

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

Municipal Annex
for
OXFORD, CT



486 Oxford Road
Oxford, CT 06478
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 Oxford representatives on September 23, 2020 for the purposes of initial data collection and review of necessary updates for this document. The meeting was convened by the HMP local coordinator, Scott Pelletier.

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 Oxford was incorporated as a town in 1798. It is located in western New Haven County in southern Connecticut approximately 18 miles north of Bridgeport and 16 miles northwest of New Haven. It is bordered to the north by the Town of Middlebury, to the east by the Borough of Naugatuck and the Town of Beacon Falls, to the south by the Towns of Seymour and Monroe and the City of Shelton, and to the west by the Towns of Newtown and Southbury. The varying terrain and land uses in the community results in vulnerability to an array of natural hazards.

Oxford is part of both the Naugatuck River Valley and the Housatonic River Valley. The topography of the community is characterized by higher elevations that slope towards the two river valleys. Peaks in the northern part of the community reach elevations nearing 900 feet above sea level, while the majority of the community lies at elevations between 200 and 700 feet above sea level. Oxford is characterized by several substantial north-south trending ridges including Hull's Hill, the Mount Pisgah Ridge, Bowers Hill, Fivemile

Hill, Jacks Hill, Towantic Hill, and Hunters Mountain along with many small parallel and orthogonally oriented valleys.

1.4 Land Cover

The land area of Oxford is approximately 32.6 square miles with an additional 0.8 square miles of water. Oxford is slowly transitioning from a rural community to a suburban community associated with the nearby cities of New Haven, Waterbury, Danbury, and Bridgeport. The majority of development is concentrated in the vicinity of State Routes 34, 42, 67, and 188. Access to major highways is available along these routes to Interstate 84 in Southbury and Route 8 in Beacon Falls, Seymour, and Derby. State parks and forests in Oxford include Kettletown State Park, Southford Falls State Park, and the Naugatuck State Forest.

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 69% of Oxford is forested and approximately 15% is developed.

Table 1-1: 2015 Land Cover by Area

Land Cover	Area (acres)	Percent of Community
Developed	3,240.4	15.19%
Turf & Grass	1,309.3	6.14%
Other Grass	478.5	2.24%
Agricultural Field	789.4	3.70%
Deciduous Forest	13,103.2	61.43%
Coniferous Forest	1,084.9	5.09%
Water	488.3	2.29%
Non-Forested Wetland	29.4	0.14%
Forested Wetland	565.4	2.65%
Tidal Wetland	0.0	0.00%
Barren	89.1	0.42%
Utility Row	153.8	0.72%
Total	21,332	100%

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

General residential zoning (Residential A) is located in the western, northern, and northeastern portions of Oxford, with the Residential Community Golf District zoning located in the northeastern portion of town. Industrial zoning and corporate business park zoning is located in the northern and northwestern portions of town, respectively. The Oxford Airport dominates much of the industrially-zoned area. The office professional district is located along Route 67 in the northwestern and central portion of town, and commercial zoning is located along Route 67 in the central and southeastern portions of town.

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 Oxford.

Oxford is underlain by relatively hard metamorphic and igneous bedrock including a variety of gneiss, schist, and granite. The bedrock formations trend generally north to south. While no mapped fault lines underlie

Oxford, a high angle fault from the Jurassic period is mapped trending southwest to northeast through Newtown and Southbury, and a second high angle fault from this period is mapped trending southwest to northeast through Ansonia and Seymour. These faults are believed to be inactive.

Oxford's surficial geology is characteristic of the depositional environments that occurred during glacial and postglacial periods. Oxford is covered primarily by glacial till. 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 Oxford.

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. The amount of stratified glacial meltwater deposits also has bearing on the relative intensity of earthquakes.

Stratified glacial meltwater deposits in Oxford are particularly found along the Housatonic River, Eightmile Brook, Little River, Fourmile Brook, and Towantic Brook. These deposits primarily contain stratified sands and gravels.

1.6 Drainage Basins and Hydrology

Oxford is divided among six sub-regional watersheds. The drainage basins on the eastern side of the community drain into the Naugatuck River and then to the Housatonic River, with areas on the western side of Oxford draining to the Housatonic River. Jack's Brook, Towantic Brook, and Riggs Street Brook all drain to the Little River and then to the Naugatuck River, while Eightmile Brook and its tributaries, Fourmile Brook, and Fivemile Brook flow to the Housatonic River. All of the water that passes through Oxford eventually empties into Long Island Sound via the Housatonic River.

Several large impoundments exist in Oxford. The largest of these is Lake Zoar, a backwater area formed along the Housatonic River by the Stevenson Dam. Other large impoundments include Towantic Pond, Chanko Pond, the four Seymour Reservoirs, Swan Lake, and Nichols Pond.

1.7 Climate and Climate Change

In Oxford, the summers are warm and wet, the winters are freezing, and it is partly cloudy year round. Over the course of the year, the temperature typically varies from 20°F to 81°F and is rarely below 6°F or above 88°F.

"The warm season lasts for 3.5 months, from June 1 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 64°F.

The cold season lasts for 3.3 months, from December 3 to March 13, with an average daily high temperature below 44°F. The coldest day of the year is January 29, with an average low of 20°F and high of 35°F."

The wetter season lasts 3.5 months, from May 3 to August 18, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 36% on May 30. The drier season lasts 8.5 months, from August 18 to May 3. The smallest chance of a wet day is 23% on January 29.

The most rain falls during the 31 days centered around June 4, with an average total accumulation of 4.0 inches. The snowy period of the year lasts for 5.3 months, from November 5 to April 15, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 26, with an average total liquid-equivalent accumulation of 1.1 inches.

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

Climate Change

Climate change projections for Connecticut were sourced from the 2019 Connecticut Physical Climate Science Assessment Report, which was developed by the University of Connecticut (UConn) Atmospheric Sciences Group, commissioned by the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) with funding from the Department of Energy and Environmental Protection (DEEP). All projections are based on the IPCC high CO₂ emission scenario (RCP8.5).

Temperature

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

Precipitation

Rainfall data in "Technical Paper No. 40" by the U.S. Weather Bureau (now the National Weather Service) (Hershfield, 1961) dates from the years 1938 through 1958. According to these data, the 24-hour rainfall amount for a 10% annual-chance storm in New Haven County is 5 inches.

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

The Northeast Regional Climate Center (NRCC) has partnered with the Natural Resources Conservation Service (NRCS) to provide a consistent, current regional analysis of rainfall extremes (<http://precip.eas.cornell.edu/>). In 2020 this dataset listed the 24-hour rainfall amount for a 10% annual-chance storm in Oxford as 4.97 inches.

The NOAA Atlas 14, released on September 30, 2015 puts the 24-hour rainfall amount for a 10% annual-chance storm in Oxford 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	5.0	5.6	7.1
NRCC	5.0	6.2	8.7
NOAA Atlas 14	5.6	6.9	8.9

Annual precipitation has been increasing statewide and is projected to continue to increase. By mid-century, annual precipitation is projected to increase by 8.5%, with the greatest increase (13.4%) occurring in the winter months. Extreme precipitation events are projected to increase in both frequency and magnitude. Based on this increase and the precipitation figures above, by 2050 Oxford can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.4 to 6.1 inches or greater.

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

1.8 Development Trends

The 2010 U.S. Census reported a population in Oxford of 13,086 individuals. U.S. Census Bureau estimates for 2019 show a population around 15,695 individuals, an increase from 2010 of 19.9%. The Connecticut State Data Center predicts that population will decrease by 2.6% through 2025 to an estimated population of 4,551 individuals.

According to the Connecticut Data Collaborative, the number of annual housing permits in Oxford increased over the last decade. The number of permits issued in 2010 and 2011 was 45 and 13, respectively, while 23 permits were issued in 2016, and 104 permits were issued in 2017. On average, 41 housing permits were issued each year in Oxford between 2010 and 2017.

According to the U.S. Census Bureau, the overall number of housing units in Oxford rose by approximately 3.2-percent between 2010 and 2019, from 4,746 units in 2010 to 4,902 units in 2019. In 2019, the housing stock was made up of approximately 99% single-unit structures, 1% two-unit structures, 0% multi-unit structures, and 0% mobile-homes or other types of structures.

According to the Connecticut Office of Policy and Management, Oxford's 2019 Total Equalized Net Grand List was valued at \$1,559,000,000. 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 Oxford, included as Appendix C.

Development in Oxford has been spread throughout the community without a centralized downtown. Most development has occurred along major arterial roadways and associated collector roads. Oxford continues to be predominantly residential in nature, with residential development is scattered across the Town, although many small businesses and industries are located throughout the community. The economic downturn from 2007 through 2011 generally slowed housing development in Oxford. Newer buildings are

constructed to more recent building codes and are considered to be less vulnerable to natural hazards than older buildings.

Recent years have seen the development of large age-restricted subdivisions; additionally, commercial and industrial development has increased over the past 6 years. Completed, continuing and upcoming development projects include the following:

- Several new buildings were added to the Industrial Park on Fox Hollow Road.
- Four or five new facilities have been built along Patriot Way (mixed-use industrial).
- Towantic Energy Center was constructed.
- Northeast Steel has opened a 100,000 square foot facility along Pheasant Run.
- Quarry Walk was constructed.
- Oxford Commons, a manufactured housing community, was recently built along Hurley Road. The community has a population of elderly residents but is not age restricted.
- Canterbury Estates, located on the corner of Christian Street and Jacks Hill Road, continues to add houses.
- Meadowbrook Estates has been completed as age-restricted housing.
- A development project on Main Street will include a new walking bridge over the Little River.
- Developers are interested in additional industrial park properties near Towantic Energy Center that could be constructed in the next five years.
- The airport is proposing to double or triple hanger space in the near future. Part of this space will be used to support U.S. Customs on a part time basis.
- Oxford Greens is constructing its next phase of housing along Championship Drive, Saint Andrews Drive, and Augusta Drive.

Oxford Greens (600 homes situated around a golf course) off Riggs Street is a large development that has in the past been identified as a concern for emergency officials as the hilltop location of the development makes it vulnerable to wind damage and winter storm effects. The large increase in the number of homes also increases the community's level of vulnerability to earthquakes, wildfires, and other natural hazards. This development has generators and underground utilities.

Quarry Walk is a new mixed-use development in Oxford Town Center that was constructed in a former stone quarry. The development contains a grocery store, pharmacy, bank, mixed retail, restaurants, and 150 rental units.

In addition to the new developments listed above, redevelopment projects are occurring, mainly in the area along the Housatonic River.

Summary

Recent development in Oxford has increased community exposure to natural hazard risks; vulnerabilities may arise due to the increased strain on emergency services, the presence of elderly residents who need additional assistance during hazards, and simply the increase in population and infrastructure that may be impacted by a hazard event. Continuation of recent development trends may further increase hazard vulnerabilities. Balancing development with continued and accelerated improvement of hazard mitigation capabilities, and continued enforcement of zoning regulations and building codes, will help prevent an increase in natural hazard risk.

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 Oxford 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

Oxford is considered to have a Low level of social vulnerability, with a relatively higher vulnerability score for the SVI category of Household Composition & Disability. In other words, a particular challenge in Oxford may include the presence of residents who need additional assistance during a disaster event due to disabilities or mobility limitations.

2.0 MUNICIPAL CAPABILITIES

2.1 Governmental Structure and Capabilities

The Town of Oxford 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 Selectman, 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 Department** reviews plans to ensure conformance with all applicable codes and inspects work for final approval.
- **The Conservation Commission** is Oxford's Inland Wetlands Agency and reviews applications with wetland impacts.
- **The Emergency Services Department** coordinates emergency response activities and planning and oversees the local ambulance, fire, and police services.
- **The Town Engineer** position is contracted to a local engineering firm. The Town engineer reviews applications for a variety of requirements including compliance with Oxford's flood protection regulations.
- **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 Grant Writer** applies for and administers a variety of project grants including those for mitigation activities.
- **The Planning and Zoning Commission** reviews and approves zoning and subdivision applications and drafts regulation changes for Town Meeting approval. The Zoning Enforcement Officer and staff of the Planning and Zoning Department review applications for minor improvements and enforce zoning and wetland regulations. The Zoning Board of Appeals reviews requests for variances and handles appeals for rejected applications.
- **The Police Department** provides traffic control and assistance staffing shelters.
- **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 to the Public Works Director and are investigated and remediated as necessary. Oxford has a Tree Warden that identifies dangerous trees and directs the Public Works Department to hire contractors to perform trimming and removal when necessary.

