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

Municipal Annex
for

WOODBURY, CT

281 Main St South
Woodbury, CT 06798
MMI #3211-29

Prepared for:
NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS
47 Leavenworth Street, 3rd Floor
Waterbury, CT 06702
(203) 489-0362
www.nvcogct.org

Prepared by:
SLR CONSULTING
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773
www.slrconsulting.com

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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 Woodbury representatives on September 28, 2020 for the purposes of initial data collection and review of necessary updates for this document. The meeting was convened by the HMP local coordinator, David Lampart.

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 Woodbury was incorporated as a town in 1672. It is located in the southeastern corner of Litchfield County in northwestern Connecticut approximately 18 miles north of Bridgeport and 16 miles northwest of New Haven. It is bordered on the east by the Towns of Watertown and Middlebury, on the north by the Towns of Bethlehem and Washington, on the west by the Town of Roxbury, and on the south by the Town of Southbury. The varying terrain and land uses results in vulnerability to an array of natural hazards.

1.4 Land Cover

The land area of Woodbury is approximately 36.5 square miles with an additional 0.3 square miles of water. Woodbury is primarily a residential suburban community within the larger Waterbury metropolitan area.

Unlike many towns in Connecticut, Woodbury does not have a dense town center; instead, the historic district stretches for a linear mile. Residential areas have been constructed along minor roads that connect to Route 6, Route 132, Route 47, Route 64, and Route 317, but most of the community is forested. Access to major highways is provided via Route 6 into neighboring communities. Several small parks are located in Woodbury, including Hollow Park, Orenaug Park, and the Flanders Nature Center.

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 67% of Woodbury is forested and approximately 11% is developed. Most development is located along Route 6, with the densest development being near the center of the community. Forests and agricultural uses are primarily located in outlying areas.

Table 1-1: 2015 Land Cover by Area

Land Cover	Area (acres)	Percent of Community
Developed	2,477.2	10.53%
Turf & Grass	1,313.5	5.59%
Other Grass	293.5	1.25%
Agricultural Field	3,233.5	13.75%
Deciduous Forest	13,533.7	57.55%
Coniferous Forest	1,611.7	6.85%
Water	232.3	0.99%
Non-Forested Wetland	57.5	0.24%
Forested Wetland	559.9	2.38%
Tidal Wetland	0.0	0.00%
Barren	148.2	0.63%
Utility Row	54.0	0.23%
Total	**23,515**	**100%**

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

Low-density residential zoning is located throughout most of Woodbury, while higher-density residential zoning is located at Woodlake, near the town center, and along Route 6 and Route 64 in the southern portion of town. Commercial zoning generally lies along Route 6 south of the town center, while industrial zoning is very limited.

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 Woodbury.

Woodbury is underlain by relatively hard metamorphic and igneous bedrock including a variety of gneiss, schist, arkose, basalt, and granite. The bedrock formations trend generally southwest to northeast along a series of mapped faults dating from the Jurassic period. The faults are believed to be inactive.

Woodbury surficial geology consists primarily of glacial till. Stratified glacial meltwater deposits are related to the various water bodies in town, particularly the Pomperaug River, Weekeepeemee River, and the Nonnewaug River. Tills contain an unsorted mixture of clay, silt, sand, gravel, and boulders deposited by glaciers as a ground moraine. The deposits are generally less than 50 feet thick, although deeper deposits

of till are scattered across the hillier sections of Woodbury, and deeper stratified glacial meltwater deposits can be found along the Pomperaug River.

Stratified glacial meltwater deposits are generally coincident with inland floodplains. These materials were deposited at lower elevations by glacial streams, and these valleys were later inherited by the larger of our present day streams and rivers. Oftentimes these deposits are associated with public water supply aquifers or with wetland areas that provide significant floodplain storage. However, the smaller glacial till watercourses throughout Woodbury can also cause flooding. The amount of stratified drift also has bearing on the relative intensity of earthquakes.

1.6 Drainage Basins and Hydrology

Woodbury is part of the Pomperaug River Valley. The topography of the community is characterized by higher elevations that slope towards the Pomperaug River in the central area of town. Peaks in the western part of the community reach elevations nearing 900 feet above sea level, while the Pomperaug River valley lies between elevations 200 and 250 feet.

Woodbury is divided among ten sub-regional watersheds. Significant watercourses include the Nonnewaug River, Weekeepeemee River, Sprain Brook, Hesseky Brook, and the Pomperaug River. The majority of the drainage basins drain into the Pomperaug River and then to the Housatonic River, but areas on the eastern side of Woodbury drain to the Naugatuck River. All of the water that passes through Woodbury eventually empties into Long Island Sound.

Several large impoundments exist in Woodbury. These include the Reichenbach Pond, Cat Swamp Pond, Ricker Pond, Alder Swamp, Hesseky Meadow Pond, Radey Pond, Transylvania Pond, Woodbury Reservoir, Kelley Pond, and a portion of Lake Quassapaug.

1.7 Climate and Climate Change

In Woodbury, 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 89°F.

The warm season lasts for 3.6 months, from May 31 to September 16, with an average daily high temperature above 72°F. The hottest day of the year is July 21, with an average high of 81°F and low of 63°F. The cold season lasts for 3.3 months, from December 2 to March 12, with an average daily high temperature below 44°F. The coldest day of the year is January 29, with an average low of 19°F and high of 34°F.

The wetter season lasts 3.5 months, from May 3 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 3. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 5, with an average total accumulation of 4.0 inches. The snowy period of the year lasts for 5.4 months, from November 3 to April 16, 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 1.1 inches.

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

Climate Change

Climate change projections for Connecticut were sourced from the 2019 Connecticut Physical Climate Science Assessment Report, which was developed by the University of Connecticut (UConn) Atmospheric Sciences Group, commissioned by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) with funding from the Department of Energy and Environmental Protection (DEEP). All projections are based on the IPCC high CO_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 Litchfield County is 4.7 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 Woodbury as 4.94 inches.

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

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

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

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	10%	4%	1%
Technical Paper No. 40	4.7	5.5	7.0
NRCC	4.9	6.2	8.6
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 Woodbury can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.1 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

The 2010 U.S. Census reported a population in Woodbury of 9,562 individuals. U.S. Census Bureau estimates for 2019 show a population around 9,703 individuals, an increase from 2010 of 1.5%. The Connecticut State Data Center predicts that population will increase by 9.3% through 2025 to an estimated population of 2,664 individuals.

According to the Connecticut Data Collaborative, the number of annual housing permits in Woodbury increased somewhat over the last decade. The number of permits issued in 2010 and 2011 was 4 and 6, respectively, while 8 permits were issued in 2016, and 24 permits were issued in 2017. On average, 8 housing permits were issued each year in Woodbury between 2010 and 2017.

According to the U.S. Census Bureau, the overall number of housing units in Woodbury rose by approximately 1.9-percent between 2010 and 2019, from 4,564 units in 2010 to 4,652 units in 2019. In 2019, the housing stock was made up of approximately 81% single-unit structures, 3% two-unit structures, 16% multi-unit structures, and 1% mobile-homes or other types of structures.

According to the Connecticut Office of Policy and Management, Woodbury's 2019 Total Equalized Net Grand List was valued at $1,076,000,000. 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 Woodbury, included as Appendix C.

Woodbury is unique in that it did not develop around a traditional town center, but rather along a mile-long linear Main Street. Development in Woodbury has been historically centered on agriculture with a small commercial district associated with Main Street. Recent years have seen more subdivisions and homes being developed away from the traditional center. One such development is at Woodlake in the southwestern part of the community where more than 3,000 residents live. The vast majority of homes in Woodbury are detached single-family homes (accounting for 68% of all residential structures). The majority of homes in Woodbury (74%) were built before 1990, and 25% were built before 1950. Newer buildings are constructed to more recent building codes and are considered to be less vulnerable to natural hazards than older buildings. A total of 25% of all housing units are rental-occupied.

Most development has occurred along major arterial roadways and associated collector roads, including Route 47, Route 64, and Route 317.

While public water supply is available in many areas, the lack of sewer in Woodbury restricts development of large scale residential, commercial, and industrial facilities.

Limited commercial development and almost no industrial development exists in the community. A small commercial area is located along Route 6 near the central area of Woodbury that has a supermarket and shops. Most commercial activities along roads leading away from the central area consists of restaurants, clothing stores, specialty stores, and antique shops. A commercial development called South Green was started a few years ago and two of the proposed six buildings were constructed. Woodbury would like to see the undeveloped portion of this property re-zoned by the developer for development of assisted living facilities. Industrial activities are mainly related to resource extraction (mining).

In general, Woodbury encourages future residential and non-residential development that can be supported by existing infrastructure. Should new or expanded infrastructure be required, such expansion is to be paid by the developer whenever possible.

Single-family zoning districts account for 97% of the community area. More than 50% of the town requires a minimum lot size of 2.3 acres in order to preserve the rural feel of the community. The remaining residential lot sizes include 0.9 acres, 1.4-acres, and 1.8-acre lot sizes. Higher density development is allowed closer to the community center, while the moderately sized lots are allowed in the southern areas of the community and along the Route 6 corridor.

A build-out analysis in the 2010 POCD estimates a maximum town population of 15,000 based on existing zoning and accounting for undevelopable areas. A total of 6,000 housing units would be needed to support this population, which would likely be realized in 50 years. It is not expected that significant commercial or industrial growth would occur, although the POCD calls for a slight increase. Planners in Woodbury expect that some of the population increase to be supported by expansion of public water supply, although the creation of public sewer is not expected. Increases in the building stock in Woodbury, whether residential, commercial, or industrial in nature, will increase the community's level of vulnerability to natural hazards as more building value will be potentially at risk. However, it is expected that new development projects will be generally free from flooding.

Although there has not been any major commercial or industrial development in Woodbury since 2014, residential development has continued. In particular, the number of constructed single-family homes has been increasing each year. Other residential developments have included the completion of an apartment complex near Emergency Services (Quassuk Road). Adding to Woodbury's development slump is the lack of recent subdivision approvals. Many previous subdivision approvals have expired without being built or with being only partially built. One of these projects is a 12-unit, 24-lot subdivision which is currently under construction. These recent developments do not pose any drainage concerns for the Town.

Summary

Recent residential development in Woodbury has been relatively significant, and increased population and infrastructure construction has increased exposure to natural hazard impacts. Most of this development is concentrated along existing arteries and near dense areas, so despite the increase in exposure, overall vulnerability has not necessarily risen significantly. Future development trends in Woodbury are not expected to increase natural hazard risks over the next five years.

1.9 Historic and Cultural Resources

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

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

Historic resources in Woodbury 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

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

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

Woodbury is considered to have a Moderate level of social vulnerability, with a higher vulnerability score for the SVI category of Household Composition & Disability. In other words, a particular challenge in

Woodbury may include the presence of residents who need additional assistance during a disaster event due to disabilities.

2.0 MUNICIPAL CAPABILITIES

2.1 Governmental Structure and Capabilities

The Town of Woodbury is governed by a Selectman-Town Meeting form of government. The Board of Selectmen or other commissions draft legislation for the electors of the community to vote upon, and enact such legislation when approved. The First Selectman serves as the chief executive managing day-to-day affairs, while the two remaining selectman are part-time.

In addition to the Board of Selectmen, there are boards, commissions and committees providing input and direction to town administrators while town departments provide municipal services and day-to-day administration. Many of these commissions and departments play a role in hazard mitigation, including the following:

- The Building Official reviews plans to ensure conformance with all applicable codes and inspects work for final approval.
- The Civil Preparedness Advisory Council oversees and coordinates emergency response activities and planning.
- The Fire Department is the primary responder to emergency situations caused by natural hazards.
- The Fire Marshal reviews zoning and subdivision applications for fire protection safety concerns.
- The Inland Wetlands Agency and reviews applications for activities within and adjacent to wetlands in the community.
- The Planning Commission reviews and approves subdivision applications and drafts regulation changes for local approval. The Zoning Commission reviews applications for special permits and exceptions throughout the community, and revises and enforces regulations as needed. The Land Use Office consists of the Town Engineer and Town Planner and coordinates review of applications between town departments as well as processing basic land use applications. Enforcement of local land use regulations also occurs through the Land Use Office. The Zoning Board of Appeals reviews requests for variances and handles appeals for rejected applications.
- The Police Department provides traffic control, assistance to local fire departments and ambulance services, and emergency response. They also report road conditions to Public Works during inclement weather.
- The Public Works Department provides investigation assistance, cleanup, and repair support following disasters, and is relied upon to provide access to areas during storm events. They maintain and construct culverts, bridges, and roads on public land. Complaints related to town maintenance issues are routed Public Works Director and are investigated and remediated as necessary. The Public Works Director is also identifies dangerous trees and hires contractors to perform trimming and removal. Currently, the Tree Warden is contracted out to Neal Tree Service, LLC (Bud Neal).

