Western Connecticut Council of Governments
Multi-Jurisdiction Hazard Mitigation Plan Update
2021 – 2026

Municipal Annex
for
New Canaan, CT

77 Main St.
New Canaan, CT 06840
August 2021

Prepared for:
WESTERN CONNECTICUT
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ENGINEERING | PLANNING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL SCIENCE

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1.0 INTRODUCTION

1.1 Purpose of Annex

The purpose of this Hazard Mitigation Plan (HMP) annex is to provide a community-specific hazard risk assessment, capability analysis, and evaluation and prioritization of hazard mitigation measures and projects. Background information and the regional effects of pertinent natural hazards are discussed in the main body of the Western Connecticut Council of Governments (WestCOG) Multi-Jurisdictional Hazard Mitigation Plan. This annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific detail for the Town of New Canaan and is not to be considered a standalone document.

The primary goal of this HMP, including this Municipal Annex, is to identify natural hazard risks and mitigation opportunities in order to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources. This includes the reduction of public and private damage costs. Limiting losses of and damage to life and property will also reduce the social, emotional, and economic disruption associated with a natural disaster.

2.0 COMMUNITY PROFILE

2.1 Geography

2.1.1 Physical Setting

The Town of New Canaan was incorporated in 1801 and is located in southern Fairfield County and home to a population of 19,738 (2010 U.S. Census). New Canaan is bordered by the municipalities of Darien to the south, Wilton and Norwalk to the east, Stamford to the west, and New York State to the north. Refer to Figure 2-1 for maps showing the regional location of New Canaan within the WestCOG region.

New Canaan is a suburban community, with several rivers and streams flowing throughout. The Fivemile River flows from north to south through the center of town. The Silvermine River runs from north to south on the eastern border. The Noroton River originates in the northwestern central part of town and flows south. The highest elevation in New Canaan is about 500 feet in the eastern most areas bordering Wilton. With the south western area of New Canaan being at, or close to 150 feet. The varying terrain of New Canaan makes the town vulnerable to an array of natural hazards.

The Center for Land Use Education and Research (CLEAR) has developed a land cover dataset derived from 2016 satellite imagery to depict statewide land cover. The land cover by percent of total land can be found in Table 2-1.

Table 2-1: Land Cover by Area

Land Cover Class	Percent of Total Land
Developed	32.3
Turf & Grass	23.7
Other Grasses	0.9
Agricultural Field	0.4
Deciduous Forest	36.2
Coniferous Forest	2.3
Water	2.0
Non-Forested Wetland	0.04
Forested Wetland	1.8
Tidal Wetland	0.3
Barren Land	0.0
Utility Corridor	0.0

2.1.2 Land Use

According to New Canaan's 2016 POCD, 97% of the town developed or committed to different land uses. Most of the town is designated for residential use, with the majority of that residential being single family lots.

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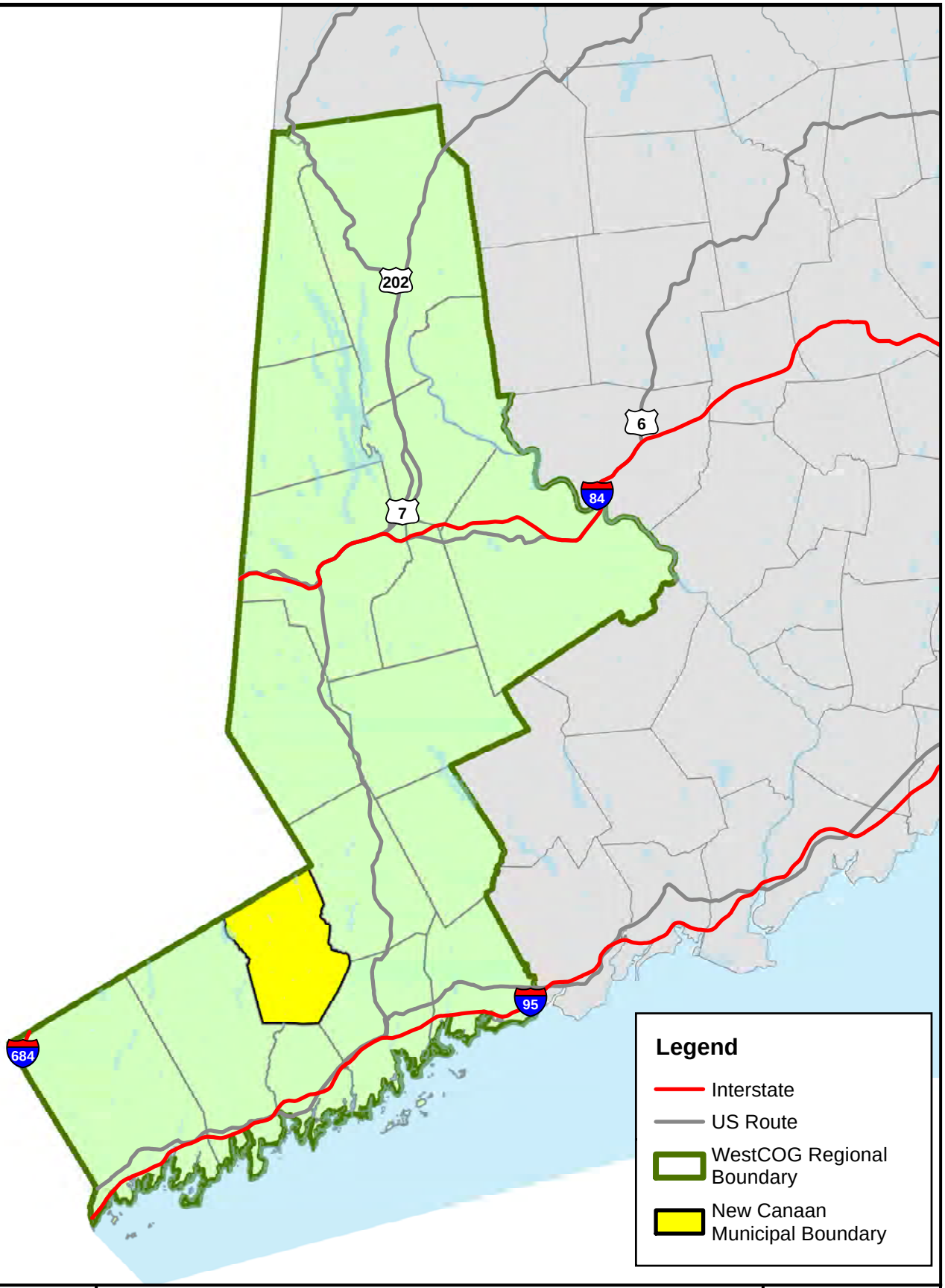

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Regional Location of New Canaan

WestCOG Hazard Mitigation Plan
Town of New Canaan

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FIG. 2-1

2.1.3 Climate and Climate Change

Current Conditions

Over the course of the year, the temperature in New Canaan typically varies from 22°F to 82°F and is rarely below 8°F or above 89°F. The warm season lasts from June 1 to September 15, with an average daily high temperature above 73°F. The hottest day of the year is July 20, with an average high of 82°F and low of 66°F. The cold season lasts from December 3 to March 12, with an average daily high temperature below 45°F. The coldest day of the year is January 29, with an average low of 22°F and high of 36°F.

Precipitation falls throughout the year in New Canaan. The wetter season lasts from April 1 to August 19, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 36% on August 2. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 3, with an average total accumulation of 3.8 inches. The least rain falls around February 5, with an average total accumulation of 1.9 inches.

The snowy period of the year lasts from November 15 to April 7, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 26, with an average total liquid-equivalent accumulation of 0.9 inches.

Climate data was sourced from Weather Spark based on analysis of the years 1980 to 2016.

Climate Change

Climate change projections for Connecticut were sourced from the 2019 Connecticut Physical Climate Science Assessment Report, which was developed by the University of Connecticut (UConn) Atmospheric Sciences Group, commissioned by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) with funding from the Department of Energy and Environmental Protection (DEEP). All projections are based on the IPCC high CO_2 emission scenario (RCP8.5).

Temperature

Annual temperatures have been increasing throughout Connecticut and is projected to continue to do so in the future. By mid-century, average annual temperature is projected to increase by 5°F. Seasonal average temperatures are also expected to rise, with the greatest increase (6°F) experienced in summer (June to August). The number of nights over which temperature remains above 68°F will quadruple from 10 days per year to more than 40 days, and the number of extremely hot days will increase from above 4 a year to 48 per year.

Precipitation

Rainfall data in "Technical Paper No. 40" by the U.S. Weather Bureau (now the National Weather Service) (Hershfield, 1961) dates from the years 1938 through 1958. According to these data, the 24-hour rainfall amount for a 50% annual-chance storm in Fairfield County is 3.3 inches.

The continued increase in precipitation only heightens the need for hazard mitigation planning as the occurrence of floods may change in accordance with the greater precipitation.

The Northeast Regional Climate Center (NRCC) has partnered with the Natural Resources Conservation Service (NRCS) to provide a consistent, current regional analysis of rainfall extremes (http://precip.eas.cornell.edu/). In 2020 this dataset listed the 24-hour rainfall amount for a 50% annual-chance storm in Greenwich as 3.46 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 50% annual-chance annual storm in Greenwich at 3.62 inches.

These precipitation amounts, and more details, are summarized in Table 2-2, below.

Table 2-2: 24-Hour Rainfall Amounts by Annual-Chance Occurrence

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	50%	4%	1%
Technical Paper No. 40	3.3	5.7	7.2
NRCC	3.46	6.41	9.02
NOAA Atlas 14	3.62	6.64	8.43

Annual precipitation has been increasing statewide and is projected to continue to increase. By mid-century, annual precipitation is projected to increase by 8.5%, with the greatest increase (13.4%) occurring in the winter months. Extreme precipitation events are projected to increase in both frequency and magnitude. Based on this increase and the precipitation figures above, by 2050 Greenwich can expect the 24-hour rainfall amount for a 50% annual-chance storm to be around 3.7 to 3.9 inches or greater.

Impervious surfaces and infrastructure in town have increased over time as well, leading to increasing runoff and peak discharge values.

Despite overall increases in precipitation, drought risk is projected to increase, especially during summer, due to changing precipitation patterns and projected increases in potential evapotranspiration (plants taking up more water in hotter temperatures and longer growing seasons).

2.1.4 Drainage Basins and Hydrology

New Canaan is divided among six sub-regional watersheds as described in Table 2-3. All of the water that passes through New Canaan eventually empties into Long Island Sound.