Existing Planning Documents

Emergency Operations Plan

Oxford 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 is considered to be effective for providing a framework for emergency response within the Town of Oxford.

Plan of Conservation and Development

The Oxford Plan of Conservation and Development (POCD) is a broad planning document that provides guidelines for evaluating future land-use decisions. The 2018 update includes many goals, policies, and recommendations related to hazard mitigation planning, including:

- Continue to protect inland wetland areas from development that impairs their ability to store floodwater, to control erosion, to recharge and purify surface and groundwater and to support wildlife.
- Consider updating the regulation of development so that it is of low environmental impact, through strategies concerning drainage, use of alternative transportation, encouragement of alternative power sources, and other means to enforce Oxford as a modern emerging, sustainable "green" community.
- Continue to enforce the wetland regulations.
- Continue to protect the slopes and hillsides of Oxford in residential development, through provisions in the zoning and subdivision regulations.
- The acquisition of open space parcels should prioritize those which contain ecologically important areas, hillsides, linkages between other open space areas, and areas useful for public recreation.
- Explore the use of easements and/or purchasing riparian corridors when possible for protection of water assets and public access to identified water courses, especially those near larger waterbodies such as Towantic Brook.
- Establish a system of natural river corridor open space greenways throughout the Town to protect the major watercourses of the Town. This shall include corridors with a minimum width of 100 feet, or 50 feet off the centerline of the watercourse. This should include Eight Mile Brook, Towantic Brook, Little River, and Jacks Brook.
- Continue to provide and maintain public infrastructure facilities such as roads, sewers and storm drainage, where needed, in all areas throughout the town to prevent physical deterioration.
- Evaluate the need for additional emergency medical services to serve the 55 and over population within the northeastern section of Town. This may include an ambulance station.
- At some point in the future, a new police station will be needed as well.
- Consider the consolidation of town offices, the Police Department and other town offices in one centralized location.

The 2018 POCD is considered effective for informing and assisting in decision making by the Planning & Zoning 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.

Long Range Plan

Oxford prepared a Long Range Plan in 2009. Many of the goals, policies, and strategies from the 2007 PoCD were included in the plan. The Plan also included the following additional strategies relative to hazard mitigation:

- Plan for an ultimate population of approximately 20,000 to provide for a superior quality of life for present and future Oxford residents;

The Long Range Plan also discussed a number of major construction and structural needs in the community that are of interest for hazard mitigation, including replacement of the roof at Great Oak School and the windows at Center School.

The Long Range Plan has been effective at providing local officials guidance related to the timing of a variety of capital projects. Any revisions to the Long Range Plan will benefit from the information in this HMP Update, particularly with regard to major construction and structural needs around the community to prevent damage from natural hazard events.

Existing Regulations

Zoning Regulations

One of the stated purposes of the Oxford *Zoning Regulations* is to secure safety from fire, panic, flood, and other dangers. Development density is limited by requirements for large lot sizes (1.5-acres, two acres, or 2.75-acres for residential lots).

- Article 3, Section 20 requires that land with slopes in excess of 35% are not to be disturbed from their natural state for residential developments.
- Article 3, Section 23 prohibits new residential uses and places of public assembly within the airport runway protection zone.
- Article 3, Section 24 requires that driveways longer than 500 feet be widened at 300-foot maximum intervals to allow for the passing of vehicles.
- Article 10, Section 10 requires age-restricted housing developments to be served by public water and sewer, that all electrical, cable, telephone, and other service utilities be placed underground, and that fire hydrants be provided as directed by the Commission. In addition, such developments must reserve 30% of the total area of the site as open space.
- Article 12 presents Oxford's soil erosion and sediment control regulations.
- Article 13 presents Oxford's regulations regarding trailers and mobile homes.
- Article 14 presents Oxford's regulations regarding earth regarding and excavation.

- Article 15 presents the regulations for the Flood Plain District. The Flood Plain District consists of all areas of special flood hazard within the Town of Oxford identified by FEMA dated December 17, 2010. The regulations further reference the “Flood Plain Management Ordinance” passed by Town Meeting on November 8, 1979. Oxford utilizes the Flood Insurance Rate Map (FIRM) established by FEMA to identify the local Special Flood Hazard Area (SFHA). Plot plans are required to show the locations of wetlands and floodplain lines where appropriate. Applications for development in floodprone areas require a concurrent application for a Flood Hazard Areas Permit from the Commission.

Flood Plain Management Ordinance

Chapter 151 of the Oxford Town Ordinances presents Oxford’s “Floods and Floodplain Regulations”, while Chapter 152 presents “Flood Damage Prevention”. These ordinances comprise the town’s Flood Plain Management Ordinance. Chapter 151 indicates the following:

- Section 02 vests the Planning and Zoning Commission with the authority to delineate or assist with the delineation of the limits of special flood (and/or mudslide hazards) in the community, provide information to the program Administrator concerning present usage of the floodplain area, to cooperate with other agencies to map such areas in order to prevent aggravation of existing hazards, and to maintain a record of elevations of the lowest floor and next lowest floor (if needed) of all new or substantially improved structures located in special flood hazard areas.
- Section 15 requires that all new construction or substantial improvement be designed and anchored to prevent floatation, collapse, or lateral movement of the structure, and use construction materials and utilities through construction methods and practices that will minimize flood damage.
- Section 16 requires the Commission to review all subdivision proposals and other new developments to ensure that they are consistent with the need to minimize flood damage; that all public utilities and facilities are located, elevated, and constructed to minimize or eliminate flood damage; and that adequate drainage is provided to reduce exposure to flood hazards.
- Section 17 authorizes the local Sanitarian to require that new or replacement water supply systems and/or sanitary sewage systems be designed to minimize or eliminate infiltration of floodwaters into the systems, discharge from the systems into floodwaters, and require on-site wastewater disposal systems to be located so as to avoid impairment of them or contamination from them during a flood.

Chapter 152 states that the flood hazard areas of Oxford are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base. All these adversely affect the public health, safety, and general welfare. Such flood losses are caused by the cumulative effect of obstructions in floodplains causing increases in flood heights and velocities, and by the occupancy in flood hazard areas by uses vulnerable to floods or inadequately elevated, floodproofed or otherwise unprotected from flood damages. The goal of Chapter 152 is to protect human life and health, to minimize expenditure of public money for costly flood control projects, to minimize the need for rescue and relief efforts associated with flooding, to minimize business interruptions, and to minimize damage to public facilities and infrastructure.

- Section 15 identifies the base flood (the area subject to 1% or greater chance of flooding in any given year) as the area of Special Flood Hazard.
- Section 31 defines the base flood as being shown on maps prepared by FEMA dated December 17, 2010 unless amended by a map amendment or map revision obtained from FEMA.
- Section 36 states that the degree of flood protection required by Chapter 152 is considered reasonable for regulatory purposes.
- Section 50 identifies the Planning and Zoning Commission as being appointed to administer and implement the provisions of this chapter.
- Section 51 requires a registered professional engineer or architect is required to certify that the design and methods of construction are in accordance with the accepted standards of practice for meeting the floodplain provisions.
- Section 53 requires that elevation, floodproofing, and access information be submitted with a Flood Plain Permit.
- Section 70 presents the general standards (generally the same as in Chapter 151).
- Section 71 presents requirements for manufactured homes and recreational vehicles.
- Section 72 presents regulations for above-ground storage tanks.
- Section 76 authorizes the Commission to obtain, review, and reasonably utilize any base flood elevation and floodway data as criteria for activities in Zone A. No activities shall be permitted which will increase base flood elevations more than one foot at any point along the watercourse when all anticipated development is considered cumulatively with the proposed development.
- Section 77 states that proof of dry access to the structure during the 1% annual chance flood is required.
- Section 79 requires new construction or substantial improvement to have the lowest floor, including basement, elevated at least one foot above the base flood elevation. Non-residential structures may be floodproofed to a similar elevation in lieu of being elevated. A professional engineer or architect must certify the floodproofing.
- Section 81 states that no activities are allowed in the floodway that will result in any (0.00 feet) increase in flood levels during occurrence of the base flood discharge.
- Section 82 requires compensatory storage for floodplain activities that reduce floodplain storage.
- Section 83 requires equal conveyance in the floodplain, i.e. activities may not increase flood levels or flood velocity.
- Section 111 allows variances for historic buildings, pre-existing small lots, and functional-dependent uses provided no increase in flood levels in the floodway would result.

Overall, the Planning and Zoning Regulations and the Flood Plain Development Ordinance are considered effective at preventing unwanted side effects of development. These regulations are updated by the Planning and 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

The stated purposes of the Oxford *Subdivision Regulations* include securing safety from fire, flood, and other dangers; to provide proper provision for surface drainage; to insure proper protective and flood control measures for areas near brooks, rivers, and other bodies of water and to prevent damage from flooding and storm water runoff; to encourage wise use and management of natural resources; and to provide for open spaces and environmental protection through the most efficient design and layout of the land.

- Article 3, Section 5 requires concurrent submittal of any application to the Oxford Inland Wetlands Agency if the application includes a regulated activity as defined by the Inland Wetlands regulations.
- Article 5 requires grades over 20% to be specially shaded on site plans, delineation of special flood hazard areas, and submittal of a soil erosion and sedimentation control plan.
- Article 6 presents a variety of requirements for subdivisions. This article restricts permanent dead-end or cul-de-sacs to being less than 1,500 feet in length and discourages their use. Utilities are required to be located underground in subdivisions. Fire hydrants are required at a maximum of 600 feet apart. Where public water is not available, an alternative and adequate supply of water for fire control may be required by the Commission. Land with slopes greater than 35% shall not be distributed from its natural state.
- Article 6, Section 12-A provides the drainage requirements for Oxford. Drainage improvements shall be designed to achieve no net increase in stormwater runoff from the predevelopment condition. The use of retention basins or any structures that are designed to hold standing water for an extended period of time shall be avoided. The subdivision plan is required to indicate that the Town is not responsible for the maintenance of retention basins, detention basins, swales, and other surface water features and shall designate the party or parties responsible for such maintenance.
- Article 8 requires up to 20% of the gross area of the subdivision to be designated as open space. A maximum of 50% of this space so designated may be wetlands or watercourses. Open space areas are required to perform one or more of the following functions: conservation of soils or wetlands, preservation of natural streams or water bodies, provision and preservation of wildlife corridors, provision of land suitable for active recreation facilities, and enhance the overall design of the subdivision by providing breaks in the urban development. Open space must be physically accessible to the public, have frontage on a public road, or be accessible through existing open space.
- Article 12 requires that any subdivisions designed with the Special Flood Hazard Area be designed and constructed with the need to minimize flood damage, that utilities must be located and constructed to minimize flood damage, that adequate drainage shall be provided to reduce exposure to flood hazards, and that base flood elevation data shall be indicated on the record subdivision plan.

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

Inland Wetland and Watercourses Regulations

The Inland Wetlands and Watercourses Regulations in Oxford 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 Flood Plain Management Ordinance 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 Oxford.

2.2 Infrastructure

Transportation

The major roadways that serve Oxford include Routes 34, 42, 67, and 188. Each connects with either Interstate 84 or Route 8, which are located immediately north and east of Oxford, respectively. The Waterbury-Oxford Airport, which is a public use, publicly-owned general aviation airport that supports corporate, business, and recreational flight operations, is located along the northern border near Middlebury. There are no railroads in Oxford – the only former line was removed and is now part of the Larkin State Park Trail (a walking trail).

