Naugatuck Valley Council of Governments

Hazard Mitigation Plan Update

2021 – 2026

Municipal Annex
for

PLYMOUTH, CT

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MMI #3211-29

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1.0 INTRODUCTION

1.1 Purpose of Annex

This Hazard Mitigation Plan (HMP) annex provides a community-specific hazard risk assessment, capability analysis, and evaluation and prioritization of hazard mitigation measures and projects.

Background information and the regional effects of pertinent natural hazards are discussed in the main body of the Naugatuck Valley Council of Governments (NVCOG) Multi-Jurisdictional Hazard Mitigation Plan. This annex is designed to supplement the information presented in the Multi-Jurisdictional HMP with more specific local detail, and is not to be considered a standalone document.

The primary goal of this HMP, including this Municipal Annex, is to identify natural hazard risks and mitigation opportunities in order to reduce the loss of or damage to life, property, infrastructure, and natural, cultural, and economic resources. This includes the reduction of public and private damage costs. Limiting losses of and damage to life and property will also reduce the social, emotional, and economic disruption associated with a natural disaster.

The goal for the Town of Plymouth is to "maximize survival of people, prevent and/or minimize injuries, and preserve property and resources of the Town of Plymouth in the event of natural disasters".

1.2 Planning Process

A meeting was held with Plymouth representatives on January 20, 2021 for the purposes of initial data collection and review of necessary updates for this document. The meeting was convened by the HMP local coordinator, Charles Wiegert.

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 City of Bristol borders Plymouth to the east, and Burlington borders to the northeast. Other neighboring communities include Harwinton to the north, Thomaston to the west, and Waterbury and Wolcott to the south.

Elevation in Plymouth ranges from approximately 450 to 950 feet. Most of the land area in Plymouth drains to the Naugatuck River with the remainder draining to the Pequabuck River. Notable streams in Plymouth include the Poland River and Marsh Brook which drain to the Pequabuck River; and Sutliffe Brook, Nibbling Brook, Todd Hollow Brook and Hancock Brook which drain to the Naugatuck River in Thomaston and Waterbury. The town is home to several distinct residential sections, including Terryville (the largest section) located in the east side of Plymouth, Pequabuck, Greystone, Fall Mountain, Lake Plymouth, East Church,

and Plymouth Center. Topography and historical settlement patterns in the Town of Plymouth have maintained distinct boundaries between the sections.

While the Town of Plymouth is vulnerable to the same hazards as the other towns of the region, its risks are unique. This is due to the particular stock of assets the town possesses, including local and state routes and highways, rail lines, historical sites, business and employment centers, schools, elderly populations, building and building content value, and police and fire departments. Each hazard will impact these assets to a different extent. The impacts of flooding are local and can be anticipated with some measurement of certainty, snow storms impact the entire region and are considered annual events, and a tornado can have severe impacts on a very local level and are basically unpredictable. The breadth of these impacts make it necessary to inventory all community assets and, where possible, identify if they lie in a high risk area.

1.4 Land Cover

Table 1-1 summarizes 2015 land cover data which was derived from satellite imagery. Areas shown as turf and grass are maintained grasses such as residential and commercial lawns or golf courses. According to this data, about 67% of Plymouth is forested and approximately 16% is developed.

Table 1-1: 2015 Land Cover by Area

Land Cover	Area (acres)	Percent of Community
Developed	2,356.9	16.50%
Turf & Grass	1,119.8	7.84%
Other Grass	160.3	1.12%
Agricultural Field	575.0	4.03%
Deciduous Forest	8,499.2	59.50%
Coniferous Forest	822.7	5.76%
Water	389.8	2.73%
Non-Forested Wetland	11.7	0.08%
Forested Wetland	211.7	1.48%
Tidal Wetland	0.0	0.00%
Barren	78.5	0.55%
Utility Row	59.5	0.42%
Total	**14,285**	**100%**

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

As a suburb of Bristol, Plymouth is primarily zoned for residential development, but the town is also home to commercial and retail development along State Route 6 and State Route 72 corridors, both of which cross the town and connect in other parts of the former CCRPA region to Interstate 84. Another major thoroughfare is Route 262. In addition, the town is home to small to medium-sized industrial zones located in Pequabuck and Greystone, and near Harwinton Avenue. A railroad line carries freight from Waterbury to New Britain through the southeastern section of Plymouth.

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 Plymouth. Regional geology is described in the Multi-Jurisdictional document.

1.6 Drainage Basins and Hydrology

Plymouth is split into five subregional drainage basins. The western side of Town drains directly into the Naugatuck River mainstem, while the Town is drained by Hancock Brook in the south and Leadmine Brook in the northwest, both of which then drain to the Naugatuck River. The Northeastern side of Town drains eastward into the Farmington River Watershed by way of the Poland River and then the Pequabuck River.

1.7 Climate and Climate Change

In Plymouth, 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 18°F to 81°F and is rarely below 4°F or above 89°F.

The warm season lasts for 3.6 months, from May 30 to September 16, with an average daily high temperature above 71°F. The hottest day of the year is July 20, with an average high of 81°F and low of 63°F. The cold season lasts for 3.3 months, from December 2 to March 12, with an average daily high temperature below 43°F. The coldest day of the year is January 30, with an average low of 18°F and high of 33°F.

The wetter season lasts 3.5 months, from May 4 to August 19, with a greater than 30% chance of a given day being a wet day. The chance of a wet day peaks at 38% on May 30. The drier season lasts 8.5 months, from August 19 to May 4. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 5, with an average total accumulation of 4.0 inches. The snowy period of the year lasts for 5.7 months, from October 28 to April 19, 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 24, with an average total liquid-equivalent accumulation of 1.3 inches.

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

Climate Change

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

Temperature

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

Precipitation

Rainfall data in "Technical Paper No. 40" by the U.S. Weather Bureau (now the National Weather Service) (Hershfield, 1961) dates from the years 1938 through 1958. According to these data, the 24-hour rainfall amount for a 10% annual-chance storm in Litchfield County is 4.7 inches.

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

The Northeast Regional Climate Center (NRCC) has partnered with the Natural Resources Conservation Service (NRCS) to provide a consistent, current regional analysis of rainfall extremes (http://precip.eas.cornell.edu/). In 2020 this dataset listed the 24-hour rainfall amount for a 10% annual-chance storm in Plymouth 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 Plymouth at 5.76 inches.

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

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

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	10%	4%	1%
Technical Paper No. 40	4.7	5.5	7.0
NRCC	5.0	6.2	8.8
NOAA Atlas 14	5.8	7.1	9.2

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 Plymouth can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.1 to 6.2 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 Plymouth of 11,711 individuals. U.S. Census Bureau estimates for 2019 show a population around 12,156 individuals, an increase from 2010 of 3.8%. The Connecticut State Data Center predicts that population will decrease by 1.1% through 2025 to an estimated population of 2,248 individuals.

According to the Connecticut Data Collaborative, the number of annual housing permits in Plymouth remained steady over the last decade. The number of permits issued in 2010 and 2011 was 11 and 9, respectively, while 5 permits were issued in 2016, and 5 permits were issued in 2017. On average, 6 housing permits were issued each year in Plymouth between 2010 and 2017.

According to the U.S. Census Bureau, the overall number of housing units in Plymouth rose by approximately 5.1-percent between 2010 and 2019, from 5,109 units in 2010 to 5,382 units in 2019. In 2019, the housing stock was made up of approximately 78% single-unit structures, 7% two-unit structures, 14% multi-unit structures, and 2% mobile-homes or other types of structures.

According to the Connecticut Office of Policy and Management, Plymouth's 2019 Total Equalized Net Grand List was valued at $759,000,000. 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 Plymouth, included as Appendix C.

Plymouth's major businesses and industries include local government (including schools), manufacturing, health care and social assistance, and construction. Top employers include Nicard Enterprises, Alliance One, Inc., Al Simmons Co. Inc., and the cook Willow Convalescent Hospital. Recent development has been relatively steady in the community. Several new stores have been built on Route 6 over the past few years, and the Plymouth Business Park has reached its third construction phase with 40 acres of land still available. A major redevelopment project is underway on South Main Street for the construction of a propane gas wholesale distribution center which, when constructed, will be the largest propane distribution center in Connecticut. This facility will receive supplies by rail for distribution to retailers. Residential development has been relatively slow over the past five years, with only a few single family homes being built.

Sewers, water, and gas utilities are available in the more densely-populated areas of Plymouth. The Plymouth 2015 Plan of Conservation and Development (POCD) update identifies that 3,438 acres of buildable (unconstrained) land remains in Plymouth, with a potential population increase of 7,684 people at full-buildout over the next 40 years. The POCD update includes recommendations such as considering low-impact development regulations, reconvening the Town's Storm Water Committee, and implementing the recommendations of the Pequabuck River Study. The 2015 POCD update incorporates several elements of natural hazard mitigation planning as presented in the 2011 initial plan, including discussion of the impact of extreme weather events and the need to adhere to local floodplain regulations.

Summary

Recent development in Plymouth has been limited, and has not significantly increased the natural hazard vulnerability of the community. As the population of the community, building square footage, and associated infrastructure increases, so does the risk of damage from natural hazards. Plymouth can help prevent increasing natural hazard risks through continued improvement of its hazard mitigation capabilities and enforcement of zoning regulations and building codes.

1.9 Historic and Cultural Resources

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

> **Historic preservation planning** helps protect historic properties and cultural resources from demolition or alteration. **Hazard mitigation planning** helps protect life and property from damage caused by natural and manmade hazards. **Integrating** these two planning processes helps create safe and sustainable historic communities.
> *- Paraphrased from FEMA Report 386-6*

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

Historic resources in Plymouth near flood sources may be damaged during flooding or other hazard events.

Steps to incorporate historical and cultural preservation into hazard mitigation planning include:

- Inventory and survey historic and cultural resources
- Implement appropriate mitigation measures for those resources
- Take steps to move portable resources, such as artwork or documents, to safe locations prior to the occurrence of a hazard, if possible
- Consider these resources in emergency operations plans to prevent accidental damages during recovery efforts

Specific actions to mitigate natural hazard risks to historic resources are listed at the end of this Annex.

1.10 Social Vulnerability Index

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

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

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

2.0 MUNICIPAL CAPABILITIES

2.1 Governmental Structure and Capabilities

The Town of Plymouth is professionally managed by a full-time Mayor who is assisted by municipal staff. The basement of Town Hall (the Police Department) serves as the Emergency Operations Center and the Middle School acts as the backup. The Police Department is comprised of 24 full-time police officers and additional dispatch and support staff. Fire protection is provided by the volunteer Plymouth Fire Department though three fire stations.