Table 2-3: Sub-Regional Drainage Basins

Drainage Basin	Overall Sub-regional Area (sq. mi)	Area within Town (sq. mi)	Area within Town (acres)	Percent of Town
Darien River	6.21	1.15	734.95	5%
Fivemile River	12.40	5.99	3,835.02	27%
Mill River	13.51	2.90	1,857.05	13%
Noroton River	11.03	6.53	4,181.49	29%
Rippowam River	23.53	5.31	3,399.73	24%
Silvermine River	22.52	0.65	416.10	3%
Total	n/a	22.53	14424.34	

Source: Connecticut Department of Energy & Environmental Protection GIS Data

New Canaan is nearly entirely encompassed within the Southwest Coast drainage basin, which drains directly into Long Island Sound. The eastern edge around Silvermine River is in the Norwalk drainage basin, which also drains into Long Island Sound. Of the six sub-regional drainage basins and their respective streams, the Noroton River is the largest, followed by the Fivemile River.

The Noroton River is approximately 9.4 miles, and originates near downtown New Canaan.

2.2 Society, Culture, and Government

2.2.1 Population and Demographic Setting

According to the 2010 U.S. Census, New Canaan had a population of 19,738, with 900 persons per square mile. According to the 2018 American Community Survey five-year estimates, New Canaan's population between 2013 and 2018 was approximately 20,273.

One important aspect of natural hazard mitigation planning is to identify a community's demographic trends in relation to natural hazards. The Center for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) is used to identify vulnerable populations in New Canaan. The SVI uses census data to identify populations within the town that may be more vulnerable to natural hazards. As a result of this analysis, the town is identified to have a certain level of overall social vulnerability with a rank of 0 to 1; 1 being the most vulnerable and 0 being the least.

To determine social vulnerability, the CDC incorporates 15 factors into the overall SVI calculation under four categories, or themes: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation. Figure 2-2 represents the breakdown of the SVI process. These themes and their ranking are based on census statistics. By evaluating these factors and determining a level of social vulnerability, a community can identify specific needs for before, during, and after an event. Such needs may include sheltering capacity, evacuation routes, or to decide how many emergency personnel may be required to respond after an event.

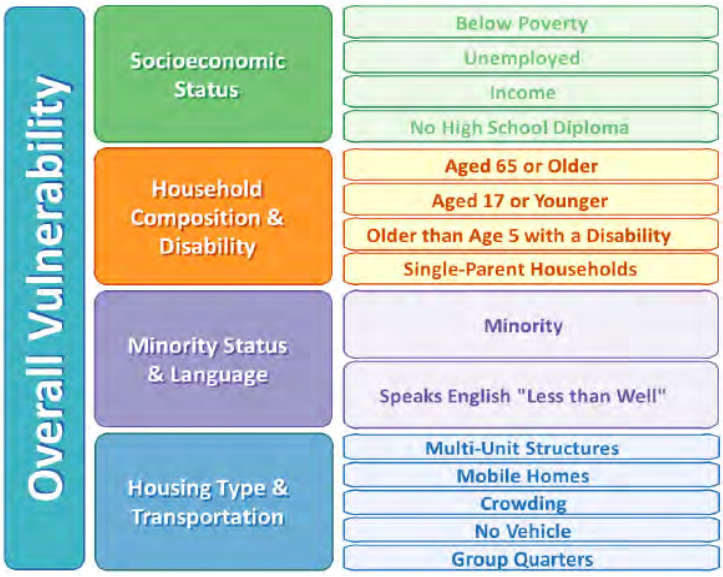

Figure 2-2: The CDC SVI Index Factors. Graphic: svi.cdc.com

The Town of New Canaan is considered to have a low level of vulnerability, with their most vulnerable population based on household composition and disability. In addition, there are vulnerable minority and linguistically challenged populations along with those based on housing

type and lack of transportation. The most concentrated areas of the most vulnerable population are identified in the central tract in town. The central and southwestern tracts are also ranked higher for minority and populations that speak English "less than well". Appendix B explores the SVI for New Canaan in more depth, including maps showing overall vulnerability, and theme vulnerability.

2.2.2 Development Trends

Until the Revolutionary War, New Canaan was primarily an agricultural community; after the war, its major industry was shoemaking. As New Canaan's shoe business gathered momentum early in the 19th century, instead of a central village, regional settlements of clustered houses, mills, and schools developed into distinct district centers. Some of the districts were centered on Ponus Ridge, West Road, Oenoke Ridge, Smith Ridge, Talmadge Hill, and Silvermine, a pattern that the village gradually outgrew.

With the 1868 advent of the railroad to New Canaan, many of New York City's wealthy residents discovered the area and built summer homes. Eventually, many of the summer visitors settled year-round, commuting to their jobs in New York City and creating the community that continues today. In recent years, development has been slow, and limited primarily to small residential developments. The Town has not participated in transit-oriented development planning as other communities have. The POCD amendment (2016) notes that "much of what New Canaan already has and seeks to enhance is often referred to in other areas as 'transit oriented development.' Our vision is not specifically for development that supports transit or is oriented toward transit." Overall, given the very low development pressures in New Canaan, vulnerabilities to natural hazards are not increasing.

2.2.3 Governmental Structure

The First Selectman, as the Chief Executive, is responsible for the procurement and administration of all functions and services required by the Town Charter. The Board of Selectmen, collectively, initiates all budget requests and appropriations, acts as purchasing agent for the Town, and approves all non-elected appointments to Boards, Commissions and Committees.

The Administrative Officer assists the First Selectman with these duties and provides administrative assistance to the other two Selectmen and all Boards and Commissions as may be required. The Administrative Officer also acts as Secretary to the Board of Selectmen and is responsible for meeting schedules, notices, agendas, minutes, and the publication of meeting actions for the Board of Selectmen and the Board of Finance. He also serves as the Risk Manager.

Town departments provide municipal services and day-to-day administration. Many commissions and departments play a role in hazard mitigation, including the Planning and Zoning, Building, Fire, and Public Works.

2.2.4 Historic and Cultural Resources

Historic and cultural resources include sites, structures, and objects that are significant in history, architecture, archaeology, engineering, and culture. Protection of these resources grows economies and enhances community character, and following a natural disaster they can help to reinforce neighborhood connections and reestablish a sense of community and normalcy. Consideration of these resources in this HMP is critical.

> **Historic preservation planning** helps protect historic properties and cultural resources from demolition or alteration. **Hazard mitigation planning** helps protect life and property from damage caused by natural and manmade hazards. **Integrating** these two planning processes helps create safe and sustainable historic communities.
> - Paraphrased from FEMA Report 386-6

Historic resources in New Canaan are concentrated within the Church Hill, and New Canaan Historic Districts. New Canaan historic resources also include the Merritt Parkway, the New Canaan Town Hall, a number of properties on Ponus Ridge Road, and sites and structures throughout the rest of Town. See Figure 2-3 for a map of historic resources in the community.

Analysis of the State Historic Preservation Office (SHPO) database of historic resources shows that some of these resources are exposed to natural hazards, as shown in Table 2-4.

Table 2-4: Number of Historic Assets Exposed to Different Hazards in New Canaan

Hazard	Count
Dam Failure	0
Earthquake	199
Flooding	-
1% Annual	0
0.2% Annual	0
Hurricane/Tropical Storm	199
Sea Level Rise	0
Thunderstorm	199
Tornado	199
Winter Storm	199
Wildfire	49

Historic buildings and structures may be particularly susceptible to natural hazards because they were built prior to the establishment of more recent construction standards. Additionally, some of the structural integrity of these resources may have been degraded over the decades or centuries since their original construction. Structural retrofits and hazard mitigation methods may be challenging or restricted in cases where alteration of a resource will also diminish its cultural or historical aesthetic and value. Finally, miscommunications or lack of knowledge may lead to historic resources being damaged during the disaster recovery process.

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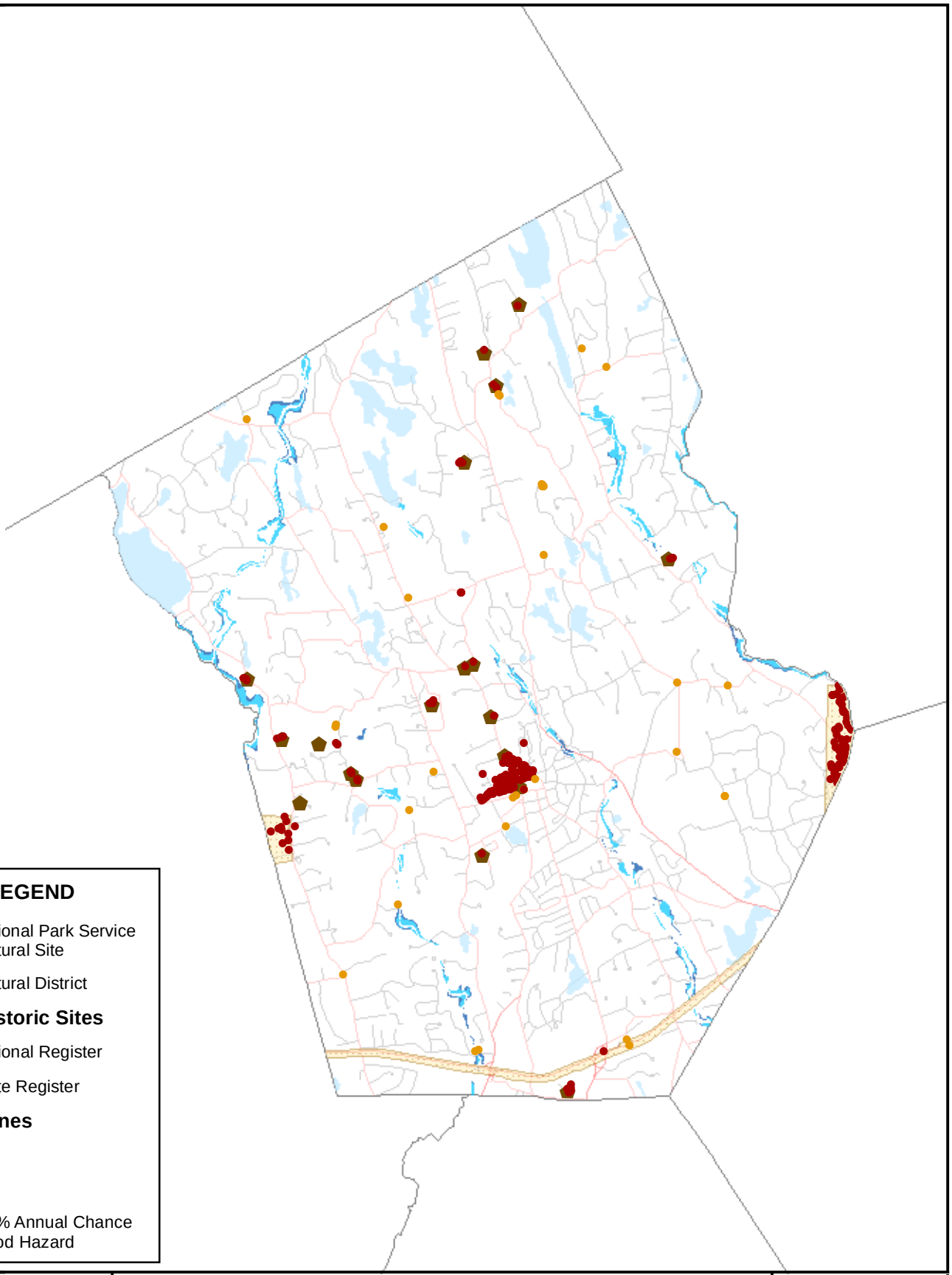

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Historic Resources with Flood Zones and Dam Failure Inundation Areas

WestCOG Hazard Mitigation Plan

Town of New Canaan

NPS: Cultural Resources CT DEEP: DFA FEMA: DFRIM & Q3

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FIG. 2-3

Steps to incorporate historical and cultural preservation into hazard mitigation planning include:

- Inventory and survey historic and cultural resources
- Implement appropriate mitigation measures for those resources
- Take steps to move portable resources, such as artwork or documents, to safe locations prior to the occurrence of a hazard, if possible
- Consider these resources in emergency operations plans to prevent accidental damages during recovery efforts

Specific actions to mitigate natural hazard risks to historic resources are listed at the end of this Annex.