Existing Plans

Emergency Operations Plan

Woodbury has an Emergency Operations Plan (EOP) that is updated and certified annually. This document provides general and specific procedures to be instituted by the First Selectman and/or designees during an emergency, including natural hazard events such as hurricanes and nor'easters. Therefore, the EOP is an action plan for providing emergency services prior to, during, and following a severe natural hazard event. The EOP also covers response to other types of emergencies including mass casualty incidents, pandemics, and terrorism. The EOP is considered to be effective for providing a framework for emergency response within the Town of Woodbury. Woodbury is currently updating the EOP and enhancing the electronic search function in the digital copy to increase its ease of use.

Plan of Conservation and Development

The 2010 PoCD is a broad planning document that provides guidelines for evaluating future land-use decisions. Pertinent to hazard mitigation planning, the goals in the PoCD call for:

- Achieving 20% to 25% of the Town's land area as open space by 2020, targeting parcels critical to protection of groundwater aquifers, wetlands, sleep slopes, ridgelines, wildlife habitat, floodplains, and prime farmland soils; and collaborating with conservation organizations to preserve important open space lands;
- Increasing the share of commercial and industrial land values on the Grand List from 7.2% to 8% by 2020 by promoting low-intensity designs such as office and light industrial uses.
- Increasing the percentage of subsidized housing units in the community, with an emphasis on elderly units and ownership units for families;
- Protect the small town atmosphere by avoiding large tract subdivisions and through the use of open space designs, and steer housing development away from agricultural land, ridgelines, and sensitive natural areas;
- Constructing a new public works garage to replace the dilapidated facility;
- Establishing an emergency shelter and purchase a generator for a backup power source;
- Implementing the key provisions of the Town's Hazard Mitigation Plan;
- Construct a branch fire station on the westerly side of the Pomperaug River to provide reliable fire service to the entire community;
- Implementing removal of overhead power lines in the commercial areas and historic districts of Main Street by 2020; and
- Evaluate the status of unimproved public ways and either repair or discontinue public ownership.

The 2010 PoCD discusses the town's Hazard Mitigation Plan and encourages the community to implement the principal recommendations of the plan (which have been performed as discussed in Table 1-11). The 2010 PoCD is considered effective for informing and assisting in decision making by the Planning Commission. While many of the goals, policies, and recommendations of the plan have not become specific regulations, the framework provided by the PoCD assists local commissions and officials in providing recommendations to developers to improve their designs prior to approval. This HMP Update is expected to further refine the goals, policies, and recommendations of the next PoCD update.

Water Supply Plans

The Aquarion Water Company maintains a Water Supply Plan for each of their water systems. A key component of such plans is the development of Emergency Contingency Plans covering response to a variety of potential water system emergencies. These plans detail the necessary system response to flooding, wind, and other natural hazards. These plans help to inform the EOP and this hazard mitigation plan of critical populations and infrastructure at risk.

Pomperaug District Department of Health Plans

The Pomperaug Health District continuously participates in local, regional, and statewide emergency preparedness. The District maintains a comprehensive Emergency Operations Plan that covers natural disasters, catastrophic events, viral and disease outbreaks, and acts of terrorism among other emergencies. This plan helps to inform the EOP and this hazard mitigation plan of critical populations at risk.

Existing Regulations

Zoning Regulations

Several of the stated purposes of the Woodbury Zoning Regulations (as revised through May 1, 2010) is to secure safety from fire, panic, flood, and other dangers.

- Section 4.2.1 states that only 20% of wetlands and watercourse areas are counted towards minimum lot size requirements.
- Section 6.1 defines the Flood Plain District which is coterminous with the boundaries of Special Flood Hazard Area as defined by FEMA in January and October 1978.
  - Applications for construction, reconstruction, enlargement, extension, movement, or structural alterations of buildings or filling, grading, or excavation of land in the floodplain district requires a Flood Plain Permit.
  - All buildings and structures must be designed with minimal flood damage potential, constructed and placed on a lot so as to offer minimum resistance to the flow of flood waters, firmly anchored to prevent floatation or other movement, and constructed with materials resistant to flood damage. Utility services must be located or designed to prevent water from entering or accumulating in the components during a flood.
  - Applicants are required to submit base flood elevation data for activities within A zones.
  - New construction and substantial improvement of residential construction shall have the lowest floor, including basement, elevated at least to the base flood elevation. Non-residential construction may either elevate as above or be floodproofed to the base flood elevation.
  - Elevated buildings with fully enclosed areas beneath the structure must be designed to preclude finished living space below the base flood elevation and allow for entry and exit of floodwaters in accordance with the NFIP.
  - Manufactured homes being constructed or substantially improved must be elevated to be above the base flood elevation.
  - No construction or substantial improvement is allowed in floodplains that would raise the base flood elevation.

- Neither the water holding nor conveyance capacity of the floodplain may be reduced.
- Applicants are required to provide information similar to that required by a FEMA Elevation Certificate for Flood Plain Permits.
- Permitted uses include agriculture, recreation, overhead and underground utility ways, and flood protection uses.

- Section 7.6 requires an erosion and sediment control plan to be approved prior to any land development cumulatively more than one-half acre in area.

Overall, the Zoning Regulations are considered effective at preventing unwanted side effects of development. These regulations are updated by the Zoning Commission as needed. While it is recognized that there are areas where improvement could be made (as discussed throughout this HMP), the current political environment is relatively slow to accept significant regulatory changes.

Subdivision Regulations

Several of the stated purposes of the Woodbury Subdivision Regulations (as revised through January 1, 2006) include preventing the creation of situations detrimental to the health and general welfare of the Town, its residents, and landowners; to preserve the Town's farmland, wildlife habitat, watercourses, wetlands, and natural resources.

- Section 1.6 requires fire hydrants when public water supply is provided to a project.
- Section 1.8 requires new drainage structures to be designed to conform to current road standards as well as consider any future improvements to ensure proper future drainage.
- Section 2.3 requires an erosion and sedimentation control plan (as outlined in Section 3.6 of the regulations), inland wetlands review, and hydrology and hydraulic report when applicable.
- Section 2.4 requires additional evidence as needed to ensure that proper provision will be made for water, drainage, sewage, and flood control measures and flooding contiguous to flooding sources.
- Section 3.3 requires delineation of all wetlands and floodplains, and the location of the subdivision in relation to existing streets.
- Section 4.2 requires subdivisions to be planned and designed in general conformity with the PoCD with regard to the location and classification of streets, water supply and drainage systems, and reservation of land for parks, recreation, open space, and conservation.
- Section 4.6 requires the preservation of natural features, including avoidance of topographic alteration; tree removal; alterations to or encroachment upon swamps, floodplains, and other land subject to flooding to the maximum extent possible.
- Section 4.7 requires that subdivisions in Flood Plain Districts must be consistent with the need to minimize flood damage, public utilities and facilities must be located and constructed to minimize flood damage, that adequate drainage must be provided, and that base flood elevation data must be provided for all subdivision proposals which contain five acres or fifty lots (whichever occurs first) and are located in Zone A.
- Section 4.9 requires that no less than 20% of the total area of any subdivision be preserved as open space.
- Section 4.12 requires new electric and telephone wires to be installed underground unless such installation is inappropriate or infeasible.

- Section 4.14 states that the Commission may require the construction of ponds or the installation of underground water storage tanks (minimum 10,000-gallon capacity) and dry hydrant connections for the purposes of fire protection.
- Section 4.15 restricts the development of cul-de-sacs to subdivisions with no more than 25 lots.
- Section 4.17 regulates storm drainage facilities. Drainage systems are to be designed and constructed to make use of, protect, and improve natural drainage. All drainage facilities within roads and easements must pass the 10-year design storm. All cross culverts under drives as well as minor rural, local rural, and residential sub-collector streets as well as improved streams, swales, and ditches must be sized to pass the 25-year design storm. All cross culverts and bridges constructed under residential collector and arterial streets, or where required by the town, must be sized to pass the 50-year design storm. A drainage analysis map must be provided. Computations of peak runoff are to be performed based on the "Connecticut Guidelines for Soil Erosion and Sediment Control", as amended. Detention basis may be installed if necessary to reduce peak flows.
- Section 5 discusses the requirements for open space subdivisions as an alternative to the conventional layout of lots.

Overall, the subdivision regulations are considered to be effective at preventing unwanted side effects of intensive development. These regulations are updated by the Zoning Commission as needed.

Inland Wetland and Watercourses Regulations

The Inland Wetlands and Watercourses Regulations in Woodbury were last amended in September l, 2008. The regulations require a permit for certain regulated activities which take place within 100 feet of a wetland or watercourse or that may impact a wetland or watercourse. These regulations build on the preventative flood mitigation provided by the Zoning Regulations and the Subdivision Regulations by preventing fill and sedimentation that could lead to increased flood stages. The wetland regulations are considered to be an effective additional level of flood mitigation for Woodbury.

Sustainable CT

The Town was recently bronze certified under the Sustainable CT program. The Nature Conservancy assisted the Town by facilitating a Community Resilience Building Workshop in July 2019. Maryellen provided a copy of this document which addresses the risk of Woodbury to various natural hazards and climate change.

2.2 Infrastructure

Transportation

Woodbury is accessible from principal arterial Route 6 which connects to Route 8 and Interstate 84 in neighboring communities. Major arterial roadways and associated collector roads include Route 47, Route 64, and Route 317. There are no active railroads in Woodbury. There is no local public transit system in Woodbury.

Utilities

Public water supply is provided by the Aquarion Water Company in Woodbury. The water utility provides water to approximately 20% of the buildings in Woodbury. Other residents and businesses are served by small Community Water Systems and Non-Community Public Water Systems, or rely on private well water. There is no public sewer system in Woodbury.

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

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

2.3 Critical Facilities and Emergency Response

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

Table 2-1: Critical Facilities

Facility	Address or Location	Type	Emergency Power	Shelter	SFHA
Emergency Services Building / Orenaug Fire Company	25 Quassuk Rd	Emergency Operations Center Secondary shelter	✓	✓	✓
Hotchkissville Fire Company	238 Quassuk Rd	Fire Department			
Police Department	271 Main St South	Emergency Response	✓		
Police Radio Tower	202 Great Hollow Rd	Communication			
Public Works	82 White Deer Rock Rd	Critical Records Heavy Equipment	✓*		
Town Offices	281 Main St South	Critical Records	✓		
Community / Senior Center	265 Main St South	Primary Shelter	✓	✓	
Public Water Supply Pump Stations	118 S. Pomperaug Ave 96 Washington Rd 112 Bethlehem Rd	Public Water Supply	✓		✓
Convalescent Homes	823 Main St South; 19 Judson Ave	Managed Care			
Woodlake Condominiums / Community center	101 Woodlake Rd	Population Center Tertiary shelter	✓	✓	
Nonnewaug High School	5 Minortown Rd	School	✓		

Emergency Response Capabilities

The Emergency Management Director staffs and runs the Emergency Operations Center and supports Woodbury's emergency response entities (Fire, Police, and Ambulance). Generators have been obtained to power the Police Department, Town Hall, and Public Works Department. The Public Works generator needs

to be replaced however, which is expected within the next five years. Evaluation of critical facilities, emergency services, shelters, equipment, and supplies are performed at least annually (concurrent with the EOP review) or more often if necessary. Similarly, emergency training is conducted as appropriate, and Woodbury purchases new equipment when funding is available. The Town does not have any set evacuation routes, and would be determined on a case-by-case basis if needed.

Sheltering Capabilities

The Woodbury Senior Center is the primary shelter. The Emergency Services Building is considered the secondary shelter, and the Woodlake Community Center is considered to be the tertiary shelter. These facilities have generators and can shelter approximately 300 people (100 at each location). However, Woodbury only has 100 cots available for overnight sheltering.

