

# Naugatuck Valley Council of Governments Hazard Mitigation Plan Update 2021 – 2026

Municipal Annex  
for  
**WATERBURY, CT**



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MMI #3211-29

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## 1.0 INTRODUCTION

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### 1.1 Purpose of Annex

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This Hazard Mitigation Plan (HMP) annex provides 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 Naugatuck Valley Council of Governments (NVCOG) Multi-Jurisdictional Hazard Mitigation Plan. This annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific local detail, 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.

### 1.2 Planning Process

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A meeting was held with Waterbury representatives on October 23, 2020 for the purposes of initial data collection and review of necessary updates for this document. The meeting was convened by the HMP local coordinator, David Simpson.

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

Public input collected at public workshops and through an online survey have also informed development of this HMP update.

### 1.3 Physical Setting

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The City of Waterbury is located in New Haven County. It is bordered by the towns of Watertown and Middlebury to the west, Thomaston and Plymouth to the north, Wolcott and Cheshire to the east, and Naugatuck and Prospect to the south.

Waterbury is located on the I-84 corridor roughly midway between Hartford and Danbury, and is a major center of banking (including the Webster Bank Corporate Headquarters), as well as home to the Federal, State, and County courthouses. The City is the most developed community in the Naugatuck Valley Region.

As the location of numerous current and former industrial facilities, as well as three local colleges (University of Connecticut – Waterbury, Naugatuck Valley Community College, and Post University), two major hospitals (St. Mary's Hospital and The Waterbury Hospital) and many state and federal buildings, utility organizations, and major financial institutions, the City of Waterbury is vulnerable to a loss of life and property due to an array of hazards.

## 1.4 Land Cover

Waterbury encompasses 28.6 square miles. The City is characterized by a compact Central Business District (CBD) surrounded by an industrial district and medium to high-density residential districts interspersed with mixed-use commercial corridors. The CBD is located near the intersection of I-84 and Route 8.

Sections of the City used predominantly for industrial purposes are largely located along the Naugatuck River, running from the north of the city to the south. An additional industrial district is located in the southeast part of the city. Medium-density residential areas surround the CBD and extend nearly to the city borders. In the northeast and southwest reaches of the city, topography limits development to small low-density residential neighborhoods surrounded by vacant land.

Table 1-1 summarizes 2015 land cover data which was derived from satellite imagery. Areas shown as turf and grass are maintained grasses such as residential and commercial lawns or golf courses. According to this data, about 29% of Waterbury is forested and approximately 56% is developed.

**Table 1-1: 2015 Land Cover by Area**

Land Cover	Area (acres)	Percent of Community
<b>Developed</b>	10,341.5	55.73%
<b>Turf &amp; Grass</b>	1,846.4	9.95%
<b>Other Grass</b>	300.3	1.62%
<b>Agricultural Field</b>	22.4	0.12%
<b>Deciduous Forest</b>	5,018.4	27.04%
<b>Coniferous Forest</b>	148.8	0.80%
<b>Water</b>	353.1	1.90%
<b>Non-Forested Wetland</b>	22.5	0.12%
<b>Forested Wetland</b>	195.6	1.05%
<b>Tidal Wetland</b>	0.0	0.00%
<b>Barren</b>	214.5	1.16%
<b>Utility Row</b>	93.9	0.51%
<b>Total</b>	<b>18,557</b>	<b>100%</b>

*Source: UCONN Center for Land Use Education and Research (CLEAR)*

## 1.5 Geology

Geology is important to the occurrence and relative effects of natural hazards such as floods and earthquakes. Thus, it is important to understand the geologic setting and variation of bedrock and surficial formations in Waterbury.

The City of Waterbury's bedrock consists of three general lithologies: metamorphic granofels and amphibolites, volcanic igneous silicate gneiss, and metasedimentary and metaigneous schists. The bedrock intrusions trend northwest-southeast through the City.

The central, western, and southern portions of the City are underlain by the Waterbury Gneiss formation. The Waterbury Gneiss is a gray to dark-gray, fine- to medium-grained schist and gneiss. The northern portion of Waterbury is underlain by formations such as the Collinsville Formation, the Straits Schist, and Basal Member of the Straits Schist, all silvery gray medium to coarse grained schists.

The remainder of the City is underlain by the Taine Mountain Formation and Basal Member of the Taine Mountain Formation, both gray granofels. In general, these formations strike northwest to southeast and dip approximately 60 degrees in a northeasterly direction, although exceptions occur. A review of geological data revealed an absence of fault lines in the City of Waterbury.

A vast area of the City is covered by glacial till. Tills contain an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. This area includes most of the upland areas of Waterbury, not in the vicinity of the Naugatuck and Mad Rivers. The remainder of the City consists primarily of stratified sand and gravel areas associated with the major rivers and brooks throughout the City. These deposits accumulated by glacial meltwater streams during the outwash period following the latest glacial recession.

The presence of stratified sands and gravels in the City is important for two reasons:

- With regard to flooding, areas of stratified materials are generally coincident with floodplains. This is because these materials were deposited at lower elevations by glacial streams, and these valleys later were inherited by the larger of our present-day streams and rivers. However, smaller glacial till watercourses can also cause flooding, such as occurs throughout Waterbury.
- The amount of stratified drift also has bearing on the relative intensity of earthquakes, as large areas of fine-grained sediment present special challenges during shaking as liquefaction may occur. The amount of stratified materials also affects the likelihood of landslides occurring in the community. These topics will be discussed in later sections

## 1.6 Drainage Basins and Hydrology

The City of Waterbury is divided by Naugatuck River, one of the largest rivers in Connecticut. Nearly all of the stream systems with drainage basins within Waterbury drain into the Naugatuck River, and while the floodplains and channels around the Naugatuck River within Waterbury are well developed, there are a number of impoundments which provide flood control both on the Naugatuck River and in its tributaries.

The City of Waterbury lies within drainage basins corresponding to the Ten Mile River, the Naugatuck River, Hancock Brook, Steele Brook, Beaver Pond Brook, Mad River, Fulling Mill Brook, and Hop Brook. These are described below.

### Ten Mile River

A very small portion (4.11 acres, 0.01 square miles) of the Ten Mile River basin lies within the southeastern boundary of Waterbury, and this section is drained by Cuff Brook in Cheshire. The Ten Mile River basin makes up 0.02% of Waterbury's land area. This river has its headwaters in Prospect and flows northeast across Cheshire, eventually draining into the Quinnipiac River near Milldale. In total, the Ten Mile River drains 20.261 square miles across Prospect, Waterbury, Cheshire, Wolcott, and Southington.

## Naugatuck River

Most of the land area of Waterbury is part of the Naugatuck River Basin. This area measures 11.85 square miles and comprises 40% of the land area in Waterbury. The Naugatuck River originates near the City of Torrington and winds south almost 40 miles to meet the Housatonic River in Derby, giving it a total drainage area of 311.16 square miles. It is the only major river in the state whose headwaters are also contained within the boundaries of the state. The Naugatuck River was once well-known for its many defunct dams, although many have been removed.

The Naugatuck River flows south through Torrington, forming the southeastern municipal boundary with Harwinton. It then becomes the municipal boundary between Litchfield and Harwinton, and then flows through Thomaston until it becomes the southern part of the municipal boundary between Thomaston and Watertown. The Naugatuck River then approximates the corporate boundary between Watertown and Waterbury, entering Waterbury proper where State Route 8 crosses Waterbury's northern boundary.

The total drainage area of the Naugatuck River above Spruce Brook, which drains into the Naugatuck just as the river becomes the corporate boundary between Watertown and Waterbury, is 137.85 square miles. At the intersection of the Naugatuck River and the southern Waterbury city line, the drainage area of the Naugatuck River has increased to about 209 square miles. All of the major basins in Waterbury drain into the Naugatuck River and will be discussed in the following sections.

Several dams of note were located along the run of the Naugatuck River in Waterbury: the Chase Brass, Freight Street, Anaconda, and Platts Mills Dams. All have been removed.

## Hancock Brook

Hancock brook has its headwaters in the City of Bristol and flows through Plymouth before entering the northern part of Waterbury, eventually joining with the Naugatuck River above Steele Brook. Hancock Brook drains 12.34 square miles before entering Waterbury and its drainage basin measures 3.05 square miles and comprises 10.51% of the land area within Waterbury, netting a total basin area of 15.39 square miles. The Hancock Pond Dam, the Lake Wequapauset Dam, and the Reidville Industrial Park Dam all impound waters in the basin of Hancock Brook in Waterbury, and the watershed is further impounded upstream on several lakes and ponds in Plymouth.

## Steele Brook

Steele Brook has its headwaters in the hills of the town of Watertown and flows east into the northwestern part of Waterbury, joining the Naugatuck River below Hancock Brook near the junction of State Route 8 and State Route 73. Steele Brook drains 14.98 square miles before entering Waterbury and its drainage basin measures 2.06 square miles and comprises 7.09% of the land area within Waterbury, netting a total basin area of 17.04 square miles. An unnamed dam lies on the lower reaches of Steele Brook in the vicinity of the Aurora Street bridge near the Naugatuck River, and there are other impoundments within Watertown as well.

## Beaver Pond Brook

Beaver Pond Brook has its headwaters in Cheshire. It flows in a westerly direction into the southeastern part of Waterbury, being joined by Turkey Hill Brook and East Mountain Brook before intersecting the Mad River at City Mills Ponds (Upper). The brook drains 3.53 square miles within the Waterbury, comprising 12.2% of the land area within Waterbury. In total, Beaver Pond Brook drains 5.58 square miles including area in the municipalities of Wolcott, Cheshire, Prospect, and Waterbury.

While there are no dams of note along the reach of Beaver Pond Brook, there are dams on its tributaries: Waterbury Reservoir Dam #2 on the Waterbury / Prospect Reservoir in Prospect, which flows into Turkey Hill Brook; the East Mountain Reservoir Dam above East Mountain Brook; and Daigle Pond Dam on Daigle / DeBishop Pond which also outlets into East Mountain Brook.

## Mad River

The Mad River has its headwaters just north of Cedar Swamp Pond in the City of Bristol. It flows in a south and southwestern direction through the Town of Wolcott and into Waterbury, where it turns northwest before turning back southwest and emptying into the Naugatuck River. The Mad River drains a total area of 15.8 square miles at the confluence of the Mad River and Old Tannery Brook at the Waterbury corporate boundary. Within the city of Waterbury, the Mad River drains a total area of 8.60 square miles, comprising 29.68% of the total land area of Waterbury. In total, the Mad River drains 25.93 square miles. The river is heavily impounded with 21 dams of note within its drainage basin, and many of these are privately-owned.

Upon entering the City of Waterbury, the Mad River drains to the south, entering into Cemetery Pond and exiting through the Cemetery Pond Dam. It is next joined by Beaver Pond Brook. After draining through the areas formerly occupied by Scovill pond and the City Mills Pond, the Mad River flows northwest into Brass Pond and through the John Dees Pond Dam before turning back to the southwest near St. Mary's Hospital and draining into the Naugatuck River about 3,000 feet southeast of the Route 8 and Interstate 84 interchange.

## Fulling Mill Brook

A very small part (10.52 acres, 0.02 square miles) of southern Waterbury lies within the Fulling Mill Brook watershed. This brook has its headwaters in central Prospect near Brewster Pond. Fulling Mill Brook flows west across Prospect into Naugatuck and is joined by Cold Spring Brook near Union City. Just west of the confluence of Cold Spring Brook and Fulling Mill Brook, Fulling Mill Brook joins the Naugatuck River, draining a total land area of 5.38 square miles.

## Hop Brook

Hop Brook has its source in the swamps just north of Great Hill in the town of Middlebury. The brook meanders through Middlebury in an east / southeast direction eventually entering Hop Brook Lake. Wooster Brook from the north and Shattuck Brook from the southwest also drain into Hop Brook Lake, which lies on the Middlebury and Waterbury corporate boundary. The lake is impounded on its southeastern end by the Hop Brook Flood Control Dam in Waterbury near the Waterbury and Naugatuck corporate boundary. The

outflow from this dam drains south into Naugatuck and flows southeast across Naugatuck to enter the Naugatuck River just south of Fulling Mill Brook.

In total, Hop Brook drains a total of 17.40 square miles across the towns of Woodbury, Middlebury, Watertown, Waterbury, and Naugatuck. The watershed area of Hop Brook to the Hop Brook Flood Control Dam is 16.05 square miles. About 3.41 square miles of this watershed lies within the limits of Waterbury, comprising 11.77% of Waterbury's total land area.

## 1.7 Climate and Climate Change

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In Waterbury, the summers are warm and wet, the winters are freezing, and it is partly cloudy year round. Over the course of the year, the temperature typically varies from 20°F to 81°F and is rarely below 5°F or above 89°F.

The warm season lasts for 3.6 months, from May 31 to September 16, with an average daily high temperature above 72°F. The hottest day of the year is July 21, with an average high of 81°F and low of 63°F. The cold season lasts for 3.3 months, from December 2 to March 12, with an average daily high temperature below 44°F. The coldest day of the year is January 29, with an average low of 20°F and high of 35°F.

The wetter season lasts 3.5 months, from May 4 to August 18, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 37% on May 30. The drier season lasts 8.5 months, from August 18 to May 4. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 4, with an average total accumulation of 4.0 inches. The snowy period of the year lasts for 5.4 months, from November 3 to April 15, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 26, with an average total liquid-equivalent accumulation of 1.1 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 10% annual-chance storm in New Haven County is 5 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 10% annual-chance storm in Waterbury as 4.97 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 10% annual-chance storm in Waterbury at 5.54 inches.

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

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

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	10%	4%	1%
<b>Technical Paper No. 40</b>	5.0	5.6	7.1
<b>NRCC</b>	5.0	6.2	8.8
<b>NOAA Atlas 14</b>	5.5	6.8	8.8

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 Waterbury can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.4 to 6.0 inches or greater.

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).

## 1.8 Development Trends

The following summary of Waterbury's development trends was adapted from *Comprehensive Annual Financial Report of the City of Waterbury Connecticut: Fiscal Year Ended June 30, 2020*. Contact Michael LeBlanc, CPA, Director of Finance for more information.

The City of Waterbury was founded in 1674, incorporated as a village in 1686 and as a city in 1853. The City is located at the crossroads of Interstate 84 and Connecticut Route 8, and is home to a passenger rail station and a bus terminal. Passenger and freight rail service is operated by Metro North and Conrail, respectively. Waterbury is also situated a relatively short distance from deep water ports in New Haven and Bridgeport, Bradley International Airport, Waterbury-Oxford Airport, and Westchester County Airport. The City serves

as a regional center of higher education, and is home to Post University, Naugatuck Valley Community College, and a branch of the University of Connecticut.

Major industries in Waterbury include healthcare, higher education, manufacturing, financial services, utilities, and retail. Waterbury continues to advance a comprehensive economic development strategy with both public and private investments. The City maintains a partnership with the State of Connecticut to demolish and remediate former large manufacturing brownfield sites to repurpose into new manufacturing facilities and mixed-use developments. Waterbury Hospital and Saint Mary's Hospital are the City's largest private employers, and serve the city and the wider region.

Waterbury's housing stock includes a variety of housing options in all price ranges. The City provides special housing for senior citizens, including those who are low-to-middle income. Recreational programs and activities are available at the River Baldwin Recreation Center, Chase Park House, North End Recreation Center, William Tracy Park House, and Waterville Recreation Center. Municipal Stadium is the main athletic facility for the City.

The City continues to invest in public service facilities. The City completed a \$36 million restoration of its historic City Hall complex in December 2010. In December 2018, the City's Department of Public Works was consolidated into a new facility, constructed on a long-vacant chemical manufacturing facility; this new facility has significantly improved the City's abilities to serve its residents. In October 2018, the City-wide Energy Savings Measure project was completed, with implementation of fourteen comprehensive energy savings measures applied to thirty school buildings and three government buildings. This project provides significant reductions in municipal energy consumptions and reduced risk of system failures. The City has also been converting its street light system to use LED lights.

Waterbury's 2021 Capital Improvement Budget commits \$22.7 million to building facility improvements, road infrastructure improvements, and vehicle & equipment purchases.

Mayor Neil M. O'Leary and his administrative and economic development teams desire to build a sustainable future for the City that makes the links between transportation, housing and the environment. The Mayor relentlessly pushes forward initiatives with the common goal of improving the quality of life for Waterbury citizens, redeveloping downtown, growing the City's taxable grand list, and increasing the City's employer base. The Mayor envisions a transformed City providing a multi-faceted locale for advanced technology, niche manufacturing, healthcare, educational opportunities, and cultural venues.

The City's net-taxable grand list has increased by \$324 million in the past five years, and several brownfield and downtown redevelopment projects have been completed and are now generating a \$12 million annual return on investment in the form of increased property tax revenues and lease income. The City continues to make advancements with an aggressive economic development strategy through both public and private investments.

Diverse manufacturing continues to be a significant component of Waterbury's economic base. Housing in the City was in very high demand in 2020 and 2021; there has been significant reuse of downtown buildings, with previously vacant structures being repurposed as market rate apartments. Significant efforts are underway to remediate and redevelop former brownfield sites. Several parcels in the south end are pending development.

According to the 2019 American Community Survey five-year estimates, the population of Waterbury between 2014 and 2019 was approximately 108,276. The Connecticut State Data Center estimates that the population in 2025 will be approximately 114,896.

### Summary

Recent development in Waterbury has consisted of a significant amount of remediation and redevelopment of brownfield sites, along with reuse of existing buildings. This type of development has not increased the City's exposure to natural hazards, as new land within hazard zones has not been developed, and the focus on densification places new populations near existing emergency response infrastructure. In fact, remediation and redevelopment of brownfield sites has reduced the risks of flooding and subsequent downstream contamination posed by those sites.

Overall, development in Waterbury has not increased natural hazard risks in the past five years, and continuation of recent development trends is not expected to increase natural hazard risks over the next five years.

## 1.9 Historic and Cultural Resources

Historic and cultural resources include sites, structures, and objects that are significant in history, architecture, archaeology, engineering, and culture. These resources grow economies and enhance 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 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.

**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 Waterbury near flood sources may be damaged during flooding or other hazard events.

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.

## 1.10 Social Vulnerability Index

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By evaluating local social vulnerabilities, a community can identify populations that may be more vulnerable to natural hazards, and implement actions to better respond to the needs of those populations. The Center for Disease Control and Prevention (CDC) uses 15 factors extracted from census data to calculate a Social Vulnerability Index (SVI) for communities. The SVI factors fall into four categories:

- socioeconomic status
- household composition and disability
- minority status and language
- housing type and transportation

Waterbury is considered to have a Medium to High level of social vulnerability, with each of the above SVI categories having a higher vulnerability score in at least one census block group. In other words, depending on the area of Waterbury, particular challenges with regards to hazard mitigation may include: a lack of access to financial resources; the presence of residents who need additional assistance during a disaster event due to disabilities; language barriers, or marginalization of local residents due to their minority identities; or the presence of lower-quality housing, or lack of access to transportation for evacuation.

