



# Western Connecticut Council of Governments 2020 Hazard Mitigation Plan Update

## Municipal Annex for **Westport, CT**

110 Myrtle Ave.  
Westport, CT 06880  
January 2021

*Prepared for:*  
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MMI #3101-22

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## TABLE OF CONTENTS

1.0	INTRODUCTION .....	4
1.1	Purpose of Annex .....	4
2.0	COMMUNITY PROFILE .....	5
2.1	Geography .....	5
2.1.1	Physical Setting.....	5
2.1.2	Land Use.....	5
2.1.3	Climate and Climate Change .....	7
2.1.4	Drainage Basins and Hydrology .....	8
2.2	Society, Culture, and Government .....	9
2.2.1	Population and Demographic Setting.....	9
2.2.2	Development Trends .....	10
2.2.3	Governmental Structure .....	10
2.2.4	Historic and Cultural Resources.....	11
2.3	Infrastructure.....	13
2.3.1	Transportation.....	13
2.3.2	Utilities .....	13
2.4	Planning and Regulatory Capabilities.....	14
2.4.1	Review of Existing Local Plans .....	14
2.4.1	Review of Regulatory Structures .....	14
2.5	Emergency Services, Critical Facilities, Sheltering, and Evacuation.....	15
3.0	HAZARD ASSESSMENT .....	19
3.1	FLOODING (COASTAL, INLAND, AND ICE JAMS) .....	19
3.1.1	Setting.....	19
3.1.2	Capabilities .....	19
3.1.3	Vulnerabilities and Risk Assessment .....	21
3.2	DAM FAILURE .....	24
3.2.1	Setting.....	24
3.2.2	Capabilities .....	24

3.2.3	Vulnerabilities and Risk Assessment .....	25
3.3	HURRICANES AND TROPICAL STORMS.....	26
3.3.1	Setting.....	26
3.3.2	Capabilities .....	26
3.3.3	Vulnerabilities and Risk Assessment .....	27
3.4	SUMMER STORMS AND TORNADOES.....	28
3.4.1	Setting.....	28
3.4.2	Capabilities .....	28
3.4.3	Vulnerabilities and Risk Assessment .....	28
3.5	WINTER STORMS AND NOR'EASTERS .....	30
3.5.1	Setting.....	30
3.5.2	Capabilities .....	30
3.5.3	Vulnerabilities and Risk Assessment .....	30
3.6	WILDFIRES AND DROUGHT.....	32
3.6.1	Setting.....	32
3.6.2	Capabilities .....	32
3.6.3	Vulnerabilities and Risk Assessment .....	33
3.7	EARTHQUAKES AND LANDSLIDES.....	35
3.7.1	Setting.....	35
3.7.2	Capabilities .....	35
3.7.3	Vulnerabilities and Risk Assessment .....	35
3.8	SEA LEVEL RISE AND SHORELINE CHANGE.....	37
3.8.1	Setting.....	37
3.8.2	Capabilities .....	37
3.8.3	Vulnerabilities and Risk Assessment .....	37
4.0	MITIGATION STRATEGIES AND ACTIONS .....	38
4.1	Goals and Objectives .....	38
4.2	Status of Mitigation Strategies and Actions from Previous HMP.....	38
4.3	Prioritization of Strategies and Actions.....	43
4.4	Mitigation Strategies and Actions Implementation Table.....	43

## LIST OF FIGURES

Figure 2-1: Location Map.....	6
Figure 2-2: The CDC SVI Index Factors. Graphic: svi.cdc.com.....	9
Figure 2-3: Historic Resources .....	12
Figure 2-4: Critical Facilities .....	17
Figure 3-1: Storm Surge Inundation Zones.....	22
Figure 3-2: USDM Drought Time Series for Fairfield County.....	32
Figure 3-3: Wildfire Risk Areas.....	34

## LIST OF TABLES

Table 2-1: 24-Hour Rainfall Amounts by Annual-Chance Occurrence.....	8
Table 2-2: Sub-Regional Drainage Basins.....	8
Table 2-3: Number of Historic Assets Exposed to Different Hazards in Westport .....	11
Table 2-4: Critical Facilities .....	15
Table 2-5: Media Outlets Used for Public Information Distribution .....	18
Table 3-1: Probability of a Damaging Earthquake in the Vicinity of Westport .....	36

## LIST OF APPENDICES

- Appendix A: STAPLEE Matrix
- Appendix B: SVI Summary



## 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 Westport 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

Incorporated in 1835, the Town of Westport is located in southern Fairfield County and home to a population of 26,391 (2010 U.S. Census). Westport is bordered by the municipalities of Norwalk and Wilton to the west, Fairfield to the east, Weston to the north, as well as Long Island Sound along the south. Refer to Figure 2-1 for a map showing the location of Westport within the WestCOG region.

Westport is a coastal community, with several rivers and streams flowing throughout the community. The town is characterized by predominately low-density residential development with commercial and business uses along Route 1. The Saugatuck River flows south through the center of the town cutting through the suburban and urban areas before it eventually flows into Long Island Sound. Sherwood Millpond is also located in Westport on the coast. Westport is low lying at only 26 feet of elevation. Both the train station and a total of 26 percent of town residents live within the 100-year floodplain. The terrain of Westport makes the town vulnerable to an array of natural hazards.

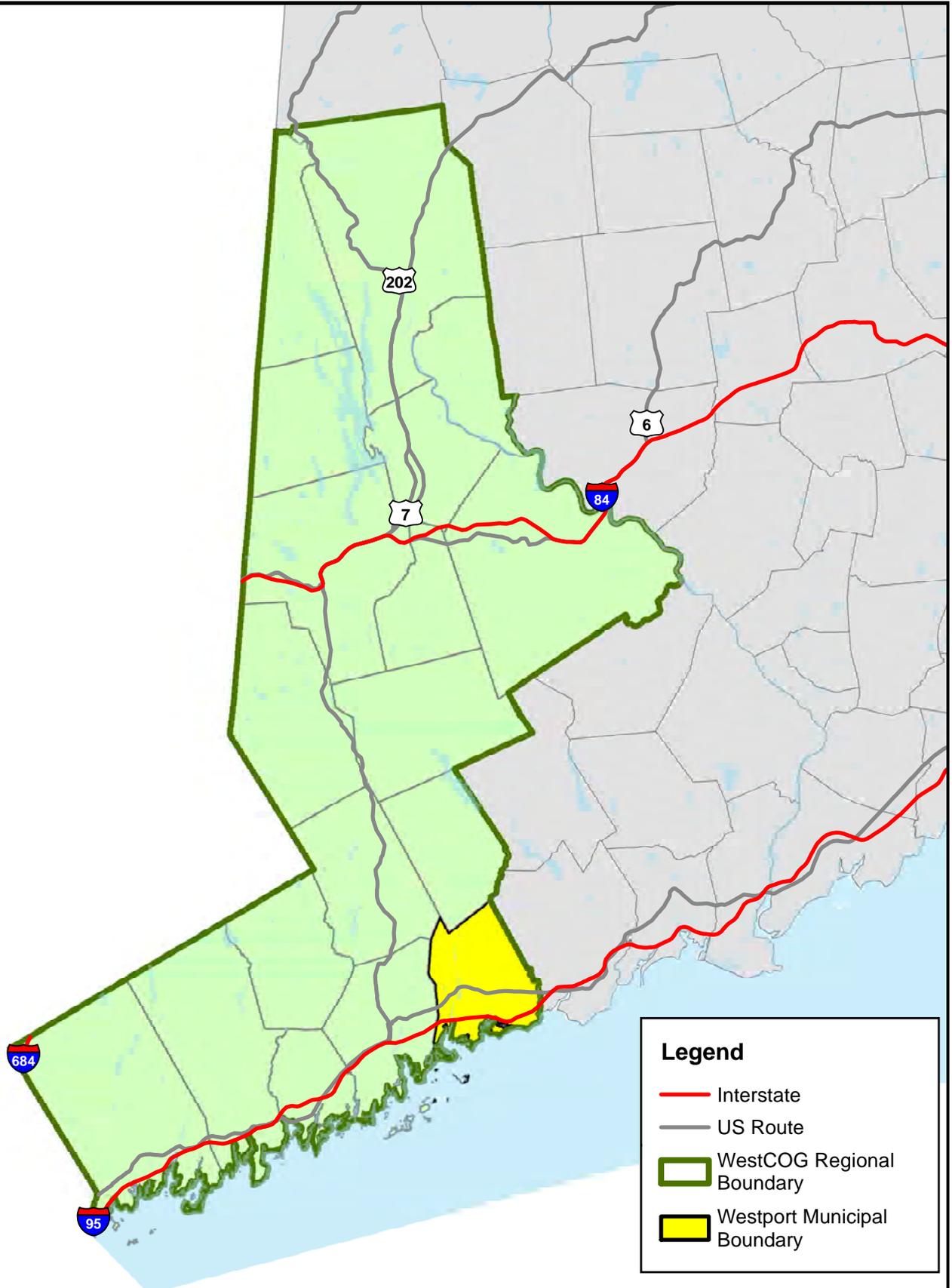
The Center for Land Use Education and Research (CLEAR) has developed a land cover dataset derived from 2016 satellite imagery to depict statewide land cover. The land cover by percent of total land for Westport can be found in Table 2-1.

**Table 2-1: Land Cover by Area**

Land Cover Class	Percent of Total Land
Developed	26.75
Turf & Grass	11.89
Other Grasses	0.81
Agricultural Field	0.06
Deciduous Forest	10.78
Coniferous Forest	3.29
Water	1.61
Non-Forested Wetland	0.09
Forested Wetland	1.24
Tidal Wetland	0.75
Barren Land	0.63
Utility Corridor	0.03

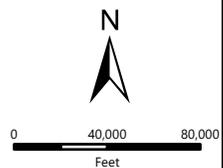
#### 2.1.2 Land Use

According to Westport's 2017 Plan of Conservation and Development, approximately 95% of the town is zoned for residential use (mostly single-family), about 4% is zoned for business uses, and about 1% is zoned for other uses. Most higher density development and commercial activity lies around of south of Route 1. The areas north of the Route 1 are primarily larger lot residential neighborhoods, in comparison to the smaller lots found to the south.



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Regional Location of Westport  
WestCOG Hazard Mitigation Plan  
Town of Westport



SCALE 1" = 82,167'  
DATE 11/12/2020  
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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 Westport typically varies from 23°F to 83°F and is rarely below 9°F or above 90°F. The warm season lasts from June 2 to September 16, with an average daily high temperature above 73°F. The hottest day of the year is July 20, with an average high of 83°F and low of 67°F. The cold season lasts from December 3 to March 12, with an average daily high temperature below 46°F. The coldest day of the year is January 29, with an average low of 23°F and high of 37°F.

Precipitation falls throughout the year in Westport. The wetter season lasts from March 31 to December 10, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 35% on May 29. 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 6, with an average total accumulation of 2.0 inches.

The snowy period of the year lasts from November 18 to April 5, 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 25, with an average total liquid-equivalent accumulation of 0.8 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<sub>2</sub> 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 Westport as 3.45 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 50% annual-chance annual storm in Westport at 3.49 inches.

These precipitation amounts, and more details, are summarized in Table 2-1, below.

**Table 2-1: 24-Hour Rainfall Amounts by Annual-Chance Occurrence**

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	50%	4%	1%
<b>Technical Paper No. 40</b>	3.3	5.7	7.2
<b>NRCC</b>	3.45	6.37	8.95
<b>NOAA Atlas 14</b>	3.49	6.51	8.30

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 Westport can expect the 24-hour rainfall amount for a 50% annual-chance storm to be around 3.7 to 3.8 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

Westport is divided among five sub-regional watersheds as shown in Table 2-2. All of the water that passes through Westport eventually empties into Long Island Sound.

