Naugatuck Valley Council of Governments

Hazard Mitigation Plan Update

2021 – 2026

Municipal Annex
for

MIDDLEBURY, CT

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Middlebury, CT 06762
MMI #3211-29

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1.0 INTRODUCTION

1.1 Purpose of Annex

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

A meeting was held with Middlebury representatives on December 09, 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, Ed St. John.

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

The Town of Middlebury is located in northern New Haven County at the intersection of Routes 64 and 188. It is bordered by the Town of Watertown to the north, The Town of Woodbury to the north and west, the Town of Southbury to the west, the Town of Oxford to the south, the Borough of Naugatuck to the east and south, and the City of Waterbury to the east.

Almost the entire east and northeastern section of Middlebury lies within the Hop Brook watershed, while some areas of town are in the Steele Brook, Nonnewaug River, Eightmile Brook, Little River, and Long Meadow Pond Brook watersheds. Hop Brook, the Town's major watercourse, runs north-south before entering Hop Brook Lake and leaving Middlebury through the town of Waterbury and the Borough of Naugatuck.

Lake Quassapaug lies in the northwest section of Town. This section of Middlebury features many hills with steep relief near and extending into the southeastern portion of the Town of Woodbury. Eightmile Brook extends southward from Lake Quassapaug and follows the border between Middlebury and the Towns of Woodbury and Southbury. Long Meadow Pond is orientated northwest-southeast ad extends into the Town of Oxford from Middlebury's southern town boundary.

The town is comprised of suburban neighborhoods, rural country areas, and historic districts. Middlebury is also home to convalescent homes, a home for the blind, many day care centers, and a handicap assistantship home.

1.4 Land Cover

Middlebury is characterized by hills and poor soils for septic systems, which together limit large-scale development in much of the Town. A limited commercial district is located in the center of town along Middlebury Road (Route 64). A concentration of municipal facilities is located southwest of the commercial district opposite Westover School. Outside of this town center, low density residential neighborhoods are interspersed with agricultural areas. An industrial area is located in the southwestern part of the town.

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 61% of Middlebury is forested and approximately 19% is developed.

Table 1-1: 2015 Land Cover by Area

Land Cover	Area (acres)	Percent of Community
Developed	2,253.7	19.12%
Turf & Grass	924.7	7.84%
Other Grass	131.1	1.11%
Agricultural Field	722.7	6.13%
Deciduous Forest	6,130.6	52.01%
Coniferous Forest	377.2	3.20%
Water	450.2	3.82%
Non-Forested Wetland	56.4	0.48%
Forested Wetland	676.9	5.74%
Tidal Wetland	0.0	0.00%
Barren	21.5	0.18%
Utility Row	43.1	0.37%
Total	**11,788**	**100%**

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 Middlebury.

The Town of Middlebury is comprised of three different bedrock geological formations. The Waterbury gneiss formation, the formation covering the largest area of Middlebury, is found throughout the central,

eastern and northeastern sections of town. The basal member of the Taine Formation around the Waterbury dome is the second largest geologic formation and is found in the northwest and southwest sections of Town. The formation covering the smallest area in Town is the Taine Mountain/Collinsville formation in the extreme southeastern corner of Middlebury.

At least twice in the late Pleistocene, continental ice sheets moved across Connecticut. As a result, surficial geology of the Town is characteristic of the depositional environments that occurred during glacial and postglacial periods.

Almost the entire Town is covered by glacial till. Tills contain an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. A smaller percentage of the Town consists primarily of stratified sand and gravel ("stratified drift") areas associated with watercourses. These deposits accumulated by glacial meltwater streams during the outwash period following the latest glacial recession. Stratified drift deposits are aligned along Hop Brook, Long Meadow Brook, and Shattuck Brook.

The amount of stratified drift present in the Town 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. The Hop Brook corridor is a good example.

- The amount of stratified drift also has bearing on the relative intensity of earthquakes.

1.6 Drainage Basins and Hydrology

The Town of Middlebury is drained by six major watersheds corresponding to Hop Brook, Long Meadow Pond Brook, Eightmile River, the Nonnewaug River, the Little River, and Steele Brook. These are described below. About 98% of the Town's land area is drained by three basins: Hop Brook, Long Meadow Pond Brook, and Eightmile River. The entire Town eventually drains into the Housatonic River, and the great majority of it drains eastward toward the Naugatuck River before entering the Housatonic. While Middlebury is home to many lakes and ponds, its largest body of water is the 271-acre Lake Quassapaug.

Table 1-2: Drainage Basins

Drainage Basin	Area (sq. mi)	Percent of Town
Hop Brook	10.32	56.03%
Long Meadow Pond Brook	4.10	22.26%
Eightmile River	3.60	19.55%
Nonnewaug River	0.29	1.57%
Little River	0.10	0.54%
Steele Brook	0.01	0.05%
Total	*18.42*	*100.0*

Source: Drainage Basins, 2008 CT DEEP GIS Data for Connecticut

Hop Brook

Hop Brook has by far the largest drainage basin in the Town of Middlebury, covering 10.32 square miles or 56% of the Town's land area. It originates in the northwestern part of Town, briefly flows to the northeast through the Town of Watertown, and continues to the southeast through the Middlebury before leading into the Naugatuck River in the Borough of Naugatuck.

In addition to a number of unnamed tributaries, there are several smaller named tributaries that flow into the Hop Brook watercourse during this stretch, including Goat Brook, Long Swamp Brook, and Welton Brook in the Town of Middlebury, and Pigeon Brook in the Borough of Naugatuck. The largest body of water that Hop Brook passes through is Hop Brook Lake, a flood control reservoir located on the border between Waterbury and Middlebury, just to the north of the Borough of Naugatuck. The Hop Brook drainage basin has a total area of 17.40 square miles of land located within the Towns of Naugatuck, Waterbury, Middlebury, Watertown and Woodbury.

Long Meadow Pond Brook

The Long Meadow Pond Brook drainage basin is the second-largest in the Town of Middlebury. The drainage basin covers 4.10 square miles of the Town or 22.3% of its total land area.

The headwaters of Long Meadow Pond Brook are located in Lake Elise in the western section of Middlebury. Originating at the lake, Long Meadow Pond Brook flows southward into Long Meadow Pond, a body of water with a surface area of approximately 100 acres. The Brook continues to meander eastward into the Town of Naugatuck, picking up a number of unnamed tributaries before entering the Naugatuck River. In total, the Long Meadow Pond Brook Watershed drains 8.47 square miles of land within the Towns of Naugatuck, Middlebury and Oxford.

Eightmile River

Eightmile River is the third-largest drainage basin in the Town of Middlebury. The drainage basin covers 3.60 square miles, or 19.5% of the Town's total land area.

The watercourse's headwaters are located in the 271-acre Lake Quassapaug located in the western section of Middlebury. South of Lake Quassapaug, Eightmile River enters Kelley Pond. Beginning just to the south of Kelley Pond, Eightmile River comprises the border with the Town of Southbury. Several tributaries that are located within the Town of Southbury enter Eightmile River during this stretch. An unnamed tributary enters the Brook in a wetland along Judd Road. Another unnamed tributary enters the Brook to the south near its crossing with Interstate 84. Walnut Hill Brook meets Eighmile River just upstream of Route 67. One final watercourse, Jeremy Brook, enters Eightmile River from the Southbury side where the section of the Brook comprises the Town of Southbury's eastern border.

After leaving Southbury and entering the Town of Oxford, Eightmile River is joined by a number of watercourses, including Sevenmile Brook, Sixmile Brook, and several unnamed tributaries, before its confluence with the Housatonic River in the Town of Oxford. In all, the Eightmile River basin drains 17.44 square miles across the Towns of Oxford, Southbury, Middlebury, and Woodbury.

Nonnewaug River

A very small 0.29 square mile section of land, or 1.6% of the total land area in the northwestern corner of the Town of Middlebury, is within the Nonnewaug River drainage basin. The Nonnewaug River flows from the Town of Bethlehem into the Town of Woodbury. After passing underneath Route 47 in Woodbury, the Nonnewaug River converges with the Weekeepeemee River, forming the Pomperaug River and entering a new subregional drainage basin. In all, Nonnewaug River drainage basin drains 21.26 square miles of land in the Towns of Bethlehem, Watertown, Woodbury, and Middlebury.

Little River

The Little River drainage basin drains 0.10 square miles, or 0.5% of the Town of Middlebury on its southernmost border adjacent to the Town of Oxford. It originates in the western portion of the Town of Oxford and flows to the southeast. In all, the Little River watershed drains 15.50 square miles of land in the Towns of Seymour, Beacon Falls, Oxford, Middlebury and Naugatuck.

Steele Brook

A 0.01 square mile portion of the Town of Middlebury, or 0.05% of the Town's land area, flows into the Steele Brook drainage basin. The Steele Brook watercourse's headwaters are located in a small, unnamed pond along Route 63 in the Town of Watertown. It flows to the southeast and is joined by a number of tributaries before eventually converging with the Naugatuck River in the City of Waterbury near the junction of Routes 8 and 73. The Steele Brook drainage basin covers 17.04 square miles in total in the Towns of Waterbury, Watertown, and Middlebury.

1.7 Climate and Climate Change

In Middlebury, 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 19°F to 81°F and is rarely below 5°F or above 88°F.

The warm season lasts for 3.5 months, from May 31 to September 16, with an average daily high temperature above 71°F. The hottest day of the year is July 20, 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 43°F. The coldest day of the year is January 30, with an average low of 19°F and high of 34°F.

The wetter season lasts 3.5 months, from May 4 to August 19, with a greater than 30% 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 19 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 5.5 months, from November 1 to April 18, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 25, with an average total liquid-equivalent accumulation of 1.2 inches.

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

Climate Change

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

Temperature

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

Precipitation

Rainfall data in "Technical Paper No. 40" by the U.S. Weather Bureau (now the National Weather Service) (Hershfield, 1961) dates from the years 1938 through 1958. According to these data, the 24-hour rainfall amount for a 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 Middlebury as 4.95 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 10% annual-chance storm in Middlebury at 5.64 inches.

These precipitation amounts, and more details, are summarized in Table 1-3, below.

Table 1-3: 24-Hour Rainfall Amounts by Annual-Chance Occurrence

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	10%	4%	1%
Technical Paper No. 40	5.0	5.6	7.1
NRCC	5.0	6.2	8.7
NOAA Atlas 14	5.6	6.9	8.9

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 Middlebury can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.4 to 6.1 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

Middlebury was settled in 1702 and experienced a significant increase in population following the Revolutionary War. The Town was officially incorporated in 1807 and was comprised of parts of Southbury, Waterbury, and Woodbury. The Town's origins were largely agrarian with dairy farming serving as a fundamental component of the local economy even into the 20th century. Due to the hilly topography and lack of a source of hydropower, Middlebury did not become industrialized like many other towns in the region. Light industry present in the 1800s included wool and silk production.

The 2010 U.S. Census reported a population in Middlebury of 7,739 individuals. U.S. Census Bureau estimates for 2019 show a population around 8,412 individuals, an increase from 2010 of 8.7%. The Connecticut State Data Center predicts that population will decrease by 1.1% through 2025 to an estimated population of 1,576 individuals.

According to the Connecticut Data Collaborative, the number of annual housing permits in Middlebury increased over the last decade. The number of permits issued in 2010 and 2011 was 7 and 4, respectively, while 27 permits were issued in 2016, and 22 permits were issued in 2017. On average, 18 housing permits were issued each year in Middlebury between 2010 and 2017.

According to the U.S. Census Bureau, the overall number of housing units in Middlebury rose by approximately 5.1-percent between 2010 and 2019, from 2,892 units in 2010 to 3,046 units in 2019. In 2019, the housing stock was made up of approximately 93% single-unit structures, 0% two-unit structures, 7% multi-unit structures, and 0% mobile-homes or other types of structures.

According to the Connecticut Office of Policy and Management, Middlebury's 2019 Total Equalized Net Grand List was valued at $971,000,000. The equalized net grand list is an estimate of the market value of all taxable property in the municipality, and gives some indication of the value of property at risk in the event of a major natural disaster.

Additional information can be found in the 2019 Connecticut Economic Resource Center profile for Middlebury, included as Appendix C.

Based on the town's Plan of Conservation and Development, efforts are being made to preserve Middlebury's rural character and limit the impact of future development through land dedication, acquisition, and conservation programs.