## 2.0 MUNICIPAL CAPABILITIES

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### 2.1 Governmental Structure and Capabilities

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The City of Waterbury is governed by a Mayor-Aldermen form of government, according to the City Charter. The Mayor is the Chief Executive Officer and oversees the actions of all City Departments, while the fifteen members of the Board of Aldermen act as the legislative body for the city. These two bodies serve and are elected together for two-year terms. Waterbury is the judicial seat of the region, housing Federal, State, and County courthouses.

In addition to Board of Aldermen and the Mayor, there are numerous boards, commissions and committees providing input and direction to city administrators. Also, there are a number of City departments providing municipal services and day-to-day administration. Many of these commissions and departments may play a role in hazard mitigation, including the City Plan Commission, the Zoning Commission, the Zoning Board of Appeals, the Inland Wetland and Watercourses Commission, the Water Pollution Control Department, the Water Bureau, the Building Inspection Department, the Fire Department, the Police Department, and the Public Works Department.

Complaints related to City maintenance issues are submitted to the Department of Public Works through the iReport WTBY application, part of Waterbury's 311 initiative, powered by the QAlert citizen request management system. Citizens are able to report problems including dangerous trees, catch basin issues, road wash-outs, debris, power outages, and more. iReport WTBY can be downloaded on a smartphone or accessed through a browser. Use of this application allows areas of concern to be easily entered into a GIS database. Such information could then be used for City planning purposes and for prioritizing areas needing significant construction or rehabilitation projects.

### 2.2 Infrastructure

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#### Transportation

The primary transportation routes into and out of the City are Route 8 running north-south, and Interstate 84 running east-west. Other key roads include Route 801, Route 844, Wolcott Street, Park Road, Thomaston Ave, Route 73, and Highland Ave.

"Paper streets" remain a significant issue in Waterbury because they are often hard to access or find. Many homes along these streets have no direct access to the streets they are addressed to. The city recognizes that the inability to locate or access homes could be devastating during a natural disaster. The city would like to acquire and remove such properties but it will be costly and unlikely to qualify for FEMA grant funding. Challenges related to paper streets are generally handled on a case-by-case basis.

Waterbury is served by the Greater Waterbury Transit District, as well as by the CTtransit bus system. Waterbury also is served by the Waterbury Branch of the Metro-North Railroad's New Haven Line.

## Utilities

### Drinking Water

Water service is a critical component of hazard mitigation, especially in regards to fighting wildfires. It is also necessary for everyday residential, commercial, and industrial use. Waterbury has the largest municipally-owned water system in Connecticut. It encompasses 7,000 acres of City-owned watershed and has sufficient capacity to provide 38 million gallons of water per day. The system consists of two inactive and five active reservoirs with a total capacity of 7.54 billion gallons of water. The system serves customers in Waterbury and neighboring communities, with its operations and capital costs fully self-supported through user charges. A \$17.7 million capital appropriation and bond authorization was approved in May 2015 for plant, equipment, and system renewal capital costs. The Fiscal 2021 Bureau of Water Capital Improvement Budget commits \$5.4 million for water projects.<sup>1</sup>

According to the City of Waterbury Plan of Conservation and Development, approximately 99% of the properties in the City are served by the Waterbury Water Department. In addition, the department sells water to water utilities in Wolcott, Middlebury, and Watertown.

A 24-inch pre-stressed concrete cylinder pipe (PCCP) is the primary water transmission main from the water treatment plant transmission line to the east side of Waterbury. At the east end of the main, a 24-inch transmission line splits and runs south to the Benefit Street water tank, and a 16-inch transmission line continues to the east, ultimately providing water for the interconnection with the town of Wolcott. The PCCP transmission main therefore provides public water supply and fire protection to thousands of people in Waterbury and Wolcott.

In the past decade, the PCCP main has catastrophically failed in two locations: twice at the 24-inch west end near the intersection of Waterville Street and Faber Avenue, and once at the 16-inch east end between Industry Lane and Route 69. A condition assessment of the pipe revealed that other sections of the pipeline were likely to fail due to corrosion of the pre-stressed wire from the surrounding soil and groundwater. The corroded condition of the pre-stressed wire causes the entire main to be more susceptible to natural hazards, including the effects of flooding, freezing due to cold weather, earthquakes, and landslides. A broken pipe reduces the ability of both Waterbury and Wolcott to fight wildfires.

In the past few years, water main breaks have caused some of the most noticeable flooding damages in the city. Approximately six high-profile breaks have occurred in the last decade, including the breaks described above. Very cold temperatures have also caused small breaks. In some areas, the City has only a limited idea of the infrastructure in place. Advances in GPS/GIS technology are helping the Water Department to get a handle on where lines run, but in many areas the valves have not been maintained. Deteriorating water infrastructure remains a critical issue in Waterbury.

<sup>1</sup> Adapted from *Comprehensive Annual Financial Report of the City of Waterbury Connecticut: Fiscal Year Ended June 30, 2020*.

## Wastewater

Sanitary waste collection and treatment are critical components of hazard mitigation, as these functions are often impaired during storms that produce heavy rainfall and/or during flood events. This underscores the importance of controlling stormwater to keep it out of the sanitary sewer system.

The City operated a municipally-owned sewage treatment plant with a sewage collection infrastructure comprising approximately 320 miles of sanitary sewers and 20 pump stations. The City's upgraded 27.05 MGD advanced Sewage Treatment Facility was put into operation in April of 2000 in accordance with a consent order between the City and the State of Connecticut Department of Environmental Protection. The planning, design, and construction phases of this upgrade were funded through the State of Connecticut Clean Water Fund Program. The City entered into a 10-year third party operations, maintenance, and management services agreement with CH2M Hill Engineers, Inc., a subsidiary of Jacobs Engineering Group, Inc. for its Water Pollution Control – Wastewater Collection and Treatment Systems in the summer of 2018. Beginning on November 1, 2018, Jacobs Engineering Group became responsible for performing all services necessary for the proper and satisfactory operation and maintenance of the wastewater collection and treatment systems, full-service 24-hours-a-day, seven days a week.<sup>2</sup>

The Fiscal 2021 Water Pollution Control Capital Improvement Budget commits \$14.4 million for plant and collection system improvements. A \$10.3 million capital appropriation and bond authorization was approved in May 2015 for other plant, equipment, and collection system capital expenses. That 2015 bond authorization along with reserves in the sewer capital sinking fund will be used to fund these capital expenses.

Nearly all of the developed land in the City of Waterbury (more than 14,000 acres) is served by the existing sanitary sewer system. In contrast, only about 3,400 acres of land in Waterbury are served by stormwater drainage systems. The Public Works Department is working to update the stormwater sewer system, while the Water Pollution Control Department is working to update the sanitary sewer system. Sewer lining was installed along Freight Street and Meadow Street, and stormwater separation was done on Meadow Street as part of the City's WATER-TIGER project.

Separation of the sanitary and stormwater systems is typically coordinated between the Public Works Department and the Water Pollution Control Department in order to prioritize the areas that need improvements most. The Water Pollution Control Facility is designed to handle an average daily flow of 27.05 million gallons per day (mgd) and a peak hourly flow of 83 mgd. As the City has a combined sanitary and stormwater system, continued separation of the sewer systems was one of the suggested actions of the prior HMP. Because the City conducts a limited number of these separations each year, the action is considered a capability. An inflow and infiltration study was completed in the Fall of 2020, flow monitoring was conducted in 2020, manhole investigations and smoke testing is in process in 2021, and inflow and infiltration separations are currently being planned.

A sanitary sewer trunk line in the northwest section of the city is currently exposed in Clough Brook (also known as Trumpet Brook) between Bunker Hill Avenue and Ardsley Road. The sewer line was washed out during a storm and needed to be repaired.

<sup>2</sup> Adapted from *Comprehensive Annual Financial Report of the City of Waterbury Connecticut: Fiscal Year Ended June 30, 2020*.



Power at the wastewater treatment plant has gone out approximately four times during 2020. The City is investigating the cause. Fuel cells installed at the plant cannot supply 100% of the plant's power needs and therefore cannot be considered a microgrid. The plant likely has about 75% power available, but the actual supply can be as low as 40%. The City continues to inquire of the vendor as to the cause and solution to this problem.

### Energy

Eversource is the primary electricity provider in Waterbury. Natural gas service is also provided by Eversource.

### Communication

According to geoISP (geoISP.com), there are 1 DSL Providers, 2 Cable Internet providers, 3 Fiber Internet (FTTH) providers, and 0 Fixed Wireless (WISP) providers in Waterbury, CT. There are also 4 Mobile Broadband (cellular) providers with service available in Waterbury.

## 2.3 Critical Facilities and Emergency Response

Waterbury has identified several critical facilities throughout the City, as summarized on Table 2-1 below.

**Table 2-1: Critical Facilities**

Facility	Address or Location	Comment	Em. Power	Shelter	SFHA
<b>City Hall/Fire Dept HQ</b>	235 Grand St	Municipal	✓		
<b>City Offices (Chase Building)</b>	236 Grand St	EOC	✓		
<b>City Offices (Jefferson Square)</b>	185 South Main St	Municipal			
<b>Engine 1, Engine 9, &amp; Truck 2</b>	1979 North Main St	Em. Response			
<b>Engine 10, Truck 1</b>	26 Field St	Em. Response			
<b>Engine 11</b>	740 Highland Ave	Em. Response			
<b>Engine 2, Truck 3</b>	519 East Main St	Em. Response			
<b>Engine 4</b>	823 Baldwin St	Em. Response			
<b>Engine 5</b>	1956 East Main St	Em. Response			
<b>Engine 6</b>	431 Willow St	Em. Response			
<b>Engine 7</b>	315 Walnut St	Em. Response			
<b>Engine 8</b>	197 Bunker Hill Ave	Em. Response			
<b>Waterbury Police Dept.</b>	255 E Main St	Em. Response	✓		
<b>Waterbury Police Dept. Annex</b>	240 Bank St	Em. Response			
<b>Saint Mary's Hospital</b>	56 Franklin St	Care Facility	✓		
<b>Waterbury Hospital</b>	64 Robbins St	Care Facility	✓		
<b>Central Vehicle Maintenance</b>	526 Huntingdon Ave	Public Works	✓		
<b>Refuse Transfer facility</b>	Mark Lane	Public Works			
<b>Water Treatment Plant</b>	1525 Branch Rd, Thomaston	Utility	✓		
<b>Public Water System</b>	Various	Utility			
<b>Water Pollution Control Facility</b>	210 Municipal Rd	Utility	✓		*



Facility	Address or Location	Comment	Em. Power	Shelter	SFHA
<b>Wastewater Pump Stations</b>	Various	Utility			*
<b>Public Sewer System</b>	Various	Utility			*
<b>Crosby High School</b>	300 Pierpont Rd	Shelter – 150 beds	✓	✓	
<b>Kennedy High School</b>	422 Highland Ave	Shelter – 150 beds	✓	✓	
<b>Wilby High School</b>	568 Bucks Hill Rd	Shelter – 150 beds	✓	✓	
<b>Municipal Stadium</b>	Watertown Ave	Recreation Center		✕	*
<b>North End Rec Center</b>	N Main Street	Recreation Center		✕	
<b>River-Baldwin Rec Center</b>	E Liberty Street	Recreation Center		✕	
<b>Waterville Rec Center</b>	Thomaston Ave	Recreation Center		✕	*
<b>Silas Bronson Library</b>	267 Grand St	Community Space			
<b>B. W. Tinker Elementary Sch.</b>	809 Highland Ave	School			
<b>Barnard School</b>	11 Draher St	School			
<b>Brooklyn School</b>	29 John St	School			
<b>Bucks Hill Elementary School</b>	330 Bucks Hill Rd	School			
<b>Bunker Hill School</b>	170 Bunker Hill Ave	School			
<b>Carrington Elementary School</b>	24 Kenmore Ave	School			
<b>Driggs Elementary School</b>	77 Woodlawn Terrace	School			
<b>F. J. Kingsbury School</b>	220 Columbia Blvd	School			
<b>Gilmartin Elementary School</b>	107 Wyoming Ave	School			
<b>H. S. Chase School</b>	40 Woodtick Rd	School			
<b>Hopeville Elementary School</b>	2 Cypress St	School			
<b>Kaynor Technical School</b>	43 Tompkins St	School			
<b>Maloney Magnet School</b>	233 South Elm St	School			*
<b>Margaret M. Generali School</b>	3196 East Main St	School			
<b>Michael F. Wallace Mid. Sch.</b>	3465 East Main St	School			
<b>Naugatuck Valley Com. Coll.</b>	750 Chase Pkwy	School			
<b>North End Middle School</b>	534 Bucks Hill Rd	School			
<b>Post University</b>	800 Country Club Rd	School			
<b>Regan Elementary School</b>	2780 North Main St	School			
<b>Rotella School</b>	380 Pierpont Rd	School			
<b>Sprague Elementary School</b>	1443 Thomaston Ave	School			
<b>State Street School</b>	35 State St	School			
<b>UConn Waterbury Campus</b>	99 East Main St	School			
<b>Walsh Elementary School</b>	55 Dikeman St	School			
<b>Washington Elementary Sch.</b>	685 Baldwin St	School			
<b>Waterbury Arts Magnet Sch.</b>	16 South Elm St	School			
<b>Wendell L. Cross Elem. School</b>	1255 Hamilton Ave	School			
<b>West Side Middle School</b>	483 Chase Pkwy	School			
<b>Woodrow Wilson Elem. Sch.</b>	235 Birch St	School			
<b>Abbott Terrace</b>	44 Abbott Terrace	Assisted Living			
<b>Health Center of Greater Waterbury</b>	177 Whitewood Rd	Assisted Living			
<b>Mattatuck Health Care Facility</b>	9 Cliff St	Assisted Living			

✕ Possible field hospitals or backup shelters.

\* Partial or 0.2% Annual Chance

## Emergency Response Capabilities

The Chase Building at 236 Grand Street is the home of the City's Emergency Operations Center, as well as the Education Department and other city offices. The city's Information Technology (IT) system is located in the Chase Building. During rainstorms, the basement of the building previously experienced flooding. This flooding has been resolved by more frequent cleaning of the drainage structures.

The City is very interested in securing HMGP funds to acquire standby power supplies for critical facilities, and plans to prepare applications for installing generators in the city.

As a feature of its emergency response program, Waterbury has GPS capabilities to locate incoming cell phone calls as part of its Enhanced 911. Enhanced 911 improves the effectiveness and reliability of wireless 911 calls by having wireless service providers inform the 911 operator of the wireless telephone number of the caller, and the origin of the call within a 50- to 300-meter radius. This technology allows emergency services to provide a faster response to wireless callers.

As a means of evacuating the area, Waterbury has convenient access to nearby towns on the following state routes that function as major transportation arteries: Route 8, I-691 and I-84. In an emergency situation, the police department is responsible for designating the specific evacuation routes to be used as appropriate. According to City personnel, this policy provides the City with the flexibility to deal with specific incidents as they occur.

The Public Works Department is responsible for maintaining stormwater systems for proper drainage and flood mitigation, as well as clearing snow and ice and maintaining access for emergency vehicles. The Public Works Department formerly utilized four facilities, but has achieved more efficient operations since the Public Works Department moved to the newly constructed complex located at 526 Huntingdon Avenue.

## Sheltering Capabilities

Waterbury has designated the three high school facilities, Crosby High School, Kennedy High School and Wilby High School, as their primary emergency shelters. Each facility can provide bedding for 150 people. Each facility has good accessibility and the three schools are evenly distributed throughout the city so that residents can quickly access the facility nearest them.

These buildings have been designated as public shelter facilities by meeting specific American Red Cross guidelines. Amenities and operating costs of the designated shelters including expenses for food, cooking equipment, emergency power services, bedding, etc., are the responsibilities of the community and generally are not paid for by the American Red Cross. In Waterbury, the Police and Fire Departments staff the shelters.

The City's recreation centers and stadium can be used as field hospitals or backup shelters during emergencies. This is especially relevant under conditions such as the COVID-19 pandemic, when additional shelter space was required in order to abide by social-distancing protocols.

## 3.0 FLOODING

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### 3.1 Existing Capabilities

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The City of Waterbury historically had limited regulations regarding floodplain management. Development within floodplains and wetlands has typically been restricted in light of the environmental costs and the human hazard that development in these sensitive lands pose. After the floods of 1955, Waterbury's General Plan of 1959 sought to limit new commercial and industrial buildings within set floodplain encroachment lines. That Plan also recommended that new residential development be prohibited from floodplain areas.

Following the adoption of the 1959 General Plan, the Army Corps of Engineers established flood control dams, levees, and detention reservoirs along the Naugatuck River, eliminating most of the flooding concerns. Today, the 100-year flood zone comprises a small area of Waterbury, and the limited flooding along the Naugatuck River and Mad River corridors is perceived as minimal and not requiring significant regulation.

One approach that the city takes is to inventory and inspect existing stormwater systems before studying them in detail or directly deciding to replace them. In some cases, existing stormwater pipes may be able to be lined instead of replaced. However, it is understood that some areas may require increased capacities.

### Regulations

#### Floodplain Management Zoning Regulations

Section 10.28 of the Zoning Regulations provides *Special Use Standards* for regulated development within a floodplain. The definition of "floodplain" in the Zoning Regulations is the following: "The floodplain is the 'Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood' consisting of land in the City identified on the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency by the 1% Annual Chance Floodplain Boundary."

Section 10.28 of the Zoning Regulations is concise and provides the following standards:

- (i) Within a designated floodplain, encroachments resulting from fill, new construction or substantial improvements, as defined in 44 Code of Federal Regulations Part 59.1, involving an increase in footprint to the structure shall be prohibited unless the applicant provides to the Zoning Commission certification by a state licensed engineer that such encroachment shall not result in any increase in base flood elevation;
- (ii) The water holding capacity of the floodplain shall not be reduced by any form of development unless such reduction:
  - 1. is compensated for by deepening or widening the floodplain,
  - 2. is on-site, or if adjacent property owners grant easements and the City Engineer authorizes such off-site compensation,
  - 3. is within the same hydraulic reach and a volume not previously used for flood storage,

4. is hydraulically comparable and incrementally equal to the theoretical volume of flood water at each elevation, up to and including the hundred-year flood elevation, which would be displaced by the proposed project, and
  5. has an unrestricted hydraulic connection to the same waterway or water body; and
- (iii) Work within adjacent land subject to flooding, including work to provide compensatory storage, shall not result in any increase in flood stage or velocity.

The Zoning Regulations explain that the Zoning Board of Appeals shall have the authority to hear and decide appeals and requests for variances from the requirements Section 153.38 of the Waterbury Code of Ordinances pertaining to flood control.

### Floodplain Management Ordinances

The City of Waterbury Code of Ordinances Chapter 153 is entitled *Flood Control*. The objectives of this chapter are:

- To protect human life and health;
- To minimize expenditure of public money for costly flood control projects;
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- To minimize prolonged business interruptions;
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- To ensure that potential buyers are notified that property is in an area of special flood hazard; and
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

Chapter 153 is essentially the city's local articulation of the NFIP regulations. New construction and substantial improvements of residential structures must be elevated at or above the base flood elevation, whereas new construction and substantial improvements of nonresident structures must be elevated or floodproofed to an elevation equal to or above the base flood elevation. Subdivisions with more than 50 lots must be supported by a calculation of base flood elevation.

