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

Municipal Annex
for

DERBY, CT

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Derby, CT 06418
MMI #3211-29

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1.0 INTRODUCTION

1.1 Purpose of Annex

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

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

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

1.2 Planning Process

A meeting was held with Derby representatives on September 24, 2020 for the purposes of initial data collection and review of necessary updates for this document. The meeting was convened by the HMP local coordinator, Mark Neuendorf.

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

Derby specifically lies within the landscape region of Connecticut called the "Naugatuck River Valley," which extends from Torrington to Derby and includes the city of Waterbury. The Route 8 corridor and the Waterbury branch of the Metro-North railroad line span this region. The "Lower Naugatuck Valley" is sometimes known to include the towns of Oxford, Bethany, Beacon Falls, and Woodbridge in addition to Ansonia, Derby, and Seymour.

In general, the topography of the region increases in elevation moving from the shorelines of the major rivers (the Housatonic and Naugatuck Rivers, which are nearly at sea level) to the east and/or west of either river. Within the region, elevations of 500 feet or greater are found along western and southwestern Seymour and western Shelton while there are a few other smaller, more concentrated areas of this elevation in northern and eastern Seymour and northeastern Ansonia.

Derby has a high elevation of 440 feet in the Derby Hill section, in the area of Iannotti Lane, along the border with Ansonia.

1.4 Land Cover

A high-density industrial center was developed in the 19th and 20th centuries in downtown Derby, and remains one of the highest-density parts of the region. A decrease in developed land cover is evident with greater distance from either river. The majority of the rural and farmland cover is found in northwest Derby. Despite its urban core, the City is suburban on the whole, with populations that flourished during the last century as Connecticut's highway network was superimposed on its historical industrial center. Agricultural land use is distributed sparsely throughout Derby. Although residential land uses are interspersed throughout the City, higher density residential and nonresidential land uses are situated near the Naugatuck and Housatonic Rivers and the Route 8 corridor.

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 31% of Derby is forested and approximately 43% is developed.

Table 1-1: 2015 Land Cover by Area

Land Cover	Area (acres)	Percent of Community
Developed	1,483.0	42.71%
Turf & Grass	325.8	9.38%
Other Grass	99.9	2.88%
Agricultural Field	179.6	5.17%
Deciduous Forest	937.5	27.00%
Coniferous Forest	110.1	3.17%
Water	249.0	7.17%
Non-Forested Wetland	0.9	0.03%
Forested Wetland	36.9	1.06%
Tidal Wetland	0.0	0.00%
Barren	49.4	1.42%
Utility Row	0.0	0.00%
Total	**3,472**	**100%**

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

1.5 Geology

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

The City is located in the northeastern part of the Appalachian Orogenic Belt, also known as the Appalachian Highlands, which extend from Maine southward to Mississippi and Alabama. The Appalachian Highlands were formed when Pangaea assembled during the late Paleozoic era. The region consists primarily of schist, granulite, and gneiss lying in fairly diagonal bands stretching from northeast to southwest in the same general orientation as the region. This bedrock is cut through by numerous thrust faults.

One main fault, the "East Derby Fault," is oriented from northeast to southwest and runs to the east of Route 8 through the eastern portion of Derby. Upon reaching the Shelton town line, the fault and the roadway are generally positioned in the same orientation from northeast to southwest. The East Derby Fault stretches from Bethany southwest to Bridgeport over a span of approximately 16.25 miles. The fault is classified as "FTO," an overturned thrust fault, and is currently inactive. There is one geologic contact (classified as "C") that branches off the East Derby Fault in Shelton.

Glaciers began forming in the northern hemisphere about three million years ago. Since then, the southernmost portions of these glaciers covered the region on at least two occasions. At the end of the ice age, the last of the glaciers' mineral holdings were released with the melting ice. The region's different formations born of bedrock while exposed to hydrological, atmospheric, and glacial processes include glacial till, **stratified drift**, rivers and lakes, outwash plains, and coastal formations.

Stratified drift formations were deposited in valleys by glacial streams. These valleys were later inherited by the larger of our present-day streams and rivers. Thus, stratified drift is generally coincident with inland floodplains.

The amount of stratified drift also has bearing on the relative intensity of earthquakes and the likelihood of soil subsidence in areas of fill.

1.6 Drainage Basins and Hydrology

The City is divided among two subregional watersheds. The majority of Derby falls within the Housatonic River mainstem watershed, with a wedge in the central portion of the City (surrounding the Naugatuck River) falling within the Naugatuck River watershed. The confluence of the Housatonic and Naugatuck Rivers is located in Derby.

Watercourses in Derby – Pink House Cove Brook and Twomile Brook flow toward the Housatonic River while some smaller, unnamed tributaries and streams flow toward the Housatonic River and/or the Naugatuck River.

1.7 Climate and Climate Change

In Derby, the summers are warm, humid, and wet; the winters are very cold; and it is partly cloudy year round. Over the course of the year, the temperature typically varies from 22°F to 81°F and is rarely below 8°F or above 88°F.

The warm season lasts for 3.5 months, from June 2 to September 17, with an average daily high temperature above 72°F. The hottest day of the year is July 21, with an average high of 81°F and low of 66°F. The cold season lasts for 3.3 months, from December 4 to March 14, with an average daily high temperature below 45°F. The coldest day of the year is January 29, with an average low of 22°F and high of 36°F.

The wetter season lasts 4.3 months, from April 10 to August 19, with a greater than 29% chance of a given day being a wet day. The chance of a wet day peaks at 35% on May 30. The drier season lasts 7.7 months, from August 19 to April 10. The smallest chance of a wet day is 22% on January 29.

The most rain falls during the 31 days centered around June 4, with an average total accumulation of 3.9 inches. The snowy period of the year lasts for 4.9 months, from November 14 to April 10, with a sliding 31-

day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around January 26, with an average total liquid-equivalent accumulation of 0.9 inches.

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

Climate Change

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

Temperature

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

Precipitation

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

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

The Northeast Regional Climate Center (NRCC) has partnered with the Natural Resources Conservation Service (NRCS) to provide a consistent, current regional analysis of rainfall extremes (http://precip.eas.cornell.edu/). In 2020 this dataset listed the 24-hour rainfall amount for a 10% annual-chance storm in Derby as 5.00 inches.

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

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

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

Source	24-Hour Rainfall Amount (inches) by Annual-Chance Occurrence		
	10%	4%	1%
Technical Paper No. 40	5.0	5.6	7.1
NRCC	5.0	6.2	8.8
NOAA Atlas 14	5.6	6.9	8.8

Annual precipitation has been increasing statewide and is projected to continue to increase. By mid-century, annual precipitation is projected to increase by 8.5%, with the greatest increase (13.4%) occurring

in the winter months. Extreme precipitation events are projected to increase in both frequency and magnitude. Based on this increase and the precipitation figures above, by 2050 Derby can expect the 24-hour rainfall amount for a 10% annual-chance storm to be around 5.4 to 6.1 inches or greater.

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

1.8 Development Trends

The 2010 U.S. Census reported a population in Derby of 12,485 individuals. U.S. Census Bureau estimates for 2019 show a population around 13,553 individuals, an increase from 2010 of 8.6%. The Connecticut State Data Center predicts that population will increase by 8.2% through 2025 to an estimated population of 2,264 individuals.

According to the Connecticut Data Collaborative, the number of annual housing permits in Derby remained steady over the last decade. The number of permits issued in 2010 and 2011 was 5 and 2, respectively, while 2 permits were issued in 2016, and 5 permits were issued in 2017. On average, 4 housing permits were issued each year in Derby between 2010 and 2017.

According to the U.S. Census Bureau, the overall number of housing units in Derby dropped by approximately 0.2-percent between 2010 and 2019, from 5,849 units in 2010 to 5,837 units in 2019. In 2019, the housing stock was made up of approximately 58% single-unit structures, 16% two-unit structures, 27% multi-unit structures, and 0% mobile-homes or other types of structures.

According to the Connecticut Office of Policy and Management, Derby's 2019 Total Equalized Net Grand List was valued at $738,000,000. 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 Derby, included as Appendix C.

Residential development in Derby is concentrated along the Route 8 corridor and the Naugatuck and Housatonic Rivers. On the whole, almost all developable parcels surrounding the Route 8 corridor within the City have been developed to-date. Due to the smaller land area size of the City, developable parcels are generally sparse throughout.

The City saw a virtual halt in development during the economic downturn beginning in 2008, similar to residential and commercial development trends across the state and the rest of the United States. Between 2014 and 2021, there have been no large-scale commercial or industrial developments or subdivisions. All residential development during this time has been single family homes on previously vacant lots, demolition, rebuilding, or additions. For example, many older buildings have been demolished over the last few years and redevelopment projects proposed for those sites.

Redevelopment planning has been particularly focused in the downtown Derby Redevelopment Area, located south of Main Street and west of Route 8, near the confluence of the Housatonic and Naugatuck

Rivers. Development in this area aligns with State and Regional initiatives to prioritize Transit-Oriented Development (TOD), due to the area's proximity to the Derby/Shelton train station (on the Waterbury Branch of the Metro-North Railroad New Haven Line). This area is located entirely within a FEMA Zone X-Protected by Levee. This indicates that the area is protected from flooding up to the 1% annual-chance flood level by a FEMA-accredited levee; importantly residual risk of flooding (due to events of a greater magnitude, or failure of the levee) remains.

Construction has not yet commenced in the Derby Redevelopment Area. It is likely that mixed-use buildings will be constructed on the site within the next five to ten years.

Summary

Recent development in Derby has been limited, and primarily consisted of redevelopment or reuse of previously developed lots. This development has not increased natural hazard risks to the community. Continued development in Derby is not expected to increase overall natural hazard risks, provided the community continues to improve its hazard mitigation capabilities and to enforce its zoning regulations, as has been the trend in the past.

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 Derby 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

Derby is considered to have a Medium to High level of social vulnerability, with a higher vulnerability score for the SVI category of Socioeconomic Status. In other words, a particular challenge in Derby may include a lack of access to financial resources.

2.0 MUNICIPAL CAPABILITIES

2.1 Governmental Structure and Capabilities

Municipal Departments and Commissions

Derby is managed by a mayor and Board of Aldermen system. The mayor appoints the Board of Aldermen following election. The mayor oversees many of the municipal departments, commissions, and boards and are directly responsible for appointing members of many commissions and boards.

Within the City, appropriate municipal departments, commissions, and boards are involved with natural hazard mitigation. The following subsections describe general departmental responsibilities, and duties related to natural hazard mitigation within the City. Where applicable, one or more of the six types of mitigation (prevention, property protection, natural resource protection, structural projects, emergency services, and public education) are identified as relevant for each department.

Public Works Department and Commission

In Derby, the Public Works Department is under the general supervision of the Board of Aldermen. These departments are responsible for planning, organizing, and administering the public works operations as well as managing the public works staff and budget. Responsibilities include directing highway construction and maintenance procedures. The Public Works Director is the Tree Warden and the NFIP coordinator.

As is common throughout Connecticut, the Public Works Department is often charged with implementing numerous structural projects that are related to hazard mitigation. Specifically, roadway/infrastructure maintenance and complaint logging/tracking are the two primary duties of the Public Works Department. For example, the Public Works Department tracks, plans, preparse for, and responds to flooding, inundation, and/or erosion of roads and infrastructure such as the sewer pumping station and the wastewater treatment plants. The Public Works Department also conducts snow removal and deicing on roads; and the appropriate maintenance and upgrades of storm drainage systems to prevent flooding caused by rainfall. Generally, the City contracts out tree maintenance and removal services.

Because of the duties described above, Public Works Department personnel are often the de facto first responders during emergencies. The Public Works Department must maintain access for the Police and Fire Departments to respond to emergencies.