**Table 2-2: Sub-Regional Drainage Basins**

Drainage Basin	Overall Sub-regional Area (sq. mi)	Area within Town (sq. mi)	Area within Town (acres)	Percent of Town
Aspetuck River	23.05	2.08	1333.64	10%
Sasco Brook	10.21	1.88	1203.47	9%
Saugatuck River	48.55	7.61	4872.01	38%
Southwest Shoreline	11.08	7.93	5047.45	39%
West Branch Saugatuck River	11.92	0.57	364.11	3%
Total	n/a	20.18	12916.85	

Source: Connecticut Department of Energy & Environmental Protection GIS Data

Westport is entirely encompassed within the Southwest Coast drainage basin, which drains directly into Long Island Sound. Of the five sub-regional drainage basins and their respective streams, the Southwest Shoreline running along Westport is the largest, followed by the Saugatuck River in the western part of town.

The Saugatuck River is approximately 24 miles, and originates at Sugar Hollow Pond in Danbury, Connecticut. The Saugatuck Basin drains 48.55 square miles of land, and ultimately flows directly into Long Island Sound.

## 2.2 Society, Culture, and Government

### 2.2.1 Population and Demographic Setting

According to the 2010 U.S. Census, Westport had a population of 26,391, with 789 persons per square mile. According to the 2018 American Community Survey five-year estimates, Westport's population between 2013 and 2018 was approximately 27,840.

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 Westport. 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.

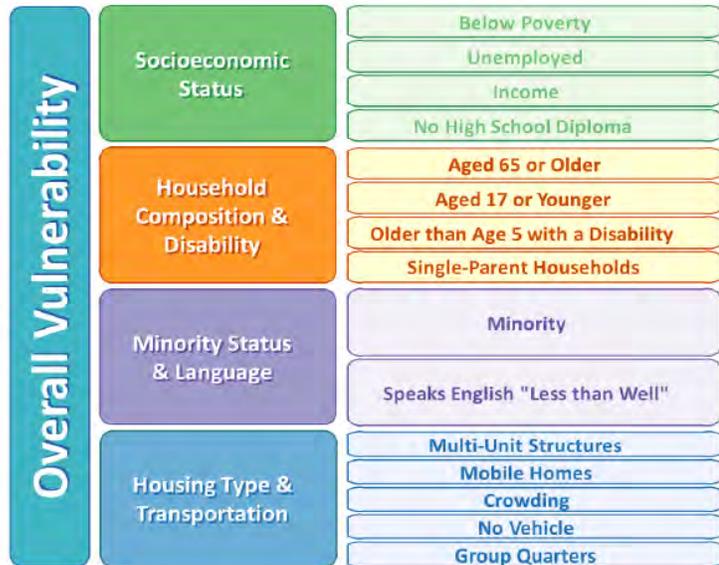


Figure 2-2: The CDC SVI Index Factors. Graphic: svi.cdc.com

The Town of Westport is considered to have a low level of vulnerability, with their most vulnerable social aspect being based on household composition and disability. However, the town does have vulnerable populations which live in higher density housing populations, and vulnerable minority populations and language barrier concerns. These vulnerable populations are concentrated in the central northern tract north of Route 1 between Wilton Road and North Avenue. Appendix B explores the SVI for Westport in more depth.

### 2.2.2 Development Trends

Agriculture was Westport's first major industry. By the 19th century, Westport had become a shipping center in part to transport agricultural goods to market. The first railroad track was opened Dec. 27, 1848. The second track was laid in 1853, but not until the 1890s were the present tracks completed. By the end of the 19th century, there were mills and factories in town.

In the 20th century, a combination of industrialization and popularity among New Yorkers attracted to Westport resulted in a reduction of farmland. Westport changed from a community of farmers to a suburban development.

In the 1950s through to the 1970s, in part due to New Yorkers relocating from the city to the suburbs, the population tripled. This influx of people desiring a suburban lifestyle led to a building boom and developing much of the land in town.

Now, Westport had developed into a center for finance and insurance, as well as professional, scientific, and technical services. The town center is a very desirable shopping and dining attraction in the region. The Saugatuck area located south of downtown has a less significant commercial impact but is also developed with non-residential land uses.

The 2017 POCD does not promote significant development in Westport, with the exception of the Saugatuck train station area. The POCD encourages zoning for mixed-use development and multifamily housing around the rail station. The TOD area is centered around the Saugatuck Train Station, as described in *Saugatuck: A Gateway for Westport*, published in 2018. The document identifies about 70 acres extending mostly to the north of the train station as the "Primary Study Area," with a one-half-mile radius "Area of Influence" considered as well. The total area envisioned for redevelopment is 24,000 to 33,000 square feet of retail, and 128 to 172 residential units over a 12-year period. This TOD area is adjacent to the Saugatuck River estuary and therefore has some coastal flood risk. Because most of the anticipated development in Westport is in this area, the Town will be able to carefully regulate it and prevent increasing risks to flooding.

Overall, the very low pace of development townwide and the closely-regulated development in the TOD area will prevent vulnerabilities to natural hazards from increasing.

### 2.2.3 Governmental Structure

The town switched to a Representative Town Meeting style governance in 1949. The government consists of a three-member Board of Selectmen, a Representative Town Meeting (RTM), a Board of Finance, a Board of Education, a Planning and Zoning Commission, and various other commissions, boards, and committees.

## 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.

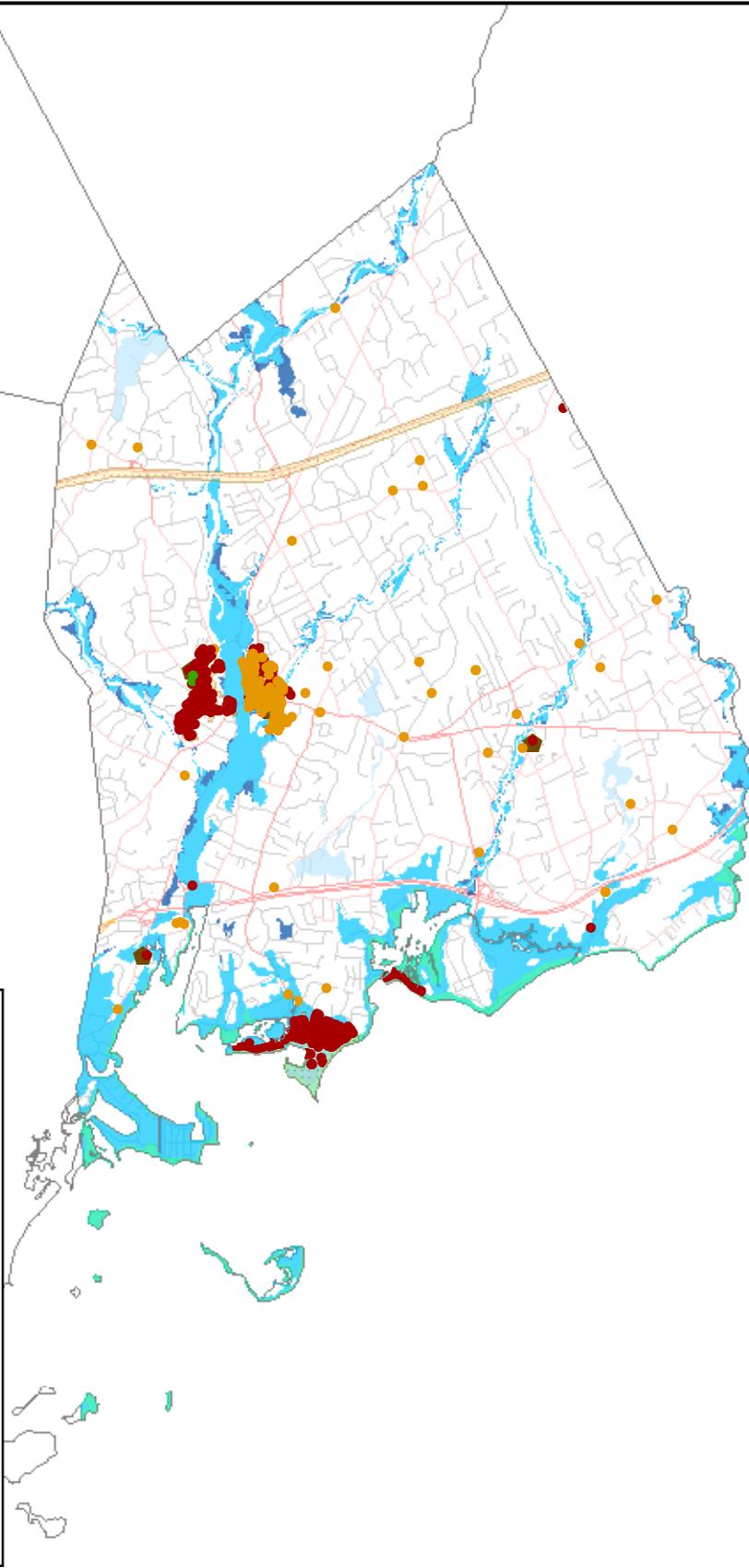
- Paraphrased from FEMA Report 386-6

Historic resources in Westport are concentrated within the Compo/Owenoke, East Bank, Evergreen Avenue, Gorham Avenue, Jesup Road, Kings Highway North, Mill Cove, Myrtle Avenue, National Hall, Violet Lane, and Westport Center Historic Districts. Resources also include the Beachside Avenue Bridge and the Saugatuck River Railroad Bridge. 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 2-3. There are numerous historic sites along the coast and the Saugatuck River that could be vulnerable to flooding, whether it be coastal, riverine, or poor drainage.

**Table 2-3: Number of Historic Assets Exposed to Different Hazards in Westport**

Hazard	Count
<b>Dam Failure</b>	
<b>Earthquake</b>	713
<b>Flooding</b>	
1% Annual	
0.2% Annual	24
<b>Storm Surge</b>	
Category 1	228
Category 2	156
Category 3	26
Category 4	29
<b>Hurricane/Tropical Storm</b>	713
<b>Sea Level Rise</b>	18
<b>Thunderstorm</b>	713
<b>Tornado</b>	713
<b>Winter Storm</b>	713
<b>Wildfire</b>	64



**LEGEND**

-  National Park Service Cultural Site
-  Cultural District

**SHPO Historic Sites**

-  National Register
-  State Register
-  Local Register

**Flood Zones**

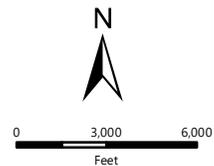
-  A
-  AE
-  VE
-  0.2% Annual Chance Flood Hazard



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Historic Resources with Flood Zones and  
 Dam Failure Inundation Areas  
 WestCOG Hazard Mitigation Plan  
 Town of Westport

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



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**FIG. 2-3**

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.

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 Westport include Interstate 95 and the Merritt Parkway (Route 15), which run east to west through town. The Parkway runs through the northern part of town, while I-95 runs through the southern. Between these two thoroughfares lay Route 1, the predominate commercial corridor.

In addition, the Metro North/Amtrak rail lines also run through town, just south and parallel to Interstate 95. There are two train stations in Saugatuck and Green's Farms. The CTtransit bus system is also active in town with several stops throughout the community.

### **2.3.2 Utilities**

Aquarion Company provides public water service in many areas of Westport and this helps ensure that an adequate quality and quantity of water is available to support public health and safety and meet community needs. Westport has regulations in place to protect water quality in the two wellfield areas in Coleytown and Canal Street.

Residents and businesses use oil, propane, or natural gas for heat. Natural gas is available from Southern Connecticut Gas. The Water Pollution Control Facility operates and maintains the town's Waste Water Treatment Plant along with seventeen pumping stations and 117 miles of sewer pipe lines. Sewer service is available in many parts of town but as a rule is not available north of the Merritt Parkway (Route 15).