### Other Regulations and Ordinances

Other regulations, codes, and ordinances that apply to flood hazard mitigation include:

- **Drainage** (Section 5.30 of Waterbury Land Subdivision Regulations). This regulation states that applicants must provide for the disposition of surface water run-off that may exist either previously to, or as a result of, the subdivision. Such drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, inside and outside the subdivision, under conditions of maximum development permitted by the zoning regulations.

- **General Design – Streams and Natural Features** (Section 5.34 of Waterbury Land Subdivision Regulations). The City Plan Commission may require recreational or scenic easements along streams or major natural features.
- **Activities Requiring Permit** (Section 4.3 of Waterbury Inland Wetlands and Watercourses Agency Regulations). All activities in wetlands or watercourses involving filling, excavation, dredging, clear cutting, grading, or any other alteration or use of a wetland or watercourse requires a permit from the Inland Wetlands & Watercourses Agency.
- **Required Information for Significant Activity** (Section 7.5 (g) of Waterbury Inland Wetlands and Watercourses Agency Regulations). Applications require the inclusion of mitigation measures which reduce the impact of a proposed activity, including: Plans or actions which 1) avoid destruction or diminution of wetland or watercourse functions, recreational uses and natural habitats, 2) which prevent flooding, degradation of water quality, erosion and sedimentation and obstruction or drainage, or 3) which otherwise safeguard water resources.

## Structural Projects

Several structural projects in the City of Waterbury currently mitigate flood damage. In addition to the Army Corps of Engineers levees, dams, and detention basins described above, there are several dams within the City of Waterbury that regulate flow along the Naugatuck River and the Mad River. Also, many brooks and streams have riprap along the sides to prevent bank erosion.

A selection of recent structural projects to prevent localized flooding or to maintain existing flood controls is summarized below:

- ❑ **Great Brook Rehabilitation:** Great Brook is the outflow from Great Brook Reservoir in the Long Hill section of the City. It flows south through the City Mills Playground and flows into an underground culvert near the intersection of Division Street and Robinson Street. This culvert brings Great Brook underneath the City, eventually daylighting at West Liberty Street above its confluence with the Naugatuck River. A reach of this culvert runs underneath the Palace Theatre on East Main Street. The reconstruction of the Great Brook culvert at two locations (Water and Brown Streets, and under Cherry Street) has been completed.
- ❑ **Mad River Brush Clearing:** The City is looking for additional funding to help clear brush in the floodplain and floodway of the Mad River to reduce growth inhibiting flood flows. This is especially important in the Townline Road and Sharon Road area where the topography is very flat and where significant flooding occurred as recently as April 2007 during the spring nor'easter. This is proposed to be a recurring budget item.
- ❑ **Trumpet Brook Watershed Study and Reconstruction:** Clough Brook, locally known as Trumpet Brook, flows east-northeast through the Bunker Hill section of Waterbury and is a tributary to Steele Brook. Numerous problems related to backyard flooding and poor drainage in the area of the brook are occurring, so culvert upgrades are planned. Several private detention ponds need rehabilitation and maintenance along this brook, and the City would like to get additional funding to acquire easements so the city can do maintenance. A study of the brook was completed subsequent to the last HMP. Mitigation projects along the brook may include

stormwater system improvements (\$34 million to protect up to the 25-year storm) or acquisition of properties in the SFHA while strengthening existing utilities (\$9 million). These estimates are too high for the city to pursue at the present time.

- ❑ The East Liberty Bridge has been repaired.
- ❑ Underground utilities have been replaced under the downtown section of East Main Street.
- ❑ A drainage project on Freight Street has been completed.
- ❑ A pump station along the Mad River has been replaced as part of the I-84 widening project.

### Combination of Regulations and Structural Projects

In some cases, the City has worked to mitigate flood damage with a combination of regulations and structural projects. When the initial HMP was developed, a potential subdivision between Pearl Lake Road and Purdy Road was identified as an action that could exacerbate localized flooding in an area with steep slopes that is known to have drainage issues. Since then, the subdivision has been completed and a combination of on-site detention and adequate ground cover has adequately addressed local drainage problems.

### Cooperation with Other Communities

With regard to neighboring communities, the town of Wolcott has been drawing-down impoundments along the Mad River in preparation for large rain events. This helps to reduce flooding along the Mad River in both Wolcott and Waterbury.

### New Capabilities and Completed Actions

Waterbury continues to maintain its strong flood mitigation capabilities. The city's capabilities to mitigate for flooding and prevent loss of life and property have improved *significantly* since the initial hazard mitigation plan was adopted.

The Chase Building (Municipal Offices and the City's Emergency Operations Center) flooding has been resolved by more frequent cleaning of the drainage structures.

### Summary

In summary, the City of Waterbury primarily mitigates flood damage and flood hazards by restricting building activities inside flood-prone areas. The City Engineer instructs subdivision applicants to perform drainage analyses for both the upstream and the downstream areas, but this is not an official regulation. Such an analysis would be more straightforward if there was a comprehensive stormwater management plan in place that a new regulation could refer to for such activities. This would help applicants understand and demonstrate how their projects would fit into the overall stormwater management scenario.

## 3.2 Vulnerabilities and Risk Assessment

Given Waterbury's location in a river valley surrounded by steep slopes, rainfall collects quickly and has limited locations for storage, so proper conveyance of stormwater is important. In addition, poor drainage can cause additional impacts associated with other natural hazards. For example, localized flooding and poor drainage often lead to icing issues in the winter, and localized nuisance flooding near steep slopes can lead to saturation of groundwater and possibly lead to landslides.

None of Waterbury's critical facilities are located in SFHAs.

Flood prone areas in the community today, as mapped by FEMA, are presented in Figure 3-1.

### Vulnerability Analysis of Repetitive Loss Properties and Critical Facilities

Waterbury has five Repetitive Loss Properties (RLP). Of those, zero are classified as Severe RLP (SRL). Zero of the RLPs in Waterbury have been mitigated in the past.

**Table 3-1: Repetitive Loss Properties in Waterbury**

Street	Associated Watercourse	Flood Zone	Type
<b>Hanover Street</b>	None	C	Single-Family Home
<b>MacArthur Drive</b>	None	X	Single-Family Home
<b>John Street</b>	None	C	Commercial Condominium
<b>North Main Street</b>	Great Brook	A	Formerly Industrial; now Jonathan Reed School
<b>West Main Street</b>	None	C	Commercial building used as a church facility

The repetitive loss structure on North Main Street was demolished several years ago (along with several adjacent structures) and a new school was constructed on the site. Great Brook flows beneath the school athletic fields in a new culvert. With the improvements to the site that were made for the school construction, the frequency of flooding is believed to be reduced. The City should work with CTDEEP and FEMA to update and validate the RLP list.

The remaining four repetitive loss properties are not located near watercourses, and the city believes that inadequate drainage systems may be the cause of some of the flooding associated with these properties. The two homes are located on roads that lack stormwater collection and conveyance systems, and all four of these repetitive loss properties have basements that may be susceptible to flooding.

### Vulnerability Analysis of Areas Along Watercourses

The City of Waterbury lies within the Naugatuck River Valley. Thus, all of the outlets for stormwater collection within the City of Waterbury are the Naugatuck River and its tributaries (Mad River, Steele Brook, Hancock Brook, and Great Brook). Routine large-scale flooding from storms is not an issue within the City. This is primarily due to the fact that the Naugatuck River is heavily flood controlled throughout its reaches, both within Waterbury and upstream. Notable areas at risk of flooding along the Naugatuck and Mad Rivers include the areas described below.



### Naugatuck River

The Army Corps flood control projects have confined all but the most extreme flood events to the primary channel of the Naugatuck River. Only one location has a repeated history of flooding. Specifically, overbank flooding occurs infrequently and temporarily near the Wastewater Treatment Plant on South Main Street. This is a minor issue that causes little damage in the surrounding area.

### Mad River

Condominiums and apartments are clustered in the floodplain of the Mad River upstream and downstream of Sharon Road. This area has a history of repeated flooding.

The condominiums at the northwest corner of the river and the road lie several feet above the river elevation. The River's Edge apartment complex, located at the southeast corner of the river and the road, has expansive common areas that were partly underwater following the June 2, 2006 storm, and some of the paved areas were close to the water elevation. Most recently, a powerful spring nor'easter of April 15-16, 2007 caused severe flooding of the Mad River corridor, affecting residents of Woodtick Road (including evacuation of 45 condominium units) and Sharon Road.

Flooding along the Mad River occurs elsewhere, as well. In spring 2006, flooding occurred in the area of Maybury Circle off Southmayd Road. Near the downstream end of the river, the Industrial Arts School on Mill Street may experience limited flooding since it is much lower than adjacent properties.

### Other Major Streams

Few flooding problems were reported along Steele Brook or Hancock Brook. However, beaver dams along Steele Brook have caused flood damage to surrounding properties recently.

Flashy conditions along smaller streams can be a problem. Some of the troublesome smaller streams include Beaver Pond Brook, Little Brook, Clough Brook/Trumpet Brook, Great Brook, Beaver Pond Brook, Sled Haul Brook, and Hopeville Pond Brook and its tributaries (including Pritchards Pond). These streams are described below.

#### **Beaver Pond Brook**

The area of Beaver Pond Brook near Interstate 84 is believed to experience drainage and flooding problems, although few complaints have been received due to the non-residential nature of the neighborhood.

#### **Little Brook**

Little Brook is a tributary to Great Brook which drains the Fulton Park ponds. The City is upgrading Fulton Park which experiences drainage problems. The upstream drainage system is very limited and excessive sediment has filled in downstream ponds and the drainage channel. The park experiences shallow flooding that causes sediment to deposit, but houses are not affected.

Little Brook flows underground into a culvert at Hopkins Street and intersects with the Great Brook culvert underneath Brook Street near the Palace Theatre. The culvert at the corner of Bishop Street and Grove Street backed up due to a debris clog during the September 17, 2005 storm, so proper maintenance of this culvert system is important.



**Great Brook**

There are concerns about the structural integrity and capacity of a below-grade culvert on Great Brook throughout its reach in Waterbury. In particular, the reach of the culvert near Brown Street and Water Street reportedly needs maintenance and a structural integrity study. The reconstruction of the Great Brook culvert at two locations (Water and Brown Streets, and under Cherry Street) is currently under design. However, the City does not possess drainage easements where the brook crosses through private properties and will not be able to upgrade these sections.

**Hopeville Pond Brook and Tributaries**

Several areas in the Hopeville Pond Brook watershed were revealed to be insufficient in regards to conveying heavy stormwater discharges. Edgewood Avenue and Edgewater Street are very flat and near the level of Pritchards Pond, contributing to poor drainage in that area. There is an area of repeated flooding in the vicinity of Pritchard's Pond, and the city believes that home acquisitions may be an option in this area. Beaver dams along Hopeville Pond Brook have caused flood damage to surrounding properties recently.

An unnamed tributary to Hopeville Pond Brook running under Jersey Street was insufficient to convey the June 2, 2006 storm, and the stream backed up through a culvert on Jersey Street. In addition, poor drainage to a stream running parallel to East Mountain Road allowed a good deal of sheet flow down East Mountain Road, causing erosion and slumping during the same storm. The road had to be closed following that storm.

**Sled Haul Brook**

As described in Section 3.3.1, culverts running under Chipman Avenue and Highland Avenue were insufficient to convey flood flow in Sled Haul Brook during the June 2, 2006 storm.

**Trumpet Brook (aka Clough Brook)**

This corridor of this brook has experienced several problems with backyard flooding and poor drainage throughout its reach. A study of the stream corridor has been completed, and mitigation projects identified. Some mitigation projects have been completed in the Trumpet Brook watershed.

The sewer line that crosses Trumpet Brook was washed in a flood after the last plan was adopted and needed to be repaired.

**Vulnerability Analysis of Problem Areas Related to Localized Flooding**

The infrastructure of the City of Waterbury has a difficult time handling stormwater runoff for several reasons:

- Most significantly, much of the City is not served by storm drainage systems. This problem is described in the following paragraphs.
- Much of the topography of the City includes steep slopes and a shallow glacial till water table that decreases infiltration and increases runoff velocity.
- Residents encroach onto stream channels and detention basins in their yards, sometimes dumping in or otherwise altering watercourses and storage basins.
- Individual property owners can pave private driveways and make certain changes without permits, increasing impervious surfaces without the City's knowledge.

- The endpoints of the existing stormwater systems along the Naugatuck River are not able to convey stormwater to the river when it is high, as the outflows become submerged.
- The Water Pollution Control Facility is designed to handle an average daily flow of 27.05 mgd and a peak flow of 83 mgd. As the City has a combined sanitary and stormwater system, inflow and infiltration impacts the chance of these flows being exceeded.

As indicated above, the existing stormwater collection system is limited in its coverage area. There are approximately 14,100 acres of developed land in the City. Nearly all of this developed land is served by the existing sanitary sewer system. In contrast, only about 3,400 acres of land in Waterbury are served by storm drainage systems.

As much of the stormwater is handled via drainage swales, localized flooding is a major problem throughout the City under heavy rainfall conditions. Runoff on streets becomes sheet flow, flowing down roadways until it infiltrates in yards or reaches a down-gradient storm drain. This sheet flow causes erosion along roadways and in yards. Some storm sewers tie into the City sanitary sewers, reducing available carrying capacity.

A comprehensive stormwater management plan is desired to define problem areas, create a maintenance schedule, and incorporate proposed runoff conditions from new and proposed developments into a watershed framework to demonstrate and understand the down-gradient effects of runoff.

The Public Works Department is working to update the stormwater sewer system, while the Water Pollution Control Authority Department is working to update the sanitary sewer system. The lack of a comprehensive plan means that sometimes individual projects can patch the local-scale problem but fail to correct the overall watershed-scale problem. Separation of the sanitary and stormwater systems needs to be coordinated between the Public Works Department and the Water Pollution Control Authority Department in order to prioritize the areas that need improvements most.

Additionally, numerous areas of the City suffer repeated water damages to curbing, sidewalks, and pavement during heavy rainfalls. A few priority areas are listed in the table below; while the areas noted do not necessarily require drainage systems, such systems would alleviate future erosion problems.

**Table 3-2: Areas Needing Curbing or Sidewalk Repair/Installation Due to Repeated Water Damage**

1. Amity Street	5. East Main Street near Silver Street
2. Boyden Street	6. Gaylord Drive
3. Brookview Avenue	7. Highland Drive
4. Columbia Boulevard	8. Reid Street

**References:**

1. A-N Consulting Engineers, Inc., 2006, *Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury*.
2. Public works complaint logs and files.

On the other hand, several areas of the City suffer such repeated drainage problems that the installation of a stormwater management system is warranted. These vulnerable areas have been verified by City personnel and are outlined in Table 3-3.

**Table 3-3: Areas Needing Stormwater Management Systems\***

Street Name	Comment
1. Arline Drive	Poor drainage
2. Bank St near Congress St	High slopes, one-way streets, and multiple flooding occurrences per year; it will be challenging and expensive to construct a culvert beneath Route 8
3. Bank St near Fifth St	
4. Baldwin Avenue	Street runoff floods private property
5. Blanchard St	Water ponds on the road and ices in winter
6. Campfield Rd	Runoff from yards tends to pond on roadway
7. Chambers St	Excessive erosion to the street, gutters
8. Charles St near Fourth St	Seepage floods the street
9. Colby Avenue (a "paper" St)	Local road used by children to access Crosby High School. The area washed out and is continuing to erode, preventing egress
10. Corby Avenue	This area is very flat with poor drainage
11. Fiske St	Water ponds on the street
12. Gem Drive	Repeated driveway flooding
13. George St	Runoff ponds on streets and in nearby yards
14. Hillhouse Rd	Drainage problems flood home, driveway, and cellar
15. John St	Floods three times per year due to poor drainage
16. Lakeside Boulevard East	Water pools and ices in winter
17. Meriline Avenue	Poor drainage
18. Mountain View Drive	Seepage ices road in winter
19. North Walnut St	Drainage needed to prevent occurrence of sinkholes
20. Rose St	Low point in road causes poor drainage
21. Robins St near hospital	Heavy runoff washes out sidewalks and the edge of the road regularly
22. Woodstock Rd	Local flooding due to poor drainage
23. Wooster Avenue	Stormwater damaging driveway, yard

**References:**

1. A-N Consulting Engineers, Inc., 2006, *Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury*.
2. Public works complaint logs and files.

\* The drainage problems existed prior to the development of Saint Mary's Physical Medicine & Rehabilitation Center

Stormwater system improvements for Rockledge Drive have been completed since the adoption of the initial HMP, and it has been removed from the Table 3-4.

Several areas with existing stormwater management systems are either in need of maintenance or are now insufficient to convey required storm discharges. These areas are outlined below.