Woodbury recently renovated and expanded Nonnewaug High School. This $63.8 million dollar project included athletic field improvements that were partially performed within the Nonnewaug River floodplain. Nonnewaug High School has emergency power and could become a shelter in the future. The LEPC will decide if this facility should supplement or replace the existing shelter facilities.

In case of a sustained power outage, it is anticipated that 10 to 20% of the population (1,000 to 2,000 people) would relocate, although not all of those relocating would necessarily utilize the shelter facilities. If additional shelter space is needed, Woodbury will utilize its public educational institutions to the extent possible.

Woodbury continues to work to improve sheltering capacity.

Communications

Woodbury's has updated its emergency communications capabilities in recent years. In the past, residents have expressed interest an improved warning and response system to improve disaster management. Woodbury has also worked with a telecommunications consultant on a system that relays visual information from first responders to the command center in real-time.

Residents have also suggested maintaining a list of seniors and other residents who need special assistance when electricity is lost, recruiting new volunteers to provide support during emergencies, and ensuring that the Emergency Operations Center is completely stormproof.

Information regarding natural hazard mitigation and preparedness is posted on the town website, bulletin boards, and in the senior center. In addition, hazard mitigation and preparedness topics are occasionally addressed as part of the "Friday Coffee Break Series" that residents are invited to attend to learn about things that are going on in the community. The coffee break series is an open forum for any and all to attend with presentations on preparedness being conducted by the Emergency Management Director and Community Emergency Response Team. The series is advertised by pin ups, website postings, social media, and in local newspapers.

Woodbury utilizes the "CodeRED" Emergency Notification System to send geographically-specific telephone warnings into areas at risk for natural hazard damage. This is extremely useful for natural hazard mitigation, as a community warning system that relies on radios and television is less effective at warning

residents during the night when the majority of the community is asleep. Town officials and residents have both commented that the system has been very successful at informing residents of critical information regarding natural hazards.

Evacuation and Access

Transportation infrastructure is reviewed continually; a major issue in Town is the lack of good east-west access, particularly during flooding conditions. In addition, the State's Interstate 84 diversion plan indicates that a closure of Interstate 84 has the potential to redirect a significant amount of traffic along Route 6 into Woodbury. A major area of vulnerability is Woodlake Road, as this is the only access to more than 400 residences. Woodbury officials have reported that there are many areas of Town with a single point of egress. This is a key concern during natural hazards.

3.0 FLOODING

3.1 Existing Capabilities

NFIP Participation

Woodbury has participated in the NFIP since 01/05/1978. The Flood Insurance Rate Map (FIRM) for the community was most recently updated in 10/20/1978. Woodbury does not participate in the FEMA Community Rating System (CRS) program.

According to FEMA, there are 45 flood insurance policies in force in Woodbury as of 6/30/2019 with an insurance value of $10,714,600.

Prevention

The Department of Public Works (DPW) is in charge of the maintenance of local drainage systems and performs clearing of bridges and culverts and other maintenance as needed. Public Works has increased this effort which has helped to reduce the frequency of roadway overtopping and nuisance flooding. Drainage system upgrades are often performed during road repaving projects. Woodbury currently has an "as-needed" schedule of drainage system maintenance, with regular inspections of drainage systems supplemented by problem areas reported to the Director of Public Works. Maintenance includes programs to clean out blockages caused by overgrowth and debris.

Citizen complaints are recorded and used to as evidence to spur future capital improvement projects. Public Works receives and responds to these flooding complaints. The current frequency of these inspection and maintenance programs is considered sufficient to meet the needs of the Town of Woodbury. Increasing the budget for these preventative activities would slightly improve the effectiveness of local drainage systems but not to a sufficient degree to be considered cost-effective. The Connecticut Department of Transportation (DOT) is responsible for maintenance along the state roadways.

Woodbury has a variety of regulations to help prevent increasing the vulnerability of residents and businesses to flood hazards. Regulations pertaining to flood damage prevention are included as Section 6 of the *Zoning Regulations* and Section 4.7 of the *Subdivision Regulations* were detailed in Section 2. 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 Woodbury 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
- Minimize prolonged business interruptions
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, and streets and bridges located in floodplains;
- Maintain a stable tax base by providing for the sound use and development of floodprone areas in such a manner as to minimize flood blight areas

- Ensure that purchasers of property are notified of special flood hazards
- Ensure the continued eligibility of owners of property in Woodbury for participation in the National Flood Insurance Program

In addition to the regulations, Woodbury has a policy to avoid riverbank erosion by addressing land use and encroachment near watercourses. Clear-cutting to the riverbank has historically occurred in Woodbury which has caused slumping and erosion in certain areas. NRCS has needed to complete erosion control projects in order to protect homes. Woodbury performs outreach and education to prevent recurrences.

The Zoning Enforcement Officer in the Woodbury Land Use Office is currently the NFIP administrator for Woodbury and oversees the enforcement of NFIP regulations. The degree of flood protection established by the variety of regulations in Woodbury meets the minimum reasonable for regulatory purposes under the NFIP. Woodbury plans to remain compliant with the NFIP and will continue to participate in the NFIP. Woodbury is not currently considering enrollment in the Community Rating System program.

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

The current Zoning Regulations and Subdivision Regulations are believed to be generally effective at preventing flood damage to new development and substantial improvements, and the majority of flooding issues within the Town of Woodbury are related to infrastructure or existing properties.

Property Protection

Local officials are prepared to provide outreach and education about floodproofing measures to individual property-owners where appropriate. These intermittent outreach efforts are considered to be generally effective, although additional staff and funding would be necessary to make them a regular occurrence. Such additional funding is not currently available.

Many floodproofing measures are costly and may require acquisition of grant funding to successfully complete. Woodbury has experience in preparing grant applications such that this effort can be performed when applicable.

Emergency Services

Woodbury utilizes the CodeRED emergency notification system to target emergency calls into specific areas of the community. The existing equipment and capabilities are considered to be effective for responding to flood damage and are evaluated at least annually.

The Emergency Management Director and the Fire Department monitor local flood warnings. The National Weather Service website http://www.weather.gov/ can be accessed to obtain the latest flood watches and warnings before and during precipitation events.

Woodbury receives regular weather updates through DEMHS Region 5 email alerts as well as watches and warnings through the National Weather Service. 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 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.

Public Education and Awareness

Woodbury makes a variety of information available for the public at its municipal buildings (town hall, senior center) and on the town's website regarding mitigating natural hazards and flood hazards, including FEMA pamphlets on preparedness. The Emergency Management Director, Town Engineer, and Zoning Enforcement Officer are local resources for preparedness and mitigation activities. Woodbury feels that education and outreach to citizens is critical since many people are not knowledgeable (or sometimes act heedless of) potential flood risks. The availability of these materials and resources is considered sufficient for the amount of flooding present in the community.

Natural Resource Protection

Open space preservation is part of all subdivision projects as well as other development projects, with areas within floodplains being prioritized for preservation by the Planning Commission and the Zoning Commission. These activities have been effective at maintaining stream buffers in the community.

Structural Projects

There are no flood control dams or dikes within or upstream of Woodbury. Recent large structural projects in Woodbury have focused on protecting homes at risk of damage from erosion of riverbanks. The April 2007 nor'easter caused extensive erosion along the Pomperaug River. NRCS oversaw the existing slope being reconstructed and stabilized, the installation of a steel sheet piling wall with boulder rocks at the toe of the sheets, and rock riprap placed at the toe of the constructed slope above the sheet pile wall. The total cost for this work was $442,000.

Typically, bridges are evaluated as needed. If structural deficiencies are found, then the bridges are prioritized for replacements. Bridge capacities are not increased unless there is a need to do so.

Connecticut DOT "Climate Change and Extreme Weather Pilot Project" completed in 2013 that provides recommendations that can inform bridge or culvert upgrades in Woodbury.

New Capabilities and Completed Actions

Woodbury continues to maintain its strong flood mitigation capabilities. Many of Woodbury'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 and emergency communications. The increased knowledge of vulnerable areas, combined with other local planning efforts, have assisted community officials and commissions to provide a variety of flood mitigation recommendations for new development.

Public Works recently replaced two bridges due to age and not flooding concerns. One was the Hazel Plain Road bridge over Sprain Brook near Route 47. The second bridge was on Middle Quarter Road over South

Brook. The latter bridge was upgraded to two lanes wide and provides Public Works with a new route to detour traffic (i.e. bypass traffic around Main Street South). Woodbury is currently in the process of performing several culvert and bridge projects which are of high priority to the Town. The bridge at Grassy Hill Road on Good Hill Brook is scheduled to be replaced by the end of 2014.

Transylvania Road's subsurface has since been upgraded with riprap. This improvement will allow water to pass through without washing out the road surface. Although water levels overtopping Transylvania Road is still a concern, it is no longer at risk of washing out.

The Pomperaug River is meandering in the vicinity of Orton Lane (south of Judson Avenue). There is concern that nearby homes could be undermined. The Town and the Pomperaug River Watershed Coalition have discussed this issue. The Town is pursuing a grant to protect this area and believes a project design could be completed in the next five years.

Woodbury plans to install gates along Jack's Bridge Road (Weekeepeemee River) and Judson Avenue (Pomperaug River) at the edges of the respective flood zones. These gates will allow Woodbury to easily provide a physical barrier to prevent vehicular access to these areas when flooding occurs. The gates will be located such that egress to homes on these streets is not affected, and will be reflective so as to be seen from afar with "Road Closed" signs affixed. Until the gates are constructed, temporary measures will be used to prevent flooding in this area.

Summary

Woodbury 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

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

Vulnerability Analysis of Private Property

According to the 1977 FEMA FIRM, a total of 1,675 acres of land in Woodbury are mapped within the 1% annual chance floodplain, and a total of 167 additional acres of land are mapped within the 0.2% annual chance floodplain. Based on correspondence with the State of Connecticut NFIP Coordinator at the Connecticut DEEP, one repetitive loss property (RLP) is located in Woodbury. While this residential property is not listed as being in a SFHA, it is located near a bend in the Pomperaug River and along an unnamed tributary. Although this property does not normally flood, either of these potential flooding sources could contribute to the flooding damage occurring at this property during extreme weather events.

Properties in the vicinity of the Nonnewaug River near Minortown Road and Minortown Road Extension are susceptible to minor flooding. A major flood event has not occurred in this area within the past 20 years. However, **Woodbury should consider potential mitigation projects to protect properties in this area.**

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

Table 3-1: Repetitive Loss Properties in Woodbury

Total	Residential	Non-Residential	Mitigated	SRL
1	1	0	0	0

Vulnerability Analysis of Critical Facilities

Two critical facilities appear to be located within the 1% annual chance floodplain. The wellfield operated by the Watertown Fire District is located within the 1% annual chance floodplain of the Nonnewaug River, but the facility has reportedly not experienced flood damage. The Watertown Fire District has plans and procedures in place to mitigate flooding damage at this facility. The Woodbury Emergency Services Building is also located partially within the 1% annual chance floodplain of the Nonnewaug River. Specifically, the southernmost fire truck bay and the road around the building are located in the SFHA based on the current mapping. The office, shelter, and EOC area of the building are not within the SFHA. Existing precautions, including the use of sandbags, are considered sufficient to mitigate potential flooding damage.

Woodbury's transportation network is at risk of flooding. This is particularly a concern given fact that flooding can make it difficult for ambulances to access hospital facilities in Waterbury if a variety of detours are enacted on State Roads due to road closures. In particular, flooding along the Pomperaug River can isolate sections of the western side of the community from the eastern side since major roads can be overtopped. An obvious solution to this issue is not clear.

Another area of concern for the Town is the potential for isolation of the Woodlake community. Woodlake Road and Transylvania Road are both located relatively low in relation to Radey Pond, an impoundment of Hesseky Brook. These roads are also within the 1% annual chance floodplain. Flooding of Woodlake Road would isolate the Woodlake development which contains approximately one-third of the community's population. Flooding of Transylvania Road could either induce lengthy detours or also isolate the residential community. Recent improvements to Transylvania Road mitigate some risk of washout from flooding.

Vulnerability Analysis of Areas along Watercourses

The Nonnewaug River, Weekeepeemee River, and Sprain Brook generally have steep slopes that result in high velocities of flow and relatively narrow floodprone areas. The Pomperaug River and Hesseky Brook are lower gradient channels and flooding is moderated somewhat by three ponds in the watershed which provide a significant amount of storage. Significant erosion damage has occurred along the Pomperaug River and the Weekeepeemee River that has needed to be mitigated in recent years.