2.2 Infrastructure

Transportation

The primary transportation routes into and out of the town are Route 6 running east-west, and Routes 262 and 72 running north-south. Other key roads include Allentown Road, Old Waterbury Road, South Riverside Road, Harwinton Ave, and Matthews Street. There is no local public transit system in Plymouth.

Utilities

Public water in Plymouth is provided by the Connecticut Water Company, as well as a handful of small Non-Community Water Systems. Many residents and businesses in rural areas rely on private well water. Sewer is provided by the Plymouth Water Pollution Control Authority, or private septic systems.

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

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

2.3 Critical Facilities and Emergency Response

Plymouth 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
Town Hall And Police	80 Main Street	Em. Response	✓		
Plymouth Emergency Management	7 North Main St	Em. Response			
Terryville Vol. Fire Dept: Station 2	691 Main St	Em. Response			
Terryville VFD: Fall Mountain Fire House	1 Allentown Road	Em. Response			

Facility	Address or Location	Comment	Emergency Power	Shelter	SFHA
Terryville VFD: Fire Headquarters	21 Harwinton Ave	Em. Response			
Public Safety Access Point	297 North St	Em. Response	✓		
Eli Terry Middle School	21 N Main St	Shelter	✓	✓	
Terryville High School	33 N Harwinton Avenue	Shelter	✓	✓	
Pump Station 3	783 Main Street	Sewer			
Main Treatment Plant	35 Canal Street	Sewer	✓		
Pump Station 4	553 Main Street	Sewer			
Cook-willow Convalescent Hospital, Inc.	81 Hillside Ave	Care Facility			
Highway Garage	42 Hillside Avenue	Municipal			
Plymouth Volunteer Ambulance	191 Main St	Em. Response			
Plymouth Bulk Waste Landfill	-	Municipal			

Emergency Response Capabilities

The Town of Plymouth has a variety of emergency operation procedures in place to respond to the effects of natural hazards. In addition to maintaining an Emergency Operations Plan (updated annually) and an Emergency Operations Center, the Town maintains shelters, has identified warming/charging stations, and has identified a variety of resources to assist with response to natural hazard events. The current Emergency Operations Plan for the Town will need to be revised to include procedures specific to the proposed propane distribution facility.

The Town maintains a training program for its emergency personnel, and utilizes low-band radios and ham radio to provide emergency and regional communications during extended outages when traditional services are not available. The Town coordinates with DEMHS Region 5 for regional emergency response, and has GIS capabilities to coordinate emergency planning and response. In general, the Town attempts to get emergency response activated as many as five days prior to a natural hazard event. The Town utilizes the statewide CT Alerts emergency notification system when residents need to be informed about a natural hazard event, but performs door to door notifications when necessary. The Town also participates in DEMHS Region 5 for regional emergency planning.

The Town maintains extensive information regarding preparedness on its website, preparedness pamphlets are available at municipal buildings, and the local cable access channel is used to discuss emergency planning and preparedness. The Emergency Management Director publishes one to two monthly safety bulletins (including articles related to natural hazard preparedness) in the Plymouth Connection, a free monthly newspaper mailed to every home and business in Plymouth. The Town also conducts fire education programs at local schools, and plans to look into the FEMA STEP program for students to learn about emergency preparedness in the near future.

Plymouth has been acquiring backup generators for critical facilities over the last few years.

Sheltering Capabilities

The Eli Terry Middle School is the primary shelter in the community and is the backup Emergency Operations Center. The town uses a mobile 60 kW generator at the site when needed. This facility was used as the Emergency Operations Center during Irene and Alfred because the generator can power a significant part of the building, and because a variety of offices and food stuffs are available. Terryville High School is the backup shelter and has a generator, but is located at the edge of Town so it is geographically less preferable than the Middle School. The shelters can sleep 100 people. The Town plans to create a tertiary shelter at Plymouth Center School once a generator is installed.

Shelters are operated in accordance with a Shelter Management Plan that was recently updated. Shelter staff include a registered nurse, EMS, and the police department along with other emergency personnel. The Town acquires shelter supplies whenever possible, and all shelters have been recently restocked with cots and blankets. The local bus company provides a bus for Town staff to pick up seniors and others who need transportation to shelters. The shelters can sleep 100 people, and although there were a lot of people at the shelters following Irene and Alfred not every bed was filled. The Town recognizes that most residents choose to shelter in place if possible, and recommends that residents stock three days of supplies.

Backup Power

Other critical facilities in the community also have backup power supplies. The Town Hall previously had a generator that could only power the lowest floor of the building (the Police Department), but this generator failed in June 2015. The Town has prioritized this generator for replacement so that the primary Emergency Operations Center can have long-term backup power. The Fire Department Headquarters in Terryville has a 40-year old generator that is the Town's second priority for replacement. The Water Pollution Control Facility also has a very old generator from the 1970s, and the generator may no longer power all of the facility due to successive expansions. The remaining two Fire Stations also have generators, with one (Hose Company No. 2's) being attached to a portable light stand that can be transported when needed during an emergency. The Maintenance Garage and Highway Garage (collectively, the Town Garage) both have relatively new generators, and the volunteer ambulance facility has a generator.

Although the Town is interested in creating micro-grids, it would be difficult for one micro-grid to provide backup power to all of the necessary buildings. Gas stations in Plymouth are typically located near the edges of the community, so a localized solution would be needed for these businesses.

Other Emergency Response Concerns

While the above assets are necessary to keep the town up and running, emergency planners also pay close attention to their most vulnerable citizens. Populations that may be particularly vulnerable include: people living under the poverty line, people with limited or no English proficiency, minorities, and people who are dependent on transit.

A final concern in Plymouth is access: Routes 6 and 72 are both crossed by low railroad bridges with restrictive clearances that limit the height of approaching vehicles. This limits the ability of trucks and other large vehicles to access the town, which could be problematic in the case of a natural hazard if supplies are needed. Although the Town would like to see these railroad bridges elevated to increase clearance, staff do not anticipate that it will happen due to the expense.

3.0 FLOODING

3.1 Existing Capabilities

The Town of Plymouth has in place codes and ordinances to reduce the risks to public health and property posed by flooding. These regulations primarily limit any activities on floodplains that would increase flood heights and velocities, or reduce or alter naturally occurring floodplains and water catchment areas. The regulations require certain improvements for development in floodplains, including the use of flood-resistant construction, raise-connections to utilities, and maintaining floodway capacity. The Town defines floodplains, hereafter special flood hazard areas, off of the Federal Flood Insurance Rate Maps identified in FEMA's Flood Insurance Study. Table 3-1 includes a brief description of how the Town of Plymouth is addressing flood risk in its most important planning documents.

Table 3-1: Town of Plymouth Planning Documents.

Planning Documentation	Year	Lead Department(s)	Recommendation for Natural Hazard Mitigation
Plan of Conservation & Development (POCD)	2015	Planning and Zoning Commission	- The Plymouth POCD does not directly address flood risk but identifies floodplains as "constrained" areas.
Municipal Building Codes	2003	Building Department	- Plymouth requires buildings be constructed in accordance with the most recent version of the Connecticut State Building Code.
Bristol-Plainville-Plymouth Pequabuck River Flooding Study	2015	Inland Wetlands and Conservation Commission	- The Bristol-Plainville-Plymouth Pequabuck River Flooding Study was made possible by a $200,000 grant from the Economic Development Administration. - This study addressed flooding and the accompanying economic risks that have restrained development and recovery for the communities along the river following extensive flooding caused by rainfall during Hurricane Irene in 2011.
Subdivision Regulations	2005	Planning and Zoning Commission	- The Flood Damage Prevention Regulations stipulate that subdivision must minimize the risk of flood damage. This includes locating public utilities and other facilities away from danger. - The regulation requires that drainage be designed to reduce flood exposure, and that elevations and floodway data be included in all subdivision applications for parcels situated in the special flood hazard area.
National Flood Insurance Program (NFIP)	1982	Town Manager	- The Town of Plymouth is a participating community in FEMA's National Flood Insurance Program since 10/15/1982 and intends to continue participation in the NFIP for the foreseeable future. - The Flood Insurance Rate Map (FIRM) for the community was most recently updated in 11/06/1998. Plymouth does not participate in the FEMA Community Rating System (CRS) program. - According to FEMA, there are 26 flood insurance policies in force in Plymouth as of 6/30/2019 with an insurance value of $6,952,700.

Planning Documentation	Year	Lead Department(s)	Recommendation for Natural Hazard Mitigation
Zoning Regulations	2012	Planning and Zoning Commission	- Plymouth addresses development in special flood hazard areas in the Zoning Regulations (adopted 2008) under the Flood Damage Prevention Regulations. - These regulations fulfill the requirement for participation in the NFIP. The regulations apply to all special flood hazard areas identified by the Federal Emergency Management Agency in its "Flood Insurance Study." - The regulations acknowledge that there are areas of periodic inundation, "which may result 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 of which adversely affect the public health, safety and general welfare." - The purpose of the regulations is to restrict uses that result in greater vulnerability. This includes the prohibition of certain uses and the restriction of others. It also requires permits for all activities that might alter the river channel or floodplain. The Planning and Zoning Commission is authorized to administer permitting. - The regulations generally require that all new development is engineered to resist flood forces and that the lowest floor is elevated to at least one foot above base flood elevation (BFE). For non-residential construction, the lowest floor may be located below BFE if it is adequately flood proofed to BFE. Similarly, all utilities and electrical appliances must be located above the BFE or be situated to ensure no water is able to enter their workings. - Plymouth requires that manufactured homes and recreation vehicles that are parked in a special flood hazard area for longer than 180 days have their lowest floor elevated to or above the BFE within the special flood hazard area.
Inland Wetlands and Watercourses Regulations	2010	Inland Wetlands and Conservation Commission	- The Plymouth Inland Wetlands and Conservation Commission was established in 1973 to implement the Inland Wetlands and Watercourses Regulations. Under CT General Statutes all municipalities shall regulate activities on those wetlands and watercourses that lie within their borders. The regulations include a list of activities that may be regulated and the environmental justifications for the prohibitions. - While these regulations are primarily for the protection of environmental and ecological assets, they do address impacts to safety and public health. As such, the Inland Waterways and Watercourses Commission also has a role to play in mitigating risk in flood hazard areas.
Community Emergency Response Team (CERT)	2015	Emergency Management	- Plymouth does not currently have a Community Emergency Response Team (CERT), but can improve the safety of its residents by creating a CERT. - Bristol, Burlington, New Britain and Southington have Community Emergency Response Teams (CERT). CERT is composed of volunteers who received training in disaster preparedness and response. Using the training, CERT members are able to assist town personnel and support emergency response functions. - For example, in Bristol CERT members are responsible for staffing the emergency shelter when it is activated. In addition, CERT members would engage with the community to educate fellow residents about disaster preparedness. They also have a library of resources online that provides information about emergency situations.
Local Emergency Operations Plan	2020	Emergency Management	- All towns in Connecticut must annually prepare a Local Emergency Operations Plan and submit it to the Department of Emergency Management and Homeland Security (DEMHS) for review. - These plans are meant to be applied during an emergency to maximize survival, give direction, integrate departments and expertise, define roles to departments and community leaders, and provide a basis for continued preparation. Specifically the plans identify town personnel and assign responsibilities to each department and its personnel during disasters and emergencies. As part of the plan, instructions are also outlined for activation of the emergency operations center. - These plans offer communities an important opportunity to take stock of their level of preparedness and consider any additional steps they can take that may influence their ability to cope and recover.