**Table 3-4: Areas Needing Stormwater Management System Improvements or Maintenance**

Street Name	Comment
1. Brook Street near Scovill St	Two deteriorating catch basins need replacement; related flooding of nearby basements
2. Calumet Street near Columbia Blvd.	September 2005 rainstorm backed up catch basins and sent debris flow in front of #16 and eroded side
3. Cooke Street near Adam St. & Grove St.	Flooding occurred during the September 2005 rainstorm due to the clogging of the Little River culvert with debris
5. East Main Street near Fairlawn Ave.	Catch basins are insufficient to handle parking lot runoff
6. Grandview Avenue	Insufficient drainage system overflows causing erosion
7. Grove Street	Washed out due to clogging of Little River culvert

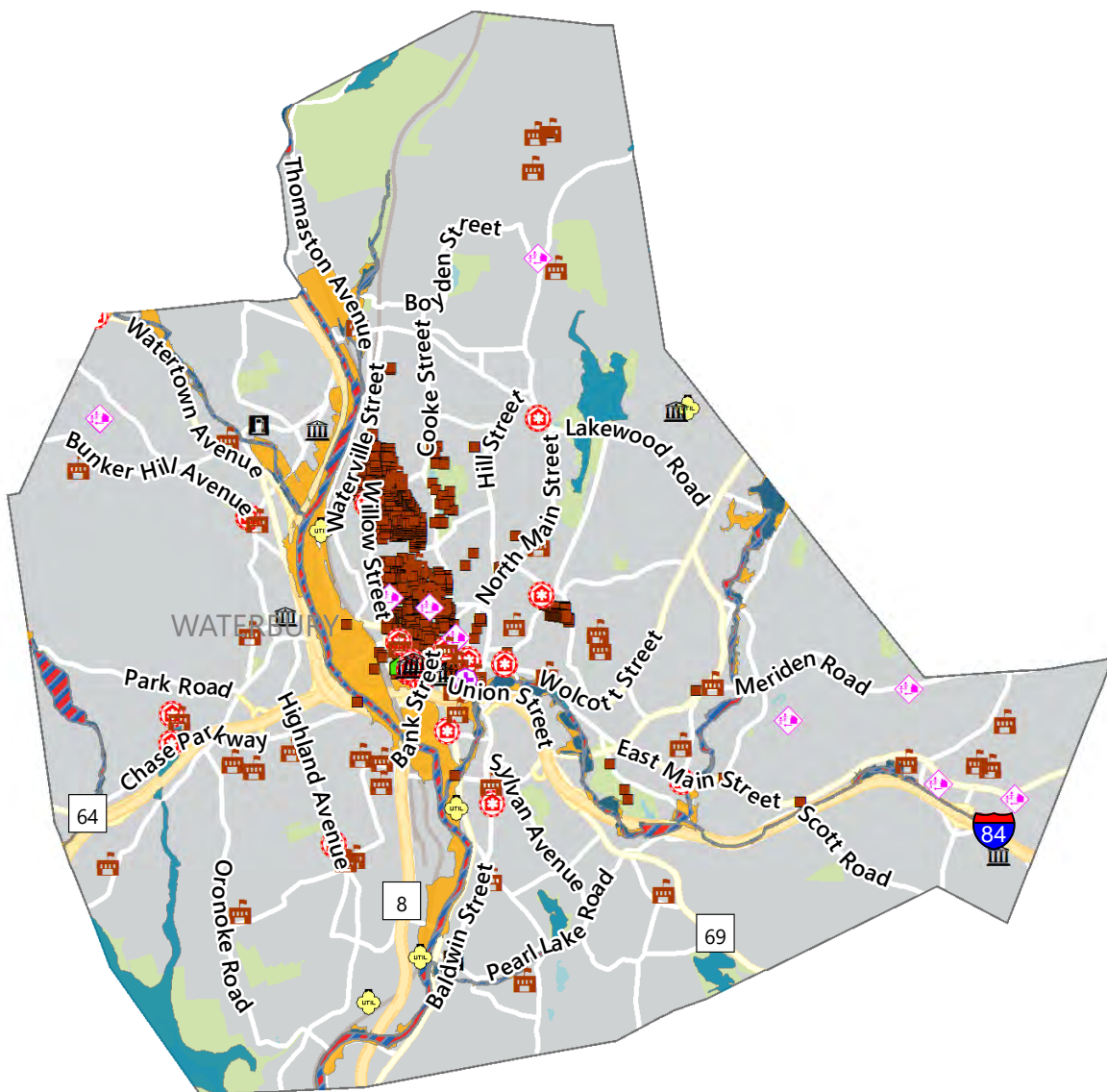
Street Name	Comment
<b>8. Hans Avenue</b>	Insufficient drainage causes icing in winter
<b>9. Highview Street</b>	Insufficient stormwater management system
<b>10. Jersey Street near Pearl Lake Rd</b>	Culvert clogged during June 2006 storm, backing up into Jersey Street
<b>12. St. Jean Street below Greenmount</b>	Insufficient drainage system on a high slope road
<b>13. Robbins Street</b>	Insufficient drainage system on primary egress to Waterbury Hospital
<b>14. West Main Street</b>	Insufficient drainage system near Douglas Ave. and Park Road results in repetitive basement flooding of Saint Mary's Physical Medicine & Rehabilitation Center*
<b>15. Westwood Avenue</b>	Insufficient drainage system near Devonwood Drive
<b>16. Woodhaven Street</b>	Insufficient drainage system causes nearby flooding

**References:**

1. A-N Consulting Engineers, Inc., 2006, *Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury*.
  2. Public works complaint logs and files.
- \* The drainage problems existed prior to the development of Saint Mary's Physical Medicine & Rehabilitation Center

Separation of sanitary and stormwater systems is also necessary and should coincide with any repairs.

One other area of the City with drainage concerns not directly related to the above categories is Bishop Street, which has been affected by sinkholes that may be related to the underground Little Brook culvert. Additional areas that flood include Platts Mill, Washington Avenue, Robin Street (in front of the hospital), and Robin Street at the Route 8 underpass.



Critical Facilities		Historic Sites	
	Care Facility		Historic Sites
	Community Center	<b>Flood Zone</b>	
	Emergency Response		AE
	Fuel		A
	Government Services		AE
	School		Floodway
	Utility		X: 0.2% Annual Chance
	Vulnerable Population		



99 REALTY DRIVE  
CHESHIRE, CT 06410  
203.271.1773

## Flood Hazards in Waterbury

NVCOG Hazard Mitigation Plan Update  
Naugatuck Valley Council of Governments  
47 Leavenworth Street, 3rd Floor  
Waterbury, CT 06702



0 3,000 6,000  
Feet

DATE 6/15/2021

141.3211.00029

PROJ. NO.

**FIG. 3-1**

### June 2, 2006 Storm

The storm of June 2, 2006 caused such widespread damage across the City that it deserves continued special attention. Up to eight inches of rain fell in less than six hours in Waterbury, causing flooding, power outages, and landslides. Numerous Roads were washed out and many water rescues were needed. The flooding prompted the Waterbury Mayor to declare a state of emergency. The hardest-hit areas were Highland Ave, Watertown Ave, South Main St, and Charles St. Damage estimates were over \$4 million, with most damage in older neighborhoods with insufficient drainage.

Waterbury commissioned A-N Consulting Engineers, Inc. to inventory damage. Highlights are listed below.

- Stilling basin west of the Metro North mainline at Highland Ave storm drainage system outfall: Stormwater overwhelmed retention embankment, causing embankment to fail and sending a torrent of debris-laden water downstream. Debris flow washed out a box culvert and undermined railroad.
- Mark Lane Landfill: Excessive stormwater and a lack of stormwater controls caused erosion damage.
- South End Landfill near Lower Highland Ave: Excessive stormwater combined with a lack of stormwater controls caused erosion damage at the closed landfill.
- Madison St at Southview St: These streets intersect 45 feet above S Main St. The drainage system was overwhelmed, causing pipe leakage which saturated the embankment and led to material washout and water ponding in the intersection. This led to collapse of the nearby hillside leading to S Main St, exposing and damaging sanitary sewer, storm drainage, and natural gas lines.
- Bank St at Fifth St: Water and debris overloaded the drainage system and overflowed into the St, causing damage to the pavement and manholes.
- Chipman St near Old Colony Drive: Stormwater in Sled Haul Brook exceeded capacity of 36-inch reinforced concrete pipe culvert; water topped Rd causing damage to the guard rails and pavement.
- East Mountain Rd from Pearl Lake Rd to Peach Orchard Rd: Stormwater exceeded capacity of Rd gutters, causing scour and erosion and damage to pavement, Rd shoulder, and embankment.
- Hamilton Ave east of Prospect Rd: Clogged catch basins were not equipped to handle the volume of water and overflowed, causing damage to pavement and manholes and eroding the sides of the Rd.
- Robbins St off West Main St: Pavement on Robbins St bubbled off the ground due to underflow, affecting egress to Waterbury Hospital.

Numerous areas experienced damage to curbing and pavement, and erosion damage to yards and driveways :

#### Other Areas Damaged by Runoff from June 2, 2006 Storm

1. Alberta St	8. Carriage Dr	15. Highland Ave North of Highview	22. Ridgefield Ave
2. America St	9. Country Club Rd	16. Karen Ave	23. Robbins St
3. Arden Rd	10. Division St	17. Long Hill Rd	24. Robinwood Rd
4. Bank St	11. Fiske St	18. North Walnut St	25. Rosario Dr
5. Bellewood Ave	12. Glen St	19. Peach St	26. Saint Jean St
6. Bristol Ave	13. Greenmount Terr	20. Pear St	27. Tree Hill Rd
7. Calumet St	14. Hamilton Ave West of Prospect	21. Piedmont St	28. Woodland Ave

Additional areas reported as damaged during the June 2, 2006 storm include:

- Highland Ave was damaged by Sled Haul Brook when it jumped its culvert and followed its historical course. The culvert was not designed for the storm experienced, and the culvert backed up from flooding and debris.
- An unnamed tributary to Hopeville Pond Brook flowing under Jersey St backed up through a catch basin. It is believed that the runoff and debris blocked the culvert and forced water onto the St. The water proceeded to run down Jersey St toward Pearl Lake Rd. A review of historical USGS maps reveals that this stream was not recorded on the maps in 1892 or 1904, but was shown flowing under Jersey St in 1951 and 1955.

Damage to the sanitary sewer system also is believed to have occurred. Significant amounts of debris entered the system, and portions of the system will need to be cleaned to remove the debris.



## 4.0 HURRICANES AND TROPICAL STORMS

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### 4.1 Existing Capabilities

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#### **Flooding**

Existing capabilities appropriate for flooding were discussed in Section 3.0. These include the ordinances, codes, and regulations that have been enacted to minimize flood damage. In addition, various structures exist to protect certain areas, including dam and local flood protection projects.

#### **Wind**

Wind loading requirements are addressed through the state building code. The State Building Code has been amended several times in the past two decades. The 2005 Code was amended in 2009, 2011, and 2013. The code was then updated and amended in 2016, with the current code having been updated and effective as of October 1, 2018. The code specifies the design wind speed for construction in all the Connecticut municipalities. Effective October 1, 2018 the design wind speed for Waterbury is 110 mph for a Category 1 event, 125 mph for a Category 2, and 130 mph for a Category 3, 4 or 5 hurricane event.

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. This wind speed could occur as a result of either a hurricane or a tornado in western Connecticut and southeastern New York. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

Trees and branches may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles. The Waterbury Public Works Department approaches residents on a case-by-case basis if branches appear to be hazardous. Otherwise, it performs roadside tree maintenance, and Eversource performs trimming near power lines as well. According to Section 5.27 of the Waterbury Land Subdivision Regulations, the City policy is for utilities in new subdivisions to be located underground whenever possible. This helps to mitigate wind-related and other natural hazard-related damages.

Eversource was under intense scrutiny after storms Irene and Alfred in 2011 and Tropical Storm Isaias in 2020. The utility has reportedly done an adequate job trimming trees since 2011. The Parks Department and Eversource work closely together. Personnel from these two entities drive intended project routes together, and the City signs off on Eversource maintenance projects. Loss of power is a concern for the City. The Public Works Department gives Eversource permission to trim whatever the utility deems is necessary. Trimming has reportedly helped avoid significant outages in a few recent high wind events. Costs related to tree maintenance are covered by the Parks Department budget. The City has a Tree Warden.

The City relies on radio and television to spread information on the location and availability of shelters. Prior to severe storm events, the City ensures that warning/notification systems and communication equipment is working properly, and prepares for the possible evacuation of impacted areas.

## New Capabilities and Completed Actions

Waterbury continues to maintain its strong tropical cyclone mitigation capabilities. Waterbury's capabilities to mitigate for wind damage and prevent loss of life and property have improved since the initial hazard mitigation plan was adopted. Furthermore, Eversource has increased its capabilities relative to tree and tree limb maintenance near utility lines.

## Summary

Waterbury mitigates hurricane and tropical storm damages through tree and limb maintenance, public alert and communications procedures, and enforcement of building code requirements related to high winds.

## 4.2 Vulnerabilities and Risk Assessment

---

The City of Waterbury is vulnerable to hurricane damage from wind and flooding, and from any tornadoes accompanying the storm. Most of the damage to Waterbury from historical tropical cyclones has been due to the effects of flooding.

The entire City is also vulnerable to wind damage. Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. There are currently no mobile home parks in Waterbury. Waterbury's housing stock consists of historic buildings greater than 50 and sometimes 100 years old, relatively younger buildings built before 1990 when the building code changed to mitigate for wind damage, and relatively recent buildings that utilize the new code changes. Since most of the existing housing stock in the city predates the recent code changes, many structures are highly susceptible to roof and window damage from high winds.

Waterbury is expected to experience moderate population growth in the coming years. Areas of growth and development increase the community's vulnerability to natural hazards such as hurricanes, although new development is expected to mitigate potential damage by meeting the standards of the most recent building codes.

City-owned critical facilities do not have wind-mitigation measures installed to specifically reduce the effects of wind. Thus, it is believed that nearly all of the critical facilities in the city are as likely to be damaged by hurricane-force winds as any other. However, newer critical facilities are more likely to meet current building code requirements and are therefore considered to be the most resistant to wind damage even if they are not specifically wind-resistant. Older facilities are considered to be more susceptible to wind damage.

As the City of Waterbury is not affected by storm surge, hurricane sheltering needs have not been calculated by the Army Corps of Engineers for the City. It is assumed that sheltering need will be based upon areas damaged within the City. Under limited emergency conditions, a high percentage of evacuees will seek shelter with friends or relatives rather than go to established shelters. During extended power outages, it is believed that only 10% to 20% of the affected population of Waterbury will relocate.



The entire city was impacted by Tropical Storm Isaias, although the Town Plot area may have had slightly worse impacts. Numerous wires were down, and Eversource was not timely with shut offs which resulted in many fires. However, the City was able to remove debris and has sufficient debris storage and disposal locations. Asplundh was available for help with the largest limbs. In the City's opinion, Eversource was responsible for much of the response but lacked the manpower.

During Tropical Storm Isaias, several critical facilities lost power. Six fire stations had to use their generators. Fire Station No. 4's generator failed due to gas line problems that have been resolved. In addition, the wastewater treatment plant lost power during the storm.

## 5.0 SUMMER STORMS AND TORNADOES

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### 5.1 Existing Capabilities

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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.

Aside from warnings, several other methods of mitigation for wind damage are employed in Waterbury as explained in Section 4. In addition, the Connecticut State Building Code includes guidelines for the proper grounding of buildings and electrical boxes.

In the City of Waterbury, Eversource is responsible for tree branch removal and maintenance above and near power lines. In addition, all new developments in Waterbury must place utilities underground wherever possible. The Public Works Department has the responsibility of maintaining trees on municipal property. The Department is responsible for trimming over roadways, and staff routinely monitor for downed tree limbs during storms. The City also approaches residents on a case-by-case basis when trees and branches on their property look hazardous.

Municipal responsibilities relative to tornado mitigation and preparedness include:

- Developing and disseminating emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.
- Identify and designate appropriate shelter space in the community that could potentially withstand tornado impact.
- Periodically test and exercise tornado response plans.
- Put emergency personnel on standby at tornado 'watch' stage.
- Utilizing the "CT Alert" Emergency Notification System to send warnings into potentially affected areas.

### New Capabilities and Completed Actions

Waterbury continues to maintain its summer storm mitigation capabilities. Its tree and limb removal procedures continue to be adequate, and it coordinates closely with Eversource on protecting power lines. Many of Waterbury's capabilities to mitigate for wind damage and prevent loss of life and property have improved since the initial hazard mitigation plan was adopted, such as the use of CT Alert. Furthermore, Eversource has increased its capabilities relative to tree and tree limb maintenance near utility lines.

### Summary

Waterbury mitigates summer storm risks primarily through tree, limb, and debris management, emergency communications, and coordination with Eversource.

## 5.2 Vulnerabilities and Risk Assessment

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The entire community is at relatively equal risk for experiencing damage from summer storms and tornadoes. Based on the historic record, only a few summer storms and tornadoes have resulted in costly damages in Waterbury. Most damages are relatively site-specific and occur to private property (and therefore are paid for by private insurance). For municipal property, the budget for tree removal and minor repairs may need to be adjusted from time to time to address storms. Given the limited historic record for damaging tornado events, an estimate tens of million dollars in damage may be reasonable for an EF2 tornado striking Waterbury, and with a greater damage amount to be expected should an EF3 or stronger tornado strike.

Most thunderstorm damage is caused by straight-line winds exceeding 100 mph. Straight-line winds occur as the first gust of a thunderstorm or from a downburst from a thunderstorm and have no associated rotation. The risk of downbursts occurring during such storms and damaging the city of Waterbury is believed to be low for any given year. Waterbury is susceptible to damage from high winds due to its heavily treed landscape in outlying areas, older buildings, and high residential density.

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 of electrical fires. Such fires can be extremely dangerous during the summer months during drought conditions. Most downed power lines in Waterbury are detected quickly and any associated fires are quickly extinguished. However, it is important to have adequate water supply for fire protection to ensure this level of safety is maintained.

There are no critical facilities believed to be more susceptible to summer storm damage than any other. Some critical facilities are more susceptible than others to flooding damage due to summer storms. Such facilities susceptible to flooding damage were discussed in Section 3.6.

The Waterbury Public Works Department reports that the typical cost for the town to respond to downed branches and wires from a localized severe thunderstorm is upwards from \$1,600; this is based on two crews working for at least four hours after one event.

## 6.0 WINTER STORMS

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### 6.1 Existing Capabilities

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Programs that are specific to winter storms are generally those related to preparing plows, sand and salt trucks; tree-trimming to protect power lines; and other associated snow removal and response preparations.

Snow removal is mainly subcontracted in Waterbury. The state plows Routes 8, 69, 73, and Interstate 84. In addition, the City has approved capital budget funding in the 2007-2010 budget for road de-icing safety improvements, and a small sand/salt storage facility in the City.

The City of Waterbury Land Subdivision Regulations discourages the creation of cul-de-sacs whenever a feasible connection to a through street can be created. This policy presents residents and emergency personnel with two means of egress into neighborhoods in the City, ensuring that residents will not be cut off from critical facilities during times of need.

Although the City's geography prevents a prioritization of plowing routes due to the many dead-end streets and meandering arterials, the City is zoned into plowing districts and the subcontractors in each district can respond to individual needs within their districts. This procedure has worked in the past and is proposed for future winter storms.

In summary, Waterbury's capabilities to mitigate for winter storm damage and prevent loss of life and property have improved moderately since the initial hazard mitigation plan was adopted, such as the increasing attention to removing snow from buildings.

#### **New Capabilities and Completed Actions**

Waterbury continues to maintain its strong winter storm mitigation capabilities.

#### **Summary**

Waterbury mitigates snow damages through implementation of road and building clearing protocols, enforcement of the State Building Code, and through the mitigation measures previously discussed for high wind events.

### 6.2 Vulnerabilities and Risk Assessment

---

The entire community is at relatively equal risk for experiencing damage from winter storms, although some areas may be more susceptible. Many damages are relatively site-specific and occur to private property (and therefore are paid for by private insurance), while repairs for power outages is often widespread and difficult to quantify to any one municipality. For municipal property, the budget for plowing and minor repairs is generally adequate to handle winter storm damage, although the plowing budget is often depleted in severe winters. In particular, the heavy snowfalls associated with the winter of 2010-2011 drained the local plowing budget and raised a high level of awareness of the danger that heavy snow poses

to roofs, as did the snow associated with Winter Storm Alfred in October 2011 and storm Nemo in February 2013.

The heavily treed landscape in outlying areas in close proximity to densely populated residential areas in the City poses problems in relation to blizzard condition 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 ice freezing water pipes in basements.

Road icing is a major problem in Waterbury. The shallow water table contributes to the icing of roads in several areas through a combination of frequent seepage, a lack of infiltration, and poor or absent drainage systems. These ice-prone areas are listed in the table below.

