actions Identified by NVCOG Towns
- Regional and State Initiatives
- Next Steps
- Open Discussion



## PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

### Authority

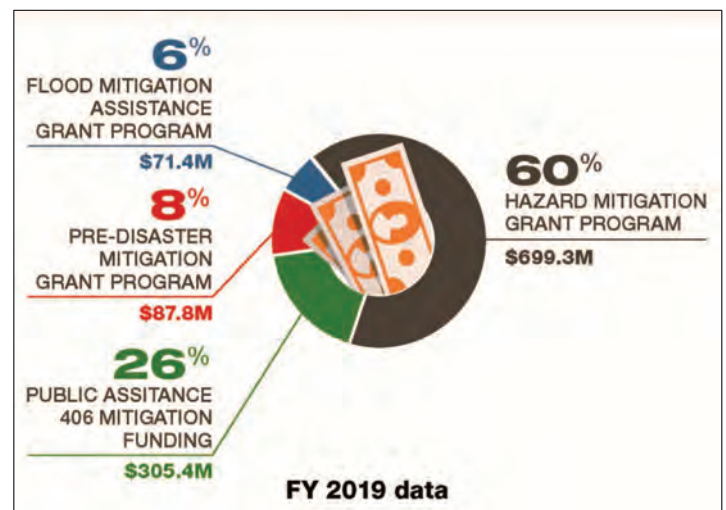
- Disaster Mitigation Act of 2000 (amendments to Stafford Act of 1988)

### Goal of Disaster Mitigation Act

- Promote disaster *preparedness*
- Promote hazard mitigation *actions* to reduce losses

### Mitigation Grant Programs

- Flood Mitigation Assistance (FMA)
- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities (BRIC) – Replaced Pre-Disaster Mitigation (PDM)



Graphic courtesy of FEMA



# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

## What is a Natural Hazard?

- An extreme natural event that poses a risk to people, infrastructure, and resources.



## What is Hazard Mitigation?

- Actions we take now that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects.



New Elevated Construction



Removal of Structures from Floodplain

# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

- **Status of Plans in Connecticut**
  - Most initial plans developed 2005-2011
  - Local plans updated every five years
- **Status of NVCOG Plans**
  - Most initial plans developed 2005-2011 for individual towns and cities
  - The most recent plans were adopted between December 2012 and July 2016, and many have expired
  - All towns and cities will be part of ONE new plan





# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING

After Adopting a Plan, mitigation grants can be used for:

- Building acquisitions or elevations
- Culvert replacements
- Drainage projects
- Bank stabilization
- Landslide stabilization
- Wind retrofits
- Seismic retrofits
- Snow load retrofits
- Standby power supplies for critical facilities



This home in Trumbull was acquired and demolished using a FEMA grant



# PURPOSE AND NEED FOR HAZARD MITIGATION PLANNING



## Top 5 Hazard Mitigation Project Types in 2020

For fiscal year 2020, FEMA obligated more than \$684 million in Hazard Mitigation Assistance grants to states, local communities, tribes and territories for 1,684 projects that will reduce risk.

These top five project types, ranked by dollars obligated, comprise approximately 59 percent of total dollars obligated, or \$522 million.

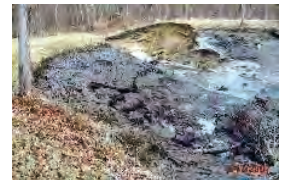




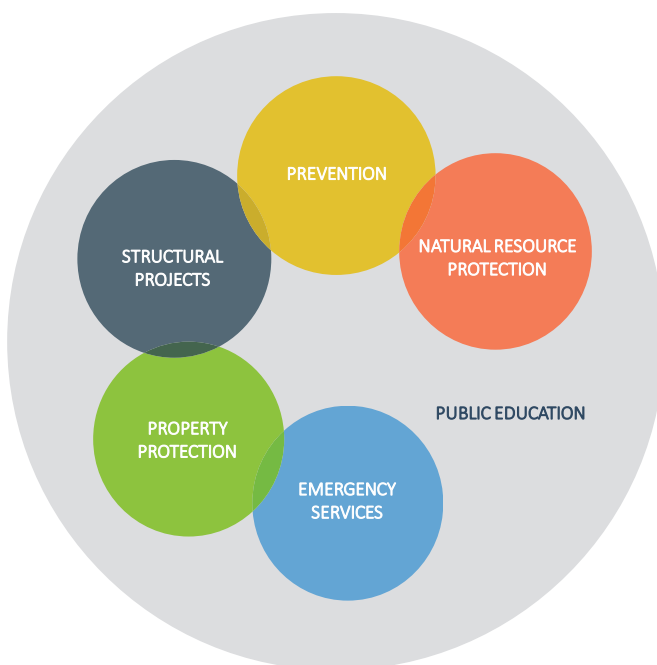
# HAZARDS TO INCLUDE IN THE PLAN

- Floods
- Hurricanes and Tropical Storms
- Summer Storms
- Tornadoes and High Winds
- Severe Winter Storms
- Dam Failure
- Wildfire
- Earthquakes
- Landslides and Sinkholes (for some towns)

↑  
CLIMATE CHANGE



# TYPES OF HAZARD MITIGATION ACTIONS



Structural Project



Property Protection



# EXAMPLES OF HAZARD MITIGATION ACTIONS



- Replace Bridges and Culverts
- Remove In-Stream Dams
- Remove Obstructions
- Upstream Detention
- Install Stormwater Systems
- Create Floodways
- Enlarge Channels
- Reduce Flow Resistance
- Install Levees
- Install Flood Walls

## FLOOD MITIGATION

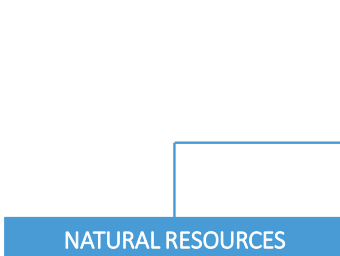
## PROPERTY PROTECTION

- Wet Floodproofing
- Dry Floodproofing
- Elevate Buildings
- Relocate Buildings
- Secure Utilities
- Anchor Floatables
- Remove Hazardous Materials
- Re-Grade Properties
- Purchase Flood Insurance



- Modify Zoning
- Modify Plan of Conservation and Development
- Stormwater Management Regulations
- Increase Flood Damage Prevention Standards
- Freeboard
- Low Impact Development
- Minimize Impervious Cover

# EXAMPLES OF HAZARD MITIGATION ACTIONS

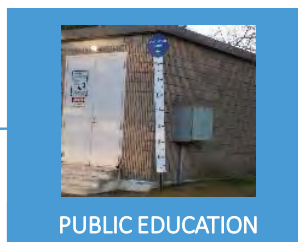


- Acquire or Preserve Floodplain Land
- Acquire and Remove Structures from Floodplains and Convert to Open Space
- Acquire or Preserve Other Lands
- Increase Wetland Storage
- Re-Connect Streams to Floodplains

## FLOOD MITIGATION

## EMERGENCY SERVICES

- Build Local Capacities to Respond
- Move Critical Facilities from Flood Risk Areas
- Establish Emergency Shelters
- Elevate Roads or Bridges to Ensure Egress
- Develop Community Evacuation Plans
- Develop Site-Specific Evacuation Plans
- Establish Satellite Facilities in Areas Subject to Isolation

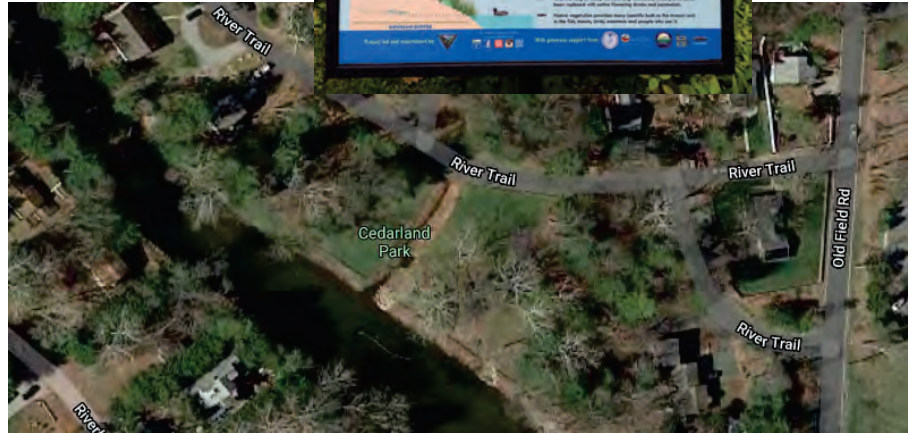


- Newsletters
- Community Meetings
- Information Kiosks
- Web Site with Flood Risk Maps
- Education of Municipal Staff
- Leverage State and FEMA Education Programs
- Establish a Standing Committee or Board to Oversee Outreach
- Join Community Rating System (CRS)



# EXAMPLES OF HAZARD MITIGATION ACTIONS

## PROPERTY ACQUISITIONS LIKE THOSE IN SOUTHBURY



# EXAMPLES OF HAZARD MITIGATION ACTIONS

## DRAINAGE PROJECT IN BROOKFIELD

- Brookfield
  - Meadowbrook Manor
  - \$1.3 M
  - New system to alleviate drainage and conveyance problems from Lime Kiln Brook. Flooding has led to flooded septic systems, wells, and homes.





## MITIGATION ACTIONS IDENTIFIED BY NVCOG TOWNS

### PREVENTION

- Flood study
- Stormwater regulations
- Repetitive loss property buyouts
- Riverbank stabilization
- Dam safety upgrades
- Road and drainage repairs
- Culvert upgrades
- Expand public water service

### PROPERTY PROTECTION

### STRUCTURAL PROJECTS

- Stream daylighting & restoration
- Increased tree management budget
- EOC & Shelter improvements
- Flood warning system
- Critical facility generators
- Evacuation Planning
- “We’re good”

### NATURAL RESOURCE PROTECTION

### EMERGENCY SERVICES

### PUBLIC EDUCATION

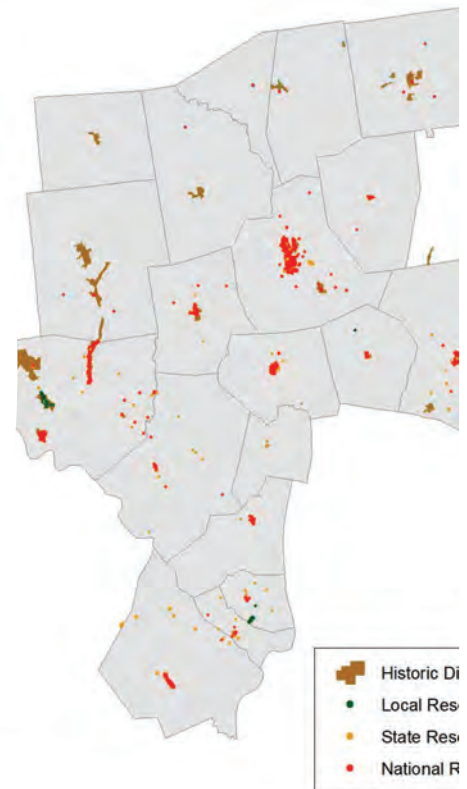
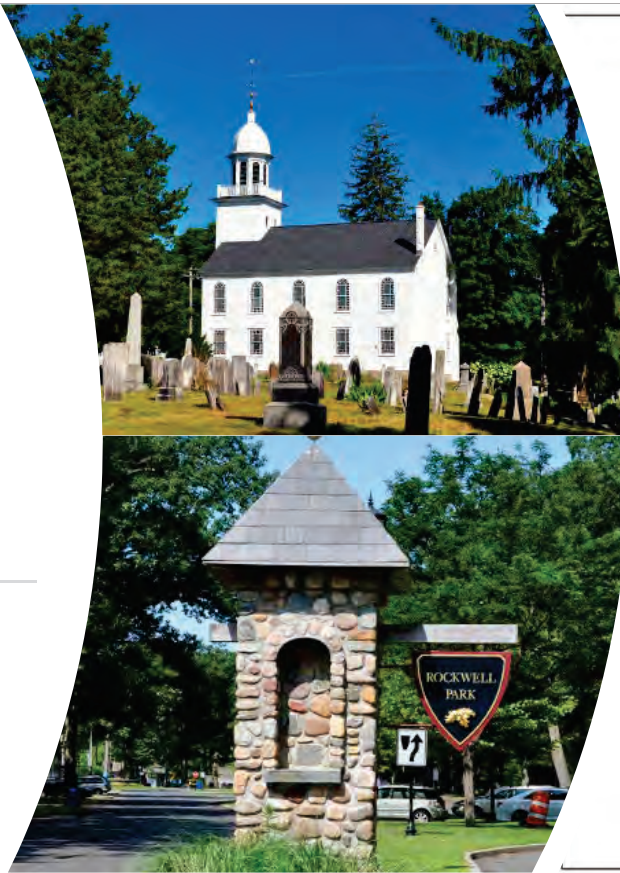
## REGIONAL AND STATE INITIATIVES

- Historic & Cultural Resources
- Repetitive Loss Properties
- State Building Code & Flood Regulations
- Small Businesses Chemical Management
- “Sustainable CT”
- “Resilient Connecticut”
- Low Impact Development (LID) Handbook for Rural Communities



# STATE INITIATIVE

## Historic & Cultural Resources



## REGIONAL AND STATE INITIATIVES Historic & Cultural Resources

### Historic & Cultural Resources Action 1

Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to support the preparation of resiliency plans across the state.

### Historic & Cultural Resources Action 2

Coordinate with CT SHPO to conduct outreach to owners of historic properties to educate them on methods of retrofitting historic properties to be more hazard-resilient while maintaining historic character.

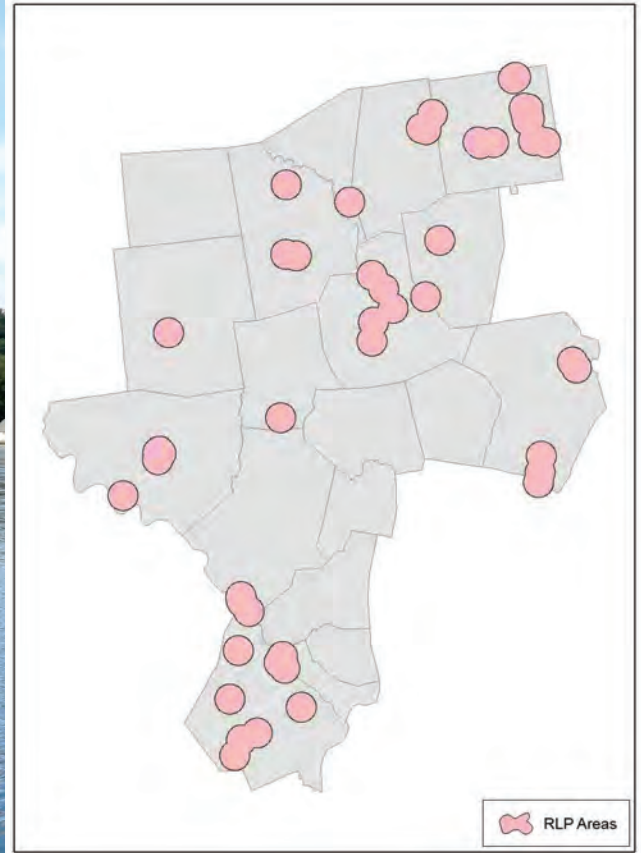
All towns

Towns with known, listed historic  
resources in flood zones



# STATE INITIATIVE

## Repetitive Loss Properties



## REGIONAL AND STATE INITIATIVES Repetitive Loss (RL) Properties

### Repetitive Loss Properties Action 1

Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.

### Repetitive Loss Properties Action 2

Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.

Any Municipality with at least 1 RL property

Towns with 2 or more RL properties



## STATE INITIATIVE

### State Building Code & Flood Regulations

#### CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION

#### MODEL FLOODPLAIN MANAGEMENT REGULATIONS NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Inland/Riverine Community (AE and A Zones only)

Level "D" Community

October 2018

Effective October 1, 2018, the Connecticut Office of the State Building Inspector issued the current state building code to adopt the 2015 International Residential Code (IRC). Please see the OSBI website for more information on this change, which can be found at: <http://www.osbi.org/About/Office-of-State-Building-Inspector/Building-and-Fire-Code-Enforcement> and the 2015 IRC, Chapter 3, Section R322, Flood-Resistant Construction. <http://www.osbi.org/public/document/653/>

Adoption of the 2015 IRC has made significant changes to the elevation and construction requirements for new construction and substantially improved structures in both coastal and inland floodplains. Section R322.2 contains the elevation requirements for A and AE Zones. R322.3 contains the elevation requirements for VE Zones and Coastal AE Zones. A summary of these new requirements:

**AE and A Zone** – Lowest floor elevated to Base Flood Elevation (BFE) plus 1 foot.

**AO and AH Zones** – Lowest floor elevated to Highest Adjacent Grade (HAG) or the depth number specified on the flood insurance rate map plus 1 foot or not less than 3 feet if no depth number is specified.

**VE Zone and Coastal AE Zone** – Bottom of the lowest horizontal member supporting the lowest floor elevated to the BFE plus one foot, with structure built on pier, post or pile foundation utilizing breakaway walls. Breakaway walls in Coastal AE zones must also contain hydraulic flood vents.

Adoption of the 2015 IRC will make significant changes to the elevation requirement for construction and substantially improved structures in coastal floodplains that may be different than the standards currently contained in your local floodplain zoning regulations or ordinances. There are also other changes. **Bold red text** in this model highlights the changes that need to be made to floodplain zoning regulations or ordinances to match the new state building code standards.



## REGIONAL AND STATE INITIATIVES

### State Building Code & Flood Regulations

#### Revised State Building Code Action 1

Revise floodplain zoning regulations to reflect the new State Building Code requirements for one foot of freeboard for construction in the 1% annual-chance flood zone.

Towns with floodplain regulations that do not require freeboard.

#### Revised State Building Code Action 2

Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement.

All other Towns



# STATE INITIATIVE

## Small Business Chemical Management



## REGIONAL AND STATE INITIATIVES Small Business Chemical Management

### Small Business Chemical Management Action 1

Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.

### Small Business Chemical Management Action 2

Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.

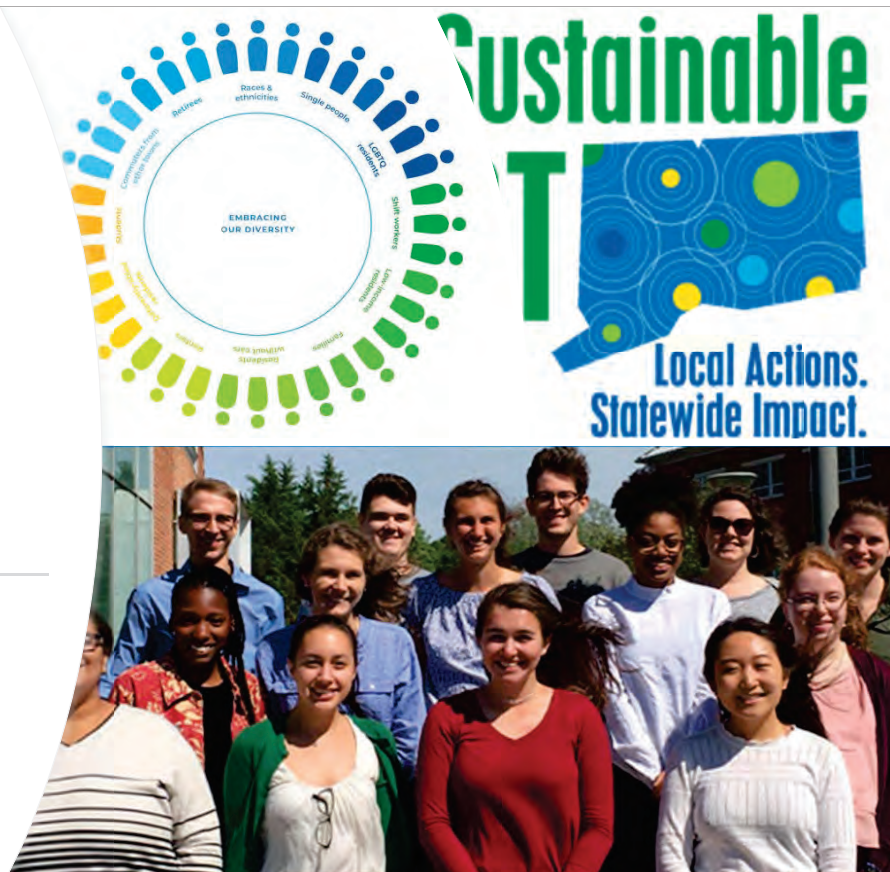
### Small Business Chemical Management Action 3

Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.



# STATE INITIATIVE

## Sustainable CT



## REGIONAL AND STATE INITIATIVES Sustainable CT

### Sustainable CT Action 1

Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.

Towns not currently in the program

### Sustainable CT Action 2

Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives:

1. Disseminate a toolkit for pre-disaster business preparedness.
2. Revise regulations to promote Low Impact Development.
3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.

Registered and Certified Towns



# REGIONAL INITIATIVE

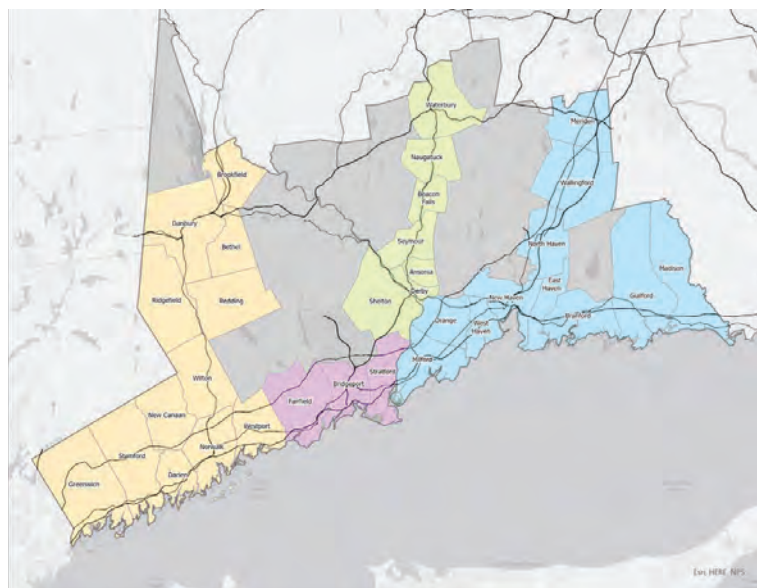
Resilient  
Connecticut



## REGIONAL AND STATE INITIATIVES

### Resilient Connecticut Target Communities

- Communities with major highways and passenger rail lines
- Communities with transit-oriented (TOD) potential
- Able to accommodate the resilient corridor concept linking “zones of shared risk” with resilient hubs
- “Pilot projects” will be developed





# REGIONAL AND STATE INITIATIVES

## Resilient Connecticut Target Communities

### Resilient Connecticut Action 1

Participate in Resilient Connecticut.