Building and Engineering Departments

In Derby, the engineering responsibilities are contracted by an outside firm. The Building Inspector administers the City's building inspection program adhering to and enforcing all code requirements of the State of Connecticut relating to building construction. Additional responsibilities include administering and enforcing all related state codes for the safety, health, and welfare of persons and properties in the municipality, supervising departmental policies and procedures, and providing technical assistance to municipal officials.

The Building Inspector has a unique responsibility when it comes to hazard mitigation as he or she is responsible for overseeing a number of codes such as those related to wind damage prevention as well as those related to inland flood damage prevention. Although other departments and commissions may review development plans and develop or revise regulations, many important types of pre-disaster mitigation are funneled through and enforced by the Building Inspector's Office. For example, the Building Inspector's Office enforce standards for floodproof construction and building elevations, maintain elevation certificates, and enforce building codes that protect against wind and fire damage. Thus, the types of mitigation that are administered by the Building Inspector's Office include prevention and property protection.

The City Engineer plans, directs, and coordinates engineering contracts and construction projects, including bridges, sanitary, and different developments. The Engineer provides technical consultation to municipal boards and commissions and serves as the municipal liaison with various state agencies. As such, the Engineer will often need to review issues related to drainage, flood conveyance, and flood mitigation and related elements of structural hazard mitigation.

Fire Department and Emergency Management Department

The Fire Department and Emergency Management Departments are the primary entities involved with hazard mitigation through emergency services in the City. The EMDs are the primary municipal contacts for this HMP.

Police Department

Typical day-to-day duties of the Police Department includes crime prevention, criminal investigations, traffic enforcement, motor vehicle accident investigations, and patrols. Duties related to natural hazard mitigation include planning and coordination of personnel, equipment, shelters, and other resources necessary during an emergency. The types of mitigation that are directly administered by the Police Department include mainly emergency services and public education. Communication and coordination with the Fire Department is critical before, during, and after natural hazard emergencies.

Planning Department

Planning and Zoning Commissions and municipal planning or land use staff are in charge of planning provide assistance to other applicable departments within the municipality, including the Building and Engineering personnel, and are responsible for housing and economic development planning. The Zoning Enforcement Officers/Inland Wetlands Enforcement Officers enforce the zoning regulations and are the administrators of the inland wetlands regulations on issues of zoning compliance.

Because the Planning staff assist the applicable commissions with administration of the Zoning Regulations, Subdivision Regulations, and Inland Wetland Regulations (described below in Section 2.8), the municipal departments are responsible for elements of almost all six facets of mitigation (prevention, property protection, natural resource protection, structural projects, emergency services, and public education).

Commissions Related to Hazard Mitigation

In addition to the Public Works Commission and Emergency Management Committee described above where applicable, several commissions are involved with hazard mitigation:

- Conservation Commission – Charged with the development, conservation, supervision, and regulation of natural resources and water resources (hazard mitigation through natural resource protection)
- Inland Wetlands and Watercourses Commission – Charged with implementing and enforcing all provisions of the Connecticut General Statutes as regards the Inland Wetlands and Watercourses Act (hazard mitigation through prevention, natural resource protection, and structural projects)
- Planning and Zoning Commission – Charged with establishing, implementing, and overseeing planning and zoning regulations as provided by the Connecticut General Statutes (hazard mitigation through prevention, property protection, natural resource protection, structural projects, emergency services, and public education)

Existing Plans and Regulations

Plans of Conservation and Development

The Derby Planning and Zoning Commission adopted the most recent update to the POCD in 2008. The POCD is organized into six sections that cover conservation, development, and infrastructure strategies and recommendations. Section 3 identifies SFHAs, slopes in excess of 25%, and wetlands as "significant conservation areas." The POCD notes that Derby already protects wetlands and SFHAs but notes that Derby "should consider strengthening regulations related to development on steep slopes and… 500-year floodplain areas." The listed conservation strategies for natural resources and open space are as follows:

- Continue to protect watercourses, waterbodies, wetlands, floodplains, vernal pools, and other important water resources in order to maintain water quality, wildlife habitats, water supply, and ecological balance.
- Continue to require buffer zones to protect important water resources.
- Consider regulations to protect slopes in excess of 25%.
- Continue to acquire land around aquifers and public water supply watersheds to aid in their protection.
- Seek to reduce the amount of impervious surface in Derby by promoting less density in future development and redevelopment efforts.
- Require alternatives to paving entire parking lots and driveways and encourage natural drainage systems to decrease polluted runoff.
- Identify local animal habitats and protect them at the time of development.
- Seek city funds to prepare an Open Space Plan overseen by the Derby Open Space Commission, with recommendations made to the Derby Board of Aldermen.
- Interconnect open space and recreational areas in Derby through a system of greenbelt trails.
- Establish small parks and recreation areas in all redevelopment efforts. Examine all vacant parcels of land owned by the city as possible locations for well landscaped "pocket parks."
- Require that open space or fees in lieu of open space be a part of every new development or redevelopment effort in Derby.

- Establish a Land Acquisition Fund as authorized by the Connecticut General Statutes and strive to set aside funds from the annual municipal budget and other sources for open space acquisition.
- Pursue state funding, rights of first refusals, rights-of-way or easements, and other methods of obtaining desired open space.
- Make preservation of farmland a priority and seek to preserve remaining farms through purchase of development rights.

Strategies for utilities include "encourage all replacement and new wired utilities to be placed underground" and "work with utility companies to establish a reasonable tree-trimming schedule that balances reliability and community character."

Many of the above strategies are considered consistent with the goals of this HMP.

Emergency Operations Plan

The Derby EOP is reviewed annually.

Sections I and II of the City's EOP provide its purpose and assumptions. Section III of each EOP describes mitigation, increased readiness, emergency phase operations, and recovery phase operations. The EOP may list snowfall, ice storms, blizzards, hazardous material incidents, aircraft accidents, hurricanes, tornadoes, flooding, electrical storms, major fires, energy/fuel shortages, forest fires, dam failures, water contamination, earthquakes, and highway accidents as hazards covered by the EOP. Specific mitigation measures typically include the following:

1. Carry out hazard mitigation activities appropriate to the functions of departments, agencies, and offices
2. Restrict development in hazardous areas consistent with the degree of risk
3. Promote fire prevention
4. Work with commerce and industry to improve hazardous materials storage, use, transport, and disposal
5. Encourage public safety at all levels
6. Maintain a stock of sandbags
7. Develop and maintain all-hazard evacuation and mass care annexes with predesignated evacuation routes and shelter facilities
8. Maintain mutual aid agreements with neighboring communities
9. Maintain a radiological protection reference guide

Section IV of the EOP sets and describes roles and responsibilities. The EMD coordinates with the Chief Elected Official and other agencies. Roles of the Fire Department, Police Department, Health District, Public Works Department, and other specific people are also described.

Section V of the EOP describes administration and logistics. This section also describes the duties of the American Red Cross (ARC) and Salvation Army such as provision of food, clothing, and various types of assistance. Section VI of the EOP describes plan maintenance. Section VII of each provides various attachments, such as templates for declaring an emergency.

Flood Damage Prevention Code

Flood damage prevention is covered by Chapter 92 of the Code of the City of Derby. The Flood Damage Prevention Code was adopted in 1991 and is essentially a local, abbreviated articulation of the NFIP regulations. The code includes a brief explanation of the standards for residential and nonresidential construction in A zones and floodways. The code was amended on November 18, 2010 to make reference to the December 2010 Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) for New Haven County Digital Flood Insurance Rate Maps (DFIRMs). As requested by the Connecticut DEEP, the code requires compensatory storage in flood zones and also requires that floodplain encroachments shall not result in any ("0.00 feet") increase in base flood elevations.

Zoning Regulations

In Derby, the Planning and Zoning Commission is charged with administering the Zoning Regulations. Zoning was covered by Chapter 195 of the Code of the City of Derby from 1976 through 2000, at which point the Zoning Regulations were adopted and superseded the chapter in the code. The Zoning Regulations were most recently amended in August 2010.

- Section 195-21 of the Derby Zoning Regulations describes the Floodplain (FP) Zone and states that "Applicable standards on the construction and the use of land, buildings and other structures and the filling or excavation of land are established to protect life and property, avoid health problems, and avoid increase in flood danger." The FP zone is an overlay zone such that the underlying zone standards also apply.

- Section 195-100 through 195-106 of the Derby Zoning Regulations (Article XIV) describes Soil Erosion and Sediment Control. The article requires the development and approval of a certified soil erosion and sediment control plan in connection with most development projects.

- Section 195-107 through 195-112 of the Derby Zoning Regulations (Article XV) describes Floodplain Management Controls. The article requires issuance of a zoning permit from the Planning and Zoning Commission for a variety of activities in the FP overlay zone. However, the article does not include a set of standards such as the NFIP regulations; these are in Chapter 92 of the city code. Exemptions are listed in Section 195-110 (repairs equal to less than 50% of the market value and repairs to historic structures), and procedures are described in Section 195-112. Section 195-112(C) explains that an applicant must be notified that flood insurance premiums will be higher than typical if permission is granted for construction of a structure below the base flood elevation. This implies that the Planning and Zoning Commission has the authority to permit such construction below the base flood elevation, which could occur as a result of an exemption.

Subdivision Regulations

The Planning and Zoning Commission is charged with administering the Subdivision Regulations in Derby. These regulations were adopted in 1970 and have been amended through February 1992. Components of the regulations that directly or indirectly address hazard mitigation (flooding, public safety, etc.) are listed below:

- Section 2.3.6 describes the need for soil erosion and sediment control plans.
- Section 3.6 describes streets. Permanent dead-end streets "should be avoided" and may not serve more than 20 lots. Street right-of-way widths are set at 50 feet (local) or 60 to 100 feet (thoroughfares and commercial streets). Paved widths must be 32 to 36 feet depending on type of street, with turnarounds of 80 to 100 feet.
- Section 3.7 describes drainage provisions. Street drainage systems must be designed to handle two inches of rain per hour, and culverts must be designed to handle four inches per hour.
- Section 3.12 describes special considerations for flood hazard areas and floodways. When land to be subdivided is within a flood hazard area or floodway, the section requires that lots, streets, drainage, and other improvements shall be designed to be capable of use without danger from flooding. Streets shall be "of such elevation or shall be suitably protected as to allow access during flood."

Inland Wetland and Watercourses Regulations

The Inland Wetlands Commission is charged with administering the Inland Wetlands and Watercourses Regulations. These regulations are revised through August 1993. In Connecticut, wetlands are identified as related to flood hazard mitigation within the state enabling regulations, and this is often stated as such in the title section of local regulations. The same is true in the Derby Inland Wetlands and Watercourses Regulations. Section 6.2 of the regulations sets a regulated review area of 50 feet from edge of wetlands. Section 6.4 prohibits the increase of stormwater flows from a development site and requires that detention be sized for the 100-year storm with six hours of retention time. The remainder of the regulations describe procedures, appeals, amendments, etc.

2.2 Infrastructure

Transportation

The primary transportation routes into and out of the City are Route 8 traveling north-south through the center of the City,,and Route 34 running east-west along the southern edge of the community . Other key roads include Seymour Ave, Derby Ave, Academy Hill Road, Water Street, and Marshal Lane.

Derby is served by the Valley Transit District and the CTtransit public bus systems. Derby-Shelton station is a commuter rail station on the Waterbury Branch of the Metro-North Railroad New Haven Line. It is located in Derby.

Utilities

Public water in Derby is provided by the Regional Water Authority, as well as by the Aquarion Water Company East Derby System. Public sewer services are provided by the Derby Water Pollution Control Authority.

United Illuminating is the primary electricity provider in Derby. Natural gas service is provided by Eversource.