2.3 Infrastructure

2.3.1 Transportation

Major transportation routes in New Canaan include the Merritt Parkway (Route 15), which runs east to west through the southern edge of town. In addition, a spur of the Metro North/Amtrak rail line also runs up to the center of town, connecting to the main New Haven line. There are two trains station, one in the center of town and one in Talmage Hill.

2.3.2 Utilities

Water service is provided by Aquarion and the Norwalk 2nd Taxing District. Service is available along the entirety of the Danbury Road corridor as well as the Westport Road area and in the Silvermine neighborhood. Much of the rest of New Canaan depends on private wells.

Residents and businesses use oil, propane, or natural gas for heat. Natural gas service is provided by Eversource to a small area of southwest New Canaan near Ponus Ridge Road and Running Brook Lane; Eversource is actively expanding its New Canaan natural gas service area. Eversource also provides electricity to New Canaan.

The New Canaan Waste Water Treatment division of the Public Works Department treats wastewater and septic tank waste at the New Canaan Waste Water Treatment Plant, and also maintains three pumping stations and 25 miles of sanitary sewers.

2.4 Planning and Regulatory Capabilities

New Canaan has in place a number of community planning mechanisms, regulations, and policies that serve to mitigate natural hazards by limiting development in hazardous areas, requiring buildings be constructed to certain standards, or otherwise directing development and construction toward increased resilience. These are summarized below. More specific information about how each of these capabilities is relevant to each specific natural hazard type covered in this document is presented in each hazard chapter.

2.4.1 Review of Existing Local Plans

The Town of New Canaan has a number of plans that are relevant to hazard mitigation. These are noted here:

- **Plan of Conservation and Development (POCD):** New Canaan's most recent POCD was adopted in 2014. It addresses natural hazard concerns within the community, and includes strategies that will mitigate risks from those hazards as the community continues to develop.

- **Stormwater Management:** New Canaan maintains a Stormwater Management Plan. This document has been updated to comply with the requirements of the US EPA 2017 updated *General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems* (MS4 General Permit).
- **Capital Improvement Plan (CIP):** New Canaan maintains a CIP that is updated annually and lays out capital investments for a five-year period. The CIP often includes road, drainage, and other infrastructure improvement projects relevant to hazard mitigation.
- **Economic Development Plan:** New Canaan is included within the Western Connecticut Economic Development Plan of 2017, developed by WestCOG. The plan aligns with the COG's other efforts to promote climate sustainability and resiliency in the region.
- **Emergency Operations Plan (EOP):** New Canaan's EOP is reviewed annually and updated as needed. Dam failure Emergency Action Plans (EAPs) for dams with failure inundation zones that may impact New Canaan, and for which EAPs are available, are on file locally.
- **Watershed Management Plan:** A Watershed Management Plan has been developed for the Norwalk River Watershed. The Norwalk River Watershed Action Plan was prepared by the Norwalk River Watershed Initiative Committee, HDR/HydroQual, and the former South Western Regional Planning Agency (SWRPA) in 1998 and updated in 2011. This plan is focused on water quality, but can help the community mitigate inland flood risks by incorporating watershed management best practices into its planning efforts.
- **Open Space:** New Canaan does not maintain a stand-alone Open Space Plan; instead, open space planning is incorporated into the community's POCD.

2.4.1 Review of Regulatory Structures

New Canaan regulates development through a number of regulations, codes, and ordinances. These are summarized below. More detailed information about how these regulations relate to specific natural hazards are described in Section 3.

- **Building Code:** New Canaan enforces the Connecticut State Building Code locally.
- **Zoning Regulations:** Most recently updated in August 2019.
- **Inland Wetlands and Watercourses Regulations:** Most recently updated in January 2013.
- **Subdivision Regulations:** Most recently updated in December 2008. Include provisions promoting control of stormwater runoff, installation of firefighting water sources, construction of adequate emergency access and egress, and burial of utilities.

2.5 Emergency Services, Critical Facilities, Sheltering, and Evacuation

The Town considers its police, fire, and governmental facilities to be critical since these are needed to ensure that emergencies are addressed while day-to-day management of New Canaan continues. The town also considers various facilities housing higher-risk individuals (such as elderly individuals or children) and large populations to be critical facilities. Table 2-5 identifies all of these critical facilities.

Table 2-5: Critical Facilities

Facility	Address or Location	Type	Emergency Power	Shelter	In 1% Floodplain
Town Hall	77 Main St.	Town Hall / Backup EOC	✓		
Department of Public Works	77 Main St.	Public Works			
New Canaan Health Department	77 Main St.	Community Health Programs Administration			
Human Services	77 Main St.				
New Canaan Police Dept.	174 South Ave	Police / EOC	✓		
New Canaan YMCA	564 South Ave	Shelter	✓	✓	
Waveny House	Waveny Park	Shelter		✓	
Lapham Community Center	Waveny Park	Shelter	✓	✓	
New Canaan High School	11 Farm Rd.	School	✓		
Saxe Middle School	468 South Ave	School	✓		
East School	54 Little Brook Rd	School			
West School	769 Ponus Ridge	School			
South School	8 Farm Rd	School			
Silver Hill Hospital	208 Valley Rd	Hospital			
New Canaan Fire Company 1	60 Main St	Fire	✓		
Waveny Care Center, Inc.	3 Farm Rd	Care Facility	✓		
New Canaan Volunteer Ambulance Incorporated	182 South Ave	Ambulance Service	✓		
Highway Department	394 Main St	Municipal Services	✓		
WWTF	394 Main St	Municipal Services	✓		

There are multiple shelters for residents throughout the town, including the YMCA, Waveny House, and the Community Center.

Emergency Response

The Town's Emergency Operations Center (EOC), including its Emergency Communications Center, is located on Route 1 near the commercial center. New Canaan is located in the Connecticut Department of Emergency Services and Public Protection (DESPP) Region 1, consisting of 14 municipalities in southwestern Connecticut.

New Canaan's Tree Warden is responsible for the care and control of all trees and shrubs in whole or in part within the limits of any Town road or grounds, those that extend or overhang the limits of any public roads or grounds. The Tree Warden has exclusive control over trees within highways even though trees themselves stand on private grounds. The Warden determines the condition of trees, particularly with respect to safety.

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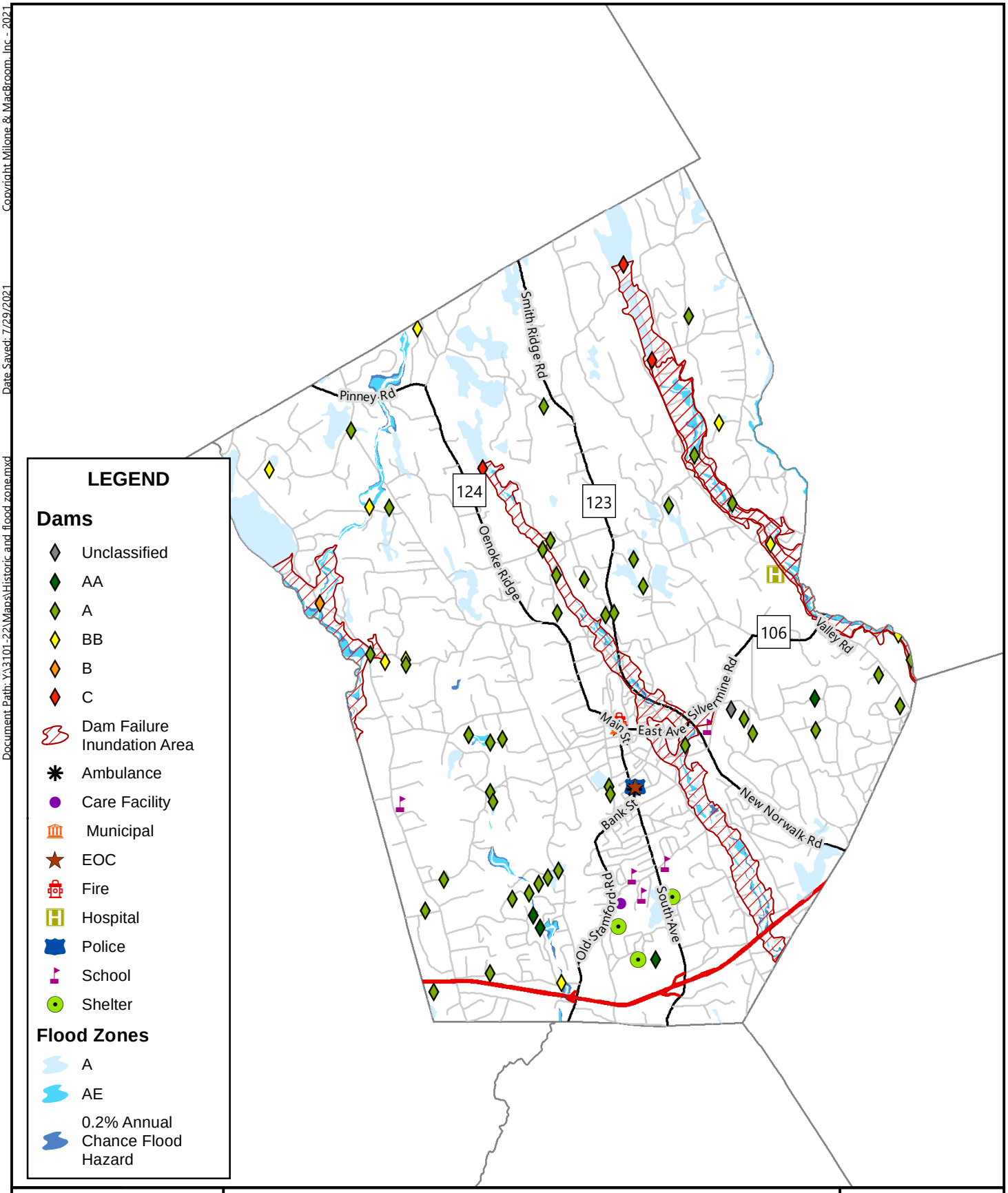

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Critical Facilities with Flood Zones and Dam Failure Inundation Areas

WestCOG Hazard Mitigation Plan

Town of New Canaan

NPS: Cultural Resources CT DEEP: DFA FEMA: DFRIM & Q3

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FIG. 2-4

Emergency Communication Capabilities

The Office of Emergency Management prepares for emergencies and disseminates emergency notifications through three methods:

- Blackboard Connect (the Town is reviewing this service, and potential alternatives)
- Smart911: residents can sign up for this service
- Town-wide email list

The Town of New Canaan also utilizes the CT Alert notification system to alert residents of emergency situations. This system allows the state to direct geographically specific emergency notification telephone calls into affected areas.