Oxford is served by CTtransit public bus system.

Utilities

Public water supply is provided by the Heritage Village Water Company in the northern and central portion of Oxford and by the Aquarion Water Company in small areas of the southeastern and southwestern sections of Oxford. Major expansion of the public water system are not currently anticipated, although the POCD suggests expanding sewers along Route 67 in order to encourage more intensive commercial development. Sewage is directed into Borough of Naugatuck or the Town of Seymour sewer system for treatment.

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

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

2.3 Critical Facilities and Emergency Response

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

Table 2-1: Critical Facilities

Facility	Address or Location	Comment	Emergency Power	Shelter	SFHA
Public Works Building	21 Great Oak Road	Emergency Operations Center	✓		
Oxford Town Hall	486 Oxford Road	Critical Records	*		
Oxford Center Fire House	484 Oxford Road	Emergency Response			0.2%

Facility	Address or Location	Comment	Emergency Power	Shelter	SFHA
Quaker Farms Fire House	403 Quaker Farms Rd	Emergency Response			
Riverside Fire House	151 Coppermine Road	Emergency Response			
Police Department	429 Oxford Road	Emergency Response			1%
Oxford High School	61 Quaker Farms Rd	Primary Shelter	✓	✓	
Quaker Farms School	30 Great Oak Road	Elementary School	✓	✓	
Great Oak School	50 Great Oak Road	Elementary School	✓	✓	
Airport Runway Lighting	Woodruff Hill Road	Regional Airport	✓		
Waterbury-Oxford Airport	Airport Road	Regional Airport	✓		
Housing Authority	100 Stakum Circle	Susceptible Population	✓		
Oxford Center School	462 Oxford Road	Elementary School			
Oxford Middle School	40 Great Oak Road	Middle School	✓		
Oxford Greens	Putting Green Lane	Elderly Population			
Gas Pumping Station (Spectra Energy)	40 Woodruff Hill Rd	Natural Gas			
Wastewater Pump Station	Towner Lane	Wastewater System	✓		0.2%
Wastewater Pump Station	Christian Street	Wastewater System	✓		
Wastewater Pump Station	100 Oxford Road	Wastewater System	✓		1%
Wastewater Pump Station	Perkins Road	Wastewater System	✓		
Wastewater Pump Station	Long Meadow Rd	Wastewater System	✓		
Wastewater Pump Station	3 Oxford Road	Wastewater System	✓		
Wastewater Pump Station	58 Oxford Road	Wastewater System	✓		1%
Towantic Energy Center	Woodruff Hill Road	Power Plant			
Oxford Commons	117 Hurley Road	Manufactured Housing			
Quarry Walk	300 Oxford Road	Mixed-Use Development			

* Oxford Town Hall is expected to be outfitted with Emergency Power in 2021

Evaluation of emergency services, shelters, equipment, critical facilities, and supplies is performed at least annually (concurrent with the EOP review) or more often if necessary. Similarly, emergency training is conducted as appropriate and Oxford purchases new equipment when funding is available.

Emergency Response Capabilities

Emergency response capabilities are overseen by the Emergency Management Director. Evacuations are managed on a case-by-case basis.

The Public Works Garage houses the community's Emergency Operations Center (EOC). The Town has noted that the EOC is inadequately-sized for emergency response activities and is not suited for long-term emergency management activities such as during the extended power outages.

The Center Fire Department is the backup EOC.

Oxford has identified a need for a climate-controlled facility to store emergency food supplies and equipment. The current storage space is too small and not climate-controlled, limiting the shelf life of food supplies.

All of the Town's wastewater pumping stations have backup power. Oxford anticipates that additional stations may be installed in the future.

Sheltering Capabilities

Oxford High School is the primary shelter. The facility has a generator and can shelter approximately 200 people. Backup shelters include Quaker Farms School and Great Oak School. These facilities all have generators. The Town Hall also has areas that could be used for sheltering, but the facility does not have a generator. None of the shelters are American Red Cross certified. Instead, the Town provides staff for the shelters. Each of the shelters allow pets.

In addition to shelters, warming and charging stations are setup at the Town Hall and Library. The Town Hall is scheduled to install a generator in 2021, however, the Library does not have a generator. The Fire Department has portable generators that they can set up for people who have special needs such that they do not need to go to an established shelter.

The Town has identified Quarry Walk in the Town Center, which contains a grocery store and pharmacy as well as other retail and residential uses, as a good candidate for installation of a microgrid; maintaining operations at this location can allow residents to meet basic needs during a widespread power outage.

Communications

Oxford 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. This system is particularly useful for warning residents of flooding and controlled releases along the Housatonic River.

Oxford distributes public information regarding natural hazards and preparedness to residents with FEMA flyers being available in the municipal buildings.

Evacuation and Access

The town roadway system is reviewed each year to identify critical risks and evaluate alternative access, and new applications are reviewed for safety concerns. This information is provided to the Planning and Zoning Commission as requested to facilitate improvements through associated developments. For example, private communities often have one-way roads but are typically required to have two modes of egress and emergency access points. In addition, there are many cul-de-sacs located throughout Oxford.

3.0 FLOODING

3.1 Existing Capabilities

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. Oxford 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. The current frequency of these inspection and maintenance programs is considered sufficient to meet the needs of the Town of Oxford. 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. Two state-owned bridges have been identified as being "scour-critical" along the Little River (at Route 42 and Route 67) and are inspected during storms.

Oxford has a variety of regulations to help prevent increasing the vulnerability of residents and businesses to flood hazards. Regulations pertaining to flood damage prevention 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 Oxford 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 Oxford for participation in the National Flood Insurance Program

The Zoning Enforcement Officer in the Planning and Zoning Department is currently the NFIP administrator for Oxford and oversees the enforcement of NFIP regulations. The degree of flood protection established by the variety of regulations in Oxford meets the minimum reasonable for regulatory purposes under the NFIP. Oxford plans to remain compliant with the NFIP and will continue to participate in the NFIP. The Town Engineer (a private consulting firm) reviews all proposals to ensure compliance with Oxford's floodplain regulations. Oxford is considering enrollment in the Community Rating System program to lower the cost of flood insurance for their residents.

Oxford has participated in the NFIP since 12/04/1979. The Flood Insurance Rate Map (FIRM) for the community was most recently updated in 07/08/2013. Oxford does not participate in the FEMA Community Rating System (CRS) program.

According to FEMA, there are 45 flood insurance policies in force in Oxford as of 6/30/2019 with an insurance value of \$11,298,900.

The Planning and Zoning Commission uses 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. Although placing utilities underground is a requirement for subdivisions and age-restricted developments, it is not a requirement for all development cases. Oxford strongly encourages the placement of utilities underground whenever possible as part of the review process, although this is not always possible due to the prevalence of shallow ledge throughout much of the community.

The current Flood Plain Management Ordinance, Planning and 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 Oxford are related to infrastructure or existing properties.

Property Protection

Oxford routinely encourages residents to purchase flood insurance although homes without mortgages are not required to do so.

Many property protection improvements are costly and may require acquisition of grant funding to successfully complete. Oxford has experience in preparing grant applications such that this effort can be performed when applicable. The Town has an in-house Grant Writer who has recently prepared five grant applications that have been submitted to FEMA, three of which are to perform home elevations along the Housatonic River. Details are as follows:

- Drainage remediation at Oxford Center Fire House: \$402,200
- Drainage remediation at home on Brooklawn Terrace: \$10,676
- Home elevation (~11 feet) along Roosevelt Drive: \$255,100
- Home elevation (~11 feet) along Roosevelt Drive: \$229,000
- Home elevation (~11 feet) along Roosevelt Drive: \$149,000

In addition, beaver activity is also an issue in certain areas. The Public Works Department is constantly addressing beaver dam activity to ensure passable conditions along roadways. The response is generally effective at mitigating the flood potential of the beaver dams, although many times the beavers are active on private property out of view from public streets. As such, the Town must rely on citizen reporting to identify problem areas.

Emergency Services

Oxford already implements the emergency services mitigation measures outlined in Section 3.3.3. Oxford utilizes the “CodeRED” emergency notification system to target emergency calls into specific areas of the community.

The Oxford Fire Department also has a supply of portable pumps that they utilize to perform basement pumpouts. They also have a fire boat to perform water rescues. The existing equipment and capabilities are considered to be effective for responding to flood damage (except as specified in Section 3.6) and are evaluated at least annually.

Public Education and Awareness

Oxford makes a variety of information available for the public at its municipal buildings regarding mitigation flood hazards, including FEMA pamphlets on preparedness. The Director of Emergency Management, Zoning Enforcement Officer, and Building Official are local resources for preparedness and mitigation activities. The availability of these materials and resources is considered sufficient for the amount of flooding present in the community.

The Oxford Fire Department is responsible for warning residents along the Housatonic River when there will be controlled releases from Stevenson Dam. The residents of Under the Rock Park operate their own electrical power service shut-off for periods of controlled flooding.

Natural Resource Protection

Open space preservation is part of all subdivision projects as well as other development projects, with areas within wetlands and floodplains being prioritized for preservation by the Planning and Zoning Commission. Maintaining stream buffers is a priority for Oxford planners that has the secondary benefit of mitigating flood damage. Maintenance of such buffers is accomplished through the Inland Wetlands review. These activities have been effective at maintaining stream buffers in the community.

Oxford is interested in acquiring floodprone properties near the Housatonic River and converting the properties to open space although they have not received any commitments from property owners at this time. The community also maintains a wish list of open space that is desired that is annually reviewed. However, the ability to obtain such properties is subject to property availability and available funding.

Structural Projects

There are no existing flood control structures in Oxford. Structural projects have generally included evaluating local bridges and culverts and repairing or replacing these structures as needed. The regular evaluations have allowed Oxford staff to compile a list of undersized culverts, floodprone areas, and drainage problems as discussed in Section 3.6.

In summary, many of Oxford’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. 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.

New Capabilities and Completed Actions

Oxford continues to maintain its strong flood mitigation capabilities.

Summary

Oxford 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

3.2.1 Vulnerability Analysis of Private Property

Many structures in Oxford are located within the floodplains delineated by FEMA. Oxford does not currently have a list identifying the location and number of structures that are susceptible to flooding. **Oxford should utilize current aerial photography and parcel mapping to determine the number of houses within the 1% annual chance floodplain.** Table 3-1 presents a list of roadways with structures known to be located in floodprone areas.

Table 3-1: Roadways with Structures in the 1% Annual Chance Floodplain

Street	Flooding Source
O'Neil Road	Eightmile Brook
Pope Road	
Route 188 (Quaker Farms Road)	
Route 188 (Strongtown Road)	
Punkup Road	Housatonic River
Route 34 (Roosevelt Drive)	
Fiddlehead Road	Lake Zoar
Freeman Road	
Maple Tree Hill Road	
Bice Drive	Little River
Brooklawn Terrace	
Governors Hill Road	
Hogs Back Road	
Old State Road 3	
Old State Road No. 67	
Route 67 (Oxford Road)	
Seth Den Road	
Woodside Avenue	
Wyant Road	
Trefoil Drive	Nichols Pond
Academy Road	Riggs Street Brook
Riggs Street	
Still Road	Sixmile Brook
Route 42 (Chestnut Hill Road)	Towantic Brook

According to the 2013 FEMA FIRM, a total of 920 acres of land in Oxford are mapped within the 1% annual chance floodplain, and a total of 1,027 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, a total of 16 repetitive loss properties (RLPs) are located in Oxford. Three of these properties are considered to be Severe Repetitive Loss Properties. Each of the properties are residential and each is located along Route 34 (Roosevelt Drive) within the floodway of the Housatonic River downstream of Stevenson Dam. One of the 16 properties is listed as having been mitigated. Based on the RLP list, properties along the Housatonic River appear to be at the greatest risk of receiving flood damage. Oxford has attempted to purchase these properties to prevent development, however these properties are very expensive. Typically, the properties are taken off the market prior to grant funding availability. The Town continues to be interested in buyouts but cannot guarantee any will occur in the next five years. **Oxford should continue to pursue home elevations in this area.** If property owners are amenable, **Oxford should also pursue acquisition of floodprone property in this area with conversion of the property to open space.**

Chapter 152 of Oxford's Flood Plain Management Ordinance requires one foot of freeboard for new development or substantial improvement in floodplains. Given recent changes to rainfall and runoff patterns discussed in Section 2.4, **Oxford should consider requiring additional freeboard beyond one foot.** Additionally, the Flood Plain Management Ordinance already requires submission of and retention of elevations for such activities; the use of a standardized form would streamline the data collection and retention process. **Oxford should formally require the use of the FEMA Elevation Certificate to record all elevation submissions for new developments and substantial improvements requiring a Flood Hazards Area Permit.**

Emergency responders and code enforcement officials continue to be frustrated by unpermitted additions and renovations to residential structures within floodplains. This trend, particularly along the Housatonic River, has had the effect of transforming what was predominantly a seasonal population to year-round status. This has created a situation where residents and emergency responders are exposed to risk more often than in the past. One potential mitigation measure suggested by Town officials is to **install signage showing flood elevations along the Housatonic River** as a deterrent to development.