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

2.3 Critical Facilities and Emergency Response

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

Table 2-1: Critical Facilities

Facility	Address or Location	Comment	Emergency Power	Shelter	SFHA
City Hall	1 Elizabeth St	EOC	✓		
Police Department	125 Water St	Emergency	✓		✓
Hotchkiss Hose Company No. 1	200 David Humphrey Rd	Emergency	✓	✓*	
Storm Engine Company No. 2	151 Olivia St	Emergency		✓*	
East End Hose Company No. 3	Derby Milford Rd	Emergency		✓*	
Paugassett Hook & Ladder Co. No. 4	57 Derby Ave	Emergency		✓*	
Middle School	73 Chatfield St	Primary Shelter	✓	✓	
Bradley School	155 David Humphreys Rd	Backup Shelter		✓	
St. Mary – St. Michael	14 Seymour Ave	Backup Shelter		✓	
Public Works	65 Coon Hollow Rd	Municipal			
Wastewater Treatment Plant	Factory Street	Utility			✓
WPCA Sewer Pump Stations	Roosevelt Dr (2) S Division St (2) Burtville Ave (2) Patty Ann Terr (2)	Utility	✓		
WPCA Stormwater Pump Stations	Division St (Derby), Ansonia City Line (Derby) Ansonia Line (Ansonia) Derby WWTF Maple St (Ansonia) Riverside Dr (Ansonia)	Utility	✓		✓
Marshall Lane Manor	101 Marshall Lane	Language Barrier	✓		
Stygar Terrace	Stygar Terrace	Elderly			
Guardino Terrace	Guardino Terrace	Elderly			
Cicia Manor	West Fourth St	Elderly			
Hallock's Landing	Minerva St	Elderly			
Lakeview Apartments	Roosevelt Drive (Route 34)	Elderly			
Griffin Hospital	130 Division Street	Healthcare	✓		
Griffin Hospital Cancer Center	350 Seymour Avenue	Healthcare	✓		

Facility	Address or Location	Comment	Emergency Power	Shelter	SFHA
Derby Dam	Housatonic @ Galiardi St	Dam			✓
Fire Alarm Tower	74 Cottage St	Emergency	✓		
Telephone Switching Station	No Location Provided	Utility			

* Temporary shelters only.

Fire and Police Department Facilities

The Derby Fire Department consists of four firehouses located through the city:

- Hotchkiss Hose Company No. 1 at 200 David Humphrey Road
- Storm Engine Company No. 2 at 151 Olivia Street
- East End Hose Company No. 3 on Derby-Milford Road
- Paugassett Hook and Ladder Company No. 4 at 57 Derby Avenue

In addition to serving the city, the Fire Department is often called into neighboring municipalities for mutual aid. All of the firehouses are located outside of the flood zones in the city.

Most of the firehouses, including the combined fire department and ambulance corps at Storm Engine Company No. 2, do not have backup power. Hotchkiss Hose Company No. 1 has a generator; however, it is reportedly 45 years old and in need of replacement.

The Fire Alarm Tower is considered to be a critical facility and has a backup power source.

The Derby Police Department is located at 125 Water Street. The parking lot of the Police Department is located in the X-Protected by Levee flood zone (protected by the Derby/Ansonia Levee System). The Police Department provides service, protection, and assistance to the city's residents.

Shelters

Derby has three shelters that are designated by the EMD. The Middle School is the primary shelter and is equipped with a generator. The Bradley School still does not have emergency power. St. Mary – St. Michael is a private elementary school with a cafeteria that could be used as another shelter.

The EMD also designates the four firestations as temporary shelters. According to Derby officials, people may congregate at any of the four firestations while waiting for transpiration to the two designated shelters. Only one of the firestations has a generator, and none are located in a flood zone.

Municipal Utilities

The Derby Wastewater Treatment Plant (WWTP) is located at the south end of Factory Street, in the FEMA-designated flood zone X-Protected by Levee. The Derby eight Sewer Pump Stations that bring wastewater to the WWTP, as well as the six WPCA Stormwater Pump Stations, are located throughout the city, and many

also fall within the X-Protected by Levee flood zone. Sewer and stormwater pumping stations have been refurbished since the last HMP update and all pumping stations now have backup power.

The telephone switching station is also considered to be a critical facility.

Health Care, Assisted Living, Daycare, and Special Needs Populations

Marshall Lane Manor is no longer an assisted living facility; it now houses foreign students. The facility is still considered a critical facility because of the language barrier in responding to this facility.

Evacuation Routes and Preparedness

The City does not have set evacuation routes as these are determined on a case-by-case basis depending on the event type and level of impact; however, there are certain neighborhoods that are known to be at risk for impaired access during floods. These areas should be targeted for development of specific evacuation protocols.

Certain critical facilities – those that house vulnerable populations and have a higher disaster risk than comparable facilities elsewhere – should also be targeted for development of site-specific evacuation plans or protocols.

In general, generators are a critical need for the city. Many critical facilities either do not have backup power or have generators that need to be replaced.

3.0 FLOODING

3.1 Existing Capabilities

Regulations, Codes, and Ordinances

The municipal codes, Zoning Regulations, Subdivision Regulations, and Inland Wetland and Watercourses Regulations were described in detail in Section 2.1. The Planning and Zoning Commissions, Inland Wetlands and Watercourses Commissions, and the Building Officials are all charged with reviewing projects and developments in SFHAs as well as projects not located in SFHAs that will alter hydrology and runoff.

The City has regulations that are at least as stringent as the NFIP regulations. One of the provisions of these codes and regulations are especially notable relative to preventing flood damage:

- *The City of Derby requires a roadway of suitable elevation to access subdivisions in SFHAs. This is consistent with FEMA's recommendation for dry land access to residential populations.*

Flood Control Structural Projects

A system of levees and floodwalls lies along a portion of the Housatonic River and along the entire west bank of the Naugatuck River within the city of Derby, extending north into Ansonia. The Ansonia and Derby flood control projects were constructed by the U.S. Army Corps of Engineers in the 1960s and 1970s.

The flood control systems in Ansonia and Derby provide protections that are *additional* to the protection from the upstream dams. They are necessary because Ansonia and Derby are located at the end of the Naugatuck River, far from the flood control dams located upstream, and because the Naugatuck River can experience backwater conditions in Derby and Ansonia due to tidal flooding of the Housatonic River downstream of the point that the two rivers conjoin.

In 2012 it was calculated that Derby's flood control system provides protection from the base flood for approximately 80 private and municipally owned properties with an assessed value of approximately $40,000,000.

On May 9, 2008, FEMA notified the Cities of Derby and Ansonia that FEMA would be providing updated flood maps for New Haven County and that the land behind the levees would be remapped as areas protected by "Provisionally Accredited Levees" (PALs). In response to this notification, the City executed a Letter of Agreement and Request for PAL designation and an agreement to provide adequate compliance with 44 CFR 65.10. Under the terms of this agreement, the City was to provide FEMA with the supporting documentation to show that the levees comply with the regulations. If documentation was not provided, FEMA indicated that they will initiate a task order with their mapping consultant to revise the FIRM to redesignate the areas behind the levees as prone to flooding. Certification for the Derby levee system has been achieved.

The Naugatuck River levee system in Derby has been recertified by the U.S. Army Corps of Engineers in 2010. The certification allowed FEMA to maintain the classification of the floodplain area protected by the levee as "Zone X: Protected by Levee." One consequence of this recertification was that many residents and

businesses within this zone continued to not require flood insurance. The levee system is considered to be in good condition although many of its components are aging and must be manually operated.

The levee system is considered to be in good condition although many of its components are aging and must be manually operated. The U.S. Army Corps of Engineers were reportedly pleased with the system improvements during the most recent inspection in September 2020. The City plans to seek funding to install a flood warning system and ideally to install automatic controls to reduce the manual effort needed to operate the levee.

Bridge Replacements, Drainage, and Maintenance

The Public Works Department is in charge of maintaining catch basins, bridges, and culverts. Drainage complaints are routed to Public Works and recorded. The City uses these reports to identify potential problems and plan for maintenance and upgrades. Time sensitive flood complaints during flooding events are routed to the Fire Department. The Fire Department has the equipment necessary to pump out flooded basements (pump-outs are not always possible and are dependent on neighborhood water levels). Long-term drainage problems are typically directed to the Mayor's office. The EMD often performs outreach to properties who contact the Mayor's office.

The Gilbert Street area in Derby suffers flooding from a stream that flows from two reservoirs at Witek Park. The city has a policy of drawing down the two dams to provide some flood abatement and reduce flows in the outlet stream. However, high flows sometimes occur, which jump the culverts and cause flooding downstream in the Gilbert Street area.

Flood Watches and Warnings

The City receives regular weather updates through DEMHS Region 3 email alerts and can also access the Automated Flood Warning System to monitor precipitation totals and river stage changes. The Connecticut DEEP installed the Automated Flood Warning System in 1982 to monitor rainfall totals as a mitigation effort for flooding throughout the state.

Warnings are particularly necessary for the Housatonic River below the Stevenson Dam as the flooding in this area can rapidly catch the riverfront neighborhoods off guard in Derby. While these warnings have not always prevented a loss of property, they have prevented loss of life.

NFIP Participation

Derby has participated in the NFIP since 09/15/1977. The Flood Insurance Rate Map (FIRM) for the community was most recently updated in 05/16/2017. Derby does not participate in the FEMA Community Rating System (CRS) program.

According to FEMA, there are 26 flood insurance policies in force in Derby as of 6/30/2019 with an insurance value of $6,694,500.

The previous edition of this HMP noted

New Capabilities and Completed Actions

Derby continues to maintain its strong flood mitigation capabilities.

The City has reportedly acquired a number of properties that had been affected by flooding from the unnamed stream flowing from the Lower Ansonia Reservoir. Structures on these properties have been demolished.

A consultant has designed channel improvements from the Lower Ansonia Reservoir at Sentinel Hill Road downstream to the culvert at the bottom of the hill which were constructed in 2013. The mitigation has helped reduce the flooding risk in this area.

Derby staff report that all three repetitive loss properties in the City have been mitigated (discussed further below).

Summary

In summary, the City has primarily attempted to mitigate flood damage and flood hazards by restricting activities in floodprone areas and relying on existing flood control structures such as dams and levees. The former is primarily carried out through the Planning and Zoning Commission working with the Building Officials. The City anticipates that a wider range of mitigation efforts will be utilized in the future, including additional elevations and acquisitions of floodprone structures.

3.2 Vulnerabilities and Risk Assessment

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

Vulnerability Analysis of Specific Areas

Flooding is known to occur along numerous watercourses in the City. These areas are described below, grouped by drainage basin.

Housatonic River

Riverine flooding occurs downstream of the Stevenson Dam along the Housatonic River in Shelton, Seymour, and Derby. The floodprone section is from the Stevenson Dam (upstream of Shelton) to the Derby Dam, which spans the river at downtown Shelton and Derby.

McConney Grove, 9/8/11

Residential properties along the Housatonic River in Derby are floodprone. Approximately 25 homes in the McConney Grove neighborhood off Roosevelt Drive are at risk for flooding, and several residents have been evacuated during past flood events. This neighborhood is located across the river from the Maples neighborhood of Shelton which suffered extreme damage during the March

2011 flood. Residents in this area have been approached about buyouts, and have indicated that are not interested. The Emergency Management Director performs direct door-to-door outreach each year, encouraging residents to sign up for the Reverse 911 system and advising of the flood risk.

O'Sullivan's Island in downtown Derby was completely submerged during the March 2011 flood. A web page describing the flooding in Derby can be viewed at www.electronicvalley.org/derby/2011/flooding.htm. One RLP was located on the island, but the structure has been removed.

Naugatuck River

The Naugatuck River is largely controlled by upstream flood control dams and the flood control system of levees and floodwalls in Ansonia and Derby. Areas behind the levees are designated as "Zone X Protected by Levee," but they can be flooded.