Changes to Emergency Services since the Previous HMP

The town has improved support services for seniors in light of the recent COVID-19 pandemic. As a result, the town is confident these services will continue to progress and be available for natural hazards as well. The town has also hardened their emergency radio system by installing additional emergency generators.

3.0 HAZARD ASSESSMENT

3.1 FLOODING (COASTAL, INLAND, AND ICE JAMS)

3.1.1 Setting

The potential for flooding exists across New Canaan, with the majority of major flooding occurring along established riverine SFHAs. The areas impacted by overflow of river systems are generally limited to river corridors and floodplains. Indirect flooding that occurs outside floodplains and localized nuisance flooding along tributaries can also be a concern. This type of flooding occurs particularly along roadways as a result of inadequate drainage and other factors. The frequency of flooding in New Canaan is considered likely for any given year, with flood damage potentially having significant effects during extreme events.

A regulatory floodplain with AE designation has been mapped along the Rippowam and Silvermine Rivers. The areas identified as providing flood storage are identified with A Zone designations, meaning they are regulated as floodplain, but flood elevations have not been established. The New Canaan Reservoir and John D Milne Pond have these traits. Floodplain and floodway designations have also been established along the rivers with AE designations. Refer to Figure 2-4 for the areas of New Canaan susceptible to flooding based on FEMA flood zones.

In general, potential flooding problems in New Canaan are concentrated along the multiple rivers.

3.1.2 Capabilities

New Canaan has rigorous land use regulations designed to protect natural resources and restrict development in flood zones and other hazard-prone areas. These regulations help prevent the loss of life and property by preventing inappropriate development in flood zones and reducing the amount of stormwater discharge that may exacerbate flooding.

Floodplain Management, NFIP and CRS

The town has consistently participated in the NFIP since July 19, 1974 and intends to continue participation in the NFIP. SFHAs in New Canaan are delineated on a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS). The FIS and FIRMs for the town were most recently revised in 2010.

The NFIP administrator for the Town and oversees the enforcement of NFIP regulations. The degree of flood protection established by the variety of regulations in the Town meets the minimum reasonable for regulatory purposes under the NFIP. The town has a minimum elevation standard to include two feet of freeboard.

The Town's Planning and Zoning Commission uses the 1% annual chance flood lines from the FIRM delineated by FEMA to determine floodplain areas. Site plan standards require that all proposals be consistent with the need to minimize flood damage, that public facilities and utilities be located and constructed to minimize flood damage, and that adequate drainage is provided.

Ordinances, Regulations, and Plans

Regulations, codes, and ordinances that apply to flood hazard mitigation in conjunction with and in addition to NFIP regulations are listed below, with examples of sections and content with specific relevance to flood mitigation.

- ***Zoning Regulations***:
  - 5.5: Floodplain Overlay Zone. The Floodplain Overlay Zone is intended to provide reasonable notice regarding property that may be subject to the effects of flooding.

- ***Inland Wetland and Watercourse Regulations***:
  - Chapter 193 - Inland Wetlands and Watercourses.
  - Chapter 300 - Floodplain Management Regulations.
  - Chapter 310 - Inland Wetlands Regulations.

- ***Subdivision Regulations:***
  - Subdivision proposals must be consistent with the need to minimize flood damage.
  - Proposals must have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
  - Proposals must provide adequate drainage to reduce exposure to flood hazards
  - Base flood elevation data shall be provided for all subdivision proposals greater than five acres or fifty lots in Zone A

Drainage and Street Flooding

The Town Engineering Department is in charge of the maintenance of the town's drainage systems and performs clearing of bridges and culverts and other maintenance as needed. The department maintains a list of drainage concern areas.

Public Information

The town receives regular weather updates through Division of Emergency Management and Homeland Security (DEMHS) Region 1 email alerts as well as watches and warnings through the National Weather Service. Stream gages near New Canaan, such as along the Fivemile River, allow municipal officials to monitor for flood conditions.

Actions Completed and New Capabilities

The town routinely inspects culverts and catch basins for necessary repairs, replacement, and cleaning. An asset management system is currently in place for tracking infrastructure. The town has about 70% of storm drains mapped in GIS. This system allows for easy tracking of damages and necessary repairs throughout town.

3.1.3 Vulnerabilities and Risk Assessment

Repetitive Loss Properties

There are 6 repetitive loss properties (RLPs) located in New Canaan; all are residential. The majority are on the Five Mile River. Town staff have reported that there is a Repetitive Loss Property (RLP) that the Town has considered for acquisition and removal in the past; however other mitigation steps have been taken.

Critical Facilities

There are no facilities located within the 100-year flood zones.

At-Risk Areas

There are delineated floodplains throughout the town which are at increased risk of flooding; the primary area of risk related to delineated floodplains is the area long the Five Mile River. The town has also reported there are issues with poor drainage areas. Drainage issues have been noted on Southwood Drive, Old Stamford Road, and in Waveny Park.

Changes and Improvements

New Canaan continues to maintain and improve its flood mitigation capabilities. The town performs maintenance dredging of both Mill and Mead ponds on an annual basis. The town has also assisted a property owner to address flooding issues that frequently occur; the Town has helped some property-owners complete Letters of Map Amendment (LOMAs) to submit to FEMA. New Canaan completed a drainage and flood mitigation study of Five Mile River, and uses the results of this study as an element for review during the permitting process.

3.2 DAM FAILURE

3.2.1 Setting

Dam failures can be triggered suddenly, with little or no warning, and often from other natural disasters such as floods and earthquakes. Dam failures often occur during flooding when the dam breaks under the additional force of floodwaters. In addition, a dam failure can cause a chain reaction where the sudden release of floodwaters causes the next dam downstream to fail. While flooding from a dam failure generally has a moderate geographic extent, the effects are potentially catastrophic. Fortunately, a major dam failure is considered only a possible hazard event in any given year.

The Connecticut DEEP administers the statewide Dam Safety Program and designates a classification to each state-inventoried dam based on its potential hazard.

- *Class AA*: negligible hazard potential
- *Class A*: low hazard potential
- *Class BB*: moderate hazard potential
- *Class B*: significant hazard potential
- *Class C*: high potential hazard

3.2.2 Capabilities

Dam failure inundation areas are included in the CT Alert emergency notification system contact database. The Town has the Emergency Action Plan (EAP) for the South Norwalk Electric and Water (SNEW) and City of Norwalk owned dams on file in the event of a potential failure. There are three high hazard dams in town.

The Dam Safety Section of the Connecticut DEEP Inland Water Resources Division is charged with the responsibility for administration and enforcement of Connecticut's dam safety laws. The existing statutes require that permits be obtained to construct, repair, or alter dams and that existing dams be inventoried and periodically inspected to assure that their continued operation does not constitute a hazard to life, health, or property.

Dams regulated by the Connecticut DEEP must be designed to pass the 1% annual chance rainfall event with one foot of freeboard, a factor of safety against overtopping.

Significant and high hazard dams are required to meet a design standard greater than the 1% annual chance rainfall event.

The dam safety requirements are codified in Sections 22a-401 through 22a-411 inclusive of the Connecticut General Statutes. Sections 22a-409-1 and 22a-409-2 of the Regulations of Connecticut State Agencies have been enacted and set requirements for the registration, classification, and inspection of dams. Dams must be inventoried by the owner with the Connecticut DEEP according to Connecticut Public Act 83-38.

Effective October 1, 2013, the owner of any high or significant hazard dam (Class B and C) must develop and implement an EAP after the Commissioner of DEEP adopts regulations. The EAP shall be updated every two years, and copies shall be filed with DEEP and the chief executive officer of any municipality that would potentially be affected in the event of an emergency. New regulations shall establish the requirements for such EAPs, including but not limited to (1) criteria and standards for inundation studies and inundation zone mapping; (2) procedures for

monitoring the dam or structure during periods of heavy rainfall and runoff, including personnel assignments and features of the dam to be inspected at given intervals during such periods; and (3) a formal notification system to alert appropriate local officials who are responsible for the warning and evacuation of residents in the inundation zone in the event of an emergency.

The CT DEEP also administers the Flood and Erosion Control Board program, which can provide noncompetitive state funding for repair of municipality-owned dams. Funding is limited by the State Bond Commission. State statute Section 25-84 allows municipalities to form Flood and Erosion Control Boards, but municipalities must take action to create the board within the context of the local government such as by revising the municipal charter. The Town's Planning and Zoning Commission is responsible for reviewing all development activities that occur within flood hazard or flood-prone areas.

The Town uses the CT Alert system for emergency notification. The dam failure inundation mapping discussed in the next section can be used to help streamline the geographic contact areas if the failure of a major dam is imminent.

Actions Completed and New Capabilities

New Canaan continues to mitigate dam failure where appropriate.

3.2.3 Vulnerabilities and Risk Assessment

As of 2013, there were 49 DEEP-inventoried dams within the Town of New Canaan. The higher hazard dams are shown in Figure 2-4. Three of these dams are Class C, or high hazard dam, and seven others are a Class B, or significant hazard dam. As shown in Table 3-1, the higher hazard dams located in the town pose a risk to New Canaan.

Table 3-1: High Hazard Dams with Potential to Affect the Town of New Canaan

#	Name	Location	Class	Owner
9001	New Canaan Reservoir Dam	New Canaan Reservoir	C	South Norwalk Electric and Water
9002	John D. Milne Lake Dam	John D. Milne Lake	C	City of Norwalk
9003	Grupes Reservoir Dam	Grupes Reservoir	C	City of Norwalk
9004	Silvermine Dam	Silvermine	BB	Private
9005	Hickok Pond	Hickok Pond	BB	Private
9006	Jeliliff Mill Pond Dam	Jeliliff Mill Pond	BB	Private
9007	Siscowit Reservoir Dam	Siscowit Reservoir	BB	Town of New Canaan
9008	Lockwood Pond Dam	Lockwood Pond	BB	Private
9010	Above Pond Dam	Above Pond	BB	Private
9011	Collins Pond Dam	Collins Pond	BB	Private
9012	Greenly Pond Dam	Greenley Pond	BB	Private
9013	Two Acre Pond Dam	Two Acres Pond	BB	Private

Failure of a high hazard dam can affect properties downstream of the impoundment both in and outside of the town, with potential large inundation zones traveling along each respective waterway.