NVCOG Communities with TOD Potential

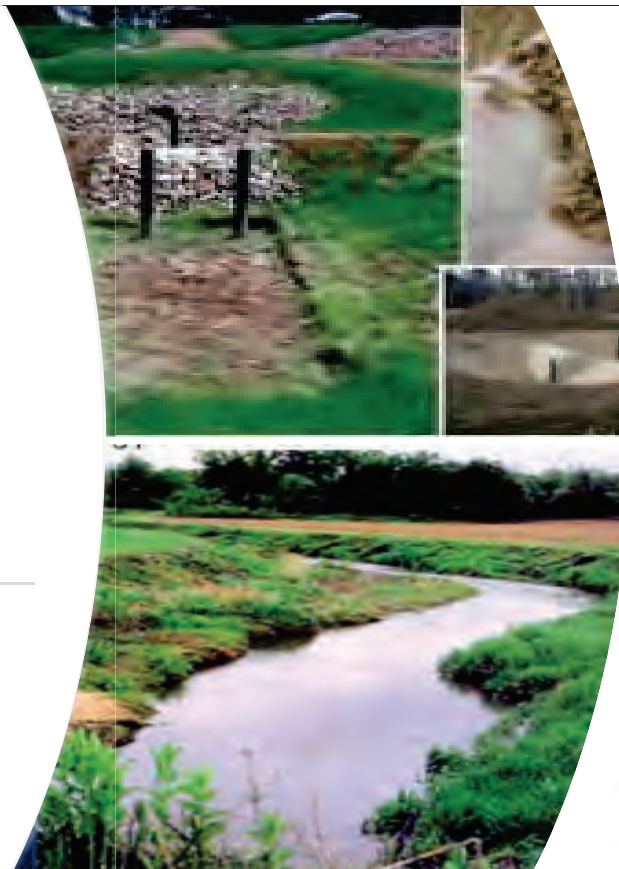
### Resilient Connecticut Action 2

Support CIRCA in the advancement of Pilot Projects.

NVCOG Communities with Pilot Projects

## STATE INITIATIVE

Low Impact Development



Effective Date: January 1, 2018

## MORRIS

Low Impact Sustainable Development and Stormwater Management Design Manual



LOW IMPACT SUSTAINABLE  
**LISD**  
DEVELOPMENT  
TRINKAUS ENGINEERING

Trinkaus Engineering, LLC  
114 Hunters Ridge Road  
Southbury, Connecticut 06488  
(203) 264-4558 (office/fax)  
Email: [stinkaus@earthlink.net](mailto:stinkaus@earthlink.net)  
[www.trinkausengineering.com](http://www.trinkausengineering.com)



# REGIONAL AND STATE INITIATIVES

Building Municipal Resilience and Climate Adaptation through Low Impact Development

## LID Action 1

Refer to the manual in your guidance or regulations

Towns With LID Guidance or Requirements

## LID Action 2

Evaluate whether LID should be incorporated into practices

Towns Without LID Guidance or Requirements

## NEXT STEPS

- Online Survey is OPEN – can access through <https://nvcogct.gov/project/current-projects/regional-natural-hazard-mitigation-plan-update/>
- View Story Map (clip below) from the same link
- Additional public meetings hosted by each town's planning, zoning, or wetlands commission
- Prepare draft plan document for public review in March-April 2021







**NVCOG Hazard Mitigation Plan**  
**Public Meeting #3 – Update on Planning Process**  
**August 4, 2021**  
**Time: 6:00 to 7:00 pm**  
**Location: Zoom**

**Panelists:**

David Murphy, PE, CFM, SLR (previously MMI)

Noah Slovin, CFM, SLR (previously MMI)

**Attendees:**

**Meeting Summary:**

Noah Slovin and David Murphy from SLR Consulting (previously MMI) conducted the meeting. Topics covered included:

- A review of hazard mitigation planning
- A review of hazards covered in the planning process, including climate change impacts and specific challenges identified through the planning process
- A review of different mitigation approaches and project types
- A summary of the NVCOG Hazard Mitigation Plan Update contents and structure
- A review of comments received through public input
- A summary of municipal hazard mitigation action items included in the HMP
- Steps to adoption of the plan

No public comments were received



# HAZARD MITIGATION PLAN UPDATE NAUGATUCK VALLEY REGION

## *Public Information Meeting*



**Presented by:**  
**SLR Consulting**  
David Murphy, PE, CFM  
Noah Slovin, CFM



August 4, 2021



1

## MEETING TOPICS

- What is a Hazard Mitigation Plan?
- Public Feedback
- Mitigation Actions
- Next Steps

2



# What is a Hazard Mitigation Plan?

Developing Community Capacities to Reduce Risks from Natural Hazards

3

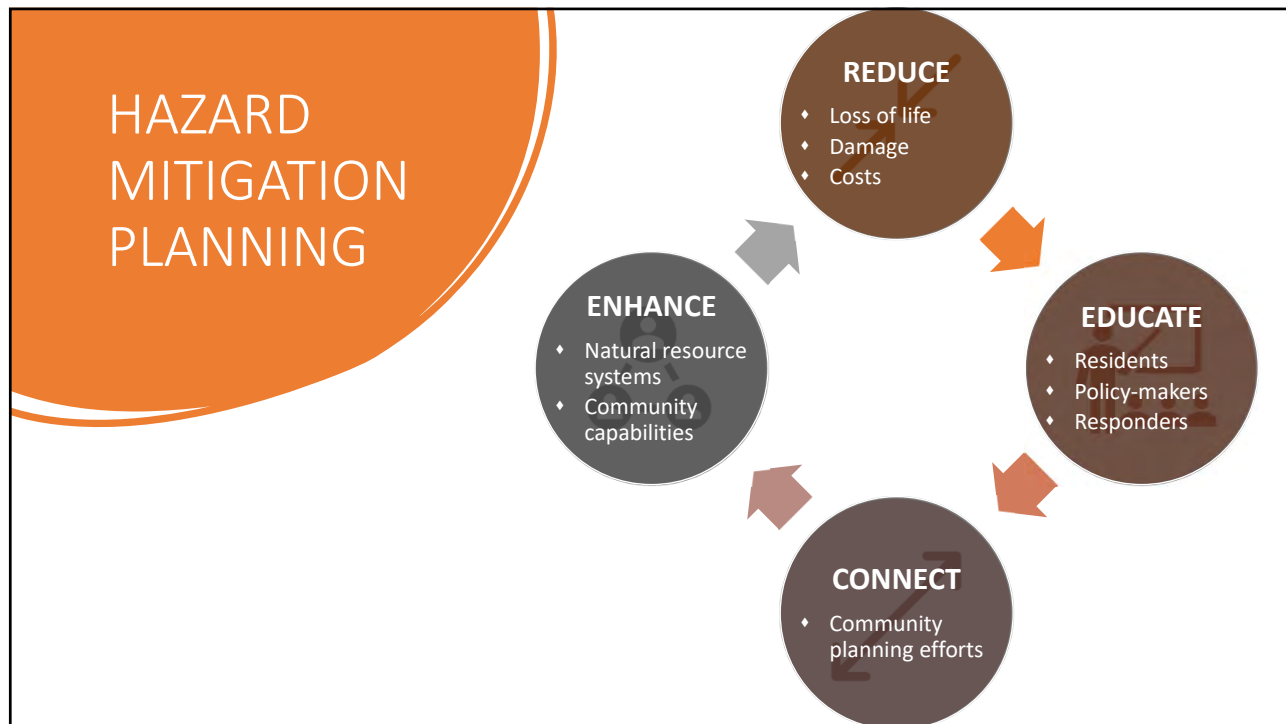
## HAZARD MITIGATION PLANNING

- **What is a Natural Hazard?**
  - An extreme natural event that poses a risk to people, infrastructure, and resources.
- **What is Hazard Mitigation?**
  - Actions we take now that reduce or eliminate long-term risk to people, property, and resources from natural hazards and their effects.

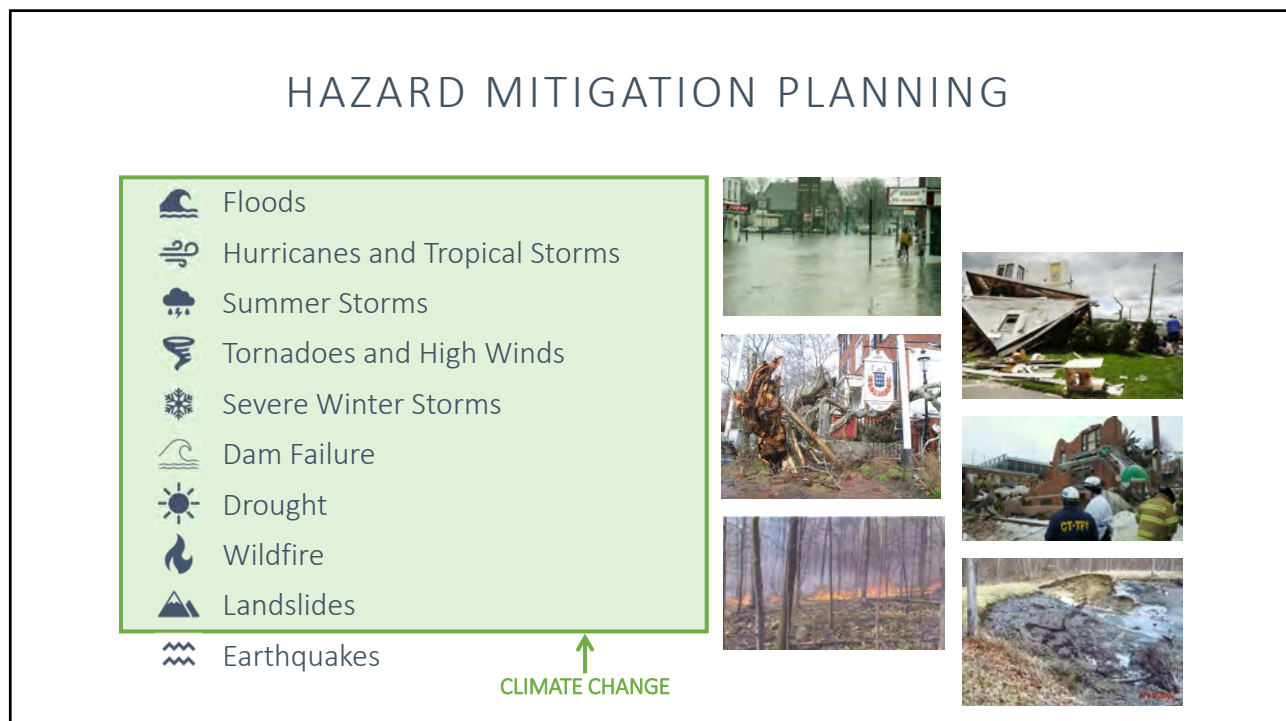


4












5



6



## HAZARD MITIGATION PLANNING Climate Change Impacts

-  Riverine flood and erosion risks increase; more intense precipitation
-  More atmospheric heat energy may lead to more intense hurricanes, tornadoes, and other wind events
-  Snow may be heavier, though season will be shorter
-  More severe precipitation events may cause more dam failure
-  Flashy droughts will become more frequent
-  Wildfires may become more severe
-  More intense precipitation may cause more landslides

7

## HAZARD MITIGATION PLANNING STRATEGIES AND ACTIONS



Structural Project

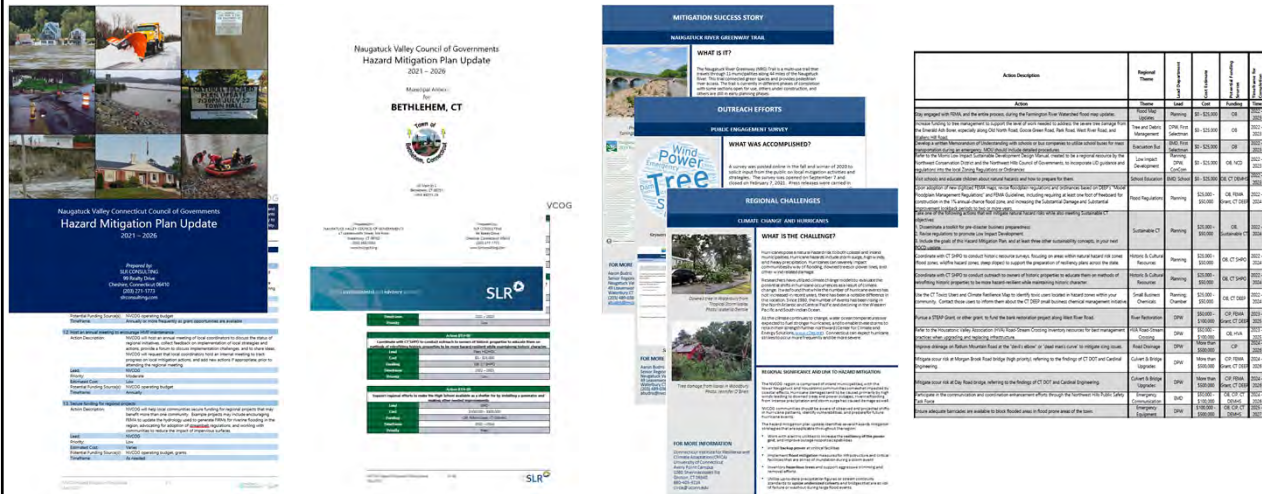


Property Protection

8



# HAZARD MITIGATION PLANNING PLAN STRUCTURE



9

# Public Comments

Received During the Planning Process

10



## Public Input Opportunities

- **Public Survey**
- **Virtual Public Workshops**
- **Community Meetings:** Planning & Zoning Commissions
- **Story Map**

11

## Priority Actions



RESILIENT POWER GRID



UPGRADE INFRASTRUCTURE



IDENTIFY RISK AREAS



ASSIST VULNERABLE RESIDENTS



COORDINATE STATE &amp; LOCAL RESPONSE



EDUCATION &amp; OUTREACH

12



## Priority Actions

- Identification of Risk Areas
- Protecting Power Lines from Trees and Wind
- Emergency Response & Floodplain Management Training for Municipal Staff



13

# Mitigation Actions

## Review of Actions in Draft Documents

14



## NEW HAZARD MITIGATION ACTIONS

Actions identified by municipal staff in summer 2020 meetings



Actions from state and regional initiatives



Actions identified through public outreach



15

## TOP ACTIONS

- Culverts, Bridges, Drainage
- Dam Safety
- Emergency Response & Access
- Administrative Capacity
- Studies
- Wildfire Risk Reduction

THEME	Number of Actions	Communities Implementing
Drainage	27	12
Dam Safety	25	10
Critical Facility Protection	20	11
Backup Power	19	10
Culvert & Bridge Upgrades	19	10
Evacuation & Access	18	9
Administration, Enforcement, & Maintenance	11	8
Study	10	7
Wildfire Risk Reduction	10	7
Acquisition & Open Space	9	6
Landslide Mitigation	9	4
Public Education & Engagement	9	8
Emergency Response, Alerts, & Communication	8	6

16



# REGIONAL AND STATE INITIATIVES

- FEMA Map Updates: Farmington River & Housatonic River Basins
- Historic Resources: Outreach and Surveys
- Repetitive Loss Properties: Validate Lists and Make Contact
- State Building Code & Flood Regulations
- Small Businesses Chemical Management: ID Toxic Users in Hazard Zones
- “Sustainable CT”: register and act
- *Resilient Connecticut Program*
- Low Impact Development (LID) Handbook for Rural Communities



17

## Next Steps

18





## Next Steps

- Draft posted on the NVCOG website Aug 5
- Review your community's annex in the next two weeks
- Focus on mitigation actions
- Share your thoughts to [nslovin@slrconsulting.com](mailto:nslovin@slrconsulting.com)
- Draft plan will be sent to the State in mid-August, for review by FEMA in late August
- Municipalities will adopt the plan in fall 2021



Record of Local Public Meetings  
Held During Municipal Commission Meetings



David Murphy presented a set of slides to the Beacon Falls Planning and Zoning Commission during its regular meeting of March 18, 2021. Commission members and other attendees did not have any comments or questions.



David Murphy presented a set of slides to the Derby Planning and Zoning Commission during its regular meeting of March 16, 2021. A brief discussion occurred after the presentation.

- Commission members are very concerned about detention basin maintenance in Derby. In fact, the item is coming up late on this meeting agenda. One of the prior actions is about a basin that may contribute to flooding.
- Commission members asked who can apply for grants. David explained that the local coordinator would typically watch for grant opportunities. Andrew Baklik noted that a new individual may be nominated to be the local coordinator.



David Murphy presented a set of slides to the Naugatuck Planning Commission during its regular meeting of February 1, 2021. A brief discussion occurred after the presentation.

- One member of the commission asked, aside from FEMA maps, what other risk maps are available? David explained that numerous map products are available for events like floods and wildfires, but accurate wind/power outage maps are not available.
- Another member followed up that question with a statement that United Illuminating provides maps of areas that have been subject to tree trimming overlaid with power outages. He would like to see similar mapping for Naugatuck.
- At the end of the discussion, David noted that Naugatuck was also a key community the CIRCA's Resilient Connecticut program due to its TOD potential.



David Murphy presented a set of slides to the Plymouth Planning and Zoning Commission during its regular meeting of December 10, 2020. A brief discussion occurred after the presentation.

- One member of the commission indicated that he would have some comments and edits for the Plymouth section of the plan, given his involvement with emergency management. He served as a CERT coordinator in the past.
- Plymouth does not current have a CERT team.



David Murphy presented a set of slides to the Thomaston Planning and Zoning Commission during its regular meeting of March 3, 2021. A brief discussion occurred after the presentation.

- Stacey asked for a copy of the presentation for the commission members.
- Commission members discussed some of the prior actions:
  - Action #1 – the web site could possibly be improved.
  - Action #2 – A pumping station generator may have been installed during a recent upgrade; this should be checked.
  - Action #3 – Reverse 911 may be used; this should be checked.
  - Action #10 – Attendees asked whether this action (“Conduct an evaluation of Northfield Brook to determine if maintenance is required to prevent potential flooding impacts”) was needed. David recommended changing it to be more holistic. Stacey will check on this.
  - Action #20 – Attendees noted that the Town does not own many dams. The Northfield Pond dike is partly in Litchfield.
- David asked if attendees had ideas for new actions. Some ideas included:
  - Bolster resources and infrastructure for shelters.
  - Develop evacuation plan.
- Dry hydrants cannot be installed without new funding sources.



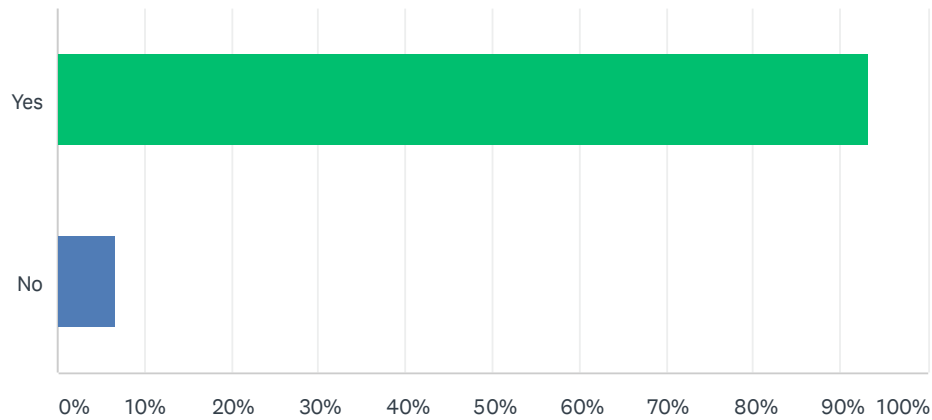
David Murphy presented a set of slides to the Waterbury City Plan Commission during its regular meeting of March 10, 2021. A brief discussion occurred after the presentation.

- Aaron placed the NVCOG link in the chat box.
- Ray Work noted that eligibility for funding is the first step in accessing mitigation funds.
- The commission members thanked NVCOG for the presentation.



## Q1 Do you live (full- or part- time), own property, work, or study in one of the NVCOG-member communities (see map above)?

Answered: 15 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	93.33%	14
No	6.67%	1
TOTAL		15



Q2 Thank you for your interest in this survey! This abbreviated survey is available to those who do not live (full or part time), own property, work, or attend school in the NVCOG region. A more detailed survey is available to those who do fit that description. If you believe you were mistakenly directed to this abbreviated survey, please scroll to the bottom of this page and select the "Previous" button.

Answered: 0   Skipped: 17

 No matching responses.