During Tropical Storm Irene, the floodgates on the Naugatuck River were reportedly closed for the first time in 47 years. The Housatonic River experienced backwater conditions in this area as a result of the incoming storm surge, which led to water moving northward up the Naugatuck River.

Gilbert Street Area

According to Derby officials, the most pressing flooding issue in the city after McConney's Grove is the Gilbert Street area. This is a densely developed residential neighborhood on a steep slope. Flooding is associated with an unnamed tributary to the Housatonic River that flows from the two former Ansonia Reservoirs located in Witek Park. Recently, new culverts have been installed on and along Gilbert Street to relieve flooding in this area.

The stream flowing from the reservoirs is flashy, and its flow can overflow culverts, leading to water flowing down Crescent Street and Gilbert Street as well as through residential properties and structures. When large-scale rain events take place, homes and properties experience damage to basements and driveways. To date, hundreds of thousands of dollars in claims have been made against the city, of which the city has paid a portion. The city implements a policy of drawing down the two dams at Witek Park to provide flood abatement and reduce flows in the stream whenever large-scale rain events are forecast. This is written in the Public Works policy. Flood mitigation is needed in this area. One home in particular should be acquired for implementation of the current mitigation plan.

Downstream, the watercourse flows under Route 34 in a culvert toward the Housatonic River. During high flows, the stream overtops Route 34 with up to a foot of water causing the major arterial roadway to be closed. Additionally, overtopping reportedly occurs when the Housatonic River is high and backwater conditions inhibit the stream from flowing freely through the culvert.

The city has commissioned design of improvements to alleviate flooding in the Gilbert Street area. The preferred design will replace the headwall on the south side of Crescent Street with a new culvert/headwall combination that will allow capture of a higher flow, which will reduce flooding where the stream jumps the culvert, and will replace sections of the culvert beneath outbuildings, homes, and Gilbert Street with upsized sections that avoid buildings and convey greater flow rates. The new sections of the system will join the existing 48-inch by 76-inch culvert at the intersection of Bank Street, Gilbert Street, and Route 34. The system has been designed to convey the 50-year design flow. At the present time, upstream components cannot convey the 10-year storm.

Other Areas of Risk

Properties along Great Hill Road have experienced flooding due to nearby wetlands in recent years.

Minor flooding occurs downstream of O'Sullivan Road near Sodom Lane in Derby. The detention ponds in this area require routine maintenance, which is not occurring as needed. As a result, flooding is exacerbated downstream. Commercial buildings and parking lots on the south side of Sodom Lane experience flooding. High intensity storms have caused flooding of parking areas and basement flooding of these businesses. The frequency of flooding in this area seems to have increased over the last few years. Twomile Brook flows beneath some of the buildings and parking lots in culverts.

Summary

In summary, flooding problems are apparent in certain areas of the City. Flooding events along watercourses with or without SFHAs often result in damage to insured and uninsured structures, roads, and other drainage systems. Many properties that formerly had routine basement flooding have been self-mitigated by installing curtain drains and sump pumps. Priority flooding areas to address are the McConney Grove neighborhood and Gilbert Street.

Vulnerability Analysis of Private Properties

In 2012, the software platform *ArcGIS* was utilized along with 2010 *Microsoft Virtual Earth* aerial photography to determine the number of structures located within the various floodplains within the City. According to that analysis, Derby has 96 structures within the 100-year floodplain or floodway.

Repetitive Loss Properties

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

Table 3-1: Repetitive Loss Properties in Derby

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

Based on correspondence with the City, all three RLPs formerly listed in Derby have been mitigated through demolition. One RLP on O'Sullivan Island was classified as commercial/industrial use, and has been vacated and demolished. The other two properties were reportedly located south of Main Street in an area where many buildings have been demolished. Derby should work with FEMA and CT DEEP to update the RLP list.

The City recognizes that many private properties may suffer flood damage that is not reported because the structures are not insured under the NFIP. These residents and business owners are likely repairing structures on their own. Flood mitigation as recommended in this plan will likely help many of these property owners.

Vulnerability Analysis of Critical Facilities

A number of critical facilities in Derby are associated within a FEMA-mapped 1% annual-chance or 0.2% annual chance floodplain (including Zone X-Protected by Levee). These facilities are listed below:

Table 3-2: Critical Facilities Located Within or Adjacent to Floodplains

Name or Type	Address	Flooding Source
Police Department	Water Street	Naugatuck River
WPCA Stormwater Pump Stations	Multiple Locations	Naugatuck/Housatonic Rivers
Derby Dam	Housatonic River	Housatonic River

Although some of these facilities are protected by the Derby and Ansonia flood control systems, the potential exists that these critical facilities can become flooded any year.

Recent Events

A September 25, 2018 storm brought high-intensity rainfall to Derby, and several areas of the City experienced flooding:

- Route 34 near Chapel Avenue was flooded as drainage systems were overwhelmed by the amount of precipitation. This area has reportedly not been a flood issue in the past. Route 34 also experienced flooding near A Street and B Street, near the Housatonic River.
- The detention pond on O'Sullivan Road overtopped and caused flooding downstream.
- The heavy rains resulted in significant erosion from the High School construction site that was in operation at the time. This led to downstream siltation.
- Flooding occurred on Pershing Drive and Seymour Avenue near Summer and Winter Streets due to overwhelmed drainage systems. The drainage from these areas is directed to the Naugatuck River through the dike.

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

Historic Sites
- Historic Sites

Flood Zone
- A
- AE
- Floodway
- X: 0.2% Annual Chance
- Reduced Risk Due to Levee

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Flood Hazards in Derby

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

N

0 1,500 3,000
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 Derby is 115 mph for a Category 1 event, 125 mph for a Category 2, and 135 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.

United Illuminating (UI), the local electric utility, provides tree maintenance near its power lines. The City participates in annual training that has benefited both UI and the City by enhancing understanding between the two entities. Response times and restoration efforts by UI are well-understood by City staff.

The City's Tree Warden performs tasks with variable responsibilities and resources as noted below:

- The Public Works Director holds the position of Tree Warden in the city.
- The old and threatening trees in the city's rights-of-way and on city property are maintained and removed as needed.
- Trees on private properties are not handled by the program.
- UI performs a limited amount of tree trimming, which typically includes branches within five feet of its wires.

In general, clearance between trees and overhead electrical lines throughout the city has good. The City of Derby believes that its tree maintenance program has helped during past events like Tropical Storm Irene and Winter Storm Alfred. Only 125 properties lost power during Tropical Storm Irene, and only 42 lost power as a result of Winter Storm Alfred, in comparison to hundreds to thousands of properties losing power in other Connecticut municipalities during both disasters.

Prior to severe storm events, the City ensures that warning/notification systems and communication equipment are working properly and prepare for the possible evacuation of impacted areas. Derby relies

on Reverse 911 for communicating emergency alerts to citizens. In addition, all municipalities rely on radio, cable television, area newspapers, and the internet to spread information on the location and availability of shelters. Text messaging, another powerful tool, should be explored by each municipality as an option of relaying emergency-related messages to citizens. It is understood that several of these information sources can be cut off due to power failure, so emergency personnel should also pass this information on manually.

New Capabilities and Completed Actions

Derby continues to maintain its strong tropical cyclone mitigation capabilities. The City has improved coordination with United Illuminating in recent years, and strengthened tree maintenance activities.

Summary

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

4.2 Vulnerabilities and Risk Assessment

Derby is susceptible to both high winds and flooding from heavy inland precipitation caused by hurricanes. Wind damage is a risk throughout the City, flooding is possible along rivers and in areas with poor drainage, and structures along the tidal portion of the Housatonic River below the Derby Dam are vulnerable to storm surge.

Of particular concern to Derby staff are the blockage of roads and the damage to the electrical power supply from falling trees and tree limbs. According to municipal officials, most areas within the City are vulnerable to falling trees and limbs with the exception of each city or town center where the number of trees is significantly lower.

The City's housing stock consists of many historic buildings and homes greater than 50 and sometimes 100 years old, relatively younger buildings built before the 1990s when the building codes changed to mitigate for wind damage, and relatively recent buildings that utilize the new code changes. Since most of the existing housing stock in the municipalities predates recent code changes, many structures are highly susceptible to roof and window damage from high winds.

According to city officials, municipally owned critical facilities do not have wind-mitigation measures installed to specifically reduce the effects of wind. Thus, it is possible that many of the critical facilities in the City are as vulnerable to damage from hurricane-force winds as other noncritical structures. Newer critical facilities, such as Griffin Hospital and the Cancer Center, are considered to be the most resistant to wind damage even if they are not specifically wind resistant for hurricane gusts.

Also of particular concern are the conditions of levees and dams such as the Witek Park dams, the Derby Dam on the Housatonic River, and others that necessitate emergency planning during a high-precipitation hurricane event.

Areas identified by City staff as being highly prone to wind damage include heavily wooded areas on Silver Hill and Great Hill. In addition, many trees at Osbornedale State Park are reportedly rotting inside without

external indicators; these unhealthy trees have fallen and resulted in blocked roads and power outages along Route 34 before UI or City staff were aware that they were potential risks. UI is aware of the problems in this area.

Tropical Storm Isaias struck Derby in August 2020. Tree damage occurred throughout the city, and power outages lasted up to five days in some areas. The outages were generally due to single trees damaging main power lines leading into outer neighborhoods. Flooding was not an issue for the City during this storm.

5.0 SUMMER STORMS AND TORNADOES

5.1 Existing Capabilities

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

- Developing and disseminating emergency public information and instructions concerning tornado, thunderstorm wind, lightning, and hail safety, especially guidance regarding in-home protection and evacuation procedures and locations of public shelters.
- Designating appropriate shelter space in the community that could potentially withstand lightning and tornado impact.
- Periodically test and exercise tornado response plans.
- Putting emergency personnel on standby at tornado "watch" stage.
- Providing all summer storm and tornado mitigation procedures and plans to the public in appropriate municipal buildings, on municipal websites, and through municipal social media platforms.

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 Derby as explained in Section 4. The City has a Tree Warden and as-needed programs for tree trimming, and UI has tree trimming maintenance programs in place. Utilities in new subdivisions must be located underground whenever possible in order to mitigate storm-related wind damage. The Public Works Department has the necessary equipment to clean up downed tree limbs and brush following major wind events.

In addition, the Connecticut State Building Code includes guidelines for the proper grounding of buildings and electrical boxes.

New Capabilities and Completed Actions

Derby 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

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

5.2 Vulnerabilities and Risk Assessment

Thunderstorms are expected to impact the City at least 20 days each year. The majority of these events do not cause any measurable damage. Although lightning is usually associated with thunderstorms, it can occur on almost any day. The likelihood of lightning strikes in the City is very high during any given

thunderstorm. The risk of at least one hailstorm occurring in City is considered moderate in any given year. The City has moderate to high potential to experience tornado damage in the future.

Most thunderstorm damage is caused by straight-line winds (called by names including downbursts, microbursts, and macrobursts) exceeding 100 mph. The risk of downbursts damaging the City is believed to be moderate for any given year. All areas of the City are susceptible to damage from high winds, although more building damage is expected in the City center and the densely populated neighborhoods surrounding them.

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

Two of Derby's emergency shelters, the Bradley School and the St. Mary – St. Michael School, lack generators, and may therefore have reduced capacity to serve the community following a summer storm wind event.

Based on the historical record, only a few summer storms or tornadoes have resulted in costly damages to Derby. Most damages are relatively site-specific and occur to private property (and therefore are paid for by private insurance). For municipal property, city budgets for tree removal and minor repairs are generally limited to handling routine summer storm damage. The EF1 tornado that caused minor property damage along a 0.5-mile path through eastern Shelton in 2009 and the EF1 tornado that struck Bridgeport in 2010 have raised awareness regarding the potential catastrophic damage such storms can cause and the possibility of one taking place within the area. Tornadoes also struck the region in May of 2018. Significant tree damage occurred in Derby near the boundaries with Ansonia and Seymour. Power outages were isolated and short-duration. Developed areas of the City did not experience damage.