Town staff believe that existing ordinances do a good job of discouraging development in and near wetlands and in floodplains. Enforcement and outreach regarding floodplain activities is performed by the Land Use Department, with outreach typically occurring on a case-by-case basis. Town staff do not believe that the Community Rating System program will be cost-effective for the community at this time given the relatively limited number of homes that are subject to flooding, although there are some areas where the Town regularly brings sandbags in an effort to migrate flooding.

According to the Town of Plymouth FIS, the State of Connecticut appropriated $170,000 in 1978 for the construction of flood control improvements in Terryville. These included the reconstruction of the upper portion of Main Street bridge, the demolition of a dwelling immediately upstream of the bridge, and channel modifications. Reconstruction of the Main Street bridge was completed in 1996.

The Town's Public Works Department has had success over the last few years in acquiring money from state and federal bridge programs to replace deficient bridges. North Main Street, Keegan Road, and two other bridges will be replaced in the near future. Many old corrugated metal pipes used for culverts are concerns because the salt is deteriorating them. The Town is replacing these with concrete or plastic culverts. Culverts are replaced whenever possible, although culvert replacements are generally timed to coincide with other road improvements (such as paving) to save costs. Recent improvements have also been performed along Seymour Road. The Town conducts annual catch basin cleaning with maintenance as needed.

All new construction is designed using the most recent NRCC rainfall return periods in accordance with December 2014 CT DOT guidance. The Town has not evaluated other culverts in the community based on the new rainfall return periods. Drainage and flooding complaints are routed to either the Fire Department or Public Works, depending on if it is an emergency. The Fire Department pumps out basements when they are inundated with more than four inches of water. Usually Public Works will be involved in resolving any road-related complaint. Drainage easements in many places are not clearly defined, which complicates maintenance and repair efforts. Specific regulations are required to clarify both new and existing easements, and mapping is needed to assist with identification of these areas.

The Pequabuck River Study was completed in 2015. This study (prepared by AECOM and paid for with the assistance of a grant from the State of Connecticut) has examined the impact of the Pequabuck River on the communities of Plymouth, Bristol, and Plainville and identifies measures to reduce the impact of flooding. The study includes major revisions to the hydrology and hydraulics originally used to generate the special flood hazard area for the Pequabuck River, and it is expected that the effective FIS and FIRMs for the three communities will be updated with the new information. Although hoped for by the three communities, the Pequabuck River Study did not identify any one project that would provide significant mitigation for all three communities.

The Pequabuck River Study evaluated numerous alternatives for mitigating flooding, including the installation of flood control structures to detain flows, channelization of the river, construction of levees and floodwalls, sediment removal to enlarge the channel, removal of vegetation, enlargement of bridge crossings, removal of instream obstructions, individual floodproofing, acquisitions, and modifications of local ordinances. The following potential structural strategies and actions have been identified for Plymouth:

- Increase capacity of secondary driveway bridge serving Plymouth Village Apartments. The existing bridge over the Pequabuck River serves as part of a secondary mode of egress from the apartment complex, with the main entrance being on Route 6. The bridge is undersized and it increases the 1% annual chance flood elevation upstream of the bridge by approximately 2.5 feet. Resizing the bridge to pass the 1% annual chance flood event would result in the removal of 15 buildings from the 1% annual chance floodplain and the reduction in flood risk for other buildings remaining in the floodplain. Alternatively, the bridge could be removed for a similar benefit (and likely lower overall project cost) provided another secondary mode of egress can be determined.

- Removal of White House at 150 Main Street and conducting channel clearing. Removal of the currently Town-owned structure at risk of flooding would eliminate damages to this property, and the site could be redeveloped into a parking lot or other nonstructural use. Clearing the channel upstream and downstream of this location will help to reduce the impact of debris blockages that can exacerbate flooding conditions. AECOM believes that the home removal should qualify for a FEMA grant.

In addition to these priority recommendations, other recommendations for further consideration are provided including floodproofing of commercial and industrial buildings and modifying private driveways. Other non-structural mitigation measures are also identified, including updating this Plan, developing low-impact development guidance and adopting standards in conjunction with other watershed communities, updating the local floodplain management ordinance to meet current model ordinance requirements, and developing a Pequabuck River flood response plan to allow dam operators with gated spillways a chance to close or open spillways to mitigate the effect of flooding. These include adding a freeboard requirement of two feet for all new development and substantial improvement, and selective acquisitions of properties. Other strategies and actions identified in the Pequabuck River Study are not recommended to be pursued to generate flood mitigation benefits, including replacing the bridge at Route 6 and performing dam modifications to the Upper and Lower Pond dams.

The Town's capability to mitigate flooding damage is considered to be effective at preventing damage to new development and substantial improvements. In general, the level of capability of the Town of Plymouth relative to all facets of flood mitigation has slightly increased since the 2011 Plan. The recent studies have enabled the Town to move towards mitigation projects that will reduce the impacts of flooding over the long-term.

New Capabilities and Completed Actions

Plymouth continues to maintain its strong flood mitigation capabilities.

Summary

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

3.2 Vulnerabilities and Risk Assessment

Flooding is a primary concern in the town with recurrent flooding occurring throughout the town and regular localized flooding occurring at known locations several times per year. The Pequabuck River winds through Terryville, and a number of structures are within the floodplain. The Poland River, Marsh Brook, Todd Hollow Brook, and Hancock Brook flood frequently as well.

A large portion of Plymouth is located within the 1% annual flood zone, and the Fire Department Headquarters is located in the 0.2% annual chance floodplain. Most of the most densely populated areas of town are close to a flood zone.

North Main Street, North Riverside Avenue at Sandra Avenue, Beach Avenue, the Post Office, Canal Street, Woodside Lane, and Old Waterbury Road are areas of known flood risk.

Many trees have come down in recent years due to smaller storms. Trees and tree limbs are getting caught in streams and rivers, and there is concern that they will clog downstream bridges. The slowly-developing risk is worrisome to the Town. The Pequabuck River has experienced significant sedimentation in some areas, as well. The Town uses sand for some de-icing, but the State's change to salt has helped reduce sedimentation. The Pequabuck River Study demonstrated that dredging is not cost-effective as a flood risk reduction method.

Nevertheless, significant flood events have reportedly not occurred in the last five years.

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

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

Table 3-2: Repetitive Loss Properties in Plymouth

Total	Residential	Non-Residential	Mitigated	SRL
3	2	1	0	0

Plymouth experiences regular flooding in three of its sub-regional watershed basins: the Poland River to the Northeast, the Pequabuck River in central Terryville, and Hancock Brook to the south. In the Poland River watershed, flooding problems include:

- Residential flooding on North Main Street due to insufficient capacity;
- River level at the North Main Street bridge coming within inches of breach; and
- Marsh Brook breaches on North Riverside Ave at Sandra Ave, causing significant bank erosion in the rear of properties on Hoye Street.

The Pequabuck River watershed faces the following flooding risks:

- Insufficient culvert and channel capacity, which causes flooding from Beach Avenue through the rear of properties on Main Street and across Main to the junction of the Pequabuck and Poland Rivers;

- Floodwaters can overtop the berm near Upper Pond and flood Bemis Street;
- Flooding in the Terryville Post Office parking area can render it unusable. When the possibility of flooding is predicted, mail trucks are moved to a nearby private parking lot which is at a higher elevation;
- Flooding has caused significant damage to the river bank that protects the Water Pollution Control Facility on Canal Street; and
- Floodwaters nearly reach the electrical substation on Woodside Lane.

Flooding concerns with Hancock Brook, to the south, include:

- Road closures and washouts along Old Waterbury Road due to inadequate private culverts in the area;
- Regular flooding along Todd Hollow Brook such as on Todd Hollow Road due to combination of insufficient culvert size and downstream capacity; and
- Localized street flooding which affects private properties when storm events exceed street drainage capacity.

Town staff noted that flooding in the upper reaches of the Pequabuck River is exacerbated by the Upper Pond Dam. A sufficient level of rainfall can cause water levels in the pond to rise and overflow a natural berm onto Bemis Street which can cause severe damage to the road as the river essentially finds a new course. This most recently happened during Tropical Storm Irene and FEMA money was used to repair the three- to five-foot deep gullies in the road near Sherman Lane. As the Pequabuck River Study determined that dam modifications would have little flood mitigation benefit, the Town is interested in determining other methods to protect this area.

In addition, two homes near Bemis Street to the north of Armbruster Road regularly flood, and the Town regularly delivers sandbags to this area to help protect the properties. Site specific mitigation measures are needed for these properties. Although the Town believes that changing the river profile in Terryville from the vicinity of Beach Avenue downstream to the flatter area near Route 72 would mitigate peak flows by lengthening the profile, this activity is not believed feasible due to permitting difficulty and access constraints. Finally, the flooding problems on Todd Hollow Road and Beach Avenue continue to require drainage system reconstruction, which has not yet been accomplished because grant funding could not be obtained to assist with the work.