ANSWER CHOICES	RESPONSES	
This was a mistake, I'll go back.	0.00%	0
This is where I want to be.	0.00%	0
TOTAL		0



### Q3 Please describe your connection to the NVCOG Region.

Answered: 0   Skipped: 17

#	RESPONSES	DATE
	There are no responses.	



## Q4 How have Natural Hazards in the NVCOG Region impacted you?

Answered: 0   Skipped: 17

#	RESPONSES	DATE
	There are no responses.	



## Q5 What ideas or suggestions do you have with regard to natural hazard mitigation in the NVCOG region?

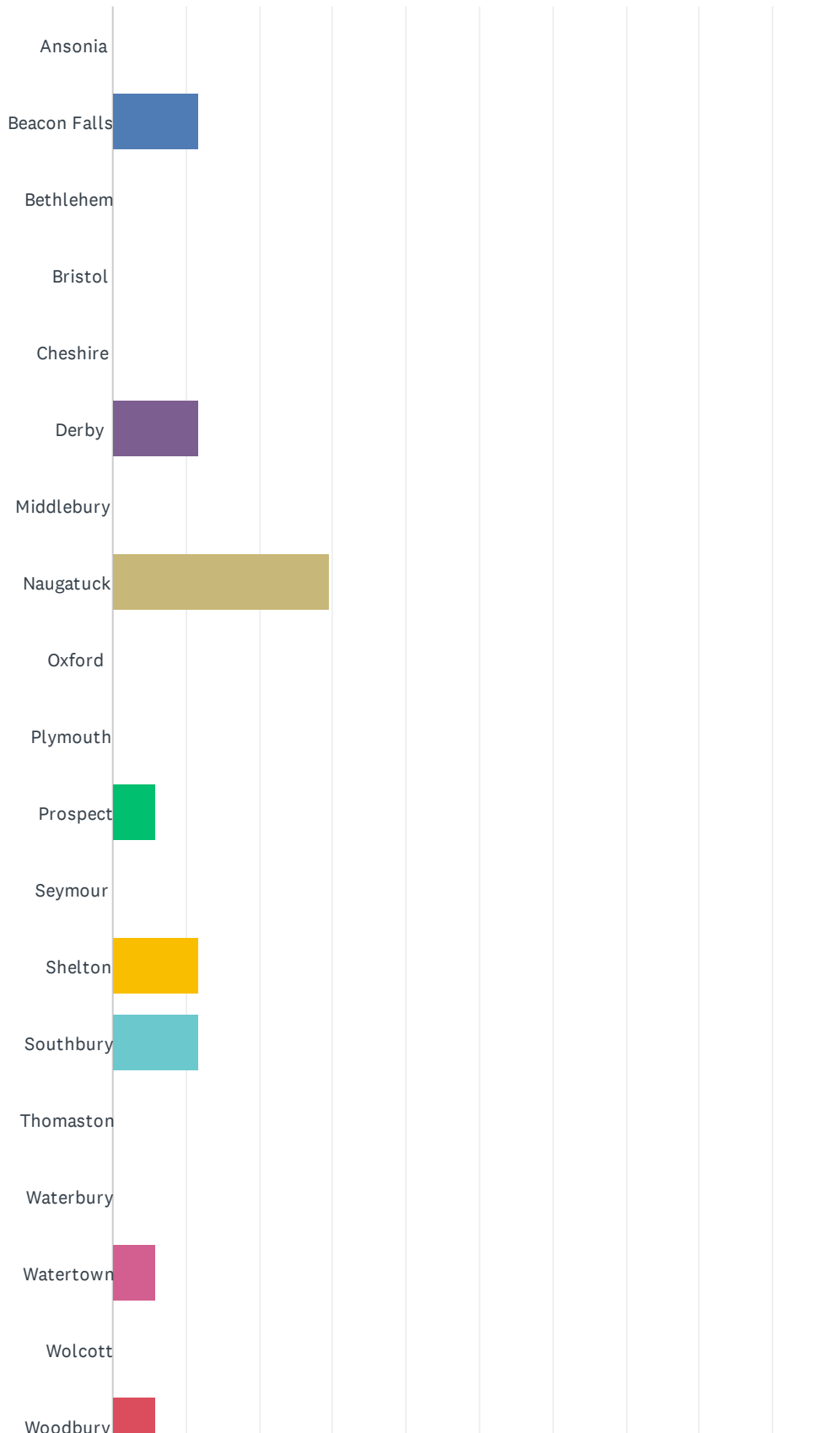
Answered: 0   Skipped: 17

#	RESPONSES	DATE
	There are no responses.	

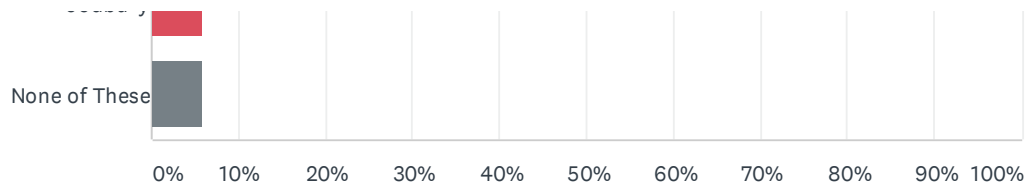


# Q6 In which community do you live (full- or part-time) or own property?

Answered: 17 Skipped: 0







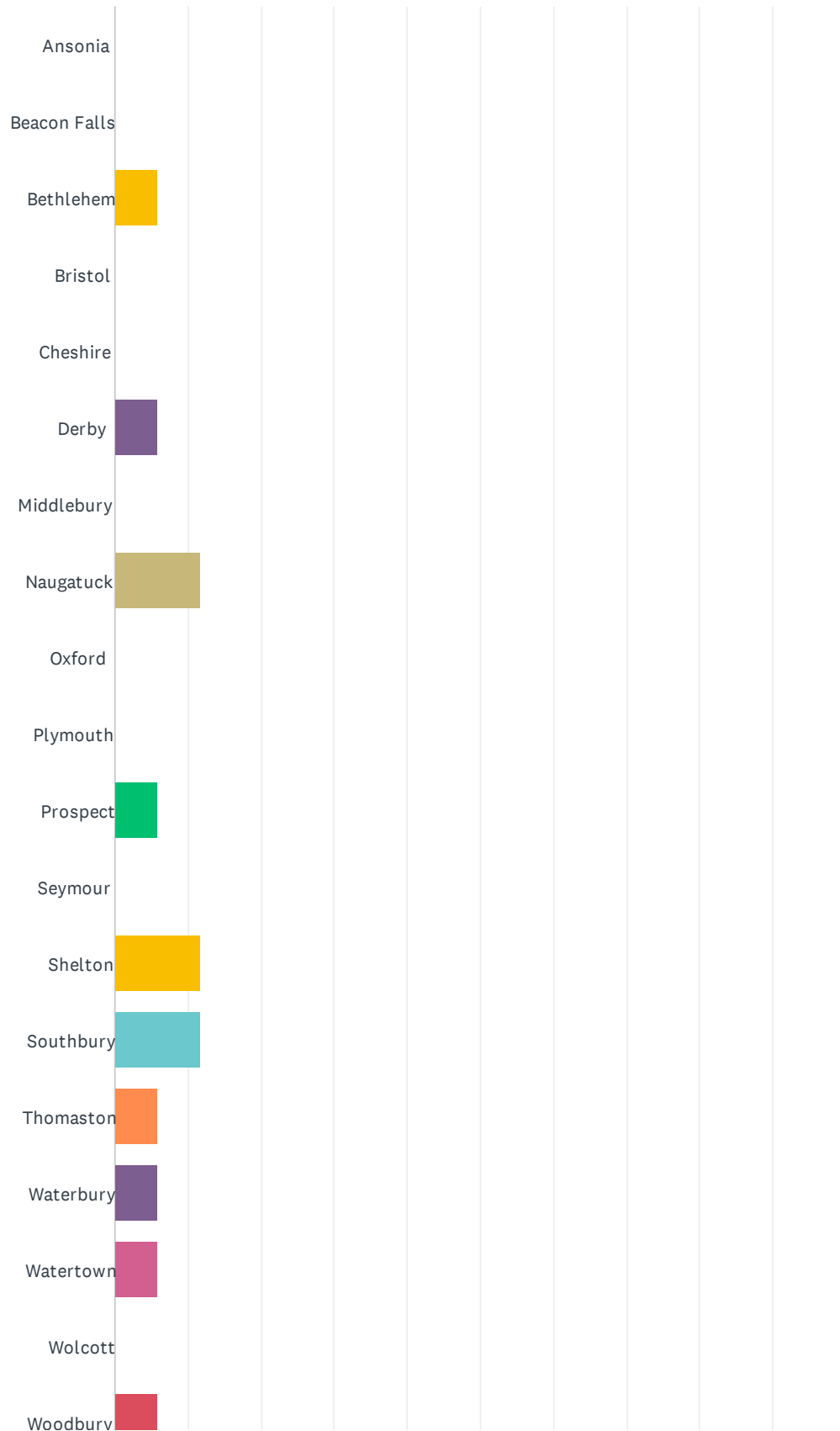
ANSWER CHOICES	RESPONSES
Ansonia	0.00% 0
Beacon Falls	11.76% 2
Bethlehem	0.00% 0
Bristol	0.00% 0
Cheshire	0.00% 0
Derby	11.76% 2
Middlebury	0.00% 0
Naugatuck	29.41% 5
Oxford	0.00% 0
Plymouth	0.00% 0
Prospect	5.88% 1
Seymour	0.00% 0
Shelton	11.76% 2
Southbury	11.76% 2
Thomaston	0.00% 0
Waterbury	0.00% 0
Watertown	5.88% 1
Wolcott	0.00% 0
Woodbury	5.88% 1
None of These	5.88% 1
<b>TOTAL</b>	<b>17</b>

#	NONE OF THESE	DATE
1	I live outside of the region.	12/22/2020 4:23 PM

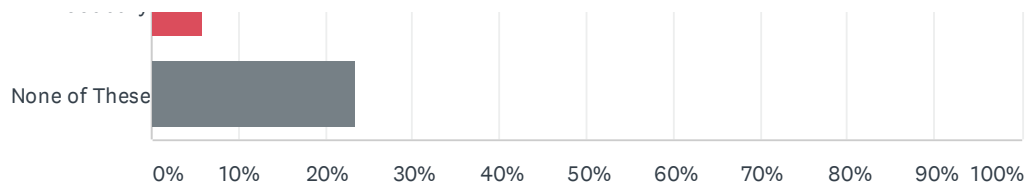


## Q7 In which community do you work or attend school?

Answered: 17 Skipped: 0







ANSWER CHOICES	RESPONSES
Ansonia	0.00% 0
Beacon Falls	0.00% 0
Bethlehem	5.88% 1
Bristol	0.00% 0
Cheshire	0.00% 0
Derby	5.88% 1
Middlebury	0.00% 0
Naugatuck	11.76% 2
Oxford	0.00% 0
Plymouth	0.00% 0
Prospect	5.88% 1
Seymour	0.00% 0
Shelton	11.76% 2
Southbury	11.76% 2
Thomaston	5.88% 1
Waterbury	5.88% 1
Watertown	5.88% 1
Wolcott	0.00% 0
Woodbury	5.88% 1
None of These	23.53% 4
<b>TOTAL</b>	<b>17</b>

#	NONE OF THESE	DATE
1	Retired	2/7/2021 6:20 PM
2	Hamden	2/7/2021 4:17 PM
3	My husband and I work out of town. Our youngest child attends school in Beacon Falls while our eldest attends a Tech HS out of town	11/11/2020 5:31 AM
4	Berlin	9/9/2020 5:51 PM



## Q8 Please enter your street of residence or place of business, or both (optional, can be approximate)

Answered: 15   Skipped: 2

ANSWER CHOICES	RESPONSES
Residence (Street Name, Town/City)	93.33% 14
Place of Business (Street Name, Town/City)	66.67% 10

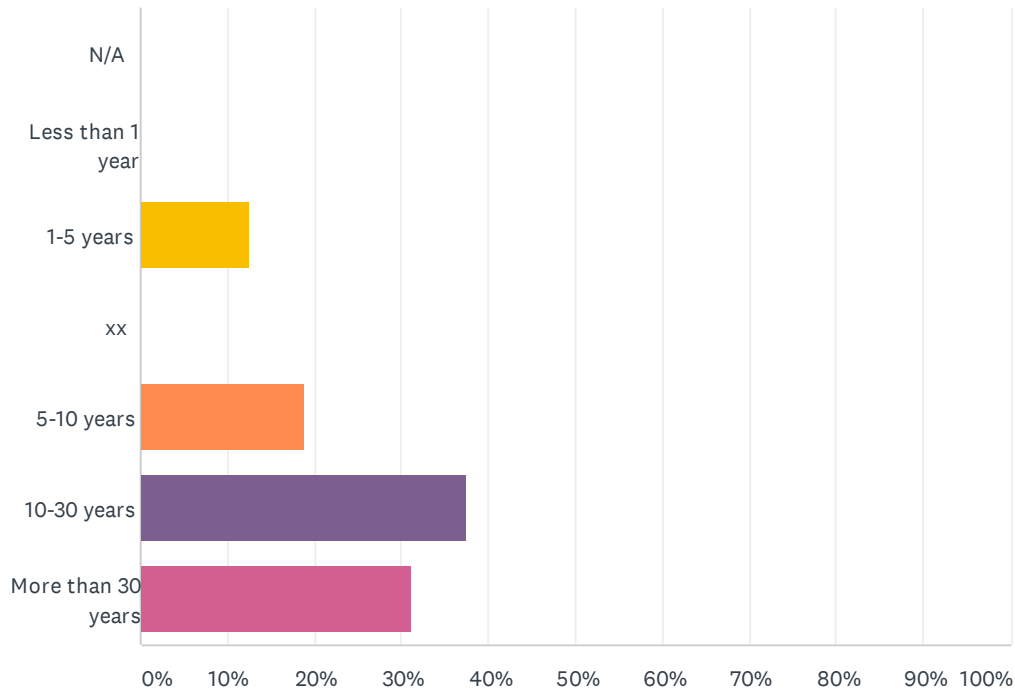
#	RESIDENCE (STREET NAME, TOWN/CITY)	DATE
1	18 MCCONNEY GROVE	2/7/2021 6:56 PM
2	Wakeley Strett	2/7/2021 6:24 PM
3	Shelton	2/7/2021 6:20 PM
4	Stephen street, Derby	2/7/2021 4:17 PM
5	Cliff St., Naugatuck	2/5/2021 12:44 AM
6	Putting Green	2/5/2021 12:25 AM
7	490 Wooster St	1/19/2021 11:38 PM
8	Homestead Road, Southbury,CT	12/8/2020 9:49 PM
9	Heritage Village	11/25/2020 5:23 PM
10	36 Ash Swamp Rd	11/13/2020 6:34 PM
11	Burton rd, Beacon Falls	11/11/2020 5:31 AM
12	School st, naugatuck	11/10/2020 6:10 PM
13	Rubber avenue	10/27/2020 1:26 PM
14	Andrew Mountain Road, Naugatuck	9/11/2020 9:58 PM

#	PLACE OF BUSINESS (STREET NAME, TOWN/CITY)	DATE
1	Shelton	2/7/2021 6:24 PM
2	Shelton	2/7/2021 6:20 PM
3	Callender Rd., Watertown	2/5/2021 12:44 AM
4	Prospect	2/5/2021 12:25 AM
5	229 Church St	1/19/2021 11:38 PM
6	158 Main Street, Thomaston, CT 06787	12/22/2020 4:23 PM
7	295 Main Street South	11/13/2020 6:34 PM
8	Hartford	11/11/2020 5:31 AM
9	Main st, derby	11/10/2020 6:10 PM
10	Leavenworth Street, Waterbury	9/11/2020 9:58 PM



## Q9 For how many years have you lived or worked in the Region?

Answered: 16 Skipped: 1

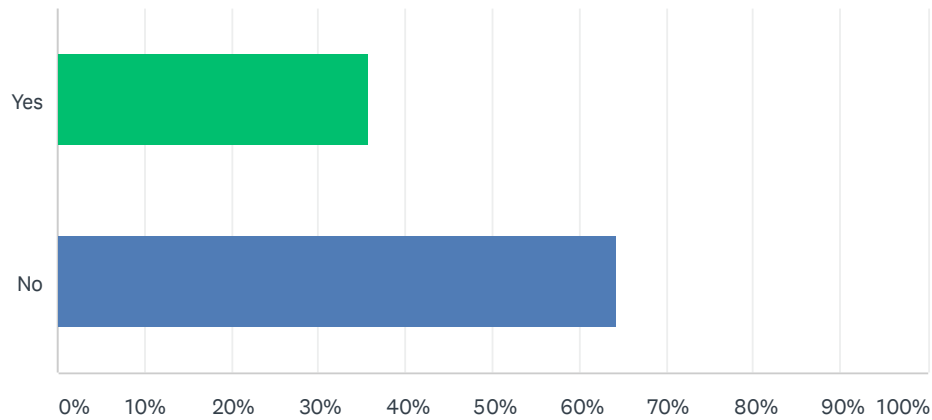


ANSWER CHOICES	RESPONSES	
N/A	0.00%	0
Less than 1 year	0.00%	0
1-5 years	12.50%	2
xx	0.00%	0
5-10 years	18.75%	3
10-30 years	37.50%	6
More than 30 years	31.25%	5
<b>TOTAL</b>		<b>16</b>



## Q10 Did you know that the community where you live or work is covered by a Hazard Mitigation Plan?

Answered: 14 Skipped: 3

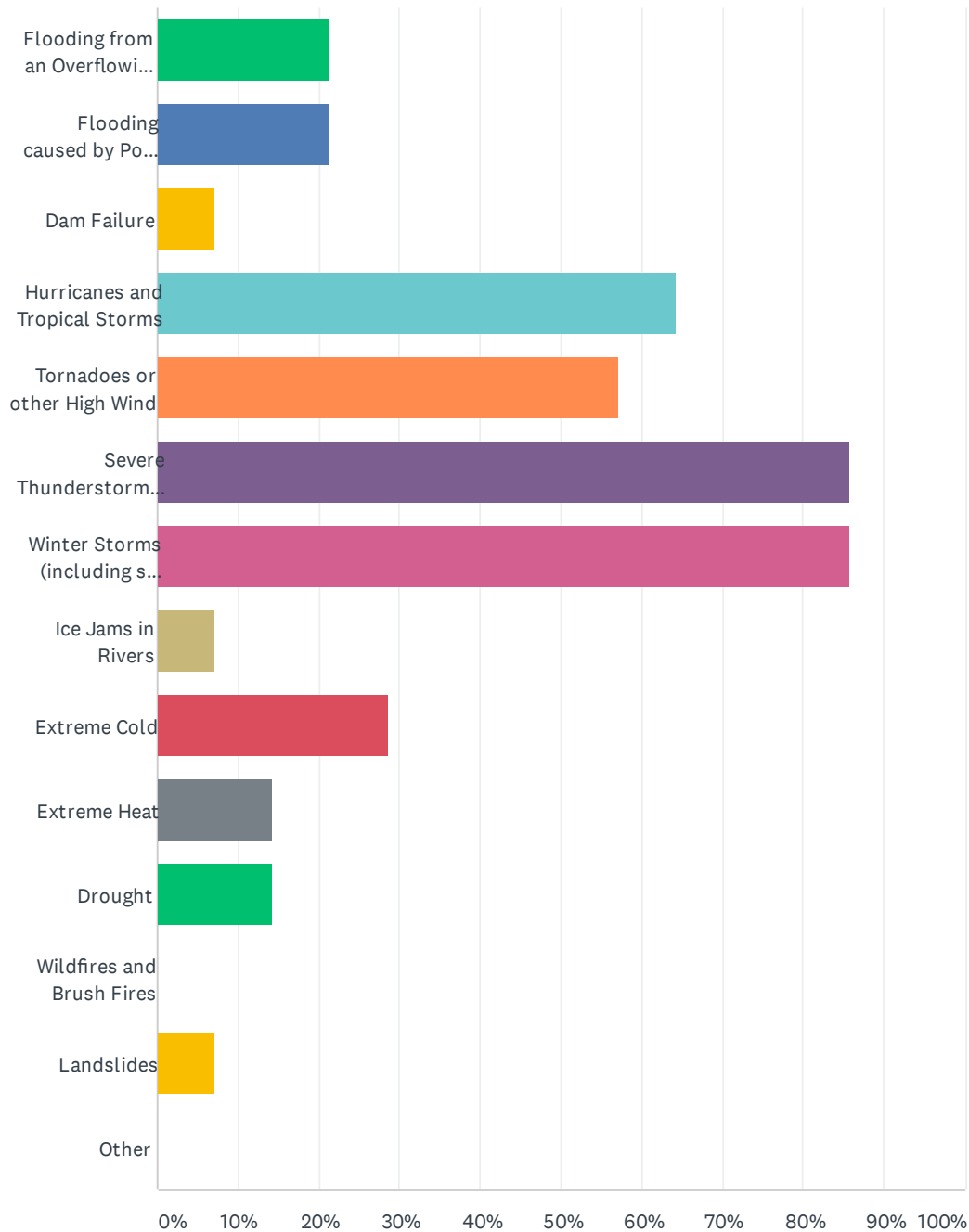


ANSWER CHOICES	RESPONSES	
Yes	35.71%	5
No	64.29%	9
TOTAL		14



## Q11 Which of the following natural hazards have affected you or your NVCOG home or place of work/study?

Answered: 14 Skipped: 3





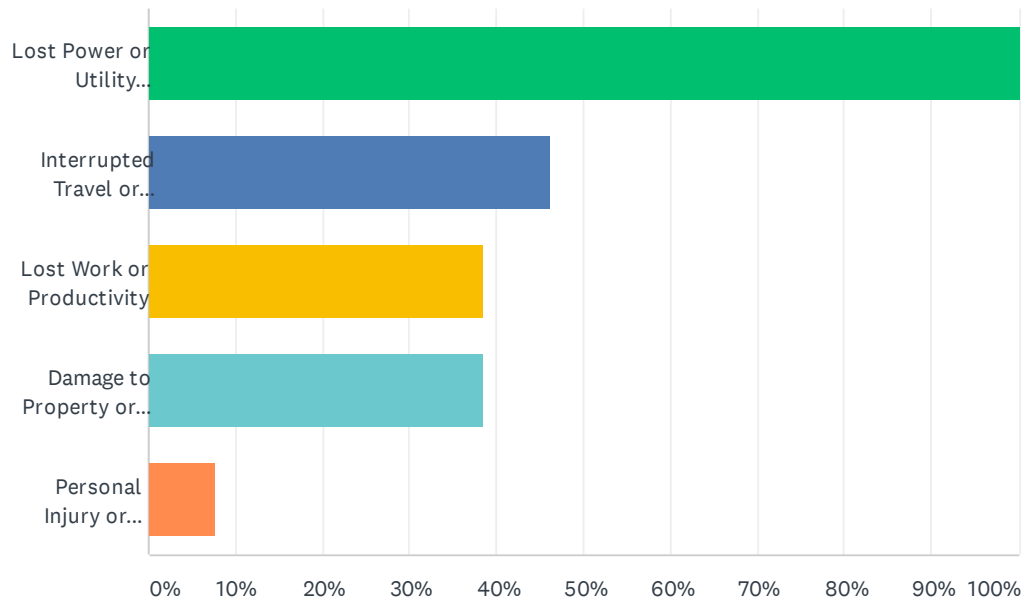
ANSWER CHOICES	RESPONSES	
Flooding from an Overflowing River or Lake	21.43%	3
Flooding caused by Poor Drainage or Ponding on Streets	21.43%	3
Dam Failure	7.14%	1
Hurricanes and Tropical Storms	64.29%	9
Tornadoes or other High Wind	57.14%	8
Severe Thunderstorms (including wind, hail, and lightning)	85.71%	12
Winter Storms (including snow or ice) and Blizzards	85.71%	12
Ice Jams in Rivers	7.14%	1
Extreme Cold	28.57%	4
Extreme Heat	14.29%	2
Drought	14.29%	2
Wildfires and Brush Fires	0.00%	0
Landslides	7.14%	1
Other	0.00%	0
Total Respondents: 14		

#	PLEASE PROVIDE DETAILS IF YOU WISH:	DATE
1	Landslides because we're on a large hill with houses directly behind us @ a higher elevation, with adjoining land; run off is a concern	11/11/2020 5:38 AM