The New Canaan Reservoir Dam is 445 feet in length, with a maximum height of 37 feet. It is an earthen and concrete structure, and impounds roughly 320 acres at normal water levels with a contributing watershed of 0.84 square miles.

The Grupes Reservoir Dam is a 940-foot-long and 70-foot-high concrete dam. This dam impounds roughly 1,870 acres, with a contributing watershed of 9.5 square miles.

The Silvermine Dam is 235 feet in length, with a maximum height of 24 feet. It is a masonry structure, and impounds roughly 171 acres at normal water levels with a contributing watershed of 10.2 square miles.

Changes and Improvements

New Canaan continues to be at low risk from dam failure.

3.3 HURRICANES AND TROPICAL STORMS

3.3.1 Setting

Several types of hazards may be associated with tropical storms and hurricanes including heavy or tornado winds, heavy rains, and flooding. While only some of the areas of New Canaan are susceptible to flooding damage caused by hurricanes, wind damage can occur anywhere in the town. Hurricanes, therefore, have the potential to affect any area within the Town of New Canaan. A hurricane striking New Canaan is considered a possible event each year and could cause critical damage to the town and its infrastructure. Wind damage from a hurricane can occur anywhere in the town, and heavy rainfall may cause riverine and urban flooding.

Connecticut is located in FEMA Zone II regarding maximum expected wind speed. The maximum expected wind speed for a three-second gust is 160 mph. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

3.3.2 Capabilities

Wind loading requirements are addressed through the state building code. The 2005 Connecticut State Building Code was amended in 2011, and again in 2018, with an effective date of October 1, 2018. The code specifies the design wind speed for construction in all the Connecticut municipalities. Effective 2018, the design wind speed for New Canaan is 110 miles per hour for a Category 1, 120 miles per hour for a Category 2 and 130 for Category 3 or greater. New Canaan has adopted the Connecticut Building Code as its building code. The town website provides links to the State Building Codes so that developers are able to find design standards for wind.

New Canaan DPW has a robust tree maintenance budget.

The Town of New Canaan has worked to ensure that citizens have the information needed to properly plan and prepare for natural disasters. The Office of Emergency Management prepares for emergencies and disseminates emergency notifications. Residents can choose to receive phone, email or text alerts about severe weather events, power outages, police bulletins and other vital emergency information.

Utilities must be placed underground in new developments; this capability is considered proactive to prevent damage from wind and falling trees.

Actions Completed and New Capabilities

Coordination with the Town's electric utility, Eversource, has improved since the previous HMP (Connecticut Lights & Power was the utility at the time). The State of Connecticut has updated its State Building Code; new construction that adheres to this new code is expected to be more resilient to hurricane winds.

The Town has also hardened its emergency radio system by installing additional emergency generators, and has acquired a trailer for transportation of a portable generator. The Town has a strong solarization initiative, with solar panels having been added to many municipal buildings and plans for expanding solarization in the works. The Town Pool and Nature Center solar systems are able to operate off the grid.

3.3.3 Vulnerabilities and Risk Assessment

Blocked roads or loss of power due to falling trees is a primary concern for the town; the Public Works Department aggressively funds tree maintenance and considers its capabilities to be adequate.

Most of the housing stock in town predates recent building code changes, and so may be susceptible to roof and window damage from high winds. The primary risk associated with tropical storm winds is the downing of trees and limbs, leading to power outages and blocked roads.

Changes and Improvements

New Canaan continues to mitigate the impacts of hurricanes and tropical storms by way of flooding mitigation and aggressive tree maintenance.

3.4 SUMMER STORMS AND TORNADOES

3.4.1 Setting

Heavy wind (including tornadoes and downbursts), lightning, heavy rain, hail, and flash floods are the primary hazards associated with summer storms. Like hurricanes and winter storms, summer storms and tornadoes have the potential to affect any area within the Town of New Canaan. Furthermore, because these types of storms and the hazards that result (flash flooding, wind, hail, and lightning) might have limited geographic extent, it is possible for a summer storm to harm one area within the town without harming another. The entire Town of New Canaan is therefore susceptible to summer storms (including heavy rain, flash flooding, wind, hail, and lightning) and tornadoes.

Based on the historic record, it is considered highly likely that a summer storm that includes lightning will impact the Town of New Canaan each year although lightning strikes have a limited effect. Strong winds and hail are considered likely to occur during such storms but also generally have limited effects. A tornado is considered a possible event in Litchfield County each year that could cause significant damage to a small area.

3.4.2 Capabilities

Warning is the primary method of existing mitigation for tornadoes and thunderstorm-related hazards. The NOAA National Weather Service issues watches and warnings when severe weather is likely to develop or has developed, respectively. New Canaan's emergency communication capabilities are described in Section 2.5.

The town also has contracts with private contractors to assist with debris removal after an event.

Actions Completed and New Capabilities

The town is continuously pursuing upgrades to backup power systems for municipal facilities and had also installed solar power capabilities in several municipal buildings.

3.4.3 Vulnerabilities and Risk Assessment

The entire Town of New Canaan is at relatively equal risk for experiencing damage from summer storms and tornadoes. Based on the historic record, a few summer storms have resulted in costly damages to the Town. Most damages are relatively site specific and occur to private property (and therefore are paid for by private insurance). For municipal property, the town budget for tree removal and minor repairs is generally adequate to handle summer storm damage.
The Town of New Canaan has moderate to high potential to experience tornado damage. In general, thunderstorms and hailstorms in Connecticut are more frequent in the western and northern parts of the state and less frequent in the southern and eastern parts. The majority of these events do not cause any measurable damage. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the New Canaan area is very high during any given thunderstorm although no one area of the town is at higher risk of lightning strikes. The risk of at least one hailstorm occurring in New Canaan is considered moderate in any given year.

The risk of downbursts occurring during such storms and damaging the Town of New Canaan is believed to be low for any given year. All areas of the town are susceptible to damage from high winds although more building damage is expected in central, more developed area of town, while more tree damage is expected in the less densely populated areas of town.

Secondary damage from falling branches and trees is more common than direct wind damage to structures. Heavy winds can take down trees near power lines, leading to the start and spread of fires. Most downed power lines in New Canaan are detected quickly, and any associated fires are quickly extinguished. Such fires can be extremely dangerous during the summer months during dry and drought conditions. It is important to have adequate water supply for fire protection to ensure the necessary level of safety is maintained.

A tornado hit New Canaan in 2018. According to the NCEI, the tornado occurred on October 2, 2018 and was rated an EF1. Wind speeds were around 100 miles per hour. The path was nearly 4 miles long and about 300 feet wide. Damage to cars was reported; total property damage was estimated at $50,000. Impacts of the storm included downed trees and power lines, and temporary road closures. The tornado began near Weed Street and Marshall Ridge Road and traveled southeast through Waveny Park to Conrad Road. The Tornado "hopped over" the High School and Middle School without causing any damage

Changes and Improvements

New Canaan continues to mitigate summer storm and tornado impact.

3.5 WINTER STORMS AND NOR'EASTERS

3.5.1 Setting

The entire Town of New Canaan is susceptible to winter storms. In general, winter storms are considered highly likely to occur each year (although major storms are less frequent), and the hazards that result (nor'easter winds, snow, and blizzard conditions) can potentially have a significant effect over a large area of the town.

Connecticut can expect to experience at least two or more major snow events each year, with an average of 14 winter events in a season. It is estimated that New Canaan's average annual snowfall is about 2.5 to 4 feet.

3.5.2 Capabilities

Prior to a winter weather event, the town ensures that all warning/notification and communications systems are ready and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. In some known problem areas, prestorm treatment is applied to roadways to reduce the accumulation of snow. The town also prepares for the possible evacuation and sheltering of some populations that could be impacted by the upcoming storm (especially the elderly and special needs persons).

The New Canaan highway department plows and deices 125 miles of public roads in town. The DPW deicing and plowing policy is posted on the town website and outlines the procedures for winter storm response responsibilities.

Actions Completed and New Capabilities

New Canaan's winter storm mitigation capabilities continue to be significant, although there has not been a significant change in these capabilities since the previous HMP was adopted.

3.5.3 Vulnerabilities and Risk Assessment

The entire Town of New Canaan is at relatively equal risk for experiencing damage from winter storms although some areas (such as icing trouble spots and neighborhoods with a high concentration of flat roofs) are more susceptible. The public assistance reimbursement from Winter Storm Alfred was $435,347, proving that winter storms can be costly. However, many damages are relatively site specific and occur to private property (and therefore are paid for by private insurance) while repairs for power outages are often widespread and difficult to quantify to any one municipality.

The structures and utilities in New Canaan are vulnerable to a variety of winter storm damage. Tree limbs and some building structures may not be suited to withstand high wind and snow loads. Ice can damage or collapse power lines, render steep gradients impassable for motorists, undermine foundations, and cause "flood" damage from freezing water pipes in basements. Drifting snow can occur after large storms, but the effects are generally mitigated through municipal plowing efforts.

Changes and Improvements

New Canaan continues to maintain tree maintenance capabilities, reducing the vulnerability of the town's electric grid and roads system to severe snow events.

3.6 WILDFIRES AND DROUGHT

3.6.1 Setting

New Canaan is generally considered a moderate risk area for small wildfires but a low risk area for large wildfires. Wildfires are of particular concern in outlying areas without public water service and other areas with poor access for fire-fighting equipment. Small pockets of such areas in New Canaan are located outside of the more built up parts of town. Hazards associated with wildfires include property damage and loss of habitat.

In addition, New Canaan, and Fairfield County overall, has experienced drought challenges over recent years. The U.S. Drought Monitor (USDM), which has been monitoring nationwide drought conditions since 2000, estimates that over the past two decades Connecticut experienced its longest drought of 46 weeks beginning June 21, 2016 and lasting until May 2, 2017. It was also estimated that the most intense period of this extended drought occurred the week of November 15, 2016, where approximately 44.5% of Connecticut lands were impacted. Figure 3-1 depicts the various drought conditions in Fairfield County since 2000, where the warmer colors represent more advanced drought stages.