Input from Town staff and a significant number of residents indicated that flooding was a widespread problem in Woodbury. Some homes along the Pomperaug River can be affected by flooding during severe events, but road closures and infrastructure damage are the most common issues with flooding. An extensive list of roads that are at risk of flooding are presented in Table 3-2.

Note the following other areas that are susceptible to flooding:

- Hollow Park is located within the floodplain of the Pomperaug River and is susceptible to flooding.
- Three Rivers Park is located at the intersection of Route 47 and Jack's Bridge Road and the confluence of the Weekeepeemee River and the Nonnewaug River (forming the Pomperaug River). This area is susceptible to flooding. Residents suggested that trees needed to be cleared from the Weekeepeemee River south of the bridge at the park. **Woodbury should investigate this issue and consider a project if needed.**
- The Woodbury Ski Area is located on Route 47 along Sprain Brook. Access is via a bridge over the brook that is vulnerable to flooding.
- Residents suggested raising Minortown Road to prevent flooding. **Woodbury should investigate flooding in this area and consider raising the road if necessary.**
- Residents suggested that streets off Route 6, Route 47, and Route 317 were also vulnerable to flooding.

Table 3-2: Roads Susceptible to Flooding in Woodbury

Road	Flooding Source
Bethlehem Road (Route 61)	Nonnewaug River
Brushy Hill Road	Weekeepeemee River
Flanders Road (Cowles Road to Elephant Rock Road)	Unnamed streams, East Meadow Brook
Good Hill Road (Route 317)	Good Hill Brook
Hazel Plain Road	Sprain Brook
Hollow Road	Pomperaug River
Jack's Bridge Road	Weekeepeemee River
Judson Avenue	Pomperaug River
Main Street North (Route 6)	Nonnewaug River, East Meadow Brook
Main Street South near Southbury line (Route 6)	Pomperaug River
Minortown Road	Nonnewaug River
Minortown Road Extension	Nonnewaug River
Orton Lane	Pomperaug River
Paper Mill Road	Sprain Brook, Weekeepeemee River
Peter Road	Carmel Hill Brook, Weekeepeemee River
Sycamore Avenue (Route 317)	Pomperaug River
Transylvania Road	Radey Pond / Hesseky Meadow Pond
Transylvania Road	Unnamed stream draining from Grassy Hill Road area
Washington Road (Route 47)	Weekeepeemee River
Weekeepeemee Road (Route 132)	Weekeepeemee River

Areas close to Sprain Brook and the Weekeepeemee River are susceptible to intense and sudden floods as a result of the steeply sloping streets and terrain of the basin. Three to four inches of rain in one event will cause flooding, and flash flooding is a particular problem. Floodwaters converge quickly due to the limited natural storage in the upper basin, quickly exceeding the channel capacity. Numerous restrictions such as low bridges, private dams, and sharp bends in the channel also contribute to the flooding problems. The flash flooding along these upstream tributaries results in flash flooding along the Pomperaug River downstream. Woodbury's current approach is to monitor the river corridors to avoid encroachments and collection of debris that could exacerbate flooding or lead to erosion.

Fallen trees have the potential to disrupt drainage structures and cause localized flooding. For example, a large tree that was blocking the Judson Road bridge was recently cleared from the Pomperaug River. This

helped restore the capacity of the bridge. To prevent another blockage along the Pomperaug River a tree near Route 317 (Sycamore Avenue) may need to be removed before it falls.

Town officials also expressed concern over a proposed hydroelectric dam at the former Pomperaug Mill on Pomperaug Road. The new impoundment is expected to reduced flood storage in the Pomperaug River floodplain and therefore exacerbate flooding conditions. As this project is located within the floodway of the Pomperaug River (one is defined within the FIS even if a floodway designation is not presented on the current FIRM), **Woodbury should require that the project does not increase flood elevations along the Pomperaug River as a result of the project** per the requirement for equal conveyance (Section 6.1.7 I of the *Zoning Regulations*).

Vulnerability of Other Areas

Woodbury has a variety of areas that are subject to minor flooding away from defined watercourses. Many of these areas flood due to clogged or undersized drainage systems, or the complete lack of a drainage system. Such minor flood events can damage roads and cause ponding of nearby yards, basement flooding, and other damages. These events can usually be repaired by the Department of Public Works through cleaning, curb repair, and asphalt patching. More extreme events can require complete infrastructure replacement. These damage events are expected to become more frequent in the future as the intensity and magnitude of rainfall events continues to increase.

Specific areas of concern, or past impacts from flooding, include:

- A drainage outfall pipe in the vicinity of 55 Westwood Road was causing nuisance flooding.
- High water levels caused by a beaver dam have nearly overtopped Route 64 in the past. This beaver dam was reportedly breached, and the water level has receded.
- Beaver dams downstream of Transylvania Road may exacerbate flooding damage. The Town estimates that one of the dams is between One dam is 8 to 10 feet tall and needs to be removed or breached.
- The Pomperaug River is meandering in the vicinity of Orton Lane (south of Judson Avenue). There is concern that nearby homes could be undermined.
- A culvert failure at the bottom of Grassy Hill Road closed Transylvania Avenue for more than a month following Hurricane Sandy. This culvert was damaged over many years and the rainfall and runoff associated with Sandy finally caused it to fail.
- An area of the Pomperaug River from the Jack's Bridge area to the Judson Avenue bridge was damaged by flooding during Tropical Storm Irene. Woodbury subsequently reached an agreement with the NRCS EWP to clean up and remove debris from 900 linear feet of the river including 30 trees. The estimated project cost was $65,000.

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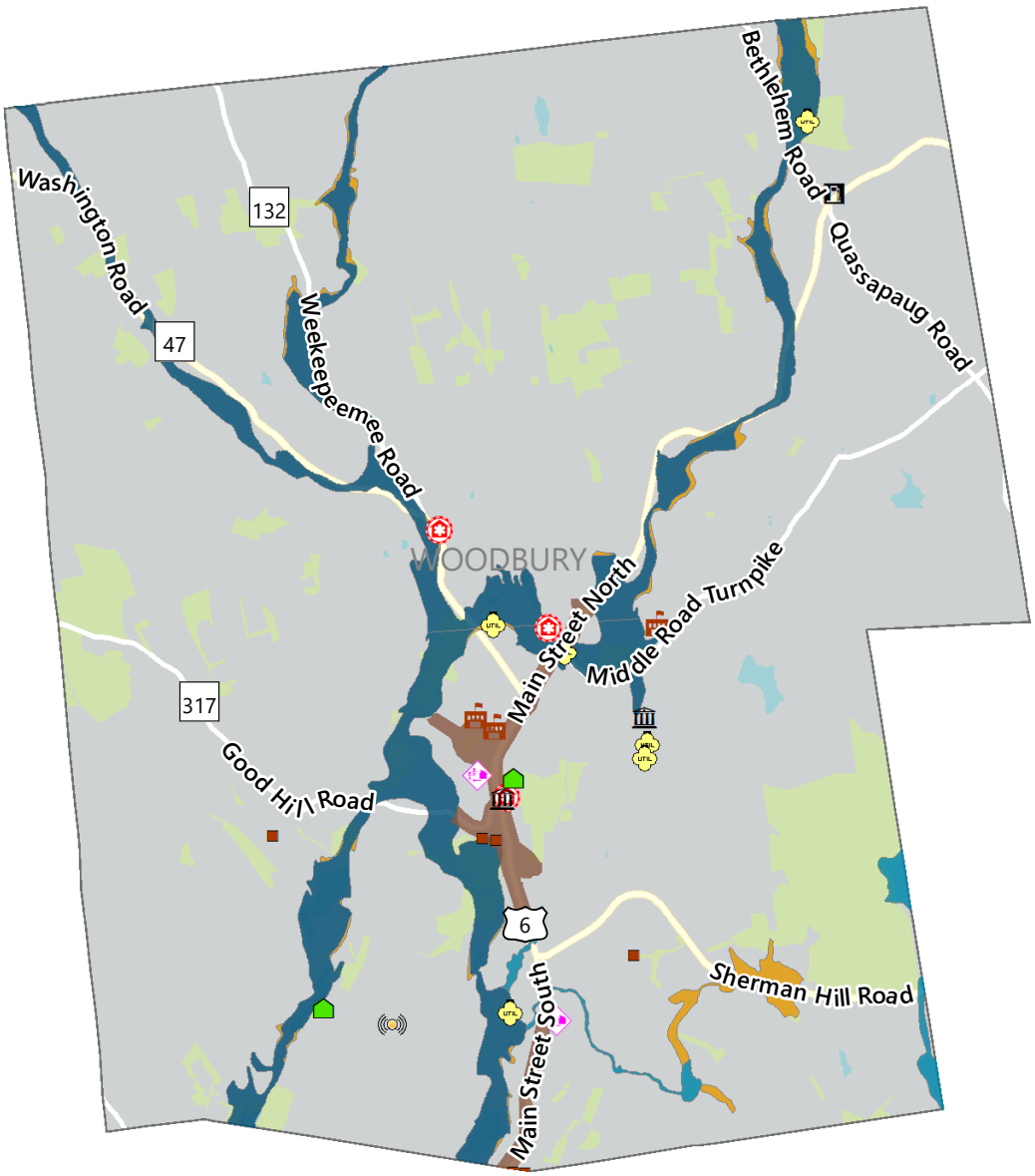

Critical Facilities
- Communications
- Community Center
- Emergency Response
- Fuel
- Government Services
- School
- Utility
- Vulnerable Population

Historic Sites
- Historic Sites
- NR Historic Districts

Flood Zone
- A
- AE
- X500

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

Flood Hazards in Woodbury

NVCOG Hazard Mitigation Plan Update

Naugatuck Valley Council of Governments

47 Leavenworth Street, 3rd Floor

Waterbury, CT 06702

SLR

99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

N

0 3,000 6,000

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 Woodbury 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.

Eversource, the local electric utility, provides tree maintenance near its power lines. Woodbury encourages residents to cut trees that can be dangerous to power lines. Currently, the Woodbury Tree Warden function is contracted out to Neal Tree Service, LLC (Bud Neal). The tree removal budget has steadily increased over the last several years. Most of the budget goes towards hiring outside contractors to perform tree and limb removal. For example, the Town has removed many trees on Grassy Hill Road to prevent damage to power lines. In addition, Public Works has been working steadily to remove all of the dead Ash trees.

Woodbury has regulations that can help prevent wind damage to utilities. All utilities associated with communications towers and electric and telephone wires for new subdivisions must be located underground in order to mitigate storm-related damages. These regulations have been effective at reducing vulnerability for new developments. While moving all utilities underground would prevent wind damage to this infrastructure, this activity is too cost-prohibitive for the community.

Woodbury attempts to educate its residents (through the Woodbury Shade Tree Committee program) that tall trees can be cut down and replaced with more appropriate vegetation such as dogwoods which do not grow large enough to damage power lines. The committee has been successful and has planted more than 3,000 trees to date, which most of the trees being developed and grown by in-town nurseries.

Woodbury relies on its CodeRED emergency notification system, radio, television, area newspapers, and the internet to spread information on the location and availability of shelters. It is understood that several of these information sources can be cut off due to power failure, so emergency personnel can also pass this

information on manually. Prior to severe storm events, Woodbury ensures that warning/notification systems and communication equipment are working properly and prepares for the possible evacuation of impacted areas. These protocols are considered effective preparation for storm events.

New Capabilities and Completed Actions

Woodbury continues to maintain its strong tropical cyclone mitigation capabilities.

Summary

Woodbury 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

Woodbury is vulnerable to wind and flooding caused by tropical storms.

While all streets with large trees were considered vulnerable to high wind, particular areas of concern include standing dead trees on Hoop Pole Hill Road, recent tree falls and long power outages along Washington Road and Hard Hill Road North, and the thick stands of trees near power lines on Mill Road. Approximately 90% of the Ash trees in Woodbury have been affected by the Emerald Ash Borer, presenting a particular concern regarding high winds. Nevertheless, Woodbury staff report that during two recent windstorms, the tree types most affected were hickory, maple, and oak. This is likely because the Ash trees were without leaves and were therefore less affected by the wind.