According to geolSP (geolSP.com), access to Broadband Internet is available to most residents in Westport. There are 2 DSL Providers (MegaPath and AT&T), 1 Cable Internet providers (CSC Holdings), and 4 Fiber Internet providers (CSC Holdings, Fibertech Networks LLC, Level(3))

Communications, and Connecticut Education Network). There are also 4 Mobile Broadband (cellular) providers with service available in Westport.

## 2.4 Planning and Regulatory Capabilities

Westport 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 Westport has a number of plans that are relevant to hazard mitigation. These are noted here:

- **Plan of Conservation and Development (POCD):** Westport's most recent POCD was adopted in 2017. It does not address natural hazard concerns within the community, or include strategies that will mitigate risks from those hazards as the community continues to develop. This will be pursued in the next update of the POCD.
- **Stormwater Management:** Westport 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):** Westport 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:** Westport 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):** Westport's EOP is reviewed annually and updated as needed. Dam failure Emergency Action Plans (EAPs) for dams with failure inundation zones that may impact Westport, and for which EAPs are available, are on file locally.
- **Watershed Management Plan:** A Watershed Management Plan has been developed for the Saugatuck-Aspetuck River Watershed. The Saugatuck River Watershed Based Plan was developed by the former South Western Regional Planning Agency (SWRPA) in 2012. 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:** Westport 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

Westport 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:** Westport enforces the Connecticut State Building Code locally.
- **Zoning Regulations:** Most recently updated in March 2020.
- **Inland Wetlands and Watercourses Regulations:** Most recently updated in August 2004.
- **Subdivision Regulations:** Most recently updated in June 2020. Include provisions promoting control of stormwater runoff, 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 Westport continues. Table 2-4 and Figure 2-4 identifies all of these critical facilities.

**Table 2-4: Critical Facilities**

Facility	Address or Location	Type	Emergency Power	Shelter	In 1% Floodplain
Town Hall	110 Myrtle Ave	Town Hall			
Westport Fire Department Headquarters Westport Emergency Operations Center	515 Post Rd East	Emergency Response			
Westport Fire Department - Saugatuck	555 Riverside Ave	Emergency Response			✓
Westport Fire Department - Coleytown	61 Easton Road	Emergency Response			
Westport Fire Dept - Greens Farms	66 Center St	Emergency Response			
Westport Volunteer Emergency Medical Service (WVEMS)	50 Jesup Rd	EMS			
Westport Police Department	50 Jesup Rd	Police, EMS			
DPW	110 Myrtle Ave	Public Works			
Westport Leaf Compost Facility	180 Bayberry Lane	Public Works			
Westport Transfer Station	300 Sherwood Island Connector	Public Works			
Highway Division	300 Sherwood Island Connector	Public Works			
Landmark Academy	11 Burr Road	School			
King's Highway Elementary School	125 Post Rd West	School			
Green's Farms School	17 Morningside Dr	School			
Saugatuck Elementary School	170 Riverside Ave	School			✓
CT Center for Massage Therapy	25 Sylvan Road S	School			
Greens Farms Academy	35 Beachside Ave	School			
Seton Academy	47 Long Lots Rd	School			
Bedford Middle School	88 North Ave	School			
The Learning Community Day School	90 Hillspoint Rd	School			
Long Lots School	13 Hyde Ln	Shelter		✓	

Facility	Address or Location	Type	Emergency Power	Shelter	In 1% Floodplain
Westport Senior Center	21 Imperial Ave	Shelter		✓	
Coleytown Middle School	255 North Ave	Shelter		✓	
Coleytown Elementary School	58 Easton Rd	Shelter		✓	
Staples High School	70 North Ave	Shelter		✓	
Alcoholism & Drug Dependency Council, Inc.	420 Post Rd West	Care Facility			
Jewish Family Service	431 Post Rd East	Care Facility			
Hall-Brooke Hospital	47 Long Lots Rd	Care Facility			
Westport Weston Health District	180 Bayberry Lane	Community Health Programs Administration			

There are several shelters for residents throughout the town, including schools and the senior center.

*Emergency Response*

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

The Town’s Department of Public Works performs tree and shrub removal and trimming on town-owned lands and rights-of-way. During emergencies and following storms, the Department, responds to calls related to downed trees.

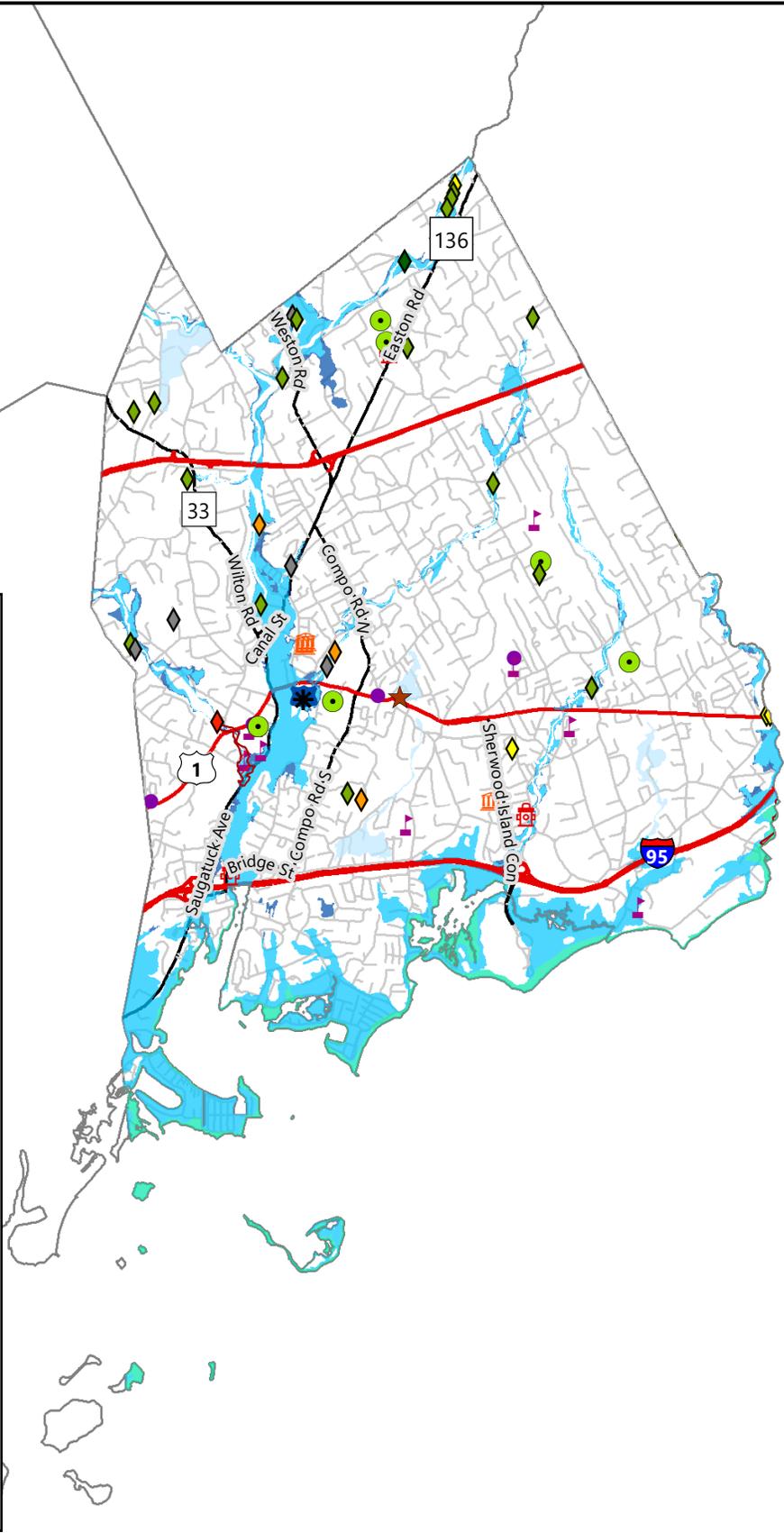
### LEGEND

**Dams**

- ◇ Unclassified
- ◆ AA
- ◆ A
- ◆ BB
- ◆ B
- ◆ C
- 🌀 Dam Failure Inundation Area
- ✳ Ambulance
- Care Facility
- 🏛 Municipal
- ★ EOC
- 🚒 Fire
- 👮 Police
- 🎓 School
- 🟢 Shelter

**Flood Zones**

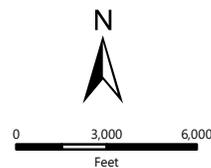
- 🟡 A
- 🟠 AE
- 🟢 VE
- 🟦 0.2% Annual Chance Flood Hazard



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Critical Facilities with Flood Zones and Dam Failure Inundation Areas  
 WestCOG Hazard Mitigation Plan  
 Town of Westport

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



SCALE	1" = 6,349'
DATE	7/29/2021
PROJ. NO.	3101-22

**FIG. 2-4**

*Emergency Communication Capabilities*

The Town of Westport utilizes the Nixle Community Notification System for alerting residents and businesses in real-time for localized emergency situations and relevant community advisories. This system provides notifications via telephone calls, text, and social media.

The Town of Westport 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. Various media outlets are also used to relay information to the public.

Various media outlets are also used to relay information to the public. These resources are identified in Table 2-5.

**Table 2-5: Media Outlets Used for Public Information Distribution**

<b>Outlet</b>	<b>Media Type</b>
Stamford Advocate	Newspaper
Westport News	Newspaper
The Hartford Courant	Newspaper
Staples Radio WWPT 90.3 FM	Radio
Cablevision (Channel 12)	Television
Channel 79, the Westport Public Access Channel	Television

*Changes to Emergency Services since the Previous HMP*

The Town has acquired two portable generators that can be used for shelters or pump stations if backup power sources fail. These generators utilize standard outlets, and the Town is continuing to upgrade facilities to accommodate these portable generators if necessary.

## 3.0 HAZARD ASSESSMENT

### 3.1 FLOODING (COASTAL, INLAND, AND ICE JAMS)

#### 3.1.1 Setting

The potential for flooding exists across Westport, with the majority of major flooding occurring along established riverine and coastal 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. Coastal flooding can occur during a severe storm event by way of storm surge, and can also occur as nuisance flooding, which is experienced during extremely high tide events. The frequency of flooding in Westport 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 Aspetuck and Saugatuck River. There are also regulatory floodplain areas with a VE or an AE designation along the Long Island Sound shoreline. 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 Patrick Wetlands and the area near Greens Farms Road and High Street distribute 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 Westport susceptible to flooding based on FEMA flood zones.

In general, potential flooding problems in Westport are concentrated along the multiple rivers, and the coastline. Town officials have reported that nuisance flooding along the coast is becoming more of a concern, especially in the area of Saugatuck Shores and Canal Road.

Coastal flood events, especially storm surge during hurricanes and tropical storms, can cause some of the most severe damage with high economic impacts to municipal and residential properties. Figure 3-1 shows hurricane storm surge inundation zones.

#### 3.1.2 Capabilities

Westport has historically been proactive in flood mitigation with the town participating in several FEMA mitigation programs prior to the Disaster Mitigation Act of 2000. Some specific past efforts include:

- 1995 Repetitive Loss Plan
- 1997 Hazard Mitigation Plan
- 2000 Flood Management Plan

The Town primarily attempts to mitigate future flood damage and flood hazards by restricting building activities in floodprone areas. Westport also uses regulations to protect the normal functioning of the natural drainage systems and to prevent inappropriate development in flood plains and coastal areas. The regulations are in accordance with the CT DEEP, FEMA and NIFP requirements.

The town owns a high-water rescue truck and is looking to acquire a second. This vehicle allows for easier access during flooding events, as well as snow events if necessary.