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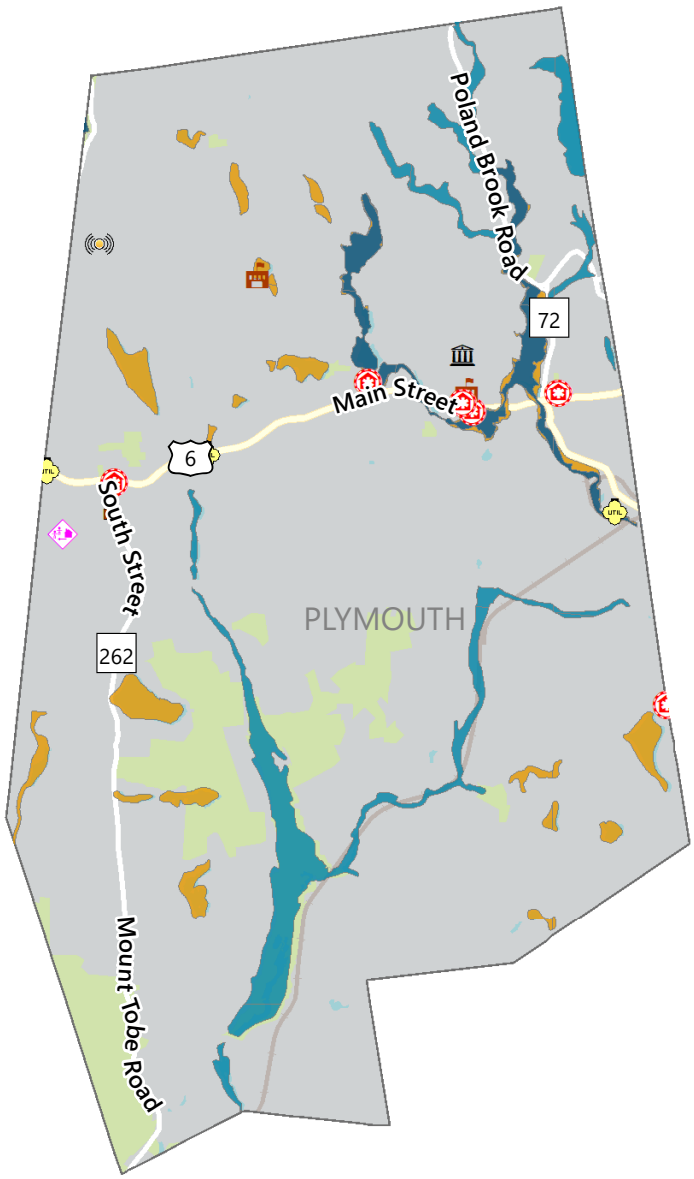

Critical Facilities
- Communications
- Emergency Response
- Government Services
- School
- Utility
- Vulnerable Population

Historic Sites
- Historic Sites

Flood Zone
- A
- AE
- X500

Flood Zone
- A

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Flood Hazards in Plymouth

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

N

0 3,000 6,000
Feet

DATE 6/15/2021

141.3211.00029
PROJ. NO.

FIG. 3-1

4.0 HURRICANES AND TROPICAL STORMS

4.1 Existing Capabilities

Flooding

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

Wind

Wind loading requirements are addressed through the state building code. The State Building Code has been amended several times in the past two decades. The 2005 Code was amended in 2009, 2011, and 2013. The code was then updated and amended in 2016, with the current code having been updated and effective as of October 1, 2018. The code specifies the design wind speed for construction in all the Connecticut municipalities. Effective October 1, 2018 the design wind speed for Plymouth is 110 mph for a Category 1 event, 120 mph for a Category 2, and 130 mph for a Category 3, 4 or 5 hurricane event.

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

Town departments have purchased sufficient supplies over the past few years to be prepared for the next major storm event. Much of the tree trimming in Plymouth near power lines is conducted by Eversource Energy. A significant amount of trimming occurred in Plymouth following the 2011 storms, and there have been few problems with fallen limbs since that time.

Tree complaints are directed to Public Works. The Public Works Director is the tree warden. Services are contracted, and the budget for trees is about $25,000 per year out of a total public works budget of $100,000 per year (this does not include snow removal).

New Capabilities and Completed Actions

Plymouth continues to maintain its strong tropical cyclone mitigation capabilities. In general, the level of capability of the Town of Plymouth relative to all facets of tropical storm and hurricane mitigation has slightly increased since the 2011 Plan as the recent trimming by Eversource has reduced the overall vulnerability of the town, and the increased tree maintenance budget has provided more local resources to address these hazards.

Summary

Plymouth mitigates hurricane and tropical storm damages through tree and limb maintenance, public alert and communications procedures, and enforcement of building code requirements related to high winds. The Town's capabilities are considered to be effective with regard to mitigating hurricane damage.

4.2 Vulnerabilities and Risk Assessment

Plymouth faces a number of challenges due to tropical storms and hurricanes. The primary problem is dealing with the impact of downed trees which can interrupt power supply for many days and hinder egress through neighborhoods. Secondary impacts are generally caused by heavy rainfall accompanying the storm.

All areas of Plymouth are susceptible to tropical storms and hurricanes. Higher elevations (such as near the Business Park and the High School) may be at a greater risk because the speed of the wind may be greater. Areas in floodplains are at increased risk of tropical storm and hurricane damage due to any flooding that may accompany such an event. There are mobile home parks in town that would be at increased risk of significant damage during severe wind events.

Following Tropical Storm Irene in 2011, power was lost for approximately one day in Plymouth for most residents, although some residents were without power for four days. A maximum of 1,718 customers were without power. A significant amount of damage in low-lying areas was due to flooding, such as on Todd Hollow Road, Bemis Street, North Main Street, Beach Avenue, and Route 72 at Sandra Avenue. Irene occurred during the Terryville Fair and only one day out of three was able to be held. Shelters were opened for several days and the Lions Club donated the food that would have been used at the fair. Tropical Storm Sandy also caused power outages and the shelters were opened for a couple of days.

According to municipal staff, the local damage during Tropical Storm Isaias was not as bad as other towns reported. Power was 99% restored, town-wide, after three days. The maximum span of outages was about 60% of customers in Plymouth. However, power was lost along Route 6 as a result of Tropical Storm Isaias, and the Town ran out of spare stop-signs to place at intersections. Power was restored to the Route 6 corridor within 48 hours. The Town submitted about $20,000 for PA reimbursement, and the disaster declaration was approved.

5.0 SUMMER STORMS AND TORNADOES

5.1 Existing Capabilities

The strategies used to mitigate tornado and thunderstorm damage are similar to those used to mitigate damage from tropical storms and hurricanes. The Town has increased its budget for tree maintenance over time, and it is considered sufficient at this time. This is only for Town properties and rights-of-way. The frequency of power outages has been reduced in recent years since the significant trimming programs conducted following the 2011 storms.

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

New Capabilities and Completed Actions

Plymouth 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

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

5.2 Vulnerabilities and Risk Assessment

Plymouth faces regular challenges due to tornadoes and thunderstorms, although these events are typically less damaging than tropical storms or hurricanes. The primary problem is dealing with the impact of downed trees which can interrupt power supply and hinder egress through neighborhoods. Secondary impacts are generally caused by heavy rainfall accompanying the storm, and direct wind damage or lightning and hail damage to structures and vehicles.

All areas of Plymouth are susceptible to tornadoes and thunderstorms. Higher elevations may be at a greater risk because the speed of the wind may be greater. Areas in floodplains are at increased risk of thunderstorm damage due to any flooding that may accompany such an event.

According to Town staff, there are no areas of the Town that are specifically prone to thunderstorm damage. However, the mobile home parks in town would be at increased risk to experience tornado damage.

6.0 WINTER STORMS

6.1 Existing Capabilities

Removal of the ice and snow for Plymouth's town-owned roads is primarily handled by town workers although some contractors are also used; the town also handles debris removal. The Town has established plowing routes that prioritize access to critical facilities.

Severe storms can stretch manpower and resources beyond expectations, but in general the plows do a very good job of keeping roads clear. Occasionally state forces are not available and the Town will need to treat state roads, particularly when accidents occur. Plymouth has had its emergency services strained during prolonged icing events when power outages and road closures occur throughout town and shelters are opened. The budget for preventive tree removal has recently increased and is now considered adequate.

Town staff mitigate areas prone to icing during the winter using additional treatment, or install drainage systems if necessary if a high groundwater table is present. Areas with snow drift issues are mitigated through additional plowing efforts.

The Town has an informal program to review snow accumulation on town-owned roofs each winter, with clearing occurring when depths are sufficiently deep or wet each year. Roofs with solar panels will be more closely monitored in the future, and snow removal will need to occur much more carefully than previously. A formal snow load evaluation plan for buildings fitted with solar panels will be considered by the Town.

The Town subdivision regulations require that utilities in new residential developments are installed underground, and the underground installation of utilities is encouraged for all new development.

New Capabilities and Completed Actions

Plymouth continues to maintain its strong winter storm mitigation capabilities. In general, the level of capability of the Town of Plymouth relative to all facets of winter storm mitigation has slightly increased over time because there is now an adequate tree maintenance budget and the recent tree trimming by Eversource reduced the overall vulnerability of the town. One notable change is that new concerns have arisen related to monitoring the snow load on roofs with solar panels.

Summary

Plymouth 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. The Town's capabilities are considered to be effective in regards to response to winter storms, although the Town's capability to mitigate severe winter storm damage is limited to Town facilities.

6.2 Vulnerabilities and Risk Assessment

Winter storms are one of the primary natural hazards affecting Plymouth. The Town has approximately 95 miles of local roads and many additional miles of state roads.

Plymouth faces challenges during winter storms as ice and snow make roads impassable and knock down tree limbs which in turn disrupts utility service. The combined effect can leave people stranded in their homes, potentially without heat or power.

All areas of Plymouth are susceptible to winter storms. Higher elevations may be at a greater risk because the frequency of winter storm events is typically greater in such areas. In addition, a winter storm could have very different effects in Plymouth depending on the elevation; for example, higher elevations could be receiving snow and need plowing while the lower elevations could be dealing with flooding during the same storm. Areas in floodplains are at increased risk of winter storm damage due to any flooding that may accompany a winter storm.

There are a few areas in Plymouth where icing is a problem on hills. Many of the icing concerns are reportedly temporary in nature and occur due to homeowners directing their basement sump pumps into the street. There are also a few areas that are prone to drifting snow, such as near the Business Park and the High School, and on Preston Road and North Harwinton Avenue.