The use of an emergency notification system can help communities avoid casualties due to flash flooding. **Oxford should use the list of structures within the 1% annual chance floodplain to target flood warnings through the CodeRED system.** In addition, the Fire Department has found that it needs more equipment to properly respond to widespread flooding. **Oxford should pursue acquiring more portable pumps and an additional rescue boat.**

3.2.2 Vulnerability Analysis of Critical Facilities

The list of critical facilities provided by Oxford (Section 2.9) was used with Oxford's online parcel data and 2012 aerial photography to accurately locate each critical facility. The Oxford Police Department building appears to be located partially in the 1% annual chance floodplain, while the Oxford Center Fire House building appears to be mapped within the 0.2% annual chance floodplain.

The Oxford Police Department Building is located at the corner of Governor's Hill Road and Route 67. The southwest corner of the building appears to be located within the 1% annual chance floodplain of the Little River along with most of the rear parking area. The remainder of the building is located within the 0.2% annual chance floodplain. As a result, the Police Department sump pump runs constantly. **Oxford may wish to consider installation of a low flood wall to protect this structure.** An elevation survey may also be needed to determine if the building is truly subject to the 1% annual chance flood.

The Center Fire House has drainage and flooding issues due to an undersized culvert that drains from Kirk's Pond to the Little River. As a result, the edge of the parking lot has been scoured by overtopping flows and water tends to back up through the drainage system into the Fire House. The Town has been applying for grants to upgrade the culvert to no avail.

Many sewer pumping stations are located in low areas adjacent to watercourses as these areas are where pumping is needed. It is not currently known which sewer pumping stations may be at risk of flooding, although some are definitely in or near floodplains. **Oxford should perform a survey of each sewer pumping station to determine if they are vulnerable to flooding.**

Oxford's transportation network is at risk of flooding either from poor drainage or overbank conditions. This is particularly a concern given fact that flooding can make it difficult for ambulances to access hospital facilities in Derby and Waterbury if a variety of detours are enacted on State Roads due to road closures.

3.2.3 Vulnerability Analysis of Areas along Watercourses

In addition to the recurrent flooding conditions along the Housatonic River discussed above, the Little River and Riggs Street Brook are also reported as being recurring problem areas for flooding. The Little River has experienced flooding problems at Hogs Back Road and at its confluence with Towantic Brook in the south portion of Oxford near the Route 67 crossing, with the flooding extending to Park Road. Additional flooding has occurred at the Riggs Street Brook crossing of Route 67 near its confluence with the Little River. Flooding has also occurred on Riggs Street Brook upstream of the school access road. **Oxford should pursue funding to complete flood mitigation projects along the Little River.**

Many structures along the route of Riggs Street Brook and the Little River are threatened by even relatively routine floodwaters. Emergency evacuations have been completed during flood periods at a shopping plaza in the southeastern part of Oxford where the Little River crosses Route 67. To mitigate this issue, larger culverts need to be installed at Route 67 near Old State Road, and just northwest at Route 67 (Oxford Road). However, the Connecticut DOT would need to make those improvements since the affected area is along a State road. Eightmile Brook also has areas with recurring flooding issues; most of the problems are to conveyance structures and roadways and not to individual structures. Residents also indicated that flooding along Towantic Brook was an issue.

There are many old and deteriorating bridges in the community that are often overtopped and/or undermined during even routine storm events due to aging components and inadequate sizing. A list of these bridges is presented in Table 3-2. A detailed evaluation of the flooding impact on the local transportation system is a town goal. Such an evaluation would include an engineering study to prioritize culvert and small bridge replacement projects. For example, the Park Road bridge over the Little River is one lane and floodprone, but has been difficult to mitigate because it is a historic structure. For this reason, the design phase of the bridge's replacement has been progressing slowly. The Dutton Road bridge over

the Little River is also floodprone. A replacement project for Dutton Road Bridge has recently been bid. **Oxford should evaluate culverts and bridges and prioritize potential flood mitigation projects.**

Table 3-2: Floodprone Bridges in Oxford

Bridge	Flooding Source
Barry Road	Eight Mile Brook
Edmonds Road	Eight Mile Brook
Loughlin Road	Eight Mile Brook
O'Neil Road	Eight Mile Brook
East Hill Road at Punkup Road	Fivemile Brook
Moose Hill Road at Holbrook Road	Fourmile Brook
Brooklawn Terrace at Route 67	Little River
Dutton Road	Little River
Governor's Hill Road	Little River
Hogs Back Road	Little River
Old State Road No. 3	Little River
Park Road	Little River
Seth Den Road at Old State Road No. 67	Little River
Academy Road	Riggs Street Brook
Autumn Ridge Road	Riggs Street Brook
Fairfield Road at Great Hill Road	Unnamed Tributary to Little River

Given that rainfall intensity and magnitude has been increasing over the past few decades since the time that many local bridges and culverts were designed, the conveyance of each structure should be checked utilizing more recent rainfall data, and the structure redesigned if necessary. This could be done on a case-by-case basis, or as part of a larger watershed effort. The construction of a hydrologic and hydraulic model of the Little River watershed could be utilized to re-size bridges and check culvert sizes against the recently updated NRCC rainfall return periods and various flood events. Such a model could further enable Oxford to present comprehensive flooding data from various storm sizes and flood magnitudes in a straightforward manner for use by planners, emergency responders, and design professionals. While a model of this scope will be costly to develop, Oxford should consider creating such a model for future use following the proposed evaluation of culverts discussed above.

Residents indicated that Oxford needs to do a better job of controlling runoff into ponds and streams. Oxford's control over runoff typically occurs prior to development through the Planning and Zoning process, and when applicants come forward for improvement permits. As the town does not have jurisdiction on private property, it is instead focusing its efforts towards studying its existing drainage system such that upgrades and mitigation actions may be prioritized.

Residents also indicated that Oxford should coordinate water releases from dams before storms. This potential mitigation measure should be considered within a watershed framework for prioritizing mitigation projects. It is possible that lowering the water level behind particular dams could help mitigate downstream flooding during large storms. The creation of a watershed model would help make this determination on a case-by-case basis.

3.2.4 Vulnerability of Other Areas

Oxford has a variety of areas that are subject to 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.

Many new flooding problems are related to drainage from recent developments. Ridge Street, Wyatt Road, Academy Road, O'Neil Road, Dutton Road, Park Road, East Hill Road, Edmonds Road, and Route 188 all have areas with new drainage issues that initially occurred following the construction of upgradient developments. Runoff from the golf course has been a concern since nearby culverts have required extensive cleaning. Great Hill Road and Echo Valley Road near Haynes Materials reportedly seem to have become more floodprone. Higher intensity rainfall and the use of outdated drainage computations may also be playing a role in the new drainage issues. Additional areas identified by the Department of Public Works as having drainage problems include:

- Riggs Street
- Hurley Road
- Pope Road
- Ploch Road
- Old Farm Road at Old Country Road
- Dorman Road
- Seth Den Road
- Moose Hill Road
- Kirk's Pond at Center Fire House (Route 67)

Similar to the other flooding areas, it is likely that these areas will experience more frequent and intensive flooding events in the future. Drainage and flooding complaints typically go directly to Public Works, although sometimes the Selectman's office receive them. Flooding emergencies typically come in through 9-1-1.

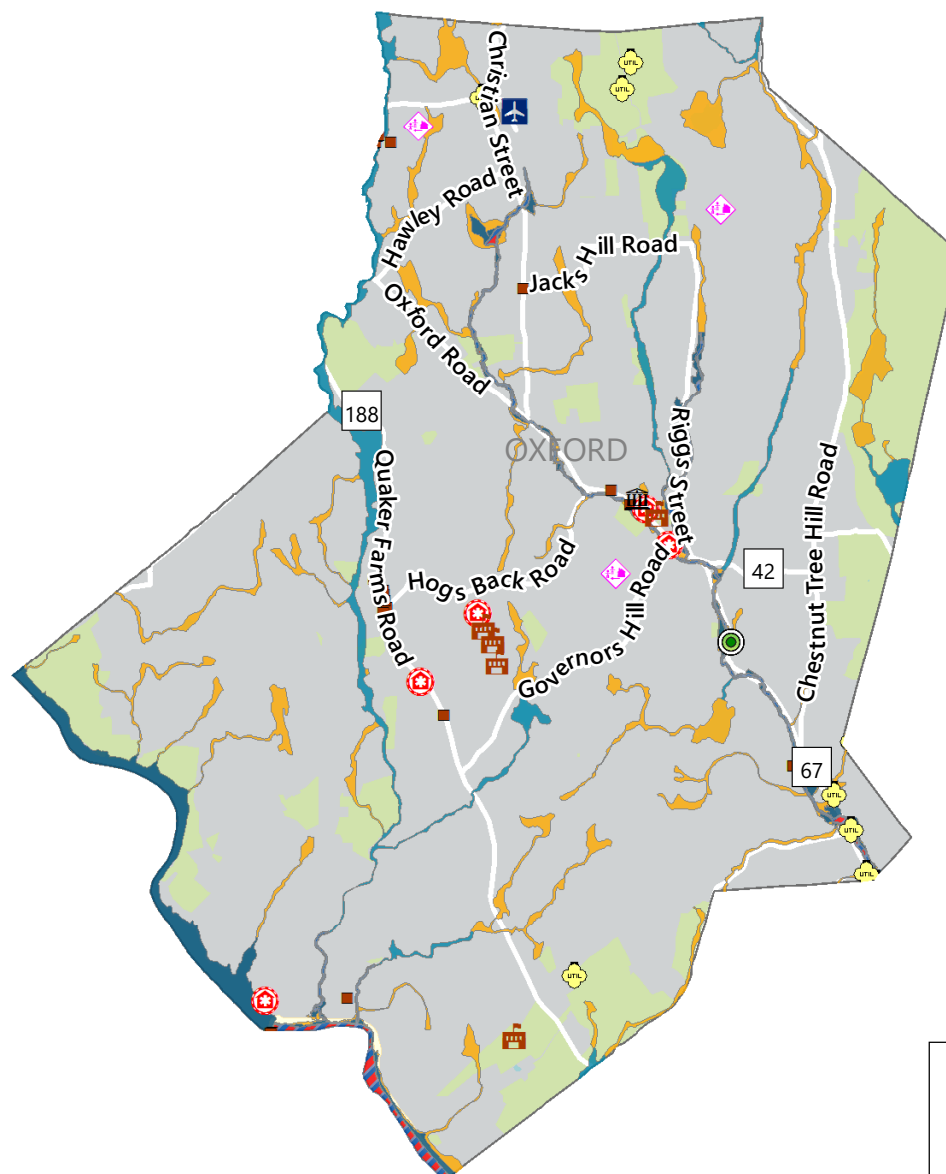
Flood prone areas in the community today, as mapped by FEMA, are presented in Figure 3-1.