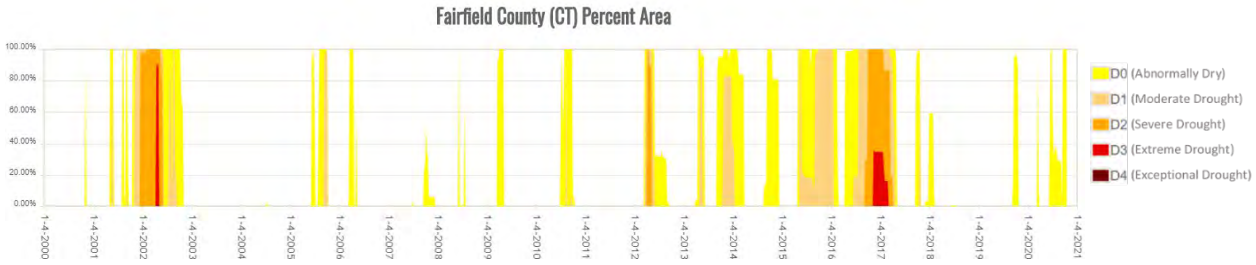


Figure 3-1: USDM Drought Time Series for Fairfield County

The 2019 Connecticut Natural Hazard Mitigation Plan assumes that the State of Connecticut has a medium probably of future drought events. This assumption is based on climate change projections anticipating hotter and wetter conditions in the near future. Climate forecasts often suggest that while precipitation may increase, the overall pattern will generally be higher intensity storms, with longer than average dry periods between events. The State Plan also identifies that Fairfield County accounts for roughly 7.34% of the state's total number of farms, with a market value of over $34 million in product sold from these farms.

3.6.2 Capabilities

Regulations regarding fire protection in New Canaan are outlined in the *Code of Ordinances:*

- Chapter 22 – Fire Department
- Chapter 23 - Fire Zones
    - A designated, unobstructed passageway sufficient in size to permit free passage of fire and other emergency equipment from a public sheet to all necessary areas or portions of any public or private property open to the public.

The New Canaan Fire Department consists of both career firefighters and volunteers. The Department has a full complement of twenty-five made up of 16 career firefighters, 4 career

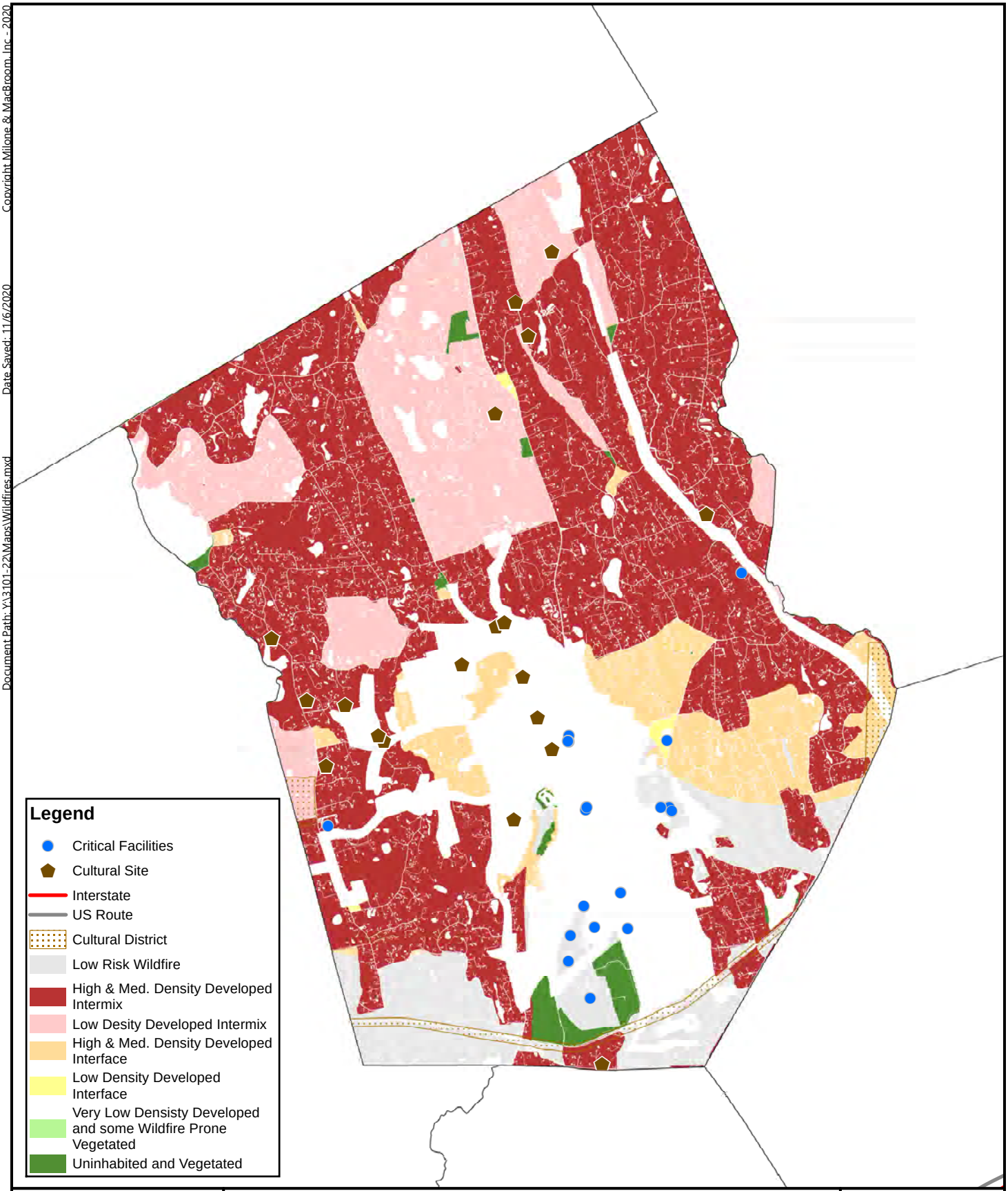
lieutenants, 4 career captains and a career Chief, supplemented by a well-trained group of volunteers. The Department relies heavily on volunteers, and it is vital that there is a sufficient pool of volunteers available to respond to the various calls for help. Applications for being a volunteer firefighter are accepted throughout the year.

Actions Completed and New Capabilities

Information on Open Burning has been added to the Town website.

Date Saved: 11/6/2020

Document Path: Y:\3101-22\Maps\Wildfires.mxd



MILONE & MACBROOM
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
WWW.MMINC.COM

Wildland-Urban Interface: Wildfire Risk Areas

WestCOG Hazard Mitigation Plan

Town of New Canaan

NPS: Cultural Resources

Wildland-Urban Interface:USFA

N

0 2,000 4,000

Feet

SCALE 1 " = 4,963 '

DATE 11/13/2020

3101-22
PROJ. NO.

FIG. 3-2

3.6.3 Vulnerabilities and Risk Assessment

In the drought year of 1999, the average wildfire in Connecticut burned five acres in comparison to the two most extreme wildfires recorded since 1986 that burned 300 acres each. Given the availability of firefighting water in New Canaan, including the use of nearby water bodies, it is believed that this average value for a drought year and the extreme value are applicable to the town as well.

Wildfire Risk Areas are mapped in Figure 3-2.

Changes and Improvements

The town's vulnerability to wildfires continues to be low.

3.7 EARTHQUAKES AND LANDSLIDES

3.7.1 Setting

The entire Town of New Canaan is susceptible to earthquake damage. However, even though earthquake damage has the potential to occur anywhere both in town and in the northeastern United States, the effects may be felt differently in some areas based on the type of geology. In general, earthquakes are considered a hazard that may possibly occur but that may cause significant effects to a large area.

According to the 2019 *Connecticut Natural Hazard Mitigation Plan Update*, Connecticut is at a low to moderate risk for experiencing an earthquake of a magnitude greater than 3.5 and at a moderate risk of experiencing an earthquake of a magnitude less than 3.0 in the future. No earthquake with a magnitude greater than 3.5 has occurred in Connecticut within the last 30 years, and the USGS currently ranks Connecticut 43rd out of the 50 states for overall earthquake activity.

3.7.2 Capabilities

The town has adopted the state building codes for new construction, and they are enforced by the Building Official. Due to the infrequent nature of damaging earthquakes, land use policies in town do not directly address earthquake hazards. However, various documents do indirectly discuss areas susceptible to earthquake damage and regulations that help to minimize potential earthquake damage.

- Subdivision Regulations:
  - Encourages the wise use of natural features throughout the community, which might include sloping areas and prone soil types.

- Plan of Conservation and Development:
  - Promotes conservation of natural resources in town, and promotes low impact development (LID). Conservation and LID techniques may reduce erosion therefore mitigating earthquake and landslide damages.

- Zoning
  - Prohibits development on slopes greater than 25%.
  - The town has a height restriction of 45 feet for residential structures, and 30 feet for retail or commercial, which may help reduce earthquake damage risks.

Actions Completed and New Capabilities

New Canaan continues to have appropriate capabilities for mitigating earthquake events.

3.7.3 Vulnerabilities and Risk Assessment

Some areas in New Canaan are underlain by sand and gravel, particularly along the Noroton River, Fivemile river and Silvermine River. Structures in these areas are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. Most of the remaining area is underlain by glacial till and is therefore not at increased risk during an earthquake due to unstable soils.

A series of earthquake probability maps was generated using the 2009 interactive web-based mapping tools hosted by the USGS. These maps were used to determine the probability of an earthquake of greater than magnitude 5.0 or greater than magnitude 6.0 damaging the Town of New Canaan. Results are presented in Table 3-1 below.

Table 3-1: Probability of a Damaging Earthquake in the Vicinity of New Canaan

Time Frame (Years)	Probability of the Occurrence of an Earthquake Event > Magnitude 5.0	Probability of the Occurrence of an Earthquake Event > Magnitude 6.0
50	2% to 3%	< 1%
100	4% to 6%	1% to 2%
250	10% to 12%	2% to 3%
350	12% to 15%	3% to 4%

Changes and Improvements

The town's vulnerability to earthquakes continues to be low.

4.0 MITIGATION STRATEGIES AND ACTIONS

4.1 Goals and Objectives

Municipal goals and objectives have been made consistent regionally and are presented in the Multi-Jurisdictional Plan document.

4.2 Status of Mitigation Strategies and Actions from Previous HMP

The table below lists the mitigation actions developed in the previous HMP and the status of each. Actions to be carried forward are noted as such. Actions that have been institutionalized as capabilities are not carried forward.

#	Description	Status	Notes
1	Maintenance dredging of Mill and Mead Ponds, including other areas as necessary	Capability	Town performs maintenance dredging annually as part of normal operations.
2	Reconstruct Nursery Road Bridge to widen waterway opening and mitigate flooding issues.	Carry Forward	Reconstruction of the bridge has been included in the Town's 5-year Capital Improvement Plan. The bridge is structurally sound, but its narrowness has in the past caused upstream ponding that has affected nearby properties. The Town has not experienced any flooding related to this bridge in the last 5 years.
3	Purchase properties known to have flooding problems and that reside within the 100-year floodplain.	Drop (Mitigated)	At the time of the adoption of the previous HMP the Town had identified one property with known flood risks for which this action was considered. Since then, the Town and the property owner collaborated to take flood mitigation steps, successfully addressing most flood concerns. There has not been any flooding at this property since then. The Town has not identified any other properties for which this action would be appropriate.
4	Budget appropriate money necessary to maintain and remove dead, dying, dangerous or diseased trees.	Capability	The Town reports that its tree maintenance budget is adequate.
5	Maintain a reverse 911 or similar system to alert residents of natural phenomena and if necessary, evacuation procedures.	Capability	Town has 3 methods for alerting residents of hazards: Blackboard Connect Smart911 Town wide email system The Town is not satisfied with Blackboard Connect and is currently exploring alternatives.
6	Enhance services to at-risk populations	Capability	As part of its COVID-19 response, Human Services has been providing additional support services for seniors, including grocery shopping for them and performing more frequent check-ins. This has improved the Town's capabilities in this regard and is considered to be progress toward completion of this action.