#### *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 Westport are delineated on a Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS). The FIS and FIRMs for town were most recently revised in 2013. The town also participates in the FEMA Community Rating System (CRS) program, which recognizes and rewards more stringent floodplain regulations. By participating in the program, residents receive a discount on flood insurance.

The NFIP administrator for the Town 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 one foot 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:**

- 31-7: Regulations Applying to All Districts - Setbacks from Waterbodies, Watercourses and Wetlands, restricting structures within 25 feet of a wetland or waterbody.
- 31-11.3: Regulations Applying to All Districts - Flood Protection Requirements
- 54-22: Design Standards: Flood Prone Areas

➤ **Inland Wetland and Watercourse Regulations:**

- Chapter 30 - Environmental & Natural Resources: Inland Wetlands. The purpose of this division is to establish a means by which the Town may more effectively enforce its Inland Wetlands and Watercourses Regulations, known as the Regulations for the Protection and Preservation of Wetlands and Watercourses, with the implementation of fines for violations.
- Chapter 31 - Flood and Erosion Control Board. The Flood and Erosion Control Board shall have all the powers and duties conferred or imposed by law on Flood and Erosion Control Boards.

➤ **Plan of Conservation and Development:**

- Focuses on development, conservation, and infrastructure related strategies
- Preserve resources, such as historic and open space, guide development, and improve overall quality of life.
- Continue to preserve open space which provides flood storage.
- Highlights the need for coastal flood mitigation.
- Recommends non-structural applications for erosion control in coastal development and projects.

*Drainage and Street Flooding*

The Town Department of Public Works (DPW) 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 town has a catch basin cleanout program.

Some roadways in town with flooding concerns include:

- Hiawatha Lane
- Berkeley Road
- Black Birch Road
- Compo Mill Cove
- Saugatuck Shores

*Public Information*

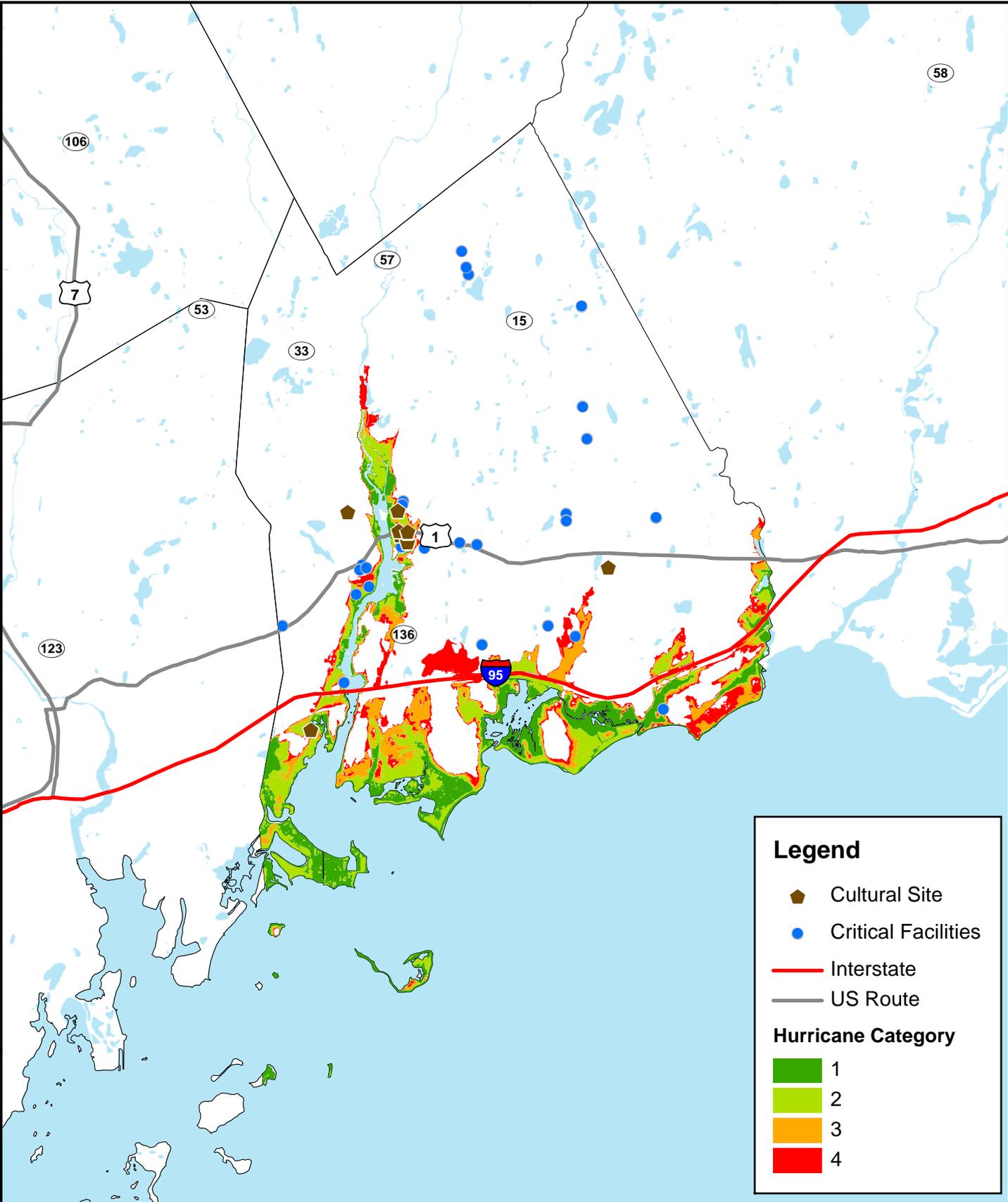
The city receives regular weather updates through Division of Emergency Management and Homeland Security (DEMHS) Region 1 email alerts as well as watches and warnings through the National Weather Service. Tidal gauges in Bridgeport and Stamford help town officials watch for flooding conditions and respond accordingly.

*Actions Completed and New Capabilities*

The town has completed infrastructure upgrades to the Westport train station parking lot, providing high ground parking. These upgrades included elevating some parking areas, regrading and repaving, and a new drainage system. The town has also changed the floodplain regulations to require at least one foot of freeboard for new or substantially improved homes.

### **3.1.3 Vulnerabilities and Risk Assessment**

Flooding can impact properties along the various river corridors in town, as well as those along the coastline. With climate change projections showing more intense precipitation events in the future, flooding in any of these areas may be exacerbated under future conditions. Areas that already see flooding may see increased levels, while areas that may not be a concern may see flooding issues in the future. While future conditions are uncertain, there are currently some areas in town that are presently experiencing flooding challenges.



**Legend**

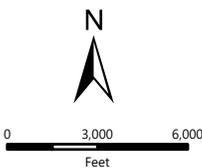
- Cultural Site
- Critical Facilities
- Interstate
- US Route

**Hurricane Category**

- 1
- 2
- 3
- 4

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**Hurricane Storm Surge Inundation Areas**  
WestCOG Hazard Mitigation Plan  
Town of Westport  
NPS: Cultural Resources  
DEEP: Storm Surge Areas



SCALE 1" = 6,353'  
DATE 11/13/2020  
3101-22  
PROJ. NO.

**FIG. 3-1**

### *Repetitive Loss Properties*

There are 213 repetitive loss properties (RLPs) located in Westport; 209 are residential and 4 are commercial. 187 RPLs are located within a 1% flood zone. They are concentrated along the coast but there is also a significant number along the Saugatuck River.

Many of the RLPs and Severe RLPs (SRLPs) in town have been elevated or completely rebuilt, and ultimately mitigated for flooding. Some concerning properties do remain unelevated and unmitigated. The town is hopeful to acquire some of these properties in the near future in the event that funding is available.

### *Critical Facilities*

There are two facilities located within the 100-year flood zones. The fire department is critical to emergency response during a hazard event, and Saugatuck Elementary School is critical for day to day operations and an evacuation priority.

The at-risk facilities include:

- Westport Fire Department Saugatuck
- Saugatuck Elementary School

### *At-Risk Areas*

While FEMA flood zones have similar risk levels, there are some areas in Westport that experience flooding more frequently and are at a greater risk of frequent flooding for various reasons.

Riverine areas include:

- Muddy Brook: several culverts are undersized and need to be upgraded
- Dead Man Brook: several culverts along the stream are undersized and need to be upgraded.

There are several specific undersized culverts in town that also present flooding concerns including Violet Lane, Myrtle Avenue, and the Boston Post road. Also, flooding along some private roadways is a concern for the town, however, due to their ownership the Town finds mitigation more challenging. Other at-risk roadways were previously discussed in the drainage and street flooding.

Aside from riverine and infrastructural risks, the coastline of Westport is also at risk of flooding. This may be attributed to astronomically high tides, or nuisance flooding, or due to storm surge. Certain areas, such as Canal Road and Saugatuck Shores, frequently experience nuisance flooding. Low-lying coastal areas are at risk of coastal flooding or storm surge, while those that are coastal and in proximity to a river may see compounded flooding during extreme events.

Town staff has also noted a concern with regard to privately-owned and maintained roads; the associations responsible for these roads sometimes do not perform the maintenance or upgrades necessary to ensure adequate drainage and flood control. This can result in blocked or washed-out roads, and a need for municipal intervention to perform emergency stabilization or resident rescues.

### Saugatuck River

The river has several delineated floodplains, and therefore may be considered to be the most at-risk areas along the river. Within Westport and along the river, there are 17 RLPs, indicating past flood challenges. There are several road crossings over the river, in the downtown area, which may present challenges in regard to infrastructural capacity during a heavy event.

### Long Island Sound Coastline

The shoreline of Westport is primarily residential, with pockets of commercial activity. The entire coastline is all identified to have low lying, coastal stretched which may be at risk of both nuisance and storm surge flooding. There are 178 repetitive loss properties.

## **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 very unlikely in any given year.

### **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 Aquarion owned dams on file in the event of a potential failure. The Nash Pond dam is the only high hazard dam in town.

Following moderate to major flooding events, staff of the Westport Engineering Department attempt to visually inspect Class B dams and report any obvious problems to the Dam Safety Unit of DEEP. Dam Safety inspects these dams in approximately 5-year intervals.

An EAP for the Candlewood Lake Dam was prepared in 2004 by Northeast Utilities Service Company for First Light Power. The plan addresses the requirements of FERC Project No. 2576 and includes Candlewood Lake Dam, Lake Candlewood Dike #2, North Lanesville Dike and Middle Lanesville Dike on Candlewood Lake. The EAP contains a Dam Breach Analysis for the main dam and dikes, and Inundation Maps for a "sunny day" failure and failure under 100-year flood conditions.

The EAP describes the thorough maintenance and monitoring schedule for all structures. This includes continuous staffing at the Rocky River Station; weekly inspections of the dikes; monthly weir and piezometer readings; and annual inspections by FERC representatives. Water levels in Candlewood Lake are monitored continuously by a signal transmitted via an underground cable. Tailrace levels in the Housatonic River are also monitored continuously via a mounted staff gage. Monitors have also been installed at weirs downstream of the Danbury Dike, Middle Lanesville Dike, the Main Dam, and the Canal Dike.

The EAP specifies that representatives of the Rocky River Project are responsible for notifying Brookfield government officials in the event of an emergency.

*Actions Completed and New Capabilities*

Brookfield’s dam failure mitigation capabilities have improved since adoption of the previous plan through increased dam monitoring and dam safety enforcement capabilities at the state level, as well as the digitization and inclusion of dam failure inundation areas into the CTAlert system.

**3.2.3 Vulnerabilities and Risk Assessment**

As of 2013, there were 33 DEEP-inventoried dams within the Town of Westport. Dams and dam failure areas, where available, are show in Figure 2-4. One of these dams is a Class C, or high hazard dam, and four 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 Westport.