Oxford has ten Repetitive Loss Properties (RLP). Of those, two are classified as Severe RLP. One of the RLPs in Oxford have been mitigated in the past.

Table 3-3: Repetitive Loss Properties in Oxford

Total	Residential	Non-Residential	Mitigated	SRL
10	10	0	1	2 Residential

In September 2018, rains produced flooding along the Housatonic River. Roosevelt Drive was flooded. Elevated homes did not have issues, but lower lying houses had water on the first floor. In one case, water was coming out the first-floor windows. The depth of flooding was estimated at eight feet.

**Critical Facilities**

- Emergency Response
- Fuel
- Government Services
- Population Center
- Regional Airport
- School
- Utility
- Vulnerable Population

Flood Zone

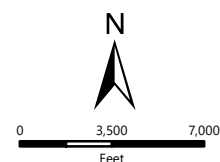
- A
- AE
- Floodway
- X: 0.2% Annual Chance



99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Flood Hazards in Oxford

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



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 Oxford is 110 mph for a Category 1 event, 125 mph for a Category 2, and 130 mph for a Category 3, 4 or 5 hurricane event.

Connecticut is located in FEMA Zone II regarding maximum expected wind speed. The maximum expected wind speed for a three-second gust is 160 mph. This wind speed could occur as a result of either a hurricane or a tornado in western Connecticut and southeastern New York. The American Society of Civil Engineers recommends that new buildings be designed to withstand this peak three-second gust.

Eversource, the local electric utility, provides tree maintenance near its power lines. The electric utility has assigned a liaison to the community through whom the Public Works Department may present concerns and request assistance. Communication and response can be limited such that the best results for Oxford were when the power company simply assigned a crew to operate under the town's direction.

The local tree warden and encourages residents to cut trees that can be dangerous to power lines. The Department of Public Works has a budget for tree trimming but a larger budget would be preferred since a large percentage goes to outside contractors for elevated tree work. Oxford has several crews and sufficient equipment to perform ground-level tree maintenance and cleanup. Recently, the Town has been focusing its tree removal efforts on Ash trees. In addition, all utilities must be located underground in certain developments and are encouraged to be placed underground wherever possible in order to mitigate storm-related damages. These regulations have been effective at reducing vulnerability for new developments.

As a result of extended power outages following storms in 2011, many residents in Oxford have installed generators.

Oxford relies on 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, Oxford 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

Oxford continues to maintain its strong tropical cyclone mitigation capabilities.

Summary

In summary, many of Oxford's capabilities to mitigate for wind damage and prevent loss of life and property have improved slightly since the initial hazard mitigation plan was adopted. Furthermore, Eversource has increased its capabilities and response relative to tree and tree limb maintenance near utility lines.

4.2 Vulnerabilities and Risk Assessment

One particular area of vulnerability for recurring tree damage is located on Pines Bridge Road. Large pine trees snap and fall during high wind events and damage overhead utilities in the area.

Due to the relatively limited communication coming from Eversource, Oxford typically does not know what resources are available during and immediately following a severe storm event. Therefore, Oxford performs much of its own trimming and cleanup during emergencies, which can be problematic if lines are not de-energized. In addition, while the electric utility trimmed in some areas, they did not trim in many areas that were planned.

Residents have indicated concerns relative to the need for increased trimming near power lines along town rights-of-way. In particular, Chestnut Tree Hill Road was mentioned by residents as a problem area for downed trees and power lines. Several suggested actions related to storm cleanup and trimming are available. **Oxford should review the existing tree maintenance budget and make improvements if necessary. Additionally, the acquisition of a boom truck would allow for town personnel to perform elevated tree work, saving the expense of contracting such work out. Finally, Oxford should work with other communities in the State to improve communications with Eversource during emergency situations.**

Oxford is vulnerable to hurricane damage from wind and flooding and from any tornadoes accompanying the storm. In fact, most of the damage to Oxford from historical tropical cyclones has been due to the effects of flooding. Wind damage is typically widespread, and no town areas are at greater risk than any other. Fortunately, Oxford is less vulnerable to hurricane damage than coastal towns in Connecticut because it does not need to deal with the effects of storm surge. Factors that influence vulnerability to tropical cyclones in the community include building codes currently in place, and local zoning and development patterns and the age and number of structures located in highly vulnerable areas of the community.

Some critical facilities are more susceptible than others to flooding damage associated with hurricane rainfall. Such facilities susceptible to flooding were discussed in Section 3.

The Emergency Management Director is 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.

Oxford'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 Oxford.

As Oxford is not affected by storm surge, hurricane sheltering needs have not been calculated by the U.S. Army Corps of Engineers for the community. Oxford determines sheltering need based upon areas damaged or needing to be evacuated within the community. Under limited emergency conditions, a high percentage of evacuees will seek shelter with friends or relatives rather than go to established shelters. In the case of a major (Category Three or above) hurricane, it is likely that Oxford will depend on state and federal aid to assist sheltering displaced populations until normalcy is restored.

Tropical Storm Isaias in August 2020 caused widespread tree damage with power outages lasting up to one week. Route 188 was intermittently closed due to fallen trees and powerline repairs. In total, the major throughfare was impeded for about one week. Detours were difficult due to fallen trees on other roads. Town staff provided a priority list of restorations to Eversource, but restoration was not conducted in accordance with the Town's list. The Oxford Greens elderly community lost power for several days. Since this development does not have backup power, emergency personnel needed to find ways to ensure medical needs (e.g. breathing machines) were powered. Meadowbrook Manor (age-restricted housing) should have also been a restoration priority, but was without power for six days. Shelters were opened following the storm. Generally, Town buildings had minor damage including fallen trees and some roof shingle loss at Old Center School and sheet metal roof damage at the Public Works building.

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 Oxford 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 "CodeRED" 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 Oxford. 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

Oxford 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

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

5.2 Vulnerabilities and Risk Assessment

Similar to the discussion for hurricanes, there are no critical facilities believed to be more susceptible to summer storm damage than any other. While the Public Works Garage is reportedly located within a “wind corridor” that can experience higher than normal winds, damage to this facility has not been recorded. Some critical facilities are more susceptible than others to flooding damage due to summer storms. Such facilities susceptible to flooding damage were discussed in Section 3.

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 and no tornadoes have resulted in costly damages to Oxford. 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. **Oxford should review the existing tree maintenance budget and make improvements if necessary.** Given the limited historic record for damaging tornado events, an estimate of several million dollars in damage may be reasonable for an EF2 tornado directly striking the downtown 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.

Tornadoes that touched down in the region in May 2018 caused extensive tree damage and resultant power outages in Oxford. The entire town lost power for up to a week, and shelters were opened.

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.

As it is almost guaranteed that winter storms will occur annually in Connecticut, it is important for Oxford to budget fiscal resources toward snow management. In extreme years, such as the winter of 2010-2011, this budget can be quickly eclipsed and must be supplemented from other budget sources. 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.

Oxford primarily uses Town staff for plowing operations and has adequate capacity to deal with snow and ice. Oxford has defined plow routes with priority given to accessing critical facilities and primary roads, and an established snow removal plan. This plan is reviewed annually. Plow routes are not publicly posted. As Oxford is very hilly, most areas receive treatment in the winter to prevent icing. 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.

Prior to a winter weather event, Oxford 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. Oxford 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 vehicles are temporarily rerouted to clear the route ahead of an emergency vehicle.

Overall, these programs are considered effective at mitigating the effects of winter storms. While additional budget could supplement these programs, the amount of experience that local personnel have in managing winter storm events makes it unlikely that a significant additional benefit could be achieved with additional funding.

New Capabilities and Completed Actions

Oxford continues to maintain its strong winter storm mitigation capabilities.

Summary

Oxford 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 Oxford is elevation-dependent during storms. As the population of Oxford increases and more areas (particularly in the higher elevations) are developed, the vulnerability of Oxford 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.

After a storm, snow piled on the sides of roadways can inhibit sight lines and reflect a blinding amount of sunlight. When coupled with slippery road conditions, poor sightlines and heavy glare create dangerous driving conditions. Stranded motorists, especially senior and/or handicapped citizens, are at particularly high risk of injury or death from exposure during a blizzard. The elderly population in Oxford, 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 Oxford are vulnerable to a variety of winter storm damage. Tree limbs and some building structures may not be suited to withstand high wind and snow loads. Ice can damage or collapse power lines, render steep gradients impassable for motorists, undermine foundations, and cause "flood" damage from freezing water pipes in basements. Drifting snow can occur after large storms, but the effects are generally mitigated through municipal plowing efforts and have not been an issue in recent years. In particular, drifting snow used to be an issue along Jacks Hill Road where 12- to 13-foot drifts would form. Such drifts have not occurred recently.

Residents have expressed concern regarding existing snow removal processes. While Oxford performs plowing on local roads to the extent reasonable and practical for a given storm event and local financial capabilities, it is recognized that most residents want their own roads cleared as fast as possible. This is in conflict with the town's established plowing plan which prioritizes access to main roads and critical facilities. In addition, local officials have little direct control over the timing of plowing along State roads.

Icing causes difficult driving conditions throughout the hillier sections of the community, but local personnel note that there are few unusual areas or particular "trouble spots" for icing. Most areas prone to icing are associated with areas of poor drainage discussed in Section 3.6. The Housatonic River is prone to ice jams.

Similar to the discussion for hurricanes and summer storms in the previous two sections, 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. Such facilities susceptible to flooding damage were discussed in Section 3. **Critical facilities and schools 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 are 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 snowstorms were a challenge for emergency management due to the inability to respond through snow-covered roads. Many homes in town use natural gas, and in several cases, snow-covered exhaust vents led to carbon monoxide buildup in structures, requiring emergency response. Public Works was diverted from plowing streets to provide access for response vehicles. One building fire was caused by snow loads leading to the collapse of the supports on a pipe at a commercial building. The snowstorms also caused some power outages.

7.0 GEOLOGICAL HAZARDS

7.1 Existing Capabilities

The Connecticut Building Codes include design criteria for buildings specific to each municipality as adopted by the Building Officials and Code Administrators (BOCA). These include the seismic coefficients for building design in Oxford. Oxford has adopted these codes for new construction, and they are enforced by the Building Official. Due to the infrequent nature of damaging earthquakes, land use policies in Oxford do not directly address earthquake hazards. However, the various regulations do attempt to prevent development on steep slopes or ridgelines.

The Town of Oxford'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 Oxford has incorporated those changes. If the event that a damaging earthquake occurs, Oxford will activate its Emergency Operations Plan and initiate emergency response procedures as necessary.

New Capabilities and Completed Actions

Oxford continues to maintain its earthquake and landslide mitigation capabilities.

Summary

Oxford 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

As explained in Section 1.5, several areas in Oxford 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. The best mitigation for future development in areas of sandy material may be application of the most stringent building codes or possibly the prohibition of new construction. However, many of these areas occur in floodplains associated with the various streams and rivers in Oxford so they are already regulated. The areas that are not at increased risk during an earthquake due to unstable soils are those underlain by glacial till.

A series of earthquake probability maps were generated using the 2009 interactive web-based mapping tools hosted by the USGS. These maps were used to determine the probability of an earthquake of greater than magnitude 5.0 or greater than magnitude 6.0 occurring within 50 kilometers of Oxford. Results are presented below.

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

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%
250	8% to 10%	2% to 3%
350	12% to 15%	2% to 3%

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 Oxford 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 Oxford.

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

Oxford currently inspects each of its dams semi-annually.

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

Actions Completed and New Capabilities

Oxford continues to maintain its capabilities for mitigating and responding to dam failure risks. Overall, the Town of Oxford's capability to mitigate for dam failure and prevent loss of life and property have increased since the initial hazard mitigation plan was adopted, mainly as a result of recent statewide legislative actions described above. This is because the Town of Oxford does not have any direct control over the high and significant hazard dams within or upstream of the community. Over the next few years, it is expected that dam safety programs will continue to strengthen in Connecticut.