The loss of electrical service is a critical concern for residents and Town officials. In addition to overhead power lines located along streets, major electrical backbone systems run through Woodbury and these are vulnerable to wind. One particular issue when power is lost is that the majority of Town residents rely on private water supplies and no longer have access to potable water. Many homeowners in Woodbury have purchased and installed private generators to deal with potential electrical power loss. Another particular issue is that the Woodlake development holds a large population served by one electrical line.

According to Town officials, coordination with Eversource has historically been poor. Recent improvements in communications on the utility side has proven invaluable in mitigation efforts. Quicker restoration times are necessary to ensure that residents do not exhaust the typically recommended three-day emergency supply of water and are able to access their private potable water supplies. Residents would like to see a utility company plan that outlines the process regarding how areas will be restored following a storm event.

Residents suggested that power lines be buried along routes where power lines are vulnerable to tree damage. Areas for prioritization should include locations where trees are located near power lines and there have been numerous outages in the past. Main Street (Route 6) was suggested as a potential area for this work.

Woodbury staff are unsure if any Town-owned critical facilities have wind-mitigation measures installed to specifically reduce the effects of wind. Thus, it is believed that nearly all of the critical facilities in the community are as likely to be damaged by hurricane-force winds as any other. Newer critical facilities are

more likely to meet current building code requirements and are therefore considered to be the most resistant to wind damage even if they are not specifically wind-resistant. Older facilities, such as schools, are considered to be more susceptible to wind damage as they have older roofs.

Woodbury's housing stock consists of historic buildings greater than 50 and sometimes 100 years old, relatively younger buildings built before 1990 when the building code changed to mitigate for wind damage, and relatively recent buildings that utilize the new code changes. Since most of the existing housing stock in the community 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 Woodbury.

During Tropical Storm Isaias, there was tremendous tree damage throughout the community, but the area near Southbury was hit the hardest. The entire Town was without power for five to six days and even longer in many areas. This was especially concerning given that the privately owned cellular towers have limited on-site backup power. The Town relies on these cellular communications for event response. During future storm events, Town staff plan to improve coordination with Verizon, Frontier, and other communications companies to ensure that vehicle access to these facilities is prioritized. This will prevent delays between switching from battery backups to portable generators. Eversource's response was poor and hindered by a lack of communication from the utility. There was no coordination with Public Works or the EOC during and following the event.

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 Woodbury as explained in Section 4. In addition, the Connecticut State Building Code includes guidelines for the proper grounding of buildings and electrical boxes.

Municipal responsibilities relative to summer storm and tornado mitigation and preparedness include:

- Developing and disseminating emergency public information and instructions concerning tornado, thunderstorm wind, lightning, and hail safety, especially guidance regarding in-home protection and evacuation procedures and locations of public shelters.
- Designating appropriate shelter space in the community that could potentially withstand lightning and tornado impact.
- Periodically test and exercise tornado response plans.
- Putting 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 Woodbury. 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

Woodbury 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

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

5.2 Vulnerabilities and Risk Assessment

Thunderstorms are expected to impact Woodbury at least 20 days each year. The majority of these events do not cause any measurable damage. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the Woodbury area is very high during any given thunderstorm although no one area of the community is at higher risk of lightning strikes. The risk of at least one hailstorm occurring in Woodbury is considered moderate in any given year.

Most thunderstorm damage is caused by straight-line winds exceeding 100 mph (downbursts, microbursts, or macrobursts). The risk of downbursts occurring during such storms and damaging Woodbury is believed to be low for any given year. All areas of the community are susceptible to damage from high winds, although more building damage is expected in the more densely populated areas, while more tree damage is expected in the less densely populated areas in the away from the center of the community.

Secondary damage from falling branches and trees is more common than direct wind damage to structures. Heavy winds can take down trees near power lines, leading to the start and spread of fires. Most downed power lines in Woodbury are detected quickly and any associated fires are quickly extinguished. Such fires can be extremely dangerous during the summer months during dry and drought conditions.

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.

In summary, 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 or tornadoes have resulted in costly damages to Woodbury. 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 increased. 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 the downtown / Route 6 area, with less damage for a tornado striking the outskirts of the community, and with a greater damage amount to be expected should an EF3 or stronger tornado strike.

The May 2018 tornadoes missed Woodbury but struck nearby Southbury.

6.0 WINTER STORMS

6.1 Existing Capabilities

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. Other programs are aimed at warning residents about potential winter hazards, such making educational pamphlets available at municipal buildings.

Woodbury primarily uses Town staff for plowing operations and is able to quickly plow and remove snow and ice. Priority is given to plowing major roads (which typically includes access to critical facilities), then arterials, then collectors, and then school bus routes. Low-volume residential roads and cul-de-sacs receive the lowest priority. The Town has set plowing routes, but they are not publicized. The Connecticut Department of Transportation plows all state roads. Homeowners, private associations, and businesses are responsible for plowing their own driveways and roads, as well as clearing sidewalks and fire hydrants fronting their properties.

The Public Works Department is prepared to assist the Board of Education with snow removal and assessments of schools, as occurred after the heavy snowfalls in January 2011.

Prior to a winter weather event, Woodbury ensures that all warning/notification and communications systems are ready, and ensures that appropriate equipment and supplies, especially snow removal equipment, are in place and in good working order. Woodbury 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). During emergencies, plow vehicle are temporarily rerouted by Public Works to clear the route ahead of an emergency vehicle.

New Capabilities and Completed Actions

Woodbury continues to maintain its strong winter storm mitigation capabilities.

Summary

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

6.2 Vulnerabilities and Risk Assessment

The amount of snowfall and freezing precipitation in Woodbury is elevation-dependent during storms. As the population of Woodbury increases and more areas (particularly in the higher elevations such as the northwestern corner of the community) are developed, the vulnerability of Woodbury residents to the effects of winter storms will increase.

There is a high propensity for traffic accidents and traffic jams during heavy snow and even light icing events. Roads may become impassable, inhibiting the ability of emergency equipment to reach trouble spots and the accessibility to medical and shelter facilities. Residents have commented that plowing is difficult during large storms as many roads are narrow and plows run out of places to place snow. The elderly population in Woodbury, in particular, is susceptible to the impacts created by winter storms due to resource needs (heat, electricity loss, safe access to food, etc.).

The structures and utilities in Woodbury are vulnerable to a variety of winter storm damage. Tree limbs and some building structures may not be suited to withstand high wind and snow loads. Major electrical backbone systems traverse Woodbury and these are vulnerable to damage from snow and ice.

Ice can damage or collapse power lines, render steep gradients impassable for motorists, undermine foundations, and cause "flood" damage from freezing water pipes in basements. Ice jams are not typically a problem along the rivers and streams in Woodbury.

Drifting snow can occur after large storms, particularly along Grassy Hill Road and Artillery Road. However, these areas are adequately addressed by plowing and are not significant enough to require mitigation.

Snow and ice often can sag tree limbs into the path of taller vehicles such as school buses. **Woodbury should ensure that enough clearance is provided through trimming activities to maintain clear access for taller vehicles during the winter.**

No critical facilities are believed to be more susceptible to winter storm damage than any other. Some critical facilities are more susceptible than others to flooding damage due to winter storms. **Critical facilities should be evaluated for the design snow load of each structure and a response plan developed to clear excessive snow from each facility.**

In summary, the entire community is at relatively equal risk for experiencing damage from winter storms, although some areas may be more susceptible. Based on the historic record, it is difficult to determine if any winter storms have resulted in costly damages to the community, as damage estimates for severe storms are generally spread over an entire county. 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.

The January 2015 snow event required an increased plowing effort, however, there no major issues.

7.0 GEOLOGICAL HAZARDS

7.1 Existing Capabilities

Due to the infrequent nature of damaging earthquakes, land use policies in Woodbury do not directly address earthquake hazards. However, the various regulations do attempt to prevent development on steep slopes or ridgelines.

In the event that a damaging earthquake occurs, Woodbury will activate its Emergency Operations Plan and initiate emergency response procedures as necessary.

New Capabilities and Completed Actions

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

Summary

Woodbury 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

Several areas in Woodbury are underlain by sand and gravel, particularly within the valleys associated with major streams and rivers. Structures in these areas are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. Areas that are not at increased risk during an earthquake due to unstable soils are those underlain by glacial till.

Based on the historic record and the probability maps generated from the USGS database, the State of Connecticut has areas of seismic activity. It is likely that Connecticut will continue to experience minor earthquakes (magnitude less than 3.0) in the future. While the risk of an earthquake affecting Woodbury is relatively low over the short-term, long-term probabilities suggest that a damaging earthquake (magnitude greater than 5.0) could occur within the vicinity of Woodbury.

Table 7-1: Probability of a Damaging Earthquake in the Vicinity of Woodbury

Timeframe (Years)	Probability of the Occurrence of an Earthquake Event > Magnitude 5.0	Probability of the Occurrence of an Earthquake Event > Magnitude 6.0
50	1% to 2%	< 1%
100	3% to 4%	<1%

Timeframe (Years)	Probability of the Occurrence of an Earthquake Event > Magnitude 5.0	Probability of the Occurrence of an Earthquake Event > Magnitude 6.0
250	8% to 10%	1% to 2%
350	10% to 12%	2% to 3%

As a damaging earthquake would likely affect a large area beyond Woodbury, 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.

It is believed that owners of Class B and Class C dams located upstream of Woodbury each have prepared an EOP. These dams include dams in Bethlehem, Roxbury, and Middlebury.

Woodbury uses the CodeRED emergency notification system. The dam failure inundation mapping can be used to help streamline the geographic contact areas if the failure of a major dam is imminent.

Actions Completed and New Capabilities

Woodbury continues to maintain its capabilities for mitigating and responding to dam failure risks. During a recent high water event, a targeted CodeRed call was placed into a dam failure inundation area along the Weekeepeemee River. Direct door-to-door outreach was also performed.

The Pomperaug Mill Hydroelectric Dam on Pomperaug Road (Pomperaug River) has been approved by FERC. No in-water work has commenced. The Town will be refurbishing the bridge here next year.

Summary

Woodbury 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 44 DEEP-inventoried dams within Woodbury. Zero of these dams had a Significant or High Hazard Potential rating. Dams with hazard class ratings are listed in Table 8-1. Dams are also shown in Figure 8-1.

Table 8-1: DEEP-Inventoried Dams in Woodbury

Number	Name	Class	Owner
16801	TANNER'S POND DAM	BB	Private
16802	RADER POND DAM	BB	Municipal
16803	WOODBURY RESERVOIR DAM	AA	Municipal
16804	KELLEY POND DAM	BB	Private
16805	PARKINS POND UPPER DAM	BB	Private
16806	REICHENBACH POND DAM	BB	Association
16810	CHARLES STOCKWELL DAM	A	Private
16812	ENGLEKE POND DAM	A	Private
16814	CLARK POND DAM	A	Private
16816	RICKER POND DAM	A	Private
16817	JUDD HILL POND DAM	A	Private
16818	TRANSYLVANIA POND DAM	A	Municipal
16819	RADLEY POND (See dam # 16802)	A	Private Corporation
16821	FLANDERS WLDF CENTER	BB	Land Trust
16822	MILL AT POMPERAUG	A	Private
16823	GERMAINELA POND DAM	A	Private
16824	DeCORTIN POND DAM	A	Private
16825	PRIVATE POND DAM	AA	Private
16826	SKLUTH POND DAM #1	A	Private
16827	SKLUTH POND DAM #2	A	Private
16828	DICK'S POND DAM	AA	Private
16831	LEWIS POND DAM	AA	Private
16832	THE POOL DAM	AA	Private Corporation
16833	SNIECKUS POND DAM	A	Private
16835	BUD'S FROG POND DAM	A	Private
16836	LOWER RESERVOIR DAM	AA	Municipal
16837	BOTANY POND DAM	AA	Land Trust
16838	VanVECK POND DAM	BB	Land Trust

Number	Name	Class	Owner
16839	JUDSON POND DAM	A	Private
16842	LEDGEWOOD POND DAM	A	Private Corporation
16843	WOODBURY SKI AREA DAM	AA	Private Club
16844	PAPARAZZO POND DAM	A	Private

While high hazard or significant hazard dams do not currently exist within Woodbury, they do exist upstream of Woodbury. In addition, there are several lower hazard dams that the Town considers to be vulnerable to failure. Damage from dam failure would likely occur as part of a large flood event.