Cul-de-sacs in new developments are discouraged and connectivity of roads is encouraged in Section 6.0 of the *Middlebury Subdivision Regulations* and Section 9.12 of the *Middlebury Road and Drainage Regulations*. Subdivisions featuring cul-de-sacs offer a single access point for emergency services, lengthening emergency response times and rendering those residential areas vulnerable if access is cut off by flooding or downed tree limbs. The Town of Middlebury requires a 50-foot right of way for local

residential streets with a hammerhead located at the end of dead end streets, and the number of homes at the end of dead end streets should be kept to a minimum.

Utilities serving new developments must be installed underground wherever possible, according to Section 6.8 of the Middlebury Subdivision Regulations. Exceptions due to shallow bedrock are granted on a case-by-case basis.

Residential development is reportedly booming. The Town of Middlebury has continued to ensure that new development is sited and approved with minimal risk from natural hazards.

Recent developments include:

- A 50-home development was constructed off Benson Road.
- A large cluster-type development of 326 units known as Ridgewood was constructed over the course of several years through five phases near the center of town.
- The Toll Brothers housing project is 2/3 to 3/4 built out. The project (formally known as Ridgewood) is sometimes called "the City of Ridgewood."
- The Route 63 corridor near Watertown is reportedly booming. New medical buildings are being developed in this area.
- 199 Benson Road, the former Chemtura facility, will eventually be redeveloped.

In addition to residential subdivisions, minor commercial development has recently taken place in Middlebury, with much of the development occurring within the location of the former Timex World Headquarter Complex. Much of the property has now been redeveloped and is being used as a business park.

Summary

A relatively significant amount of residential and commercial development has occurred in Middlebury. While this development has been located outside of risk zones, the presence of additional population and infrastructure represents an increase in hazard exposure and vulnerability. By maintaining and improving hazard mitigation capabilities, the Town has minimized the impact of this rising vulnerability on overall risk. Continued development in Middlebury is not expected to increase overall natural hazard risks in the next five years, as ongoing improvements to the community's hazard mitigation capabilities and continued enforcement of zoning and building regulations balance the pace of development.

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 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 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 resources in Middlebury 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

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

Middlebury is considered to have a Low to Medium level of social vulnerability, with a relatively higher vulnerability score for the SVI categories of Housing Type & Transportation, and Socioeconomic Status. In other words, a particular challenge in Middlebury may include the presence of lower-quality housing, or lack of access to transportation for evacuation; or a lack of access to financial resources.

2.0 MUNICIPAL CAPABILITIES

2.1 Governmental Structure and Capabilities

The Town of Middlebury is governed by a Selectman-Town Meeting form of government in which legislative responsibilities are shared by the Board of Selectmen and the Town Meeting. The First Selectman serves as the chief executive.

In addition to Board of Selectmen and the Town Meeting, there are boards, commissions and committees providing input and direction to town administrators. Also, town departments provide municipal services and day-to-day administration. Many of these commissions and departments play a role in hazard mitigation, including the Planning & Zoning Commission, the Conservation Commission, the Economic & Industrial Development Commission, the Land Preservation Commission, the Building Department, the Fire Commission, the Police Commission, the Public Works Committee, the Fire Department, the Police Department, the Highway Department and the Emergency Management Services. The Emergency Management Director for the Town of Middlebury is the Fire Chief.

The Public Works Department is a critical municipal department related to hazard mitigation because it maintains, repairs, and constructs stormwater systems and roadways. The generator at the Public Works facility is dated and only powers basic operations. Therefore, the town may consider purchasing a new generator for this facility.

The 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 Department of Public Works is the principal municipal department that responds to problems caused by natural hazards. Complaints related to town maintenance issues are routed to the Department of Public Works. The complaints are investigated as necessary until remediation surrounding the individual complaint is concluded.

Likewise, the Public Works Department believes that establishment of working inter-municipal agreements with other public works departments in nearby communities would allow for sharing of resources when disasters affect one community more than others. This Plan continues to recommend that these types of agreements be pursued.

2.2 Infrastructure

Transportation

The Town of Middlebury does not have any hospitals. Instead, residents use the nearby facilities in the City of Danbury and the City of Waterbury. As a means of accessing these facilities, the Town has convenient access on Interstate 84 West to Danbury and East to Waterbury.

Evacuation routes are regionally defined by the Regional Evacuation Plan. No local evacuation plan exists. Interstate 84 and State Routes 63, 64, and 188 are the primary evacuation routes. Secondary evacuation routes include Watertown Road and Old Watertown Road (to Watertown), Christian Road (to Oxford), and

Long Meadow Road to South Street (to Naugatuck). Interstate 84, which runs east-west through the southern half of the Town, provides access to the City of Waterbury and the City of Danbury. During an evacuation-necessary emergency, Interstate 84 would presumably be the most effective means of evacuating Middlebury.

Utilities

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. Water service in Middlebury is relatively recent and is currently expanding. The municipal water system on the eastern side of the Town was initiated in 1988 by the developer that constructed the Crossroads East commercial property on Route 63. Water for this initial system was provided by the City of Waterbury, which is an arrangement that continues. The water main was extended from an existing water main on Country Club Road in Waterbury. Subsequent extensions brought the main to Woodside Avenue and then the Kelly Road and Three Mile Hill area to the north.

Through grants from the State, the Town coordinated the construction of a water storage tank and expanded the system in phases to a point where, as of 2005, the system was comprised of over 10 miles of water mains serving over 200 customers with water and fire protection. The water system is operated and maintained by the Connecticut Water Company under a long term agreement with the Town. The water serving the east section of town is supplied by the Naugatuck Division of the Connecticut Water Company.

The municipal water system on the western side of town is comprised of approximately four miles of water mains. Approximately 2.5 miles of the system is owned and operated by the Heritage Village Water Company and the remaining 1.5 miles of the system was constructed by the Town and operated and maintained by the Connecticut Water Company under an agreement with the Town. The water serving the western section of town is supplied by The Heritage Village Water Company.

Subsequent to the adoption of the previous HMP, critical redundancies have been established for the Heritage Village Water Company. An interconnection between the Connecticut Water Company's Middlebury System and the Heritage Village Water Company was permitted and constructed in 2009-2010, and an interconnection between the Waterbury Water Department and Connecticut Water Company's Middlebury System was permitted and constructed in 2010-2011. With these interconnections in place, potable water can be moved from Waterbury and Naugatuck into western Middlebury, if the Heritage Village Water Company wells are compromised. As a result, the Heritage Village Water Company system and the Connecticut Water Company's municipal systems are interconnected in the Middlebury town center, providing reliable water service and pressures suitable for firefighting to municipal buildings, including the shelter at Shepardson community center.

Westover School has retired its public water system and is now fully served by Connecticut Water Company. Water main replacements have been underway in the former Westover School system.

Wastewater

Approximately one-third of Middlebury's land area is sewered, including the sites of major corporate and commercial developments along Routes 63, 64, and 188. Sewage is routed via ten pumping stations to a treatment facility located in the Borough of Naugatuck. The Town of Middlebury currently contributes approximately 10% of the facility's operating budget. The ten pumping stations are considered critical facilities, because the failure of any one of them could impair the ability of the Town of move sewage to Naugatuck.

Some of the sewer pumping stations are located in or adjacent to floodplains, as these stations are necessarily located at low elevations where streams are crossed. The Town has not experienced flooding at these pumping stations, but if it were to occur, response would be appropriate to bring the stations back into working order.

Other

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

According to geoISP (geoISP.com), access to Broadband Internet and Mobile Broadband (cellular) service is very limited in Middlebury.

2.3 Critical Facilities and Emergency Response

The Town considers its emergency response, public works facilities, school facilities, municipal facilities, childcare facilities, age-restricted facilities, home for the blind facilities, handicap assistantship facilities, convalescent facilities, companies dealing with hazardous chemicals, and its sewerage utility facilities as its critical facilities. Of these critical facilities, the Fire Department, Police Department and Public Works are considered to be the most important as they are needed to ensure that emergencies are addressed while day-to-day management of Middlebury continues. In the event of a significant natural hazard occurring, the Westover School, the Memorial Middle School, the fire house and the Shepardson Community Center could be used as additional shelter facilities.

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

Table 2-1: Critical Facilities

Facility	Location	Type	Emergency Power	Shelter	SFHA
Middlebury Police Department	Middlebury Rd	Em. Response			
Middlebury Fire Department	65 Tucker Hill Rd	Backup Shelter	✓		*
Middlebury Public Works	1 Service Rd	Municipal			
Shepardson Community Center	1172 Whittemore Rd	Backup Shelter	✓	✓	
Middlebury Town Hall Offices	1212 Whittemore Rd	Municipal			
Middlebury Public Library	65 Crest Rd	Municipal			
Pomperaug High School	234 Judd Rd, Southbury	Primary Shelter	✓	✓	

Facility	Location	Type	Emergency Power	Shelter	SFHA
Westover School	1237 Whittemore Rd	Backup Shelter	✓	✓	
Region 15 Board of Education	286 Whittemore Rd	School Offices			
Middlebury Elementary School	550 Whittemore Rd	School			
Memorial Middle School	Memorial Dr	Backup Shelter	No	✓	
Sewage Pump Station 1	Shadduck Rd near Hop Br	Sewer			✓
Sewage Pump Station 2	Long Meadow Rd	Sewer			✓
Sewage Pump Station 3	270 North Benson Rd	Sewer			*
Sewage Pump Station 4	Southford Rd	Sewer			✓
Sewage Pump Station 5	Straits Tpk	Sewer			*
Sewage Pump Station 6	Christian Lane – Triangle Hill Subdivision	Sewer			
Sewage Pump Station 7	West end of Gleneagle Rd	Sewer			
Sewage Pump Station 8	Somerset Dr	Sewer			*
Sewage Pump Station	1 Service Rd	Sewer			
Sewage Pump Station	1 Service Rd	Sewer			
Pumping Station	285 Kelly Rd	Water			
Middlebury Edge	Straits Tpk & Park Rd	Vulnerable Pop.			
The Nest Day Care	984 Southford Rd	Vulnerable Pop.			
Middlebury Convalescent Home	Middlebury Rd	Vulnerable Pop.			
New Horizons Handicap Assistantship Home	Nutmeg Rd	Vulnerable Pop.			
Benson Woods	North Benson Rd	Vulnerable Pop.			
Home for the Blind	George St near Yale Ave	Vulnerable Pop.			

Potential Impacts from Natural Hazards

Two of Middlebury's critical facilities are located near flood risk areas. The Fire Station on Tucker Hill Road is adjacent to the Goat Brook and Hop Brook floodplains, located to the south and east of the facility, respectively. The Department of Public Works is not located adjacent to a mapped SFHA, but its location south of Woodside Avenue and near the unnamed stream that causes flooding in that area is of concern. The Town must strive to keep these two critical facilities operational during the largest of flood events, which is precisely when they will be needed the most. In particular, the Fire Department facility risks isolation from other parts of town.

Some of the sewer pumping stations are adjacent to watercourses that experience flooding, and therefore it is important for the Town of continually monitor conditions nearby and mitigate for any factors that could exacerbate conditions along those watercourses.

None of the critical facilities are any more susceptible to wind, summer storms, winter storms, or earthquakes than the rest of the Town. The following sections will discuss each natural hazard in detail and include a description of populations at-risk.

Sheltering Capabilities

Emergency shelters are considered to be an important subset of critical facilities, as they are needed most in emergency situations. Middlebury has designated Pomperaug High School on Judd Road in Southbury as the primary shelter. The school recently submitted a grant application to obtain a generator.

The Shepardson Community Center and the Middlebury Fire House have been designated as back-up shelters. The Shepardson Community Center, located on Whittemore Road, has a generator and can accommodate a maximum of 100 people. The Middlebury Fire House, located on Tucker Hill Road can accommodate up to 50 people and is also equipped with a generator.

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.

The Westover School located on Whittemore Road, houses up to 200 overnight students during the school year and can operate as a shelter if needed. The school is currently upgrading its standby capabilities in order to provide power to the entire campus to ensure that that the students have appropriate shelter during emergency situations. This is especially important for the international students, who may not have alternative housing readily available during storm events. Currently, the schools effectiveness as a shelter is greater during the summer than during the school year. The school's 1920s wood-frame construction makes it susceptible to rapidly-spreading fires, so the Middlebury Fire Department is well prepared for fighting any fires that may occur at the school.