The majority of roofs on Town-owned buildings are flat, including the schools and snow load is a concern for Town staff. The former Highway Garage roof collapsed during the 2011 winter due to snow load and has been replaced by a new building, and another roof collapsed on the old factory site that is being redeveloped for the propane distribution facility. Of note is that the Town has embarked on a solar panel installation program for Town-owned buildings. There is concern among local emergency personnel that the solar panels being installed on the Middle School roof and two elementary schools will exacerbate concerns with snow load due to the additional year-round weight.

Winter Storm Alfred was a particular problem for Plymouth because there was a significant amount of wind damage in addition to the ice and snow. The Town prepared payloaders prior to the storm to ensure that access could be maintained. Trees fell throughout the community, and Plymouth received upwards of 20 inches of snow and several roofs were damaged or needed to be cleared.

Communications were extremely strained during Alfred because power was out for nine to 11 days and cell phone towers were not available. The town has since invested in alternative communication methods (e.g. ham radio) to ensure that some level of communication continues. Town staff reported that the FEMA damage assessor was very cursory and Town staff had to travel to Boston to challenge the inspector's ruling regarding the snow load reimbursement. Congresswoman Elizabeth Esty assisted in getting the Town an additional $83,000 reimbursement.

The January 2013 blizzard produced a lot of snow in Plymouth and contractors were needed to remove it. Snow removal was the primary financial impact.

7.0 GEOLOGICAL HAZARDS

7.1 Existing Capabilities

Due to the very infrequent nature of damaging earthquakes, and the fact that earthquakes generally cannot be predicted, local land use policies in Plymouth do not directly address earthquake damage. In the event that significant earthquake damage occurred, the Town of Plymouth would activate its Emergency Operations Plan and respond as appropriate.

New Capabilities and Completed Actions

Plymouth continues to maintain its earthquake and landslide mitigation capabilities.

Summary

Plymouth 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

Although low intensity earthquakes regularly occur in Connecticut, these earthquakes are not damaging and are generally imperceptible to residents. Stronger earthquakes have historically occurred in Connecticut which have the potential to cause critical levels of damage.

All areas of Plymouth are susceptible to earthquakes. Property owners with structures that pre-date current building codes (particularly pre-1990 structures) are considered to be at increased risk of suffering earthquake damages, as well as structures built on sandy soils that could be prone to liquefaction.

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.

High hazard dams that could affect Plymouth include those owned by Bristol Water Department, the Plymouth Fish & Game Club, the United States Army Corps of Engineers, and private property owners. The Town participates in dam failure training exercises when offered by the dam owners, and performs its own exercises for its dams. The Town performs releases from its dams prior to storm events when possible.

According to the DEEP, the Town owns one Class C dam (Plymouth Reservoir Dam), and two Class B dams (Wilton Pond Dam and Zeiner Pond Dam). The Town recently updated the Emergency Action Plans for its dams to meet current DEEP guidelines. The Town previously had a committee to study the condition of dams in town, but it is not currently active. The Town has copies of EAPs prepared for other dams whose failure could affect Plymouth; this information is maintained by the Emergency Management Director. Town staff report that may residents would like to see the old defunct dams removed.

Actions Completed and New Capabilities

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

The Town is aware of pending updates to FEMA flood maps for the Naugatuck and Farmington River watersheds; however, Town staff believe that the Pequabuck River Study may have useful data that can inform those map updates. The Town will coordinate with CT DEEP and FEMA regarding map updates and incorporation of Pequabuck River Study information.

Summary

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

8.2 Vulnerabilities and Risk Assessment

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

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

As of 2020, there were 42 DEEP-inventoried dams within Plymouth. Ten 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 Plymouth

Number	Name	Class	Owner
11101	GREYSTONE FALLS DAM	BB	Private
11102	McCOY POND DAM	BB	Private
11103	UPPER POND DAM	BB	Private Club
11104	WILTON POND DAM	B	Municipal
11105	OLD MARSH POND DAM	C	Municipal
11106	PLYMOUTH RESERVOIR DAM	C	Municipal
11107	ELECTRO DAM		Private
11108	BRISTOL RESERVOIR #3 DAM	B	Municipal
11109	INDIAN HEAVEN POND DAM	B	Private
11110	HART POND DAM	BB	Private
11111	BROPHY POND DAM	BB	Private
11112	MIDDLE POND DAM AND DIKE	B	Private Club
11113	SERRA POND DAM	B	Private
11114	MINOR POND DAM	BB	Water Utility
11115	FALL MOUNTAIN LAKE DAM	B	Lake Association
11116	ZEINER POND	B	Municipal
11117	TERRYVILLE RESERVOIR #3 DAM	BB	Water Utility
11118	PRATT POND DAM	BB	Private
11119	SHEPPARD POND aka MASTERBONE DAM	B	Private
11120	EUGENE PARK POND DAM	BB	Private
11121	LAKE PLYMOUTH DAM	BB	Lake Association
11122	PLAINVILLE FISH & GAME CLUB DAM	A	Private Club
11123	SOUTH POND	A	Private Club
11124	TOMLINSON LAKE DAM	BB	Institution
11125	GREYSTONE POND	A	Private
11126	MEYERS POND	AA	Private
11127	MARCOTT DAM #1	A	Private

Number	Name	Class	Owner
11128	MARCOTT DAM #2	A	Private
11129	MARINO POND	A	Private
11130	LANE POND	A	Private
11131	BUTTERMILK POND	A	Private
11132	HANCOCK POND DAM	A	Private
11133	DAN SLEVINSKY DAM	A	Private
11134	HANCOCK BROOK DAM	C	Federal USACE
11135	PEQUABUCK RIVER DAM	BB	Private Corporation
11136	ALFIERI POND	A	Land Trust
11137	ORCHARD POND DAM	BB	Private
11138	PINKY'S POND	A	Private
11139	CARROS POND		Private
11140	TERRYVILLE RESERVOIR #2 DAM	AA	Water Utility
11141	TERRYVILLE RESERVOIR #1 DAM	AA	Water Utility
11142	OZ GEDNEY UPPER DAM		Private

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

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

Number	Name	Class	EAP Status	EAP Status Date
11103	UPPER POND DAM	B	Updated EAP Not Received	4/22/2021
11104	WILTON POND DAM	B	Updated EAP Not Received	1/22/2018
11105	OLD MARSH POND DAM	C	Acceptance Letter Sent	8/23/2018
11106	PLYMOUTH RESERVOIR DAM	C	Review letter sent revisions needed	8/7/2017
11108	BRISTOL RESERVOIR #3 DAM	B	Assigned to DEEP Staff for review	8/9/2017
11109	INDIAN HEAVEN POND DAM	B	Updated EAP Not Received	1/22/2018
11112	MIDDLE POND DAM AND DIKE	B	Updated EAP Not Received	3/25/2021
11113	SERRA POND DAM	B	Letter of Intent to submit EAP Received	6/25/2018
11115	FALL MOUNTAIN LAKE DAM	B	Assigned to DEEP Staff for review	7/19/2019
11116	ZEINER POND	B	Updated EAP Not Received	1/22/2018
11119	SHEPPARD POND aka MASTERBONE DAM	B	Updated EAP Not Received	1/22/2018
11134	HANCOCK BROOK DAM	C	USACE dam on Federal Land EAP exists	

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

Only areas of Plymouth that are near watercourses that are downstream of dams are susceptible to dam failure. In many cases a breach could flood a similar area to the 1% annual chance or 0.2% annual chance flood; in some cases (particularly for high hazard dams) the impacted area could be much wider.

The Hancock Brook Dam (Class C) is a federal flood control dam for the Naugatuck River owned by the United States Army Corps of Engineers and is reportedly in good condition. The dam was constructed in 1966 and the impounded lake provides a public recreational resource. Failure of this dam would primarily

affect Waterbury, although Greystone Road and homes along Graystone Road Extension would likely be affected.

With regards to dams owned by the Town of Plymouth, the Plymouth Reservoir Dam (Class C) is located on North Street. Failure of this dam would likely primarily impact Thomaston, although homes on North Street, Blakeman Road, and Railroad Street could be affected in Plymouth. Similarly, Wilton Pond Dam (Class B) could impact Wilton Road and Carter Road with its failure, but most impacts would be felt downstream in Thomaston. The failure of Zeiner Pond Dam (Class B) would cause significant flooding along the Pequabuck River in Terryville.

The Bristol Water Department owns several Class C and Class B dams that could affect Plymouth. The Bristol Water Department retained a consultant to perform dam inspections in accordance with the new DEEP regulations, and the dams are believed to be in generally fair to good condition although they are very old. The Town has concerns regarding Bristol Reservoir No. 3 as the Bristol Water Department activated its Emergency Action Plan several years ago when they believed a failure was possible. The Town evacuated downstream areas to protect residents, but fortunately the dam ultimately did not fail.

The Plymouth Fish & Game Club owns the Upper Pond Dam (previously classified as Hazard Class BB, but most recently upgraded to a Class B). This dam is 110 years old and was originally installed for hydropower and reportedly may have historic significance. Modifications to the dam have long been desired to allow for the water level to be lowered in anticipation of flood events in an effort to reduce flooding along Bemis Street. The Fish & Game Club does not have funding to complete the modifications which reportedly will be very expensive. The Town was reportedly willing to assume ownership of the dam if this is necessary to facilitate grant funding. However, the Pequabuck River Study found that modifications to the dam would likely have a limited effect on flooding, although it is unclear from the final draft report the exact modifications that were modeled to make this assessment.

The Town reportedly experienced a "close call" this winter at the Mill Pond (the local name for Hancock Pond Dam, Class A). A whirlpool developed, and the Town worked with Terryville Fish & Game (the pond owner) to plug the hole. The Town and the owner are working on a plan for the dam. An emergency action plan does not exist for this dam due to its low hazard rating.

The Fall Mountain Lake Dam (Class B) is a privately owned dam that could impact a few homes by its failure.