**Table 6-1: Roadways Prone to Significant Icing in Winter**

Street Name	Reason
<b>1. Aldur Street</b>	Icing due to poor drainage
<b>2. Blanchard Street*</b>	Road has no storm drains. Ice ponds on roads and in yards in winter. Repeated freeze/thaw creates uneven ice and treacherous walking/driving conditions
<b>3. Campfield Road*</b>	Road has no storm drains. Runoff from private property pools on roadway and freezes in winter
<b>4. East Main Street near Silver St.</b>	Deteriorated sidewalk contributes to icing problems at this intersection
<b>5. East Mountain Road west of Pineridge Road</b>	Icing due to poor drainage
<b>6. Fiske Street</b>	Icing due to poor drainage
<b>7. Gem Drive</b>	Road ices and floods driveways
<b>8. Hans Avenue near Bradley Avenue &amp; Arnold Street</b>	Icing due to poor drainage
<b>9. Lakeside Boulevard East</b>	Chronic icing due to lack of a drainage system
<b>10. Mountain View Drive*</b>	Road has no storm drains. Groundwater seeping into the roadway freezes in winter
<b>11. North Walnut Street*</b>	Groundwater seepage ices the roadway. Needs a curtain drain near #154
<b>12. Ohio Avenue</b>	Technically a "paper" street, the steep slope prevents this road and Connecticut Avenue from being plowed. Three houses are affected by limited emergency and public service egress in the winter.
<b>13. Traverse Street at Hope Street</b>	Groundwater seepage on Hope Street causes icing on both roads in winter
<b>14. Waterville Street</b>	Icing due poor drainage
<b>15. Westridge Drive</b>	Water flowing down the street causes icing problems.

\*Denotes an existing or proposed capital improvement project for fiscal years 2007-2011.

Freezing conditions in the upper levels of the soil can also cause shallow utility lines to stress or breaks to occur in water transmission lines. Such breaks can cause a reduction in the availability of public water supply and fire fighting capability. The loss of fire fighting capability can be dangerous during winter storms when electrical fires can start as a result of roof collapses and power line breaks due to ice damage. Upper soil freezing and thawing can cause frost heave, contributing to the disintegration of sidewalks and impeding

pedestrian egress along the sides of streets and potentially to and from critical facilities. A notable example of this type of damage is on the sidewalk along Boyden Street.

Drifting snow is not as large a problem in Waterbury as other communities, but it still occurs. This problem is mitigated through municipally subcontracted plowing efforts.

## 7.0 GEOLOGICAL HAZARDS

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### 7.1 Existing Capabilities

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Due to the infrequent nature of damaging earthquakes, land use policies in the City of Waterbury do not directly address earthquake hazards. However, various regulations indirectly address areas susceptible to earthquake damage and regulations that help to minimize potential earthquake damage. For example, the city's Zoning Regulations define steep slopes as those exceeding 20% and also specify requirements for finished grades that are sloping.

Specific landslide prevention programs, policies, or mitigation measures are not outlined in the regulations governing zoning, land use, or development plans in the City of Waterbury. However, the Zoning regulations consider areas with greater than 10% slopes to be areas definable as open space, and slopes greater than 20% are considered steep slopes. Furthermore, the city's Zoning Regulations established a standard for maximum slope of a finished grade on April 25, 2012 (effective May 5, 2012).

Landslides, slumps, and retaining wall failures that occur on private properties are considered to be the responsibility of the property owners. When such failures occur on municipal property or affects City utilities, the Public Works Department is in charge of repairs.

#### **New Capabilities and Completed Actions**

Waterbury continues to maintain its earthquake and landslide mitigation capabilities. Waterbury's capabilities to mitigate for earthquake damage and prevent loss of life and property have not necessarily changed since the initial hazard mitigation plan was adopted, although the State's building code has been updated and the town has incorporated those changes.

#### **Summary**

Waterbury mitigates geological hazards through enforcement of zoning and subdivision regulations preventing development in higher risk areas. Other mitigation measures consist of general emergency response capabilities.

### 7.2 Vulnerabilities and Risk Assessment

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#### **Earthquake Vulnerabilities**

Surficial earth materials behave differently in response to seismic activity. Unconsolidated materials such as sand and artificial fill can amplify the shaking associated with an earthquake. In addition, artificial fill material has the potential for liquefaction.

Portions of the City of Waterbury are underlain by sand and gravel. Structures in these areas are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. The areas that are not at increased risk during an earthquake due to unstable soils are those underlain by glacial till.

Areas of steep slopes can collapse during an earthquake, creating landslides. Seismic activity can also break utility lines, such as water mains, electric and telephone lines, and stormwater management systems. Dam failure can also pose a significant threat to developed areas during an earthquake.

Because a damaging earthquake would likely affect a large area beyond Waterbury, it is likely that the community may not be able to receive regional aid for a few days. It is important for municipal facilities and departments to have adequate backup plans and backup supplies to ensure that restoration activities may begin and continue until outside assistance can be provided.

### **Landslide Vulnerabilities**

Numerous areas of the City of Waterbury are built on steeply sloping terrain. Such areas have the potential for a landslide to develop, especially when the terrain is characterized by poorly draining soils or served by an inadequate drainage system. Despite steep slopes existing throughout Waterbury, the topography is generally stable. However, minor and major landslides have occurred throughout the City. Most landslides in the City of Waterbury develop due to heavy rainfall saturating the upper parts of the soil with groundwater, although there are some that develop due to poor excavation practices.

Figure 7-1 depicts areas of the City which have slopes greater than 25% and sandy surficial materials. These areas have a higher probability of slope failure compared to the rest of the City. An outline of these areas is provided below:

- The slope south of and above Kukas Lane in southeastern Waterbury.
- Areas above Watertown Avenue north of Waterbury Hospital.
- Sections below the southern part of Waterville Street. This is currently a one-way street due to persistent sliding that has not been mitigated. The necessary detour increases the route from 0.2 mile to 0.5 mile, so the extra mileage does not significantly contribute to annual losses when coupled with the traffic counts. However, the roadway repair costs will be in the hundreds of thousands of dollars.
- Several areas above Thomaston Avenue in northern Waterbury.
- Areas above Spruce Brook Road in the Mattatuck State Forest near the Plymouth town line.
- An undeveloped area north of Steele Brook above the abandoned railroad line.
- A small area east of Denver Place near the Watertown town line.
- Southview Street and Madison Street to South Main Street. The hill next to a house on Southview Street gave way during the 2006 storm. Jersey barriers, mud, and rock cascaded down the hill burying a 40-foot section of the road with about three feet of debris. It pushed a car from the north side of South Main Street against a building on the other side. Yankee Gas officials responded to gas main breaks. An abandoned car was buried in the parking lot of Shaker's Chrysler Jeep. Total cleanup and repairs were in the hundreds of thousands of dollars, and property damage was in the tens of thousands.

Landslides and slumps do not always occur near watercourses. In areas where the drainage network is comprised only of sheet flow, roadways can act as watercourses and break apart. When construction activities undermine the natural grade of a hill, the hillside can collapse as occurred on Waterville Street.

Deterioration of the PCCP running eastward through the City has rendered it more susceptible to damage from natural hazards. The 24-inch and 16-inch PCCP mains travel through several areas of steep slopes. The



two western water main breaks occurred in an area of greater than 25% slopes, and the eastern occurred in an area of greater than 20% slope. In addition, other areas of the pipe are also in high slope areas. As this pipe provides public water supply and fire protection to thousands of people in two municipalities, this water main is a critical piece of infrastructure vulnerable to landslides and earthquakes.

Insufficient or poorly installed drainage systems can also lead to landslides in high slope areas, as occurred at Southview Street (now corrected), Highland Avenue, and East Mountain Road. Oversizing drainage structures, wherever possible, may help mitigate the results of such systems being overwhelmed. The expansion of the City drainage network would also help in this regard.

Debris from landslides can flow or move beyond the bottom of the slope, or may impact utilities, resulting in the effects of the landslide being felt in a wider area. The likelihood of a naturally-induced landslide occurring in Waterbury is believed to be possible for any given year because severe of rain events will potentially trigger a landslide, slump, or slope failure.

### Historic Landslides in Waterbury

One notable example of a landslide due to human activities is visible on Waterville Street. Waterville Street overlooks the east side of the Naugatuck River just northwest of the City center. Construction activities in the 1990s occurring at the toe of the slope below Waterville Street compromised the natural grade of the 50 to 75 foot high hill, resulting in a collapse. Part of Waterville Street later collapsed as well, and the road is currently a one-way street. This street is considered a potential landslide area, and concerns along Waterville Street have continued since the last edition of this HMP.



Waterville Street

The extreme rain event that occurred on June 2, 2006 caused many slopes to fail throughout the City with varying amounts of damage. These incidents are described below

- Charles Street – One of the two 18-foot high stone walls lining the backyard at 22 Charles Street crumbled under the weight of floodwaters. The second wall collapsed about two hours later, crashing through the porch of 26 Fourth Street. This area reportedly had as much as three feet of floodwaters. Deep patches of mud were also recorded in the Brooklyn neighborhood around Fourth Street.
- East Mountain Road. While approaching the end of the road from the west along Pearl Lake Road, an excessive amount of water was observed crossing downhill along the side of Pearl Lake Road. This water was crossing from the north end of East Mountain Road, and the road was closed with a barricade. A brief reconnaissance of the road was undertaken, and a severe condition was observed where a landslide/gully had caused the road to fail. Potholes and sinkholes were scattered in various nearby locations. While this area is not in a mapped

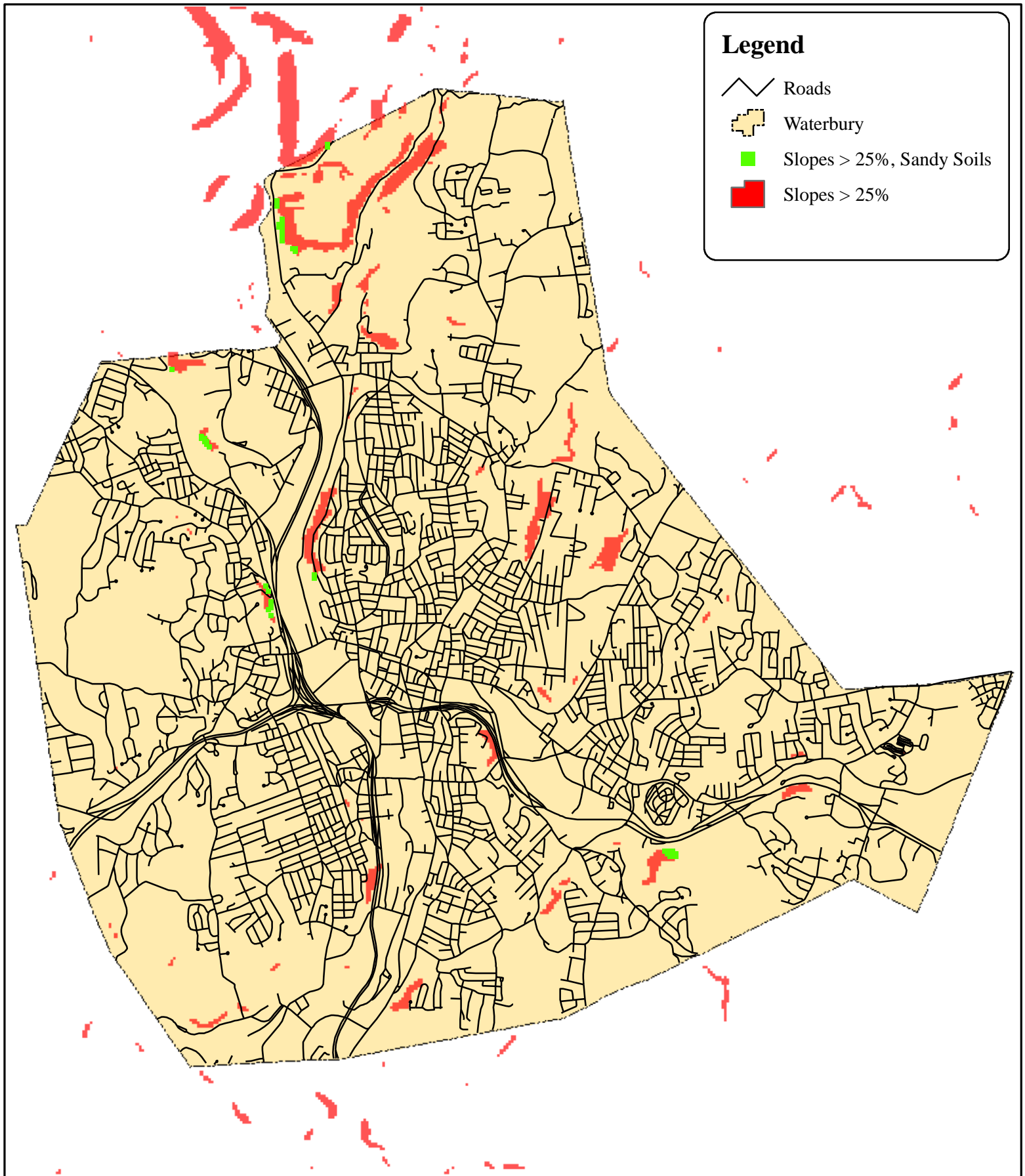
floodplain or floodway, it appears that a small watercourse (an unnamed tributary to Hopeville Pond Brook) flowing from the east caused this damage.

- Rosario and Tedesco Drive – Thick layers of silt and debris flowed into the intersection, prompting removal with a backhoe and truck. Damage may have been caused by an unnamed tributary to the Naugatuck River backing up a cross culvert under Tedesco Drive. This backup caused heavy erosion and a subsequent mudflow.
- Southview Street and Madison Street to South Main Street – A new storm drainage system had been installed the previous October when Madison Street and Southview Street were connected. It was overwhelmed and washed out. In addition, the city believes that older pipes in the stormwater system were compromised and failed. The hill next to a house on Southview Street gave way in a matter of minutes during the storm. Jersey barriers, mud, and rock cascaded down the hill burying a 40-foot section of the road with about three feet of debris. It pushed a car from the north side of South Main Street against a building on the other side. The torrent of earth, rock, and water severed the gas main on both sides of the cleft carved into the hill. Yankee Gas Company officials responded immediately to cap the breaks there and in one other location. An abandoned car was almost completely buried in the employee parking lot of Shaker's Chrysler Jeep on South Main Street. New drainage systems were installed in 2007.



Site of slide between Southview Street & South Main Street

- Highland Avenue at Highview Street: An extreme amount of stormwater concentrated in a depression on the north side of an abandoned railroad siding embankment located to the southeast of this intersection. The embankment likely had a catastrophic failure as the water level neared the top. A further description of downgradient damage is included in Section 3.3 under the description of events impacting Highland Metro North.
- Willow Street: Although the portion of Clowes Terrace above this area was abandoned many years ago, eliminating the active pressure on the slope, the retaining wall and accompanying slope continue to erode.



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### Areas of Steep and Sandy Slopes

MMI#: 2937-01  
MXD: H:\8-2\_slopes.mxd  
SOURCE: DEP Bulletin No.40



### NVCOG Hazard Mitigation Plan Update

LOCATION:  
Waterbury, CT

DATE:  
April 2007  
SCALE:  
1:57,000

SHEET:  
Figure 7-1

## 8.0 DAM FAILURE

### 8.1 Existing Capabilities

The Dam Safety Section of the Connecticut DEEP Inland Water Resources Division is responsible for administration and enforcement of Connecticut's dam safety laws. Dam safety laws are codified in Sections 22a-401 through 22a-411 of the Connecticut General Statutes. The statutes require that permits be obtained to construct, repair, or alter dams and that existing dams be inventoried and periodically inspected to assure that their continued operation does not constitute a hazard.

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

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

Effective October 1, 2013, the owner of any high or significant hazard dam (Class B and C) must develop and implement an Emergency Action Plan (EAP). The EAP shall be updated every two years, and copies shall be filed with DEEP and the chief executive officer of any municipality that would potentially be affected in the event of an emergency. The EAP must include inundation zone mapping, procedures for monitoring the structure during periods of heavy rainfall and runoff, and a system to alert local officials in the event of an emergency.

The CT DEEP also administers the Flood and Erosion Control Board (FECB) program, which can provide noncompetitive state funding for repair of municipality-owned dams. State statute Section 25-84 allows a municipality to form an FECB.

The City of Waterbury is responsible for maintaining EAPs for the East Mountain Reservoir Dam and Bellevue Lake Dam. According to the DEEP, the Risdon Pond Dam and Cemetery Pond Dam (a.k.a. Homestead Avenue Dam) are privately owned. It is believed that the owners maintain emergency plans, but they are not on file with the DEEP. The city does not know if an EAP is available for Lake Wequapauset Dam.

The City of Waterbury is home to a levee system along its boundary with Watertown on the Naugatuck River. This levee system is maintained by DEEP and consists of channel improvements, a floodwall, and a protective dike. The system confines the 500-year flood and protects a major industrial area of the City. In addition, there are several dams upstream of Waterbury along the Naugatuck River that collectively mitigates flood flows.

Several dam removals have been performed in the City of Waterbury that had the secondary result of mitigating downstream hazards associated with dam failure. These include the Naugatuck River main stem dams and the John Dees Pond Dam. Other dams in the City have been breached to reduce the hazard of dam failure, such as the Scovill Pond Dam and the Risdon Pond Dam. In addition, a run-of-the-river dam has been removed upstream in Thomaston.



## Actions Completed and New Capabilities

Waterbury continues to maintain its capabilities for mitigating and responding to dam failure risks. A run-of-the-river dam has been removed upstream in Thomaston.

### Summary

Waterbury mitigates dam failure hazards primarily by supporting State Dam Safety Program efforts locally.

## 8.2 Vulnerabilities and Risk Assessment

While flooding from a dam failure generally has a moderate geographic extent, the effects are potentially catastrophic. The Connecticut DEEP administers the statewide Dam Safety Program and designates a classification to each state-inventoried dam based on its potential hazard.

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

As of 2020, there were 37 DEEP-inventoried dams within Waterbury. Six of these dams had a Significant or High Hazard Potential rating. These dams are listed in Table 8-1 and shown in Figure 8-1.