Summary

Oxford 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 26 DEEP-inventoried dams within Oxford. Six of these dams had a Significant or High Hazard Potential rating. These dams are listed in Table 8-1 and shown in Figure 8-1.

Table 8-1: DEEP-Inventoried Dams in Oxford

Number	Name	Class	Owner
10801	STEVENSON DAM - use 8501 going forward	C	Power Utility
10802	SEYMOUR RESERVOIR #3 DAM	B	State Owned
10803	SEYMOUR RESERVOIR #2 DAM	B	State Owned
10805	TOWANTIC POND DAM	B	Private
10806	GREAT HILL ROAD POND DAM	BB	Private Corporation
10807	EMERSON POND DAM		Private
10808	SWAN LAKE DAM	C	Lake Association
10809	SEYMOUR RESERVOIR #4 DAM	B	State Owned
10811	STODDARD DAM	BB	Private
10812	HURLEY ROAD POND DAM	BB	Private
10813	KEISER DAM	BB	Private
10814	KWOKA'S POND DAM	BB	Private
10815	NICHOLS POND DAM		Lake Association
10816	OPUSZYNSKI & LODA DAM		Private Corporation
10817	BYLE'S DAM	A	Private
10818	SOUTHFORD FALLS DAM	A	State Owned
10819	CHANKO POND DAM	AA	Private
10820	MISTY POND DAM	A	Private
10821	TURNER POND DAM	AA	Private
10822	VONWETTBERG POND DAM	AA	Private
10823	BELINSKY POND DAM	A	Private
10824	DALY POND DAM		Private
10825	TEDESCO POND DAM	A	Private
10826	WARD DAM		Private Corporation
10827	FATAL POND DAM	AA	Private
10828	CPV TOWANTIC DETENTION BASIN DAM	AA	Private

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

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

Number	Name	Class	EAP Status	EAP Status Date
10801	STEVENSON DAM - use 8501 going forward	C	FERC Regulated Dam No Review Needed	7/21/2017
10802	SEYMOUR RESERVOIR #3 DAM	B	Review letter sent revisions needed	3/9/2017
10803	SEYMOUR RESERVOIR #2 DAM	B	Review letter sent revisions needed	3/9/2017
10805	TOWANTIC POND DAM	B	Assigned to DEEP Staff for review	7/19/2019
10808	SWAN LAKE DAM	C	Acceptance Letter Sent	7/5/2018
10809	SEYMOUR RESERVOIR #4 DAM	B	Review letter sent revisions needed	3/9/2017

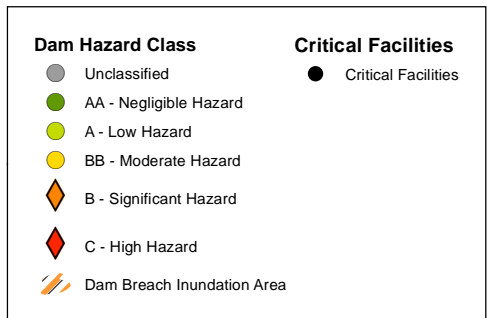
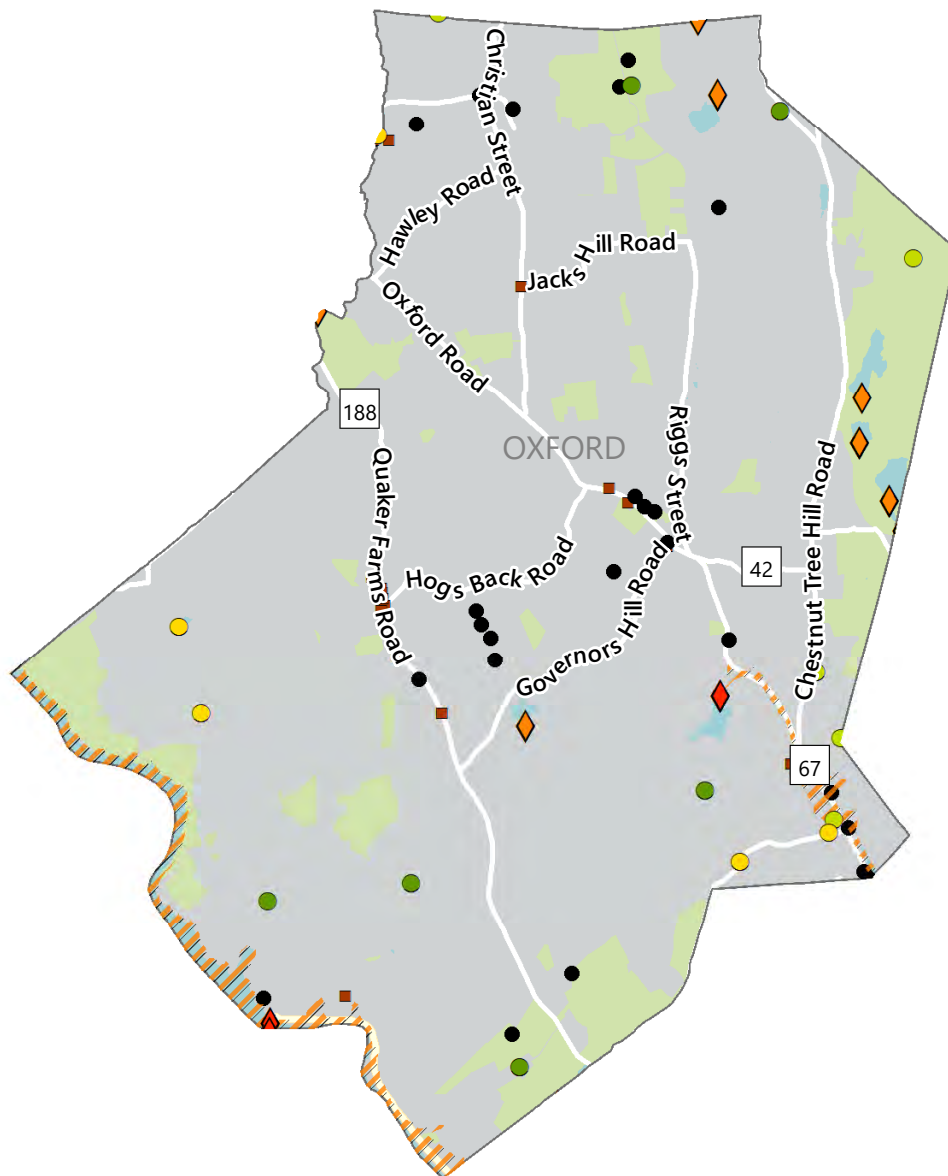
Oxford should work to ensure EAPs are up-to-date.

The Town of Oxford considers itself highly vulnerable to dam failure with the potential for a catastrophic amount of damage. The largest concern is associated with a failure of the Stevenson Dam and the potential to cause catastrophic damage to homes along the Housatonic River, while the second greatest concern is associated with the failure of the Swan Lake Dam and its possible significant impacts downstream along the Little River. The size of upstream dams is a concerns, however, Town staff are well informed of the potential risk and have copies of the EAPs. **Oxford should utilize the dam failure inundation mapping associated with the EAPs for these dams to identify properties that could be affected such that telephone calls can be directed to failure areas.**

The Stevenson Dam is also of concern for the Town of Newtown. **Oxford should pursue improved communications with the Town of Newtown and First Light regarding emergency response along Lake Zoar.**

Residents indicated that they considered the Towantic Pond dam, a privately owned Class B dam, to be vulnerable to dam failure. Residents should contact Connecticut DEEP directly with any concerns at (860) 424-3706. **Oxford should work with the Connecticut DEEP to ensure that it has copies of the most current Emergency Action Plans on file.** In addition, residents indicated that coordination of water releases at dams prior to storms could help to mitigate downstream flooding. **Oxford should work with dam owners in an attempt to coordinate such releases.**

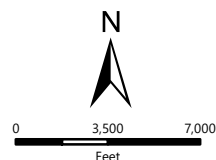
A significant dam failure event would likely occur as part of a large flood event. This belief has fostered a climate of responsibility to ensure that dam failure is adequately prevented and prepared for through proper planning and maintenance of the structures. While the higher hazard dams are generally believed to be in good conditions, the condition of the many lower hazard, privately-owned dams throughout the community is not known. It is assumed that they are in generally adequate to good condition.



99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Dam Failure Hazards in Oxford

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



DATE 6/15/2021
141.3211.00029
PROJ. NO.

FIG. 8-1

9.0 WILDFIRES

9.1 Existing Capabilities

Existing mitigation for wildland fire control is typically focused on Fire Department training and maintaining an adequate supply of equipment. Firefighters are typically focused on training for either structural fires or wildland fires, and maintain a secondary focus on the opposite category.

Regulations regarding fire protection are outlined in the *Zoning Regulations* and the *Subdivision Regulations*. The Fire Marshal reviews new developments for fire protection requirements and provides recommendations to the Planning and Zoning Commission. The Fire Marshal encourages new developments to connect to public water supply whenever possible. New developments in outlying areas are either fitted with dry hydrants or are required to install underground storage tanks to store firefighting water. The level of fire protection is considered adequate throughout the community.

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

Oxford is fortunate to have public water supply in certain areas, but often requires the installation of fire suppression tanks in new developments. The Fire Department has some water storage capability in its tanker trucks and storage tanks, but primarily relies on the use of the municipal water system to fight fires throughout the community whenever possible.

Oxford has all-terrain vehicles and other equipment for fighting fires in remote areas. The community also has mutual aid agreements with all of its neighbors, and works with Connecticut DEEP regarding fire protection of State-owned lands. Oxford is generally the first responder to fires occurring within State Forests in Oxford, with the State firefighters assuming command when they arrive on scene. 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 Oxford to monitor the drier areas of the state to be prepared for forest fire conditions.

Actions Completed and New Capabilities

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

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.

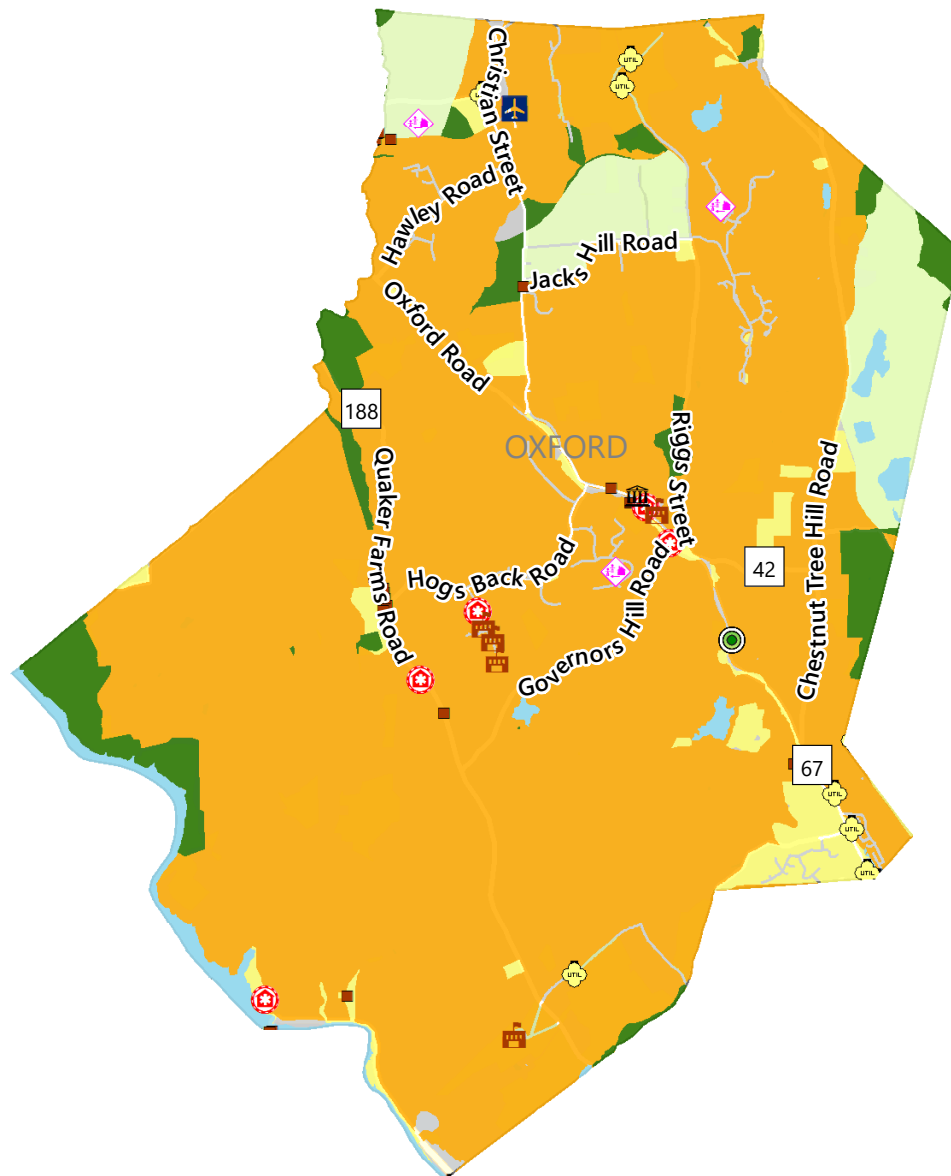
9.2 Vulnerabilities and Risk Assessment

The approximately 15,497 acres of forests and undeveloped land in Oxford may be susceptible to drought conditions that make them more vulnerable to wildfires. The approximately 1,268 acres of agricultural fields and maintained grasses may be vulnerable to direct damage from drought conditions.