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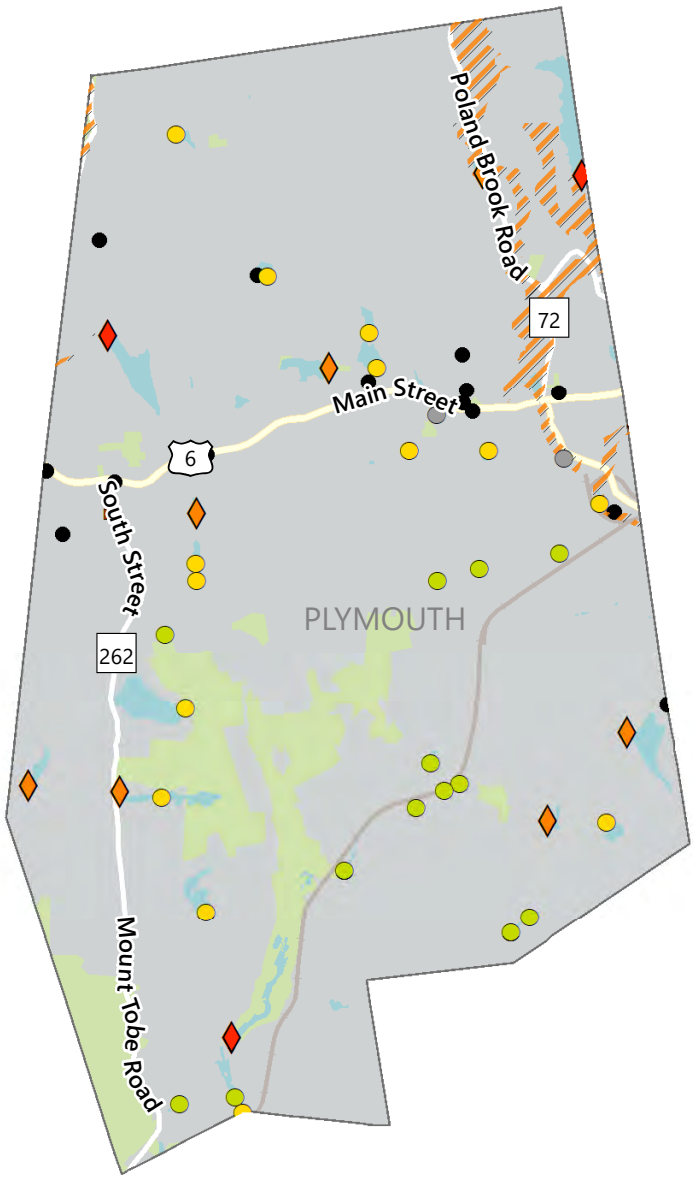

Dam Hazard Class
- Unclassified
- A - Low Hazard
- BB - Moderate Hazard
- B - Significant Hazard
- C - High Hazard
- Dam Breach Inundation Area

Critical Facilities
- Critical Facilities

Historic Sites
- Historic Sites

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Dam Failure Hazards in Plymouth

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

N

0 3,000 6,000
Feet

DATE 6/15/2021

141.3211.00029
PROJ. NO.

FIG. 8-1

9.0 WILDFIRES

9.1 Existing Capabilities

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

The Town maintains mutual aid agreements with Burlington, Wolcott, Thomaston, Bristol, and Harwinton for fire protection. Fire protection needs are typically reviewed by Emergency Management as part of site plan review. The Town's policy is to not go deep into the woods to attack fires, but rather to control the perimeter to prevent damage to structures. The Town has an all-terrain response vehicle that helps first responders to access and control wildfires. The Town has three local Open Burning Officials certified by the Connecticut DEEP who issue permits for open burning in accordance with Connecticut DEEP regulations.

Approximately 63% of the Town has public water supply. The Town has a few dry hydrants and cisterns installed in outlying areas, but may are old and no maintenance plan was required for them. Many are leaking and unreliable. The Town has a moratorium on new dry hydrants and cisterns until a regulation is created to support ongoing maintenance. The Town typically uses its 8,000-gallon tankers to shuttle water into outlying areas for fire-fighting needs, and most small fires can be put out with that much water. Much more water is needed for the larger 40-50 acre fires that can occur.

The Town primarily relies on regional and statewide measures for mitigating the impacts of drought such as the Connecticut Drought Management Plan. The local water company (The Connecticut Water Company) maintains an Emergency Contingency Plan that outlines the necessary response procedures when drought is impacting their sources of supply. The company's Rules and Regulations include water use restrictions that could be implemented during times of drought, although such restrictions have not been implemented in recent years. Although the Town of Plymouth is not a member, The Connecticut Water Company is a member of the Water Utility Coordinating Committee that will be reconvening in 2016 and will discuss regional water supply issues and needs including ensuring that supply is available during periods of drought.

Actions Completed and New Capabilities

Plymouth 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

Wildfires in Plymouth regularly occur approximately 12 times per year. When they do occur, they are usually accidentally set, although some may have been ignited by lightning or undetermined sources.

Less developed areas in Town are at the highest risk for a wildfire. The approximately 10,442 acres of forests and undeveloped land in Plymouth may be susceptible to drought conditions that make them more vulnerable to wildfires. Many large fires have occurred in the southwestern portion of town. Wildfire risk zones are mapped in Figure 9-1.

There is relatively little non-forested land left in Plymouth that could be developed, so most recent development has been of previously forested lands. This has increased the wildland-urban interface in town. The greatest areas of concern are the areas of town that do not have public water service and have limited access, which is primarily the western and southern parts of Plymouth. A 100-acre fire recently burned off Graystone Road south of the Boy Scout Camp, and fires this size usually take two to three days to get under control.

The outlying areas of town include a variety of state, federal, municipal, land trust, water utility, and private land. Some of the outlying areas are situated where access could be difficult. One suggestion for Town staff is to review areas for potential fire risk by looking at debris accumulation and access issues.

There is a lot of local concern at the local level regarding State resource restrictions. Whereas the State previously maintained a professional firefighting force, now State responders are being pulled from other jobs at the DEEP. The Town now relies on mutual aid agreements more than state assistance.

The Town has reportedly struggled somewhat with dry hydrants and cisterns, as responsible parties cannot be identified.

All areas of Plymouth are susceptible to drought. The approximately 735 acres of agricultural fields and maintained grasses in Plymouth may be vulnerable to direct damage from drought conditions. Property owners with private wells may have an increased risk of damage due to drought as lower groundwater levels could impact water supply wells.

Although the Fall Mountain area historically had problems with failing wells, this area now has public water supply available. The private wells in this area were very close to each other in this area which exacerbated the impact of dry conditions. Town staff did not recall any well deepening permits or new drilling permits being issued recently due to private wells going dry during a drought, nor could they recall any specific damages occurring due to drought.

Only severe droughts would have the potential to cause damages in Plymouth. The short-duration and moderate droughts that generally occur every few years are not a concern to Town staff.

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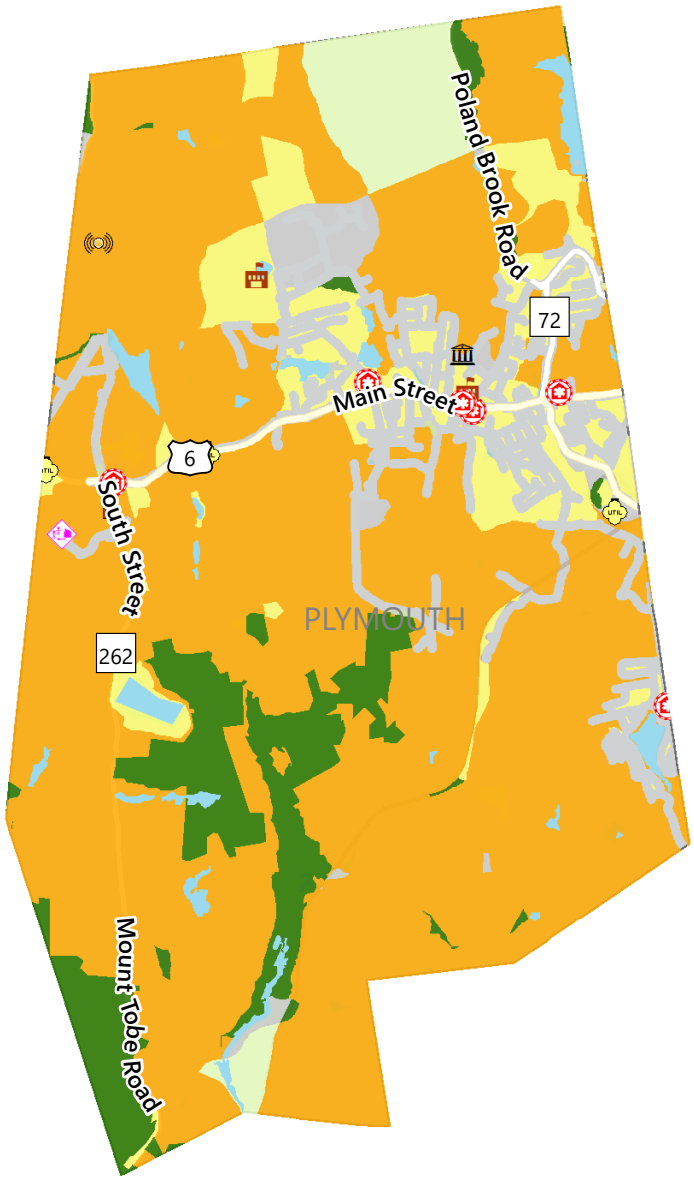

Critical Facilities

- Communications
- Emergency Response
- Government Services
- School
- Utility
- Vulnerable Population

Historic Sites

- Historic Sites

Wildland Urban Interface Type

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

SLR
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CHESHIRE, CT 06410
203.271.1773

Wildfire Hazard in Plymouth

NVCOG Hazard Mitigation Plan Update
Naugatuck Valley Council of Governments
47 Leavenworth Street, 3rd Floor
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PROJ. NO.