## Q12 In what way have natural hazards affected you or your NVCOG home or place of work/study?

Answered: 13 Skipped: 4



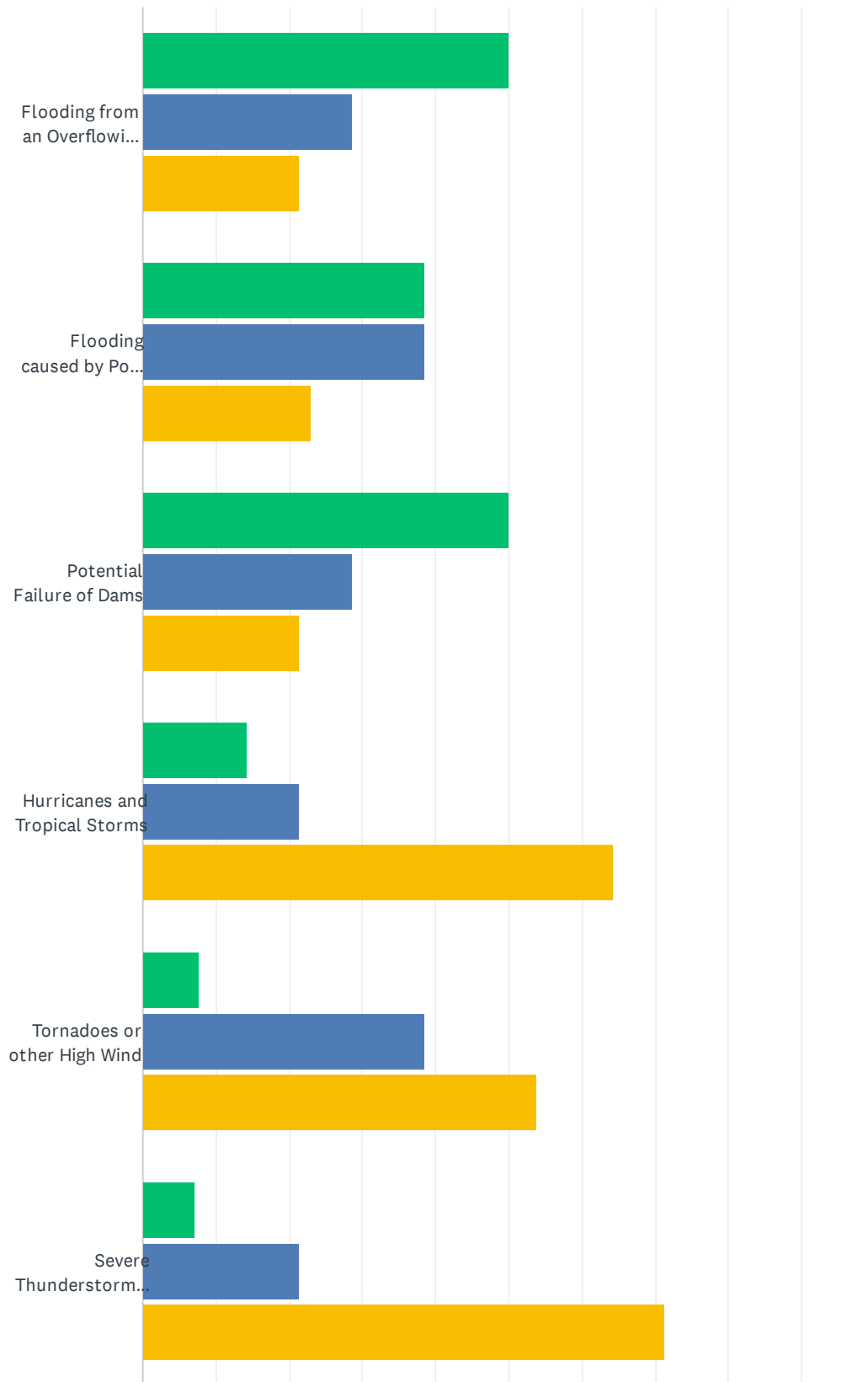
ANSWER CHOICES	RESPONSES	
Lost Power or Utility Services	100.00%	13
Interrupted Travel or Access	46.15%	6
Lost Work or Productivity	38.46%	5
Damage to Property or Assets	38.46%	5
Personal Injury or Health Impacts	7.69%	1
Total Respondents: 13		

#	PLEASE DESCRIBE ANY SPECIFIC DETAILS.	DATE
1	Wind storm brought down trees during various storms.. wind, snow etc	2/7/2021 6:26 PM
2	Ice Dams caused extensive damage to our antique home and business	11/25/2020 5:26 PM
3	Tornado of 2018 - lost power, tree blocked our driveway and parts of our road. More storms with high winds and downed trees over the last several years have caused power outages too many times ( we bought a generator as my mother, who lives with us was on oxygen)	11/11/2020 5:38 AM

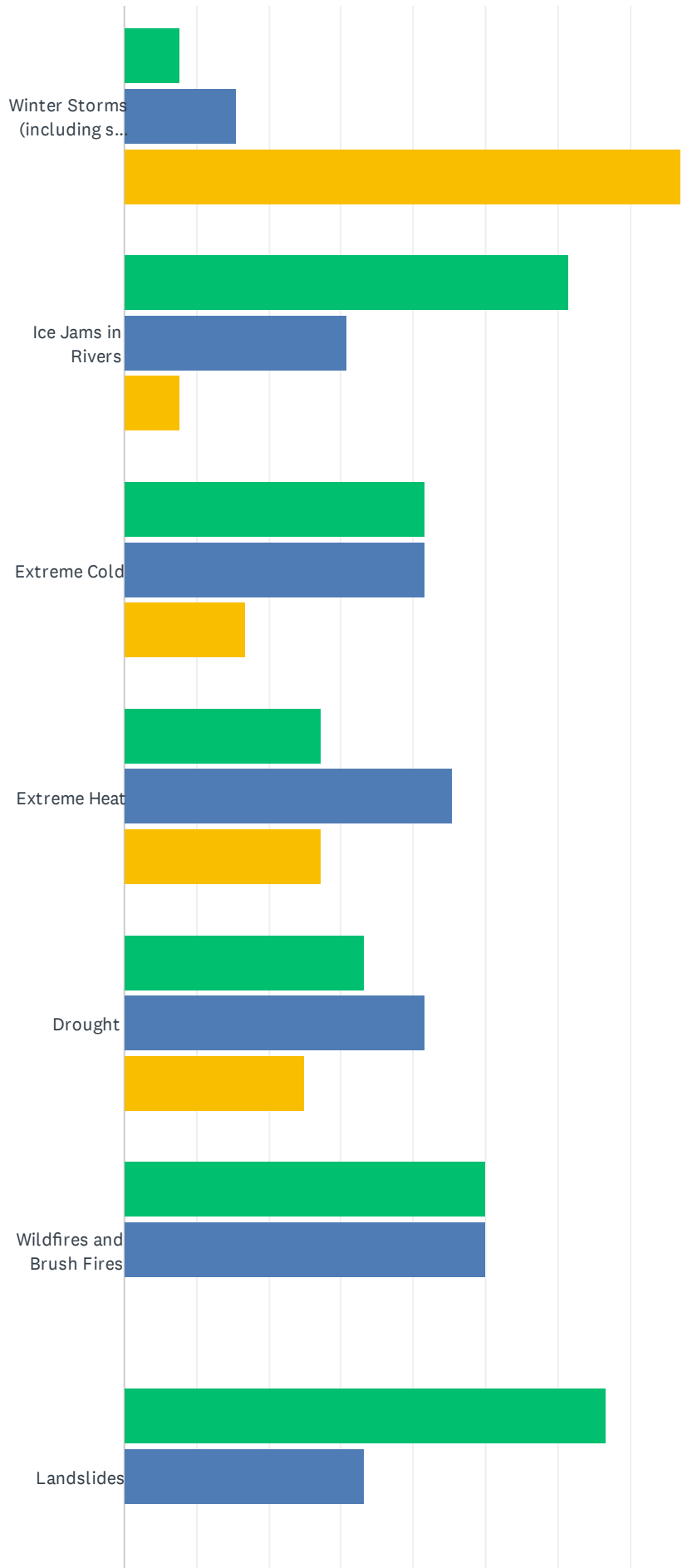


## Q13 How concerned are you about each of those hazards happening in the NVCOG region in the future?

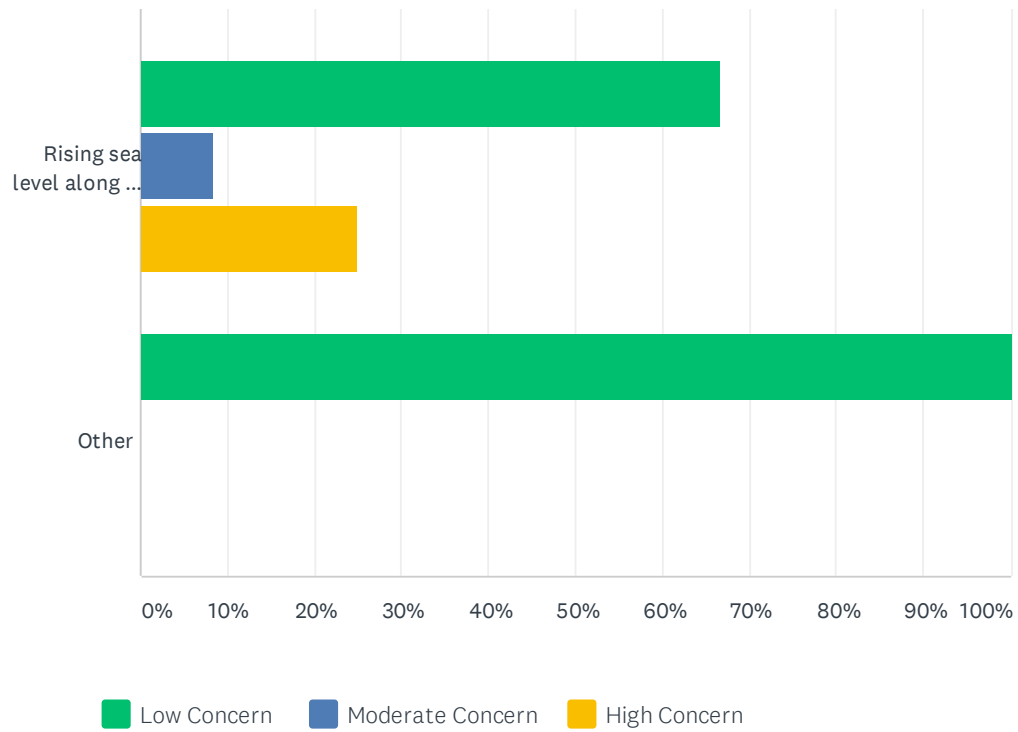
Answered: 14 Skipped: 3













	LOW CONCERN	MODERATE CONCERN	HIGH CONCERN	TOTAL	WEIGHTED AVERAGE
Flooding from an Overflowing River or Lake	50.00% 7	28.57% 4	21.43% 3	14	1.71
Flooding caused by Poor Drainage or Ponding on Streets	38.46% 5	38.46% 5	23.08% 3	13	1.85
Potential Failure of Dams	50.00% 7	28.57% 4	21.43% 3	14	1.71
Hurricanes and Tropical Storms	14.29% 2	21.43% 3	64.29% 9	14	2.50
Tornadoes or other High Wind	7.69% 1	38.46% 5	53.85% 7	13	2.46
Severe Thunderstorms (including wind, hail, and lightning)	7.14% 1	21.43% 3	71.43% 10	14	2.64
Winter Storms (including snow or ice) and Blizzards	7.69% 1	15.38% 2	76.92% 10	13	2.69
Ice Jams in Rivers	61.54% 8	30.77% 4	7.69% 1	13	1.46
Extreme Cold	41.67% 5	41.67% 5	16.67% 2	12	1.75
Extreme Heat	27.27% 3	45.45% 5	27.27% 3	11	2.00
Drought	33.33% 4	41.67% 5	25.00% 3	12	1.92
Wildfires and Brush Fires	50.00% 6	50.00% 6	0.00% 0	12	1.50
Landslides	66.67% 8	33.33% 4	0.00% 0	12	1.33
Rising sea level along the Housatonic below Derby Dam	66.67% 8	8.33% 1	25.00% 3	12	1.58
Other	100.00% 2	0.00% 0	0.00% 0	2	1.00

#	PLEASE PROVIDE DETAILS IF YOU WISH:	DATE
1	Flooding and restricted travel due old culvert design	11/25/2020 5:26 PM



**Q14 Are any specific areas of your community vulnerable to any of the above hazards? If so, please list them by location. Please use street intersections or landmarks to describe locations, and include the Town/City.**

Answered: 3 Skipped: 14

ANSWER CHOICES	RESPONSES
Location 1	100.00% 3
Location 2	66.67% 2
Location 3	0.00% 0
Location 4	0.00% 0
Additional Locations	0.00% 0

#	LOCATION 1	DATE
1	The Maples, Shelton	2/7/2021 6:23 PM
2	Intersection of Main Street North and South	11/25/2020 5:26 PM
3	Hopbrook lake	11/10/2020 6:12 PM

#	LOCATION 2	DATE
1	Birchbank, Shelton	2/7/2021 6:23 PM
2	Breen field	11/10/2020 6:12 PM

#	LOCATION 3	DATE
	There are no responses.	

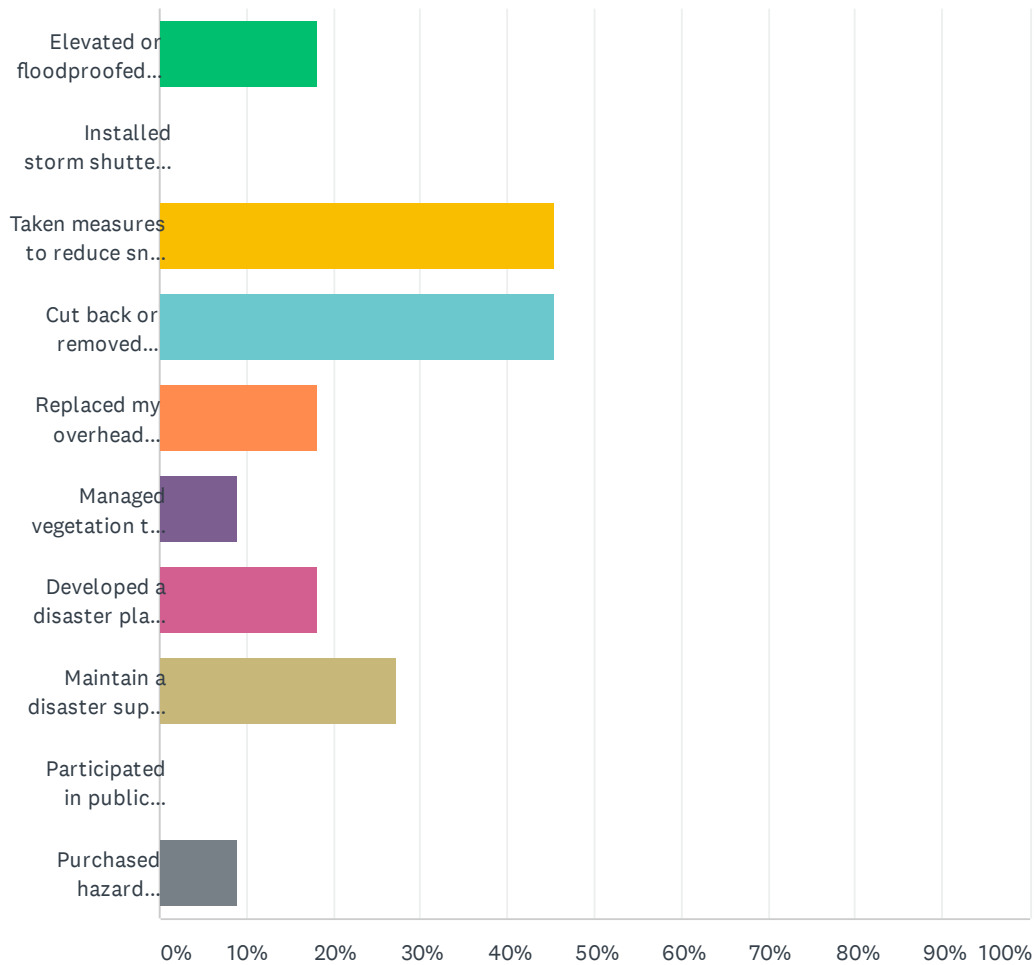
#	LOCATION 4	DATE
	There are no responses.	

#	ADDITIONAL LOCATIONS	DATE
	There are no responses.	



# Q15 Have you taken any of the following actions to protect your family, home, or business? Select all that apply.

Answered: 11 Skipped: 6





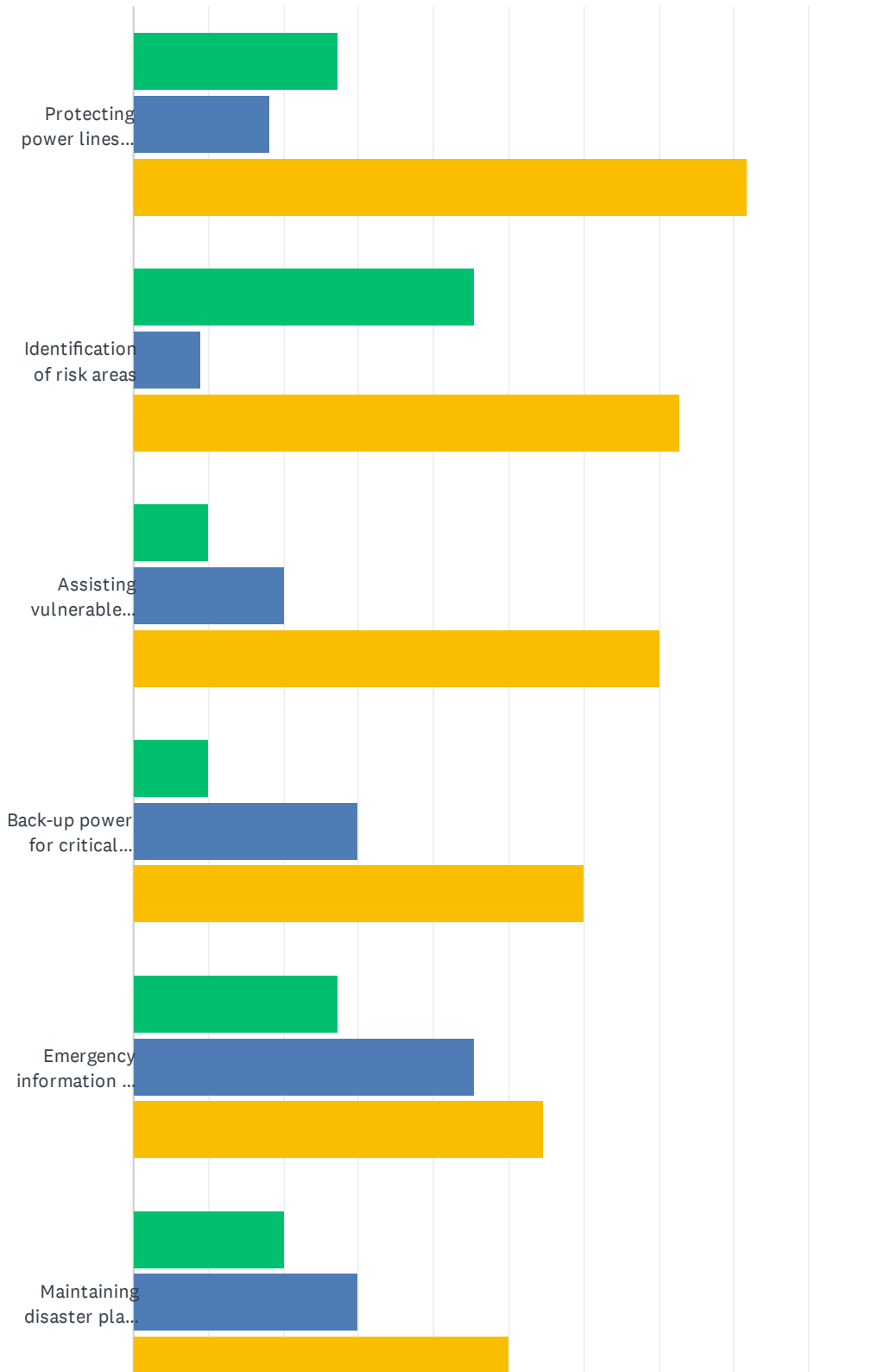
ANSWER CHOICES	RESPONSES	
Elevated or floodproofed to reduce flood damage	18.18%	2
Installed storm shutters or structural braces to reduce wind damage	0.00%	0
Taken measures to reduce snow build-up on roofs	45.45%	5
Cut back or removed vegetation from my overhead utility lines or roof	45.45%	5
Replaced my overhead utility lines with underground lines	18.18%	2
Managed vegetation to reduce risk of wildfire reaching my home or business	9.09%	1
Developed a disaster plan for my family, home, or business	18.18%	2
Maintain a disaster supply kit for my family, home, or business	27.27%	3
Participated in public meetings to discuss relevant plans and regulations	0.00%	0
Purchased hazard insurance (like flood insurance)	9.09%	1
Total Respondents: 11		

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

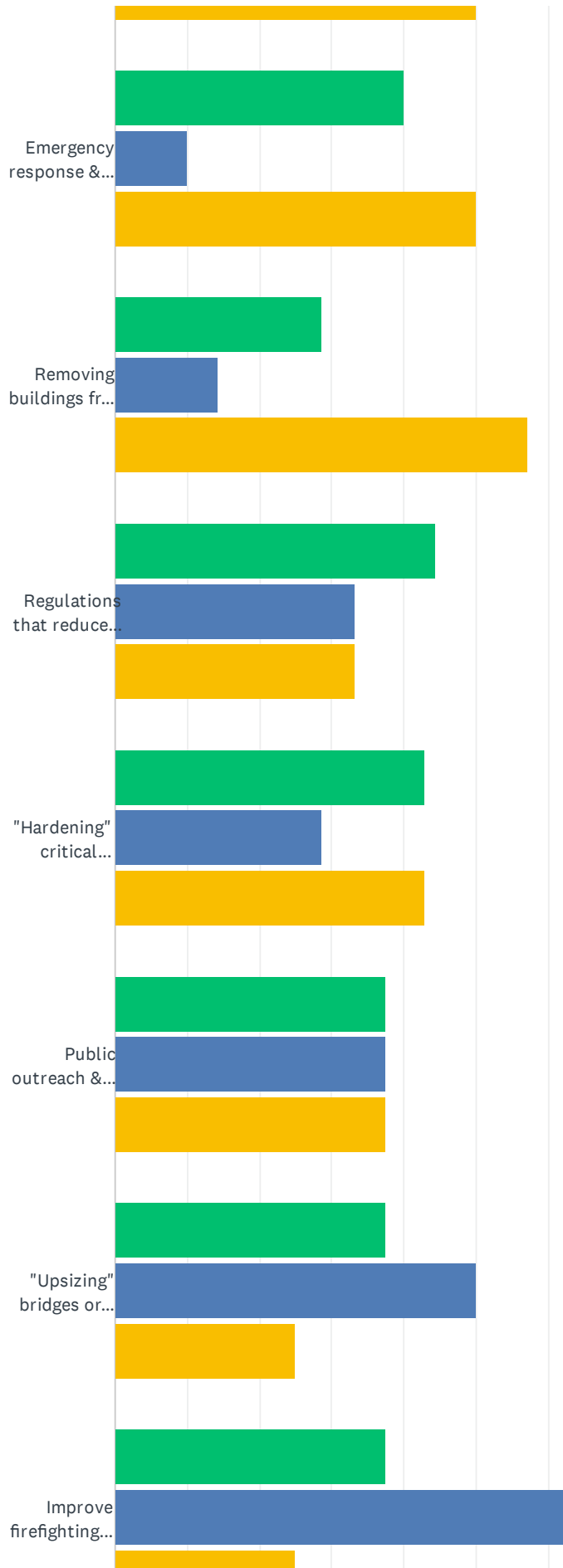


Q16 For each of the following hazard mitigation tools, check the columns you feel are true for your community. Select all that apply. You do NOT need to select a checkbox for every tool.