**Table 3-1: High Hazard Dams with Potential to Affect the Town of Westport**

#	Name	Location	Class	Owner
15801	Nash Pond Dam	Nash Pond, Westport	C	Private
15804	Aspetuck River	Aspetuck River, Westport	BB	Private
15802	Lee’s Pond Dam	Lee’s Pond, Westport	B	Private
15805	Westport Pond Dam	Westport Pond, Westport	B	Town of Westport
15806	Greenacre Lane Pond Dam	Greenacre Lane Pond, Westport	B	Private

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

The Nash Pond Dam is 105 feet in length, with a maximum height of 24 feet. It is a masonry structure, and impounds roughly 58 acres at normal water levels with a contributing watershed of 3.05 square miles.

The Aspetuck River dam is 190 feet in length, and 12 feet high. The dam impounds a total watershed area of 20.8 square miles, with a total pond area of 1.5 acres.

The Lee’s Pond Dam is a 200-foot-long and 17-foot-high masonry dam. This dam impounds roughly 97 acres, with a contributing watershed of 77.50 square miles.

The Westport Pond Dam, owned by the Town of Westport, is 75 feet in length, 4 feet high, and is located along Deadman Brook. The dam impounds approximately 2.25 square miles of watershed, with a pond size of about 1.0 square miles.

Greenacre Lane Pond Dam is a 50-foot-long masonry dam that is about 4 feet high. The dam is located along an unnamed stream and has an area of about 0.5 square miles.

*Changes and Improvements*

Westport continues to be at low risk from dam failure. The Town has installed, and now maintains, warning gauges on local dams.

### **3.3 HURRICANES AND TROPICAL STORMS**

#### **3.3.1 Setting**

A hurricane striking Westport is considered a possible event each year and could cause critical damage to the town and its infrastructure. 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 Westport are susceptible to flooding or storm surge 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 Weston. A hurricane striking the town is considered a possible event each year and could cause critical damage to the town and its infrastructure.

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 2018 Connecticut State Building Code was amended in 2009 and adopted with an effective date of October 1, 2018. Effective 2018, the design wind speed for Westport is 110 miles per hour for a Category 1, 120 miles per hour for a Category 2 and 130 for Category 3 or greater. Westport 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.

Westport has a tree warden, an annual tree maintenance program for public property, and the DPW maintains the necessary equipment to clean up downed tree limbs, brush, and debris following major wind events. Staging areas have been identified for short term storage, and an agreement with Sherwood Island State Park was reached for temporary storage and processing following major storm events.

Education and preparedness are critical components in reducing vulnerability to severe storm events. Westport officials continue to visit schools and educate children about the risks from natural hazards and necessary preparedness actions. Town staff have also attended trainings on mitigation measures from FEMA, Building Officials & Code Administrators International Inc., and the DEEP.

The Town has also devoted significant resources to ensure that emergency responders are prepared during a severe storm event. A weather monitoring station is employed, and emergency communications facilities have been updated to withstand high wind. The Westport/Weston Health District, in cooperation with the American Red Cross, the Westport Housing Authority, the Department of Human Services and the local Visiting Nurse agencies continued to maintain a list of residents requiring additional services and support during emergencies. The Town also regularly reviews the Westport Emergency Operations Plan, providing updates as needed.

#### *Actions Completed and New Capabilities*

When working with Eversource there is a community liaison, as well a Subject Matter Expert (SME), that is employed by the town. This SME is a former electric employee and has extensive knowledge on the system in town and electric infrastructure. The SME assists in power restoration efforts during an event.

### **3.3.3 Vulnerabilities and Risk Assessment**

Most of the damage to the town from historical tropical cyclones has been due to the effects of flooding and wind. Areas of known and potential flooding problems are discussed in Section 3.1

The Town of Westport is vulnerable to hurricane damage from wind and flooding and from any tornadoes accompanying the storm. In fact, most of the damage to the town from historical tropical cyclones has been due to the effects of flooding. Factors that influence vulnerability to tropical cyclones in the town include building codes currently in place, local zoning and development patterns, and the age and number of structures located in highly vulnerable areas of the community.

#### *Changes and Improvements*

The Town of Westport continues to mitigate hurricane and tropical storm damage via flood mitigation strategies and tree maintenance efforts.

## **3.4 SUMMER STORMS AND TORNADOES**

### **3.4.1 Setting**

Summer storms and tornadoes have the potential to affect any area within the Town of Westport. 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.

Based on the historic record, it is considered highly likely that a summer storm that includes lightning will impact Westport 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 Fairfield County each year that could cause significant damage to a small area.

### **3.4.2 Capabilities**

The town's capabilities regarding mitigation of high wind events are described in Section 3.3.2.

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. Westport's emergency communication capabilities are described in Section 2.5.

#### *Actions Completed and New Capabilities*

Westport's summer storm and tornado capabilities continue to be strong.

### **3.4.3 Vulnerabilities and Risk Assessment**

The entire Town of Westport 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.

According to the 2019 State Natural Hazard Mitigation Plan Update, Fairfield County has a moderate to high risk of tornado activity based on historical occurrences. Therefore, by virtue of its location in Fairfield County, the Town of Westport 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 Westport 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 Westport is considered moderate in any given year.

Thunderstorms are expected to impact the region about 20 days each year. 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 Westport

area is high during any given thunderstorm although no one area of the town is at higher risk of lightning strikes. There is also risk of a hailstorm occurring at least once per year in Westport.

The risk of downbursts occurring during such storms and damaging the Town of Westport 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 densely developed corridors, such as along Route 7, and surrounding areas, while more tree damage is expected in the less densely populated more rural 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 Westport 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.

#### *Changes and Improvements*

Westport continues to mitigate summer storms and tornadoes.

## **3.5 WINTER STORMS AND NOR'EASTERS**

### **3.5.1 Setting**

The entire Town of Westport 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.

According to the 2019 Connecticut State Natural Hazard Mitigation Plan the state 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 the western half of Westport's average annual snowfall is about 2.5 to 4 feet, while the eastern half is less than 2.5 feet.

### **3.5.2 Capabilities**

The town continuously reviews snow removal procedures and explores options for reducing costs. 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 has staging areas for debris disposal for after winter storms, and other high wind events.

#### *Actions Completed and New Capabilities*

In 2017 and 2018 WestCOG developed a local snow action plan, which included an update of road clearing routes and the salt distribution plan. This was part of the regional winter maintenance practices initiative led by WestCOG. Reports produced as part of that initiative are:

- Winter Maintenance Practices Baseline Assessment Report, November 2017. Prepared for WestCOG by Axiomatic, LLC
- Winter Maintenance Practices Guide, September 2018. Prepared for WestCOG by Axiomatic, LLC

### **3.5.3 Vulnerabilities and Risk Assessment**

The entire Town of Westport 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 \$69,000, 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 Westport 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.

The elderly population in Westport is particularly susceptible to the impacts created by winter storms due to resource needs (heat, electricity loss, safe access to food, etc.).

*Changes and Improvements*

Westport continues to mitigate snowstorm damages.

### 3.6 WILDFIRES AND DROUGHT

#### 3.6.1 Setting

Westport is generally considered a moderate to low 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. Such areas in Westport are limited to the northern areas of the town. Hazards associated with wildfires include property damage and loss of habitat.

In addition, Westport, 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 3-2 depicts the various drought conditions in Fairfield County since 2000, where the warmer colors represent more advanced drought stages.

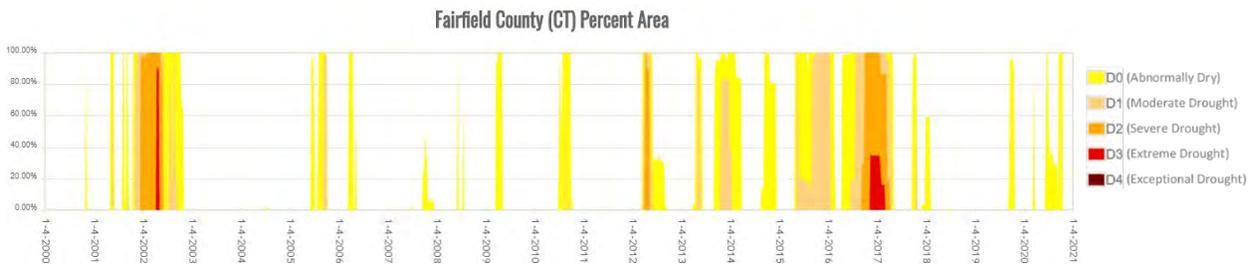


Figure 3-2: USDM Drought Time Series for Fairfield County

The 2019 Connecticut Natural Hazard Mitigation Plan assumes that the State of Connecticut has a medium probability 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 Westport are outlined in the *Zoning Regulations* and the *Town Code of Ordinances*:

- Chapter 34 - FIRE PREVENTION AND PROTECTION
  - 2(a): No person, without a permit granted by the Fire Chief or his/her designee, shall kindle or maintain any outdoor fire in the Town
  - 3. - Accumulation of combustible material prohibited; notice; removal
- 34-11.3 Fire Lanes - Fire lanes shall be provided on a site where required by Fire Marshal pursuant to Town Fire Lanes Ordinance. Such designated fire lanes shall be at least eight (8) feet in width and shall be marked "No Parking." No required parking or loading space shall encroach on any required fire lane.

The town's Fire Department is served by 64 career firefighters, staffing 4 firehouses in town.

*Actions Completed and New Capabilities*

The town continues to require adequate water for firefighting in new developments.

### 3.6.3 Vulnerabilities and Risk Assessment

According to the Connecticut DEEP, the actual forest fire risk in Connecticut is low due to several factors. First, the overall incidence of forest fires is very low. According to the 2019 State Hazard Mitigation Plan, an average of 109 fires per year occurred in Connecticut from 2013 to 2017, which is less than one per municipality per year. Secondly, as the wildfire/forest fire prone areas become fragmented due to development, the local fire departments have increased access to those neighborhoods for firefighting equipment. Third, the problematic interface areas such as driveways too narrow to permit emergency vehicles are site specific. Finally, trained firefighters at the local and state level are readily available to fight fires in the state, and inter-municipal cooperation on such instances is common.