In case of an extended power outage, it is anticipated that 10-20% of the population would relocate, although not all of those relocating would necessarily utilize the shelter facilities. Many communities only intend to use these facilities on a temporary basis for providing shelter until hazards such as hurricanes diminish. Regionally-located mass care facilities operated and paid for by the American Red Cross may be available during recovery operations when additional sheltering services are necessary.

Communications

The Town of Middlebury has established the CodeRED Emergency Notification System in an effort to streamline emergency notifications to residents of the Town. The Fire Department and ambulance service currently operates on high band and they have no communication dead spots. The Police currently operate on a lower band, and it experiences some communications dead spots near the intersection of Route 64 and Route 63. There is limited cellular service in that area of Town due to topography. The Town is currently looking into an upgrade to put all emergency services on the same radio band.

The Town has also created the Emergency Management Department and, for long-term planning, the Town has a Local Emergency Preparedness Commission that meets regularly with agendas related to emergency planning.

The Police Department is currently used as the Emergency Operations Center for the town and the Fire Department is the back –up facility. However, the town of Middlebury will be using the dispatch center in Prospect in the near future.

3.0 FLOODING

3.1 Existing Capabilities

Participation in the NFIP

Middlebury has participated in the NFIP since 10/16/1979. The Flood Insurance Rate Map (FIRM) for the community was most recently updated in 07/08/2013. Middlebury does not participate in the FEMA Community Rating System (CRS) program.

According to FEMA, there are 36 flood insurance policies in force in Middlebury as of 6/30/2019 with an insurance value of $8,884,700.

Regulatory Capabilities

The Town of Middlebury has in place a number of measures to prevent flood damage. These include regulations, codes, and ordinances preventing encroachment and development near floodways.

The Town of Middlebury uses the 100-year flood lines from the FEMA FIRM for determining special flood hazard areas. Regulations require that all structures in flood hazard areas have their lowest floor be above established flood elevations. Site plan standards require that all proposals be consistent with the need to minimize flood damage, that public facilities and utilities be located and constructed to minimize flood damage, and that adequate drainage is provided.

Rather than prohibiting development in floodplains, the Town of Middlebury seeks to strictly control it. Section 5.14 of the Middlebury Plan of Conservation and Development (March 2001), "Wetlands and Floodplains," states that Middlebury has regulations that limit construction in floodplains. According to this section, "Development within 100-year floodplains is inherently dangerous and therefore strictly regulated." The Plan also promotes creation of greenbelts, stating that "the development of greenbelt systems along floodplains also provides an opportunity for the preservation of open space."

Specific regulations, codes, and ordinances that apply to flood hazard mitigation in conjunction with and in addition to NFIP regulations include:

- ***Flood Plain District*** (Section 53 of 2011 Middlebury Zoning Regulations). Section 53 of the Zoning Regulations is essentially the local version of the NFIP regulations. This section states that "*In the Flood Plain District, no structure within the Town should be constructed, reconstructed, enlarged, extended, moved or structurally altered, no land use shall be established and no land shall be filled, graded or excavated until the Planning and Zoning Commission has approved a plan for the proposed structure, land use or alteration of land contour.*" Additionally:
  - ***Section 53.3*** (General Standards) sets for standards for anchoring; use of flood-resistant materials; siting and placement of systems such as water, wastewater, electrical, heating, and cooling; maintaining flood carrying capacities of streams; outdoor storage; and installation of manufactured homes.

- ⇨ ***Section 53.4*** (Specific Standards) provides for elevation of new construction and substantial improvements at least two feet above the base flood elevation, and requires dry floodproofing of the parts of structures below the base flood elevation.
- ⇨ ***Section 53.5*** (Floodway Standards) prohibits development that cumulatively increases the base flood elevation by more than one foot.

- ❑ ***Setbacks and Buffer Areas*** are addressed in numerous sections of the 2011 Middlebury Zoning Regulations. Section 64.2.1-64.2.2 specifies that wherever necessary, the Town will protect floodplains or water recharge areas. Thus, the Zoning Commission may require greater setbacks.

- ❑ ***Soil Erosion and Sedimentation Control*** (Section 68.2 of the 2011 Middlebury Zoning Regulations) states that "*any proposal for development that will cumulatively create a disturbed area more than one-half acre in area on land being developed must have a Certified Erosion and Sediment Control Plan.*"

- ❑ ***Storm Drainage*** (Section 7 of Middlebury Road and Drainage Regulations) outlines the Town's requirements to manage stormwater, which includes the collection and disposal thereof in an attempt to:

  - ⇨ design drainage systems which take into account effects upon downstream systems;
  - ⇨ coordinate with general drainage requirements for the use and development of the abutting land;
  - ⇨ avoid diversion of drainage from one watershed or watercourse to another is to be avoided;
  - ⇨ minimize all adverse effects of all work to the stream or watercourse which is being affected;
  - ⇨ discharge all storm water into sufficient streams or rivers or into Town or State drainage systems with sufficient capacity to carry the discharge; and
  - ⇨ locate and size drainage facilities in order to minimize danger to life and property.

This section also calls for the protection and improvement of the natural drainage system and the prevention of flooding and soil erosion.

- ❑ ***Drainage Standards*** (Section 7 of the 2006 Middlebury Subdivision Regulations). This section states that "*The storm drainage system shall provide for drainage from the entire area of the subdivision and shall take into account land outside the subdivision that normally drains across the area of the subdivision, as well as the effects of the subdivision upon downstream drainage systems.*" Additionally, the drainage system shall provide for the following:

  - ⇨ Adequate drainage of proposed streets,
  - ⇨ Interception of existing channeled drainage coming from any adjoining streets,
  - ⇨ Protection of locations necessary for on-site sewage disposal and water supply facilities,
  - ⇨ Prevention of flooding and soil erosion, and protection of wetlands and watercourses, and
  - ⇨ On-site detention where feasible, in order that runoff from the developed subdivision not exceed the rate of runoff before subdivision.

- ❑ ***Wetlands and Watercourses*** (Middlebury Inland Wetlands and Watercourses Regulations). These regulations cover actions within and surrounding wetlands and watercourses throughout

the Town of Middlebury. Although flooding is not specifically addressed, many of the requirements of the regulations are believed to be preventive of flooding.

Overall, the intent of these regulations is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas of the town of Middlebury by the establishment of standards designed to:

- ❑ Protect human life and public health;
- ❑ Minimize expenditure of money for costly flood control projects;
- ❑ Minimize the need for rescue and relief efforts associated with flooding;
- ❑ Ensure that purchasers of property are notified of special flood hazards;
- ❑ Ensure that all land approved for subdivision shall have proper provisions for water, drainage, and sewerage and in areas contiguous to brooks, rivers, or other bodies of water subject to flooding, and that proper provisions be made for protective flood control measures;
- ❑ Ensure that property owners are responsible for their actions;
- ❑ Ensure the continued eligibility of owners of property in Middlebury for participation in the National Flood Insurance Program.

The Town of Middlebury Zoning Enforcement Officer serves as the NFIP administrator and oversees the enforcement of NFIP regulations.

Structural and Maintenance Projects

The Middlebury Public Works Department is in charge of the maintenance of the Town's drainage systems, and performs clearing of public streets, bridges, culverts, and other structures as needed. The Department of Public Works responds to the complaints and subsequently informs the Engineering Department of the problems in order to plan maintenance and upgrades to infrastructure prior to extensive precipitation events.

Town officials have indicated that a significant amount of work has been done with regard to replacing and maintaining bridges and culverts throughout Middlebury. For example, the Long Meadow Pond Brook culvert at Long Meadow Road was replaced with a box culvert in 2012.

Emergency Services

The Town's Police and Fire Departments regularly monitor Hop Brook and combine forces to provide advanced notice to residents in the floodplain surrounding the watercourse of potential flooding problems.

The Town can access the National Weather Service to monitor flood watches and warnings. The National Weather Service issues a flood watch or a flash flood watch for an area when conditions in or near the area are favorable for a flood or a flash flood, respectively. A flash flood watch or flood watch does not necessarily mean that flooding will occur. The National Weather Service issues a flood warning or a flash flood warning for an area when parts of the area are either currently flooding, highly likely to flood, or when flooding is imminent.

The Town of Middlebury has instituted the CodeRED™ Emergency Notification System. This system allows the Town to telephone all or targeted areas of the town in case of an emergency situation that requires

immediate action. The system is capable of dialing 60,000 phone numbers per hour. It then delivers a recorded message to a person or answering machine, making three attempts to connect to each number. It can also send text messages and e-mails.

The Town of Middlebury also provides many informational pamphlets free of charge related to citizen preparedness for natural hazard events. These pamphlets include "*Preparing Makes Sense. Get Ready Now*" by the U.S. Department of Homeland Security and "*Disaster Preparedness Coloring Book*" by FEMA and distributed by Connecticut DEHMS. These pamphlets are available at the Shepardson Community Center.

New Capabilities and Completed Actions

Middlbury continues to maintain its strong flood mitigation capabilities. Many of Middlebury's capabilities to mitigate for flood damage have improved since the initial hazard mitigation plan was adopted, particularly with regard to knowledge of hazard areas. Specifically, the floodplain district regulations require two feet of freeboard which far exceeds the minimum criteria set by NFIP. Overall, the increased knowledge of vulnerable areas, combined with other local planning efforts, has assisted community officials and commissions to provide a variety of flood mitigation recommendations for new development.

A 72-inch culvert at Biosky Road (Shattuck Brook) was replaced recently. Most of the other bridge and culvert work accomplished by the Town was completed more than five years ago.

Summary

Middlebury mitigates flood damages primarily through regulating development in floodprone areas, performing maintenance and upgrades of drainage infrastructure, and performing structural projects when appropriate.

3.2 Vulnerabilities and Risk Assessment

Flooding is a considerable natural hazard in the Town of Middlebury. Hop Brook passes through one of the most vital section of Town. Approximately 98% of the Town's land area is drained by Hop Brook, Long Meadow Pond Brook, and Eightmile Brook. The remainder of the town is drained by, the Nonnewaug River, Little River, and Steele Brook.

Prior to floodplain regulations, homes were constructed within floodplains along Hop Brook and its tributaries and Long Meadow Pond Brook. These areas experience the most significant overbank flooding in the town. Localized nuisance flooding along tributaries and, more commonly, along roadways resulting from inadequate drainage and other factors is also a flooding issue that the Town regularly faces. The overall frequency of occurrence of flooding in Middlebury is considered to be likely.

According to municipal personnel, flood events have not occurred in Town in the last five years.

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

Vulnerability Analysis of Repetitive Loss Properties

Two repetitive loss properties are located in the Town of Middlebury. These are listed in Table 3-1. Severe repetitive loss properties are not located in Middlebury.

Table 3-1: Repetitive Loss Properties

Street	Associated Watercourse	Flood Zone	Type
Narcissus Road	Long Meadow Pond	C	Single-Family Home
Old Regan Road	Hop Brook	A05	Single-Family Home

In general, the repetitive loss property listed on Old Regan Road may remain floodprone for the foreseeable future because it likely reflects riverine flooding situations. It should be noted that, extensive drainage improvements have recently been made in the vicinity of Narcissus Road, which may alleviate flooding concerns in this area. The Town of Middlebury will continue to work with property owners to address flooding as they request assistance.

Vulnerability Analysis of Areas Along Watercourses

Flooding in Middlebury is generally concentrated in discrete areas of Town and is not widespread, with the exception of flooding along Hop Brook. Most flooding events occur due to large amounts of rainfall in conjunction with snowmelt and due to undersized road culverts and/or storm drains. Specific areas susceptible to flooding were identified by Town personnel.

Hop Brook and Tributaries

- Regan Road and Old Regan Road at Hop Brook and Long Swamp Brook – Old Regan Road, Regan Road, and the approximately 15 homes located on the two streets can become flooded during large scale precipitation events. Hop Brook, which lies between the two roadways, is the primary contributing water body during inundation events. However, Long Swamp Brook lies on the east side of Reagan Road and is also a contributor. During the development of the initial HMP, some residents of these two roads reported that storms have appeared to intensify in the last eight years. Floods reportedly occurred in April 2006, June 2006, and April 2007. They also reported that the stream is aggrading, and that it was dredged in the 1980s. The residents would like to see it dredged again. Some of the homes (including 420 Regan Road) have streams in the front (Hop Brook) and the back (Long Swamp Brook), and they both flood. As noted above, one repetitive loss property is located on Old Regan Road.