Table 8-2 lists the high and significant hazard dams located upstream of Woodbury.

Table 8-2: High and Significant Hazard Dams Upstream of Woodbury

Number	Name	Location	Watercourse	Class	Owner
1001	Bronson Lockwood Dam	Bethlehem	East Spring Brook	C	Watertown Fire District
1002	Addie Road Pond Dam	Bethlehem	Weekeepeemee River	B	Private
1004	Watertown Reservoir Dam	Bethlehem	East Spring Brook	B	Watertown Fire District
1005	Bird Pond Dam	Bethlehem	Weekeepeemee River	B	Private
1006	Long Meadow Pond Dam	Bethlehem	Weekeepeemee River	B	Town of Bethlehem
1007	Zieglers Pond Dam	Bethlehem	Weekeepeemee River	B	Private
8101	Quassapaug Lake Dam	Middlebury	Eightmile Brook	B	West Shore Owners Association, Inc.
12001	Panther Dam	Roxbury	Sprain Brook	B	Private

Based on the dam failure inundation area for the Bronson Lockwood Dam (Class C) on file with the Connecticut DEEP, the inundation area primarily affects East Spring Brook. The inundation area ends at the confluence of East Spring Brook with the Nonnewaug River. This confluence occurs almost immediately upon East Spring Brook entering Woodbury. Failure of the Bronson Lockwood Dam is not expected to cause significant flooding within Woodbury, although a dam failure could exacerbate downstream flooding along the Nonnewaug River and the Pomperaug River.

Long Meadow Pond Dam (Class B) in Bethlehem is a concern for Woodbury officials because local officials believe that Woodbury is within the downstream inundation area. However, much of the velocity associated with the floodwaters would likely dissipate within Bethlehem, although a dam failure would certainly exacerbate any downstream flooding. The remaining significant hazard dams in Bethlehem present a potential risk to their immediate downstream area but are unlikely to have a significant effect on stream corridors in Woodbury should they fail.

The Panther Dam (Class B) in Roxbury is located on the Woodbury / Roxbury border south of Painter Hill Road. Failure of the dam would direct floodwaters into an unnamed tributary to Sprain Brook located along Painter Hill Road and eventually into Sprain Brook. Several road crossings and a few structures are likely to be within the inundation area.

The Quassapaug Lake Dam (Class B) in Middlebury is located on Lake Quassapaug on the Woodbury / Middlebury Border. A dam failure at this location would send floodwaters into Eightmile Brook. While structures in Woodbury are unlikely to be affected, Old Woodbury Road, Route 64, the Kelley Pond Dam, and Judd Hill Road could all be damaged.

Town officials also have concerns about the dams impounding Radey Pond (Class BB & Class A). One of the dams is located at the crossing where Transylvania Road presents a flood concern. The other is located on Transylvania Road near Woodlake Road. Town officials are concerned that high waters in Hesseky Meadow may be increasing the vulnerability of this dam to failure. As Transylvania Road is a Town-owned road that passes over these dams, **Woodbury should work with the Woodlake Association to perform inspections of the area and consider improvements to prevent increased vulnerability to dam failure.**

The Reichenbach Pond Dam (Class BB) on Pond Valley Road is another area of concern for the Town. The current dam was reportedly constructed by placing earth materials over an old weir board structure (previously registered with the Connecticut DEEP as a dam) that impounded Reichenbach Pond and thereby raising the water elevation. The concern is that the placement of the earth materials was not done to dam construction standards and that the increased water elevation is saturating the new materials such that the dam is susceptible to failure. **Woodbury should discuss the condition of this dam with Connecticut DEEP.** Similar to the dams in the vicinity of Woodlake, the dam carries a Town-owned road and is the only means of access to 16 homes on Pond Valley Road and Beaver View Court. **Woodbury should work with the homeowner's association to perform inspections of the area and consider improvements to prevent increased vulnerability to dam failure.** In addition, beavers have impounded the downstream side of Reichenbach Pond Dam near Pond Valley Road. As a result, the water level is now higher on the downstream side of the dam than usual. It is unclear if this will affect the dam.

The condition of the many minor, privately-owned dams throughout the community is not known, although it is assumed that the majority are in adequate to good condition. The Connecticut DEEP Dam Safety information notes that Tanner's Pond Dam, Transylvania Pond Dam and Dike, and Paparazzo Pond Dam are rated as being in either "Poor" or "Unsatisfactory" condition.

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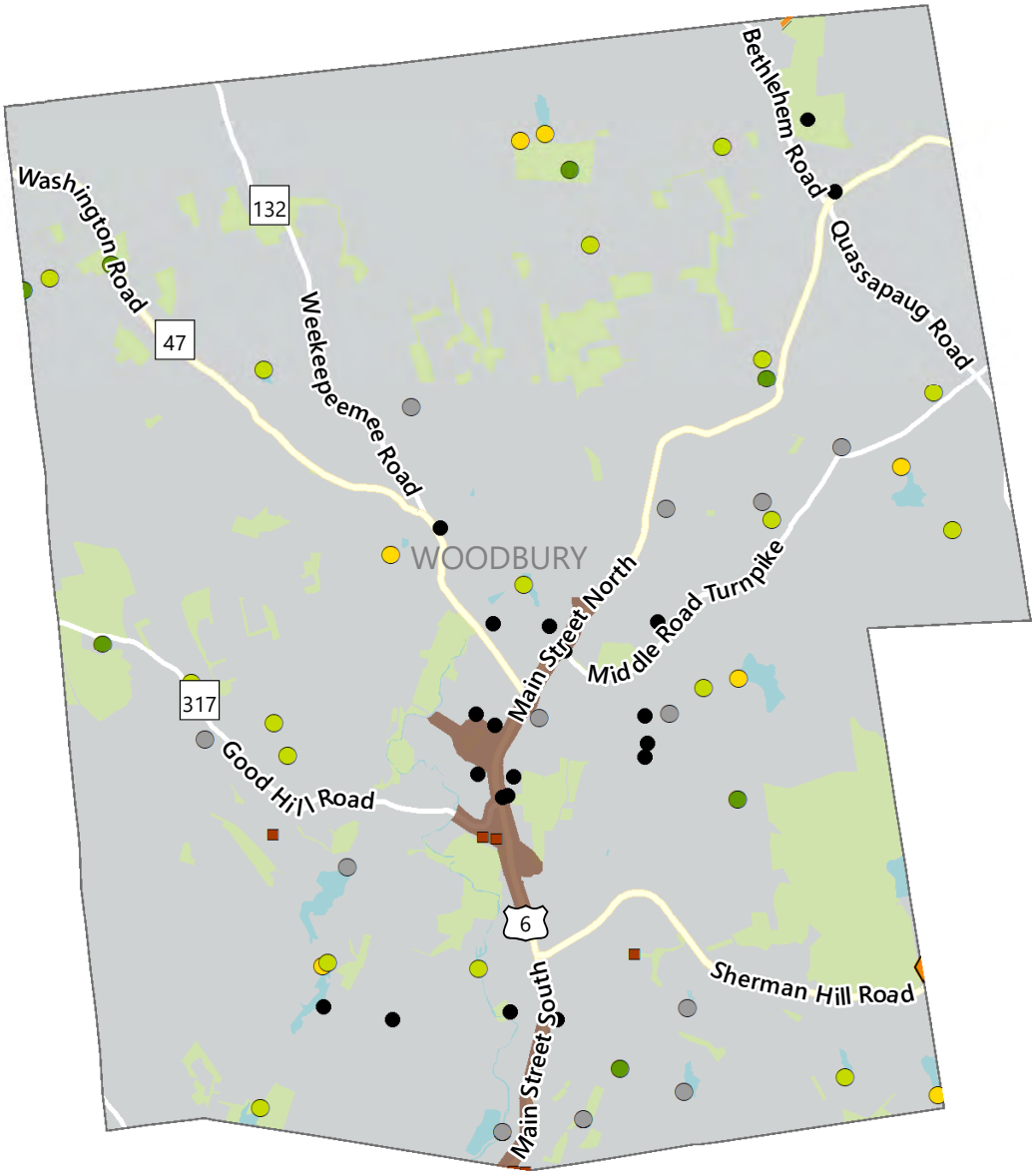

Dam Hazard Class
- Unclassified
- AA - Negligible Hazard
- A - Low Hazard
- BB - Moderate Hazard
- B - Significant Hazard
- Dam Breach Inundation Area

Critical Facilities
- Critical Facilities

Historic Sites
- Historic Sites
- NR Historic Districts

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Dam Failure Hazards in Woodbury

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 Waterbury is compliant with this program and has a designated Burning Official.

Woodbury has public water supply provided by the Aquarion Water Company. The system serves a relatively small area in central Woodbury and along Route 6 leading south into Southbury. Aquarion Water Company has been upsizing water mains in the community as part of a capital improvement project which has the added benefit of increasing fire flows. The remaining public water supplies in the community do not provide a significant amount of fire protection. Woodbury has many dry hydrants and cisterns installed in outlying areas where public water service is not available, and also relies on the use of streams and ponds to fight fires in outlying areas. The Town has a 25-year plan to evaluate and install new dry hydrants and cisterns. In addition, the Woodbury Fire Department works with Aquarion Water Company to survey fire hydrants to assess vulnerabilities where improved fire flows are needed.

Regulations regarding fire protection are outlined in the *Zoning Regulations* and the *Subdivision Regulation*s. The Fire Marshall reviews new developments for fire protection requirements and provides recommendations to the Planning Commission and Zoning Commission. The *Subdivision Regulations* authorizes the Planning Commission to require the installation of a minimum of 10,000-gallons of fire protection water with dry hydrant connections in new subdivisions. This can be accomplished through underground storage tanks or the construction of ponds. For subdivisions to be connected to public water supply, the installation of fire hydrants is required. The Town has separate development requirements for developments of more than three structures requiring installation of certain sized cisterns or dry hydrants. The regulations also restrict the development of cul-de-sacs to developments with no more than 25 lots.

The Fire Department has some water storage capability in its tanker trucks and storage tanks, but primarily relies on the use of the public water system and dry hydrants to fight fires throughout the community whenever possible.

The Woodbury Fire Department has limited off-road capabilities to fight fires and often relies on its mutual aid agreements to contain fires in outlying areas. The community has mutual aid agreements with all of its neighbors, and works with Connecticut DEEP regarding fire protection of State-owned lands. Fire protection needs and potential problem areas are reviewed at least annually. Finally, the DEEP Forestry Division uses rainfall data from a variety of sources to compile forest fire probability forecasts. This allows the DEEP and Woodbury to monitor the drier areas of the state to be prepared for forest fire conditions.

Actions Completed and New Capabilities

Woodbury continues to maintain its capabilities for mitigating and responding to wildfire risks. Aside from moderate changes in State policy and improvements to the public water systems in Woodbury, local capability to mitigate for wildfires and prevent loss of life and property have not changed significantly since the initial hazard mitigation plan was adopted. The Town of Woodbury will continue to evaluate whether capabilities need to be strengthened in the future.

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 approximately 16,459 acres of forests and undeveloped land in Woodbury may be susceptible to drought conditions that make them more vulnerable to wildfires. The approximately 3,527 acres of agricultural fields and maintained grasses may be vulnerable to direct damage from drought conditions.

Given the lack of public water supply in most areas of the community and the lack of egress to large tracts of land in outlying areas of the community, Woodbury officials believe that the community is very vulnerable to wildland fires. Coupled with the community's reliance on mutual aid agreements to fight difficult to access fires and the associated delay involved, it is believed that the average fire size would be larger than the state average for a drought year. Most outlying areas of the community are considered to be of moderate risk for wildfires, while areas closer to roads and the public water system in the central and southern area of the community are considered to be a low-risk area for wildfires (Figure 9-1). **Woodbury should pursue purchase of off-road fire-fighting equipment to increase the community's ability to access and contain wildfires.**

Woodbury understands that there are weaknesses in its firefighting capability, particularly in outlying areas away from the public water systems. The level of fire protection is considered adequate for structures but not for wildfires. There are many areas of the community where access roads into residential properties are long and narrow. This hinders emergency access to fight fires. The Fire Department should continue public education in these areas and **encourage homeowners and private communities to widen the access for emergency vehicles wherever possible.** In addition, requiring multiple modes of egress or the creation of through streets for new subdivisions will help to increase egress for firefighting.