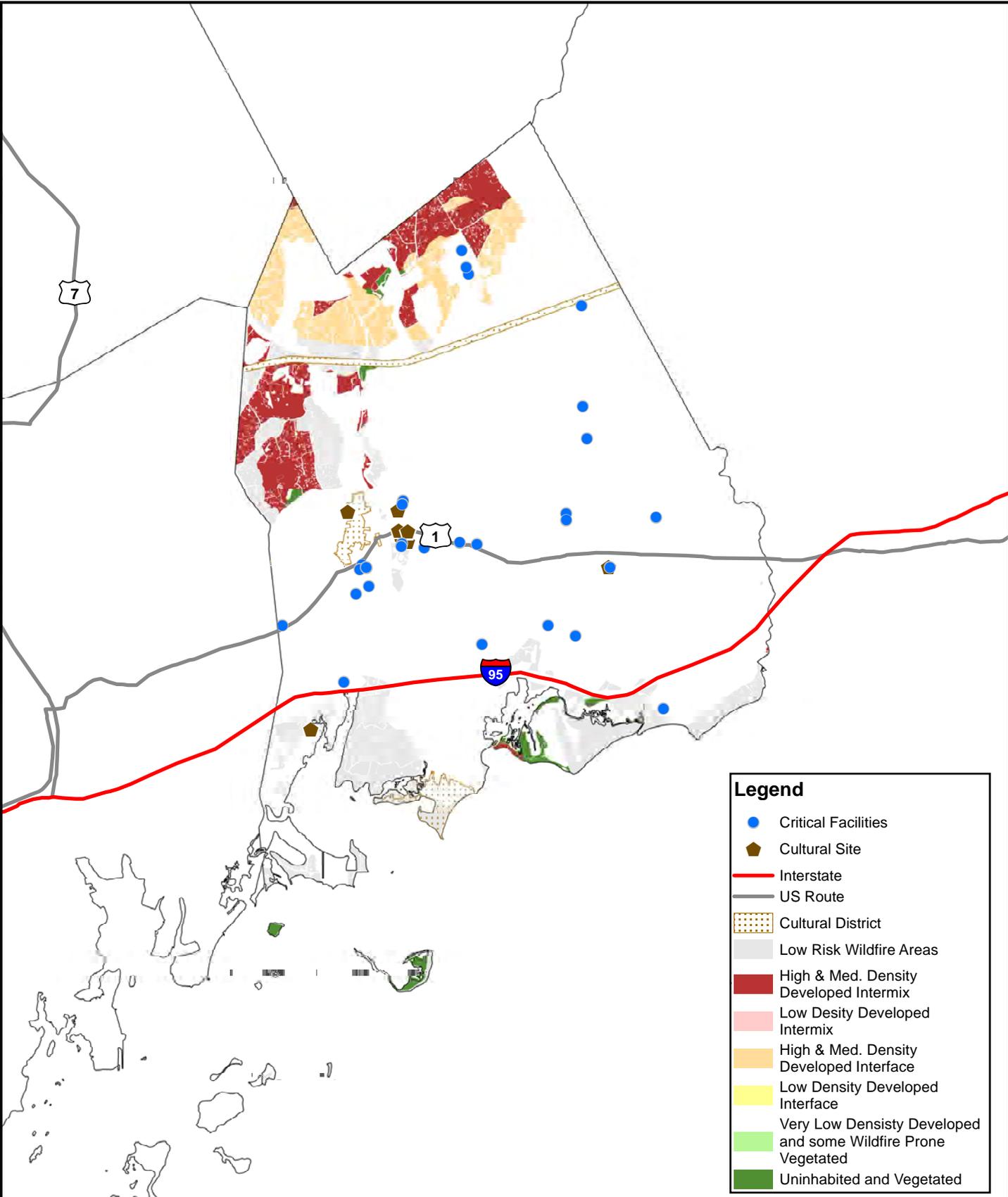
In the drought year of 1999, the average wildfire in Connecticut burned five acres in comparison to the two most extreme wildfires recorded since 1986 that burned 300 acres each. Given the availability of firefighting water in Westport, including the use of nearby water bodies, it is believed that this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

The Wildland-Urban Interface (WUI) index is used to identify areas that may be at greater risk of wildfires based on the density of development in comparison to the amount of wildfire prone vegetation. The northern areas of Westport of those that could be considered at greater risk due to moderate to high levels of development intermixed with fire prone vegetation. However, given firefighting capacity and water availability, it is likely that the town has effective capabilities to minimize damage from fires that may occur.

Wildfire Risk Areas in Westport are mapped in Figure 3-3

*Changes and Improvements*

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



**Legend**

- Critical Facilities
- ⬠ Cultural Site
- Interstate
- US Route
- Cultural District
- Low Risk Wildfire Areas
- High & Med. Density Developed Intermix
- Low Density Developed Intermix
- High & Med. Density Developed Interface
- Low Density Developed Interface
- Very Low Density Developed and some Wildfire Prone Vegetated
- Uninhabited and Vegetated

**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 Westport  
 NPS: Cultural Resources  
 Wildland-Urban Interface:USFA

N

0      3,000      6,000  
Feet

SCALE 1" = 6,348'

DATE 11/13/2020

3101-22  
PROJ. NO.

**FIG. 3-3**

## 3.7 EARTHQUAKES AND LANDSLIDES

### 3.7.1 **Setting**

The entirety Westport 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 43<sup>rd</sup> out of the 50 states for overall earthquake activity.

### 3.7.2 **Capabilities**

The city 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:
  - Encourage the conservation of existing undeveloped land by preserving water bodies, wetlands, watercourses, major stands of trees, steep slopes, ridge lines, significant geological features and other areas of environmental value.
  - Require that soil erosion and sediment control plans be developed for proposed projects.
  
- Plan of Conservation and Development:
  - Promotes the conservation of open space, which may include vulnerable soil types and steep slopes.
  
- Zoning
  - Limits development on land with slopes of 25% or greater.

#### *Actions Completed and New Capabilities*

Westport continues to have appropriate capabilities for mitigating earthquake events.

### 3.7.3 **Vulnerabilities and Risk Assessment**

Some areas in Wilton are underlain by sand and gravel, particularly in areas along the Saugatuck river and the coastline. 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 Westport. Results are presented in Table 3-1 below.

**Table 3-1: Probability of a Damaging Earthquake in the Vicinity of Westport**

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.

## **3.8 SEA LEVEL RISE AND SHORELINE CHANGE**

### **3.8.1 Setting**

The coastal areas of Westport are susceptible sea level rise and shoreline change. Sea level rise may not be considered a high hazard risk in and of itself, however, rising seas in conjunction with extreme weather may result in inundation farther inland than seen during past events. In addition to extreme weather, nuisance flooding may also become a more frequent issue during extreme high tides.

The State of Connecticut has adopted the recent sea level rise projections developed by the University of Connecticut, Connecticut Institute for Resilience and Climate Adaptation (CIRCA) as the latest planning threshold for coastal municipalities. This projection anticipates a rise of 50 cm by the year 2050.

### **3.8.2 Capabilities**

The town has begun to see an increase in nuisance flooding, and has experienced the impacts of extreme storm surge, leaving officials aware of the potential impacts of an extreme storm with elevated sea levels.

A flood study was conducted on 8 to 9 streams in town to assess for flooding concerns and infrastructure. The town also acquired a high-water rescue truck and is looking to acquire a second.

#### *Actions Completed and New Capabilities*

Westport has been increasing its sea level rise and shoreline change mitigation capabilities through studies, improvement of emergency response capabilities, and monitoring of changing sea levels.

### **3.8.3 Vulnerabilities and Risk Assessment**

The most at-risk areas are those immediately along the shoreline, with risk slightly declining moving inland. Saugatuck Shores is particularly at risk of increased nuisance flooding under future sea levels. In addition, a 100-year storm event with one foot of sea level rise has the potential to inundate many of the coastal areas including Compo and Hale Court. Much of these areas are residential.

#### *Changes and Improvements*

The town has updated GIS resources to include coastal AE zones and has provided the building department with a database of properties located in this zone. The town has also been encouraging residents to elevate homes to comply with flood regulations and has improved bridge access to Saugatuck Shores community.

## 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	Incorporate a Natural Hazards Awareness Week and conduct corresponding outreach the community and all interested parties. Activities will focus on flooding and other natural hazards, including associated hazard functions, governing laws/regulations, mitigation strategies and precautions. Outreach will also be conducted throughout the year, wherever possible	Carry Forward	This was not achieved due to staffing limitations. It was noted some similar outreach is already conducted during some town events.
2	Acquire properties within the floodplain as funding becomes available.	Carry Forward with Revisions	<i>Encourage the preservation of undeveloped lands within the 100-year flood zone with the use of open space purchases, donations and conservation easements.</i>
3	Review the Westport Plan of Conservation and Development and other relevant plans to identify open space projects that preserve or restore the functions of natural systems and may be eligible for funding under mitigation grants.	Carry Forward with Revisions	Condense actions 2 and 3 as the town would like to pursue specific property acquisitions for flood storage and open space preservation.
4	Identify and publicize regulations that will preserve and protect watercourses, waterbodies, wetlands, steep slopes, and floodplains, and those that will conserve floodplain fringe areas, wellhead areas, areas of high groundwater availability, and unique/special habitat areas.	Capability	This is an ongoing action.
5	Minimize the amount and intensity of development in "V" flood zones, new non-water dependent development from "V" zones.	Capability	Updates to Zoning regulations increasing mitigation requirements The town believes this action needs to be addressed by way of other regulations. Possibly incorporate V-zone acquisitions into actions 2 & 3.
6	Change the floodplain regulations to require at least one foot of freeboard for new or substantially improved homes.	Completed	

#	Description	Status	Notes
7	Study the use of V-Zone standards for coastal A-Zones.	Completed	Regulations have been changed to clearly state the standards.
8	Adopt an ordinance that would place responsibility for stream channel maintenance on the property owner and give Westport enforcement power. Such ordinances would include stream dumping, channel maintenance, and land clearing disturbances. These ordinances would reduce the likelihood of localized flooding and could lead to additional points toward CRS reclassification.	Carry Forward	The town believes this is an achievable action and would like to pursue it under the development of a new committee.
9	Evaluate the zoning regulations for ways to reduce land coverage and building size, including in flood zones.	Carry Forward with Revisions	The P&Z representative would like to form a working group or committee that is capable of evaluating, developing and pursuing zoning regulations changes associated with flood hazard areas. This includes actions 9-13
10	Modify Zoning Regulations to change the time horizon for work that is to be included in substantial improvement from 5 years to life of structure.	Carry Forward with Revisions	
11	Modify Zoning Regulations to require that any building or structure even if only a portion of which lies in a flood hazard zone is designed to be fully protected as if the entire structure were in the zone.	Carry Forward with Revisions	
12	Modify Zoning Regulations to require that any building or structure even if only a portion of which lies in a more restrictive flood hazard zone that the building be designed to be fully protected as if the entire structure were in the more restrictive zone	Carry Forward with Revisions	
13	Modify Zoning Regulations to prohibit structures entirely or partially over water unless water dependent uses	Carry Forward with Revisions	<i>Modify Zoning Regulations to prohibit <u>new living space</u> entirely or partially over water unless water dependent uses.</i>
14	Regularly review subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood prone areas and to minimize impermeable ground coverings, if necessary.	Carry Forward with Revisions	<i>Eliminate "and to minimize impermeable ground coverings, if necessary" Add new action: Minimize impermeable ground coverings</i>
15	Undertake preparation of an update to the 1970 master drainage plan (the "Jackson" study).	Complete	

#	Description	Status	Notes
16	Westport will encourage the Aspetuck Land Trust to initiate a maintenance program for Sasco Creek as it passes through their property, in an attempt to foster an understanding that maintaining a clear channel in the northern section of the parcel will reduce flooding occurrences on Gristmill Lane. If necessary, Westport can pursue clearing rights on these parcels.	Carry Forward with Revisions	<i>The privately-owned Bulkley Pond Dam on Sasco Brook was breached during a severe storm event in the Fall of 2018.</i>  <i>Action: The Town will work with the State and other Non-Governmental Organizations to encourage the dam and surrounding property owners to formalize the breach and restore and manage the wetland system as it transitions from a pond to a wet meadow</i>
17	Pursue and support comprehensive studies that recommend specific strategies for effective erosion abatement.	Carry Forward with Revisions	
18	Investigate and pursue the purchase of an automated sand bagger.	Drop	No longer a necessity
19	Obtain FEMA training on post disaster single-family dwelling assessments and other flood related issues.	Capability	Town does this.
20	Make FEMA's Emergency Management Institute classes available to Town Employees, including Rapid Visual Screening Techniques, designed to teach skills necessary for inventorying disaster-susceptible buildings. Skills acquired by attending this course could be utilized in implementing the Hazard Mitigation Plan.	Capability	Town employees have been participating in training events and the annual conference of the Connecticut Association of Flood Managers since 2014, meeting the intent of this action. Employees also receive training through FEMA EMI and CIRCA.
21	Request that FEMA continue to work to improve the accuracy of the updated FIRM maps, with special attention paid to unnumbered A-zones.	Carry Forward	
22	Obtain and update town GIS with Coastal AE Zones (Limit of Moderate Wave Action [LiMWA]) due to new Building Code requirements for properties within this area	Completed	
23	Provide the Building Department with database of properties within Coastal AE Zones (Limit of Moderate Wave Action [LiMWA])	Completed	
24	Encourage elevations of existing homes to comply with Floodplain Regulations	Completed	
25	Promote the use of functional shutters for properties located along the coast to guard against window breakage which can result in structural failure. Investigate funding sources to promote this relatively inexpensive type of retrofitting on a large scale.	Drop	