- Ravenwood Drive – Hop Brook, which flows southerly beneath Ravenwood Drive, contributes to nuisance flooding on Ravenwood Drive during heavy rain events.

- Shadduck Road – The road sometimes becomes inundated near the sewer pumping station after a heavy rainfall. However, the pump station does not become inundated.

- Porter Avenue and Steinmann Avenue – Both roadways are prone to nuisance flooding due to the overbanking of Long Swamp Brook which runs adjacent to and crosses the two streets. A

culvert which runs beneath Middlebury Road at the north end of Steinmann Avenue, conveying Long Swamp Brook, is undersized and is in need of upgrading and replacement. Homes on both roadways are affected by flooding.

- Charcoal Avenue – The portion of Charcoal Avenue that is adjacent to Artillery Road regularly becomes inundated during significant rain events. Goat Brook contributes to the roadway flooding that takes place at this location.

- Cemetery Road – A small, unnamed watercourse near the roadway sometimes causes nuisance flooding. Water runs down the hill near the intersection of Cemetery Road and Middlebury Road. Three culverts at this location are undersized and are insufficient for the flow following heavy rains. Also affected in the area is a gas station, which experiences both building and parking lot flooding during sustained rain events.

- Watertown Road – A washout of Watertown Road at Hop Brook occurred in spring 2006. Middlebury attempted to submit to FEMA for reimbursement as a co-applicant with the City of Waterbury's application, in hopes of receiving grant money to rebuild the roadway. However, funding from FEMA to repair the roadway could not be obtained. Middlebury documented the episode with extensive photography. Following the occurrence, Middlebury plated the roadway immediately following the occurrence on the weekend and then began repairs the following Monday. Although the roadway has been repaired, Middlebury remains concerned about Hop Brook causing further damage.

Town officials have noted that Hop Brook has been bankful in the past few years but that the Brook has not overtopped since the initial HMP was developed. However, officials have noticed a significant amount of debris within Hop Brook. Therefore, the town would like to develop a debris removal plan in an effort to reduce the potential for flooding due to blocked culverts and/or bridges.

Residents of Porter Avenue have initiated a dialog with the town relative to the status of SFHA mapping in the Hop Brook watershed. Specifically, homeowners along Porter Avenue believe that the SFHA depicted on the 2010 FIRM is overly conservative, and that the 1% annual chance flood would not affect their home. The homeowners are evaluating several options for reducing flood insurance premiums, from making improvements to their home to requesting either the town or FEMA to initiate a physical map revision (PMR) or letter of map revision (LOMR).

Vulnerability Analysis of Problem Areas Related to Localized Flooding

A repetitive loss property is located on Narcissus Road, just downstream of the Long Meadow Road Bridge on the western side of Long Meadow Pond. As mentioned above extensive drainage improvements have recently been completed in the vicinity of Narcissus Road, alleviating some of the historical flooding issues in the area. In addition, given the 20-year interval of time since the last flood claim under NFIP, it is believed that flooding at this particular property is either no longer a concern, or that the owner no longer submits claims.

- Triangle Boulevard – The Triangle Boulevard area is impacted by runoff from the adjacent Oxford Airport to the south. Water from a small stream jumps a culvert, flows onto the road, and floods at least two homes to the north while making its way to the nearby stream

channel. The Town has added a catch basin to help collect water, but it doesn't work well if the outlet is submerged. The nuisance flooding is particularly problematic along the easternmost section of the roadway.

- Judd Hill Road – Kelly Pond, which straddles both the Town of Southbury and Middlebury, floods a portion of Judd Hill Road in Middlebury during significant rain events.

- Woodside Avenue – Flooding is a problem along the roadway in the eastern part of town due to an undersized culvert. The undersized culvert creates a backwater condition, which causes property flooding and basement flooding of residences along the roadway.

- Ravenwood Road and Biasci Road – Flooding occurs at both of these locations due to failing and undersized culverts.

Two of Middlebury's critical facilities are located in floodprone areas. The Fire Station on Tucker Hill Road is adjacent to the Goat Brook and Hop Brook floodplains, located to the south and east of the facility, respectively. The Department of Public Works is not located adjacent to a mapped floodplain, but its location south of Woodside Avenue and near the unnamed stream that causes flooding in that area, is of concern. The town must strive to keep these two critical facilities operational during the largest of flood events, which is precisely when they will be needed the most. In particular, the Fire Department facility risks isolation from other parts of Town.

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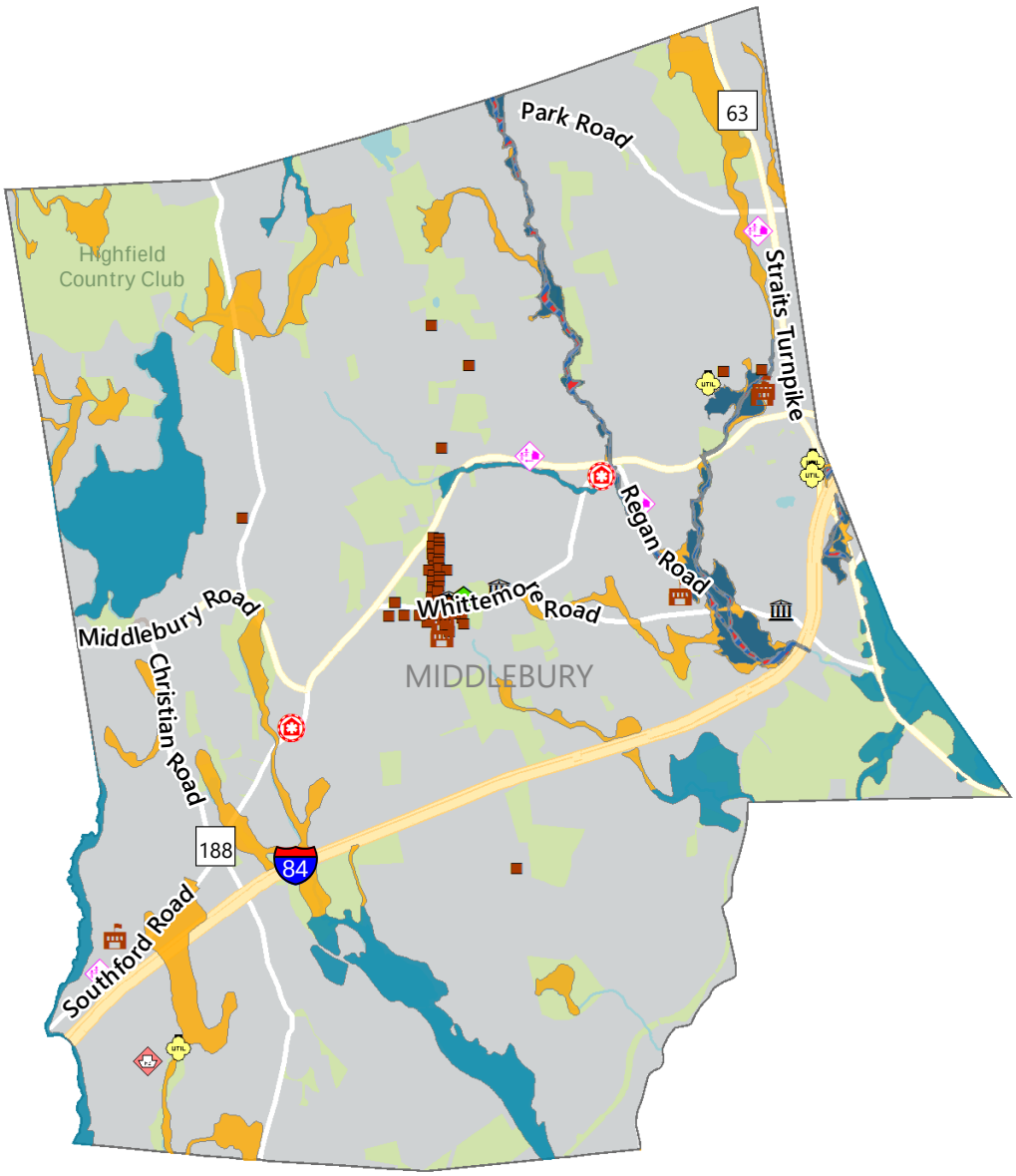

Critical Facilities
- Community Center
- Emergency Response
- Government Services
- Hazardous Materials
- School
- Utility
- Vulnerable Population

Historic Sites
- Historic Sites

Flood Zone
- A

Flood Zone
- A
- AE
- Floodway
- X: 0.2% Annual Chance

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Flood Hazards in Middlebury

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

N

0 2,000 4,000
Feet

DATE 6/15/2021

141.3211.00029
PROJ. NO.

FIG. 3-1

4.0 HURRICANES AND TROPICAL STORMS

4.1 Existing Capabilities

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 Middlebury is 110 mph for a Category 1 event, 120 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.

Tree limbs and trees may fall during heavy wind events, potentially damaging structures, utility lines, and vehicles. The Town of Middlebury Department of Public Works performs annual tree maintenance on any tree or tree limb which crosses the vertical imaginary plane of Town property. These trees are considered the ownership of the Town and, if there is a threat presented, then the Town will either maintain the threat or remove it altogether. Town tree crews are reportedly adequate.

Those residents who reach the DPW by telephone or in person with concerns are given priority on a first-call/first-come basis and a "condition rating" is given to each case in an effort to prioritize all situations. The Town is sufficiently suited for debris removal maintaining proper equipment such as different claws and a tub grinder. Once processed, the debris is disposed of at different specified locations throughout Middlebury.

The Public Works Director is the tree warden for the town of Middlebury. As a result of significant wind damage sustained during storms Tropical Storm Irene and Winter Storm Alfred, the town has begun to bid out spring tree removal activities in an effort to supplement the work being done by the town.

Eversource, the local electric utility, provides tree maintenance near its power lines.

The town has expressed a desire to coordinate with regional municipalities to work with the State in an effort to empower the local tree wardens to deal with unsafe trees on public and private properties.

During a disaster, the Town will notify residents of emergency information on a neighborhood basis using its CodeRED™ Emergency Notification System. The system has the ability to deliver recorded messages to person or an answering machine, making three attempts to connect to any telephone number when making calls. Due to the infancy of the system in the Town, education on the benefits and operation of the system residents' perspectives is needed. It is recommended that public resources such as the Town's website should be utilized at any point possible in order to educate the public.

Prior to a hurricane, the Town ensures that warning/notification systems and communication equipment is working properly and prepares for the possible evacuation of susceptible areas.

New Capabilities and Completed Actions

Middlebury continues to maintain its strong tropical cyclone mitigation capabilities.

Summary

Middlebury 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

Hazards associated with tropical storms and hurricanes include winds, heavy rains, and flooding. Most of the damage to Middlebury from historical tropical cyclones has been due to the effects of flooding. While only concentrated areas of Middlebury are susceptible to flooding damage caused by hurricanes, wind damage can occur over widespread areas throughout the Town. Hurricanes therefore have the potential to affect any area within the Town of Middlebury. A hurricane striking the Town of Middlebury is considered a possible event each year that could cause critical damage to the Town and its infrastructure.

Town officials have raised strong concerns regarding the stability of the ash trees in Middlebury, specifically in the vicinity of Tucker Hill Road, and would like to work closely with Eversource and private property owners to address this concern.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing material, and small items left outside become flying missiles in hurricanes. Extensive damage to trees, towers, aboveground and underground utility lines (from uprooted trees), and fallen poles cause considerable disruption for residents. Streets may be flooded or blocked by fallen branches, poles, or trees, preventing egress. Downed power lines can also start electrical fires, so adequate fire protection is important.

Middlebury's housing stock consists of a handful 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 much of the existing housing stock in the town predates the recent code changes, many structures are highly susceptible to roof and window damage from high winds.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. There are currently no mobile home parks in Middlebury.

As the residents and businesses of the State of Connecticut become more dependent on the internet and mobile communications, the impact of hurricanes on commerce will continue to increase. A major hurricane has the potential of causing complete disruption of power and communications for up to several weeks, rendering electronic devices and those that rely on utility towers and lines inoperative. According to the Connecticut DEEP, this is a significant risk which cannot be quantitatively estimated.