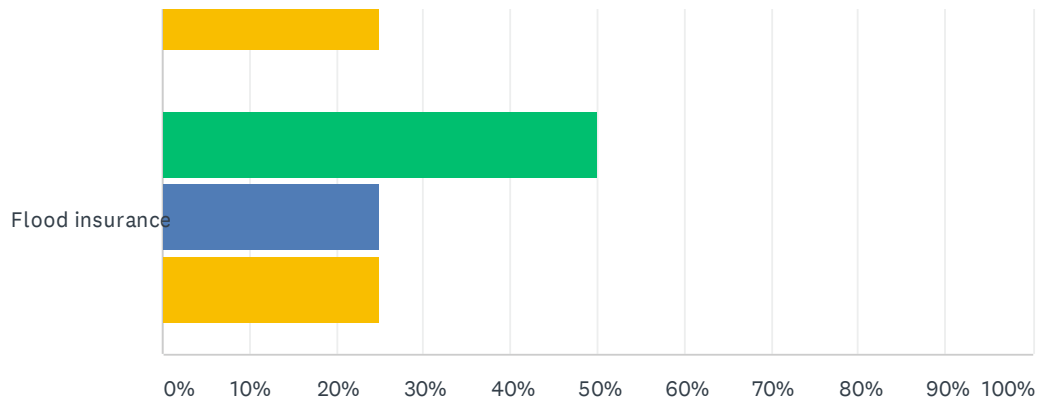
Answered: 12 Skipped: 5











■ Important to reduce risks
 ■ Has been used successfully in the past
 ■ Should be a priority moving forward

	IMPORTANT TO REDUCE RISKS	HAS BEEN USED SUCCESSFULLY IN THE PAST	SHOULD BE A PRIORITY MOVING FORWARD	TOTAL RESPONDENTS
Protecting power lines from trees and wind	27.27% 3	18.18% 2	81.82% 9	11
Identification of risk areas	45.45% 5	9.09% 1	72.73% 8	11
Assisting vulnerable populations	10.00% 1	20.00% 2	70.00% 7	10
Back-up power for critical facilities	10.00% 1	30.00% 3	60.00% 6	10
Emergency information and alerts	27.27% 3	45.45% 5	54.55% 6	11
Maintaining disaster plans & kits	20.00% 2	30.00% 3	50.00% 5	10
Emergency response & floodplain management training for municipal staff	40.00% 4	10.00% 1	50.00% 5	10
Removing buildings from risk areas	28.57% 2	14.29% 1	57.14% 4	7
Regulations that reduce risks	44.44% 4	33.33% 3	33.33% 3	9
"Hardening" critical facilities to make them less vulnerable	42.86% 3	28.57% 2	42.86% 3	7
Public outreach & education	37.50% 3	37.50% 3	37.50% 3	8
"Upsizing" bridges or stream culverts	37.50% 3	50.00% 4	25.00% 2	8
Improve firefighting capabilities	37.50% 3	62.50% 5	25.00% 2	8
Flood insurance	50.00% 2	25.00% 1	25.00% 1	4

#	OTHER (PLEASE SPECIFY)	DATE
---	------------------------	------



1

Evacuation resources like school.buses

11/10/2020 6:14 PM

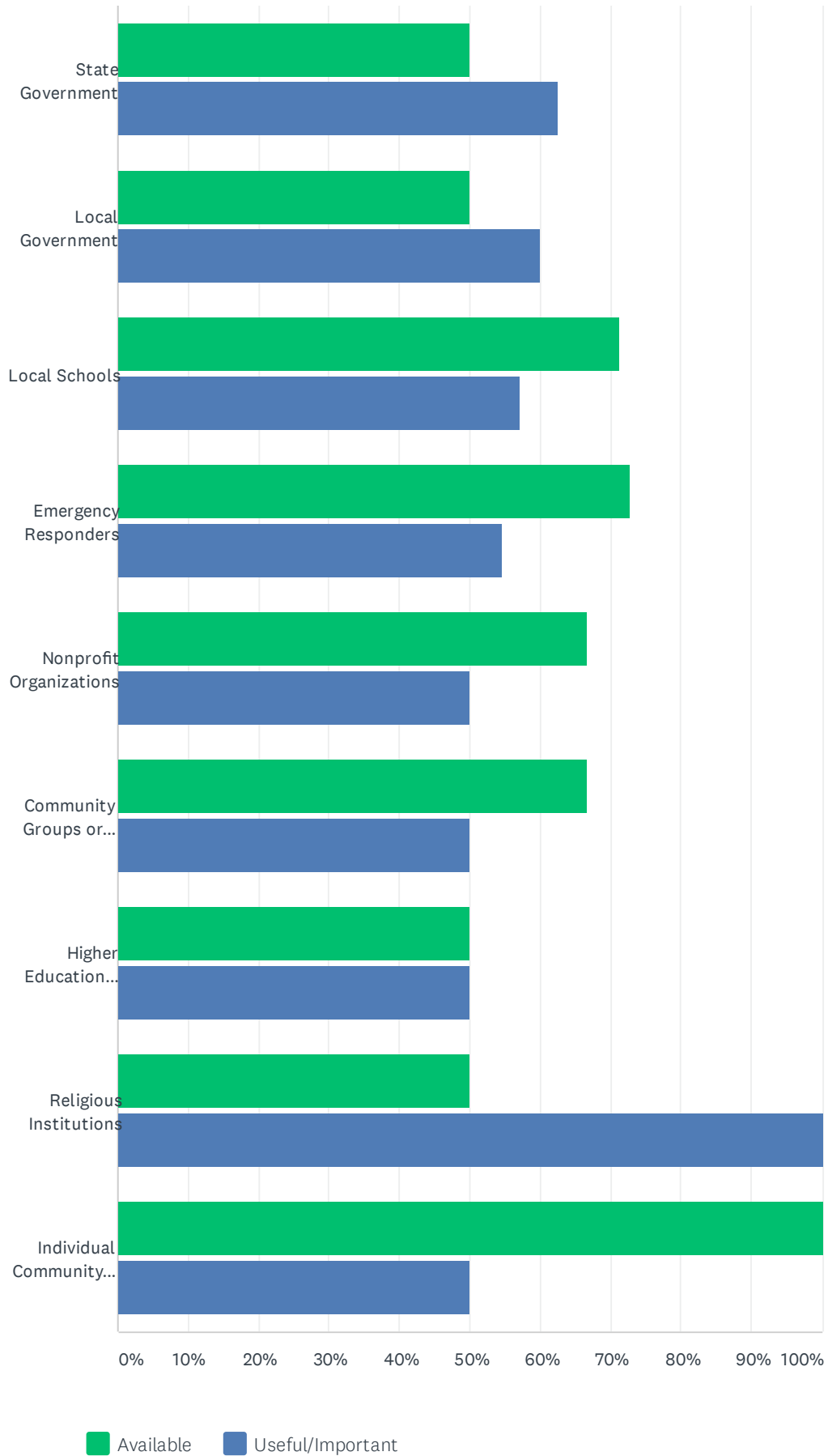
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Q17 What local resources are available to support or assist with hazard preparation, response, or recovery? What resources are or would be useful or important? Select all that apply. You do NOT need to select a checkbox for every resource.

Answered: 11   Skipped: 6







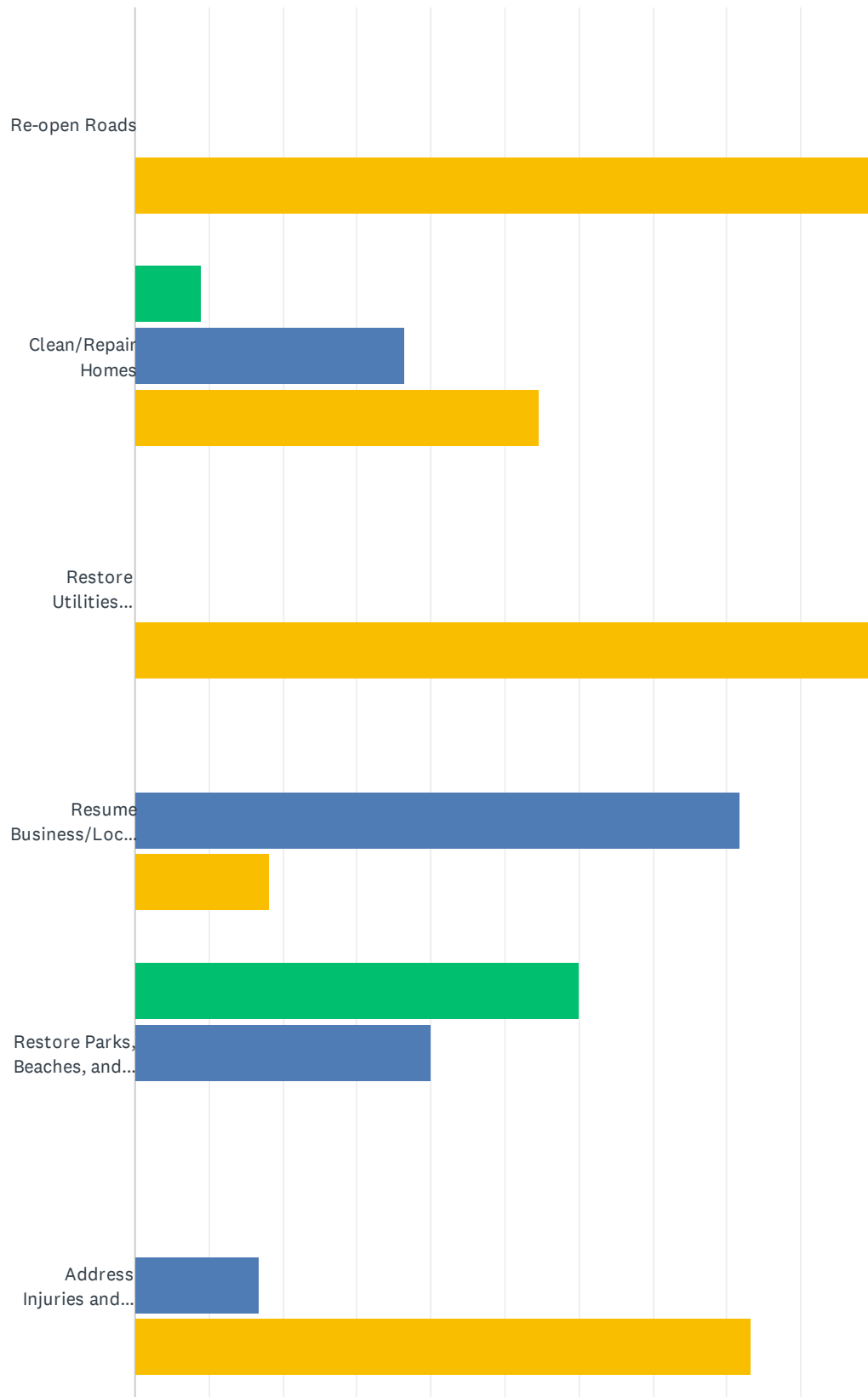
	AVAILABLE	USEFUL/IMPORTANT	TOTAL RESPONDENTS
State Government	50.00% 4	62.50% 5	8
Local Government	50.00% 5	60.00% 6	10
Local Schools	71.43% 5	57.14% 4	7
Emergency Responders	72.73% 8	54.55% 6	11
Nonprofit Organizations	66.67% 4	50.00% 3	6
Community Groups or Neighborhood Associations	66.67% 4	50.00% 3	6
Higher Education Institutions	50.00% 1	50.00% 1	2
Religious Institutions	50.00% 2	100.00% 4	4
Individual Community Members or Neighbors	100.00% 6	50.00% 3	6

#	COMMENTS	DATE
1	non-profit environmental groups (BOTR, PRWC, SLT)	11/25/2020 5:31 PM

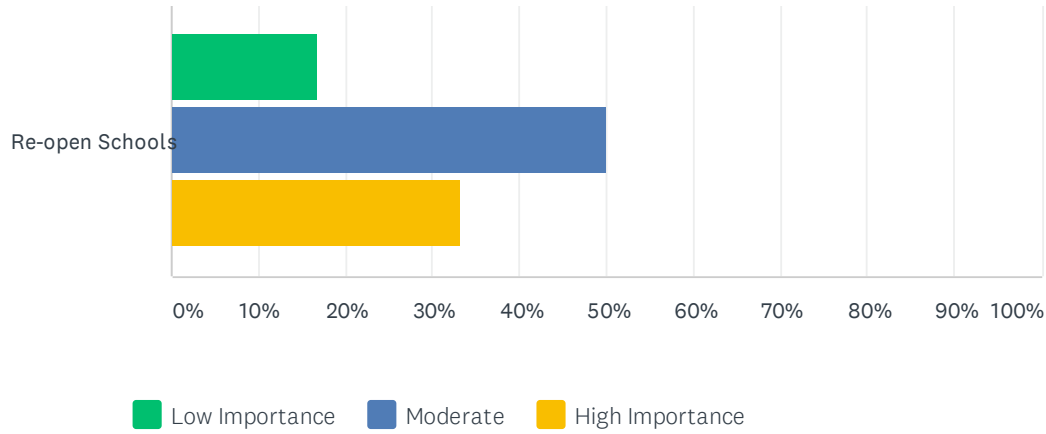


## Q18 How important is each of the following activities to recovering from a hazard event?

Answered: 12 Skipped: 5





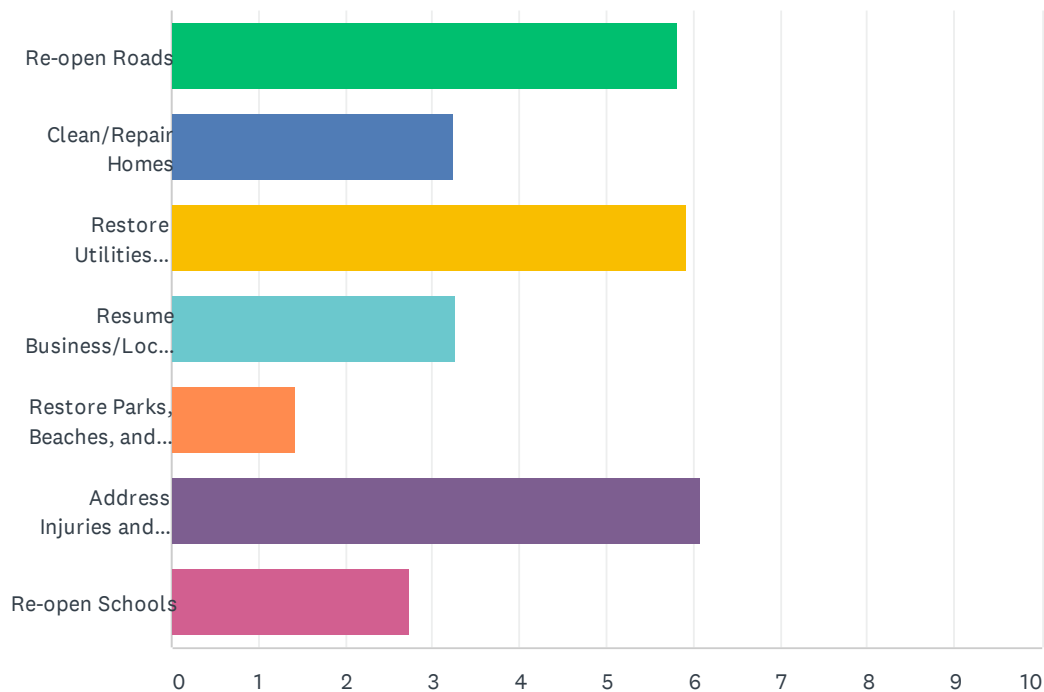


	LOW IMPORTANCE	MODERATE	HIGH IMPORTANCE	TOTAL	WEIGHTED AVERAGE
Re-open Roads	0.00% 0	0.00% 0	100.00% 12	12	5.00
Clean/Repair Homes	9.09% 1	36.36% 4	54.55% 6	11	3.91
Restore Utilities (electric, water, wastewater, communication)	0.00% 0	0.00% 0	100.00% 12	12	5.00
Resume Business/Local Economy	0.00% 0	81.82% 9	18.18% 2	11	3.36
Restore Parks, Beaches, and other Natural Resources	60.00% 6	40.00% 4	0.00% 0	10	1.80
Address Injuries and Casualties	0.00% 0	16.67% 2	83.33% 10	12	4.67
Re-open Schools	16.67% 2	50.00% 6	33.33% 4	12	3.33



**Q19 Please drag-and-drop or use the dropdown menus to rank each of the following activities in terms of importance to recovering from a hazard event. Your highest-priority action should be at the top of the list.**

Answered: 12 Skipped: 5

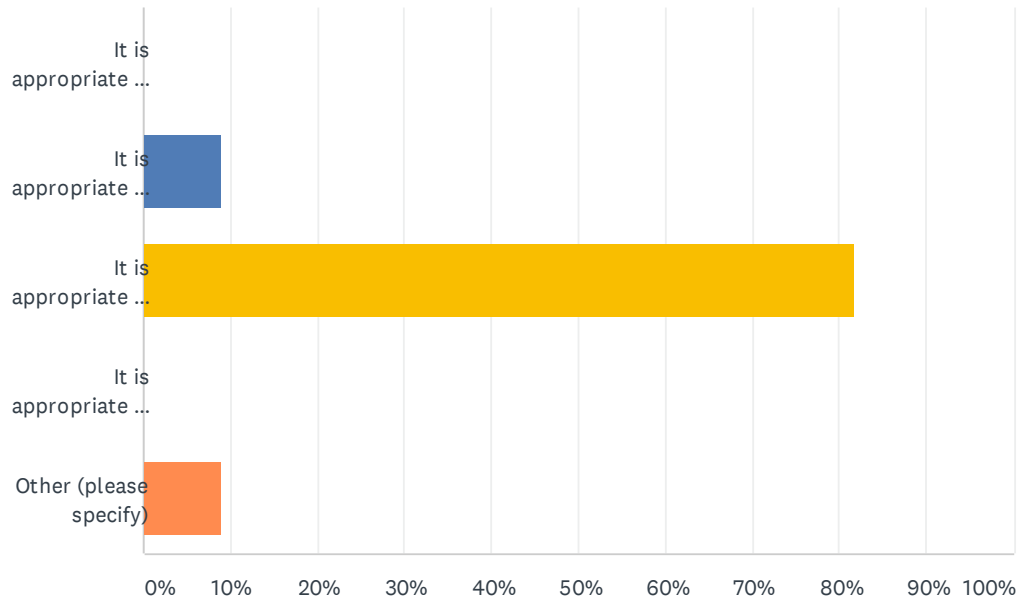


	1	2	3	4	5	6	7	TOTAL	SCORE
Re-open Roads	36.36% 4	18.18% 2	36.36% 4	9.09% 1	0.00% 0	0.00% 0	0.00% 0	11	5.82
Clean/Repair Homes	0.00% 0	0.00% 0	8.33% 1	25.00% 3	50.00% 6	16.67% 2	0.00% 0	12	3.25
Restore Utilities (electric, water, wastewater, communication)	16.67% 2	58.33% 7	25.00% 3	0.00% 0	0.00% 0	0.00% 0	0.00% 0	12	5.92
Resume Business/Local Economy	0.00% 0	0.00% 0	0.00% 0	54.55% 6	27.27% 3	9.09% 1	9.09% 1	11	3.27
Restore Parks, Beaches, and other Natural Resources	0.00% 0	0.00% 0	0.00% 0	8.33% 1	8.33% 1	0.00% 0	83.33% 10	12	1.42
Address Injuries and Casualties	50.00% 6	25.00% 3	16.67% 2	0.00% 0	8.33% 1	0.00% 0	0.00% 0	12	6.08
Re-open Schools	0.00% 0	0.00% 0	16.67% 2	8.33% 1	8.33% 1	66.67% 8	0.00% 0	12	2.75



**Q20 Scientists expect rain and storm events may increase in this area due to Climate Change. Which of the following statements about planning for future changes in precipitation do you most agree with?**

Answered: 11 Skipped: 6



ANSWER CHOICES		RESPONSES	
It is appropriate to plan for storm events to occur more frequently.		0.00%	0
It is appropriate to plan for storm events to become more severe.		9.09%	1
It is appropriate to plan for storm events to become more severe and more frequent.		81.82%	9
It is appropriate to plan for storm events to occur at a similar frequency and severity as in the past.		0.00%	0
Other (please specify)		9.09%	1
TOTAL			11

#	OTHER (PLEASE SPECIFY)	DATE
1	Climate change is happening now, science is real	11/11/2020 5:44 AM



## Q21 If you could choose one action to reduce risks from natural hazards in your community, what would it be?

Answered: 8   Skipped: 9

#	RESPONSES	DATE
1	control water levels at dams	2/7/2021 7:02 PM
2	Storm mitigation	2/7/2021 6:46 PM
3	Remove homes from flood plains	2/7/2021 6:29 PM
4	Begin to replace infrastructure that was designed with outdated specifications for storm frequency/severity	11/25/2020 5:32 PM
5	Really plan for an event and have the capacity to implement it	11/13/2020 6:59 PM
6	Improved education and outreach about climate change	11/11/2020 5:48 AM
7	Power lines under ground	11/10/2020 6:18 PM
8	Safety first	10/27/2020 1:34 PM



## Q22 Please provide any additional comments or questions to be addressed as this Hazard Mitigation Plan is updated.

Answered: 3   Skipped: 14

#	RESPONSES	DATE
1	I am concerned about the ability of state, local and emergency services to coordinate action with emergency responders, hospitals, National Guard etc in an environment where the electric is down, the phones are out and the various services which should provide assistance find it difficult to coordinate efforts in an emergency situation. Is there anything out there in the internet or elsewhere which can provide seamless coordination among agencies?	11/13/2020 6:59 PM
2	Does this already "live" on the town's website? Improved outreach of the plan, when published, would be helpful- I didn't know such a thing existed for our town.	11/11/2020 5:48 AM
3	Stop Cutting healthy trees they hold back mud slides Put the power lines underground	11/10/2020 6:18 PM



## Q23 If you wish to be notified of the progress in updating the Hazard Mitigation Plan, please provide your name and email address.

Answered: 5   Skipped: 12

ANSWER CHOICES	RESPONSES
Name	100.00% 5
Email Address	100.00% 5

#	NAME	DATE
1	Arthur Blanchard	2/7/2021 6:29 PM
2	Michelle Beutel	2/5/2021 12:38 AM
3	Ed Edelson	11/25/2020 5:32 PM
4	charles Henry	11/13/2020 6:59 PM
5	Angela rovinelli	11/10/2020 6:18 PM
#	EMAIL ADDRESS	DATE
1	s2blanchard@alum.mit.edu	2/7/2021 6:29 PM
2	Beutels@sbcglobal.net	2/5/2021 12:38 AM
3	ededelson@outlook.com	11/25/2020 5:32 PM
4	cwhenry@snet.net	11/13/2020 6:59 PM
5	Arovinelli@valleytransit.org	11/10/2020 6:18 PM







## Appendix D

HAZUS-MH Output







## **HAZUS OUTPUT: FLOODING**

Additional Details are  
Available On Request





## Hazus: Flood Global Risk Report

**Region Name:** CT\_NVCOG\_R1p5

**Flood Scenario:** PROBABILISTIC

**Print Date:** Friday, February 12, 2021

**Disclaimer:**

*This version of Hazus utilizes 2010 Census Data.*

*Totals only reflect data for those census tracts/blocks included in the user's study region.*

*The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.*



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General Building Stock	7
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## General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 4 county(ies) from the following state(s):

- Connecticut

**Note:**

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is approximately 422 square miles and contains 7,327 census blocks. The region contains over 175 thousand households and has a total population of 448,738 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 154,783 buildings in the region with a total building replacement value (excluding contents) of 63,939 million dollars. Approximately 90.97% of the buildings (and 76.38% of the building value) are associated with residential housing.