Oxford understands that there are weaknesses in its firefighting capability, particularly in outlying areas away from the public water systems. There are 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.**

There are limited public camping areas in the community, so there are few fires caused by out of control campfires. The State Forest lands in Oxford are considered to be the areas of greatest vulnerability for wildfire because there are so few roads allowing access. Oxford personnel work with the DEEP to address the forests.

Wildfire risk zones are mapped in Figure 9-1.



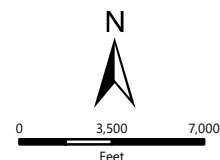
- | Critical Facilities | | Wildland Urban Interface Type | |
|---------------------|-----------------------|-------------------------------|--------------------------------|
| | Emergency Response | | Wildland-Urban Intermix |
| | Fuel | | Wildland-Urban Interface |
| | Government Services | | Vegetated: Low Housing Density |
| | Population Center | | Vegetated: No Housing |
| | Regional Airport | | Non-vegetated |
| | School | | Water |
| | Utility | | |
| | Vulnerable Population | | |



99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Wildfire Hazard in Oxford

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



DATE 6/15/2021
PROJ. NO. 141.3211.00029

FIG. 9-1

10.0 MITIGATION STRATEGIES AND ACTIONS

10.1 Goals and Objectives

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

10.2 Status of Mitigation Strategies and Actions from Previous HMP

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

Strategy	Description	Responsible Party	Status	Notes
OXF-1	Incorporate suggested actions into other local planning activities	EMD, BoS	Complete	Discussion in 2018 POCD of acquiring land in floodplains to encourage public access and ensure use of these areas for flood storage
OXF-2	Identify and outfit a new EOC facility with adjacent storage center	EMD	Carry Forward with Revision	Found storage, at the same EOC. Need to increase the size of the EOC. Planning process to expand EOC is underway.
OXF-3	Utilize aerial photography and parcel mapping to identify addresses within the 1% annual chance floodplain	ZEO	Carry Forward	Has not happened
OXF-4	Continue to pursue home elevations along the Housatonic River	ZEO, GW	Capability	Will do it when property and funding are available
OXF-5	Pursue acquisition of homes in the floodplain of the Housatonic River for demolition and conversion to permanent open space	ZEO, GW	Capability	Will do it when property and funding are available
OXF-6	Pursue acquisition of undeveloped land in floodplains to permanently protect such land from development	BoS, ZEO	Capability	Will do it when property and funding are available
OXF-7	Encourage residents within the 1% annual chance floodplain to purchase flood insurance under the NFIP and complete elevation certificates	ZEO	Capability	Encourage residents to purchase flood insurance.

Strategy	Description	Responsible Party	Status	Notes
OXF-8	Join FEMA's Community Rating System to reduce the cost of flood insurance for residents	BoS, ZEO	Carry Forward	Town has not yet joined.
OXF-9	Consider requiring additional freeboard beyond one foot for new development or substantial improvement	PZ	Carry Forward with Revision	Action not yet completed due to limited municipal capacities. Action is replaced with two new actions to adopt CT DEEP model regulations and increase substantial damage/improvement lookback periods (in line with regional priorities).
OXF-10	Formally require the use of the FEMA elevation certificate to record all elevation submissions	PZ	Carry Forward	Action not yet completed due to limited municipal capacities.
OXF-11	Install signage depicting flood elevations along the Housatonic River as a deterrent to development	DPW	Carry Forward	Would like to do if funding available
OXF-12	Utilize the list of structures within the 1% annual chance floodplain to target warnings through the CodeRED system	EMD	Capability	Still using CodeRED, and they remind folks to register, as usage affects the whole town. The Town have a targeted call list for Housatonic River flooding.
OXF-13	Pursue the acquisition of additional portable pumps and an additional rescue boat	EMD, GW	Capability	rescue boats were acquired. Constantly replacing pumps
OXF-14	Consider installation of a low flood wall to protect the Police Department	EMD, DPW	Carry Forward with Revision	The Town is discussing moving the police department.
OXF-15	Consider floodproofing measures for the north side of the Oxford Center Fire House	EMD, DPW	Carry Forward with Revision	Replacing drainage pipe is best option here
OXF-16	Pursue funding to complete flood mitigation projects along the Little River	DPW, GW	Carry Forward with Revision	Town has been looking for funding to help complete the projects
OXF-17	Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	DPW	Carry Forward	HVA did an inventory of road-stream crossings a few years ago. Town has not completed a local evaluation.

Strategy	Description	Responsible Party	Status	Notes
OXF-18	Evaluate existing drainage systems utilizing current rainfall statistics and the need for additional drainage systems	DPW	Carry Forward	Town has not completed a local evaluation.
OXF-19	Review the existing tree maintenance budget and make improvements if necessary	DPW, BoS	Capability	Using contractors; the Tree Warden can be approached about outreach
OXF-20	Pursue acquisition of a boom truck and appropriate employee training so the town may perform elevated tree work	DPW, GW	Capability	Town continually reviews and improves its tree maintenance capabilities.
OXF-21	Work with other communities to improve communications with Connecticut Light & Power	BoS, EMD	Capability	This is ongoing and needs improvement but is a capability.
OXF-22	Develop response plans to remove excessive snow from critical facilities and schools	EMD	Drop	Dealt with on a case by case basis; a formal plan is not needed.
OXF-23	Ensure that adequate backup plans and supplies are available for continued functionality following an earthquake	EMD	Capability	Fuel, MREs, water in storage
OXF-24	Utilize dam failure inundation mapping to identify properties for inclusion in the emergency notification system	EMD	Capability	CodeRED is used, and also have a special group for Housatonic River homes
OXF-25	Pursue improved communications with the Town of Newtown and First Light regarding emergency response along Lake Zoar	BoS, EMD	Capability	Good communications with these entities
OXF-26	Encourage owners of Class C and Class B dams to have current EAPs on file at Connecticut DEEP and with the town	EMD	Capability	This is complete and updates are provided as they become available.
OXF-27	Work with private dam owners to coordinate pre-storm releases from dams in order to mitigate peak flooding downstream	EMD	Capability	Pre-storm releases from small private dams not needed, large dams have this in their EAPs

Strategy	Description	Responsible Party	Status	Notes
OXF-28	Encourage homeowners and private communities to widen access for emergency vehicles where applicable	EMD, ZEO	Capability	

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 OXF-01	
Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: <ol style="list-style-type: none"> 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 OXF-02	
Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	
Lead	EM, Plan, FS
Cost	\$0 - \$25,000
Funding	OB
Timeframe	2022
Priority	High

Action OXF-03	
Refer to the Morris Low Impact Sustainable Development Design Manual, created to be a regional resource by the Northwest Conservation District and the Northwest Hills Council of Governments, to incorporate LID guidance and regulations into the local Zoning Regulations or Ordinances	
Lead	Plan
Cost	\$0 - \$25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

Action OXF-04	
Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	
Lead	EM, Plan, FS
Cost	\$0 - \$25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

Action OXF-05	
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 OXF-06	
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 OXF-07	
Remain engaged with CIRCA's Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.	
Lead	Plan
Cost	\$0 - \$25,000
Funding	OB, CT DEEP, Resilient CT
Timeframe	2022
Priority	Med

Action OXF-08	
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 OXF-09	
Incorporate use of the FEMA elevation certificate into standard practices to record all elevation submissions	
Lead	PZ
Cost	\$0 - \$25,000
Funding	OB
Timeframe	2022
Priority	Low

Action OXF-10	
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 OXF-11	
Install signage depicting flood elevations along the Housatonic River as a deterrent to development	
Lead	DPW
Cost	\$0 - \$25,000
Funding	OB
Timeframe	2022 – 2023
Priority	Low

Action OXF-12	
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 OXF-13	
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 OXF-14	
Join FEMA's Community Rating System to reduce the cost of flood insurance for residents	
Lead	BoS, ZEO
Cost	\$25,000 - \$50,000
Funding	OB, CT DEEP
Timeframe	2022 – 2023
Priority	Med

Action OXF-15	
Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	
Lead	DPW
Cost	\$25,000 - \$50,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action OXF-16	
Evaluate existing drainage systems utilizing current rainfall statistics and the need for additional drainage systems	
Lead	DPW
Cost	\$25,000 - \$50,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action OXF-17	
Utilize aerial photography and parcel mapping to identify addresses within the 1% annual chance floodplain	
Lead	ZEO
Cost	\$50,000 - \$100,000
Funding	FEMA Grant, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action OXF-18	
Pursue relocation of the Oxford Resident State Troopers Office away from flood risk zones. If relocation is not feasible, mitigate flooding at the current location by installing a low flood wall, or by rearranging the site to move the driveway farther from the Little River.	
Lead	EMD, DPW
Cost	More than \$500,000
Funding	CIP, FEMA Grant
Timeframe	2023 – 2025
Priority	High

Action OXF-19	
Replace the drainage pipe on the north side of the Oxford Center Fire House to mitigate flooding.	
Lead	EMD, DPW
Cost	More than \$500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	Low

Action OXF-20	
Complete flood mitigation projects along the Little River	
Lead	DPW, GW
Cost	\$100,000 - \$500,000
Funding	OB, CIP, FEMA Grant
Timeframe	2024 – 2026
Priority	Low

Action OXF-21	
Progress efforts to expand the Oxford EOC.	
Lead	EMD
Cost	\$100,000 - \$500,000
Funding	OB, CT DEMHS
Timeframe	2025 – 2027
Priority	Low