6.0 WINTER STORMS

6.1 Existing Capabilities

Capabilities specific to winter storms are those related to preparing plows and sand and salt trucks; tree trimming and maintenance to protect utilities, roads, and structures; and other associated snow removal and response preparations.

The Connecticut Building Code specifies that a weight of 30 pounds per square foot be used as the base "ground snow load" for computing snow loading for different types of roofs. Protocols for removal of snow from municipal building roofs is considered to be sufficient in Derby.

Derby has a robust tree-trimming program, and coordinates closely with UI on trimming near power lines.

The Connecticut DOT works with Derby's Public Works to conduct the majority of plowing within the community. Within Derby, the Connecticut DOT plows Routes 8 and 34. Private developments are responsible for their own plowing while municipal roadways are plowed by the Public Works. Primary routes and bus routes are prioritized. Although the City has set plowing routes, they are not made available to the public. During a storm event, Public Works personnel divert plow crews based on emergency radio communications to ensure road access to areas that require emergency response.

Ice jams along the Naugatuck and Housatonic Rivers have not been an issue for the City.

New Capabilities and Completed Actions

Derby continues to maintain its strong winter storm mitigation capabilities.

Summary

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

6.2 Vulnerabilities and Risk Assessment

High wind and loads from snow or ice can take down tree limbs or entire trees. Falling limbs and trees can block roads, cause power outages, and damage property. Additionally, there is a high propensity for traffic accidents during heavy snow and even light icing events. Roads may become impassable, inhibiting the ability of emergency equipment to reach trouble spots as well as the accessibility to medical and shelter facilities. Stranded motorists, especially senior and/or handicapped citizens, are at a particularly high risk during a blizzard.

A major winter storm struck the region in January 2015. Derby staff report that the City was fully capable of handling the event. The snow required a significant plowing effort, but did not cause any notable damage. A multi-alarm structure fire occurred during the storm, but the fire department was able to access and suppress the fire.

7.0 GEOLOGICAL HAZARDS

7.1 Existing Capabilities

Due to the infrequent nature of damaging earthquakes or landslides, land use policies in the City do not directly address these hazards. Landslides, slumps, and retaining wall failures that occur on private properties are considered to be the responsibility of the property owners. When such failures occur on municipal property or affect municipal utilities, then, generally, the Public Works Department is in charge of repairs

Nevertheless, various regulations indirectly address areas susceptible to earthquake damage and regulations that help to minimize potential earthquake damage.

The POCD for Derby makes reference to steep slopes in the "strategies" lists within the natural resources discussion, indicating that the community desires avoiding development on steep slopes. However, much of the Land available for development in the City consists of steep slopes, and City personnel will need to be careful in their review of development proposals.

New Capabilities and Completed Actions

Derby continues to maintain its earthquake and landslide mitigation capabilities.

The slumping issue at Commodore Commons has been mitigated by the property owner by jacking the building floor.

Summary

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

7.2 Vulnerabilities and Risk Assessment

Earthquake Vulnerabilities

The center of Derby, being adjacent to the Naugatuck River, is underlain by alluvium or sand and gravel. Structures in this area are at increased risk from earthquakes due to amplification of seismic energy and/or collapse. The areas that are not at increased risk during an earthquake due to unstable soils are those underlain by glacial till.

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

A series of earthquake probability maps was generated using the 2009 interactive web-based mapping tools hosted by the USGS. These maps were used to determine the probability of an earthquake of greater than magnitude 5.0 or 6.0 damaging the region. Results are presented in the table below.

Table 7-1: Probability of a Damaging Earthquake

Time Frame (Years)	Probability of an Earthquake > Magnitude 5.0	Probability of an Earthquake > Magnitude 6.0
50	1% to 2%	<1%
100	4% to 6%	<1%
250	8% to 10%	2% to 3%
350	12% to 15%	2% to 3%

While the risk of an earthquake affecting the City is relatively low over the short term, long-term probabilities suggest that a damaging earthquake (magnitude greater than 5.0) could occur and affect the City. Despite the low probability of occurrence, earthquake damage presents a potentially significant hazard to the City.

Landslide Vulnerabilities

The overall likelihood of a landslide occurring in the City is considered to be moderate for any given year. Although direct landslide damage generally impacts only a small area on and at the base of the slope that has failed, utilities damaged by a landslide can have more of a widespread impact.

Landslides and slumps often occur near watercourses when slopes are undercut and become unstable. In areas where the drainage network is comprised only of sheet flow, roadways can act as watercourses and cause landlides. For example, when construction activities undermine the natural grade of a hill, the hillside can collapse.

All developed areas on steep slopes are considered vulnerable to landslides. These areas are found throughout the City but are concentrated on the *peripheries* of the central business district or historic downtown area of Derby. Most landlides in Derby occur in these peripheral areas.

Recent landslide-related concerns in Derby include:

- The area behind 233 Derby Avenue has the potential for mudslides. During such an event, large trees at the top of the slope could fall downslope.
- The area behind Shop Rite has landslide potential.
- Rocks have fallen on certain areas of Route 34.

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.

According to Connecticut DEEP Dam Safety files, a DFA was performed on the Lake Housatonic Dam (Class C) in Derby. DFAs are the first step in understanding the impacts of a particular dam failure and are therefore necessary for mitigation.

Actions Completed and New Capabilities

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

Derby owns Ansonia Reservoir Dam which is undergoing continued maintenance by Public Works. Engineers have been evaluating the necessary repairs and upgrades for the dam. It is reportedly difficult to drawdown the impoundment because the reservoir is quickly spring fed.

The State owns several dams in Osbornedale State Park. The City does not have any information regarding these dams, but it is believed that they are in acceptable condition.

Summary

Derby 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 10 DEEP-inventoried dams within Derby. Six of these dams had a Significant or High Hazard Potential rating. These dams are listed in Table 8-1 and shown in Figure 8-1.

Table 8-1: DEEP-Inventoried Dams in Derby

Number	Name	Class	Owner
3701	LAKE HOUSATONIC DAM aka DERBY DAM	C	Power Utility
3702	LOWER ANSONIA RESERVOIR DAM	C	Municipal
3703	PICKETTS POND DAM	B	State Owned
3704	UPPER ANSONIA RESERVOIR DAM	C	Municipal
3705	LEMAYS POND	A	Municipal
3706	DERBYSHIRE DETENTION DAM		Private
3707	NORWOOD DETENTION BASIN DAM		Private
3708	UPPER ANSONIA RESERVOIR EAST DIKE (SEE 3704)	C	Municipal
3709	DERBY HOUSATONIC LEVEE	C	Municipal
3710	KELLOGG aka OSBORNDALE POND DAM	BB	

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

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

#	Name	Class	EAP Status	EAP Status Date
3701	LAKE HOUSATONIC DAM aka DERBY DAM	C	FERC Regulated DamNo Review Needed	7/21/2017
3702	LOWER ANSONIA RESERVOIR DAM	C	Review letter sent revisions needed	5/6/2019
3703	PICKETTS POND DAM	B	Review letter sent revisions needed	2/20/2019
3704	UPPER ANSONIA RESERVOIR DAM	C	Review letter sent revisions needed	5/6/2019
3708	UPPER ANSONIA RESERVOIR EAST DIKE	C	Review letter sent revisions needed	5/6/2019
3709	DERBY HOUSATONIC LEVEE	C	Working with Municipality - LEVEE	

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

Lake Housatonic Dam (No. 3701), or "Derby Dam"

Lake Housatonic Dam (No. 3701), or "Derby Dam" stretches the width of the Housatonic River just upstream of the confluence of the Housatonic and Naugatuck Rivers from the area of Roosevelt Drive in Derby to the area of Howe Drive (Route 110) in Shelton. The impoundment is owned and operated by McCallum

Enterprises I LP with a Federal Energy Regulatory Commission license. The dam's spillway is approximately 675 linear feet in length with flashboards. On the Derby side, the dam features an abutment wall, the Derby Gatehouse located upstream of the abutment wall which controls flow into the Derby Canal, the inlet to the Derby Canal, and the Derby Dike upstream from the Gatehouse extending 400 feet to the Yale Boathouse. On the Shelton side, an old Shelton Gatehouse with five permanently open gates controls the flow to the historical Shelton Canal. The Shelton Gatehouse and Shelton Canal no longer serve as water retention structures for the Housatonic Lake.

The main spillway has an average crest of 23 feet, is 675 feet in linear length and is comprised of cut stone and concrete arched in plan, and the spillway abutments have vertical stone masonry walls with a left (Derby) abutment top elevation of 30 feet and a right (Shelton) top elevation of 35 feet. The most recent EOP, which includes inundation mapping and an inundation area description, is dated 2009.

An Inflow Design Flood (IDF) breach of 16,500 cubic feet per second (cfs) antecedent river flow would result in the flooding of Canal Street, Riverdale Avenue, and those intersecting streets in Shelton. The same breach would result in flooding of Roosevelt Drive south of D Street, A Street, B Street, C Street, Park Avenue south of C Street, the low area protected by dikes at the confluence of the Naugatuck and Housatonic Rivers bounded to the north by Division Street, west near Water Street, north of Main Street, and the area south of Main Street.

Upper and Lower Ansonia Reservoir Dams (No. 3704 and 3702)

Upper and Lower Ansonia Reservoir Dams (No. 3704 and 3702) are located to the north of Academy Hill/Sentinel Hill Road in the northern section of Derby. Both Dams are designated as Class C. The dams are located on a tributary to the Naugatuck River and, according to Dam Safety Section files, were both most recently inspected on June 29, 2011 and found to be in need of maintenance. The dams were originally created for water supply in 1887 but are now both owned by the City of Derby.

The Upper Ansonia Reservoir Dam is 345 feet in linear length and constructed of masonry materials, with a dam height of 20.8 feet, crest elevation of 307 feet, and a crest width of 4.8 feet. The dam's spillway is weir type with zero feet of freeboard, is 20.5 feet in length, and was deemed inadequate by CT DEEP inspectors. The impounded surface area is 34 acres with a maximum storage of 310 acre-feet and a maximum discharge of 240 cfs.

The most recent inspection report for the Upper Ansonia Reservoir Dam listed the dam's condition as fair. The inspection asked Derby to retain the service of an engineer to evaluate seepage areas, investigate the dam and embankment conditions, supervise the removal of large trees near the dam, design and implement any necessary repairs, obtain a dam permit for any construction or demolition work, and update the EOP and submit. An EOP was not on file at the Dam Safety Section.

The Lower Ansonia Reservoir Dam is 423 feet in linear length and constructed of earthen materials, with a dam height of 17.8 feet, crest elevation of 277 feet, and a crest width of 25 feet. The dam's spillway is comprised of masonry materials, is weir type, and was deemed inadequate by CT DEEP inspectors. The impounded surface area is 9.6 acres with a maximum storage of 90 acre-feet and a maximum discharge of 210 cfs.

The most recent inspection report for the Lower Ansonia Reservoir Dam listed the dam's condition as fair. The inspection stated that any repairs are to be carried out in accordance with plans and specifications

prepared by an engineer and that a dam repair permit is needed for any construction or demolition work. The inspection also included a list of maintenance items similar to that provided for the Upper Ansonia Reservoir Dam. The Dam Safety Section requested that the city update the EOP. No EOP was on file at the Dam Safety Section.