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## Building Inventory

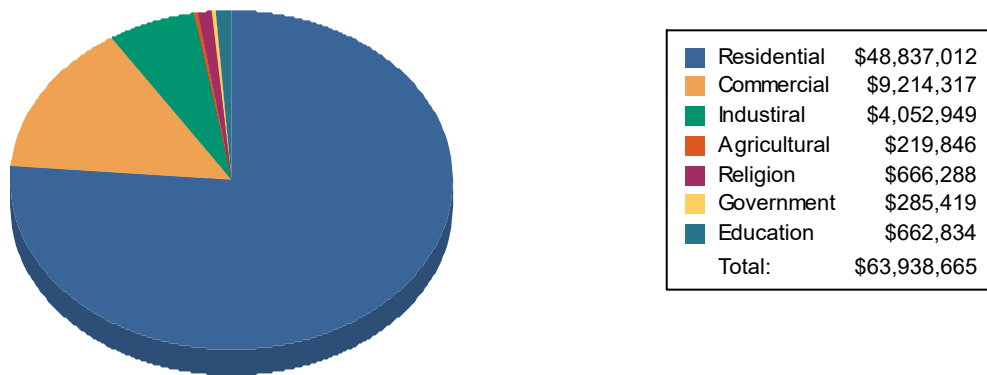
### General Building Stock

Hazus estimates that there are 154,783 buildings in the region which have an aggregate total replacement value of 63,939 million dollars. Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

**Table 1**  
**Building Exposure by Occupancy Type for the Study Region**

Occupancy	Exposure (\$1000)	Percent of Total
Residential	48,837,012	76.4%
Commercial	9,214,317	14.4%
Industrial	4,052,949	6.3%
Agricultural	219,846	0.3%
Religion	666,288	1.0%
Government	285,419	0.4%
Education	662,834	1.0%
<b>Total</b>	<b>63,938,665</b>	<b>100%</b>

**Building Exposure by Occupancy Type for the Study Region**  
**(\$1000's)**



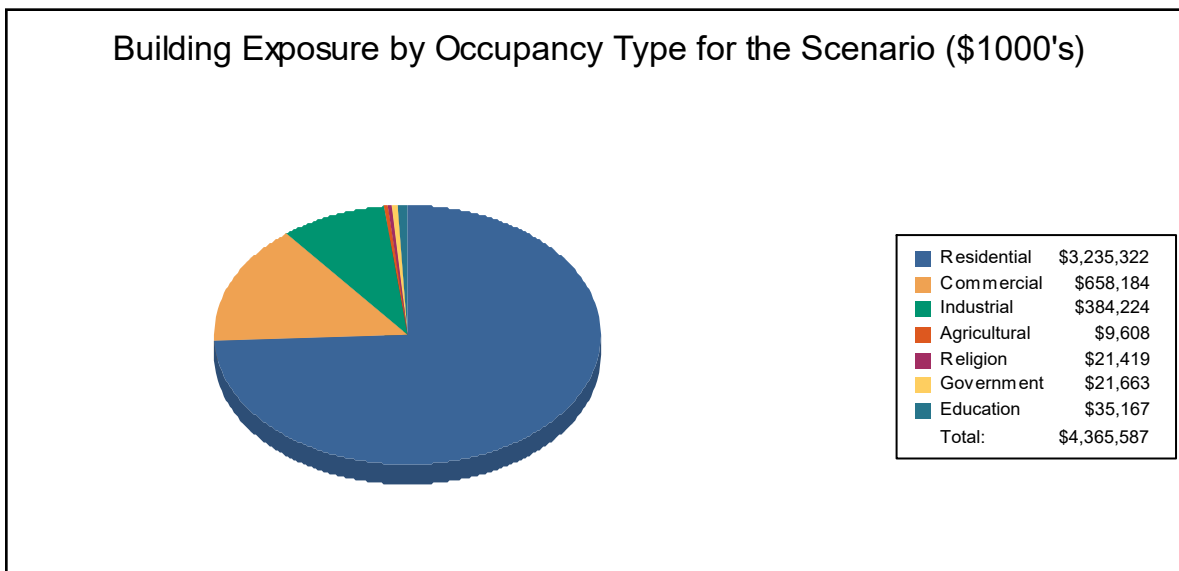
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**Table 2**  
**Building Exposure by Occupancy Type for the Scenario**

Occupancy	Exposure (\$1000)	Percent of Total
Residential	31,314,129	72.0%
Commercial	7,554,327	17.4%
Industrial	3,250,301	7.5%
Agricultural	175,075	0.4%
Religion	476,108	1.1%
Government	235,789	0.5%
Education	483,649	1.1%
<b>Total</b>	<b>43,489,378</b>	<b>100%</b>



### Essential Facility Inventory

For essential facilities, there are 5 hospitals in the region with a total bed capacity of 819 beds. There are 229 schools, 59 fire stations, 23 police stations and 21 emergency operation centers.





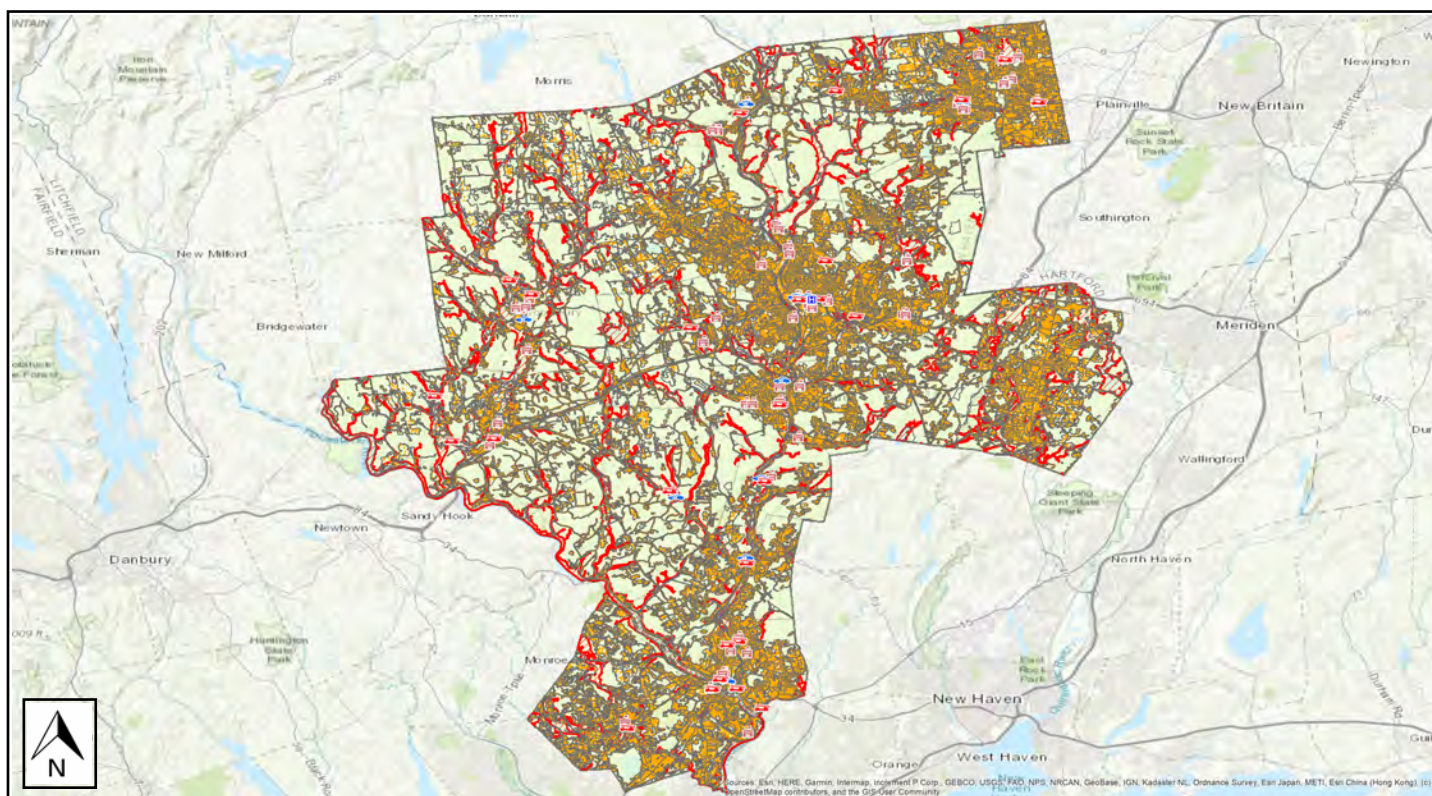
## Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

<b>Study Region Name:</b>	CT_NVCOG_R1p5
<b>Scenario Name:</b>	PROBABILISTIC
<b>Return Period Analyzed:</b>	100
<b>Analysis Options Analyzed:</b>	No What-Ifs

### Study Region Overview Map

Illustrating scenario flood extent, as well as exposed essential facilities and total exposure



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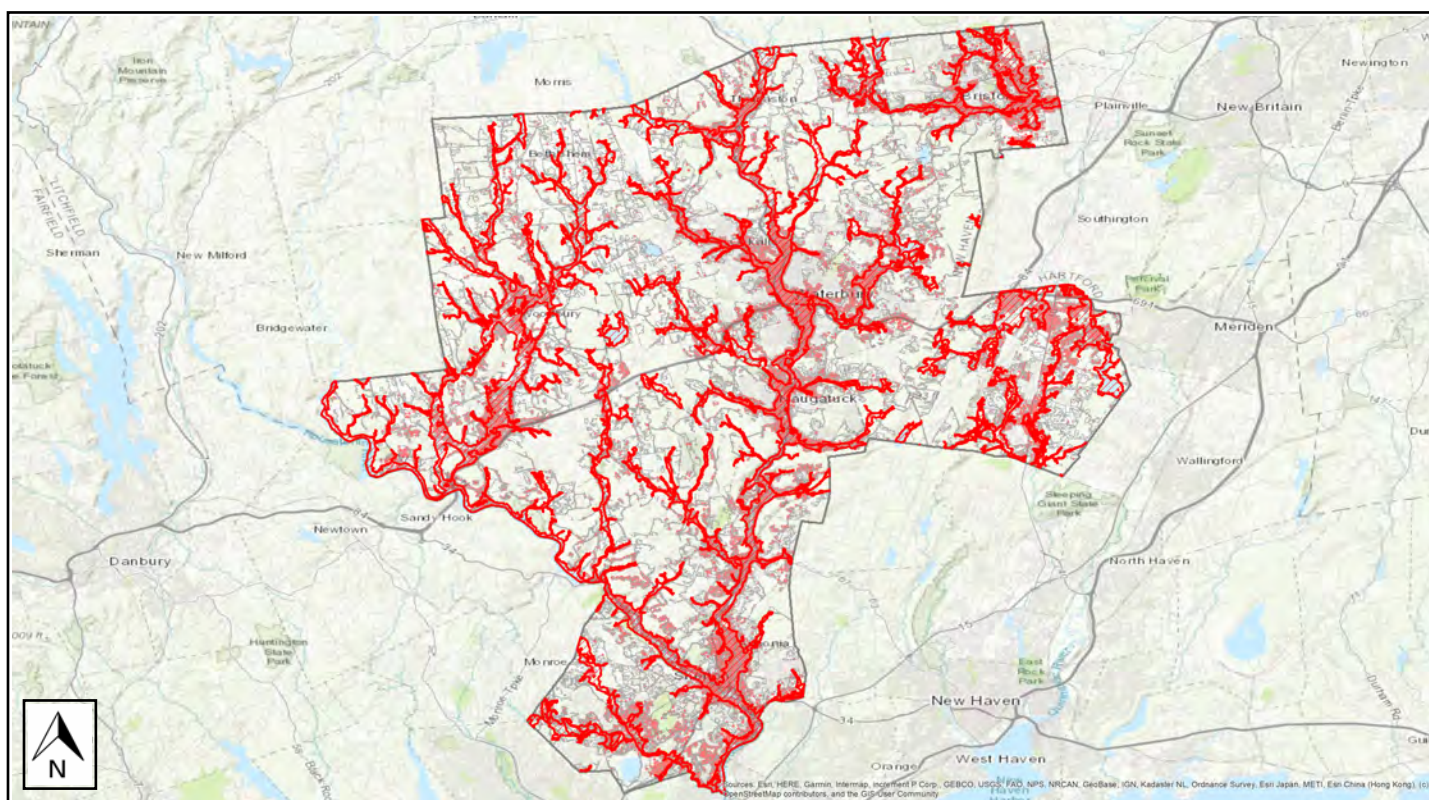


## Building Damage

### General Building Stock Damage

Hazus estimates that about 7,158 buildings will be at least moderately damaged. This is over 67% of the total number of buildings in the scenario. There are an estimated 1,720 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

**Total Economic Loss (1 dot = \$300K) Overview Map**



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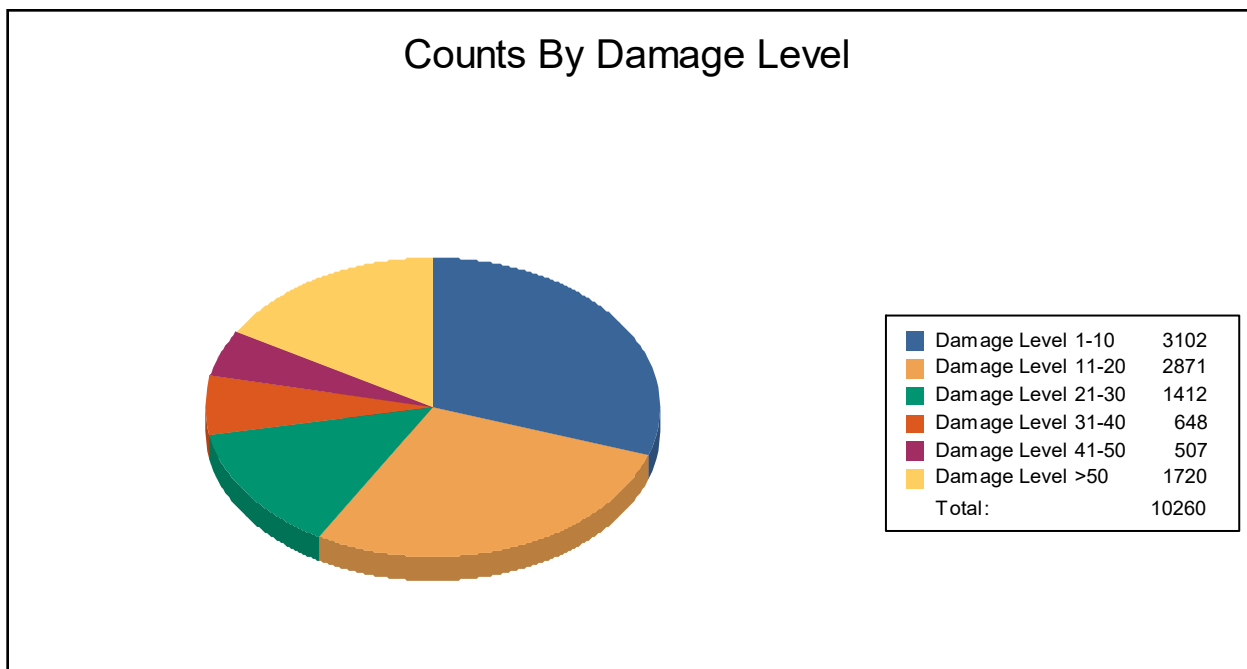
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**Table 3: Expected Building Damage by Occupancy**

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1	50	0	0	0	0	0	0	1	50	0	0
Commercial	32	13	113	45	41	16	24	10	4	2	36	14
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	13	72	3	17	1	6	0	0	0	0	1	6
Industrial	4	3	32	25	13	10	8	6	32	25	39	30
Religion	1	17	5	83	0	0	0	0	0	0	0	0
Residential	3,051	31	2,718	28	1,357	14	616	6	470	5	1,644	17
<b>Total</b>	<b>3,102</b>		<b>2,871</b>		<b>1,412</b>		<b>648</b>		<b>507</b>		<b>1,720</b>	



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**Table 4: Expected Building Damage by Building Type**

Building Type	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	5	19	8	30	6	22	0	0	2	7	6	22
ManufHousing	0	0	0	0	1	2	0	0	3	5	58	94
Masonry	109	29	112	30	47	13	15	4	22	6	71	19
Steel	32	14	83	35	31	13	20	8	28	12	43	18
Wood	2,945	31	2,647	28	1,311	14	603	6	452	5	1,525	16



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## Essential Facility Damage

Before the flood analyzed in this scenario, the region had 819 hospital beds available for use. On the day of the scenario flood event, the model estimates that 819 hospital beds are available in the region.

**Table 5: Expected Damage to Essential Facilities**

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	21	9	0	9
Fire Stations	59	20	2	22
Hospitals	5	0	0	0
Police Stations	23	8	1	9
Schools	229	39	1	38

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.



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## Induced Flood Damage

### Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

**Analysis has not been performed for this Scenario.**



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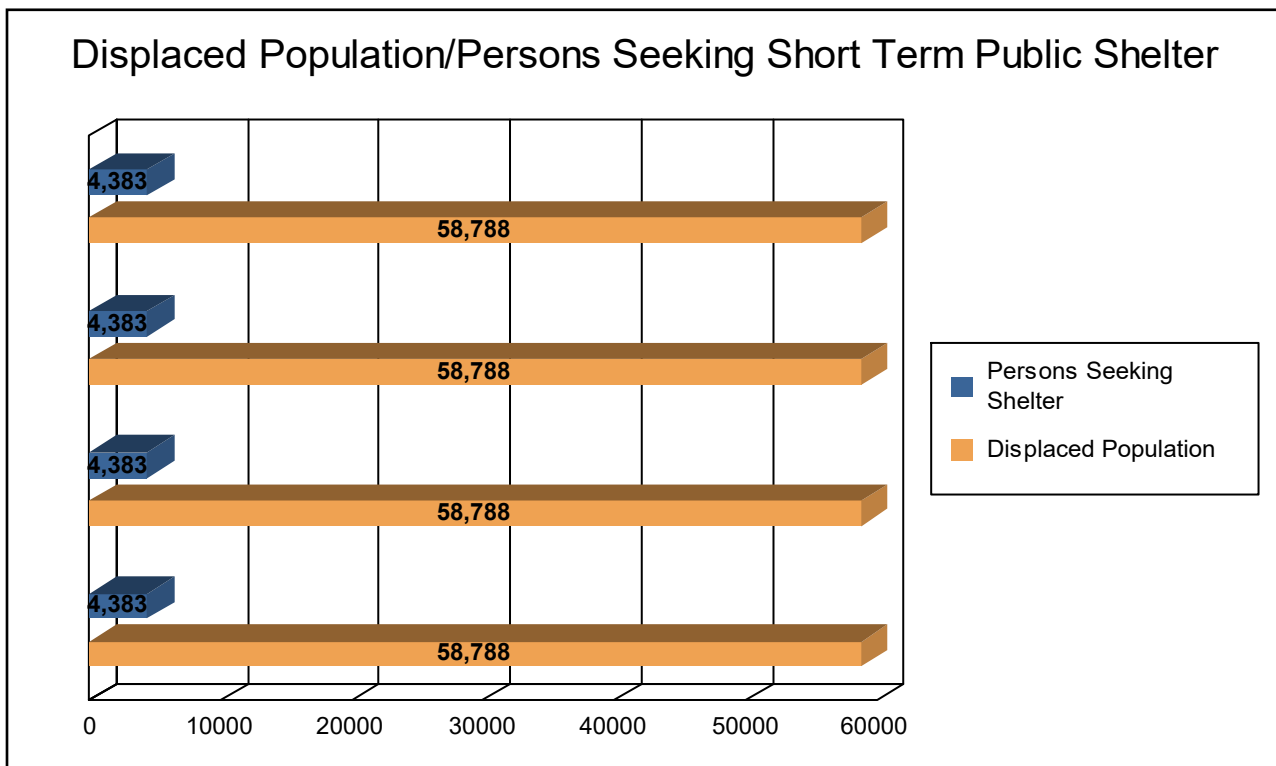




## Social Impact

### Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 19,596 households (or 58,788 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 4,383 people (out of a total population of 448,738) will seek temporary shelter in public shelters.



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## Economic Loss

The total economic loss estimated for the flood is 11,607.04 million dollars, which represents 26.69 % of the total replacement value of the scenario buildings.

### **Building-Related Losses**

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 6,926.90 million dollars. 40% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



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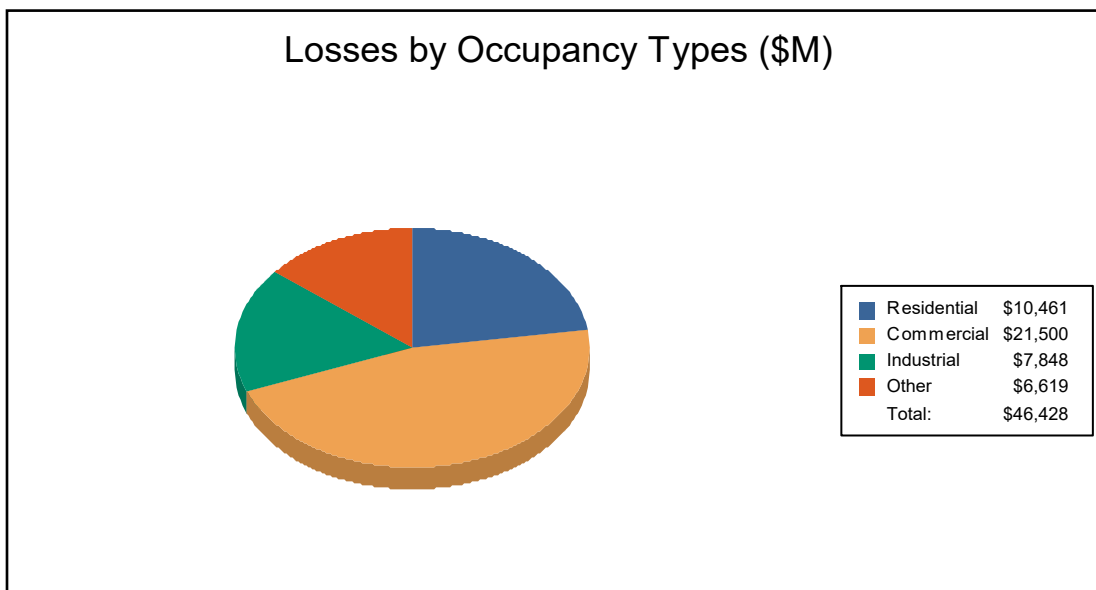
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**Table 6: Building-Related Economic Loss Estimates**  
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<b>Building Loss</b>						
	Building	5,637.21	3,254.38	2,142.05	370.57	11,404.21
	Content	2,769.16	6,750.63	4,660.59	1,414.70	15,595.08
	Inventory	0.00	130.83	564.74	12.74	708.31
	<b>Subtotal</b>	<b>8,406.37</b>	<b>10,135.84</b>	<b>7,367.38</b>	<b>1,798.00</b>	<b>27,707.60</b>
<b>Business Interruption</b>						
	Income	61.54	4,143.66	173.83	384.77	4,763.80
	Relocation	1,184.98	1,426.24	125.82	238.57	2,975.60
	Rental Income	662.71	820.26	31.32	39.66	1,553.95
	Wage	145.19	4,973.82	149.97	4,158.24	9,427.22
	<b>Subtotal</b>	<b>2,054.42</b>	<b>11,363.98</b>	<b>480.93</b>	<b>4,821.24</b>	<b>18,720.56</b>
<b>ALL</b>	<b>Total</b>	<b>10,460.79</b>	<b>21,499.82</b>	<b>7,848.31</b>	<b>6,619.24</b>	<b>46,428.16</b>



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## **Appendix A: County Listing for the Region**

Connecticut

- Fairfield
- Hartford
- Litchfield
- New Haven



**FEMA**





## Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
<b>Connecticut</b>				
Litchfield	56,226	6,890,572	2,013,855	8,904,427
New Haven	292,476	30,735,832	9,763,315	40,499,147
Fairfield	39,559	4,930,213	1,435,179	6,365,392
Hartford	60,477	6,280,395	1,889,304	8,169,699
<b>Total</b>	<b>448,738</b>	<b>48,837,012</b>	<b>15,101,653</b>	<b>63,938,665</b>
<b>Total Study Region</b>	<b>448,738</b>	<b>48,837,012</b>	<b>15,101,653</b>	<b>63,938,665</b>



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## **HAZUS OUTPUT: HURRICANE**

Additional Details are  
Available On Request



## Quick Assessment Report

January 20, 2021

Study Region : HUR\_CT\_NVCOG

Scenario : Probabilistic

### Regional Statistics

Area (Square Miles)	422	
Number of Census Tracts	95	
Number of People in the Region	448,738	
General Building Stock		
<i>Occupancy</i>	<i>Building Count</i>	<i>Dollar Exposure (\$ K)</i>
Residential	140,807	48,837,012
Commercial	8,936	9,214,317
Other	5,040	5,887,336
Total	154,783	63,938,665

### Scenario Results

#### Number of Residential Buildings Damaged

Return Period	Minor	Moderate	Severe	Destruction	Total
10	0	0	0	0	0
20	68	4	0	0	72
50	325	20	1	0	346
100	1,817	143	5	0	1,966
200	6,166	665	18	2	6,852
500	17,238	2,725	107	50	20,119
1000	28,739	5,857	328	179	35,104

#### Number of Buildings Damaged

Return Period	Minor	Moderate	Severe	Destruction	Total
10	0	0	0	0	0
20	91	4	0	0	95
50	386	21	1	0	408
100	1,980	153	6	0	2,139
200	6,598	717	26	2	7,343
500	18,448	2,999	156	51	21,654
1000	30,808	6,519	456	185	37,968

#### Shelter Requirements

Return Period	Displaced Households (#Households)	Short Term Shelter (#People)
10	0	0
20	0	0
50	0	0
100	34	28
200	253	160
500	952	604
1000	1,897	1,205



**Economic Loss (x 1000)**

<b>ReturnPeriod</b>	<b><u>Property Damage (Capital Stock) Losses</u></b>		<b><u>Business Interruption (Income) Losses</u></b>
	<b><i>Residential</i></b>	<b><i>Total</i></b>	
10	0	0	0
20	61	61	8
50	30,852	32,444	637
100	120,723	126,123	4,178
200	281,043	301,401	19,798
500	683,324	766,282	66,849
1000	1,226,352	1,413,623	137,033
Annualized	6,954	7,879	661

**Disclaimer:**

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.