**Table 8-1: DEEP-Inventoried Dams in Waterbury**

Number	Name	Class	Owner
15101	TRACY'S POND DAM		Private
15102	MAD RIVER DAM HOMESTEAD AVENUE DAM	C	Private
15103	EAST BRASS MILL DAM		Private Corporation
15104	EAST MOUNTAIN RESERVOIR DAM	C	Municipal
15105	PRITCHARD POND DAM	BB	Municipal
15106	RISDON POND DAM	BB	Private Corporation
15107	BRISTOL BABCOCK RESERVOIR #1 DAM	BB	Private Corporation
15108	MURPHY LAKE	BB	Private
15109	LAKE WEQUAPAUSET DAM	B	Private Club
15110	BRISTOL BABCOCK RESERVOIR #2	A	Private Corporation
15111	ANACONDA DAM		Private Corporation
15112	RIFLE RANGE POND DAM	A	State Owned
15113	GREAT BROOK RESERVOIR DAM	BB	Municipal
15114	BELLEVIEW LAKE DAM	C	Municipal
15115	JOHN DEES POND DAM		Private Corporation
15116	UNNAMED		Private Corporation
15117	INDUSTIAL POND DAM	A	Private Corporation
15118	GRIGGS ST POND DAM	AA	Municipal
15119	PARK POND DAM	A	Municipal
15120	DAIGLE POND DAM	A	Private
15121	HILLS POND #1	A	Private Corporation
15122	PEARL LAKE	A	Private

Number	Name	Class	Owner
15123	SPRING LAKE	A	Private Corporation
15124	PLATTS MILL DAM	A	Municipal
15125	GAME CLUB LAKE	A	Federal USACE
15126	WATERBURY CC 13TH HOLE POND	A	Private Club
15127	WATERBURY COUNTRY CLUB POND DAM	A	Private Club
15128	HANCOCK POND DAM	A	Municipal
15129	EAST AURORA STREET DAM	A	Private Corporation
15130	FROST ROAD POND DAM	B	Private
15131	HOP BROOK FLD CONTL DAM		Federal USACE
15132	REIDVILLE INDUSTRIAL PARK DETENTION DAM	B	Municipal
15133	BOYDEN STREET DAM		Municipal
15134	NONE		Private Corporation
15135	WESTWOOD POND DAM		Private
15136	BUNKER HILL ESTATES DETENTION DAM	A	Private
15137	TOMKINS STREET DAM		

The following table summarizes the status of EAPs for the higher-hazard potential dams in Waterbury:

**Table 8-2: EAP Status of Higher-Hazard Dams**

Number	Name	Class	EAP Status	EAP Status Date
15102	MAD RIVER DAM HOMESTEAD AVENUE DAM	C	NOV No Response Letter Sent	4/17/2019
15104	EAST MOUNTAIN RESERVOIR DAM	C	Review letter sent revisions needed	6/5/2017
15109	LAKE WEQUAPAUSSET DAM	B	Review letter sent revisions needed	11/16/2018
15114	BELLEVUE LAKE DAM	C	Acceptance Letter Sent	10/11/2018
15130	FROST ROAD POND DAM	B	Updated EAP Not Received	1/22/2018
15132	REIDVILLE INDUSTRIAL PARK DETENTION DAM	B	Updated EAP Not Received	1/22/2018

Waterbury should work to ensure EAPs are up-to-date.

### Bellevue Lake Dam

Bellevue Lake is owned and operated by the City of Waterbury. The USGS name for this Lake is Great Brook Reservoir. It covers a surface area of approximately 73 acres and outflows into Great Brook. Bellevue Lake Dam is an ashlar masonry gravity structure built sometime before 1880. The dam was repaired as recently as 1998 to allow safe passage of the probable maximum flood.

The area downstream of Bellevue Lake is a major residential and commercial sector of the City. As Great Brook flows through an underground culvert throughout most of its length in Waterbury, a dam failure would quickly exceed the capacity of the culvert and water would flood up through catch basins into several areas of the City. Due to the high probability of downstream damage to life and property should this structure fail, proper maintenance of this historical structure is critical.

Several critical facilities have the potential to be inundated should Belleview Lake Dam fail. These include the Abbott Terrace assisted living facility at 44 Abbott Terrace (Map #1), the Fire Department containing Engines 1 and 9 and Truck 2 at 1979 North Main Street (Map #5), State Street School at 35 State Street (Map #47), and the University of Connecticut Waterbury campus at 99 East Main Street (Map # 48).

### **Cemetery Pond Dam**

Cemetery Pond is a small impoundment located in the run of the Mad River near the Fair Lawn section of Waterbury. It covers a surface area of approximately six acres. The pond gets its name from being adjacent to Pine Grove Cemetery. Cemetery Pond Dam is also known as the Homestead Avenue Dam or the Mad River Dam. The dam is a concrete-faced stone masonry structure with a downstream earthen embankment. A sewer interceptor was installed through the dam in 1986 and the DEEP has a record of maintenance being performed at that time.

The area downstream of Cemetery Pond Dam is significantly developed with areas of residential, commercial, and industrial use. A failure of this dam would send a torrent of water downstream into the former Scovill (City Mills) Pond, where the Scovill Pond Dam has already been breached. Flooding conditions would likely occur all the way downstream to the Naugatuck River. As a Class C Dam, it is important that the owner of the dam and the DEEP continue to review this dam for potential structural issues to mitigate possible damage to life and property.

### **East Mountain Reservoir Dam**

East Mountain Reservoir is an approximately 36-acre impoundment located on the Waterbury and Prospect municipal boundary. The reservoir is owned by the City of Waterbury and was formerly used as a surface water supply reservoir by the Waterbury Water Department. The East Mountain Reservoir has been formally abandoned and will never again be used as a water supply. Currently, the reservoir is used for recreational fishing and flood control. Outflow from this reservoir is known as East Mountain Brook.

The East Mountain Reservoir Dam is an earth embankment with a concrete core wall originally built in the late 1800's. The structure of the dam was repaired as recently as 1999, and the DEEP has an emergency operations plan, an operation and maintenance manual, and a dam failure analysis study on file from 1998.

According to the dam failure analysis, a failure of this dam would be catastrophic for the highly developed commercial, industrial, and residential areas downstream. The initial impact area would be Route 69 and East Mountain Road, which would be inundated to a depth of 14 feet within seconds. Interstate 84 would receive peak inundation of two to eight feet, and floodwaters of 5 feet to 15 feet would affect areas near the Mad River from City Mills Ponds downstream to East Liberty Street. Proper maintenance of this dam is imperative to prevent such a disaster.

### **Risdon Pond Dam**

Risdon Pond is a small, privately owned impoundment along the run of Hopeville Pond Brook near South Baldwin Street and the Naugatuck River. The impoundment is maintained by a dam fashioned from an earthen embankment reinforced by stone masonry. Below Risdon Pond Dam, Hopeville Pond Brook flows

underneath what appears to be an abandoned industrial building and South Main Street before emptying into the Naugatuck River.

It is believed that a failure of this dam would have the potential to undermine the foundation of this industrial building and part of South Main Street. Consequently, the DEEP requested the elevation of the spillway lowered by 16.7 feet in 1985. As a result, Risdon Pond is now approximately one-third of its former size one-half acre size. It is unlikely that a failure of this dam would have the same destructive potential it formerly did. Nevertheless, it is still a Class C dam and the owner and the DEEP should strive to ensure that this dam is properly maintained. The dam was reconstructed in 2012 in connection with roadway repairs.

### **Flood Control Dams Upstream of Waterbury**

The six Army Corps of Engineers flood control dams of the Naugatuck River upstream of Waterbury are currently maintained by the Corps and are in excellent condition. The Corps maintains dam failure analysis plans for these dams. While a dam failure at one of these locations has the potential to cause downstream flooding damages, much of the flooding impact would occur upstream of Waterbury. Therefore, it is believed that Waterbury is at a lower risk of receiving severe flooding damage should any of these dams fail.

### **Waterbury/Watertown Levee System**

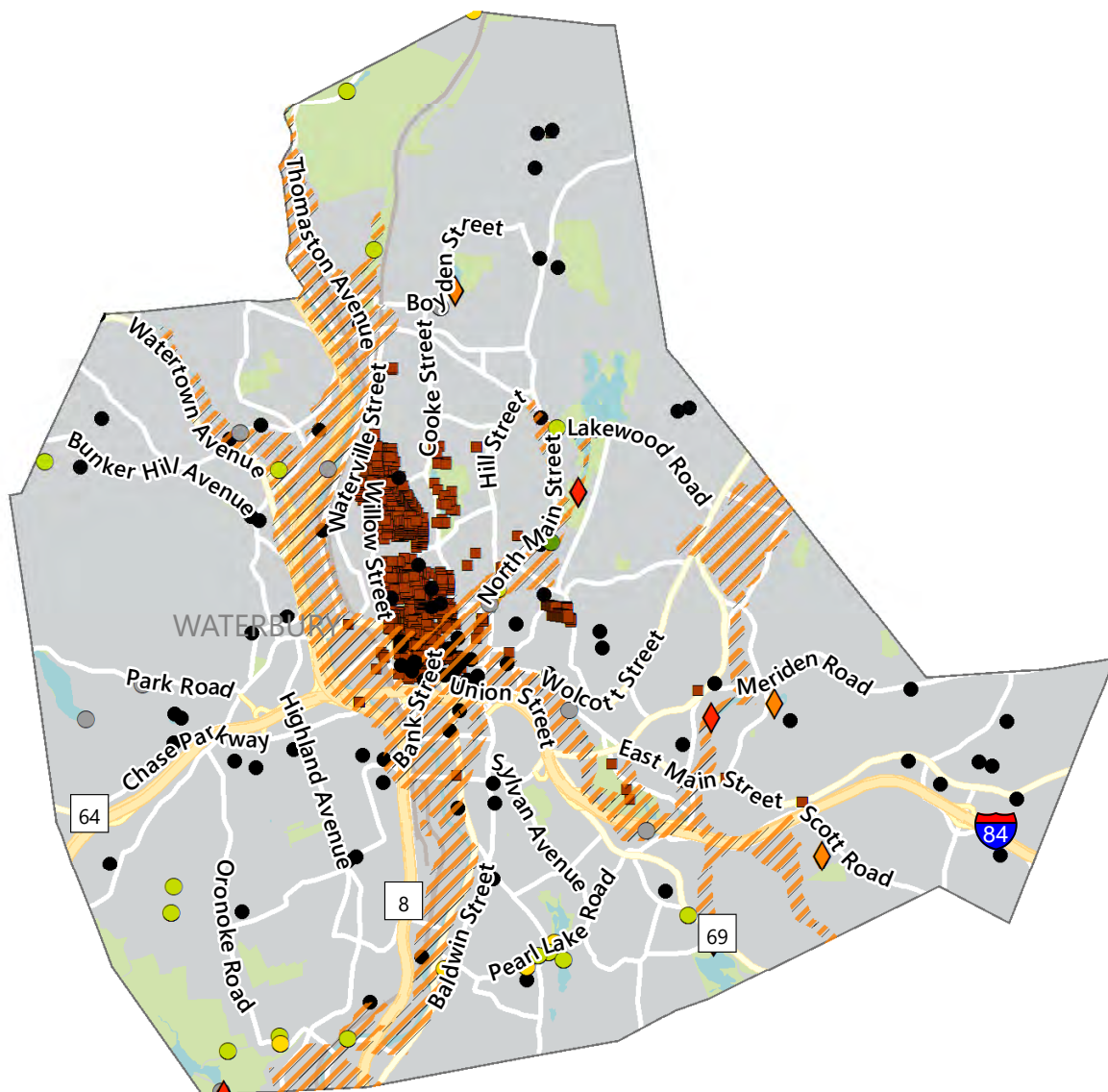
When the Army Corps of Engineers commenced its flood control improvements, the topography of the riverbanks along the Naugatuck River in Waterbury allowed the lowering and widening of the riverbed. Therefore, the levee system in this area contains fewer dikes and shorter floodwall heights than in upstream municipalities. As a result, there are few flooding problems directly related to out-of-bank conditions along the Naugatuck River.

In 2014, the Army Corps of Engineers evaluated the levee system and found that it is uncertain whether the levee will withstand water to the top of the levee without breaching. It is noted, however, that there has never been an event that brought flood elevations to more than 25% of the levee's capacity. The evaluation found that, "Currently there are significant concerns due to the number of animal burrows and amount of vegetation present, the lack of toe drains, and a large hole in the landside slope. As a result, there are some uncertainties with how the system will perform during a flood event." The USACE assigned the levee a risk rating of "Low" (<https://levees.sec.usace.army.mil/#/levees/system/4305000034/summary>).

As this levee system is designed to confine the 500-year flood to the Naugatuck River, proper maintenance of this levee system is imperative. Failure of this levee system during an extreme flood could cause millions of dollars of damages in the City's industrial sector, specifically inside Waterbury Industrial Commons. In addition, businesses and residents in the lower parts of the Waterville section of Waterbury could be inundated. A levee failure associated with an extreme flood event could take this sector of the City by surprise, resulting in multiple deaths.

If proper and required maintenance is not performed on this levee system, the Army Corps of Engineers may decertify it. Decertification means that property owners protected by the levee would be required to purchase flood insurance, and communities participating in FEMA's Community Rating System would find their ranking reduced. Despite the heavy flood controls along the Naugatuck River, it is still possible that a powerful series of storms could cause this levee system to fail.



**Dam Hazard Class**

- Unclassified
- AA - Negligible Hazard
- A - Low Hazard
- BB - Moderate Hazard
- B - Significant Hazard
- C - High Hazard

▨ Dam Breach Inundation Area

**Critical Facilities**

- Critical Facilities

**Historic Sites**

- Historic Sites



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**Dam Failure Hazards in Waterbury**

NVCOG Hazard Mitigation Plan Update  
Naugatuck Valley Council of Governments  
47 Leavenworth Street, 3rd Floor  
Waterbury, CT 06702



0 3,000 6,000  
Feet

DATE 6/15/2021

141.3211.00029

PROJ. NO.

**FIG. 8-1**

## 9.0 WILDFIRES

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### 9.1 Existing Capabilities

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#### Open Burning

The Connecticut DEEP Open Burning Program requires designated “Open Burning Officials” in every community to oversee open burning within the City. The City of Waterbury is compliant with this program and has a designated Burning Official.

Section 94.03 of the Waterbury Code of Ordinances requires a permit for brush fires as follows: *“No person shall ignite any brush fire without first having obtained from the Fire Marshal a permit for such purpose. In passing upon the application, the Fire Marshal shall consider weather conditions, the need for igniting the fire and the amount of supervision available. The Fire Marshal shall have the power to grant or refuse the permits in his discretion, depending upon the weather conditions at the time of application.”* However, open burning is rarely permitted.

#### Fire Fighting and Suppression

Existing mitigation for wildland fire control is typically focused on Fire Department training and maintaining an adequate supply of equipment. The City has a brush truck capable of accessing remote fires, and several pumpers carry extra lines of hose to supplement the range of this truck.

Unlike wildfires on the west coast of the United States where the fires are allowed to burn toward development and then stopped, the Waterbury Fire Department goes to the fires. This proactive approach is believed to be effective for controlling wildfires. The fire department has some water storage capability, but primarily relies on the City water system. Most of the City has water service that includes hydrants for fire protection. The availability of water speeds the containment time for most fires occurring in the City.

Finally, the City Fire Department has an inventory of industrial facilities containing substantial wood construction in order to mitigate the spread of fires.

#### Access and Egress

The City Land Subdivision Regulations encourage through streets in new developments, increasing the amount of egress available to the fire department for combating wildfires. However, Inland Wetland Regulations sometimes cause a conflicting pattern of street development, with a loss of egress where wetlands are located.

Since the adoption of the last HMP, water main extensions to the southwestern part of the city have reduced the wildfire risk area. Aside from moderate changes in State policy and improvements to the public water system, the city’s capabilities to mitigate for wildfires and prevent loss of life and property have not changed significantly since the initial hazard mitigation plan was adopted. The city will continue to evaluate whether capabilities need to be strengthened in the future.

## Actions Completed and New Capabilities

Waterbury continues to maintain its capabilities for mitigating and responding to wildfire risks.

### Summary

The City mitigates wildfire hazards by implementing the state's Open Burning Program locally, installing dry hydrants and firefighting-water sources in remote areas, and training its fire department to fight wildfires. The majority of the City is served by the Waterbury Water Department, so a large amount of water pressure is available for firefighting equipment. The creation of through streets increases the range of firefighting and emergency equipment, and increased public awareness has further mitigated the risk.

## 9.2 Vulnerabilities and Risk Assessment

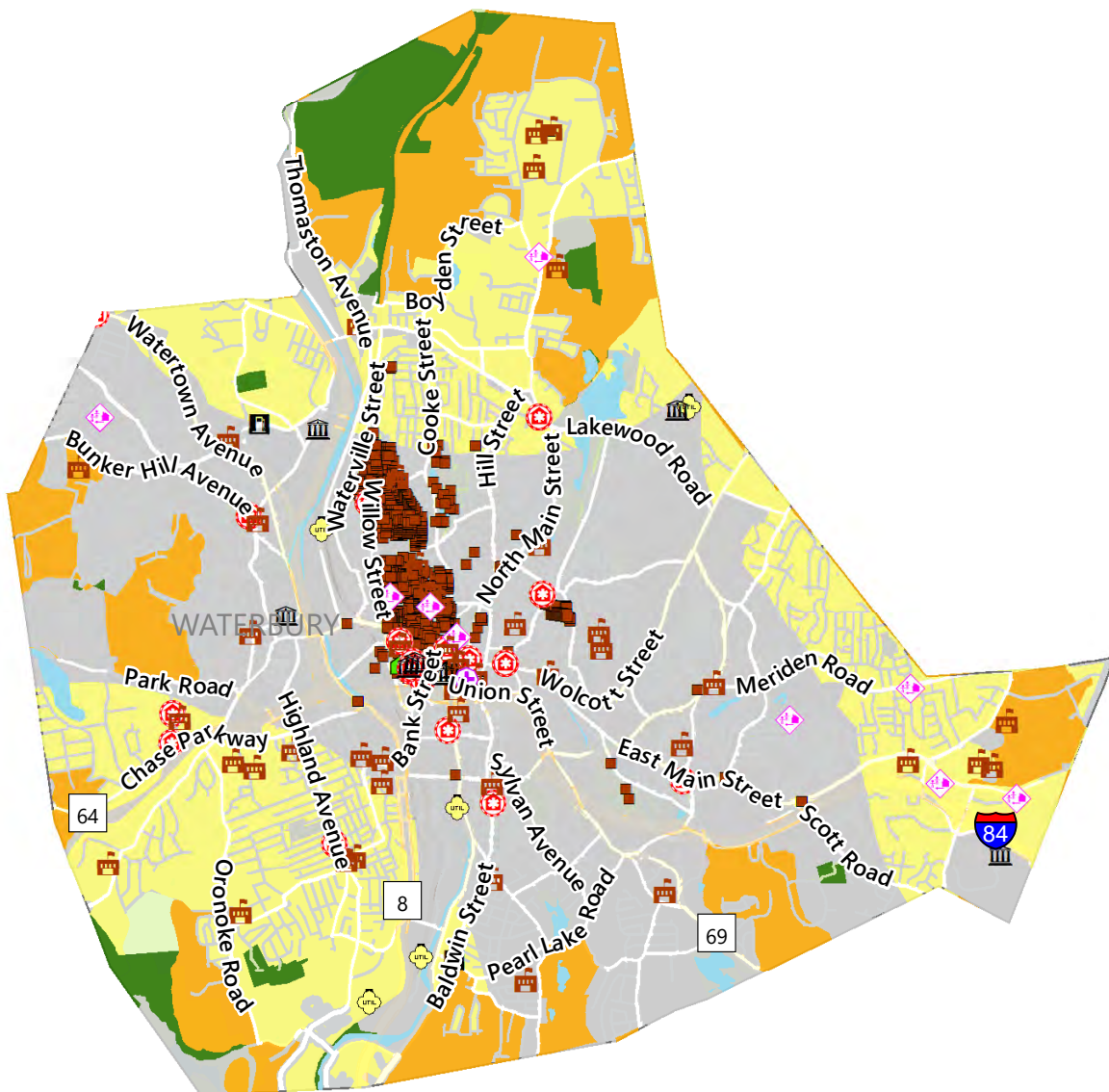
The approximately 7,014 acres of forests and undeveloped land in Waterbury may be susceptible to drought conditions that make them more vulnerable to wildfires. The approximately 323 acres of agricultural fields and maintained grasses may be vulnerable to direct damage from drought conditions.