Tropical Storm Isaias

The damage during Tropical Storm Isaias was significant. Town crews were busy with cleanup afterward, and the outage was about 5-6 days. Eversource was reportedly cooperative after the first 48 hours which were reportedly characterized by confusion.

5.0 SUMMER STORMS AND TORNADOES

5.1 Existing Capabilities

Warning is the primary method of existing mitigation for tornadoes and thunderstorm-related hazards. The NOAA National Weather Service issues watches and warnings when severe weather is likely to develop or has developed, respectively.

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

The Town is responsible for tree branch removal and maintenance of any tree which crosses through the imaginary plane extending vertically from the Town's property line. Homeowners and local utilities are responsible for tree branch removal and maintenance on private properties. In addition, all new developments in the Town must place utilities underground wherever possible.

Municipal responsibilities relative to tornado mitigation and preparedness include:

- Developing and disseminating emergency public information and instructions concerning tornado safety.
- Providing sources of guidance regarding in-home protection and evacuation procedures, and locations of public shelters.
- 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.

These protocols are considered effective for mitigating wind and summer storm-related damage in the Town of Middlebury. While additional funding could be utilized to strengthen the current level of mitigation, such funding is not currently considered cost-effective for the current level of vulnerability.

New Capabilities and Completed Actions

Middlebury 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.

Summary

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

5.2 Vulnerabilities and Risk Assessment

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 Middlebury. 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 of several million dollars in damage may be reasonable for an EF2 tornado striking Middlebury, and with a greater damage amount to be expected should an EF3 or stronger tornado strike.

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

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

In May 2018 a tornado struck the region, and just barely struck Middlebury. Trees were down and power outages occurred. The PA reimbursement for Middlebury was about $100,000.

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 town of Middlebury is believed to be low for any given year. Middlebury is susceptible to damage from high winds due to its high elevation and heavily treed landscape.

Secondary damage from falling branches and trees is more common than direct wind damage to structures. Heavy winds can take down trees near power lines, leading to the start and spread of fires. Such fires can be extremely dangerous during the summer months during dry and drought conditions. Most downed powerlines in Middlebury are detected quickly and any associated fires are quickly extinguished. However, it is important to have adequate water supply for the possibility of a spreading fire 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.

6.0 WINTER STORMS

6.1 Existing Capabilities

Winter storms are handled well by Town staff and crews.

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.

The Town ensures that all warning/notification and communications systems are ready before a storm, and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. The Town also prepares for the possible evacuation and sheltering of some populations which could be impacted by the upcoming storm (especially the elderly and special needs persons).

The Town of Middlebury Department of Public Works runs plowing operations. The DPW staff utilizes the fleet of eight trucks which run eight separate routes throughout Town. The town also utilizes one truck for parking lots. The staff continues to plow until their route is finished. Upon completion, they return to the DPW building and assess further work. Hills and intersections throughout Middlebury are given more attention than other sections of the roadways. Additionally, the northwest section of Town, which is higher in elevation and has a substantial relief garners more attention compared to the lesser relief and lower elevation found in the southeastern section of Town. The Connecticut Department of Transportation plows Interstate 84, Route 64, Route 188, and Route 63.

The Town discourages the creation of permanent dead-end streets 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 turn, this ensures that residents will not be cut off from critical facilities during times of need.

The town found it necessary to remove snow from municipal facilities in January-February 2011. As a result of this experience, the town has been careful to watch for conditions that may lead to damage from snow loads. The town has also been cognizant of the potential impacts to membrane roofs as a result of snow removal activities.

New Capabilities and Completed Actions

Middlebury continues to maintain its strong winter storm mitigation capabilities.

Summary

Middlebury 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

Winter events and the hazards that result (wind, snow, and ice) have a widespread geographic extent. The entire Town of Middlebury is susceptible to winter storms. In general, winter storms are considered highly likely to occur each year (major storms are less frequent), and the hazards that result (nor'easter winds, snow, and blizzard conditions) can potentially have a significant effect over a large area of the Town.

The heavily treed landscape in close proximity to densely populated residential areas in the Town of Middlebury 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.

A few areas in the Town of Middlebury have been identified by Town personnel as having problems with ice during the winter months. Icing causes difficult driving conditions throughout the hillier sections of Town, those roadways in the northwest portion of Town, including White Deer Rock Road, Old Watertown Road, Charcoal Avenue, Breakneck Hill Road, Tranquility Road, and others. These roadways are not easily traveled upon when ice accumulates.

Drifting snow is not as large a problem in Middlebury as other communities, but it still occurs. Problem areas include Route 188 near the police station, and Route 64 near Christian Road and Abbott Farm Road. Drifting snow is mitigated through plowing efforts by the Middlebury Department of Public Works.

In summary, 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.

7.0 GEOLOGICAL HAZARDS

7.1 Existing Capabilities

The Connecticut Building Codes include design criteria for buildings specific to municipality, as adopted by the Building Officials and Code Administrators (BOCA). These include the seismic coefficients for building design in the Town of Middlebury. The Town has adopted these codes for new construction and they are enforced by the Town Building Inspector.

Due to the infrequent nature of damaging earthquakes, land use policies in the Town of Middlebury do not directly address earthquake hazards. However, the Subdivision Regulations of the Town of Middlebury (Section 4.3.21) require that locations of exposed rocks and slopes in excess of twenty-five percent (25%) must be shown on all Construction Plans. Section 9.12.7 of the Road and Drainage Regulations requires that the minimum grade for any street shall be at least 1.0%. The maximum grade shall not exceed 8% for an arterial road and a collector street, 10% for a residential street, and 3% for a turnaround. When necessary, steeper grades may be approved by the Board of Selectmen in situations where the steeper grade is in the best interest to the Town.

Likewise, Sections 7.4, 52.6.3, and 64.2.1 through 64.2.2 of the Middlebury Zoning Regulations cover buffered and setback areas. Section 7.4 states that no buildings or other structure shall extend within less than the minimum set back distances of any street line, rear property line, other property line or Resident District boundary line as specified in the district, subject exceptions and additional limitations. Section 52.6.3 covers buffered areas, which include all setback areas. Buffered areas must be designed to be consistent and compatible with land uses. These regulations can help protect structures from damaging one another or infrastructure if an earthquake should occur.

New Capabilities and Completed Actions

Middlebury continues to maintain its earthquake and landslide mitigation capabilities.

Summary

Middlebury 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

Earthquake Vulnerabilities

The entire Town of Middlebury is susceptible to earthquakes. However, even though earthquakes have the potential to occur anywhere both in the Town and in the northeastern United States, the effects may be felt differently in some areas based on the type of geology. In general, damaging earthquakes are considered a hazard that is unlikely to occur, but that may cause significant effects to a large area of the Town if one occurred.

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. Liquefaction is a phenomenon in which the strength and stiffness of a soil are reduced by earthquake shaking or other rapid loading. It occurs in soils at or near saturation, especially the finer textured soils. When liquefaction occurs, the strength of the soil decreases and the ability of soil to support building foundations or bridges is reduced. Increased shaking and liquefaction can cause greater damage to buildings and structures, and a greater loss of life.

Only a few areas of the Town of Middlebury are underlain by sand and gravel of glacial meltwater origin. 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 from unstable soils during an earthquake are the areas underlain by glacial till. Most of the town is covered 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. Damage to utility lines can lead to fires, especially in electric gas mains. 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 Middlebury, 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.

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.

Actions Completed and New Capabilities

Middlebury continues to maintain its capabilities for mitigating and responding to dam failure risks.

Summary

Middlebury 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 42 DEEP-inventoried dams within Middlebury. Three 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 Middlebury

Number	Name	Class	Owner
8101	QUASSAPAUG LAKE DAM	B	Lake Association
8102	SUMMIT POND DAM	BB	Private
8103	LITTLE TRACYS POND DAM	B	Private Corporation
8104	MIRY POND DAM #2	BB	Private
8105	ABBOTTS POND DAM	BB	Private
8106	LAKE ELISE DAM	BB	Land Trust
8107	LONG MEADOW POND DAM	B	Private Corporation
8108	SPERRY POND DAM	A	Land Trust
8109	TURTLE POND DAM	BB	Land Trust
8110	LARKIN POND DAM	BB	Land Trust
8111	FENN POND	BB	Land Trust
8112	PAKOVITCH POND #2 DAM	A	Federal
8113	PAKOVITCH POND #1 DAM	AA	Federal
8114	JENUSAITIS DAM	A	Private
8115	NO NAME	A	Private
8116	NO NAME	A	Private
8117	REGAN POND	A	Private
8118	NO NAME	A	Private
8119	NO NAME	A	Private
8120	HETZEL DAM	A	Land Trust
8121	AVALON FARM POND DAM	A	Association
8122	NO NAME	A	Private
8123	NO NAME	A	Private
8124	NO NAME	A	Private
8125	BIOSKY POND		Private
8126	FIRE POND HARMER PROPERTY	A	Private
8127	LARKIN POND #2	A	Private
8128	TURTLE POND DAM	A	Private Corporation
8129	YMCA POND DAM	A	Private Corporation
8130	ATWOOD POND	A	Association
8131	SANDY HILL POND		Private
8132	MIRY POND DAM #1	A	Private
8133	STEWART POND		Private
8134	DETLEFSEN POND		Private
8135	ROCKEFELLER POND #1		Private
8136	ROCKEFELLER POND #2		Private
8137	TWO FARMS PONDS		Private
8138	FLANDERS POND		Land Trust
8139	FALK POND		Private
8140	LASKY POND		Private
8141	JONES POND DAM	A	Private
8142	LAYLA DAM	AA	Private

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

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

Number	Name	Class	EAP Status	EAP Status Date
8101	QUASSAPAUG LAKE DAM	B	Updated EAP Not Received	1/22/2018
8103	LITTLE TRACYS POND DAM	B	Acceptance Letter Sent	11/22/2019
8107	LONG MEADOW POND DAM	B	Acceptance Letter Sent	6/20/2019

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

According to Town personnel, the dams throughout Town are in varying stages of condition

Little Tracy's Pond Dam – This Class B dam with a ten foot embankment and a 30 foot wide, concrete lined spillway is owned by the Turnpike Office Park LLC. The dam was last repaired in 1988 when there was a crack in the spillway. A Dam Failure Analysis has not been developed for this dam. Densely-populated areas are located downstream of Little Tracy's Pond Dam, including some areas in Middlebury that are already prone to flooding along Regan Road, Porter Avenue, and Steinmann Avenue.

Quassapaug Lake Dam – This Class B earthen dam with a stone masonry outlet owned by the West Shore Owners Association, Inc. was last repaired and modified in 1992. At that time, repairs were made to the outlet and to the embankment. A Dam Failure Analysis has not been developed for this dam. The Quassapaug Lake Dam is close to the Woodbury municipal boundary, and the reach of Eightmile River immediately downstream of the dam is in Woodbury. Further downstream, the river forms the boundary between the Towns of Middlebury and Southbury, and then between the Towns of Southbury and Oxford. Thus, failure of the dam would be a concern for several communities.

Long Meadow Pond Dam – Town personnel have indicated that the Long Meadow Pond Dam (Class B) is in poor condition and is in need of repairs. Understanding the condition of the dam and determining the best course of action, if needed, should be considered a priority. According to a hydrology report developed by Wengell, McDonald & Costello, Inc. in 2006, the Long Meadow Pond dam is a concrete structure consisting of a central spillway and secondary spillways on either side of the central spillway. The central spillway is fitted with wooden weir boards, and some of them are reportedly missing. Given the dam's location at the municipal boundary with the Town of Oxford, and the fact that all downstream areas are located in Oxford and the Borough of Naugatuck, the failure of the dam would be of greater concern for Oxford and Naugatuck. Town staff remain curious about the state of the Long Meadow Pond Dam, as of a meeting held in December 2020. The dam is privately-owned, and the Town has declined accepting ownership in the past.