#	Description	Status	Notes
26	Retrofit existing above ground utility structures to make them more disaster resilient.	Carry Forward with Revisions	<i>Town has completed some of these projects. New action carried forward: Take advantage of opportunities during redevelopment projects to retrofit existing above ground structures to make them more disaster resilient.</i>
27	Determine how to reuse disposed brush within the community to reduce costs of exporting from Westport (chips, firewood, composting).	Remove	
28	Encourage moving as many utility lines underground as possible.	Capability	
29	Place deflectors on key utility lines to reduce accumulation of ice or snow.	Carry Forward with Revisions	<i>Add work with utility companies</i>
30	Encourage appropriate streetscaping and planting, particularly around utilities.	Capability	
31	Identify additional sites for yard waste and storm debris.	Carry Forward	
32	Evaluate municipality's sheltering and evacuation needs for a variety of storm scenarios.	Capability	
33	Improve coordination with CL&P and NU	Carry Forward with Revisions	<i>Now Eversource &amp; UI – add "through the community liaison"</i>
34	Identify opportunities for cooperation and coordination with private road associations	Carry Forward	
35	Improve (bridge) access to Saugatuck Shores community	Completed	Completed in 2017
36	Implement specific physical actions that help protect public critical facilities against wind damage as funds become available.	Drop	Combine with action #42
37	Encourage private marinas and yacht clubs to develop management plans that address pollution prevention and hazard mitigation.	Carry Forward	
38	Begin to evaluate and work to harden the structural integrity of Town-owned Critical Facilities and buildings and their ability to withstand earthquakes.	Drop	Combine with action #42
39	Encourage privately owned critical facilities to evaluate the ability of the buildings to withstand earthquakes and tornadoes, and to address and deficiencies identified.	Carry Forward	

#	Description	Status	Notes
40	During the Natural Hazards Awareness Week include activities, workshops and materials about all natural hazards.	Drop	This is included in the Natural Hazards Awareness Week action
41	Provide the earthquake-related publications to the public library for inclusion with the other natural hazard publications.	Carry Forward	
42	Request that the Town, including the Board of Education, if applicable, retain the services of a professional engineer to survey all municipally owned buildings for their ability to withstand earthquake and wind loading. Prioritize any retrofitting, giving those buildings to be used as shelters the highest priority. If analysis reveals that a particular building is better suited as a shelter than one that is currently being used, then consider relocating the shelter to that location.	Carry Forward with Revisions	Add " <u>fund studies and</u> retain the services..."
43	Update drought management plan to be in alignment with State of Connecticut Drought Management plan.	Carry Forward	
44	Work with the State Department of Energy and Environmental Protection, local conservation officials and dam owners to identify which dams are no longer serviceable and could be removed. Work to coordinate and identify funding opportunities.	Capability	Town works with NGOs as well as DEEP.
45	Continue to install and maintain warning gauges on local dams as the opportunity or need arises.	Capability	
46	Ensure Emergency Operations Plans are updated and on file with local emergency management officials. Local emergency management officials will assist dam owners as needed.	Capability	Dam EOPs are now called Emergency Action Plans (EAPs). Most EAPs have been completed. Town wants to carry forward an action to ensure ongoing practices and protocols to ensure this is continued.
47	Work with dam owners to ensure that maintenance and inspections are conducted as required and documented with local and state emergency management officials.	Capability	Town wants to carry forward an action to ensure ongoing practices and protocols to ensure this is continued.
48	Develop and conduct a Dam Failure Exercise that involve all stakeholders and encourages preparedness through practice using public notifications systems. Assess and practice evacuation and response plans. Practice communication and coordination of local and state emergency response personnel	Capability	Town wants to carry forward an action to ensure ongoing practices and protocols to ensure this is continued.

#	Description	Status	Notes
49	Develop public awareness information material to distribute to property owners/occupants in the dam failure inundation zones.	Carry Forward	
50	Evaluate how to best prepare for the implications of global sea level rise to best balance public health, safety, and welfare.	Carry Forward	

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

Action WPT-01	
<b>Update drought management plan to be in alignment with State of Connecticut Drought Preparedness and Response Plan.</b>	
Lead	EM, DEEP, DPW, CC
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2021
Priority	High

Action WPT-02	
<b>Identify locations for residents to park cars when flooding is forecast, ensure sufficient parking is available, and inform residents of the appropriate parking locations.</b>	
Lead	EM
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2021
Priority	High

<b>Action WPT-03</b>	
<b>Provide information on the Town website about CT DEEP training and information around small business chemical management for hazard resilience.</b>	
<b>Lead</b>	EM, BOS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget, CT DEEP
<b>Timeframe</b>	2021
<b>Priority</b>	High

<b>Action WPT-04</b>	
<b>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.</b>	
<b>Lead</b>	EM, BOS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget, CT DEEP
<b>Timeframe</b>	2021
<b>Priority</b>	High

<b>Action WPT-05</b>	
<b>Host a CT DEEP presentation for municipal staff and local businesses about business chemical management for hazard resilience.</b>	
<b>Lead</b>	EM, BOS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget, CT DEEP
<b>Timeframe</b>	2021
<b>Priority</b>	High

<b>Action WPT-06</b>	
<b>Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives:</b>	
<ul style="list-style-type: none"> <li>- Disseminate a toolkit for pre-disaster business preparedness.</li> <li>- Revise regulations to promote Low Impact Development.</li> </ul>	
<b>- Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.</b>	
<b>Lead</b>	BOS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget, Sustainable CT Community Match Fund
<b>Timeframe</b>	2021
<b>Priority</b>	High

Action WPT-07	
<b>Improve coordination with Eversource and UI through the community liaison.</b>	
Lead	EM, DPW, Private
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2022
Priority	Med

Action WPT-08	
<b>Encourage the preservation of undeveloped lands within the 100-year flood zone with the use of open space purchases, donations and conservation easements.</b>	
Lead	CC, DPW
Cost	\$0 - \$25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2022
Priority	Med

Action WPT-09	
<b>Collaborate with CIRCA on the "Resilient Connecticut" project</b>	
Lead	BOS
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2022
Priority	Med

Action WPT-10	
<b>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.</b>	
Lead	Planning
Cost	\$0 - \$25,000
Funding	Operating Budget, CT SHPO
Timeframe	2022
Priority	Med

<b>Action WPT-11</b>	
<b>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.</b>	
<b>Lead</b>	Planning
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	CT SHPO
<b>Timeframe</b>	2024
<b>Priority</b>	Med

<b>Action WPT-12</b>	
<b>The privately-owned Bulkley Pond Dam on Sasco Brook was breached during a severe storm event in the Fall of 2018. The Town will work with the State and other Non-Governmental Organizations to encourage the dam and surrounding property owners to formalize the breach and restore and manage the wetland system as it transitions from a pond to a wet meadow.</b>	
<b>Lead</b>	CC, DPW
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant
<b>Timeframe</b>	2025
<b>Priority</b>	Med

<b>Action WPT-13</b>	
<b>Identify a department, board, or individual to be responsible for ongoing implementation of dam safety practices, such as keeping EAPs up-to-date and on file, ensuring inspection and maintenance work is completed and documented, and performing dam failure exercises.</b>	
<b>Lead</b>	EM, DPW, CC, P&Z, Buildings
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-14</b>	
<b>Incorporate a Natural Hazards Awareness Week and conduct corresponding outreach the community and all interested parties. Activities will focus on flooding and other natural hazards, including associated hazard functions, governing laws/regulations, mitigation strategies and precautions. Outreach will also be conducted throughout the year, wherever possible</b>	
<b>Lead</b>	P&Z, CC, DPW
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-15</b>	
<b>Require private marinas and yacht clubs to develop management plans that address pollution prevention and hazard mitigation.</b>	
<b>Lead</b>	EM, Police, Fire, DPW
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-16</b>	
<b>Provide the earthquake-related publications to the public library for inclusion with the other natural hazard publications.</b>	
<b>Lead</b>	EM, BOE
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-17</b>	
<b>Develop a new committee to focus on flood hazard area regulations including making changes such as:</b>	
<ul style="list-style-type: none"> <li>- Changing SI lookback from 5 years to the life of the structure</li> <li>- Require a structure, even if only partially in a flood hazard zone, if designed to be fully protected as if the entire structure were in the zone</li> <li>- A building or structure, if located in two zones, is designed to the standards of the more restrictive flood hazard zone</li> <li>- Prohibit new living spaces entirely or partially over water unless water dependent uses</li> </ul>	
<b>Lead</b>	Planning, BOS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-18</b>	
<b>Adopt an ordinance that would place responsibility for stream channel maintenance on the property owner and give Westport enforcement power. Such ordinances would include stream dumping, channel maintenance, and land clearing disturbances. These ordinances would reduce the likelihood of localized flooding and could lead to additional points toward CRS reclassification.</b>	
<b>Lead</b>	P&Z
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-19</b>	
<b>Regularly review subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood prone areas</b>	
<b>Lead</b>	DPW, CC, Aspetuck Land Trust
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-20</b>	
<b>Request that FEMA continue to work to improve the accuracy of the updated FIRM maps, with special attention paid to unnumbered A-zones.</b>	
<b>Lead</b>	Town, DPW, EM, P&Z, Utilities
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WPT-21</b>	
<b>Develop public awareness information material to distribute to property owners/occupants in the dam failure inundation zones.</b>	
<b>Lead</b>	P&Z, EM, DPW, CC
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2024
<b>Priority</b>	Low

<b>Action WPT-22</b>	
<b>Conduct a detailed flood/coastal risk assessment to improve resiliency efforts to key assets and vulnerable properties.</b>	
<b>Lead</b>	P&Z
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	Operating Budget, Grant
<b>Timeframe</b>	2025
<b>Priority</b>	Low

<b>Action WPT-23</b>	
<b>Pursue and support comprehensive studies that recommend specific strategies for effective erosion abatement at Compo Mill Cove.</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	Operating Budget, Grant
<b>Timeframe</b>	2025
<b>Priority</b>	Low

<b>Action WPT-24</b>	
<b>Request that the Town, including the Board of Education, if applicable, fund studies and retain the services of a professional engineer to survey all municipally owned buildings for their ability to withstand earthquake and wind loading. Prioritize any retrofitting, giving those buildings to be used as shelters the highest priority. If analysis reveals that a particular building is better suited as a shelter than one that is currently being used, then consider relocating the shelter to that location.</b>	
<b>Lead</b>	WWHD
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	Operating Budget, Grant
<b>Timeframe</b>	2025
<b>Priority</b>	Low

<b>Action WPT-25</b>	
<b>Take advantage of opportunities during redevelopment projects to retrofit existing above ground structures to make them more disaster resilient. This action seeks to go beyond the requirements associated with substantial improvement.</b>	
<b>Lead</b>	P&Z, DPW
<b>Cost</b>	\$100,000 - \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

Action WPT-26	
<b>Compare local floodplain regulations with Revised State Model Flood Regulations to identify any remaining opportunities for improvement</b>	
Lead	Planning
Cost	\$0 - \$25,000
Funding	Operating Budget
Timeframe	2023
Priority	Low

Action WPT-27	
<b>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.</b>	
Lead	EM, BOS
Cost	\$0 - \$25,000
Funding	Operating Budget, FEMA Grant
Timeframe	2023
Priority	Low