The wildfire risk areas – contiguous wooded areas greater than 50 acres in size without access to public water service – are generally near the northern, western, and southern corporate boundaries and each area borders residential sections of the City. Therefore, residents on the outskirts of these risk areas are the most vulnerable to fire, heat, and smoke effects of wildfires.

Despite having a large amount of forest/urban interface, the overall risk of wildfires occurring in the City of Waterbury is also considered to be low. Such fires fail to spread far due speed of detection and strong fire response.

Recall that an important 24" to 16" PCCP runs west-east through the City. A break in this water main could leave thousands without public water supply and firefighting water, not only for urban fires but also for wildland fires. Furthermore, the town of Wolcott relies on the Waterbury Water Department, and this water main in particular, for much of its firefighting water. Wolcott is less developed than the City of Waterbury and is at a higher risk for wildfires because of its rural nature.

Wildfire risk zones are mapped in Figure 9-1.



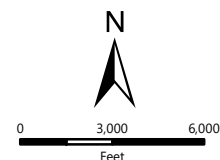
Critical Facilities	Wildland Urban Interface Type
Care Facility	Wildland-Urban Intermix
Community Center	Wildland-Urban Interface
Emergency Response	Vegetated: Low Housing Density
Fuel	Vegetated: No Housing
Government Services	Non-vegetated
School	Water
Utility	
Vulnerable Population	
<b>Historic Sites</b>	
Historic Sites	



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## Wildfire Hazard in Waterbury

NVCOG Hazard Mitigation Plan Update  
Naugatuck Valley Council of Governments  
47 Leavenworth Street, 3rd Floor  
Waterbury, CT 06702



DATE 6/15/2021  
PROJ. NO. 141.3211.00029

**FIG. 9-1**

## 10.0 MITIGATION STRATEGIES AND ACTIONS

### 10.1 Goals and Objectives

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

### 10.2 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.

Strategy	Description	Responsible Party	Status	Notes
<b>WTB-1</b>	Consolidate Public Works facilities in one location	Public Works	Complete	This has been completed and public works capabilities have reportedly become more efficient.
<b>WTB-2</b>	Develop intermunicipal agreements with other public works departments	Public Works	Carry Forward	Progress has not been made.
<b>WTB-3</b>	Add pages to City website regarding emergency planning, shelter locations, and general emergency preparedness	OEM	Carry Forward with Revision	The Public Safety page has links to the CT Alerts signup page and the Ready.gov site to prepare for disasters.
<b>WTB-4</b>	Acquire and install additional standby power supplies (generators)	Public Works	Carry Forward with Revision	At least one needs to be replaced. Additional may be needed.
<b>WTB-5</b>	Consider becoming a member of FEMA's Community Rating System	Mayor	Drop	Progress has not been made; City is not planning to pursue.
<b>WTB-6</b>	Seek methods of requiring watershed-based engineering studies for large developments	Public Works	Drop	Changes to the Zoning Regulations and Subdivision Regulations in the last few years may have addressed the intent of this action. It can likely be dropped.
<b>WTB-7</b>	Selectively pursue conservation objectives listed in the Plan of Conservation and Development, including the creation of greenways such as the Naugatuck River Greenway	Mayor	Capability	The City has been making progress with the greenway. A portion of the greenway is out to bid now, and will be constructed in the near future.

Strategy	Description	Responsible Party	Status	Notes
<b>WTB-8</b>	Clear brush and growth in the floodplain of the Mad River that could possibly inhibit flood flows at least every three years	Public Works	Carry Forward	Action not yet completed due to limited funding.
<b>WTB-9</b>	Consider property acquisitions in the area of flooding near Pritchard's Pond	Mayor	Carry Forward	Action not yet completed due to limited funding.
<b>WTB-10</b>	Commission a City-wide Stormwater Management System Study containing drainage models useful to developers, and update every five years	Public Works	Carry Forward	This is POCD policy 21-4. Progress has not been made.
<b>WTB-11</b>	Continue to investigate reports of localized flooding problems to determine cause and appropriate solution, and set goals for eliminating recurrences	Public Works	Capability	This is a capability and can be removed.
<b>WTB-12</b>	Perform a drainage study of Great Brook, including a structural analysis of the box culvert running under the Palace Theatre, and repair as needed	Public Works	Complete	The study phase is reportedly done. Construction in the area is underway. They will check on the status.
<b>WTB-13</b>	Perform engineering studies for the Mark Lane Landfill and the Highland Metro North Railroad areas outlining how to better protect these areas	Public Works	Carry Forward with Revision	Action not yet completed due to limited funding. Carried forward as two separate actions.
<b>WTB-14</b>	Conduct Clough Brook watershed mitigation projects.	Public Works	Carry Forward	Action not yet completed due to limited funding.
<b>WTB-15</b>	Conduct a study to prioritize areas for separation of sanitary and stormwater systems.	Public Works	Capability	This is POCD policy 21-3. Studies are partly complete but ongoing. The City is identifying areas of focus.
<b>WTB-16</b>	Consider installation and repair of curbing (ref. Table 3-4)	Public Works	Carry Forward	Action not yet completed due to limited funding.
<b>WTB-17</b>	Consider installation of stormwater systems for (ref. Table 3-5)	Public Works	Carry Forward	Action not yet completed due to limited funding.



Strategy	Description	Responsible Party	Status	Notes
<b>WTB-18</b>	Repair stormwater and drainage systems (ref. Table 3-6)	Public Works	Carry Forward	Action not yet completed due to limited funding.
<b>WTB-19</b>	Improve drainage at the municipal Chase Building	Public Works	Complete	More frequent drain clearing has reduced the incidence and severity of flooding.
<b>WTB-20</b>	Develop early warning system for lightning at municipally owned parks and golf courses	OEM	Carry Forward	Progress has not been made.
<b>WTB-21</b>	Construct improvements for reducing road icing	Public Works	Capability	This is a capability and can be removed.
<b>WTB-22</b>	Construct a new sand/salt storage facility at a new Public Works facility	Public Works	Complete	This is complete.
<b>WTB-23</b>	Purchase GPS units for City vehicles and subcontracted plowing vehicles	Mayor	Carry Forward with Revision	City vehicles have GPS units, but City contractor vehicles do not. The City needs about 20 more units for ancillary vehicles.
<b>WTB-24</b>	Consider preventing residential development in areas on or below steep slopes (slopes exceeding 30%)	City Planning	Drop	These are POCD policies 20-1 and 20-2. The Zoning Regulations define steep slopes as being 20% or greater, but construction is still allowed on such slopes. The Zoning and Subdivision Regulations do not address private properties directly, but they address road grades and this likely helps meet the intent of the action, which is to ensure public safety.,
<b>WTB-25</b>	Consider adding earthquakes to the list of hazards specifically identified in the EOP	OEM	Complete	Earthquakes are now included in the State's EOP template. If the City uses the State's template then this is complete.
<b>WTB-26</b>	Ensure that municipal departments have adequate backup facilities (power generation, heat, water, etc.) in case earthquake damage occurs	Public Works	Complete	
<b>WTB-27</b>	Consider bracing systems and assets inside critical facilities	Public Works	Drop	Critical facilities are believed sufficient.
<b>WTB-28</b>	Reconstruct Waterville Street and restore a proper angle to the slope to prevent future landslides	Public Works	Carry Forward	Progress has not been made, and the road is still one-way.
<b>WTB-29</b>	Secure mitigation funds for replacing and possibly relocating the 24-inch and 16-inch water mains in the eastern part of the City	Water Department	Carry Forward	Action not yet completed due to limited funding.

Strategy	Description	Responsible Party	Status	Notes
<b>WTB-30</b>	Consider preserving municipal areas of steep slopes as protected open space	City Planning	Capability	The City owns some land with steep slopes. Private properties occasionally approach the City about giving land with steep slopes to the City, but the City is cautious about accepting these parcels. They are addressed on a case-by-case basis.
<b>WTB-31</b>	Ensure local utility providers are aware of landslide potential and have responder teams on call to repair damage caused by landslides	City Planning	Carry Forward	Progress has not been made, but the City works with Eversource (the gas company) and can make progress going forward.
<b>WTB-32</b>	Continue expanding and over-sizing the drainage network in the vicinity of steep slopes	Public Works	Capability	This is a capability.
<b>WTB-33</b>	Inspect Class B and BB dams	Mayor	Capability	Based on new DEEP regulations in 2015, the City must inspect all of its dams on a schedule set forth in the regulations.
<b>WTB-34</b>	Petition FEMA to commission a new study of the Mad River to reestablish 100-year flood heights.	Public Works	Drop	A new FEMA study is underway for the Naugatuck River basin, and this will be accomplished.
<b>WTB-35</b>	Depending on the results of the updated Dam Failure Analyses, request DEEP reclassify the hazard potential of Ridson Pond and Scovill Pond Dams	Mayor	Carry Forward with Revision	Scovill Pond Dam has been removed, and the pond itself has been drawn-down and no longer exists as an impoundment. Carry forward for Ridson Pond Dam.
<b>WTB-36</b>	Assist CT DEEP in performing a levee failure analysis outlining in detail the area of impact should the levee fail at the level of the 100- and 500-year flood	Public Works	Carry Forward	Action not yet completed due to limited municipal capacities.
<b>WTB-37</b>	Encourage owner to commission engineering study considering the removal of Frost Road Pond Dam	Public Works	Carry Forward	Action not yet completed due to limited municipal capacities.
<b>WTB-38</b>	Acquire ATV/UTV for fighting wildfires in outlying areas of the city	Fire Dept.	Carry forward	This is needed. The City may apply for an Assistance to Firefighter Grant. Consider adding to this action that the City would like water rescue equipment based on the drowning at East Mountain Reservoir last year.



Strategy	Description	Responsible Party	Status	Notes
<b>WTB-39</b>	Pursue acquisitions of properties along "paper streets" and retire these streets from use	Public Works	Carry forward	This strategy was deferred to a future HMP following incorporation into the City's 2015-2025 POCD. However, it was not incorporated into the POCD. The City may be involved with legal action associated with a delayed response to an overdose after a call to 911 from a paper street. Therefore, some progress is needed in addressing paper streets.
<b>WTB-40</b>	Consider property acquisitions along Connecticut & Ohio Avenues to reduce number of people affected by the limited plowing & emergency services	Mayor	Carry forward	This strategy was deferred to a future HMP following incorporation into the City's 2015-2025 POCD. However, it was not incorporated into the POCD.
<b>WTB-41</b>	Pursue the acquisition of additional open space properties located within or partly within SFHAs	Mayor	Capability	This strategy was deferred to a future HMP following incorporation into the City's POCD. POCD policy #21-5 states that the City should "Implement flood prevention strategies from the Hazard Mitigation Plan." This is likely a capability that can be accomplished when property and funding are available.

### 10.3 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.

### 10.4 Mitigation Strategies and Actions Implementation Table

The City 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 WTB-01	
<b>Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives:</b> <b>1. Disseminate a toolkit for pre-disaster business preparedness.</b> <b>2. Revise regulations to promote Low Impact Development.</b> <b>3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.</b>	
<b>Lead</b>	Plan
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT DEEP, Sustainable CT
<b>Timeframe</b>	2022
<b>Priority</b>	High

Action WTB-02	
<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>	
<b>Lead</b>	EM, Plan, FS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB
<b>Timeframe</b>	2022
<b>Priority</b>	High

Action WTB-03	
<b>Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.</b>	
<b>Lead</b>	EM, Plan, FS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT DEEP
<b>Timeframe</b>	2022
<b>Priority</b>	High

Action WTB-04	
<b>Clear brush and growth in the floodplain of the Mad River that could possibly inhibit flood flows at least every three years</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-05</b>	
<b>Fully incorporate the provisions of the DEEP model flood regulations into the local flood damage prevention regulations (or ordinance), including but not limited to the required design flood elevations for the first floor, building electrical systems, and building mechanical systems.</b>	
<b>Lead</b>	Plan, FS, NFIP Coordinator
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, FEMA Grant, CT DEEP
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-06</b>	
<b>Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.</b>	
<b>Lead</b>	Plan, FS, NFIP Coordinator
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, FEMA Grant, CT DEEP
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-07</b>	
<b>Remain engaged with CIRCA's Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.</b>	
<b>Lead</b>	Plan
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT DEEP, Resilient CT
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-08</b>	
<b>Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.</b>	
<b>Lead</b>	Plan, FS, NFIP Coordinator
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, FEMA Grant, CT DEEP
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-09</b>	
<b>Work with CIRCA to develop potential risk reduction pilot projects in the identified “adaptation/resilience opportunity areas” near and in locations of transit-oriented development (TOD).</b>	
<b>Lead</b>	Plan
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT DEEP, Resilient CT
<b>Timeframe</b>	2022
<b>Priority</b>	High

<b>Action WTB-10</b>	
<b>Develop intermunicipal agreements with other public works departments</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WTB-11</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, FS
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	CT DEEP
<b>Timeframe</b>	2022
<b>Priority</b>	Low

<b>Action WTB-12</b>	
<b>Add more information about natural hazards, emergency planning, shelter location, and general emergency preparedness to the Public Safety page of the City website. Update regularly.</b>	
<b>Lead</b>	OEM
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB
<b>Timeframe</b>	2022 – 2023
<b>Priority</b>	Low

<b>Action WTB-13</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 support the preparation of resiliency plans across the state.</b>	
<b>Lead</b>	Plan, HC/HDC
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT SHPO
<b>Timeframe</b>	2022 – 2023
<b>Priority</b>	Low

<b>Action WTB-14</b>	
<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>	
<b>Lead</b>	Plan, HC/HDC
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CT SHPO
<b>Timeframe</b>	2022 – 2023
<b>Priority</b>	Low

<b>Action WTB-15</b>	
<b>Encourage owner to commission engineering study considering the removal of Frost Road Pond Dam</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	OB, CT DEEP
<b>Timeframe</b>	2022 – 2023
<b>Priority</b>	High

<b>Action WTB-16</b>	
<b>Develop a prioritized list of generator needs for critical facilities, and incorporate into Capital Improvement Plan.</b>	
<b>Lead</b>	EM, DPW
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB, CIP
<b>Timeframe</b>	2022 – 2023
<b>Priority</b>	Low

<b>Action WTB-17</b>	
<b>Depending on the results of the updated Dam Failure Analyses, request DEEP reclassify the hazard potential of Ridson Pond.</b>	
<b>Lead</b>	Mayor
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	OB, CT DEEP
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Med

<b>Action WTB-18</b>	
<b>Ensure local utility providers are aware of landslide potential and have responder teams on call to repair damage caused by landslides</b>	
<b>Lead</b>	City Planning
<b>Cost</b>	\$0 - \$25,000
<b>Funding</b>	OB
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Low

<b>Action WTB-19</b>	
<b>Commission a City-wide Stormwater Management System Study containing drainage models useful to developers, and update every five years</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	FEMA Grant, CT DEEP
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Low

<b>Action WTB-20</b>	
<b>Perform engineering study for the Mark Lane Landfill area outlining how to better protect this area, as identified in the 2006 A-N Consulting Engineers, Inc report: "Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury."</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	FEMA Grant, CT DEEP
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Low

Action WTB-21	
<b>Perform engineering study for the Highland Metro North Railroad area outlining how to better protect this area, as identified in the 2006 A-N Consulting Engineers, Inc report: "Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury."</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$50,000 - \$100,000
<b>Funding</b>	FEMA Grant, CT DEEP
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Low

Action WTB-22	
<b>Develop early warning system for lightning at municipally owned parks and golf courses</b>	
<b>Lead</b>	OEM
<b>Cost</b>	\$25,000 - \$50,000
<b>Funding</b>	OB, CT DEMHS
<b>Timeframe</b>	2022 – 2024
<b>Priority</b>	Low

Action WTB-23	
<b>Acquire ATV/UTV for fighting wildfires in outlying areas of the city</b>	
<b>Lead</b>	Fire Dept.
<b>Cost</b>	\$100,000 - \$500,000
<b>Funding</b>	CIP, FEMA Grant, FEMA AFG, CT DEEP
<b>Timeframe</b>	2023 – 2025
<b>Priority</b>	Low

Action WTB-24	
<b>Perform installation and repair of curbing (ref. Table 3-4)</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	More than \$500,000
<b>Funding</b>	OB, CIP, FEMA Grant, CT DEEP
<b>Timeframe</b>	2023 – 2025
<b>Priority</b>	Med

<b>Action WTB-25</b>	
<b>Perform installation of stormwater systems for (ref. Table 3-5)</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	More than \$500,000
<b>Funding</b>	OB, CIP, FEMA Grant, CT DEEP
<b>Timeframe</b>	2023 – 2025
<b>Priority</b>	Med

<b>Action WTB-26</b>	
<b>Repair stormwater and drainage systems (ref. Table 3-6)</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	More than \$500,000
<b>Funding</b>	OB, CIP, FEMA Grant, CT DEEP
<b>Timeframe</b>	2023 – 2025
<b>Priority</b>	Med

<b>Action WTB-27</b>	
<b>Secure mitigation funds for replacing and possibly relocating the 24-inch and 16-inch water mains in the eastern part of the City</b>	
<b>Lead</b>	Water Department
<b>Cost</b>	More than \$500,000
<b>Funding</b>	OB, CIP, FEMA Grant, CT DEEP
<b>Timeframe</b>	2023 – 2025
<b>Priority</b>	Med

<b>Action WTB-28</b>	
<b>Conduct Clough Brook watershed mitigation projects.</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	\$100,000 - \$500,000
<b>Funding</b>	OB, CIP, FEMA Grant
<b>Timeframe</b>	2024 – 2026
<b>Priority</b>	Low



Action WTB-29	
Assist CT DEEP in performing a levee failure analysis outlining in detail the area of impact should the levee fail at the level of the 100- and 500-year flood	
Lead	Public Works
Cost	\$100,000 - \$500,000
Funding	OB, CIP, FEMA Grant
Timeframe	2024 – 2026
Priority	Low

Action WTB-30	
Purchase GPS units for ancillary plowing vehicles for which GPS units have not yet been acquired.	
Lead	Mayor
Cost	\$50,000 - \$100,000
Funding	OB, CT DEMHS
Timeframe	2024 – 2026
Priority	Low

Action WTB-31	
Reconstruct Waterville Street and restore a proper angle to the slope to prevent future landslides	
Lead	Public Works
Cost	\$100,000 - \$500,000
Funding	CIP, CT DEEP
Timeframe	2024 – 2026
Priority	Low

Action WTB-32	
Pursue property acquisitions in the area of flooding near Pritchard's Pond	
Lead	Mayor
Cost	More than \$1 million
Funding	FEMA Grant, CT DEEP
Timeframe	2024 – 2026
Priority	Low

<b>Action WTB-33</b>	
<b>Pursue acquisitions of properties along "paper streets" and retire these streets from use</b>	
<b>Lead</b>	Public Works
<b>Cost</b>	More than \$1 million
<b>Funding</b>	FEMA Grant, CT DEEP
<b>Timeframe</b>	2024 – 2026
<b>Priority</b>	Low