There are limited public camping areas in the community, so there are few fires caused by out of control campfires. There is also concern in the community that the water being withdrawn from the Pomperaug River aquifer being directed to Watertown (and out of basin) exacerbates low flows which could contribute to wildfire risk in Woodbury.

Wildfire risk zones are mapped in Figure 9-1.

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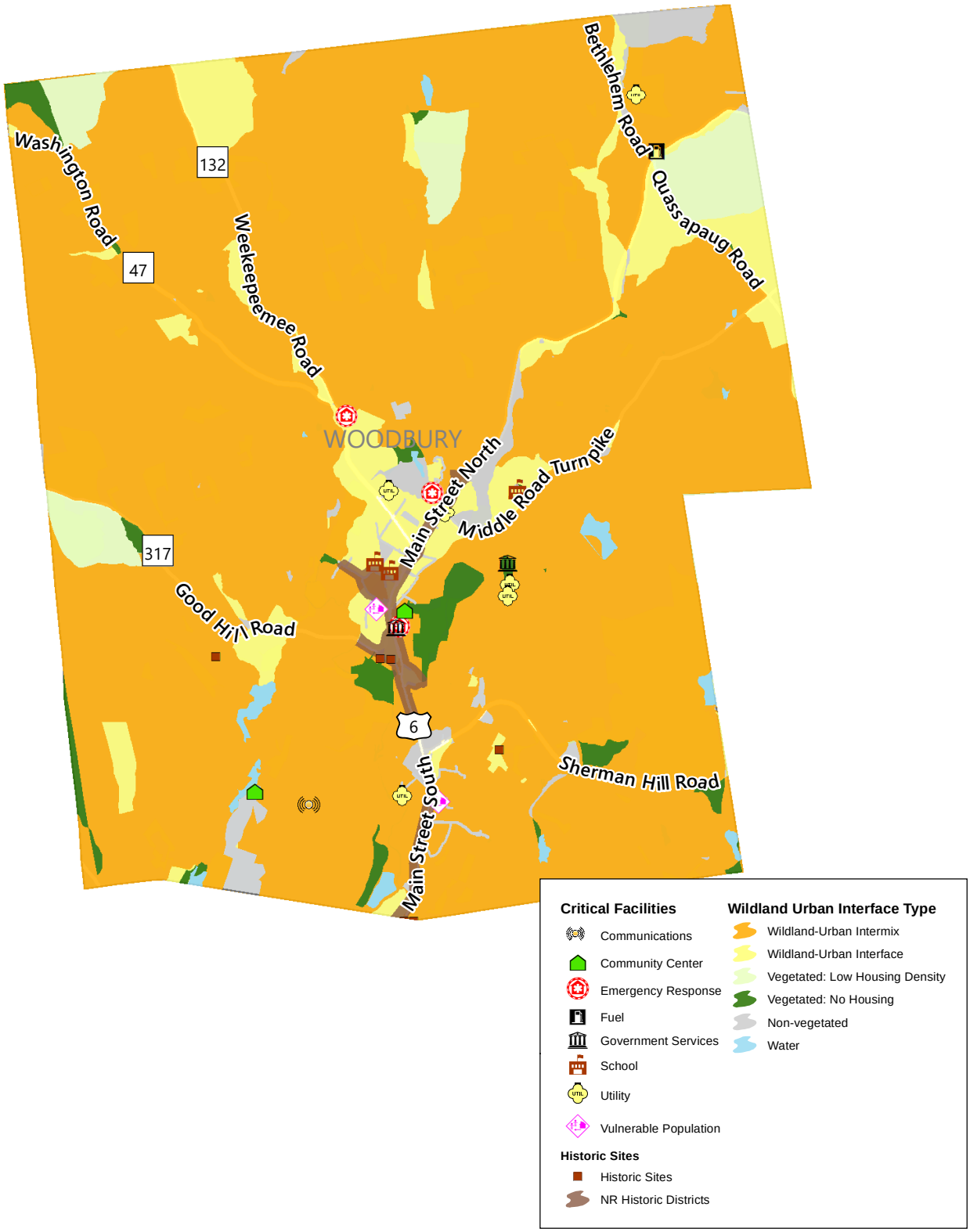

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Wildfire Hazard in Woodbury

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

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DATE 6/15/2021

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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
WDB-1	Incorporate suggested actions into other local planning activities	EMD	Complete	POCD discusses flooding and has references to the 2014 HMP planning process. A POCD update is underway and will continue to refer to the HMP.
WDB-2	Acquire a generator and additional supplies for the high school to improve sheltering capacity	BoS, EMD	Complete	Generator was installed and accepted by the town. The LEPC needs to meet to determine if and when it will be shelter.
WDB-3	Consider developing a list of seniors and vulnerable residents who need special assistance during power outages or other emergencies	EMD	Capability	Senior Center maintains this list and provides updates to emergency responders as necessary.
WDB-4	Develop a recruitment program for the Community Emergency Response Team	EMD	Complete	No formal recruitment program, but they have increased membership to 12-14 people including several from neighboring towns. There have been conceptual discussions about regionalizing the CERT with other communities.
WDB-5	Determine if the EOC is completely stormproof and perform improvements if necessary	EMD, TE, BL	Capability	The EOC is reasonably stormproof and is not a concern for continued operation during a natural hazard event.
WDB-6	Investigate and develop a second mode of egress into the Woodlake development	BoS, TE, PW	Carry Forward	Have not been able to complete this action because it would have to go through Southbury, and property owners are not interested in a new road. If this is to occur, it needs to be a secondary emergency access instead of an active egress.

Strategy	Description	Responsible Party	Status	Notes
WDB-7	Consider additional outreach to residents, businesses, and organizations regarding the risks of natural hazards and potential mitigation	EMD	Capability	The Town performs outreach as staff time and budgets allow.
WDB-8	Consider a streamlined local permit process for certain private mitigation activities	PC, ZC, BL	Drop	This may not be possible under current statutes. However, certain Town commissions (such as Wetlands) have the ability to allow permission for an emergency project to move forward and allow for permitting after the fact.
WDB-9	Adopt regulations requiring that two modes of egress be provided for all new subdivisions	BoS, PC	Carry Forward with Revision	Fire Department/PW would like this. The requirement should address all developments over a certain size. The Town would need to decide what threshold is appropriate.
WDB-10	Consider adopting regulations requiring all new utilities to be buried underground whenever possible	BoS, PC, ZC	Carry Forward with Revision	No requirement at present, as this would be tough to get passed through the commissions. It is recognized that this would greatly help emergency services and Public Works but is an expensive requirement for developers. Having it be added to the regulations as a strong recommendation may make it adoptable.
WDB-11	Encourage residents in the 1% annual chance floodplain to purchase flood insurance under the NFIP and complete elevation certificates	TE	Capability	
WDB-12	Consider requiring the completion of an elevation certificate for any structure covered under a Flood Plain Permit	PC, ZC	Carry forward	The Zoning Regulations require elevation data to be provided, but not on a FEMA Elevation Certificate. Town staff were generally in favor of a potential EC requirement. The EC requires a surveyor to sign the form, which could increase the permitting burden and would need to be considered by the commission.
WDB-13	Consider requiring freeboard of at least one foot and/or other structural mitigation measures for new/improved structures in floodplains	PC, ZC, BL	Complete	Freeboard is already required by the State Building Code. Woodbury is in the process of adopting DEEP's model floodplain regs into their Zoning regulation with the goal of adoption in 2021. This will make the regulations consistent with the State Building Code.

Strategy	Description	Responsible Party	Status	Notes
WDB-14	Identify structures within the 1% annual chance floodplain to target warnings through the CodeRED system	TE, EMD	Complete	The Town has the capability to narrow calls into affected areas. Signup for CodeRED is on the Town website and Emergency Management Facebook page.
WDB-15	Consider potential mitigation projects to protect homes in the vicinity of Minortown Road from flooding of the Nonnewaug River	TE, PW	Drop	This area is not believed to be a significant issue that warrants attention in the next five years.
WDB-16	Work with the Connecticut DOT to determine if bridges could be elevated to improve access to western Woodbury during floods	TE, BoS	Drop	Town staff believe that this is likely related to Route 47. Route 317 was raised by DOT but was not a flooding problem. The Town is unsure if elevating the bridges (to prevent overtopping) would exacerbate flooding issues further downstream. Ultimately, this would be a DOT project.
WDB-17	Investigate the presence of fallen trees and debris in the Weekeepeemee River near Three Rivers Park and remove if necessary	PW	Complete	The Town removed the trees and continues to monitor the area.
WDB-18	Seek funding sources and commission the elevation and reconstruction of Transylvania Road to mitigate flooding near Woodlake	BoS, PW, TE	Complete	The road has been modified to pass water and this strategy is no longer needed.
WDB-19	Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	TE, PW	Complete	
WDB-20	Consider developing a hydrologic and hydraulic model of the Pomperaug River watershed	BoS	Drop	The USGS constructed a model around 2005, but it was too large scale to help with localized flooding issues. As most of the flooding issues are typically minor or related to nuisance flooding, the expense of such a modeling effort is not justified over the next five years.
WDB-21	Ensure that projects in the floodway of watercourses do not result in any increase in flood elevations	PC, ZC	Complete	This is currently part of the Zoning Regulations. Woodbury is in the process of adopting DEEP's model floodplain regs into their Zoning regulation with the goal of adoption in 2021.

Strategy	Description	Responsible Party	Status	Notes
WDB-22	Consider methods to mitigate the nuisance flooding in the vicinity of 55 Westwood Road	PW, TE	Capability	This area still has the potential to flood. There is a 36-inch drainage pipe that can become clogged if it is not maintained. Public Works has been regularly clearing the inlet to prevent flooding.
WDB-23	Investigate dangerous trees along several roads and prioritize areas for tree-trimming and/or tree removal	PW	Capability	This is a capability and part of the Tree Warden's normal responsibilities.
WDB-24	Consider increasing outreach to private property owners regarding dangerous trees on private property	PW	Capability	This is a capability and part of the Tree Warden/Public Works' normal responsibilities.
WDB-25	Work with other communities to improve the emergency communications coming from the local electric utility	BoS, EMD	Capability	They have an Eversource community liaison. Communication over the past year has been poor, and they need to have a follow-up meeting regarding Tropical Storm Isaias.
WDB-26	Consider increasing the budget for tree-trimming and removal	BoS	Complete	This was done over the past 5 years
WDB-27	Consider burying power lines along Route 6 and in other areas where power lines are very vulnerable to tree damage	BoS, TE	Drop	This could be a very expensive project. Unlikely to occur in next five years.
WDB-28	Consider installing a buffer of trees to prevent the formation of snow drifts along Grassy Hill Road	PW	Drop	Has not been an issue that needs mitigation in the past few years.
WDB-29	Ensure that tree-trimming activities provide sufficient clearance for tall vehicles to pass beneath snow-laden branches	PW	Capability	They elevate cutting as needed and when possible.
WDB-30	Evaluate critical facilities for the design snow load of each structure	TE, BL	Drop	Roofs of critical facilities are generally not a concern for snow load. For facilities with flat roofs, Public Works monitors the accumulation and removes snow before there is too much build up. A formal engineering evaluation is not necessary.

Strategy	Description	Responsible Party	Status	Notes
WDB-31	Develop response plans to remove excessive snow from critical facilities and schools	EMD, PW	Drop	Snow removal occurs on a case by case basis. A formal plan is not necessary.
WDB-32	Ensure that adequate backup plans and supplies are available for continued functionality following an earthquake	EMD	Capability	They have adequate backup plans to the extent feasible under existing capabilities and budgets.
WDB-33	Work with the Woodlake Association to perform inspections of the dams along Transylvania Road and consider improvements	TE, EMD	Drop	Not really needed anymore as Transylvania Road has been rebuilt to convey water beneath road surface.
WDB-34	Discuss the condition of the Reichenbach Pond Dam with the Connecticut DEEP Dam Safety Division	EMD, TE	Complete	This is a Class BB dam on Pond Valley Road; the dam structure was reportedly enlarged many years ago without adhering to dam construction standards. They have talked to DEEP in the past about it, meeting the intent of the action. The more recent concern has been related to a beaver dam immediately downstream of the dam. However, the pond dam and downstream beaver dam have not been concerns in 2020.
WDB-35	Work with the local homeowner's association to perform inspections of the dam along Pond Valley Road and consider improvements	TE, EMD	Capability	The Town owns the dam and inspects it on the schedule required by DEEP.
WDB-36	Utilize dam failure inundation mapping to identify vulnerable properties and include contact information in CodeRED database	TE, EMD	Capability	The Town can target CodeRed to vulnerable areas of the community without the specific inundation areas being programmed into the system.
WDB-37	Pursue purchase of off-road firefighting equipment to increase ability to access and contain wildfires	BoS, EMD	Capability	The Town has a brush truck and is in the process of replacing the gator with a UTV. The Town does not have issues getting into isolated areas. The Town is part of the regional forest fire task force for mutual aid.