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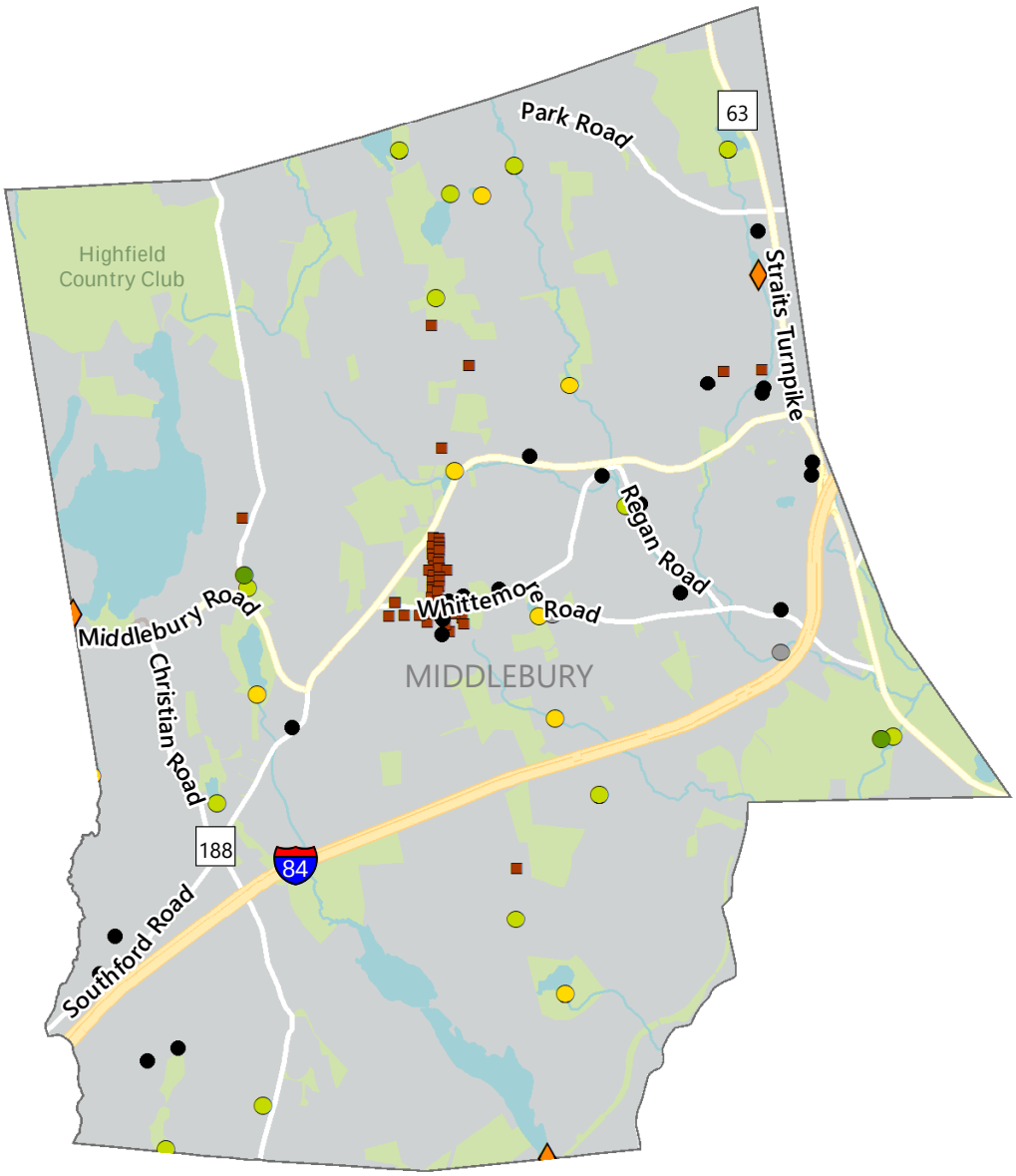

Dam Hazard Class

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

Critical Facilities

- Critical Facilities

Historic Sites

- Historic Sites

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CHESHIRE, CT 06410
203.271.1773

Dam Failure Hazards in Middlebury

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

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FIG. 8-1

9.0 WILDFIRES

9.1 Existing Capabilities

The Connecticut DEEP Open Burning Program requires designated "Open Burning Officials" in every community to oversee open burning within the town. The Town of Middlebury is compliant with this program and has a designated Burning Official.

The Town of Middlebury requires that development more distant than one mile by way of a public street to a reliable, year-round source of water, needs to include the installation of either a precast concrete tank or a fire pond with dry hydrant. The location needs to be accessible in all weather conditions and a fire truck needs to have the ability to draw/pump water. This would include those locations exceeding one mile by public roadway from year-round surface water sources or locations having the same distance from the Heritage Village Water Company (HVWC), the Connecticut Water Company (CWC), and the Westover Water Company's (WWC) existing service areas. HVWC and CWC are provided with fire suppression by way of a one-million gallon water tank located at the end of Cedar Road in the southern part of Town, and a water tower located south of Ferndale Avenue in the eastern part of Town.

The sizing of tanks and fire ponds is specified by the Board of Selectman, following consultation with the Fire Chief. At minimum, fire protection tanks need to be at least 10,000 gallons in capacity, while fire ponds need to have a right-of-way at least 30 feet in width. All fire ponds need to be constructed in accordance with the standards and practices of the U.S. Department of Agriculture, Soil Conservation Service. These requirements are outlined in Section 10.1.1 through Section 10.1.4 of Middlebury's Road and Drainage Regulations and Section 5.6 of the Subdivision Regulations. The redundancy in different sets of regulations underscores the Town's concerns regarding fire mitigation.

In addition, new roads and subdivisions are required to allow for fire truck access and are required to be at least at least 28 feet in width. Residential streets must be paved at least 28 feet in width, while arterial roads and collector streets must be paved 36 feet across.

Mitigation for wildland fire control is also focused on Fire Department training and maintaining an adequate supply of equipment. Unlike wildfires on the west coast of the United States where the fires are allowed to burn toward development and then stopped, the Middlebury Volunteer Fire Department has a proactive approach to go to the sources of the fires. This proactive approach of going on the offense is believed to be effective for controlling wildfires. The Middlebury Volunteer Fire Department has within its fleet a four-by-four brush truck and a four-wheel drive tanker truck which is capable of carrying water to remote fires.

Critical redundancies have been established for the Heritage Village Water Company. An interconnection between the Connecticut Water Company's Middlebury System and the Heritage Village Water Company was permitted and constructed in 2009-2010, and an interconnection between the Waterbury Water Department and Connecticut Water Company's Middlebury System was permitted and constructed in 2010-2011. With these interconnections in place, potable water can be moved from Waterbury and Naugatuck into western Middlebury, if the Heritage Village Water Company wells are compromised. As a result, fire protection capabilities have increased all along the water main extension and interconnection in central Middlebury and outlying areas that benefit from the interconnection.

Actions Completed and New Capabilities

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

The Town has continued working closely with Connecticut Water Company. Westover School retired its water system and is now served by Connecticut Water Company. The interconnection with Heritage Village Water Company, located in Middlebury, is considered a great success. The interconnection was utilized during the drought of 2020 to move water to Heritage Village Water Company

Summary

The Town 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.

9.2 Vulnerabilities and Risk Assessment

The Town of Middlebury is considered a low-risk area for wildfires. Wildfires are of particular concern in wooded areas and other areas with poor access for fire-fighting equipment.

The approximately 7,433 acres of forests and undeveloped land in Middlebury may be susceptible to drought conditions that make them more vulnerable to wildfires. The approximately 854 acres of agricultural fields and maintained grasses may be vulnerable to direct damage from drought conditions. Wildfire risk zones are mapped in Figure 9-1.

Wildfire risk areas are generally associated with state-owned forests, land trust property, and Town owned open space. As each area borders residential sections of the Town, residents within these risk areas are most vulnerable to fire, heat, and smoke effects of wildfires. The following specific problem areas are notable:

- Brush fires are a concern south of Interstate 84 near Wooster Road and east of Long Meadow Pond due to limited access in close proximity to the power lines. Brush fires are also a concern southwest of Hop Brook Lake near Allerton Farms Road.

- Brush fires are especially dangerous north of Lake Quassapaug. Limited accessibility and high concentrations of Mountain Laurel, which produce hazardous fumes when burned, are two conditions characteristic of the area north of Lake Quassapaug. Fires must be fought with self-contained breathing apparatuses, and homes have limited access in and out of the neighborhood in this area.

- The north-central section of Middlebury has problems with supplying fire-fighting water. Included in this section of Town are locations to the north end of East Farms Road and locations along Artillery Road, North Farms Road, and Mirey Dam Road. This area is completely without available fire fighting water – either from a surface water source, underground tanks, or a source of community water supply through one of the public water

supply companies. Similar concerns are present along Burr Hall Road slightly to the west of East Farms Road.

The Town of Middlebury would like to gain access to Atwood Pond, which lies to the north of East Farm Road in order to establish a dry hydrant. Miry Dam Pond, located to the west of Falcon Crest Road, is the second highest priority for the establishment of a dry hydrant.

- Finally, a small area in southwest Middlebury may be at increased risk due to the proximity of the Oxford Airport in the neighboring Town of Oxford. The airport primarily caters to corporate jets but can also handle commercial traffic during emergencies. The Triangle Hill subdivision in Middlebury (described in Section 3.5) is located in the runway exclusion zone. While airplanes have not crashed into the Triangle Hill neighborhood, they have crashed in the woods further north of the neighborhood. This area is wooded and an identified area of brush fire concern. An incident on April 18, 2008 occurred in this area.

In summary, the northern and southern portions of Town are considered most at risk from wildfires. These areas present potential access problems for firefighting purposes in the event of a wildfire due to natural conditions including steep relief, heavily wooded forests, and the lack of water sources. The Town has the support of owners of the open space land to provide access to their lands in the event of a wildfire.

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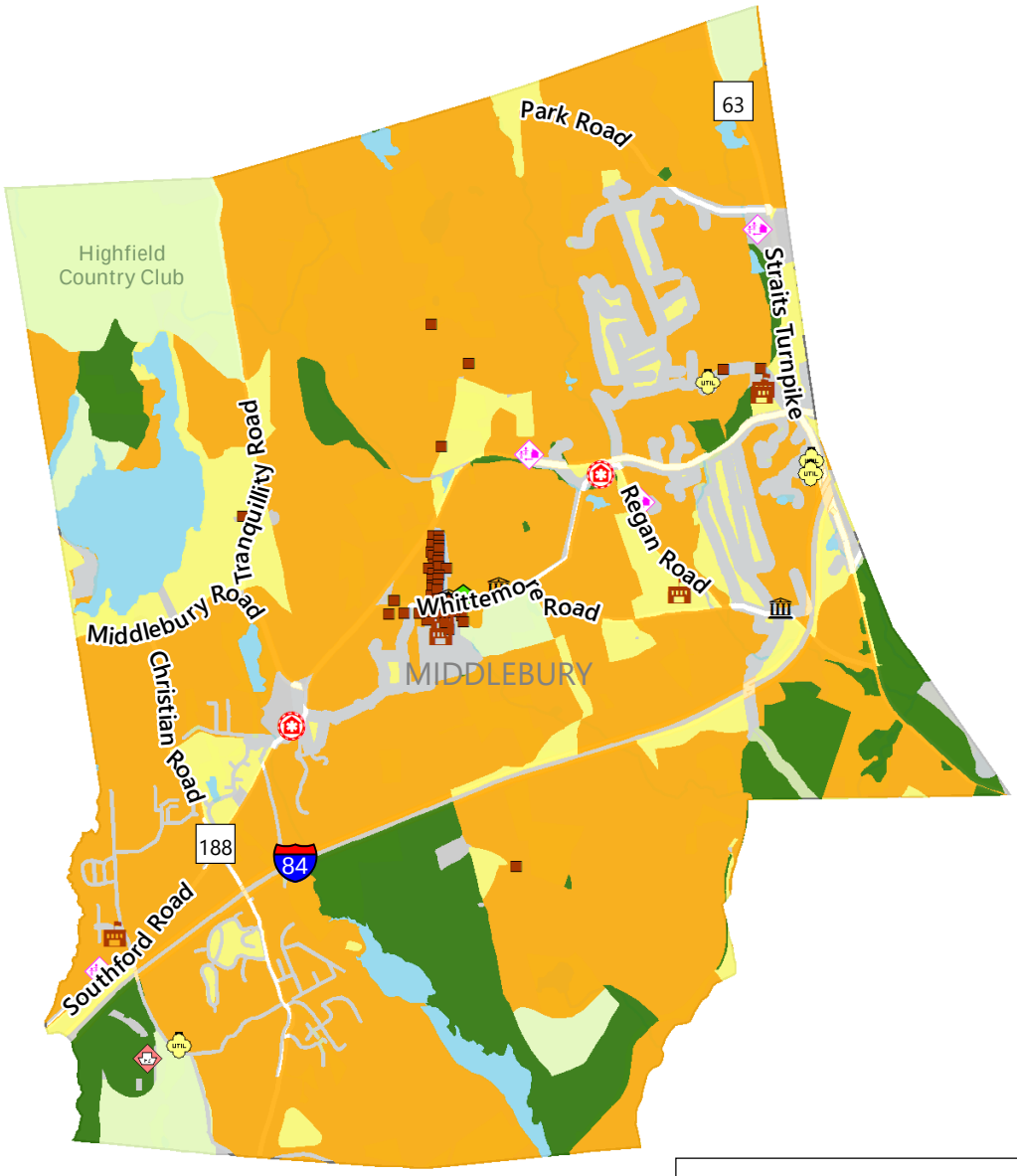