#	Description	Status	Notes
7	Develop a strategy and obtain the necessary equipment (including generators) to provide adequate heat at emergency shelters.	Completed	Town has pursued, and continues to pursue, acquisition of portable generators and supporting equipment, as well as installation of Combined Heat and Power (CHP) systems, at critical facilities, including shelters. The Town has acquired a trailer to transport a portable generator to provide backup power to shelters, and is looking into acquiring a second, larger trailer. The Town is currently developing engineering plans for installation of a CHP system at the Middle School, and has proposed funding for the coming fiscal year to install a CHP at the High School. The Town is exploring installation of a CHP at the YMCA.
8	Improve access along the transportation network during emergencies.	Capability	Town staff report that treefall and debris are the primary impacts affecting the transportation network during hazard emergencies. New Canaan budgets adequately for tree maintenance. The Town has a strong coordination system with Eversource. The tree warden works closely with the state arborist on state roads.
9	Enhance the resiliency of the power grid. Explore options to install a micro-grid (gas-powered) for downtown and emergency services	Completed/ Carry Forward with Revisions	Town has pursued, and continues to pursue, acquisition of portable generators and supporting equipment, as well as installation of Combined Heat and Power (CHP) systems, at critical facilities, including shelters. Town will be installing a CHP at the Highway Garage and WWTF. They are putting together engineering plans to install a CHP at the middle school, and have proposed including money for a CHP at the High School in next year's budget. The Town is exploring installing a CHP at the YMCA. The Town has solarized 4 municipal buildings, and one school (South School). The Town is currently in the process of solarizing East School. They have plans to solarize parts of the Middle School, High School, and WWTF. A partnership has been formed between the YMCA and Waveny Care Network to solarize their properties. There is also solar at the Town Pool and Nature Center; those two are able to operate off the grid. Increasing local power generation enhances local power resiliency in the long term, despite the fact that currently these solar systems are connected to the grid and cannot be operated if the grid goes down. The Town has a strong tree maintenance budget, and works closely with Eversource to ensure powerlines are protected from dangerous trees.
10	Review plans that fulfill DEEP Storm Water Management, Phase II requirements and identify projects that may be eligible for FEMA natural hazard mitigation grants.	Carry Forward	The Town continues to identify projects to meet MS4 requirements; at this point it has not identified any that would be eligible for FEMA grants.

#	Description	Status	Notes
11	Review completed drainage study of Five Mile River with an eye to adopting and instituting additional mitigation measures.	Completed	This drainage study has been completed, and is used as another element for review during permitting processes. Five Mile River has a TMDL plan, and the drainage study was completed in adherence with that plan.

4.3 Prioritization of Strategies and Actions

The STAPLEE method, described in the Multi-Jurisdictional document, was used to score mitigation activities. The STAPLEE matrix in Appendix A provides the total scores. Actions have been further prioritized based on implementation cost, project urgency, and municipal and public input. The strategies below are presented in priority order, with qualitative priority levels listed for each.

4.4 Mitigation Strategies and Actions Implementation Table

The Town proposed to initiate several new mitigation actions for the upcoming five years.

- Perform maintenance of drainage ditches and waterways on Southwood Drive
- Complete the Bristow Bird Sanctuary rehabilitation project, incorporating floodplain restoration and other flood mitigation actions. The project will include wetland restoration and dredging, and should improve floodplain storage capacity. Project is scheduled to be completed over the next 3 years.
- Working with the state on addressing drainage issues on Old Stamford Road / Route 106.
- Develop a drainage improvement plan for Waveny Park

Additionally, a number of actions from the previous planning period are being carried forward or replaced with revised actions.

The comprehensive list of actions to be pursued in the next five years are presented below.

Action NCN-01	
Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action NCN-02	
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.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action NCN-03	
Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, CT DEEP
Timeframe	2021
Priority	High

Action NCN-04	
Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.	
Lead	BOS
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2021
Priority	High

Action NCN-05	
Collaborate with CIRCA on the "Resilient Connecticut" project	
Lead	BOS
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2022
Priority	High

Action NCN-06	
Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action NCN-07	
Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement	
Lead	Planning
Cost	$0 - $25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action NCN-08	
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.	
Lead	EM, BOS
Cost	$0 - $25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2023
Priority	Low

Action NCN-09	
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 identify historic resources at risk and support the preparation of resiliency plans across the state.	
Lead	Planning
Cost	$25,000 - $50,000
Funding	CT SHPO
Timeframe	2024
Priority	High

Action NCN-10	
Review plans that fulfill DEEP Storm Water Management, Phase II requirements and identify projects that may be eligible for FEMA natural hazard mitigation grants.	
Lead	IWW
Cost	$0 - $25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2024
Priority	Low

Action NCN-11	
Perform maintenance of drainage ditches and waterways on Southwood Drive	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Capital Improvement Plan, FEMA Grant
Timeframe	2024
Priority	Med

Action NCN-12	
Work with the state on addressing drainage issues on Old Stamford Road / Route 106.	
Lead	DPW
Cost	$25,000 - $50,000
Funding	Capital Improvement Plan, FEMA Grant
Timeframe	2024
Priority	Low

Action NCN-13	
Conduct feasibility study to install a microgrid for downtown and emergency services.	
Lead	BOS, EM, BOE
Cost	$25,000 - $50,000
Funding	Operating Budget
Timeframe	2024
Priority	Low

Action NCN-14	
Work with CT DEEP to validate and/or correct the RL list and update the mitigation status of each listed property.	
Lead	Planning
Cost	$25,000 - $50,000
Funding	FEMA Grant
Timeframe	2024
Priority	Low

Action NCN-15	
Annually conduct an emergency operations exercise for a local terrorism, sabotage, or mass casualty event.	
Lead	EMD
Cost	$25,000 - $50,000
Funding	Operating Budget
Timeframe	2024
Priority	Low

Action NCN-16	
Identify and adopt a public alert system with improved capabilities relative to the current Blackboard Connect system utilized by the Town	
Lead	EM
Cost	$50,000 - $100,000
Funding	Operating Budget, CT DEMHS
Timeframe	2025
Priority	Med

Action NCN-17	
Complete the Bristow Bird Sanctuary rehabilitation project, incorporating floodplain restoration and other flood mitigation actions. The project will include wetland restoration and dredging, and should improve floodplain storage capacity. Project is scheduled to be completed over the next 3 years.	
Lead	DPW
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2025
Priority	High

Action NCN-18	
Install a Combined Heat and Power system at the YMCA, which is an emergency shelter.	
Lead	EM
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action NCN-19	
Develop a drainage improvement plan for Waveny Park	
Lead	DPW
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Med

Action NCN-20	
Install a Combined Heat and Power system at the Middle School (a critical facility), and pursue development of this site into a backup emergency shelter or backup municipal facility in case the primary shelters or facilities are unusable.	
Lead	BOE; EM
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

Action NCN-21	
Install a Combined Heat and Power system at the High School (a critical facility), and pursue development of this site into a backup emergency shelter or backup municipal facility in case the primary shelters or facilities are unusable.	
Lead	BOE; EM
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

Action NCN-22	
Install a Combined Heat and Power system at the WWTF.	
Lead	DPW
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

Action NCN-23	
Reconstruct Nursery Road Bridge to widen waterway opening and mitigate flooding issues.	
Lead	DPW
Cost	More than $1 million
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

Action NCN-24	
Install a Combined Heat and Power system at the Highway Garage.	
Lead	DPW
Cost	$100,000 - $500,000
Funding	Capital Improvement Plan, FEMA Grant, Other Grant
Timeframe	2026
Priority	Low

APPENDIX A

Appendix A: STAPLEE Matrix

#	Action Description	Regional Theme	Lead Department	Cost Estimate	Potential Funding Sources	Timeframe for Completion	Weighted STAPLEE Criteria														Total STAPLEE Score
							Benefits							Costs							
							Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	
NCN-01	Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
NCN-02	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.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
NCN-03	Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.	CT DEEP Small Business Chem	EM, BOS	$0 - $25,000	Operating Budget, CT DEEP	2021	1	1	1	0	1	1	1	0	0	0	0	0	0	0	8
NCN-04	Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.	Sustainable CT	BOS	$0 - $25,000	Operating Budget	2021	1	1	1	1	0	1	1	0	0	0	0	0	0	0	8
NCN-05	Collaborate with CIRCA on the "Resilient Connecticut" project	ResilientCT	BOS	$0 - $25,000	Operating Budget	2022	1	1	1	0	0	1	1	0	0	0	0	0	0	0	7
NCN-06	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 identify historic resources at risk and support the preparation of resiliency plans across the state.	SHPO	Planning	$25,000 - $50,000	CT SHPO	2024	1	1	1	1	0	1	0	0	0	0	0	0	0	0	7
NCN-07	Complete the Bristow Bird Sanctuary rehabilitation project, incorporating floodplain restoration and other flood mitigation actions. The project will include wetland restoration and dredging, and should improve floodplain storage capacity. Project is scheduled to be completed over the next 3 years.	Open Space	DPW	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2025	1	1	1	1	1	1	1	0	0	0	0	0	-1	0	7
NCN-08	Perform maintenance of drainage ditches and waterways on Southwood Drive	Drainage	DPW	$25,000 - $50,000	Capital Improvement Plan, FEMA Grant	2024	1	1	0	1	1	1	1	0	0	0	0	0	-1	0	6
NCN-09	Identify and adopt a public alert system with improved capabilities relative to the current Blackboard Connect system utilized by the Town	Emergency Response	EM	$50,000 - $100,000	Operating Budget, CT DEMHS	2025	1	1	1	0	1	1	0	0	0	-1	0	0	0	0	6
NCN-10	Install a Combined Heat and Power system at the YMCA, which is an emergency shelter.	Energy Resiliency & Backup Power	EM	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	1	0	1	1	0	0	-1	-1	0	0	0	0	4
NCN-11	Develop a drainage improvement plan for Waveny Park	Drainage	DPW	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	0	1	1	1	1	0	0	0	0	0	-1	0	6
NCN-12	Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	Floodplain Management Regulations	Planning	$0 - $25,000	Operating Budget	2023	0	1	1	0	1	1	0	0	0	0	-1	0	0	0	5
NCN-13	Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement	Floodplain Management Regulations	Planning	$0 - $25,000	Operating Budget	2023	0	1	1	0	1	1	0	0	0	0	-1	0	0	0	5
NCN-14	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.	RLPs	EM, BOS	$0 - $25,000	Operating Budget, FEMA Grant	2023	0	1	1	0	1	1	0	0	0	-1	0	0	0	0	5
NCN-15	Work with the state on addressing drainage issues on Old Stamford Road / Route 106.	Drainage	DPW	$25,000 - $50,000	Capital Improvement Plan, FEMA Grant	2024	1	1	0	1	1	1	1	0	0	-1	0	0	-1	0	5
NCN-16	Conduct feasibility study to install a microgrid for downtown and emergency services.	Energy Resiliency & Backup Power	BOS, EM, BOE	$25,000 - $50,000	Operating Budget	2024	1	1	1	1	1	1	0	0	-1	-1	0	0	0	0	5