## **HAZUS OUTPUT: EARTHQUAKE**

Additional Details are  
Available On Request



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	116830	17122	6126	654	75	23977
Portland – 5.7	104277	23159	11207	1796	367	36530
Stamford – 5.7	127782	9873	2869	259	23	13025
East Haddam – 6.4	88826	29315	17838	3740	1088	51981

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	75	76	77	74	73
Portland – 5.7	68	71	73	68	66
Stamford – 5.7	82	79	78	81	82
East Haddam – 6.4	60	61	62	60	58

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	470	294
Portland – 5.7	913	557
Stamford – 5.7	213	128
East Haddam – 6.4	1609	995



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	157 (Level 1); 22 (Level 2); 2 (Level 3); 4 (Level 4)	294 (Level 1); 46 (Level 2); 5 (Level 3); 9 (Level 4)	203 (Level 1); 31 (Level 2); 3 (Level 3); 6 (Level 4)
Portland – 5.7	276 (Level 1); 43 (Level 2); 4 (Level 3); 9 (Level 4)	617 (Level 1); 113 (Level 2); 13 (Level 3); 24 (Level 4)	410 (Level 1); 73 (Level 2); 8 (Level 3); 15 (Level 4)
Stamford – 5.7	80 (Level 1); 10 (Level 2); 1 (Level 3); 2 (Level 4)	155 (Level 1); 22 (Level 2); 2 (Level 3); 4 (Level 4)	109 (Level 1); 15 (Level 2); 1 (Level 3); 3 (Level 4)
East Haddam – 6.4	467 (Level 1); 80 (Level 2); 9 (Level 3); 17 (Level 4)	1261 (Level 1); 259 (Level 2); 32 (Level 3); 62 (Level 4)	808 (Level 1); 161 (Level 2); 20 (Level 3); 37 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	128426	18822	6734	719	82	26357
Portland – 5.7	114627	25458	12319	1975	403	40156
Stamford – 5.7	140465	10853	3154	285	25	14318
East Haddam – 6.4	97642	32225	19608	4111	1196	57141

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	83.6	58.7	142.4
Portland – 5.7	129.1	137.3	266.4
Stamford – 5.7	48.3	26.0	74.3
East Haddam – 6.4	195.2	276.8	472.0

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	358505.6445	105506.1787	22848.822	101837.281	588697.9	464011.8232	258178.04
Portland – 5.7	675739.4207	206720.4132	46407.0918	195898.9129	1124766	463266.9788	882459.83
Stamford – 5.7	191494.0249	50382.7986	11813.7588	52771.0679	306461.7	149370.9034	241876.82
East Haddam – 6.4	1149230.906	334143.8012	88560.8105	353370.3117	1925306	1483374.707	720853.88
Probabilistic	813.6489	261.8181	54.6659	233.395	1363.528	1075.467	586.3152



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	4835	571	175	16	1	763
Portland – 5.7	4745	630	202	19	2	853
Stamford – 5.7	4788	602	189	17	2	810
East Haddam – 6.4	3821	1101	573	88	15	1777

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	77	77	76
Portland – 5.7	-	-	75	75	75
Stamford – 5.7	-	-	74	74	75
East Haddam – 6.4	-	-	62	62	62

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	19	12
Portland – 5.7	22	14
Stamford – 5.7	22	14
East Haddam – 6.4	63	39



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	11 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	0 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	0 (Level 1); 7 (Level 2); 1 (Level 3); 1 (Level 4)	0 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	5335	630	193	18	2	842
Portland – 5.7	5236	695	223	21	2	941
Stamford – 5.7	5283	664	208	19	2	894
East Haddam – 6.4	4216	1215	632	97	17	1961

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	3.1	1.7	4.8
Portland – 5.7	3.4	2.0	5.4
Stamford – 5.7	3.4	1.9	5.3
East Haddam – 6.4	7.1	7.4	14.6

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	10280.9186	3051.8831	567.8912	2841.795	16742.49	13332.8017	7227.325
Portland – 5.7	11926.8317	3618.2721	659.4324	3268.5512	19473.09	8340.8998	15545.104
Stamford – 5.7	11817.1129	3454.81	613.1597	3174.44	19059.52	8839.6765	15271.923
East Haddam – 6.4	33451.0978	10133.7923	2225.0153	9689.7175	55499.62	43584.8901	21560.846
Probabilistic	33.9477	11.636	1.9009	9.2062	56.6908	45.5837	23.52



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	1755	258	87	8	1	355
Portland – 5.7	1649	321	125	14	2	461
Stamford – 5.7	1890	169	47	4	0	220
East Haddam – 6.4	1338	452	264	47	10	772

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	73	-	74	75
Portland – 5.7	-	69	-	70	71
Stamford – 5.7	-	79	-	79	79
East Haddam – 6.4	-	59	-	60	60

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	4	2
Portland – 5.7	6	3
Stamford – 5.7	3	1
East Haddam – 6.4	14	8



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	0 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	0 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	1893	279	94	9	1	382
Portland – 5.7	1778	346	134	15	2	497
Stamford – 5.7	2038	182	50	4	0	237
East Haddam – 6.4	1442	488	284	50	10	833

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.1	0.7	1.8
Portland – 5.7	1.4	1.1	2.5
Stamford – 5.7	0.7	0.4	1.1
East Haddam – 6.4	2.7	3.3	6.0

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	4919.1945	1531.3814	242.3685	1317.2628	8010.207	6450.5759	3196.4937
Portland – 5.7	7034.0118	2274.7767	355.408	1889.6786	11553.88	4550.3536	9308.7885
Stamford – 5.7	2982.5744	822.5292	140.5025	802.9389	4748.545	2090.7835	3805.1036
East Haddam – 6.4	15604.5742	4779.9534	972.8591	4702.5021	26059.89	20384.5276	8862.6666
Probabilistic	12.2218	4.208	0.636	3.3446	20.4104	16.4298	7.7658



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	1397	100	26	2	0	129
Portland – 5.7	1323	152	46	4	0	203
Stamford – 5.7	1408	92	24	2	0	118
East Haddam – 6.4	1188	231	94	11	1	338

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	82	-	82	82	82
Portland – 5.7	77	-	76	76	77
Stamford – 5.7	83	-	84	85	84
East Haddam – 6.4	69	-	68	68	68

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	1	0
Portland – 5.7	1	0
Stamford – 5.7	0	0
East Haddam – 6.4	2	1



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	1584	114	30	2	0	146
Portland – 5.7	1500	173	52	5	0	230
Stamford – 5.7	1596	105	27	2	0	134
East Haddam – 6.4	1347	262	107	12	2	383

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	0.3	0.1	0.4
Portland – 5.7	0.5	0.2	0.7
Stamford – 5.7	0.3	0.1	0.4
East Haddam – 6.4	0.8	0.6	1.3

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	1227.0461	297.141	60.7808	301.9593	1886.927	1524.1871	981.5956
Portland – 5.7	2168.3817	588.5468	102.6594	507.5451	3367.133	1774.517	2756.9285
Stamford – 5.7	1286.1406	293.0785	58.4024	293.3287	1930.95	1084.0168	1579.2191
East Haddam – 6.4	4235.989	1125.5716	226.2865	1058.9647	6646.812	5361.5606	3385.8393
Probabilistic	6.5875	2.0535	0.3475	1.5981	10.5866	8.641	5.3153



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	14438	2845	1123	127	15	4110
Portland – 5.7	10772	4277	2769	584	147	7776
Stamford – 5.7	17639	723	172	13	1	909
East Haddam – 6.4	9973	4359	3143	805	268	8575

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	69	-	70	70	69
Portland – 5.7	56	-	58	58	56
Stamford – 5.7	87	-	87	87	87
East Haddam – 6.4	53	-	54	54	53

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	108	57
Portland – 5.7	311	164
Stamford – 5.7	20	11
East Haddam – 6.4	406	214



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	29 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)	54 (Level 1); 9 (Level 2); 1 (Level 3); 2 (Level 4)	38 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)
Portland – 5.7	72 (Level 1); 12 (Level 2); 1 (Level 3); 3 (Level 4)	177 (Level 1); 35 (Level 2); 4 (Level 3); 8 (Level 4)	118 (Level 1); 23 (Level 2); 3 (Level 3); 5 (Level 4)
Stamford – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	0 (Level 1); 17 (Level 2); 2 (Level 3); 4 (Level 4)	0 (Level 1); 55 (Level 2); 7 (Level 3); 14 (Level 4)	0 (Level 1); 35 (Level 2); 4 (Level 3); 8 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	15797	3113	1228	138	17	4496
Portland – 5.7	11786	4679	3029	639	161	8507
Stamford – 5.7	19298	792	188	14	1	995
East Haddam – 6.4	10911	4769	3439	880	293	9382

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	14.8	11.0	25.8
Portland – 5.7	29.4	39.7	69.1
Stamford – 5.7	4.1	1.6	5.7
East Haddam – 6.4	34.3	56.2	90.5

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	64729.5275	19491.3889	3762.7368	17651.56	105635.2	84220.9164	48592.922
Portland – 5.7	169287.6474	52697.0008	11202.4122	48128.0374	281315.1	118237.5437	221984.65
Stamford – 5.7	10571.5752	2010.2835	678.9103	3436.8139	16697.58	7904.7916	12581.859
East Haddam – 6.4	209513.5303	61450.8127	15211.8655	62798.5411	348974.7	270964.343	133403.91
Probabilistic	103.3576	31.6708	6.3611	29.6196	171.0091	135.0284	76.0833



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	6265	1795	905	134	21	2855
Portland – 5.7	4781	2215	1608	396	119	4339
Stamford – 5.7	8591	420	101	8	0	529
East Haddam – 6.4	3766	2231	2029	729	364	5354

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	63	62	63
Portland – 5.7	-	-	53	52	53
Stamford – 5.7	-	-	86	86	85
East Haddam – 6.4	-	-	45	44	45

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	37	19
Portland – 5.7	78	42
Stamford – 5.7	5	2
East Haddam – 6.4	142	75



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	18 (Level 1); 3 (Level 2); 0 (Level 3); 0 (Level 4)	45 (Level 1); 8 (Level 2); 1 (Level 3); 2 (Level 4)	28 (Level 1); 5 (Level 2); 1 (Level 3); 1 (Level 4)
Portland – 5.7	35 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	107 (Level 1); 22 (Level 2); 3 (Level 3); 5 (Level 4)	64 (Level 1); 13 (Level 2); 2 (Level 3); 3 (Level 4)
Stamford – 5.7	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	59 (Level 1); 12 (Level 2); 2 (Level 3); 3 (Level 4)	225 (Level 1); 54 (Level 2); 7 (Level 3); 14 (Level 4)	132 (Level 1); 31 (Level 2); 4 (Level 3); 8 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	6969	1997	1007	149	24	3176
Portland – 5.7	5318	2464	1789	441	133	4827
Stamford – 5.7	9556	467	113	9	1	589
East Haddam – 6.4	4190	2482	2257	811	404	5955

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	10.2	11.5	21.7
Portland – 5.7	18.0	31.7	49.7
Stamford – 5.7	2.2	1.0	3.2
East Haddam – 6.4	25.9	58.8	84.8

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	61906.3419	18718.2686	4020.6611	17590.4836	102235.8	80624.6105	40470.419
Portland – 5.7	128442.7881	39168.2212	8995.7186	37400.7057	214007.4	74242.5178	167611.01
Stamford – 5.7	7661.961	1625.4569	455.6265	2222.3869	11965.43	5463.6605	9287.4179
East Haddam – 6.4	203396.7124	58869.2693	14900.7583	59478.1301	336644.9	262265.9817	103340.09
Probabilistic	62.8625	20.0825	3.8319	17.4027	104.1796	82.945	42.9456



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	3496	378	112	10	1	501
Portland – 5.7	3451	409	125	11	1	546
Stamford – 5.7	3362	466	153	15	1	635
East Haddam – 6.4	2801	756	377	55	9	1196

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	77	-	77	78	77
Portland – 5.7	76	-	76	77	76
Stamford – 5.7	74	-	73	73	73
East Haddam – 6.4	63	-	63	63	63

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	13	7
Portland – 5.7	14	8
Stamford – 5.7	18	10
East Haddam – 6.4	41	23



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	10 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	19 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	14 (Level 1); 2 (Level 2); 0 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	3884	420	124	11	1	557
Portland – 5.7	3834	454	139	13	1	607
Stamford – 5.7	3735	518	170	16	2	706
East Haddam – 6.4	3112	840	419	61	10	1329

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	2.0	1.1	3.1
Portland – 5.7	2.2	1.2	3.4
Stamford – 5.7	2.6	1.6	4.3
East Haddam – 6.4	4.7	4.6	9.4

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	6540.2936	1731.8712	463.6403	2034.8031	10770.61	8272.1648	4856.1692
Portland – 5.7	7312.2647	1968.1413	519.7382	2262.0959	12062.24	5416.3888	9280.406
Stamford – 5.7	9738.047	2671.2765	681.5394	2944.9033	16035.77	7447.1957	12409.324
East Haddam – 6.4	21422.7448	5819.6944	1799.265	7026.6492	36068.35	27242.4392	14947.397
Probabilistic	24.1079	7.5323	1.7929	7.4232	40.8563	31.6402	17.7054



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	2385	266	80	7	1	354
Portland – 5.7	2214	374	136	14	2	525
Stamford – 5.7	2475	204	55	5	0	264
East Haddam – 6.4	1915	520	260	38	6	824

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	76	78	77
Portland – 5.7	-	-	70	73	71
Stamford – 5.7	-	-	82	80	81
East Haddam – 6.4	-	-	62	64	63

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	2	1
Portland – 5.7	3	2
Stamford – 5.7	1	1
East Haddam – 6.4	6	3



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	2756	308	92	8	1	409
Portland – 5.7	2558	433	157	16	2	607
Stamford – 5.7	2860	236	64	5	0	305
East Haddam – 6.4	2212	601	301	44	7	953

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.0	0.6	1.6
Portland – 5.7	1.4	1.1	2.5
Stamford – 5.7	0.7	0.4	1.1
East Haddam – 6.4	2.4	2.6	5.0

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	4775.8355	1369.1224	1069.73	1890.4868	9105.175	6144.9579	3102.8155
Portland – 5.7	8075.4001	2467.8623	1796.6571	3153.5655	15493.49	5274.8181	10543.262
Stamford – 5.7	3631.4408	963.1421	879.1916	1460.5089	6934.283	2468.5885	4594.5829
East Haddam – 6.4	15487.5378	4440.765	4144.4001	6852.8501	30925.55	19928.3028	9242.3284
Probabilistic	16.0069	5.2762	4.0957	6.75	32.1288	21.2831	9.9258



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	8197	1255	433	43	4	1736
Portland – 5.7	7475	1661	702	85	11	2458
Stamford – 5.7	9036	696	185	15	1	897
East Haddam – 6.4	6206	2151	1285	239	53	3727

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	73	73	73
Portland – 5.7	-	-	68	68	67
Stamford – 5.7	-	-	81	81	82
East Haddam – 6.4	-	-	59	59	59

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	34	20
Portland – 5.7	53	31
Stamford – 5.7	16	9
East Haddam – 6.4	108	63



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	11 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	20 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	15 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	17 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	34 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	24 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Stamford – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	32 (Level 1); 5 (Level 2); 1 (Level 3); 1 (Level 4)	83 (Level 1); 16 (Level 2); 2 (Level 3); 4 (Level 4)	56 (Level 1); 11 (Level 2); 1 (Level 3); 2 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	8814	1350	465	46	5	1866
Portland – 5.7	8037	1786	754	91	12	2643
Stamford – 5.7	9716	748	199	16	1	964
East Haddam – 6.4	6672	2313	1382	256	57	4008

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	5.1	3.0	8.1
Portland – 5.7	7.1	5.3	12.4
Stamford – 5.7	2.9	1.3	4.2
East Haddam – 6.4	11.7	13.3	25.0

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	19977.3627	5531.3355	875.1667	5006.0471	31389.91	25508.6982	16312.082
Portland – 5.7	32218.0301	9483.7466	1466.2239	8037.8378	51205.84	26053.7531	41701.777
Stamford – 5.7	9915.8256	2330.8653	442.4274	2561.6482	15250.77	8161.7963	12246.691
East Haddam – 6.4	60642.0864	16835.2411	3358.9991	16584.1967	97420.52	77477.3275	44781.457
Probabilistic	46.9965	14.2777	2.2427	12.173	75.6899	61.2742	37.6236



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	4086	425	124	11	1	561
Portland – 5.7	3924	532	173	16	2	723
Stamford – 5.7	4010	476	146	13	1	637
East Haddam – 6.4	3313	854	413	58	9	1334

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	79	77	78
Portland – 5.7	-	-	76	73	75
Stamford – 5.7	-	-	75	77	76
East Haddam – 6.4	-	-	65	63	64

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	1	1
Portland – 5.7	2	1
Stamford – 5.7	2	1
East Haddam – 6.4	5	2



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	19 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	4476	465	136	12	1	614
Portland – 5.7	4298	583	189	18	2	792
Stamford – 5.7	4393	521	160	15	1	697
East Haddam – 6.4	3629	936	452	63	10	1461

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.2	0.6	1.8
Portland – 5.7	1.5	0.8	2.4
Stamford – 5.7	1.3	0.7	2.0
East Haddam – 6.4	2.9	2.6	5.4

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	5808.6688	1558.8984	442.1751	1382.0898	9191.832	7367.5672	4768.6827
Portland – 5.7	8039.6578	2285.9042	616.5143	1893.9151	12835.99	6641.6657	10325.562
Stamford – 5.7	8061.0092	2195.8457	579.0888	1762.1128	12598.06	6935.6884	10256.855
East Haddam – 6.4	18434.3046	5215.0003	1709.3683	4827.3355	30186.01	23649.3049	14496.674
Probabilistic	21.7597	7.2152	1.8519	5.308	36.1348	28.9749	17.6171



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	3780	538	179	17	2	735
Portland – 5.7	3255	824	379	50	7	1260
Stamford – 5.7	4276	190	45	4	0	239
East Haddam – 6.4	2865	966	563	100	21	1650

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	75	74	75	74
Portland – 5.7	-	66	66	66	65
Stamford – 5.7	-	86	86	86	86
East Haddam – 6.4	-	60	60	60	59

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	8	4
Portland – 5.7	16	8
Stamford – 5.7	2	1
East Haddam – 6.4	26	13



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	15 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	11 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	28 (Level 1); 5 (Level 2); 1 (Level 3); 1 (Level 4)	19 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	4100	584	194	19	2	798
Portland – 5.7	3531	894	412	54	8	1367
Stamford – 5.7	4639	206	49	4	0	259
East Haddam – 6.4	3108	1048	611	109	23	1790

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.9	1.3	3.2
Portland – 5.7	3.3	3.2	6.6
Stamford – 5.7	0.7	0.3	1.0
East Haddam – 6.4	4.6	6.1	10.8

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	8275.4548	2444.4408	274.0479	1862.4523	12856.4	10719.8956	6561.968
Portland – 5.7	17332.1661	5450.6473	637.0607	4005.9103	27425.78	13365.5349	22782.813
Stamford – 5.7	2336.7562	479.0631	81.9643	561.1468	3458.93	1847.7195	2815.8193
East Haddam – 6.4	26347.2846	7936.7633	1117.2354	6524.5132	41925.8	34284.0479	18855.59
Probabilistic	19.3747	6.1522	0.7029	4.5161	30.7459	25.5269	14.9967



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	2623	545	220	25	3	793
Portland – 5.7	2378	660	324	46	7	1038
Stamford – 5.7	3164	198	50	4	0	252
East Haddam – 6.4	1844	804	576	145	47	1572

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	68	68	68
Portland – 5.7	-	-	63	63	62
Stamford – 5.7	-	-	84	84	84
East Haddam – 6.4	-	-	53	53	53

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	2	1
Portland – 5.7	4	2
Stamford – 5.7	1	0
East Haddam – 6.4	8	4



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	13 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	35 (Level 1); 7 (Level 2); 1 (Level 3); 2 (Level 4)	24 (Level 1); 5 (Level 2); 1 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	2823	586	237	27	3	854
Portland – 5.7	2560	711	349	50	8	1117
Stamford – 5.7	3406	213	54	4	0	271
East Haddam – 6.4	1985	866	620	156	50	1692

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.7	1.3	3.0
Portland – 5.7	2.3	2.2	4.5
Stamford – 5.7	0.6	0.3	0.9
East Haddam – 6.4	4.3	6.2	10.5

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	9522.6111	2914.5965	446.2591	2231.3923	15114.86	12437.2076	7819.4247
Portland – 5.7	13974.3277	4316.3499	699.9772	3380.2529	22370.91	11283.4372	18290.678
Stamford – 5.7	2513.3874	582.3278	112.728	592.7117	3801.155	2054.8107	3095.7152
East Haddam – 6.4	27452.5615	8134.0562	1607.7086	7163.7214	44358.05	35586.6177	19790.17
Probabilistic	14.7302	4.787	0.7273	3.5713	23.8158	19.5172	11.7921