Critical Facilities
- Community Center
- Emergency Response
- Government Services
- Hazardous Materials
- School
- Utility
- Vulnerable Population

Historic Sites
- Historic Sites

Wildland Urban Interface Type
- Wildland-Urban Intermix
- Wildland-Urban Interface
- Vegetated: Low Housing Density
- Vegetated: No Housing
- Non-vegetated
- Water

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203.271.1773

Wildfire Hazard in Middlebury

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

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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
MBY-1	Obtain a grant to purchase a new generator for the Public Works facility.	Public Works	Complete	Complete
MBY-2	Consider joining FEMA's Community Rating System	Selectman's Office	Drop	The Town has too few flood insurance policies to justify CRS participation.
MBY-3	Identify potential areas that may be feasible for selective vegetation and debris removal in an effort to reduce flooding.	Public Works	Carry Forward	Still needed; permits are the issue, or potential adverse outcomes of the clearing.
MBY-4	Develop a plan to remove debris from Hop Brook to reduce the potential for flooding due to blocked culverts and/or bridges.	Public Works	Capability	The Town has not done anything in a while; some dead trees were removed as needed recently. This appears to be a capability, and no written plan is needed.
MBY-5	Encourage FEMA to update the Flood Insurance Study and SFHA mapping to reflect revised hydrology	Selectman's Office	Drop	FEMA re-study and new mapping is underway for the Housatonic River basin.
MBY-6	Work with homeowners on Regan Rd, Old Regan Rd, Ravenwood Dr, Porter Ave, Steinmann Ave, and Woodside Ave to pursue elevation of structures	Selectmans Office	Carry Forward with Revision	Nothing has been done. Revise to call for an annual letter to notify residents of options.
MBY-7	Increase the capacity of the Hop Brook culvert where it flows under Watertown Avenue to prevent future washouts like the one that occurred in 2006	Public Works	Complete	A new bridge was reportedly installed 4-5 years ago.

Strategy	Description	Responsible Party	Status	Notes
MBY-8	Increase the conveyance capacities of the culverts for the unnamed stream under the intersection of Cemetery Road and Middlebury Road	Public Works	Carry Forward	Not done
MBY-9	Increase the conveyance capacities of the culvert beneath Middlebury Rd at the end of Steinmann Ave associated with Long Swamp Brook	Public Works	Carry Forward	The Town did some work with riprap, but did not increase conveyance capacity.
MBY-10	Increase the conveyance capacities of the culverts associated with the stream running along and beneath Woodside Avenue.	Public Works	Carry Forward	This is the stream that flows from Straw Pond. The State is re-doing the intersection with I-84 and may address this.
MBY-11	Increase the conveyance capacity of the culvert at Ravenwood Road	Public Works	Drop	They re-lined the culvert; same capacity.
MBY-12	Increase the conveyance capacity of the culvert at Biasci Road.	Public Works	Drop	They replaced the culvert; same capacity.
MBY-13	Develop a plan to address weak/unstable Ash Trees	Public Works	Capability	The Town is working on the ash trees.
MBY-14	Develop a plan to prioritize snow removal from the roof of critical facilities and other municipal buildings each winter. Ensure adequate funding is available in the Town budget for this purpose.	Public Works	Capability	Public Works is keeping up with this.
MBY-15	Consider bracing systems for assets and equipment inside critical facilities	Public Works	Drop	Data is backed up to the cloud. Other needs have not been identified.
MBY-16	EOPs/EAPs and Dam Failure Analyses should be developed for Class B and C dams	Public Works	Complete	Action has been completed.
MBY-17	Develop an EOP for Little Tracy's Pond Dam, as it would identify specific means of monitoring the dam and warning downstream residents of emergency situations.	Public Works	Complete	CT DEEP sent an acceptance letter for the EAP in June 2019.
MBY-18	The Towns of Woodbury, Oxford, and Southbury should cooperate with the Town of Middlebury's efforts to address repairs to Quassapaug Lake Dam if needed.	Public Works	Drop	Dam is owned by West Lake Association; no changes to the dam are likely.
MBY-19	Likewise, the Town of Oxford and the Borough of Naugatuck should cooperate with Middlebury's efforts to address repairs to Long Meadow Pond Dam if needed.	Public Works	Carry Forward with Revision	The Town remains curious about the state of the Long Meadow Pond Dam. The dam is privately-owned, and the Town has declined accepting ownership in the past. The flood risk is downstream in Naugatuck.

Strategy	Description	Responsible Party	Status	Notes
MBY-20	Consider including dam failure areas in the CTAlert emergency notification system.	Public Works	Drop	CodeRed is used now; they moved over to that from CT Alert.
MBY-21	File EOPs/EAPs in a central location as they are received from dam owners.	Public Works	Carry Forward	Action has not yet been completed due to limited municipal capacities.
MBY-22	Identify and develop sources of fire protection for the vicinity of Burr Hall Road and the north-central section of Middlebury including the north end of East Farms Road and locations along Artillery Road, North Farms Road, and Mirey Dam Road.	Fire Department	Carry forward	Action has not yet been completed due to limited municipal capacities.
MBY-23	Explore all possible means of improving accessibility for areas which currently do not have sufficient firefighting access, including the area south of I-84 near Wooster Road and east of Long Meadow Pond and the area north of Lake Quassapaug.	Fire Department	Carry forward	Action has not yet been completed due to limited municipal capacities.
MBY-24	Explore other fire protection solutions when water main extensions are not feasible, such as the use of cisterns.	Fire Department	Capability	New development is taking place where new water mains are present. Large open areas haven't changed in Middlebury.
MBY-25	Pursue flood mitigation projects that protect the Fire Station and Public Works facility, both located in floodprone areas	Public Works	Carry Forward	Action has not yet been completed due to limited funding.
MBY-26	If the Fire Station and/or Public Works Facility should become damaged by floods, ensure that backup facilities are available to ensure continuity of operations	EMD, Public Works, Fire Department	Carry Forward with Revision	No progress. Middlebury does not have backup facilities.
MBY-27	Acquire open space properties within SFHAs and set aside as greenways, parks or other non-residential, non-commercial or non-industrial use.	Selectmans Office	Drop	Nothing recently acquired.
MBY-28	Connecticut Water Co. and Heritage Village Water Co. should continue to extend the public water supply systems into areas that require water for fire protection.	Fire Department working with the water companies	Carry Forward with Revision	Some progress has been made. Westover School water system was finally taken over by CWC.

Strategy	Description	Responsible Party	Status	Notes
MBY-29	Connecticut Water Co. and Heritage Village Water Co. should continue to identify and upgrade those portions of the public water supply systems that are substandard for fire-fighting.	Fire Department working with the water companies	Capability	Some pipes in Westover School system were replaced; CWC is waiting for PURA approvals for some projects in Middlebury.

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 Town proposed to initiate several new mitigation actions for the upcoming five years. Additionally, a number of actions from the previous planning period are being carried forward or replaced with revised actions. These are listed below.

Action MBY-01	
Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.	
Lead	Plan
Cost	$0 - $25,000
Funding	OB, CT DEEP, Sustainable CT
Timeframe	2022
Priority	High

Action MBY-02	
Send an annual letter to homeowners on Regan Rd, Old Regan Rd, Ravenwood Dr, Porter Ave, Steinmann Ave, and Woodside Ave to notify them of flood mitigation options, such as elevation of structures.	
Lead	Selectmans Office
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	High

Action MBY-03	
Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	
Lead	EM, Plan, FS
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	High

Action MBY-04	
Refer to the Morris Low Impact Sustainable Development Design Manual, created to be a regional resource by the Northwest Conservation District and the Northwest Hills Council of Governments, to incorporate LID guidance and regulations into the local Zoning Regulations or Ordinances	
Lead	Plan
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

Action MBY-05	
Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	
Lead	EM, Plan, FS
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

Action MBY-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.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action MBY-07	
Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action MBY-08	
Remain engaged with CIRCA's Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.	
Lead	Plan
Cost	$0 - $25,000
Funding	OB, CT DEEP, Resilient CT
Timeframe	2022
Priority	Med

Action MBY-09	
Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action MBY-10	
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.	
Lead	Plan, HC/HDC
Cost	$0 - $25,000
Funding	OB, CT SHPO
Timeframe	2022
Priority	Low

Action MBY-11	
Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	
Lead	EM, FS
Cost	$0 - $25,000
Funding	CT DEEP
Timeframe	2022
Priority	Low

Action MBY-12	
Identify potential areas that may be feasible for selective vegetation and debris removal in an effort to reduce flooding.	
Lead	Public Works
Cost	$0 - $25,000
Funding	OB, CIP, CT DEEP
Timeframe	2022 – 2023
Priority	Low

Action MBY-13	
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.	
Lead	Plan, HC/HDC
Cost	$0 - $25,000
Funding	OB, CT SHPO
Timeframe	2022 – 2023
Priority	Low

Action MBY-14	
Coordinate with CT DEEP, the private owner of Long Meadow Pond Dam, and the Town of Naugatuck (located downstream) to secure the most up-to-date EAP for Long Meadow Pond Dam.	
Lead	EM, DPW, FS
Cost	$25,000 - $50,000
Funding	OB, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action MBY-15	
File EAPs in a central location as they are received from dam owners.	
Lead	Public Works
Cost	$25,000 - $50,000
Funding	OB, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action MBY-16	
Identify potential backup facilities that can ensure continuit of operations in the event that the Fire Station and/or Public Works Facility should become damaged by floods. Following identification, additional actions to improve the capacities of the backup facilities may be needed.	
Lead	EMD, Public Works, Fire Department
Cost	$50,000 - $100,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEMHS
Timeframe	2023 – 2025
Priority	Low

Action MBY-17	
Coordinate with the Town of Oxford and the Borough of Naugatuck on efforts to address repairs to Long Meadow Pond Dam. The Town is not currently aware of the state of the dam.	
Lead	Public Works
Cost	$100,000 - $500,000
Funding	CIP, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-18	
Identify and develop sources of fire protection for the vicinity of Burr Hall Road and the north-central section of Middlebury including the north end of East Farms Road and locations along Artillery Road, North Farms Road, and Mirey Dam Road.	
Lead	Fire Department
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-19	
Explore all possible means of improving accessibility for areas which currently do not have sufficient firefighting access, including the area south of I-84 near Wooster Road and east of Long Meadow Pond and the area north of Lake Quassapaug.	
Lead	Fire Department
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-20	
Identify areas that require water for fire protection and for which it is appropriate to extend the public water supply system to provide service. Work with Connecticut Water Co. and Heritage Village Water Co. to extend service to those areas.	
Lead	Fire Department working with the water companies
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-21	
Pursue flood mitigation projects that protect the Fire Station and Public Works facility, both located in floodprone areas	
Lead	Public Works
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEMHS
Timeframe	2023 – 2025
Priority	Low