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	Status	Notes
PLY-1	Install drainage systems and reconstruct Todd Hollow Road and Beach Avenue	Carry Forward with Revision	Todd Hollow is complete. Carry forward for Beach Avenue.
PLY-2	Improve Bemis Street to reduce flooding damage	Complete	Road has been reconstructed with increased drainage, and changed geometry has been changed to reduce flooding.
PLY-3	Determine other methods to protect Bemis Street from flooding	Complete	Road surface geometry has been changed; it had previously been too flat and allowed water buildup. Now it is steeper and tehre is less head for floodwaters.
PLY-4	Certify the High School, Middle School, and Plymouth Center School as Red Cross Shelters	Complete	All are ARC shelters - will confirm
PLY-5	Construct a new fire station in the Fall Mountain area	Carry Forward	Town built a new Fire Station in Plymouth Center, but has not yet built a new fire station in the Fall Mountain area.
PLY-6	Acquire generators to provide adequate backup power to critical facilities	Carry Forward with Revision	Town has made progress in improving backup power at critical facilities. Additional generators may be desired.
PLY-7	Develop a Community Emergency Response Team (CERT)	Carry Forward	Action has not yet been pursued due to limited municipal capacities.
PLY-8	Prepare dam Emergency Action Plans for Town-owned dams	Carry Forward with Revision	Some are done, but some dams continue to need EAPs. According to CT DEEP, as of June 2021, EAPs are still needed for: - Upper Pond Dam (Plymouth Fish & Game Club) - Wilton Pond Dam (Plymouth) - Indian Heaven Pond Dam (private) - Middle Pond Dam and Dike (private) - Zeiner Pond (Plymouth) - Sheppard Pond aka Masterbone Dam (private)

Strategy	Description	Status	Notes
PLY-9	Develop a Town Evacuation Plan	Carry Forward with Revision	Action has not yet been completed due to limited municipal capacities.
PLY-10	Develop a Town-wide drainage/flooding study	Carry Forward	They have good mapping of structures for MS4; carry forward
PLY-11	Better define drainage easements	Drop	Action is not considered necessary.
PLY-12	Revise the Town Emergency Operations Plan to include procedures for new propane facility	Complete	Done
PLY-13	Update the local floodplain management ordinance to meet current model ordinance requirements	Carry Forward with Revision	Action has not yet been completed due to limited municipal capacities. Action is replaced with an action to fully incorporate provisions of the DEEP model flood regulations, in line with regional priorities.
PLY-14	Develop a Pequabuck River flood response plan for dams	Carry Forward	Middle and Upper Pond Dam, Horseshoe Falls Dam - no flood mitigation ability
PLY-15	Develop a formal snow load evaluation plan for buildings with roof-mounted solar panels	Drop	No formal plan written out; they have done some removal and been reimbursed. Action not considered necessary.
PLY-16	Review areas for potential wildfire risk by considering debris accumulation and access issues	Carry Forward with Revision	Carry forward / re-word
PLY-17	Develop regulations for dry hydrants and cisterns to ensure that maintenance is performed	Carry Forward	Not done; need to think about this
PLY-18	Incorporate updated hazard mitigation information into community plan updates	Carry Forward	POCD was 2015; next 2025
PLY-19	Participate in the statewide Water Utility Coordinating Committee process	Complete	Complete
PLY-20	Ensure local officials have most updated version of the Connecticut Drought Management Plan	Complete	Complete
PLY-21	Encourage preparedness workshops in schools	Drop	Action not considered necessary.
PLY-22	Encourage sign-ups for the Everbridge emergency notification system	Capability	This is a capability.
PLY-23	Develop watershed-wide low-impact development regulations with incentives	Carry Forward with Revision	Links back to MS4 - carry fwd

Strategy	Description	Status	Notes
PLY-24	Encourage the City of Bristol to perform repairs/upgrades to Bristol Reservoir #3	Drop	Dam is under jurisdiction of Bristol, and regulations are overseen by State. Action by Plymouth is not necessary.
PLY-25	Work with FEMA to update FIRMs as necessary	Capability	Update is currently underway.
PLY-26	Increase capacity of secondary driveway bridge serving Plymouth Village Apartments	Carry Forward	Action not yet completed due to limited funding.
PLY-27	Remove house at 150 Main Street and conduct channel clearing	Carry Forward with Revision	House is gone but channel not done yet
PLY-28	Assist property owners with floodproofing of commercial and industrial structures	Capability	Town can provide technical assistance as needed.
PLY-29	Assist property owners with modifying private driveways to reduce the impact of flooding	Capability	Town can provide technical assistance as needed.
PLY-30	Pursue site-specific mitigation measures for residential properties that regularly flood	Carry Forward with Revision	Has not been done. Replaced with two actions that are in line with regional priorities.

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

Action PLY-02	
Develop watershed-wide low-impact development regulations with incentives; connect this effort to MS4 requirements.	
Lead	Plan
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	High

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

Action PLY-04	
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	High

Action PLY-05	
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 PLY-06	
Remain engaged with FEMA and the State during the Farmington River Watershed flood map updates. Review draft maps and provide comments to FEMA. Coordinate with FEMA and CT DEEP regarding incorporation of Pequabuck River Study data into the mapping update, where appropriate.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	High

Action PLY-07	
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
Timeframe	2022
Priority	High

Action PLY-08	
Incorporate updated hazard mitigation information into community plan updates	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action PLY-09	
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 PLY-10	
Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA. Coordinate with FEMA and CT DEEP regarding incorporation of Pequabuck River Study data into the mapping update, where appropriate.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action PLY-11	
Develop regulations for dry hydrants and cisterns to ensure that maintenance is performed	
Lead	EM, FS, FD
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	Low

Action PLY-12	
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 PLY-13	
Develop a Community Emergency Response Team (CERT)	
Lead	EM
Cost	$0 - $25,000
Funding	OB
Timeframe	2022 – 2023
Priority	Low

Action PLY-14	
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 PLY-15	
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 PLY-16	
Prepare, file, and address any CT DEEP comments regarding EAPs for Town-owned dams: specifically, the Wilton Pond Dam and the Zeiner Pond dam.	
Lead	EM, DPW, FS
Cost	$25,000 - $50,000
Funding	OB, CT DEEP
Timeframe	2022 – 2024
Priority	Med

Action PLY-17	
Work with CT DEEP and the private dam owners to develop and file EAPs for significant and high hazard dams in Town: specifically, Upper Pond Dam, Indian Heaven Pond Dam, Middle Pond Dam and Dike, and Sheppard Pond aka Masterbone Dam.	
Lead	EM, DPW, FS
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022 – 2023
Priority	Low

Action PLY-18	
Develop a Pequabuck River flood response plan for dams	
Lead	EM, DPW, FS
Cost	$25,000 - $50,000
Funding	OB, CT DEEP
Timeframe	2022 – 2024
Priority	Med

Action PLY-19	
Create a prioritized list of emergency power improvement needs and incorporate into the Capital Improvement Plan.	
Lead	EM, DPW
Cost	$0 - $25,000
Funding	OB, CIP
Timeframe	2022 – 2024
Priority	Low

Action PLY-20	
Develop a Town-wide drainage/flooding study	
Lead	DPW, Plan
Cost	$50,000 - $100,000
Funding	FEMA Grant, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action PLY-21	
Conduct channel restoration and debris clearing, as appropriate, of the stream at 150 Main Street.	
Lead	DPW, ConCom
Cost	$50,000 - $100,000
Funding	OB, CIP, CT DEEP
Timeframe	2022 – 2024
Priority	Low

Action PLY-22	
Conduct a wildfire risk study that identifies areas of wildfire risk, considering access issues, presence of debris (fuel), and ignition sources.	
Lead	FD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEEP
Timeframe	2022 – 2024
Priority	Med

Action PLY-23	
Develop a map of evacuation routes and make publicly available on the Town website and in municipal buildings.	
Lead	EM
Cost	$25,000 - $50,000
Funding	OB, CT DEMHS
Timeframe	2022 – 2024
Priority	Low

Action PLY-24	
Install drainage systems and reconstruct Beach Avenue.	
Lead	DPW
Cost	More than $500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	Med

Action PLY-25	
Increase capacity of secondary driveway bridge serving Plymouth Village Apartments	
Lead	DPW
Cost	More than $500,000
Funding	OB, CIP, FEMA Grant, CT DEEP
Timeframe	2023 – 2025
Priority	Med

Action PLY-26	
Construct a new fire station in the Fall Mountain area	
Lead	EM, DPW, FD
Cost	More than $1 million
Funding	CIP, FEMA Grant, FEMA AFG, 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	
PLY-01	Register as a Sustainable CT community and make progress with the hazard mitigation goals associated with registration.	Sustainable CT	Plan	$0 - $25,000	OB, CT DEEP, Sustainable CT	2022	1	1	1	1	1	1	1	0	0	0	0	0	0	0	9
PLY-02	Develop watershed-wide low-impact development regulations with incentives; connect this effort to MS4 requirements.	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
PLY-03	Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	RLP	EM, Plan, FS	$0 - $25,000	OB	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
PLY-04	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
PLY-05	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
PLY-06	Remain engaged with FEMA and the State during the Farmington River Watershed flood map updates. Review draft maps and provide comments to FEMA. Coordinate with FEMA and CT DEEP regarding incorporation of Pequabuck River Study data into the mapping update, where appropriate.	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
PLY-07	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	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
PLY-08	Incorporate updated hazard mitigation information into community plan updates	HMP in Planning Docs	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
PLY-09	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
PLY-10	Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA. Coordinate with FEMA and CT DEEP regarding incorporation of Pequabuck River Study data into the mapping update, where appropriate.	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
PLY-11	Conduct a wildfire risk study that identifies areas of wildfire risk, considering access issues, presence of debris (fuel), and ignition sources.	Wildfire Risk Reduction	FD	$100,000 - $500,000	CIP, FEMA Grant, FEMA AFG, CT DEEP	2022 – 2024	0	1	0	0	1	1	1	0	0	0	0	0	0	0	6
PLY-12	Prepare, file, and address any CT DEEP comments regarding EAPs for Town-owned dams: specifically, the Wilton Pond Dam and the Zeiner Pond dam.	Dam Safety	EM, DPW, FS	$25,000 - $50,000	OB, CT DEEP	2022 – 2024	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
PLY-13	Develop a Pequabuck River flood response plan for dams	Dam Safety	EM, DPW, FS	$25,000 - $50,000	OB, CT DEEP	2022 – 2024	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
PLY-14	Install drainage systems and reconstruct Beach Avenue.	Drainage	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
PLY-15	Increase capacity of secondary driveway bridge serving Plymouth Village Apartments	Culvert & Bridge Upgrades	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
PLY-16	Develop regulations for dry hydrants and cisterns to ensure that maintenance is performed	Administration, Enforcement, & Maintenance	EM, FS, FD	$0 - $25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	6
PLY-17	Use the CT Toxics Users and Climate Resilience Map to identify toxic users located in hazard zones within your community. Contact those users to inform them about the CT DEEP small business chemical management initiative.	Small Business Chemicals	EM, FS	$0 - $25,000	CT DEEP	2022	1	0	1	0	1	1	1	0	0	0	0	0	0	0	6
PLY-18	Develop a Town-wide drainage/flooding study	Study	DPW, Plan	$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
PLY-19	Conduct channel restoration and debris clearing, as appropriate, of the stream at 150 Main Street.	Conservation & Restoration	DPW, ConCom	$50,000 - $100,000	OB, CIP, CT DEEP	2022 – 2024	1	1	0	1	1	0	1	0	0	0	0	0	0	0	6
PLY-20	Develop a Community Emergency Response Team (CERT)	Public Education & Engagement	EM	$0 - $25,000	OB	2022 – 2023	1	0.5	0	1	1	1	0	0	0	-1	0	0	0	0	5.5
PLY-21	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
PLY-22	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