#	Action Description	Regional Theme	Lead Department	Cost Estimate	Potential Funding Sources	Timeframe for Completion	Weighted STAPLEE Criteria														Total STAPLEE Score
							Benefits							Costs							
							Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	
NCN-17	Work with CT DEEP to validate and/or correct the RL list and update the mitigation status of each listed property.	RLPs	Planning	$25,000 - $50,000	FEMA Grant	2024	0	0	1	0	1	1	0	0	0	0	0	0	0	0	4
NCN-18	Annually conduct an emergency operations exercise for a local terrorism, sabotage, or mass casualty event.	Terrorism & Mass Casualty	EMD	$25,000 - $50,000	Operating Budget	2024	1	1	1	1	1	0	0	0	0	-1	0	0	0	0	5
NCN-19	Install a Combined Heat and Power system at the Middle School (a critical facility), and pursue development of this site into a backup emergency shelter or backup municipal facility in case the primary shelters or facilities are unusable.	Energy Resiliency & Backup Power	BOE; EM	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	1	0	1	1	0	0	-1	-1	0	0	0	0	4
NCN-20	Install a Combined Heat and Power system at the High School (a critical facility), and pursue development of this site into a backup emergency shelter or backup municipal facility in case the primary shelters or facilities are unusable.	Energy Resiliency & Backup Power	BOE; EM	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	1	0	1	1	0	0	-1	-1	0	0	0	0	4
NCN-21	Install a Combined Heat and Power system at the WWTF.	Energy Resiliency & Backup Power	DPW	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	1	1	0	0	1	1	1	0	-1	0	0	0	0	0	5
NCN-22	Reconstruct Nursery Road Bridge to widen waterway opening and mitigate flooding issues.	Bridge & Culvert	DPW	More than $1 million	Capital Improvement Plan, FEMA Grant, Other Grant	2026	0	1	0	1	1	1	1	0	0	0	0	0	-1	0	5
NCN-23	Review plans that fulfill DEEP Storm Water Management, Phase II requirements and identify projects that may be eligible for FEMA natural hazard mitigation grants.	Drainage	IWW	$0 - $25,000	Operating Budget, FEMA Grant	2024	0	0	1	0	1	0	1	0	0	0	0	0	0	0	3
NCN-24	Install a Combined Heat and Power system at the Highway Garage.	Energy Resiliency & Backup Power	DPW	$100,000 - $500,000	Capital Improvement Plan, FEMA Grant, Other Grant	2026	0	1	1	0	1	1	0	0	-1	-1	0	0	0	0	3

APPENDIX B

Appendix B: SVI Summary

Town of New Canaan
Climate Vulnerability Assessment
A Component of Sustainable CT Action 5.4

The Town of New Canaan, for this Climate Vulnerability Assessment (CVA) is considered a suburban inland town, resulting in various climate change vulnerabilities. Inland flooding, extreme heat, and winter storms may impact the community the most as many issues have been identified.

Hazards

Inland Flooding

With FEMA flood zones in town along several streams and rivers, such as along the Fivemile River and Noroton River, there is continuously concern for riverine flooding. The numerous streams in town pose a flood risk to adjacent properties, whether it is a larger storm event or a short intense rainstorm. With precipitation expected to increase due to climate change, flooding events may occur more frequently. Overall, flooding may continue, or become a larger issue with future shifts in precipitation.

Winter Storms

New Canaan is largely residential with a densely populated, commercialized area in the southcentral area of town. Suburban communities are often impacted by strong winter storms in several ways; power outages from downed trees, accessibility issues, and icing concerns. Anticipated shifts in winter precipitation may bring more freezing rain events, which can result in an increase of downed trees and iced roads during a winter storm event. Downed trees can result in power outage, and lack of emergency access and egress.

Drought and Extreme Temperatures

Approximately half of the town relies on private wells for drinking water, with public water systems providing water for much of the southern half of town. Therefore, impacts to water supply may be an issue to the town as temperatures rise in the future, resulting in isolated issues with water scarcity. With increased temperatures, and high pumping levels, private wells may be impacted during times of drought.

In addition to private wells, many suburban communities have high levels of agricultural activity, whether it be crop production or livestock, these operations are heavily water dependent for healthy growing and revenue generation.

When considering these impacts from climate change, the primary vulnerabilities for the town of New Canaan include:

- Private well owners
- Emergency access
- Agricultural operations

Secondary Impacts

Economic Impacts

With areas vulnerable to flooding and winter storm events, the town faces an economic challenge of addressing the flooding concerns and increasing snow and debris removal capacity. There is also a potential economic impact to local businesses during flooding events, and heavy winter storms. Businesses may incur expenses related to flood mitigation or clean-up efforts, or experience loss of income if there is no site access during a storm.

Winter storm snow removal or icing also presents financial responsibility to the town by way of roadway treatment. As precipitation events may increase during winter months, the town may seek to increase sand or salt stockpiles to account for increased icing events.

Private property owners who rely on private drinking water wells may also be impacted economically during droughts or periods of extreme heat. With increasing heat, typically comes increased water demand. This demand would be placed upon local aquifers, potentially resulting in the need for new well construction, or deepening of an existing well.

The many impacts of climate change can result in economic impacts to many citizens, business owners, and municipal budgets as the impacts can be felt on a town level, down to building level.

Social Impacts

To identify social impacts to the town, the Center for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) was used to identify any vulnerable populations within the town. This index was developed to supplement a community's natural hazard preparation actions. To evaluate social vulnerability, the CDC incorporates 15 factors (Fig. 1) into the overall calculation under the categories, or themes, of: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation. These themes and their ranking are based on census statistics. By evaluating these factors and determining a level of social vulnerability, a community can identify specific needs for before, during, and after an event. Such needs may include sheltering capacity, evacuation routes, or to decide how many emergency personnel may be required to respond after an event.

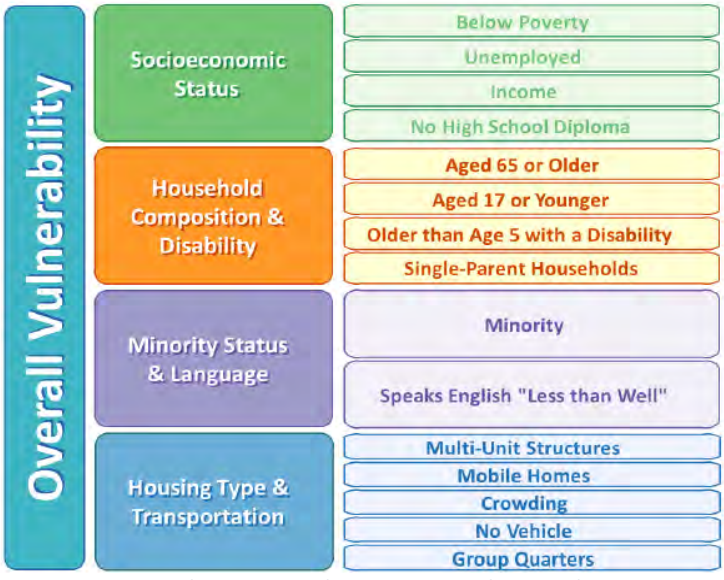


Figure 1: The CDC SVI Index Factors. Graphic: svi.cdc.com

Each municipalities' census tracts were ranked for overall vulnerability, and theme vulnerability, in comparison to other Connecticut municipalities. This rank, 0 to 1, is based on the percentile rank among all tracts within the State of Connecticut. A value closer to 0 indicates a lower vulnerability, while a value closer to

1 indicates a higher vulnerability. Table 1 presents the overall vulnerability and theme rankings for New Canaan.

Table 1: New Canaan SVI Factor Rankings

	Overall SVI	Socioeconomic	Household Composition & Disability	Minority Status & Language	Housing Type & Transportation
NEW CANAAN	.15	.08	.37	.23	.20

The Town of New Canaan is considered to have a low level of vulnerability, with their most vulnerable population based on household composition and disability. In addition, there are vulnerable minority and linguistically challenged populations along with those based on housing type and lack of transportation. The most concentrated areas of the most vulnerable population are identified in the central tract in town. The central and southwestern tracts are also ranked higher for minority and populations that speak English "less than well".

These populations may be vulnerable to impacts from drought, flooding and storm events based on the geographic concentrations.

Public Health Considerations

Of the primary vulnerabilities identified, drought and flooding can potentially have public health repercussions. During hot summer months, or drought, if private wells were to be impacted, certain populations may find themselves without adequate drinking water supply, resulting in health problems. Also, when considering the environmental shifts occurring during drought periods, drinking water contamination may become an issue as aquifers become stressed due to excessive pumping.

Food scarcity is another consideration when discussing the impacts of drought and extreme temperatures. Agricultural operations that are impacted by water shortages may find that crop or livestock yields are below average, ultimately resulting in food scarcity concerns. Depending on the size of an operation, the impacts can be on a small or large scale.

Flooding also presents the concern of pollution into nearby water bodies as commercialized and impervious areas drain, they collect pollutants and excess sediment. Depending upon the drainage areas, this runoff can have environmental impacts in associated ecosystems, or public health impacts if water bodies are used for recreational activities.

Vulnerable Populations

The SVI identified the presence of certain populations within the town that may be more vulnerable to climate change hazards. Communities, including New Canaan, should pay special attention to elderly or disabled populations, linguistically challenged population, and those that may need evacuation assistance due to lack of transportation. In addition to the SVI, the Connecticut Department of Public

Health (DPH)[1] has identified at least one assisted living facility and one convalescent home in the Town of New Canaan.

Some populations often need additional time for hazard response, so evacuation or preparation, and may find it more challenging to recover due to financial constraints or health concerns. These populations should be considered more vulnerable for the reasons that emergency response and preparation may be more challenging, health issues may be of higher concern, and language barriers may exist when working to communicate with the community on risks, response, and recovery efforts.

In addition to the populations, it is important to identify the facilities that can provide different types of assistance to the populations, and others, during or after an event. These facilities, and their proximity to flood zones, can be found in Figure 2-4.

[1] https://www.elicense.ct.gov/Lookup/LicenseLookup.aspx