Action MBY-22	
Increase the conveyance capacities of the culverts for the unnamed stream under the intersection of Cemetery Road and Middlebury Road	
Lead	Public Works
Cost	More than $500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-23	
Increase the conveyance capacities of the culvert beneath Middlebury Rd at the end of Steinmann Ave associated with Long Swamp Brook	
Lead	Public Works
Cost	More than $500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action MBY-24	
Increase the conveyance capacities of the culverts associated with the stream running along and beneath Woodside Avenue.	
Lead	Public Works
Cost	More than $500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	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	
MBY-01	Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.	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	9
MBY-02	Send an annual letter to homeowners on Regan Rd, Old Regan Rd, Ravenwood Dr, Porter Ave, Steinmann Ave, and Woodside Ave to notify them of flood mitigation options, such as elevation of structures.	RLP	Selectmans Office	$0 - $25,000	OB	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
MBY-03	Refer to the Morris Low Impact Sustainable Development Design Manual, created to be a regional resource by the Northwest Conservation District and the Northwest Hills Council of Governments, to incorporate LID guidance and regulations into the local Zoning Regulations or Ordinances	Low Impact Development	Plan	$0 - $25,000	OB, CT DEEP	2022	0	1	1	1	1	1	1	0	0	0	0	0	0	0	8
MBY-04	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	7
MBY-05	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 – 2023	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
MBY-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	5
MBY-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	5
MBY-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	7
MBY-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	5
MBY-10	Coordinate with CT DEEP, the private owner of Long Meadow Pond Dam, and the Town of Naugatuck (located downstream) to secure the most up-to-date EAP for Long Meadow Pond Dam.	Dam Safety	EM, DPW, FS	$25,000 - $50,000	OB, CT DEEP	2022 – 2024	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
MBY-11	File EAPs in a central location as they are received from dam owners.	Dam Safety	Public Works	$25,000 - $50,000	OB, CT DEEP	2022 – 2024	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
MBY-12	Coordinate with the Town of Oxford and the Borough of Naugatuck on efforts to address repairs to Long Meadow Pond Dam. The Town is not currently aware of the state of the dam.	Dam Safety	Public Works	$100,000 - $500,000	CIP, CT DEEP	2023 – 2025	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
MBY-13	Increase the conveyance capacities of the culverts for the unnamed stream under the intersection of Cemetery Road and Middlebury Road	Culvert & Bridge Upgrades	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	6.5
MBY-14	Increase the conveyance capacities of the culvert beneath Middlebury Rd at the end of Steinmann Ave associated with Long Swamp Brook	Culvert & Bridge Upgrades	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	6.5
MBY-15	Increase the conveyance capacities of the culverts associated with the stream running along and beneath Woodside Avenue.	Culvert & Bridge Upgrades	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	6.5
MBY-16	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	1	0	1	1	0	1	0	0	0	0	0	0	0	0	5
MBY-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	6
MBY-18	Identify and develop sources of fire protection for the vicinity of Burr Hall Road and the north-central section of Middlebury including the north end of East Farms Road and locations along Artillery Road, North Farms Road, and Mirey Dam Road.	Wildfire Risk Reduction	Fire Department	$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
MBY-19	Explore all possible means of improving accessibility for areas which currently do not have sufficient firefighting access, including the area south of I-84 near Wooster Road and east of Long Meadow Pond and the area north of Lake Quassapaug.	Wildfire Risk Reduction	Fire Department	$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
MBY-20	Identify areas that require water for fire protection and for which it is appropriate to extend the public water supply system to provide service. Work with Connecticut Water Co. and Heritage Village Water Co. to extend service to those areas.	Wildfire Risk Reduction	Fire Department working with the water companies	$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

#	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	
MBY-21	Pursue flood mitigation projects that protect the Fire Station and Public Works facility, both located in floodprone areas	Critical Facility Protection	Public Works	$100,000 - $500,000	CIP, FEMA Grant, FEMA AFG, CT DEMHS	2023 – 2025	0	1	1	0	1	1	0	0	0	0	0	0	0	0	6
MBY-22	Identify potential areas that may be feasible for selective vegetation and debris removal in an effort to reduce flooding.	Conservation & Restoration	Public Works	$0 - $25,000	OB, CIP, CT DEEP	2022 – 2023	0	1	0	1	1	0	1	0	0	0	0	0	0	0	5
MBY-23	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
MBY-24	Identify potential backup facilities that can ensure continuity of operations in the event that the Fire Station and/or Public Works Facility should become damaged by floods. Following identification, additional actions to improve the capacities of the backup facilities may be needed.	Critical Facility Protection	EMD, Public Works, Fire Department	$50,000 - $100,000	CIP, FEMA Grant, FEMA AFG, CT DEMHS	2023 – 2025	0	0.5	1	0	1	1	0	0	0	0	0	0	0	0	5

APPENDIX B

RECORD OF MUNICIPAL ADOPTION

TOWN OF MIDDLEBURY

Office of the Selectmen

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

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

WHEREAS, the Middlebury Board of Selectmen approved the previous version of the Plan in 2014; and

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

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

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

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

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

RESOLVED by the Board of Selectmen:

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

Adopted this 6th **day of** December**, 2021 by the Board of Selectmen of Middlebury, Connecticut**

Edward B. [illegible]
First Selectman

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of Middlebury this 8th day of Dec, 2021.

Judith M. Berson
Town Clerk

TOWN OF MIDDLEBURY SEAL CONNECTICUT

APPENDIX C

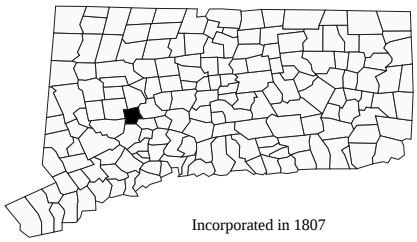
CERC Town Profile 2019

Middlebury, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

Town Hall
1212 Whittemore Road
Middlebury, CT 06762
(203) 758-2439

Belongs To
New Haven County
LMA Waterbury
Naugatuck Valley Planning Area



Incorporated in 1807

Demographics

Population

	Town	County	State
2000	6,451	824,008	3,405,565
2010	7,575	862,477	3,574,097
2013-2017	7,658	862,127	3,594,478
2020	8,233	898,514	3,604,591
'17 - '20 Growth / Yr	2.3%	1.3%	0.1%

	Town	County	State
Land Area (sq. miles)	18	605	4,842
Pop./Sq. Mile (2013-2017)	431	1,426	742
Median Age (2013-2017)	47	40	41
Households (2013-2017)	2,697	327,402	1,361,755
Med. HH Inc. (2013-2017)	$105,036	$64,872	$73,781

	Town	State
Veterans (2013-2017)	363	180,111

Age Distribution (2013-2017)

	0-4		5-14		15-24		25-44		45-64		65+		Total	
Town	275	4%	1,052	14%	839	11%	1,476	19%	2,463	32%	1,553	20%	7,658	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)

	Town	County	State
White Non-Hisp	6,635	553,000	2,446,049
Black Non-Hisp	79	105,661	350,820
Asian Non-Hisp	427	33,678	154,910
Native American Non-Hisp	0	783	5,201
Other/Multi-Race Non-Hisp	112	20,448	84,917
Hispanic or Latino	405	148,446	551,916

	Town	County	State
Poverty Rate (2013-2017)	5.1%	12.1%	10.1%

Educational Attainment (2013-2017)

	Town		State	
High School Graduate	903	16%	673,582	27%
Associates Degree	438	8%	188,481	8%
Bachelors or Higher	3,031	55%	953,199	38%

Economics

Business Profile (2018)

Sector	Units	Employment
Total - All Industries	312	4,209
23 - Construction	NA	NA
31-33 - Manufacturing	11	133
44-45 - Retail Trade	25	203
62 - Health Care and Social Assistance	54	1,366
72 - Accommodation and Food Services	24	343
Total Government	14	373

Top Five Grand List (2017)

	Amount
Connecticut Light & Power Co	$17,861,740
Olymbec Preston Park	$12,917,800
Timex Group Usa Inc	$11,814,580
Middlebury Edge LLC	$8,046,650
Toll CT II LP	$6,749,761
Net Grand List (SFY 2016-2017)	$945,136,332

Major Employers (2014)

Chemtura Corp
Quassy Amusement Park
Berlin Packaging
Timex Group USA Inc
Winchester Electronics Corp

Education

2018-2019 School Year

	Grades	Enrollment
Regional School District 15	PK-12	3628

Pre-K Enrollment (PSIS)

	2018-2019
Regional School District 15	61

4-Year Cohort Graduation Rate (2017-2018)

	All	Female	Male
Connecticut	88.3%	91.8%	85.1%
Regional School District 15	94.5%	96.1%	93.3%

Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	77.8%	53.8%	78.7%	51.3%	53.3%	43.0%
ELA	69.6%	53.1%	72.8%	54.9%	66.0%	56.1%

Rate of Chronic Absenteeism (2017-2018)

	All
Connecticut	10.7%
Regional School District 15	4.1%

Public vs Private Enrollment (2013-2017)

	Town	County	State
Public	85.2%	88.2%	86.8%
Private	14.8%	11.8%	13.2%

Middlebury, Connecticut

CERC Town Profile 2019

Connecticut Economic Resource Center

Government

Government Form: Selectman - Town Meeting

Total Revenue (2017)	$31,600,847	Total Expenditures (2017)	$31,433,428	Annual Debt Service (2017)	$740,288
Tax Revenue	$29,419,413	Education	$21,479,288	As % of Expenditures	2.4%
Non-tax Revenue	$2,181,434	Other	$9,954,140	Eq. Net Grand List (2017)	$1,354,921,070
Intergovernmental	$1,171,780	Total Indebtedness (2017)	$12,624,690	Per Capita	$175,394
Per Capita Tax (2017)	$3,815	As % of Expenditures	40.2%	As % of State Average	116.2%
As % of State Average	130.1%	Per Capita	$1,634	Moody's Bond Rating (2017)	Aa2
		As % of State Average	65.0%	Actual Mill Rate (2017)	31.01
				Equalized Mill Rate (2017)	21.75
				% of Net Grand List Com/Ind (2017)	11.6%

Housing/Real Estate

Housing Stock (2013-2017)

	Town	County	State
Total Units	2,937	365,546	1,507,711
% Single Unit (2013-2017)	90.7%	53.6%	59.2%
New Permits Auth (2017)	22	750	4,547
As % Existing Units	0.7%	0.2%	0.3%
Demolitions (2017)	2	202	1,403
Home Sales (2017)	76	4,763	21,880
Median Price	$355,400	$244,400	$270,100
Built Pre-1950 share	28.9%	33.2%	29.3%
Owner Occupied Dwellings	2,416	204,037	906,798
As % Total Dwellings	89.6%	62.3%	66.6%
Subsidized Housing (2018)	123	46,013	167,879

Distribution of House Sales (2017)

	Town	County	State
Less than $100,000	0	106	536
$100,000-$199,999	5	1,232	5,237
$200,000-$299,999	25	1,785	6,681
$300,000-$399,999	22	888	3,863
$400,000 or More	24	752	5,563

Rental (2013-2017)

	Town	County	State
Median Rent	$1,324	$1,100	$1,123
Cost-burdened Renters	50.0%	54.5%	52.3%

Labor Force

	Town	County	State
Residents Employed	3,833	438,576	1,827,070
Residents Unemployed	135	20,171	78,242
Unemployment Rate	3.4%	4.4%	4.1%
Self-Employed Rate	14.1%	8.5%	10.0%
Total Employers	312	24,958	122,067
Total Employed	4,209	366,848	1,673,867

Connecticut Commuters (2015)

Commuters Into Town From:		Town Residents Commuting To:	
Waterbury, CT	653	Waterbury, CT	699
Middlebury, CT	302	Middlebury, CT	302
Watertown, CT	302	Southbury, CT	184
Naugatuck, CT	261	Danbury, CT	151
Southbury, CT	185	Naugatuck, CT	133
Wolcott, CT	99	New Haven, CT	126
Woodbury, CT	92	Watertown, CT	115

Quality of Life

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

	Town	State
Property	1,340	1,777
Violent	74	228

Disengaged Youth (2013-2017)

	Town	State
Female	0.0%	4.2%
Male	0.0%	5.6%

	Town
Library circulation per capita	10.58

Distance to Major Cities

	Miles
Hartford	28
New York City	73
Providence	90
Boston	122
Montreal	278

Residential Utilities

Electric Provider
Eversource Energy
(800) 286-2000

Gas Provider
Eversource Energy
(800) 989-0900

Water Provider
Connecticut Water Company
(800) 286-5700

Cable Provider
Comcast Waterbury
(800) 266-2278