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	4572	559	174	16	1	750
Portland – 5.7	4432	648	219	21	2	890
Stamford – 5.7	4598	542	166	15	1	724
East Haddam – 6.4	3601	1058	560	88	16	1721

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	79	79	79	80
Portland – 5.7	-	78	79	78	79
Stamford – 5.7	-	72	70	72	70
East Haddam – 6.4	-	64	65	64	65

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	14	7
Portland – 5.7	17	9
Stamford – 5.7	14	7
East Haddam – 6.4	45	24



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	31 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	21 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	4984	609	190	17	2	818
Portland – 5.7	4832	706	238	23	2	970
Stamford – 5.7	5012	590	181	16	1	790
East Haddam – 6.4	3926	1153	610	95	17	1876

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	2.4	1.4	3.8
Portland – 5.7	2.8	1.8	4.6
Stamford – 5.7	2.3	1.2	3.5
East Haddam – 6.4	5.5	6.3	11.8

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	10282.3557	3049.9549	484.8194	2337.0948	16154.22	13332.3106	7748.0634
Portland – 5.7	12948.1597	3980.0517	614.819	2925.8013	20468.83	9709.7507	16928.211
Stamford – 5.7	10968.2969	3061.955	504.3826	2351.3132	16885.95	9324.9317	14030.252
East Haddam – 6.4	32938.4524	10007.8856	1901.5757	8050.9453	52898.86	42946.338	22851.402
Probabilistic	31.9207	10.8849	1.6183	7.2417	51.6656	42.8056	24.6121



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	12512	1093	302	26	2	1423
Portland – 5.7	12398	1173	333	29	2	1537
Stamford – 5.7	11078	2004	760	83	10	2857
East Haddam – 6.4	10347	2365	1065	138	20	3588

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	82	82	81
Portland – 5.7	-	-	79	78	77
Stamford – 5.7	-	-	75	75	76
East Haddam – 6.4	-	-	68	68	67

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	14	7
Portland – 5.7	15	8
Stamford – 5.7	30	15
East Haddam – 6.4	47	25



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	13 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	15 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	14 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	35 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	23 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
East Haddam – 6.4	20 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	50 (Level 1); 8 (Level 2); 1 (Level 3); 2 (Level 4)	33 (Level 1); 5 (Level 2); 1 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	13592	1188	329	28	2	1546
Portland – 5.7	13468	1274	362	31	3	1670
Stamford – 5.7	12035	2177	826	90	10	3103
East Haddam – 6.4	11240	2569	1157	150	22	3898

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	4.5	2.4	6.9
Portland – 5.7	4.8	2.6	7.4
Stamford – 5.7	8.7	6.9	15.6
East Haddam – 6.4	11.1	10.5	21.6

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	16840.7038	4557.6465	988.2152	4548.9021	26935.47	21398.3503	12117.043
Portland – 5.7	18475.8983	5075.5187	1066.6098	4918.7337	29536.76	13445.4489	23551.417
Stamford – 5.7	46874.4281	14324.7387	2620.0525	11511.9073	75331.13	37096.5283	61199.167
East Haddam – 6.4	57518.7015	16404.5496	3800.8074	16096.2068	93820.27	73923.2511	40084.422
Probabilistic	81.4166	27.7817	4.8567	21.0553	135.1103	109.1983	59.0615



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	7048	515	135	11	1	662
Portland – 5.7	6816	679	196	17	1	894
Stamford – 5.7	6503	887	290	28	3	1207
East Haddam – 6.4	5968	1186	490	58	7	1742

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	82	82	81
Portland – 5.7	-	-	79	78	77
Stamford – 5.7	-	-	75	75	76
East Haddam – 6.4	-	-	68	68	67

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	6	2
Portland – 5.7	8	3
Stamford – 5.7	10	4
East Haddam – 6.4	19	8



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	18 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	7611	556	146	12	1	715
Portland – 5.7	7361	733	212	19	2	965
Stamford – 5.7	7022	958	313	30	3	1304
East Haddam – 6.4	6445	1281	530	62	8	1881

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	2.0	0.9	3.0
Portland – 5.7	2.7	1.4	4.0
Stamford – 5.7	3.1	1.8	4.9
East Haddam – 6.4	5.1	3.8	8.9

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	7544.9707	1753.0303	415.9915	2060.8733	11774.87	9298.001	6310.7055
Portland – 5.7	10928.3702	2755.0189	588.903	2893.6165	17165.91	9259.1574	13683.389
Stamford – 5.7	17438.4239	4613.2811	786.4843	4032.0066	26870.2	15840.1019	22051.705
East Haddam – 6.4	25883.2592	6569.7399	1515.3834	7077.1998	41045.58	32452.9991	21681.662
Probabilistic	42.393	12.9153	2.3076	10.909	68.5249	55.3083	36.6539



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	2318	250	74	7	1	331
Portland – 5.7	2060	408	160	18	2	589
Stamford – 5.7	2501	117	28	2	0	148
East Haddam – 6.4	1859	500	248	36	6	790

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	77	77	77
Portland – 5.7	-	-	68	68	69
Stamford – 5.7	-	-	86	86	86
East Haddam – 6.4	-	-	62	62	63

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	5	2
Portland – 5.7	10	5
Stamford – 5.7	2	1
East Haddam – 6.4	16	8



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	13 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	2603	281	83	7	1	372
Portland – 5.7	2314	459	180	20	2	661
Stamford – 5.7	2809	132	32	2	0	166
East Haddam – 6.4	2088	562	279	40	7	887

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.2	0.7	1.9
Portland – 5.7	2.0	1.7	3.7
Stamford – 5.7	0.6	0.3	0.8
East Haddam – 6.4	2.8	3.3	6.1

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	4490.954	1379.9543	290.4233	1245.3434	7406.675	5870.9083	2882.3438
Portland – 5.7	9664.5257	3239.7976	652.5689	2682.6027	16239.49	6125.8167	12904.323
Stamford – 5.7	1841.8753	437.8025	126.8881	545.3527	2951.919	1242.8823	2279.6778
East Haddam – 6.4	14979.0536	4673.2194	1160.9439	4511.901	25325.12	19652.273	8859.2567
Probabilistic	15.0518	5.1538	1.0528	4.2886	25.547	20.2056	9.3042



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	22263	3551	1252	127	13	4944
Portland – 5.7	19798	4873	2208	288	41	7409
Stamford – 5.7	25308	1495	373	30	2	1899
East Haddam – 6.4	16677	5975	3669	716	170	10530

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	73	73	73	73	72
Portland – 5.7	66	65	66	66	65
Stamford – 5.7	84	84	84	84	84
East Haddam – 6.4	59	59	59	59	58

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	179	137
Portland – 5.7	309	236
Stamford – 5.7	57	44
East Haddam – 6.4	585	447



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	51 (Level 1); 7 (Level 2); 1 (Level 3); 1 (Level 4)	75 (Level 1); 12 (Level 2); 1 (Level 3); 2 (Level 4)	53 (Level 1); 8 (Level 2); 1 (Level 3); 2 (Level 4)
Portland – 5.7	82 (Level 1); 13 (Level 2); 1 (Level 3); 3 (Level 4)	140 (Level 1); 24 (Level 2); 3 (Level 3); 5 (Level 4)	96 (Level 1); 16 (Level 2); 2 (Level 3); 3 (Level 4)
Stamford – 5.7	18 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	26 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)	19 (Level 1); 3 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	141 (Level 1); 25 (Level 2); 3 (Level 3); 5 (Level 4)	304 (Level 1); 61 (Level 2); 7 (Level 3); 14 (Level 4)	197 (Level 1); 38 (Level 2); 5 (Level 3); 9 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	24764	3950	1393	141	15	5499
Portland – 5.7	22022	5420	2456	320	45	8241
Stamford – 5.7	28151	1662	415	33	2	2112
East Haddam – 6.4	18550	6646	4081	797	189	11713

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	24.3	16.3	40.6
Portland – 5.7	35.6	32.1	67.8
Stamford – 5.7	10.4	4.6	15.0
East Haddam – 6.4	53.6	72.6	126.2

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	90636.9892	27195.5143	6150.7999	29342.6944	153326	117832.5035	61387.455
Portland – 5.7	158945.5054	49037.5287	11577.7663	52473.0227	272033.8	104531.2786	207983.03
Stamford – 5.7	29113.3805	6964.755	2103.3025	10543.7219	48725.16	20097.6398	36078.136
East Haddam – 6.4	286518.2501	83697.265	24212.8374	102872.0595	497300.4	370215.5151	167581.29
Probabilistic	196.5235	62.6956	14.2677	66.0637	339.5505	259.2191	129.1347



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	7027	776	233	21	2	1032
Portland – 5.7	6353	1192	458	50	6	1706
Stamford – 5.7	7504	437	109	9	1	555
East Haddam – 6.4	5633	1528	767	113	19	2426

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	77	77	77
Portland – 5.7	-	-	70	70	70
Stamford – 5.7	-	-	84	84	84
East Haddam – 6.4	-	-	63	63	63

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	11	5
Portland – 5.7	20	10
Stamford – 5.7	5	3
East Haddam – 6.4	35	18



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	9 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	6 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	8 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	18 (Level 1); 3 (Level 2); 0 (Level 3); 1 (Level 4)	12 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	13 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	36 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	23 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	7771	858	257	23	2	1141
Portland – 5.7	7025	1318	506	56	6	1887
Stamford – 5.7	8298	484	120	10	1	614
East Haddam – 6.4	6229	1689	848	125	21	2683

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	3.0	1.8	4.8
Portland – 5.7	4.7	3.7	8.4
Stamford – 5.7	1.7	0.8	2.5
East Haddam – 6.4	7.1	7.7	14.9

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	11593.2834	3376.6659	589.8081	2992.2673	18552.02	14969.9493	8173.5614
Portland – 5.7	22467.144	7140.7822	1152.5836	5670.2976	36430.81	15885.6734	29607.926
Stamford – 5.7	6375.9038	1564.0845	332.3196	1689.3126	9961.62	4637.3562	7939.9883
East Haddam – 6.4	37845.9749	11319.0531	2245.1227	10350.1925	61760.34	49165.028	25015.142
Probabilistic	40.4186	13.6095	2.2297	10.5723	66.8301	54.0281	27.331



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	4567	881	342	38	4	1265
Portland – 5.7	3788	1236	678	110	20	2044
Stamford – 5.7	5505	260	62	5	0	327
East Haddam – 6.4	3249	1358	939	221	65	2583

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	-	69	69
Portland – 5.7	-	-	-	61	60
Stamford – 5.7	-	-	-	86	86
East Haddam – 6.4	-	-	-	54	54

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	8	4
Portland – 5.7	17	9
Stamford – 5.7	2	1
East Haddam – 6.4	29	15



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	15 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	10 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	10 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	35 (Level 1); 6 (Level 2); 1 (Level 3); 1 (Level 4)	21 (Level 1); 4 (Level 2); 0 (Level 3); 1 (Level 4)
Stamford – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	15 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	66 (Level 1); 14 (Level 2); 2 (Level 3); 3 (Level 4)	39 (Level 1); 8 (Level 2); 1 (Level 3); 2 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	4963	957	371	41	5	1374
Portland – 5.7	4116	1344	737	120	21	2221
Stamford – 5.7	5981	282	68	5	0	356
East Haddam – 6.4	3530	1476	1020	241	71	2807

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	2.7	1.9	4.6
Portland – 5.7	4.4	4.7	9.1
Stamford – 5.7	0.8	0.3	1.1
East Haddam – 6.4	6.1	8.9	14.9

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	15335.1754	4596.9426	1442.4512	4086.6789	25461.25	19932.118	12781.275
Portland – 5.7	30322.2696	9482.4274	3296.9983	8691.3318	51793.03	24353.0407	39804.697
Stamford – 5.7	3160.0781	651.7228	290.7802	877.502	4980.083	2628.2357	3811.8009
East Haddam – 6.4	44746.7462	13273.6845	5498.879	13907.7483	77427.06	58020.4307	32522.966
Probabilistic	24.9814	7.8759	2.4958	6.9525	42.3056	32.8573	20.4084



Number of Residential Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total Damaged
Haddam – 5.7	3575	285	76	6	0	369
Portland – 5.7	3403	404	124	11	1	541
Stamford – 5.7	3518	326	92	8	1	426
East Haddam – 6.4	3008	631	268	32	4	936

Essential Facilities - Average Percent Functionality on Day 1 After Earthquake					
Epicenter Location and Magnitude	Medical Facilities (0)	Emergency Operations Centers (0)	Fire Stations (0)	Police Stations (0)	Schools (0)
Haddam – 5.7	-	-	81	81	81
Portland – 5.7	-	-	76	76	76
Stamford – 5.7	-	-	81	80	80
East Haddam – 6.4	-	-	67	67	67

Shelter Requirements		
Epicenter Location and Magnitude	Number of Displaced Households	Short Term Sheltering Need (Number of People)
Haddam – 5.7	4	2
Portland – 5.7	6	3
Stamford – 5.7	4	2
East Haddam – 6.4	13	6



Casualty Estimates			
Epicenter Location and Magnitude	2:00 AM	2:00 PM	5:00 PM
Haddam – 5.7	1 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Portland – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	5 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
Stamford – 5.7	2 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	3 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)
East Haddam – 6.4	4 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)	11 (Level 1); 2 (Level 2); 0 (Level 3); 0 (Level 4)	7 (Level 1); 1 (Level 2); 0 (Level 3); 0 (Level 4)
Probabilistic	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)	0 (Level 1); 0 (Level 2); 0 (Level 3); 0 (Level 4)



Total Number of Buildings Damaged						
Epicenter Location and Magnitude	No Damage	Slight Damage	Moderate Damage	Extensive Damage	Complete Damage	Total
Haddam – 5.7	4042	323	86	7	1	417
Portland – 5.7	3848	457	140	13	1	611
Stamford – 5.7	3977	369	104	9	1	482
East Haddam – 6.4	3401	713	303	37	5	1058

Debris Generation (tons)			
Epicenter Location and Magnitude	Brick, Wood & Others	Concrete & Steel	Total
Haddam – 5.7	1.0	0.5	1.5
Portland – 5.7	1.4	0.8	2.2
Stamford – 5.7	1.1	0.5	1.6
East Haddam – 6.4	2.5	1.9	4.5

Estimated Direct Economic Losses							
Epicenter Location and Magnitude	Building Loss	Content Loss	Income Loss	Other Losses (Inventory, Relocation, Rental, Wage Losses)	Total Losses	Property Losses	Residential Property Losses
Haddam – 5.7	3817.9572	956.1421	260.8559	1113.0947	6148.05	4774.0993	2887.6943
Portland – 5.7	6176.0406	1689.8188	405.0409	1715.4111	9986.311	4775.3827	7865.8594
Stamford – 5.7	5205.808	1335.7804	326.0081	1407.0115	8274.608	4204.4995	6541.5884
East Haddam – 6.4	12812.0446	3457.4845	951.4998	3796.9369	21017.97	16269.5291	9590.7698
Probabilistic	18.9903	6.01	1.3465	5.3991	31.7459	25.0003	14.5187







## **Appendix E**

Adoption Resolutions







CERTIFICATE OF ADOPTION  
ANSONIA CITY COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Ansonia has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Ansonia City Council approved the previous version of the Plan in 2012; and

WHEREAS, the City of Ansonia and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Ansonia; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Ansonia, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Ansonia eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the City of Ansonia;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the City Council of Ansonia, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Ansonia this \_\_\_\_ day of \_\_\_\_, 2021.

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City Clerk



CERTIFICATE OF ADOPTION  
BEACON FALLS BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Beacon Falls has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Beacon Falls Board of Selectmen approved the previous version of the Plan in 2015; and

WHEREAS, the Town of Beacon Falls and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Beacon Falls; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Beacon Falls, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Beacon Falls eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Beacon Falls;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the Board of Selectmen of Beacon Falls, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Beacon Falls this \_\_\_\_ day of \_\_\_\_\_, 2021.

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Town Clerk



CERTIFICATE OF ADOPTION  
BETHLEHEM BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Bethlehem has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Bethlehem Board of Selectmen approved the previous version of the Plan in 2015; and

WHEREAS, the Town of Bethlehem and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Bethlehem; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Bethlehem, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Bethlehem eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Bethlehem;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the Board of Selectmen of Bethlehem, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Bethlehem this \_\_\_\_ day of \_\_\_\_\_, 2021.

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Town Clerk



CERTIFICATE OF ADOPTION  
BRISTOL CITY COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Bristol has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Bristol City Council approved the previous version of the Plan in 2016; and

WHEREAS, the City of Bristol and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Bristol; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Bristol, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Bristol eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the City of Bristol;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council.

**Adopted this \_\_\_\_\_ day of \_\_\_\_\_, 2021 by the City Council of Bristol, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Bristol this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

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City Clerk



CERTIFICATE OF ADOPTION  
CHESHIRE BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Cheshire has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Cheshire Board of Selectmen approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Cheshire and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Cheshire; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Cheshire, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Cheshire eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Cheshire;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectmen of Cheshire, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Cheshire this \_\_\_\_ day of \_\_\_\_, 2021.

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Town Clerk



CERTIFICATE OF ADOPTION  
DERBY CITY COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Derby has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Derby City Council approved the previous version of the Plan in 2012; and

WHEREAS, the City of Derby and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Derby; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Derby, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Derby eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the City of Derby;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council.

**Adopted this \_\_\_\_\_ day of \_\_\_\_\_, 2021 by the City Council of Derby, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Derby this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

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City Clerk



CERTIFICATE OF ADOPTION  
MIDDLEBURY BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Middlebury has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Middlebury Board of Selectmen approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Middlebury and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Middlebury; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Middlebury, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Middlebury eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Middlebury;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectmen of Middlebury, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Middlebury this \_\_\_\_ day of \_\_\_\_, 2021.

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Town Clerk



CERTIFICATE OF ADOPTION  
NAUGATUCK BOROUGH COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Borough of Naugatuck has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Naugatuck Borough Council approved the previous version of the Plan in 2015; and

WHEREAS, the Borough of Naugatuck and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Naugatuck; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Naugatuck, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Naugatuck eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Borough of Naugatuck;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Borough Council.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the Borough Council of Naugatuck, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Naugatuck this \_\_\_\_ day of \_\_\_\_\_, 2021.

---

Borough Clerk



CERTIFICATE OF ADOPTION  
OXFORD BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Oxford has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Oxford Board of Selectmen approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Oxford and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Oxford; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Oxford, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Oxford eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Oxford;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_\_ day of \_\_\_\_\_, 2021 by the Board of Selectmen of Oxford, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Oxford this \_\_\_\_\_ day of \_\_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
PLYMOUTH BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Plymouth has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Plymouth Board of Selectmen approved the previous version of the Plan in 2016; and

WHEREAS, the Town of Plymouth and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Plymouth; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Plymouth, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Plymouth eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Plymouth;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the Board of Selectmen of Plymouth, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Plymouth this \_\_\_\_ day of \_\_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
PROSPECT BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Prospect has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Prospect Board of Selectmen approved the previous version of the Plan in 2015; and

WHEREAS, the Town of Prospect and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Prospect; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Prospect, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Prospect eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Prospect;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the Board of Selectmen of Prospect, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Prospect this \_\_\_\_ day of \_\_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
SEYMOUR BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Seymour has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Seymour Board of Selectmen approved the previous version of the Plan in 2012; and

WHEREAS, the Town of Seymour and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Seymour; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Seymour, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Seymour eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Seymour;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectmen of Seymour, Connecticut**

---

First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Seymour this \_\_\_\_ day of \_\_\_\_, 2021.

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Town Clerk



CERTIFICATE OF ADOPTION  
SHELTON CITY COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Shelton has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Shelton City Council approved the previous version of the Plan in 2012; and

WHEREAS, the City of Shelton and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Shelton; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Shelton, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Shelton eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the City Council:

1. The Plan is hereby adopted as an official plan of the City of Shelton;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council.

**Adopted this \_\_\_\_ day of \_\_\_\_\_, 2021 by the City Council of Shelton, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Shelton this \_\_\_\_ day of \_\_\_\_\_, 2021.

---

City Clerk



CERTIFICATE OF ADOPTION  
SOUTHBURY BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Southbury has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Southbury Board of Selectmen approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Southbury and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Southbury; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Southbury, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Southbury eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Southbury;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectmen of Southbury, Connecticut**

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First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Southbury this \_\_\_\_ day of \_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
THOMASTON BOARD OF SELECTMEN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Thomaston has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Thomaston Board of Selectmen approved the previous version of the Plan in 2015; and

WHEREAS, the Town of Thomaston and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Thomaston; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Thomaston, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Thomaston eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Thomaston;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectmen of Thomaston, Connecticut**

---

First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Thomaston this \_\_\_\_ day of \_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
WATERBURY CITY COUNCIL

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Waterbury has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Waterbury City Council approved the previous version of the Plan in 2014; and

WHEREAS, the City of Waterbury and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Waterbury; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Waterbury, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Waterbury eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the City of Waterbury;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the City Council.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the City Council of Waterbury, Connecticut**

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Mayor

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Waterbury this \_\_\_\_ day of \_\_\_\_, 2021.

---

City Clerk



CERTIFICATE OF ADOPTION  
WATERTOWN BOARD OF SELECTMAN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Watertown has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Watertown Board of Selectman approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Watertown and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Watertown; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Watertown, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Watertown eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Watertown;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectman.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectman of Watertown, Connecticut**

---

First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Watertown this \_\_\_\_ day of \_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
WOLCOTT BOARD OF SELECTMAN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Wolcott has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Wolcott Board of Selectman approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Wolcott and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Wolcott; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Wolcott, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Wolcott eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Wolcott;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectman.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectman of Wolcott, Connecticut**

---

First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Wolcott this \_\_\_\_ day of \_\_\_\_, 2021.

---

Town Clerk



CERTIFICATE OF ADOPTION  
WOODBURY BOARD OF SELECTMAN

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the Town of Woodbury has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Woodbury Board of Selectman approved the previous version of the Plan in 2014; and

WHEREAS, the Town of Woodbury and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Woodbury; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Woodbury, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Woodbury eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Woodbury;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectman.

**Adopted this \_\_\_\_ day of \_\_\_\_, 2021 by the Board of Selectman of Woodbury, Connecticut**

---

First Selectman

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Woodbury this \_\_\_\_ day of \_\_\_\_, 2021.

---

Town Clerk







## **Appendix F**

### Mitigation Strategy Worksheet







## Mitigation Action Progress Report Form

Progress Report Period	From Date:	To Date:
Action/Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	<input type="checkbox"/> Project completed <input type="checkbox"/> Project canceled <input type="checkbox"/> Project on schedule <input type="checkbox"/> Anticipated completion date: _____ <input type="checkbox"/> Project delayed Explain _____	

### Summary of Project Progress for this Report Period

1. What was accomplished for this project during this reporting period?

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2. What obstacles, problems, or delays did the project encounter?

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3. If uncompleted, is the project still relevant? Should the project be changed or revised?

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4. Other comments

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# Worksheet 7.1

Mitigation Action Progress Report Form

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## Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision-maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	



## Worksheet 7.2

### Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	