#	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	
PLY-23	Construct a new fire station in the Fall Mountain area	Critical Facility Protection	EM, DPW, FD	More than $1 million	CIP, FEMA Grant, FEMA AFG, CT DEMHS	2025 – 2027	0	0.5	1	0	1	1	0	0	0	0	0	0	0	0	5
PLY-24	Work with CT DEEP and the private dam owners to develop and file EAPs for significant and high hazard dams in Town: specifically, Upper Pond Dam, Indian Heaven Pond Dam, Middle Pond Dam and Dike, and Sheppard Pond aka Masterbone Dam.	Dam Safety	EM, DPW, FS	$0 - $25,000	OB, CT DEEP	2022 – 2023	0	0	1	0	1	1	0	0	0	0	0	0	0	-1	3.5
PLY-25	Develop a map of evacuation routes and make publically available on the Town website and in municipal buildings.	Evacuation & Access	EM	$25,000 - $50,000	OB, CT DEMHS	2022 – 2024	1	0	1	1	1	0	0	0	0	-1	0	0	0	0	3.5
PLY-26	Create a prioritized list of emergency power improvement needs and incorporate into the Capital Improvement Plan.	Backup Power	EM, DPW	$0 - $25,000	OB, CIP	2022 – 2024	0	0.5	1	1	0	1	0	0	0	0	0	0	-1	-1	3

APPENDIX B

RECORD OF MUNICIPAL ADOPTION

TOWN OF PLYMOUTH
Office of the Mayor
80 Main Street
Terryville, CT 06786
Phone: (860) 585-4001 Fax: (860) 585-4015

CERTIFICATE OF ADOPTION
PLYMOUTH TOWN COUNCIL

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

WHEREAS, the Town of Plymouth 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 Plymouth Town Council approved the previous version of the Plan in 2016; and

WHEREAS, the Town of Plymouth 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 Plymouth; and

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

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

RESOLVED by the Town Council:

1. The Plan is hereby adopted as an official plan of the Town of Plymouth;
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 Town Council.

Adopted this 4th day of January, 2022 by the Town Council of Plymouth, Connecticut

Joseph Kilduff /Joseph Kilduff
Mayor

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of Plymouth this 11th day of January, 2022.

Erica Calviga
Town Clerk

APPENDIX C

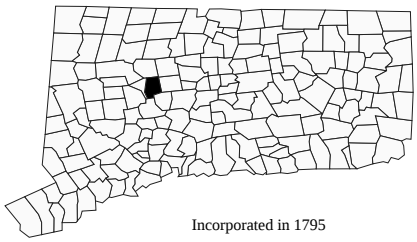
CERC Town Profile 2019

Plymouth, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

Town Hall
80 Main Street
Terryville, CT 06786
(860) 585-4002

Belongs To
Litchfield County
LMA Hartford
Naugatuck Valley Planning Area



Incorporated in 1795

Demographics

Population

	Town	County	State
2000	11,634	182,193	3,405,565
2010	12,243	189,927	3,574,097
2013-2017	11,888	184,454	3,594,478
2020	12,218	193,116	3,604,591
'17 - '20 Growth / Yr	0.9%	1.5%	0.1%

	Town	County	State
Land Area (sq. miles)	22	921	4,842
Pop./Sq. Mile (2013-2017)	543	200	742
Median Age (2013-2017)	44	47	41
Households (2013-2017)	4,842	74,605	1,361,755
Med. HH Inc. (2013-2017)	$73,430	$76,438	$73,781

	Town	State
Veterans (2013-2017)	953	180,111

Age Distribution (2013-2017)

	0-4		5-14		15-24		25-44		45-64		65+		Total	
Town	624	5%	1,095	9%	1,628	14%	2,770	23%	3,854	32%	1,917	16%	11,888	100%
County	7,668	4%	20,218	11%	21,158	11%	38,329	21%	61,693	33%	35,388	19%	184,454	100%
State	186,188	5%	432,367	12%	495,626	14%	872,640	24%	1,031,900	29%	575,757	16%	3,594,478	100%

Race/Ethnicity (2013-2017)

	Town	County	State
White Non-Hisp	10,708	164,992	2,446,049
Black Non-Hisp	258	2,843	350,820
Asian Non-Hisp	12	3,516	154,910
Native American Non-Hisp	44	267	5,201
Other/Multi-Race Non-Hisp	158	2,320	84,917
Hispanic or Latino	708	10,510	551,916

	Town	County	State
Poverty Rate (2013-2017)	5.3%	6.8%	10.1%

Educational Attainment (2013-2017)

	Town		State	
High School Graduate	3,442	40%	673,582	27%
Associates Degree	803	9%	188,481	8%
Bachelors or Higher	2,047	24%	953,199	38%

Economics

Business Profile (2018)

Sector	Units	Employment
Total - All Industries	233	2,110
23 - Construction	35	244
31-33 - Manufacturing	31	432
42 - Wholesale Trade	16	137
44-45 - Retail Trade	28	205
62 - Health Care and Social Assistance	17	235
Total Government	16	400

Top Five Grand List (2018)

	Amount
Connecticut Light & Power	$14,426,818
Connecticut Water Company	$6,676,560
Yankee Gas Service Co	$2,730,790
City of Bristol Water Dept	$2,604,210
Senior Housing at Quail Hollow Inc	$234,000
Net Grand List (SFY 2016-2017)	$767,877,559

Major Employers (2014)

Nicard Enterprises
Al Simmons Co Inc
Cook Willow Convalescent Hosp
Alliance One Inc
Plymouth Fire Dept

Education

2018-2019 School Year

	Grades	Enrollment
Plymouth School District	PK-12	1429

Pre-K Enrollment (PSIS)

	2018-2019
Plymouth School District	71

4-Year Cohort Graduation Rate (2017-2018)

	All	Female	Male
Connecticut	88.3%	91.8%	85.1%
Plymouth School District	92.4%	93.8%	91.2%

Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	61.5%	53.8%	69.6%	51.3%	37.6%	43.0%
ELA	57.3%	53.1%	64.3%	54.9%	38.9%	56.1%

Rate of Chronic Absenteeism (2017-2018)

	All
Connecticut	10.7%
Plymouth School District	9.9%

Public vs Private Enrollment (2013-2017)

	Town	County	State
Public	85.2%	84.0%	86.8%
Private	14.8%	16.0%	13.2%

Plymouth, Connecticut

CERC Town Profile 2019

Connecticut Economic Resource Center

Government

Government Form: Mayor - Council

Total Revenue (2017)	$43,712,387	Total Expenditures (2017)	$43,691,126	Annual Debt Service (2017)	$2,990,030
Tax Revenue	$27,981,899	Education	$28,265,752	As % of Expenditures	6.8%
Non-tax Revenue	$15,730,488	Other	$15,425,374	Eq. Net Grand List (2017)	$1,044,566,376
Intergovernmental	$15,226,825	Total Indebtedness (2017)	$19,970,413	Per Capita	$89,142
Per Capita Tax (2017)	$2,371	As % of Expenditures	45.7%	As % of State Average	59.1%
As % of State Average	80.9%	Per Capita	$1,704	Moody's Bond Rating (2017)	-
		As % of State Average	67.8%	Actual Mill Rate (2017)	36.02
				Equalized Mill Rate (2017)	26.60
				% of Net Grand List Com/Ind (2017)	7.7%

Housing/Real Estate

Housing Stock (2013-2017)

	Town	County	State
Total Units	5,292	88,068	1,507,711
% Single Unit (2013-2017)	75.9%	73.6%	59.2%
New Permits Auth (2017)	5	142	4,547
As % Existing Units	0.1%	0.2%	0.3%
Demolitions (2017)	0	32	1,403
Home Sales (2017)	145	1,753	21,880
Median Price	$193,400	$250,100	$270,100
Built Pre-1950 share	28.4%	31.2%	29.3%
Owner Occupied Dwellings	3,904	57,330	906,798
As % Total Dwellings	80.6%	76.8%	66.6%
Subsidized Housing (2018)	364	4,817	167,879

Distribution of House Sales (2017)

	Town	County	State
Less than $100,000	10	57	536
$100,000-$199,999	78	563	5,237
$200,000-$299,999	51	538	6,681
$300,000-$399,999	5	315	3,863
$400,000 or More	1	280	5,563

Rental (2013-2017)

	Town	County	State
Median Rent	$1,029	$995	$1,123
Cost-burdened Renters	46.9%	47.3%	52.3%

Labor Force

	Town	County	State
Residents Employed	6,373	101,000	1,827,070
Residents Unemployed	307	4,014	78,242
Unemployment Rate	4.6%	3.8%	4.1%
Self-Employed Rate	6.6%	13.0%	10.0%
Total Employers	233	6,177	122,067
Total Employed	2,110	61,496	1,673,867

Connecticut Commuters (2015)

Commuters Into Town From:		Town Residents Commuting To:	
Plymouth, CT	542	Bristol, CT	929
Bristol, CT	283	Plymouth, CT	542
Waterbury, CT	202	Waterbury, CT	501
Thomaston, CT	147	Hartford, CT	406
Torrington, CT	116	Farmington, CT	322
Harwinton, CT	63	Torrington, CT	235
Watertown, CT	56	Southington, CT	221

Quality of Life

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

	Town	State
Property	1,225	1,777
Violent	57	228

Disengaged Youth (2013-2017)

	Town	State
Female	1.8%	4.2%
Male	0.0%	5.6%

	Town
Library circulation per capita	3.78

Distance to Major Cities

	Miles
Hartford	19
Providence	84
New York City	84
Boston	113
Montreal	269

Residential Utilities

Electric Provider
Eversource Energy
(800) 286-2000

Gas Provider
Eversource Energy
(800) 989-0900

Water Provider
Connecticut Water Company
(800) 286-5700

Cable Provider
Comcast Waterbury
(800) 266-2278