<b>Action WTB-34</b>	
<b>Consider property acquisitions along Connecticut &amp; Ohio Avenues to reduce number of people affected by the limited plowing &amp; emergency services</b>	
<b>Lead</b>	Mayor
<b>Cost</b>	More than \$1 million
<b>Funding</b>	FEMA Grant, CT DEEP
<b>Timeframe</b>	2024 – 2026
<b>Priority</b>	Low

## 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		
WTB-01	Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: 1. Disseminate a toolkit for pre-disaster business preparedness. 2. Revise regulations to promote Low Impact Development. 3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update	Sustainable CT	Plan	\$0 - \$25,000	OB, CT DEEP, Sustainable CT	2022	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	9
WTB-02	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.	RLP	EM, Plan, FS	\$0 - \$25,000	OB	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	7
WTB-03	Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	RLP	EM, Plan, FS	\$0 - \$25,000	OB, CT DEEP	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	7
WTB-04	Encourage owner to commission engineering study considering the removal of Frost Road Pond Dam	Dam Safety	Public Works	\$25,000 - \$50,000	OB, CT DEEP	2022 – 2023	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	8
WTB-05	Clear brush and growth in the floodplain of the Mad River that could possibly inhibit flood flows at least every three years	Administration, Enforcement, & Maintenance	Public Works	\$0 - \$25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	0	6
WTB-06	Fully incorporate the provisions of the DEEP model flood regulations into the local flood damage prevention regulations (or ordinance), including but not limited to the required design flood elevations for the first floor, building electrical systems, and building mechanical systems.	Flood Regulations	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	0	5
WTB-07	Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	Flood Regulations	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	0	5
WTB-08	Remain engaged with CIRCA’s Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.	Resilient CT	Plan	\$0 - \$25,000	OB, CT DEEP, Resilient CT	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	7
WTB-09	Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.	Flood Map Updates	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	0	5
WTB-10	Work with CIRCA to develop potential risk reduction pilot projects in the identified “adaptation/resilience opportunity areas” near and in locations of transit-oriented development (TOD).	Resilient CT	Plan	\$0 - \$25,000	OB, CT DEEP, Resilient CT	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	7
WTB-11	Depending on the results of the updated Dam Failure Analyses, request DEEP reclassify the hazard potential of Ridson Pond.	Dam Safety	Mayor	\$25,000 - \$50,000	OB, CT DEEP	2022 – 2024	0	1	1	1	1	1	0	0	0	0	0	0	0	0	-1	6.5
WTB-12	Perform installation and repair of curbing (ref. Table 3-4)	Drainage	Public Works	More than \$500,000	OB, CIP, FEMA Grant, CT DEEP	2023 – 2025	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	0	6.5
WTB-13	Perform installation of stormwater systems for (ref. Table 3-5)	Drainage	Public Works	More than \$500,000	OB, CIP, FEMA Grant, CT DEEP	2023 – 2025	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	0	6.5
WTB-14	Repair stormwater and drainage systems (ref. Table 3-6)	Drainage	Public Works	More than \$500,000	OB, CIP, FEMA Grant, CT DEEP	2023 – 2025	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	0	6.5
WTB-15	Secure mitigation funds for replacing and possibly relocating the 24-inch and 16-inch water mains in the eastern part of the City	Drainage	Water Department	More than \$500,000	OB, CIP, FEMA Grant, CT DEEP	2023 – 2025	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	0	6.5
WTB-16	Develop intermunicipal agreements with other public works departments	Administration, Enforcement, & Maintenance	Public Works	\$0 - \$25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	0	6
WTB-17	Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	Small Business Chemicals	EM, FS	\$0 - \$25,000	CT DEEP	2022	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	6
WTB-18	Commission a City-wide Stormwater Management System Study containing drainage models useful to developers, and update every five years	Study	Public Works	\$50,000 - \$100,000	FEMA Grant, CT DEEP	2022 – 2024	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5
WTB-19	Perform engineering study for the Mark Lane Landfill area outlining how to better protect this area, as identified in the 2006 A-N Consulting Engineers, Inc report: "Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury."	Study	Public Works	\$50,000 - \$100,000	FEMA Grant, CT DEEP	2022 – 2024	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5
WTB-20	Perform engineering study for the Highland Metro North Railroad area outlining how to better protect this area, , as identified in the 2006 A-N Consulting Engineers, Inc report: "Damage Assessment Report for the Extreme Rainfall Event that Occurred June 2, 2006 Within the City of Waterbury."	Study	Public Works	\$50,000 - \$100,000	FEMA Grant, CT DEEP	2022 – 2024	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	5

#	Action Description	Regional Theme	Lead Department	Cost Estimate	Potential Funding Sources	Timeframe for Completion	Weighted STAPLEE Criteria														Total STAPLEE Score
							Benefits							Costs							
							Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	
WTB-21	Acquire ATV/UTV for fighting wildfires in outlying areas of the city	Wildfire Risk Reduction	Fire Dept.	\$100,000 - \$500,000	CIP, FEMA Grant, FEMA AFG, CT DEEP	2023 – 2025	0	1	0	0	1	1	1	0	0	0	0	0	0	0	6
WTB-22	Add more information about natural hazards, emergency planning, shelter location, and general emergency preparedness to the Public Safety page of the City website. Update regularly.	Public Education & Engagement	OEM	\$0 - \$25,000	OB	2022 – 2023	1	0.5	0	1	1	1	0	0	0	-1	0	0	0	0	5.5
WTB-23	Pursue property acquisitions in the area of flooding near Pritchard's Pond	Acquisition & Open Space	Mayor	More than \$1 million	FEMA Grant, CT DEEP	2024 – 2026	1	1	0	0	1	1	1	-1	0	0	-1	0	0	0	5.5
WTB-24	Pursue acquisitions of properties along "paper streets" and retire these streets from use	Acquisition & Open Space	Public Works	More than \$1 million	FEMA Grant, CT DEEP	2024 – 2026	1	1	0	0	1	1	1	-1	0	0	-1	0	0	0	5.5
WTB-25	Consider property acquisitions along Connecticut & Ohio Avenues to reduce number of people affected by the limited plowing & emergency services	Acquisition & Open Space	Mayor	More than \$1 million	FEMA Grant, CT DEEP	2024 – 2026	1	1	0	0	1	1	1	-1	0	0	-1	0	0	0	5.5
WTB-26	Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to support the preparation of resiliency plans across the state.	Historic & Cultural Resources	Plan, HC/HDC	\$0 - \$25,000	OB, CT SHPO	2022 – 2023	1	0	1	1	0	1	0	0	0	0	0	0	0	0	5
WTB-27	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.	Historic & Cultural Resources	Plan, HC/HDC	\$0 - \$25,000	OB, CT SHPO	2022 – 2023	1	0	1	1	0	1	0	0	0	0	0	0	0	0	5
WTB-28	Conduct Clough Brook watershed mitigation projects.	Flood Mitigation	Public Works	\$100,000 - \$500,000	OB, CIP, FEMA Grant	2024 – 2026	0	1	0	1	0	1	0	0	0	0	0	0	0	0	5
WTB-29	Assist CT DEEP in performing a levee failure analysis outlining in detail the area of impact should the levee fail at the level of the 100- and 500-year flood	Flood Mitigation	Public Works	\$100,000 - \$500,000	OB, CIP, FEMA Grant	2024 – 2026	0	1	0	1	0	1	0	0	0	0	0	0	0	0	5
WTB-30	Develop a prioritized list of generator needs for critical facilities, and incorporate into Capital Improvement Plan.	Backup Power	EM, DPW	\$0 - \$25,000	OB, CIP	2022 – 2023	0	0.5	1	1	0	1	0	0	0	0	0	0	-1	-1	3
WTB-31	Reconstruct Waterville Street and restore a proper angle to the slope to prevent future landslides	Landslide Mitigation	Public Works	\$100,000 - \$500,000	CIP, CT DEEP	2024 – 2026	0	1	0	0	1	0	1	0	0	0	0	0	0	0	4
WTB-32	Develop early warning system for lightning at municipally owned parks and golf courses	Emergency Response, Alerts, & Communication	OEM	\$25,000 - \$50,000	OB, CT DEMHS	2022 – 2024	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	3.5
WTB-33	Purchase GPS units for ancillary plowing vehicles for which GPS units have not yet been acquired.	Emergency Response, Alerts, & Communication	Mayor	\$50,000 - \$100,000	OB, CT DEMHS	2024 – 2026	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	3.5
WTB-34	Ensure local utility providers are aware of landslide potential and have responder teams on call to repair damage caused by landslides	Landslide Mitigation	City Planning	\$0 - \$25,000	OB	2022 – 2024	0	1	0	0	1	0	1	0	0	0	-1	0	0	0	3

## **APPENDIX B**

### **RECORD OF MUNICIPAL ADOPTION**





CERTIFICATE OF ADOPTION  
BOARD OF ALDERMEN  
CITY OF WATERBURY

**A RESOLUTION ADOPTING THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS  
HAZARD MITIGATION PLAN UPDATE, 2021-2026**

WHEREAS, the City of Waterbury has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of those natural hazards profiled in the plan (e.g. *flooding, high wind, thunderstorms, winter storms, earthquakes, droughts, dam failure, and wildfires*), resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Board of Aldermen, City of Waterbury approved the previous version of the Plan in 2014; and

WHEREAS, the City of Waterbury and the Naugatuck Valley Council of Governments developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for the Hazard Mitigation Plan Update, 2021-2026 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held and public input was sought in 2020 and 2021 regarding the development and review of the Hazard Mitigation Plan Update, 2021-2026; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for Waterbury; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact Waterbury, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make Waterbury eligible for funding to alleviate the impacts of future hazards; now therefore be it


RESOLVED by the Board of Aldermen:

1. The Plan is hereby adopted as an official plan of the City of Waterbury;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Aldermen.

**Adopted this 10th day of January, 2022 by the Board of Aldermen, Waterbury, Connecticut**

  
\_\_\_\_\_  
Mayor: Neil M. O'Leary

**IN WITNESS WHEREOF**, the undersigned has affixed his/her signature and the corporate seal of Waterbury this  
10 day of January, 2022.

  
\_\_\_\_\_  
City Clerk: Michael J. Dalton



## APPENDIX C

CERC City Profile 2019

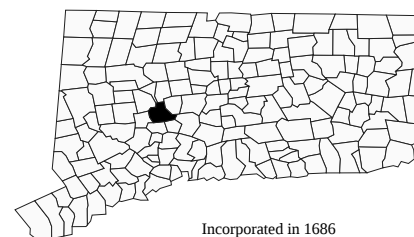


# Waterbury, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

**Town Hall**  
235 & 236 Grand Street  
Waterbury, CT 06702  
(203) 574-6716

*Belongs To*  
New Haven County  
LMA Waterbury  
Naugatuck Valley Planning Area



Incorporated in 1686

## Demographics

### Population

	<i>Town</i>	<i>County</i>	<i>State</i>
2000	107,271	824,008	3,405,565
2010	110,366	862,477	3,574,097
2013-2017	109,250	862,127	3,594,478
2020	112,571	898,514	3,604,591
'17 - '20 Growth / Yr	1.0%	1.3%	0.1%

	<i>Town</i>	<i>County</i>	<i>State</i>
Land Area (sq. miles)	29	605	4,842
Pop./Sq. Mile (2013-2017)	3,831	1,426	742
Median Age (2013-2017)	35	40	41
Households (2013-2017)	39,816	327,402	1,361,755
Med. HH Inc. (2013-2017)	\$40,879	\$64,872	\$73,781

	<i>Town</i>	<i>State</i>
Veterans (2013-2017)	3,788	180,111

### Age Distribution (2013-2017)

	<i>0-4</i>	<i>5-14</i>	<i>15-24</i>	<i>25-44</i>	<i>45-64</i>	<i>65+</i>	<i>Total</i>
Town	7,619 7%	15,655 14%	15,680 14%	29,751 27%	26,468 24%	14,077 13%	109,250 100%
County	45,072 5%	100,549 12%	120,727 14%	216,208 25%	240,037 28%	139,534 16%	862,127 100%
State	186,188 5%	432,367 12%	495,626 14%	872,640 24%	1,031,900 29%	575,757 16%	3,594,478 100%

### Race/Ethnicity (2013-2017)

	<i>Town</i>	<i>County</i>	<i>State</i>
White Non-Hisp	42,046	553,000	2,446,049
Black Non-Hisp	19,555	105,661	350,820
Asian Non-Hisp	2,873	33,678	154,910
Native American Non-Hisp	17	783	5,201
Other/Multi-Race Non-Hisp	4,160	20,489	84,958
Hispanic or Latino	40,599	148,446	551,916

	<i>Town</i>	<i>County</i>	<i>State</i>
Poverty Rate (2013-2017)	24.3%	12.1%	10.1%

### Educational Attainment (2013-2017)

Educational Attainment (2015-2017)	Town		State	
High School Graduate	25,435	36%	673,582	27%
Associates Degree	5,168	7%	188,481	8%
Bachelors or Higher	11,156	16%	953,199	38%

## Economics

### Business Profile (2018)

<i>Sector</i>	<i>Units</i>	<i>Employment</i>
Total - All Industries	2,474	39,841
23 - Construction	130	871
31-33 - Manufacturing	131	3,338
44-45 - Retail Trade	440	5,457
62 - Health Care and Social Assistance	331	10,736
72 - Accommodation and Food Services	232	2,771
Total Government	58	6,630

### Top Five Grand List (2018)

	<i>Amount</i>
Yankee Gas Services Company	\$161,018,050
Connecticut Light and Power	\$112,120,680
Brass Mill Center Mall LLC	\$73,376,780
Prospect Waterbury Inc	\$68,258,914
Waterbury Generation LLC	\$46,017,130
Net Grand List (SFY 2016-2017)	\$4,093,781,469

### Major Employers (2014)

City of Waterbury	Waterbury Hospital
Saint Mary's Hospital	Naugatuck Valley Community College
New Opportunities of Waterbury	

## Education

### 2018-2019 School Year

	<i>Grades</i>	<i>Enrollment</i>
Waterbury School District	PK-12	18847

### Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	27.1%	53.8%	25.6%	51.3%	12.4%	43.0%
ELA	27.9%	53.1%	28.2%	54.9%	26.4%	56.1%

### Pre-K Enrollment (PSIS)

	<i>2018-2019</i>
Waterbury School District	779

### Rate of Chronic Absenteeism (2017-2018)

	<i>All</i>
Connecticut	10.7%
Waterbury School District	18.2%

### 4-Year Cohort Graduation Rate (2017-2018)

	<i>All</i>	<i>Female</i>	<i>Male</i>
Connecticut	88.3%	91.8%	85.1%
Waterbury School District	76.7%	80.3%	73.2%

### Public vs Private Enrollment (2013-2017)

	<i>Town</i>	<i>County</i>	<i>State</i>
Public	89.7%	88.2%	86.8%
Private	10.3%	11.8%	13.2%

# Waterbury, Connecticut

CERC Town Profile 2019



Connecticut  
Economic  
Resource Center

## Government

Government Form: Mayor - Council

Total Revenue (2017)	\$453,470,000	Total Expenditures (2017)	\$401,751,000	Annual Debt Service (2017)	\$48,685,000
Tax Revenue	\$238,981,000	Education	\$201,163,000	As % of Expenditures	12.1%
Non-tax Revenue	\$214,489,000	Other	\$200,588,000	Eq. Net Grand List (2017)	\$5,805,276,093
Intergovernmental	\$192,754,000	Total Indebtedness (2017)	\$428,129,000	Per Capita	\$53,441
Per Capita Tax (2017)	\$2,178	As % of Expenditures	106.6%	As % of State Average	35.4%
As % of State Average	74.3%	Per Capita	\$3,941	Moody's Bond Rating (2017)	A1
		As % of State Average	156.8%	Actual Mill Rate (2017)	60.21
				Equalized Mill Rate (2017)	40.75
				% of Net Grand List Com/Ind (2017)	21.5%

## Housing/Real Estate

### Housing Stock (2013-2017)

	<b>Town</b>	<b>County</b>	<b>State</b>
Total Units	47,026	365,546	1,507,711
% Single Unit (2013-2017)	36.7%	53.6%	59.2%
New Permits Auth (2017)	29	750	4,547
As % Existing Units	0.1%	0.2%	0.3%
Demolitions (2017)	63	202	1,403
Home Sales	NA	4,763	21,880
Median Price	\$128,600	\$244,400	\$270,100
Built Pre-1950 share	38.8%	33.2%	29.3%
Owner Occupied Dwellings	17,242	204,037	906,798
As % Total Dwellings	43.3%	62.3%	66.6%
Subsidized Housing (2018)	10,046	46,013	167,879

### Distribution of House Sales

	<b>Town</b>	<b>County</b>	<b>State</b>
Less than \$100,000	NA	106	536
\$100,000-\$199,999	NA	1,232	5,237
\$200,000-\$299,999	NA	1,785	6,681
\$300,000-\$399,999	NA	888	3,863
\$400,000 or More	NA	752	5,563

### Rental (2013-2017)

	<b>Town</b>	<b>County</b>	<b>State</b>
Median Rent	\$924	\$1,100	\$1,123
Cost-burdened Renters	58.1%	54.5%	52.3%

## Labor Force

	<b>Town</b>	<b>County</b>	<b>State</b>
Residents Employed	47,623	438,576	1,827,070
Residents Unemployed	3,350	20,171	78,242
Unemployment Rate	6.6%	4.4%	4.1%
Self-Employed Rate	6.4%	8.5%	10.0%
Total Employers	2,474	24,958	122,067
Total Employed	39,841	366,848	1,673,867

### Connecticut Commuters (2015)

<b>Commuters Into Town From:</b>			<b>Town Residents Commuting To:</b>	
Waterbury, CT	13,901	Waterbury, CT	13,901	
Watertown, CT	2,380	Cheshire, CT	1,963	
Naugatuck, CT	1,853	Watertown, CT	1,915	
Wolcott, CT	1,739	Naugatuck, CT	1,477	
Bristol, CT	1,029	Hartford, CT	1,250	
Southington, CT	925	New Haven, CT	1,063	
Prospect, CT	838	Southington, CT	1,042	

## Quality of Life

### Crime Rates (per 100,000 residents) (2017)

	<b>Town</b>	<b>State</b>
Property	3,665	1,777
Violent	484	228

### Disengaged Youth (2013-2017)

	<b>Town</b>	<b>State</b>
Female	7.5%	4.2%
Male	7.3%	5.6%

	<b>Town</b>
Library circulation per capita	1.29

### Distance to Major Cities

	<b>Miles</b>
Hartford	23
New York City	77
Providence	85
Boston	117
Montreal	278

### Residential Utilities

<b>Electric Provider</b>
Eversource Energy (800) 286-2000
<b>Gas Provider</b>
Eversource Energy (800) 989-0900
<b>Water Provider</b>
Connecticut Water Company (800) 286-5700
<b>Cable Provider</b>
Comcast Waterbury (800) 266-2278