APPENDIX A

STAPLEE MATRIX

#	Action Description	Regional Theme	Lead Department	Cost Estimate	Potential Funding Sources	Timeframe for Completion	Weighted STAPLEE Criteria														Total STAPLEE Score
							Benefits							Costs							
							Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	Social	Technical (x2)	Administrative	Political	Legal	Economic (x2)	Environmental	
OXF-01	Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: 1. Disseminate a toolkit for pre-disaster business preparedness. 2. Revise regulations to promote Low Impact Development. 3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update	Sustainable CT	Plan	\$0 - \$25,000	OB, CT DEEP, Sustainable CT	2022	1	1	1	1	1	1	1	0	0	0	0	0	0	0	9
OXF-02	Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	RLP	EM, Plan, FS	\$0 - \$25,000	OB	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
OXF-03	Refer to the Morris Low Impact Sustainable Development Design Manual, created to be a regional resource by the Northwest Conservation District and the Northwest Hills Council of Governments, to incorporate LID guidance and regulations into the local Zoning Regulations or Ordinances	Low Impact Development	Plan	\$0 - \$25,000	OB, CT DEEP	2022	0	1	1	1	1	1	1	0	0	0	0	0	0	0	8
OXF-04	Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	RLP	EM, Plan, FS	\$0 - \$25,000	OB, CT DEEP	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
OXF-05	Pursue relocation of the Oxford Resident State Troopers Office away from flood risk zones. If relocation is not feasible, mitigate flooding at the current location by installing a low flood wall, or by rearranging the site to move the driveway farther from the Little River.	Relocate/Retreat	EMD, DPW	More than \$500,000	CIP, FEMA Grant	2023 – 2025	0	1	1	1	1	1	1	0	0	0	0	0	0	0	8
OXF-06	Fully incorporate the provisions of the DEEP model flood regulations into the local flood damage prevention regulations (or ordinance), including but not limited to the required design flood elevations for the first floor, building electrical systems, and building mechanical systems.	Flood Regulations	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	5
OXF-07	Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	Flood Regulations	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	5
OXF-08	Remain engaged with CIRCA’s Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.	Resilient CT	Plan	\$0 - \$25,000	OB, CT DEEP, Resilient CT	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	0	7
OXF-09	Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.	Flood Map Updates	Plan, FS, NFIP Coordinator	\$0 - \$25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	5
OXF-10	Join FEMA's Community Rating System to reduce the cost of flood insurance for residents	CRS	BoS, ZEO	\$25,000 - \$50,000	OB, CT DEEP	2022 – 2023	1	1	0	1	1	1	0	0	0	-1	0	0	0	0	6
OXF-11	Evaluate culverts and bridges utilizing current rainfall statistics to prioritize potential flood mitigation projects	Culvert & Bridge Upgrades	DPW	\$25,000 - \$50,000	OB, CIP, FEMA Grant, CT DEEP	2022 – 2024	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	6.5
OXF-12	Evaluate existing drainage systems utilizing current rainfall statistics and the need for additional drainage systems	Drainage	DPW	\$25,000 - \$50,000	OB, CIP, FEMA Grant, CT DEEP	2022 – 2024	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	6.5
OXF-13	Replace the drainage pipe on the north side of the Oxford Center Fire House to mitigate flooding.	Drainage	EMD, DPW	More than \$500,000	OB, CIP, FEMA Grant, CT DEEP	2023 – 2025	0	1	0	1	1	1	0.5	0	0	0	0	0	0	0	6.5
OXF-14	Incorporate use of the FEMA elevation certificate into standard practices to record all elevation submissions	Administration, Enforcement, & Maintenance	PZ	\$0 - \$25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	6
OXF-15	Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	Small Business Chemicals	EM, FS	\$0 - \$25,000	CT DEEP	2022	1	0	1	0	1	1	1	0	0	0	0	0	0	0	6
OXF-16	Utilize aerial photography and parcel mapping to identify addresses within the 1% annual chance floodplain	Study	ZEO	\$50,000 - \$100,000	FEMA Grant, CT DEEP	2022 – 2024	1	1	1	0	1	0	0	0	0	0	0	0	0	0	5
OXF-17	Install signage depicting flood elevations along the Housatonic River as a deterrent to development	Public Education & Engagement	DPW	\$0 - \$25,000	OB	2022 – 2023	1	0.5	0	1	1	1	0	0	0	-1	0	0	0	0	5.5
OXF-18	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
OXF-19	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
OXF-20	Complete flood mitigation projects along the Little River	Flood Mitigation	DPW, GW	\$100,000 - \$500,000	OB, CIP, FEMA Grant	2024 – 2026	0	1	0	1	0	1	0	0	0	0	0	0	0	0	5

#	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		
OXF-21	Progress efforts to expand the Oxford EOC.	Emergency Response, Alerts, & Communication	EMD	\$100,000 - \$500,000	OB, CT DEMHS	2025 – 2027	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	0	3.5

APPENDIX B

RECORD OF MUNICIPAL ADOPTION

CERTIFICATE OF ADOPTION
OXFORD BOARD OF SELECTMEN

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

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

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

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

Adopted this 17th day of November, 2021 by the Board of Selectmen of Oxford, Connecticut



First Selectman

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of Oxford this 29 day of November, 2021.



Rosemary Harner, Assistant Town Clerk



APPENDIX C

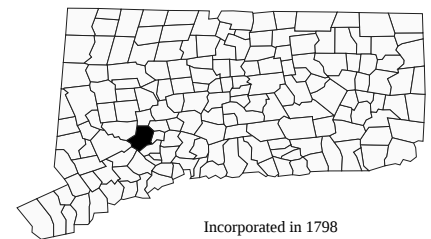
CERC Town Profile 2019

Oxford, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

Town Hall
486 Oxford Road
Oxford, CT 06478
(203) 888-2543

Belongs To
New Haven County
LMA Bridgeport - Stamford
Naugatuck Valley Planning Area



Incorporated in 1798

Demographics

Population

	Town	County	State
2000	9,821	824,008	3,405,565
2010	12,683	862,477	3,574,097
2013-2017	12,972	862,127	3,594,478
2020	14,924	898,514	3,604,591
'17 - '20 Growth / Yr	4.4%	1.3%	0.1%

	Town	County	State
Land Area (sq. miles)	33	605	4,842
Pop./Sq. Mile (2013-2017)	396	1,426	742
Median Age (2013-2017)	45	40	41
Households (2013-2017)	4,463	327,402	1,361,755
Med. HH Inc. (2013-2017)	\$104,316	\$64,872	\$73,781

	Town	State
Veterans (2013-2017)	723	180,111

Age Distribution (2013-2017)

	0-4	5-14	15-24	25-44	45-64	65+	Total
Town	560 4%	1,867 14%	1,554 12%	2,545 20%	4,296 33%	2,150 17%	12,972 100%
County	45,072 5%	100,549 12%	120,727 14%	216,208 25%	240,037 28%	139,534 16%	862,127 100%
State	186,188 5%	432,367 12%	495,626 14%	872,640 24%	1,031,900 29%	575,757 16%	3,594,478 100%

Race/Ethnicity (2013-2017)

	Town	County	State
White Non-Hisp	11,668	553,000	2,446,049
Black Non-Hisp	412	105,661	350,820
Asian Non-Hisp	96	33,678	154,910
Native American Non-Hisp	0	783	5,201
Other/Multi-Race Non-Hisp	164	20,448	84,917
Hispanic or Latino	632	148,446	551,916

	Town	County	State
Poverty Rate (2013-2017)	2.0%	12.1%	10.1%

Educational Attainment (2013-2017)

	Town	County	State
High School Graduate	2,537 28%	673,582 27%	
Associates Degree	861 10%	188,481 8%	
Bachelors or Higher	3,344 37%	953,199 38%	

Economics

Business Profile (2018)

Sector	Units	Employment
Total - All Industries	381	3,606
23 - Construction	71	433
31-33 - Manufacturing	37	667
44-45 - Retail Trade	18	275
62 - Health Care and Social Assistance	28	306
72 - Accommodation and Food Services	20	283
Total Government	12	456

Top Five Grand List (2017)

	Amount
Connecticut Light & Power	\$46,327,290
Algonquin Gas Transmission LLC	\$22,369,760
Oxford Towne Center LLC	\$10,194,200
Firstlight Hydro Generation CO	\$5,104,200
HF Industrial Park Limited Partnership	\$4,969,400
Net Grand List (SFY 2016-2017)	\$1,445,263,910

Major Employers (2016)

Algonquin Gas	CT Light & Power
Roller Bearing	Heritage Village Water
Macton	

Education

2018-2019 School Year

	Grades	Enrollment
Oxford School District	PK-12	1799

Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	59.2%	53.8%	68.5%	51.3%	45.3%	43.0%
ELA	60.0%	53.1%	68.7%	54.9%	68.0%	56.1%

Pre-K Enrollment (PSIS)

	2018-2019
Oxford School District	20

Rate of Chronic Absenteeism (2017-2018)

	All
Connecticut	10.7%
Oxford School District	10.5%

4-Year Cohort Graduation Rate (2017-2018)

	All	Female	Male
Connecticut	88.3%	91.8%	85.1%
Oxford School District	95.0%	95.9%	93.8%

Public vs Private Enrollment (2013-2017)

	Town	County	State
Public	87.9%	88.2%	86.8%
Private	12.1%	11.8%	13.2%

Oxford, Connecticut

CERC Town Profile 2019



Connecticut
Economic
Resource Center

Government

Government Form: Selectman - Town Meeting

Total Revenue (2017)	\$48,732,913	Total Expenditures (2017)	\$50,960,463	Annual Debt Service (2017)	\$2,700,399
Tax Revenue	\$35,703,087	Education	\$33,994,065	As % of Expenditures	5.3%
Non-tax Revenue	\$13,029,826	Other	\$16,966,398	Eq. Net Grand List (2017)	\$2,066,309,614
Intergovernmental	\$11,455,071	Total Indebtedness (2017)	\$24,918,364	Per Capita	\$158,520
Per Capita Tax (2017)	\$2,704	As % of Expenditures	48.9%	As % of State Average	105.0%
As % of State Average	92.2%	Per Capita	\$1,912	Moody's Bond Rating (2017)	Aa2
		As % of State Average	76.1%	Actual Mill Rate (2017)	24.21
				Equalized Mill Rate (2017)	17.06
				% of Net Grand List Com/Ind (2017)	6.9%

Housing/Real Estate

Housing Stock (2013-2017)

	Town	County	State
Total Units	4,764	365,546	1,507,711
% Single Unit (2013-2017)	94.2%	53.6%	59.2%
New Permits Auth (2017)	104	750	4,547
As % Existing Units	2.2%	0.2%	0.3%
Demolitions (2017)	4	202	1,403
Home Sales (2017)	100	4,763	21,880
Median Price	\$354,500	\$244,400	\$270,100
Built Pre-1950 share	18.0%	33.2%	29.3%
Owner Occupied Dwellings	4,037	204,037	906,798
As % Total Dwellings	90.5%	62.3%	66.6%
Subsidized Housing (2018)	72	46,013	167,879

Distribution of House Sales (2017)

	Town	County	State
Less than \$100,000	0	106	536
\$100,000-\$199,999	1	1,232	5,237
\$200,000-\$299,999	35	1,785	6,681
\$300,000-\$399,999	38	888	3,863
\$400,000 or More	26	752	5,563

Rental (2013-2017)

	Town	County	State
Median Rent	\$1,169	\$1,100	\$1,123
Cost-burdened Renters	32.1%	54.5%	52.3%

Labor Force

	Town	County	State
Residents Employed	6,936	438,576	1,827,070
Residents Unemployed	242	20,171	78,242
Unemployment Rate	3.4%	4.4%	4.1%
Self-Employed Rate	9.6%	8.5%	10.0%
Total Employers	381	24,958	122,067
Total Employed	3,606	366,848	1,673,867

Connecticut Commuters (2015)

Commuters Into Town From:		Town Residents Commuting To:	
Oxford, CT	493	Oxford, CT	493
Waterbury, CT	238	Shelton, CT	458
Seymour, CT	163	Stratford, CT	336
Southbury, CT	156	New Haven, CT	323
Naugatuck, CT	152	Waterbury, CT	280
Thompson, CT	109	Danbury, CT	256
Watertown, CT	100	Milford, CT	255

Quality of Life

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

	Town	State
Property	387	1,777
Violent	10	228

Distance to Major Cities

	Miles
Hartford	33
New York City	68
Providence	93
Boston	126
Montreal	285

Residential Utilities

Electric Provider
Eversource Energy (800) 286-2000
Gas Provider
Eversource Energy (800) 989-0900
Water Provider
Aquarion Water Company (800) 732-9678
Cable Provider
Comcast Seymour (800) 266-2278

Disengaged Youth (2013-2017)

	Town	State
Female	7.2%	4.2%
Male	0.0%	5.6%

	Town
Library circulation per capita	2.39