Dam Hazard Class

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

Critical Facilities

- Critical Facilities

Historic Sites

- Historic Sites

Dam Failure Hazards in Derby

NVCOG Hazard Mitigation Plan Update

Naugatuck Valley Council of Governments

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

47 Leavenworth Street, 3rd Floor
Waterbury, CT 06702

N

0 1,500 3,000
Feet

DATE 6/15/2021

141.3211.00029
PROJ. NO.

FIG. 8-1

9.0 WILDFIRES

9.1 Existing Capabilities

Existing mitigation for wildland fire control is typically focused on Fire Department training and maintaining an adequate supply of equipment. The City's Subdivision Regulations require provision of supplemental water supply systems for fire protection and stipulate that the Fire Department reviews and approves the location, size, design, construction specifications, and installation of these water supply systems. In addition, new roads, subdivisions, and fire ponds are required to allow for fire truck access.

Because prevention is still the primary means of reducing wildfire risks, the DEEP regularly posts updates about wildfire risk and circulates warnings to the press.

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

Actions Completed and New Capabilities

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

Summary

The City mitigates wildfire hazards by implementing the state's Open Burning Program locally, installing dry hydrants and firefighting-water sources in remote areas, and training its fire department to fight wildfires.

9.2 Vulnerabilities and Risk Assessment

The approximately 1,373 acres of forests and undeveloped land in Derby may be susceptible to drought conditions that make them more vulnerable to wildfires. The approximately 280 acres of agricultural fields and maintained grasses may be vulnerable to direct damage from drought conditions. Wildfire risk zones are mapped in Figure 9-1.

In Derby, it was reported by city officials that fires occur in the two large parks in Derby, Witek Park and Osbornedale State Park. Officials believe that the fires are often set by people; however, none have grown large historically as the Derby Fire Department has acted quickly and efficiently to extinguish the areas of fire. It was additionally noted that the development of ball fields in Witek Park has resulted in a fewer number of fires. After a review of aerial photography, it appears that the northeast corner of Derby near the municipal border with Seymour and Woodbridge could also be susceptible to wildfires as it is largely open space and not easily accessible as no public roadways are located here. There is adequate access to the Twomile Brook area via adjacent neighborhoods which has not been a wildfire concern in recent years.

There are areas of the City where roads are narrow and/or one way or are windy through areas of steeper slopes. Amongst other issues, this hinders emergency access to fight fires. These types of areas exist in most pockets described above, further complicating matters.

Should a wildfire occur, it is reasonable to estimate that the average area to burn would be five acres during a drought period and one to two acres during wetter periods, consistent with the state averages. In the case of an extreme wildfire during a long drought on forested lands, it is estimated that up to 300 acres could burn before containment due to the limited access of those lands. This is also consistent with actual data in Connecticut. Residential areas bordering such lands would thus be vulnerable to wildfires.

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Critical Facilities

- Care Facility
- Communications
- Community Center
- 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
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773

Wildfire Hazard in Derby

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

N

0 1,500 3,000
Feet

DATE 6/15/2021

141.3211.00029
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	Responsible Party	Status	Notes
DBY-1	Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series and make them available at the City and City Halls	EMD	Carry Forward	Action not yet completed due to limited municipal capacities.
DBY-2	Disseminate informational pamphlets regarding natural hazards to public locations	EMD	Carry Forward	Action not yet completed due to limited municipal capacities.
DBY-3	Develop checklists for permittees that cross-references regulations and codes related to disaster resilience	PZC, B&E, EMD	Drop	Action not considered necessary.
DBY-4	Require that utilities be placed underground in new developments	PZC	Drop	Underground utilities are installed as appropriate for new developments; a requirement is not considered necessary.
DBY-5	Pursue funding to place utilities underground in existing developments	MO	Carry Forward	Action not yet completed due to limited funding.
DBY-6	Encourage residents to purchase and use NOAA weather radio with an alarm feature	EMD	Capability	This is a capability.
DBY-7	Review and update evacuation route maps at least annually	EMD	Capability	This is a capability and performed with the regular EOP update.
DBY-8	Install evacuation signs in SFHAs	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-9	Consider floodproofing measures at the Derby WWTP on Factory Street	PW	Carry Forward with Revision	Action not yet completed due to limited funding.

Strategy	Description	Responsible Party	Status	Notes
DBY-10	Consider floodproofing measures at the Derby Police Station	EMD, PD	Carry Forward with Revision	Action not yet completed due to limited funding.
DBY-11	Consider floodproofing measures for sewer pumping stations in SFHAs	PW	Carry Forward with Revision	Action not yet completed due to limited funding.
DBY-12	Purchase and install a generator for Derby Middle School (one of the two sheltors) at 10 Nutmeg Avenue	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-13	Purchase and install a generator for Bradley School (one of the two shelters) at 155 David Humphrey Road	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-14	Consider purchasing and installing a generator at Storm Engine Company No. 2 (temporary shelter) at 151 Olivia Street	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-15	Consider purchasing and installing a generator at East End Hose Company No. 3 (temporary shelter) on Derby-Milford Road	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-16	Consider purchasing and installing a generator at Paugassett Hook & Ladder Company No. 4 (temporary shelter) at 57 Derby Avenue	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-17	Pursue ARC certification of Derby shelters	EMD	Carry Forward	Action not yet completed due to limited funding.
DBY-18	Continue to regulate activities within SFHAs to the greatest extent possible with the municipal codes and Zoning and Subdivision Regulations	PZC, B&E	Complete	This is a capability.
DBY-19	Consider requiring new buildings in floodprone areas to be protected to the highest recorded flood level regardless of SFHA status	PZC, B&E	Drop	Use of the elevations in the FIS (plus freeboard) is more appropriate for the City.
DBY-20	Ensure that new buildings be designed and graded to shunt drainage away from the building	PZC, B&E	Capability	This is a capability (building code).
DBY-21	Require developers to demonstrate whether detention or retention of storm water is the best option for reducing peak flows downstream	PZC, B&E	Capability	This is a capability.

Strategy	Description	Responsible Party	Status	Notes
DBY-22	Consider revising the section of the Derby Zoning Regulations that implies that structures can be built below flood elevation (195-112(C))	PZC	Carry Forward with Revision	Action has not yet been completed due to limited municipal capacities. Structures must be built above flood elevations per State building code.
DBY-23	Ensure that redevelopment of O'Sullivan's Island in Derby is flood damage resistant	PZC, B&E	Complete	Redevelopment project include flood damage resistance measures.
DBY-24	Provide technical assistance to owners of non-residential structures regarding floodproofing measures such as wet and dry floodproofing	EMD, B&E	Capability	This is a capability.
DBY-25	Pursue elevation of residential structures that suffer flood damage; RLPs should be prioritized.	EMD, MO	Capability	City has the capacity to provide guidance and technical assistance to property owners interested in pursuing elevation.
DBY-26	Consider enrolling in the Community Rating System	EMD, B&E	Drop	City is not intending to enroll is CRS in the near future.
DBY-27	Provide outreach regarding structure elevation, flood barriers, dry and wet floodproofing, and other improvement techniques	EMD, B&E	Complete	This is a capability.
DBY-28	Ensure that EMDs and other personnel attend DEEP and other training workshops such as the FEMA-sponsored training at EMI in Maryland	EMD, B&E	Complete	This is a capability.
DBY-29	Pursue acquisition/demolition of residential structures that suffer flood damage; RLPs should be prioritized.	EMD, BOS/BOA	Capability	Action performed as appropriate.
DBY-30	Pursue the acquisition of additional municipal open space in SFHAs	MO	Capability	Action performed as appropriate.
DBY-31	Selectively pursue conservation recommendations listed in the Plan of Conservation and Development and other studies and documents	MO	Capability	This is a capability.
DBY-32	Continue to regulate development in protected and sensitive areas, including steep slopes, wetlands, and floodplains	PZC	Capability	This is a capability.
DBY-33	Implement the drainage improvements to the Gilbert Street area to reduce flooding; acquire properties as needed to facilitate	PW	Complete	Action has been completed.

Strategy	Description	Responsible Party	Status	Notes
DBY-34	Work with owners of ret. ponds along Twomile Brook trib. that are causing nuisance flooding in the O'Sullivan Rd/Sodom Ln area to ensure they are maintained	PW	Carry Forward	Action not yet completed due to limited funding.
DBY-35	Continue tree limb inspections and maintenance and outreach to private property owners regarding branches above powerlines	TW	Capability	This is a capability.
DBY-36	Increase funding for the Tree Warden to address a wider range of tree limb hazards than the current budget allows	TW, MO	Carry Forward	Action not yet completed due to limited funding.
DBY-37	Provide for the Building Department to make literature available during the permitting process regarding appropriate design standards for wind	B&E	Capability	Information is available through the State Building Code
DBY-38	Encourage the use of wind-mitigation structural techniques in new structures to protect new buildings to a greater level than the required standard	B&E	Drop	City implements State Building Code locally. This is considered sufficient.
DBY-39	Conduct a study to identify municipal buildings, critical facilities, and commercial/industrial buildings that are vulnerable to roof damage or collapse	PW, B&E	Carry Forward	Action not yet completed due to limited funding.
DBY-40	Develop a plan to prioritize snow removal from the roof of municipal buildings (especially critical facilities) and have funding available for clearing	PW, B&E	Capability	This is a capability.
DBY-41	Retrofit or modify critical facilities as needed to strengthen roofs and structures and make them more resilient to snow loading	PW, B&E	Drop	City does not believe this is a cost-effective approach, and will focus on snow removal instead.
DBY-42	Consider posting the snow plowing routes in municipal buildings and the municipal web sites	PW	Drop	City does not believe this action will contribute to hazard mitigation.
DBY-43	Identify areas that are difficult to access during winter storm events and develop contingency plans	PW	Capability	This is a capability.
DBY-44	Provide information for mitigating icing, insulating pipes, and retrofits for flat roofed buildings	PW, B&E	Capability	Information is available through the State Building Code

Strategy	Description	Responsible Party	Status	Notes
DBY-45	Consider preventing residential development in areas prone to collapse such as below steep slopes, or in areas prone to liquefaction	PZC	Carry Forward with Revision	Action not yet completed. New action carried forward to audit zoning regulations in order to identify appropriate updates to limit development in areas at risk of liquefaction, landslides, or other geological hazards.
DBY-46	Consider restricting construction on 25% slopes* and restricting excavation and clearing above and below such slopes	PZC	Drop	Merged with action above.
DBY-47	Consider adopting or codifying USDA guidelines to regulate development in areas of steep slopes	PZC	Drop	Merged with action above.
DBY-48	Consider preserving areas of steep slopes as protected open space through acquisitions or modified zoning	MO	Drop	Merged with action above.
DBY-49	Continue to require adherence to the state building codes	B&E	Capability	This is a capability.
DBY-50	Encourage through-streets instead of dead-end streets	PZC	Capability	This is a capability.
DBY-51	Ensure that utility providers are aware of landslide potentials and have responder teams available to repair damage caused by slides	EMD	Capability	City works closely with utility companies on service reliability.
DBY-52	Make education materials available at Building and Engineering departments regarding identification of landslide risk areas	B&E	Drop	City does not believe this action is necessary.
DBY-53	Consider expanding and over-sizing drainage systems in the vicinity of steep slopes	PW	Carry Forward with Revision	Action has not yet been pursued due to limited municipal capacities.
DBY-54	Encourage property owners to have retaining walls inspected by structural engineers	EMD	Capability	This is a capability.
DBY-55	Ensure that municipal departments and critical facilities have adequate backup facilities in case damage occurs	EMD	Capability	This is a capability.
DBY-56	Work with the owners of the 233 Derby Avenue and adjacent landslide sites to conduct maintenance and prevent future slides	PW	Capability	City monitors this site and intervenes as necessary

Strategy	Description	Responsible Party	Status	Notes
DBY-57	Proactively pursue landslide prevention methods at the base of Gilbert Street in advance of problems	PW	Capability	City monitors this site and intervenes as necessary
DBY-58	Provide support as necessary to Commodore Commons property owners	PW	Capability	
DBY-59	Include dam failure areas in the Reverse 911 and CodeRed emergency contact database	EMD	Drop	
DBY-60	Develop an EOP and maintenance plan for the Upper and Lower Ansonia Reservoirs	EMD	Carry Forward with Revision	EAP submitted; review letter sent by CT DEEP in May 2019. Revisions are still needed.
DBY-61	Continue to support public outreach programs to increase awareness of forest fire danger, equipment usage, and protecting homes from wildfires	FD	Capability	This is a capability.
DBY-62	Ensure that provisions of Subdivision Regulations regarding fire protection facilities are being enforced	PZC	Capability	This is a capability.
DBY-63	Pursue additional sources of fire-fighting water where adequate supplies do not exist	FD, MO	Capability	
DBY-64	Patrol municipal-owned open space and parks to prevent campfires	FD, PD	Capability	This is a capability.
DBY-65	Continue to promote inter-municipal cooperation in fire-fighting efforts	FD	Capability	This is a capability.
DBY-66	Continue to give close attention to Witek Park and Osbornedale Park in Derby during the busy season	FD	Capability	This is a capability.
DBY-67	Enforce regulations and permits for open burning	FD, PD	Capability	This is a capability.