Strategy	Description	Responsible Party	Status	Notes
WDB-38	Encourage homeowners and private communities to widen access for emergency vehicles where applicable	EMD, ZC	Capability	This is already performed and is a capability. The Town asks for larger access than they typically get. There is some interest for a specific regulation (such as 22 feet minimum) in new developments above a certain size to ensure access. Town staff will need to determine the appropriate development size (or access length) to place such a requirement into the regulations.

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

Action WDB-02	
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 WDB-03	
Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	
Lead	EM, Plan, FS
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

Action WDB-04	
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 WDB-05	
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 WDB-06	
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 WDB-07	
Instruct the Zoning Commission to consider requiring the completion of an elevation certificate for any structure covered under a Flood Plain Permit. This could increase pemitting burden, so the impacts of such a requirement need to be considered.	
Lead	PC, ZC
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	Low

Action WDB-08	
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 WDB-09	
Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to 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 WDB-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 – 2023
Priority	Low

Action WDB-11	
Adopt regulations requiring that two modes of egress be provided for all new developments over a certain size (Town will determine an appropriate threshold).	
Lead	BoS, PC
Cost	$25,000 - $50,000
Funding	OB, CT DEMHS
Timeframe	2022 – 2024
Priority	Low

Action WDB-12	
Investigate and develop a second mode of egress into the Woodlake development	
Lead	BoS, TE, PW
Cost	$100,000 - $500,000
Funding	OB, CT DEMHS
Timeframe	2025 – 2027
Priority	Low

Action WDB-13	
Adopting regulations strongly recommending that all new utilities to be buried underground when appropriate.	
Lead	BoS, PC, ZC
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2026 – 2027
Priority	Low

Action WDB-14	
Take steps to prevent motorists from driving though floodwaters; specific actions may include installing signage, acquiring emergency barriers, developing protocols for blocking known flood areas from traffic under certain conditions, installing permanent deployable traffic gates, etc.	
Lead	DPW
Cost	$100,000 - $500,000
Funding	FEMA, CT DOT
Timeframe	2021 – 2023
Priority	High

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	
WDB-01	Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives:	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
WDB-02	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	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
WDB-03	Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	RLP	EM, Plan, FS	$0 - $25,000	OB, CT DEEP	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
WDB-04	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,	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
WDB-05	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
WDB-06	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
WDB-07	Instruct the Zoning Commission to consider requiring the completion of an elevation certificate for any structure covered under a Flood Plain Permit. This could increase pemitting burden, so the impacts of such a requirement	Administration, Enforcement, &	PC, ZC	$0 - $25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	6
WDB-08	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	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
WDB-09	Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to 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
WDB-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.	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
WDB-11	Adopt regulations requiring that two modes of egress be provided for all new developments over a certain size (Town will determine an appropriate threshold).	Evacuation & Access	BoS, PC	$25,000 - $50,000	OB, CT DEMHS	2022 – 2024	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	3.5
WDB-12	Investigate and develop a second mode of egress into the Woodlake development	Evacuation & Access	BoS, TE, PW	$100,000 - $500,000	OB, CT DEMHS	2025 – 2027	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	3.5
WDB-13	Adopting regulations strongly recommending that all new utilities to be buried underground when appropriate.	Utility Resilience	BoS, PC, ZC	$0 - $25,000	OB, CT DEEP	2026 – 2027	0	0	0	1	1	0	0	0	0	0	0	0	-1	0	0
WDB-14	Take steps to prevent motorists from driving though floodwaters; specific actions may include installing signage, acquiring emergency barriers, developing protocols for blocking known flood areas from traffic under certain	Evacuation & Access	DPW	$100,000 - $500,000	FEMA Grant, CT DOT	2021 – 2023	1	0.5	1	1	1	0	0	0	0	0	0	0	0	0	5

APPENDIX B

RECORD OF MUNICIPAL ADOPTION

CERTIFICATE OF ADOPTION
WOODBURY BOARD OF SELECTMAN

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

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

WHEREAS, the Woodbury Board of Selectman approved the previous version of the Plan in 2014; and

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

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

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

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

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

RESOLVED by the Board of Selectmen:

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

Adopted this 10 **day of** November **2021 by the Board of Selectman of Woodbury, Connecticut**

Barbara K. Rubinow
First Selectman

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of Woodbury this 15th day of Nov, 2021.

Mia M. Mancini
Town Clerk – Asst

APPENDIX C

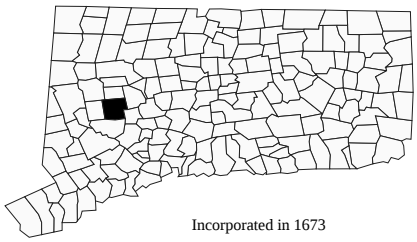
CERC Town Profile 2019

Woodbury, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

Town Hall
281 Main Street South
Woodbury, CT 06798
(203) 263-2141

Belongs To
Litchfield County
LMA Waterbury
Naugatuck Valley Planning Area



Incorporated in 1673

Demographics

Population

	Town	County	State
2000	9,198	182,193	3,405,565
2010	9,975	189,927	3,574,097
2013-2017	9,686	184,454	3,594,478
2020	9,835	193,116	3,604,591
'17 - '20 Growth / Yr	0.5%	1.5%	0.1%

	Town	County	State
Land Area (sq. miles)	36	921	4,842
Pop./Sq. Mile (2013-2017)	266	200	742
Median Age (2013-2017)	48	47	41
Households (2013-2017)	4,045	74,605	1,361,755
Med. HH Inc. (2013-2017)	$82,923	$76,438	$73,781

	Town	State
Veterans (2013-2017)	429	180,111

Race/Ethnicity (2013-2017)

	Town	County	State
White Non-Hisp	8,712	164,992	2,446,049
Black Non-Hisp	35	2,843	350,820
Asian Non-Hisp	378	3,516	154,910
Native American Non-Hisp	31	267	5,201
Other/Multi-Race Non-Hisp	48	2,320	84,917
Hispanic or Latino	482	10,510	551,916

	Town	County	State
Poverty Rate (2013-2017)	5.4%	6.8%	10.1%

Educational Attainment (2013-2017)

	Town		State	
High School Graduate	1,452	20%	673,582	27%
Associates Degree	545	7%	188,481	8%
Bachelors or Higher	3,502	48%	953,199	38%

Age Distribution (2013-2017)

	0-4		5-14		15-24		25-44		45-64		65+		Total	
Town	572	6%	1,181	12%	625	6%	2,126	22%	3,225	33%	1,957	20%	9,686	100%
County	7,668	4%	20,218	11%	21,158	11%	38,329	21%	61,693	33%	35,388	19%	184,454	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%

Economics

Business Profile (2018)

Sector	Units	Employment
Total - All Industries	357	2,207
23 - Construction	37	136
31-33 - Manufacturing	13	118
44-45 - Retail Trade	32	407
62 - Health Care and Social Assistance	32	230
72 - Accommodation and Food Services	27	347
Total Government	10	339

Top Five Grand List (2018)

	Amount
CT Light and Power Company	$17,621,040
O&G Industries, Inc	$13,600,920
Woodbury Knoll LLC Delaware	$4,220,890
SMH Grandview LLC	$4,160,240
GCO Enterprises LLC	$3,810,470
Net Grand List (SFY 2016-2017)	$1,137,984,431

Major Employers (2017)

Regional School District 14
Town of Woodbury
Woodbury Chevrolet
O&G Industries
LaBonne's Epicure Market

Education

2018-2019 School Year

	Grades	Enrollment
Regional School District 14	PK-12	1656

Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	58.9%	53.8%	46.1%	51.3%	50.9%	43.0%
ELA	71.6%	53.1%	65.2%	54.9%	65.5%	56.1%

Pre-K Enrollment (PSIS)

	2018-2019
Regional School District 14	20

Rate of Chronic Absenteeism (2017-2018)

	All
Connecticut	10.7%
Regional School District 14	8.7%

4-Year Cohort Graduation Rate (2017-2018)

	All	Female	Male
Connecticut	88.3%	91.8%	85.1%
Regional School District 14	97.4%	99.1%	95.0%

Public vs Private Enrollment (2013-2017)

	Town	County	State
Public	83.2%	84.0%	86.8%
Private	16.8%	16.0%	13.2%

Woodbury, Connecticut

CERC Town Profile 2019

Connecticut Economic Resource Center

Government

Government Form: Selectman - Town Meeting

Total Revenue (2017)	$33,020,075	Total Expenditures (2017)	$32,054,603	Annual Debt Service (2017)	$573,780
Tax Revenue	$30,374,812	Education	$22,867,071	As % of Expenditures	1.8%
Non-tax Revenue	$2,645,263	Other	$9,187,532	Eq. Net Grand List (2017)	$1,540,777,617
Intergovernmental	$1,920,535	Total Indebtedness (2017)	$30,762,071	Per Capita	$161,220
Per Capita Tax (2017)	$3,146	As % of Expenditures	96.0%	As % of State Average	106.8%
As % of State Average	107.3%	Per Capita	$3,219	Moody's Bond Rating (2017)	Aa2
		As % of State Average	128.1%	Actual Mill Rate (2017)	26.29
				Equalized Mill Rate (2017)	19.52
				% of Net Grand List Com/Ind (2017)	7.8%

Housing/Real Estate

Housing Stock (2013-2017)

	Town	County	State
Total Units	4,533	88,068	1,507,711
% Single Unit (2013-2017)	67.8%	73.6%	59.2%
New Permits Auth (2017)	24	142	4,547
As % Existing Units	0.5%	0.2%	0.3%
Demolitions (2017)	2	32	1,403
Home Sales (2017)	85	1,753	21,880
Median Price	$350,800	$250,100	$270,100
Built Pre-1950 share	23.6%	31.2%	29.3%
Owner Occupied Dwellings	3,045	57,330	906,798
As % Total Dwellings	75.3%	76.8%	66.6%
Subsidized Housing (2018)	85	4,817	167,879

Distribution of House Sales (2017)

	Town	County	State
Less than $100,000	0	57	536
$100,000-$199,999	4	563	5,237
$200,000-$299,999	22	538	6,681
$300,000-$399,999	24	315	3,863
$400,000 or More	35	280	5,563

Rental (2013-2017)

	Town	County	State
Median Rent	$1,172	$995	$1,123
Cost-burdened Renters	39.4%	47.3%	52.3%

Labor Force

	Town	County	State
Residents Employed	5,387	101,000	1,827,070
Residents Unemployed	190	4,014	78,242
Unemployment Rate	3.4%	3.8%	4.1%
Self-Employed Rate	16.2%	13.0%	10.0%
Total Employers	357	6,177	122,067
Total Employed	2,207	61,496	1,673,867

Connecticut Commuters (2015)

Commuters Into Town From:		Town Residents Commuting To:	
Woodbury, CT	542	Woodbury, CT	542
Southbury, CT	170	Waterbury, CT	434
Watertown, CT	155	Danbury, CT	338
Waterbury, CT	146	Southbury, CT	244
Bethlehem, CT	108	Hartford, CT	170
Naugatuck, CT	75	Watertown, CT	130
New Milford, CT	49	Newtown, CT	116

Quality of Life

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

	Town	State
Property	331	1,777
Violent	41	228

Disengaged Youth (2013-2017)

	Town	State
Female	16.9%	4.2%
Male	0.0%	5.6%

	Town
Library circulation per capita	NA

Distance to Major Cities

	Miles
Hartford	30
New York City	73
Providence	94
Boston	125
Montreal	276

Residential Utilities

Electric Provider
Eversource Energy
(800) 286-2000

Gas Provider
Eversource Energy
(800) 989-0900

Water Provider
Municipal Provider
Local Contact

Cable Provider
Charter Communications of Western CT
(800) 827-8288