Action WPT-28	
<b>Incentivize privately owned critical facilities to evaluate the ability of the buildings to withstand hazards such as earthquakes and tornadoes, and to address and deficiencies identified. The incentive is continuing to be listed in this plan.</b>	
Lead	EM, CC, Buildings, P&Z
Cost	\$0 - \$25,000
Funding	Operating Budget, Grant
Timeframe	2023
Priority	Low

Action WPT-29	
<b>Work with CT DEEP to validate and/or correct the RL list and update the mitigation status of each listed property.</b>	
Lead	Planning
Cost	\$25,000 - \$50,000
Funding	FEMA Grant
Timeframe	2024
Priority	Low

<b>Action WPT-30</b>	
<b>Annually conduct an emergency operations exercise for a local terrorism, sabotage, or mass casualty event.</b>	
<b>Lead</b>	EMD
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2024
<b>Priority</b>	Low

<b>Action WPT-31</b>	
<b>Work with utilities to place deflectors on key utility lines to reduce accumulation of ice or snow.</b>	
<b>Lead</b>	P&Z, DPW
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2025
<b>Priority</b>	Low

<b>Action WPT-32</b>	
<b>Pursue funding for other culvert replacements and upgrades</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	More than \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-33</b>	
<b>Upgrade undersized culverts on Muddy Brook</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	More than \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-34</b>	
<b>Upgrade undersized culverts on Dead Man Brook</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	More than \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-35</b>	
<b>Upgrade undersized culverts on Violet Lane</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	More than \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-36</b>	
<b>Upgrade undersized culverts on Myrtle Avenue</b>	
<b>Lead</b>	EM, P&Z, CC, Buildings
<b>Cost</b>	More than \$500,000
<b>Funding</b>	Capital Improvement Plan, FEMA Grant, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-37</b>	
<b>Pursue the acquisition of a second high-water emergency response vehicle</b>	
<b>Lead</b>	EMD, FD
<b>Cost</b>	\$100,000 - \$500,000
<b>Funding</b>	Capital Improvement Plan, CT DEMHS, Other Grant
<b>Timeframe</b>	2026
<b>Priority</b>	Low

<b>Action WPT-38</b>	
<b>Identify opportunities for cooperation and coordination with private road associations regarding tree and limb management, drainage maintenance, and other access and egress concerns</b>	
<b>Lead</b>	CC, P&Z, EM, Boating Advisory Committee
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget, FEMA Grant
<b>Timeframe</b>	2024
<b>Priority</b>	Low

<b>Action WPT-39</b>	
<b>Identify additional sites for yard waste and storm debris.</b>	
<b>Lead</b>	EM, WWHD, Human Services
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	Operating Budget
<b>Timeframe</b>	2024
<b>Priority</b>	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		
WPT-17	Develop a new committee to focus on flood hazard area regulations including making changes such as: - Changing SI lookback from 5 years to the life of the structure - Require a structure, even if only partially in a flood hazard zone, if designed to be fully protected as if the entire structure were in the zone - A building or structure, if located in two zones, is designed to the standards of the more restrictive flood hazard zone - Prohibit new living spaces entirely or partially over water unless water dependent uses	Floodplain Management Regulations	Planning, BOS	\$0 - \$25,000	Operating Budget	2022	1	1	1	0	1	1	1	-1	0	0	-1	0	0	0	0	6	
WPT-18	Adopt an ordinance that would place responsibility for stream channel maintenance on the property owner and give Westport enforcement power. Such ordinances would include stream dumping, channel maintenance, and land clearing disturbances. These ordinances would reduce the likelihood of localized flooding and could lead to additional points toward CRS reclassification.	Floodplain Management Regulations	P&Z	\$0 - \$25,000	Operating Budget	2022	1	1	1	0	1	1	1	-1	0	0	-1	0	0	0	0	6	
WPT-19	Regularly review subdivision regulations and make appropriate changes to encourage alternatives to placing lots in flood prone areas	Floodplain Management Regulations	DPW, CC, Aspetuck Land Trust	\$0 - \$25,000	Operating Budget	2022	1	1	1	0	1	1	1	-1	0	0	-1	0	0	0	0	6	
WPT-20	Request that FEMA continue to work to improve the accuracy of the updated FIRM maps, with special attention paid to unnumbered A-zones.	Floodplain Management Regulations	Town, DPW, EM, P&Z, Utilities	\$0 - \$25,000	Operating Budget	2022	1	1	1	0	1	1	1	-1	0	0	-1	0	0	0	0	6	
WPT-21	Develop public awareness information material to distribute to property owners/occupants in the dam failure inundation zones.	Outreach and Education	P&Z, EM, DPW, CC	\$25,000 - \$50,000	Operating Budget	2024	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0	6	
WPT-22	Conduct a detailed flood/coastal risk assessment to improve resiliency efforts to key assets and vulnerable properties.	Flood Study	P&Z	\$50,000 - \$100,000	Operating Budget, Grant	2025	1	1	1	1	1	1	0	0	-1	0	0	0	0	0	0	6	
WPT-23	Pursue and support comprehensive studies that recommend specific strategies for effective erosion abatement at Compo Mill Cove.	Flood Study	EM, P&Z, CC, Buildings	\$50,000 - \$100,000	Operating Budget, Grant	2025	1	1	1	1	1	1	0	0	-1	0	0	0	0	0	0	6	
WPT-24	Request that the Town, including the Board of Education, if applicable, fund studies and retain the services of a professional engineer to survey all municipally owned buildings for their ability to withstand earthquake and wind loading. Prioritize any retrofitting, giving those buildings to be used as shelters the highest priority. If analysis reveals that a particular building is better suited as a shelter than one that is currently being used, then consider relocating the shelter to that location.	Critical Facility Mitigation	WWHD	\$50,000 - \$100,000	Operating Budget, Grant	2025	1	1	1	1	1	1	0	0	-1	0	0	0	0	0	0	6	
WPT-25	Take advantage of opportunities during redevelopment projects to retrofit existing above ground structures to make them more disaster resilient. This action seeks to go beyond the requirements associated with substantial improvement.	Floodproofing & Elevation	P&Z, 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	0	0	-1	0	6
WPT-26	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	0	5	
WPT-27	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	0	5	
WPT-28	Incentivize privately owned critical facilities to evaluate the ability of the buildings to withstand hazards such as earthquakes and tornadoes, and to address and deficiencies identified. The incentive is continuing to be listed in this plan.	Critical Facility Mitigation	EM, CC, Buildings, P&Z	\$0 - \$25,000	Operating Budget, Grant	2023	1	1	1	1	1	1	0	-1	-1	0	0	0	0	0	0	5	
WPT-29	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	0	4	
WPT-30	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	0	5	
WPT-31	Work with utilities to place deflectors on key utility lines to reduce accumulation of ice or snow.	Energy Resiliency & Backup Power	P&Z, DPW	\$50,000 - \$100,000	Operating Budget	2025	1	1	1	1	1	1	0	0	-1	-1	0	0	0	0	0	5	





# APPENDIX B

## Appendix B: SVI Summary



**Town of Westport**  
**Climate Vulnerability Assessment**  
**A Component of Sustainable CT Action 5.4**

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

**Hazards**

***Sea Level Rise***

Rising seas have raised concerns in communities throughout the state for various reasons. The Town of Westport is currently experiencing increased occurrences of coastal flooding, both nuisance and storm related, with impacts to neighborhoods and critical infrastructure. Certain areas, such as Saugatuck Shores and Canal Road, are increasingly impacted as events occur more frequently. While many homes have begun to elevate, or have elevated, there are still pockets of residential areas that are of concern. In addition, lack of emergency access is also a concern for the Town. With sea levels rising, and storm intensity increasing, infrastructure and homes are vulnerable to inundation.

***Inland Flooding***

With FEMA flood zones along a few rivers in town, such as the Saugatuck River, there is continuously concern for riverine flooding. Specifically, the Muddy Brook and Dead Man Brook continuously prove to the flooding concerns with undersized infrastructure causing flooding during heavy precipitation events. The town is also concerned with drainage related flooding along several roadways. With precipitation expected to increase due to climate change, flooding events may occur more frequently. Overall, flooding has been an issue in several places in the past, and occurrences may increase under the future climate.

***Winter Storms***

Westport is largely residential, with relatively even distribution of development throughout town. While there are no major commercial areas in Town, most of the commercial activity and development is concentrated along Route 1. While snow removal and icing were not a notable concern for the town, shifts in winter precipitation in conjunction with poor drainage in certain areas icing may increasingly be of concern to the town.

***Drought and Extreme Temperatures***

Most of the town is serviced by public water supply, with a small area of northern parcels likely serviced by private wells. Therefore, impacts to water supply may be an issue to the town as temperatures rise in the near future, resulting in isolated issues with water scarcity for private well owners. With historic impacts to public water supply availability during droughts, and temperatures expected to rise, the challenge of maintaining adequate supply during these times may also increase.

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

- Coastal municipal infrastructure and neighborhoods
- Riverine flooding
- Poor drainage areas
- Emergency access

## **Secondary Impacts**

### ***Economic Impacts***

With vulnerable homes and infrastructure, the town faces an economic challenge of mitigating or relocating town-owned facilities, elevating roads, and assisting residents with mitigation efforts. There is also a potential economic impact to local businesses during inland flooding events. Poor drainage may reduce site access resulting in loss of business, or businesses may incur expenses related to flood mitigation or clean-up efforts.

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.

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 Westport.

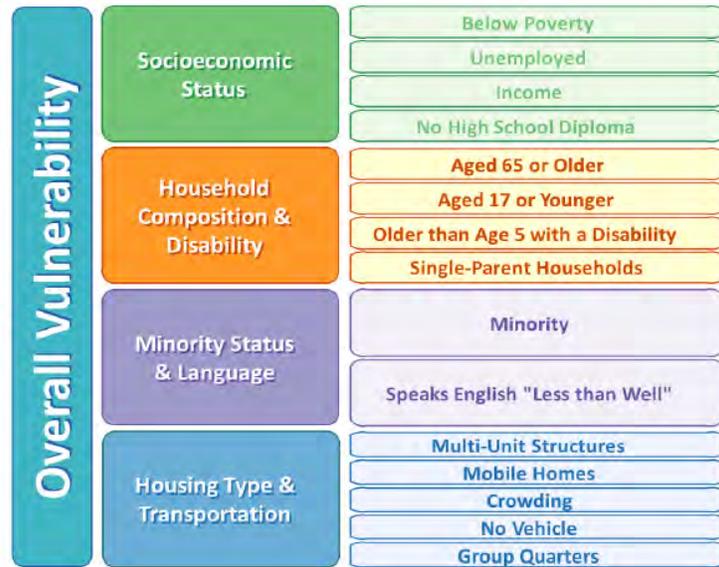


Figure 1: The CDC SVI Index Factors. Graphic: svi.cdc.com

Table 1: Westport SVI Factor Rankings

	Overall SVI	Socioeconomic	Household Composition & Disability	Minority Status & Language	Housing Type & Transportation
<b>WESTPORT</b>	.19	.11	.44	.28	.28

The Town of Westport is considered to have a low level of vulnerability, with their most vulnerable social aspect being based on household composition and disability. However, the town does have vulnerable populations which live in higher density housing populations, and vulnerable minority populations and language barrier concerns. These vulnerable populations are concentrated in the central northern tract north of Route 1 between Wilton Road and North Avenue.

These populations may be vulnerable to impacts from drought, inland flood and icing 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.

Poor drainage flooding presents the concern of pollution into nearby water bodies as these 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. In addition to the SVI, the Connecticut Department of Public Health (DPH)<sup>1</sup> has identified at least two facilities in Westport that are convalescent homes.

These 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, in addition to those identified in the SVI, 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.

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<sup>1</sup> <https://www.elicense.ct.gov/Lookup/LicenseLookup.aspx>