10.3 Prioritization of Strategies and Actions

The STAPLEE method, described in the Multi-Jurisdictional document, was used to score mitigation activities. The STAPLEE matrix in Appendix A provides the total scores. Actions have been further prioritized based on implementation cost, project urgency, and municipal and public input. The strategies below are presented in priority order, with qualitative priority levels listed for each.

10.4 Mitigation Strategies and Actions Implementation Table

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

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

Action DBY-02	
Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	
Lead	EM, Plan, FS
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	High

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

Action DBY-04	
Fully incorporate the provisions of the DEEP model flood regulations into the local flood damage prevention regulations (or ordinance), including but not limited to the required design flood elevations for the first floor, building electrical systems, and building mechanical systems. Specifically address current section of the Regulations that implies that structures can be built below flood elevation (195-112(C))	
Lead	PZC
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action DBY-05	
Increase Substantial Damage and Substantial Improvement lookback periods to two or more years.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action DBY-06	
Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.	
Lead	Plan, FS, NFIP Coordinator
Cost	$0 - $25,000
Funding	OB, FEMA Grant, CT DEEP
Timeframe	2022
Priority	Med

Action DBY-07	
Pursue ARC certification of Derby shelters	
Lead	EMD
Cost	$0 - $25,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2022
Priority	Med

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

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

Action DBY-10	
Work with CT DEEP to make the required revisions to the EAPs for the Lower Ansonia Reservoir Dam, Picketts Pond Dam, and Upper Ansonia Reservoir Dam, as requested in a Review letter sent May 6, 2019.	
Lead	EMD
Cost	$0 - $25,000
Funding	OB, CT DEEP
Timeframe	2022
Priority	Med

Action DBY-11	
Work with owners of ret. ponds along Twomile Brook trib. that are causing nuisance flooding in the O'Sullivan Rd/Sodom Ln area to ensure they are maintained	
Lead	PW
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	Low

Action DBY-12	
Increase funding for the Tree Warden to address a wider range of tree limb hazards than the current budget allows	
Lead	TW, MO
Cost	$0 - $25,000
Funding	OB
Timeframe	2022
Priority	Low

Action DBY-13	
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 DBY-14	
Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series and make them available at the City and Town Halls	
Lead	EMD
Cost	$0 - $25,000
Funding	OB
Timeframe	2022 – 2023
Priority	Low

Action DBY-15	
Disseminate informational pamphlets regarding natural hazards to public locations	
Lead	EMD
Cost	$0 - $25,000
Funding	OB
Timeframe	2022 – 2023
Priority	Low

Action DBY-16	
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 DBY-17	
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 DBY-18	
Audit zoning regulations in order to identify appropriate updates to limit development in areas at risk of liquefaction, landslides, or other geological hazards.	
Lead	PZC
Cost	$0 - $25,000
Funding	OB
Timeframe	2022 – 2024
Priority	Low

Action DBY-19	
Require that drainage systems in the vicinity of steep slopes be expanded and oversized, if doing so will not increase flood risk downstream, in order to avoid saturation of the slopes and the landslides that may result.	
Lead	PW
Cost	$0 - $25,000
Funding	OB
Timeframe	2022 – 2024
Priority	Low

Action DBY-20	
Conduct a study to identify municipal buildings, critical facilities, and commercial/industrial buildings that are vulnerable to roof damage or collapse	
Lead	PW, B&E
Cost	$25,000 - $50,000
Funding	OB, CIP
Timeframe	2022 – 2024
Priority	Low

Action DBY-21	
Purchase and install a generator at Paugassett Hook & Ladder Company No. 4 (temporary shelter) at 57 Derby Avenue	
Lead	EMD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2022 – 2024
Priority	High

Action DBY-22	
Purchase and install a generator for Bradley School (one of the two shelters) at 155 David Humphrey Road	
Lead	EMD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2022 – 2024
Priority	Med

Action DBY-23	
Purchase and install a generator at Storm Engine Company No. 2 (temporary shelter) at 151 Olivia Street	
Lead	EMD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2022 – 2024
Priority	Med

Action DBY-24	
Purchase and install a generator at East End Hose Company No. 3 (temporary shelter) on Derby-Milford Road	
Lead	EMD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2022 – 2024
Priority	Med

Action DBY-25	
Identify and pursue appropriate floodproofing measures at the Derby WWTP on Factory Street	
Lead	PW
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEMHS
Timeframe	2022 – 2024
Priority	Med

Action DBY-26	
Identify and pursue appropriate floodproofing measures at sewer pumping stations in SFHAs	
Lead	DPW
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, FEMA AFG, CT DEMHS
Timeframe	2022 – 2024
Priority	Med

Action DBY-27	
Install evacuation signs in SFHAs	
Lead	EMD
Cost	$25,000 - $50,000
Funding	OB, CT DEMHS
Timeframe	2022 – 2024
Priority	Low

Action DBY-28	
Identify and pursue appropriate floodproofing measures at the Derby Police Station	
Lead	EMD, PD
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant, CT DEMHS
Timeframe	2023 – 2025
Priority	Low

Action DBY-29	
Purchase and install a generator for Derby Middle School (one of the two sheltors) at 10 Nutmeg Avenue	
Lead	EM, DPW
Cost	$100,000 - $500,000
Funding	CIP, FEMA Grant
Timeframe	2025 – 2027
Priority	Low

Action DBY-30	
Install emergency generators at critical facilities, including Storm Engine Company No. 2, and other firehouses.	
Lead	EM, DPW
Cost	More than $500,000
Funding	CIP, FEMA Grant
Timeframe	2025 – 2027
Priority	Low

Action DBY-31	
Pursue funding to place utilities underground in existing developments	
Lead	MO
Cost	More than $500,000
Funding	CIP, CT DEEP
Timeframe	2026 – 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	
DBY-01	Take one of the following actions that will mitigate natural hazard risks while also meeting Sustainable CT objectives: 1. Disseminate a toolkit for pre-disaster business preparedness. 2. Revise regulations to promote Low Impact Development. 3. Include the goals of this Hazard Mitigation Plan, and at least three other sustainability concepts, in your next POCD update.	Sustainable CT	Plan	$0 - $25,000	OB, CT DEEP, Sustainable CT	2022	1	1	1	1	1	1	1	0	0	0	0	0	0	0	9
DBY-02	Contact the owners of Repetitive Loss Properties and nearby properties at risk to inquire about mitigation undertaken and suggest options for mitigating flooding in those areas. This should be accomplished with a letter directly mailed to each property owner.	RLP	EM, Plan, FS	$0 - $25,000	OB	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-03	Work with CT DEEP to complete a formal validation of the Repetitive Loss Property list and update the mitigation status of each listed property.	RLP	EM, Plan, FS	$0 - $25,000	OB, CT DEEP	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-04	Purchase and install a generator at Paugassett Hook & Ladder Company No. 4 (temporary shelter) at 57 Derby Avenue	Sheltering Capabilities	EMD	$100,000 - $500,000	CIP, FEMA Grant, CT DEMHS	2022 – 2024	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-05	Fully incorporate the provisions of the DEEP model flood regulations into the local flood damage prevention regulations (or ordinance), including but not limited to the required design flood elevations for the first floor, building electrical systems, and building mechanical systems. Specifically address current section of the Regulations that implies that structures can be built below flood elevation (195-112(C))	Flood Regulations	PZC	$0 - $25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	5
DBY-06	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
DBY-07	Remain engaged with FEMA and the State during the Housatonic River Watershed flood map updates. Review draft maps and provide comments to FEMA.	Flood Map Updates	Plan, FS, NFIP Coordinator	$0 - $25,000	OB, FEMA Grant, CT DEEP	2022	1	1	1	0	1	0	1	0	0	0	-1	0	0	0	5
DBY-08	Pursue ARC certification of Derby shelters	Sheltering Capabilities	EMD	$0 - $25,000	CIP, FEMA Grant, CT DEMHS	2022	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-09	Remain engaged with CIRCA's Resilient Connecticut project and utilize vulnerability mapping tools to help with local planning and project development.	Resilient CT	Plan	$0 - $25,000	OB, CT DEEP, Resilient CT	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	0	7
DBY-10	Work with CIRCA to develop potential risk reduction pilot projects in the identified "adaptation/resilience opportunity areas" near and in locations of transit-oriented development (TOD).	Resilient CT	Plan	$0 - $25,000	OB, CT DEEP, Resilient CT	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	0	7
DBY-11	Purchase and install a generator for Bradley School (one of the two shelters) at 155 David Humphrey Road	Sheltering Capabilities	EMD	$100,000 - $500,000	CIP, FEMA Grant, CT DEMHS	2022 – 2024	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-12	Purchase and install a generator at Storm Engine Company No. 2 (temporary shelter) at 151 Olivia Street	Sheltering Capabilities	EMD	$100,000 - $500,000	CIP, FEMA Grant, CT DEMHS	2022 – 2024	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-13	Purchase and install a generator at East End Hose Company No. 3 (temporary shelter) on Derby-Milford Road	Sheltering Capabilities	EMD	$100,000 - $500,000	CIP, FEMA Grant, CT DEMHS	2022 – 2024	1	1	1	0	1	1	0	0	0	0	0	0	0	0	7
DBY-14	Identify and pursue appropriate floodproofing measures at the Derby WWTP on Factory Street	Critical Facility Protection	PW	$100,000 - $500,000	CIP, FEMA Grant, FEMA AFG, CT DEMHS	2022 – 2024	0	1	1	0	1	1	1	0	0	0	0	0	0	0	7
DBY-15	Identify and pursue appropriate floodproofing measures at sewer pumping stations in SFHAs	Critical Facility Protection	DPW	$100,000 - $500,000	CIP, FEMA Grant, FEMA AFG, CT DEMHS	2022 – 2024	0	1	1	0	1	1	1	0	0	0	0	0	0	0	7
DBY-16	Work with CT DEEP to make the required revisions to the EAPs for the Lower Ansonia Reservoir Dam, Picketts Pond Dam, and Upper Ansonia Reservoir Dam, as requested in a Review letter sent May 6, 2019.	Dam Safety	EMD	$0 - $25,000	OB, CT DEEP	2022	0	1	1	1	1	1	0	0	0	0	0	0	0	-1	6.5
DBY-17	Work with owners of ret. ponds along Twomile Brook trib. that are causing nuisance flooding in the O'Sullivan Rd/Sodom Ln area to ensure they are maintained	Administration, Enforcement, & Maintenance	PW	$0 - $25,000	OB	2022	1	0.5	1	1	1	0.5	0	0	0	0	0	0	0	0	6
DBY-18	Increase funding for the Tree Warden to address a wider range of tree limb hazards than the current budget allows	Tree and Debris Management	TW, MO	$0 - $25,000	OB	2022	0	0.5	1	1	1	1	1	0	0	0	-1	0	0	0	6
DBY-19	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

#	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	
DBY-20	Identify and pursue appropriate floodproofing measures at the Derby Police Station	Critical Facility Protection	EMD, PD	$100,000 - $500,000	CIP, FEMA Grant, CT DEMHS	2023 – 2025	0	1	1	0	1	1	0	0	0	0	0	0	0	0	6
DBY-21	Obtain copies of the disaster planning guides and manuals from the "Are You Ready?" series and make them available at the City and Town Halls	Public Education & Engagement	EMD	$0 - $25,000	OB	2022 – 2023	1	0.5	0	1	1	1	0	0	0	-1	0	0	0	0	5.5
DBY-22	Disseminate informational pamphlets regarding natural hazards to public locations	Public Education & Engagement	EMD	$0 - $25,000	OB	2022 – 2023	1	0.5	0	1	1	1	0	0	0	-1	0	0	0	0	5.5
DBY-23	Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (flood zones, wildfire hazard zones, steep slopes) to support the preparation of resiliency plans across the state.	Historic & Cultural Resources	Plan, HC/HDC	$0 - $25,000	OB, CT SHPO	2022 – 2023	1	0	1	1	0	1	0	0	0	0	0	0	0	0	5
DBY-24	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
DBY-25	Conduct a study to identify municipal buildings, critical facilities, and commercial/industrial buildings that are vulnerable to roof damage or collapse	Critical Facility Protection	PW, B&E	$25,000 - $50,000	OB, CIP	2022 – 2024	0	0.5	1	0	1	1	0	0	0	0	0	0	0	0	5
DBY-26	Install evacuation signs in SFHAs	Evacuation & Access	EMD	$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
DBY-27	Purchase and install a generator for Derby Middle School (one of the two sheltors) at 10 Nutmeg Avenue	Backup Power	EM, DPW	$100,000 - $500,000	CIP, FEMA Grant	2025 – 2027	0.5	0.5	1	1	0	1	0	0	0	0	0	0	-1	-1	3.5
DBY-28	Install emergency generators at critical facilities, including Storm Engine Company No. 2, and other firehouses.	Backup Power	EM, DPW	More than $500,000	CIP, FEMA Grant	2025 – 2027	0.5	0.5	1	1	0	1	0	0	0	0	0	0	-1	-1	3.5
DBY-29	Audit zoning regulations in order to identify appropriate updates to limit development in areas at risk of liquefaction, landslides, or other geological hazards.	Landslide Mitigation	PZC	$0 - $25,000	OB	2022 – 2024	0	1	0	0	1	0	1	0	0	0	-1	0	0	0	3
DBY-30	Require that drainage systems in the vicinity of steep slopes be expanded and oversized, if doing so will not increase flood risk downstream, in order to avoid saturation of the slopes and the landslides that may result.	Landslide Mitigation	PW	$0 - $25,000	OB	2022 – 2024	0	1	0	0	1	0	1	0	0	0	-1	0	0	0	3
DBY-31	Pursue funding to place utilities underground in existing developments	Utility Resilience	MO	More than $500,000	CIP, CT DEEP	2026 – 2027	0	0	0	1	1	0	0	0	0	0	0	0	-1	0	0

APPENDIX B

RECORD OF MUNICIPAL ADOPTION

CERTIFICATE OF ADOPTION
DERBY BOARD OF ALDERMEN/ALDERWOMEN

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

WHEREAS, the City of Derby 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 Derby Board of Aldermen/Alderwomen approved the previous version of the Plan in 2012; and

WHEREAS, the City of Derby 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 Derby; and

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

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

RESOLVED by the Board of Aldermen/Alderwomen:

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

Adopted this 18TH day of November, 2021 by the Board of Aldermen/Alderwomen of Derby, Connecticut

Mayor

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

Town Clerk

2022 JAN 11 PM12:44

APPENDIX C

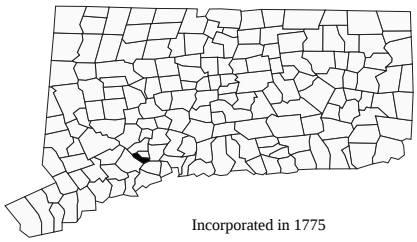
CERC City Profile 2019

Derby, Connecticut

CERC Town Profile 2019 *Produced by Connecticut Data Collaborative*

City Hall
1 Elizabeth Street
Derby, CT 06418
(203) 736-1450

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



Incorporated in 1775

Demographics

Population

	Town	County	State
2000	12,391	824,008	3,405,565
2010	12,902	862,477	3,574,097
2013-2017	12,700	862,127	3,594,478
2020	13,250	898,514	3,604,591
'17 - '20 Growth / Yr	1.4%	1.3%	0.1%

	Town	County	State
Land Area (sq. miles)	5	605	4,842
Pop./Sq. Mile (2013-2017)	2,510	1,426	742
Median Age (2013-2017)	41	40	41
Households (2013-2017)	4,919	327,402	1,361,755
Med. HH Inc. (2013-2017)	$57,432	$64,872	$73,781

	Town	State
Veterans (2013-2017)	606	180,111

Age Distribution (2013-2017)

	0-4		5-14		15-24		25-44		45-64		65+		Total	
Town	741	6%	1,573	12%	1,402	11%	3,195	25%	3,865	30%	1,924	15%	12,700	100%
County	45,072	5%	100,549	12%	120,727	14%	216,208	25%	240,037	28%	139,534	16%	862,127	100%
State	186,188	5%	432,367	12%	495,626	14%	872,640	24%	1,031,900	29%	575,757	16%	3,594,478	100%

Race/Ethnicity (2013-2017)

	Town	County	State
White Non-Hisp	8,473	553,000	2,446,049
Black Non-Hisp	708	105,661	350,820
Asian Non-Hisp	279	33,678	154,910
Native American Non-Hisp	0	783	5,201
Other/Multi-Race Non-Hisp	248	20,448	84,917
Hispanic or Latino	2,992	148,446	551,916

	Town	County	State
Poverty Rate (2013-2017)	11.4%	12.1%	10.1%

Educational Attainment (2013-2017)

	Town		State	
High School Graduate	2,790	31%	673,582	27%
Associates Degree	1,049	12%	188,481	8%
Bachelors or Higher	2,159	24%	953,199	38%

Economics

Business Profile (2018)

Sector	Units	Employment
Total - All Industries	307	4,653
23 - Construction	28	158
31-33 - Manufacturing	17	161
44-45 - Retail Trade	49	831
62 - Health Care and Social Assistance	48	1,820
72 - Accommodation and Food Services	30	572
Total Government	21	532

Top Five Grand List (2018)

	Amount
United Illuminating	$13,070,849
500 NHA LLC	$10,341,660
49 Pershing Drive LLC	$9,425,500
Home Depot USA, Inc	$8,899,091
Antinozzi, Peter etal	$7,774,240
Net Grand List (SFY 2016-2017)	$718,248,343

Major Employers (2018)

Griffin Hospital
City of Derby
Lowes
Home Depot
Shop Rite

Education

2018-2019 School Year

	Grades	Enrollment
Derby School District	PK-12	1308

Pre-K Enrollment (PSIS)

	2018-2019
Derby School District	44

4-Year Cohort Graduation Rate (2017-2018)

	All	Female	Male
Connecticut	88.3%	91.8%	85.1%
Derby School District	79.2%	90.0%	72.1%

Smarter Balanced Test Percent Above Goal (2017-2018)

	Grade 3		Grade 4		Grade 8	
	Town	State	Town	State	Town	State
Math	43.9%	53.8%	42.7%	51.3%	17.4%	43.0%
ELA	44.9%	53.1%	43.6%	54.9%	38.8%	56.1%

Rate of Chronic Absenteeism (2017-2018)

	All
Connecticut	10.7%
Derby School District	11.5%

Public vs Private Enrollment (2013-2017)

	Town	County	State
Public	87.7%	88.2%	86.8%
Private	12.3%	11.8%	13.2%

profiles.ctdata.org

Derby, Connecticut

CERC Town Profile 2019

Connecticut Economic Resource Center

Government

Government Form: Mayor - Council

Total Revenue (2017)	$51,756,248	Total Expenditures (2017)	$51,584,302	Annual Debt Service (2017)	$2,121,736
Tax Revenue	$28,607,680	Education	$26,469,328	As % of Expenditures	4.1%
Non-tax Revenue	$23,148,568	Other	$25,114,974	Eq. Net Grand List (2017)	$1,027,004,776
Intergovernmental	$19,206,507	Total Indebtedness (2017)	$14,568,935	Per Capita	$81,631
Per Capita Tax (2017)	$2,241	As % of Expenditures	28.2%	As % of State Average	54.1%
As % of State Average	76.4%	Per Capita	$1,158	Moody's Bond Rating (2017)	-
		As % of State Average	46.1%	Actual Mill Rate (2017)	39.37
				Equalized Mill Rate (2017)	27.45
				% of Net Grand List Com/Ind (2017)	15.2%

Housing/Real Estate

Housing Stock (2013-2017)

	Town	County	State
Total Units	5,462	365,546	1,507,711
% Single Unit (2013-2017)	40.4%	53.6%	59.2%
New Permits Auth (2017)	5	750	4,547
As % Existing Units	0.1%	0.2%	0.3%
Demolitions (2017)	0	202	1,403
Home Sales (2017)	70	4,763	21,880
Median Price	$194,600	$244,400	$270,100
Built Pre-1950 share	37.6%	33.2%	29.3%
Owner Occupied Dwellings	2,822	204,037	906,798
As % Total Dwellings	57.4%	62.3%	66.6%
Subsidized Housing (2018)	673	46,013	167,879

Distribution of House Sales (2017)

	Town	County	State
Less than $100,000	3	106	536
$100,000-$199,999	30	1,232	5,237
$200,000-$299,999	29	1,785	6,681
$300,000-$399,999	7	888	3,863
$400,000 or More	1	752	5,563

Rental (2013-2017)

	Town	County	State
Median Rent	$1,131	$1,100	$1,123
Cost-burdened Renters	58.9%	54.5%	52.3%

Labor Force

	Town	County	State
Residents Employed	6,402	438,576	1,827,070
Residents Unemployed	350	20,171	78,242
Unemployment Rate	5.2%	4.4%	4.1%
Self-Employed Rate	9.7%	8.5%	10.0%
Total Employers	307	24,958	122,067
Total Employed	4,653	366,848	1,673,867

Connecticut Commuters (2015)

Commuters Into Town From:		Town Residents Commuting To:	
Ansonia, CT	477	Shelton, CT	601
Derby, CT	417	New Haven, CT	431
Shelton, CT	364	Stratford, CT	428
Seymour, CT	282	Derby, CT	417
New Haven, CT	230	Milford, CT	407
Naugatuck, CT	202	Bridgeport, CT	215
Bridgeport, CT	195	Trumbull, CT	187

Quality of Life

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

	Town	State
Property	2,346	1,777
Violent	322	228

Disengaged Youth (2013-2017)

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

	Town
Library circulation per capita	6.33

Distance to Major Cities

	Miles
Hartford	37
New York City	64
Providence	93
Boston	128
Montreal	292

Residential Utilities

Electric Provider
The United Illuminating Co.
(800) 257-0141

Gas Provider
Eversource Energy
(800) 989-0900

Water Provider
Birmingham Utilities
(203) 735-1888

Cable Provider
Comcast Seymour
(800) 266-2278