

Capitol Region Council of Governments Natural Hazard Mitigation Plan Update: 2019 – 2024

Executive Summary

Introduction

Connecticut's Capitol Region encompasses the City of Hartford and 37 surrounding urban, suburban, and rural communities. The Capitol Region Council of Governments (CRCOG) received Federal Emergency Management Agency (FEMA) funds through the Connecticut Department of Emergency Services and Public Protection (DESPP) to develop a Natural Hazard Mitigation Plan (HMP) Update for the 38 municipalities comprising the region:

Town of Andover	Town of East Windsor	Town of Marlborough	Town of Suffield
Town of Avon	Town of Ellington	City of New Britain	Town of Tolland
Town of Berlin	Town of Enfield	Town of Newington	Town of Vernon
Town of Bloomfield	Town of Farmington	Town of Plainville	Town of West Hartford
Town of Bolton	Town of Glastonbury	Town of Rocky Hill	Town of Wethersfield
Town of Canton	Town of Granby	Town of Simsbury	Town of Willington
Town of Columbia	City of Hartford	Town of Somers	Town of Windsor
Town of Coventry	Town of Hebron	Town of South Windsor	Town of Windsor Locks
Town of East Granby	Town of Manchester	Town of Southington	
Town of East Hartford	Town of Mansfield	Town of Stafford	

CRCOG staff and municipal officials from each community contributed to this planning project. The Capitol Region Emergency Planning Committee (CREPC) ESF-5 Emergency Management subcommittee was expanded to provide guidance to the update process. This plan update builds on the existing Capitol Region Natural Hazard Mitigation Plan of 2014 and incorporates information from the former Central Connecticut Region Hazard Mitigation Plan Update (2016) and the former Windham Regional Hazard Mitigation Plan Update (2015). Berlin, New Britain, Plainville, and Southington were previously included in the former Central Connecticut Region Hazard Mitigation Plan. Columbia, Coventry, Mansfield, and Willington were previously included in the former Windham Regional Hazard Mitigation Plan. The other 30 communities listed above were included in the previous Capitol Region Natural Hazard Mitigation Plan (2014).

The purpose of this plan is to identify natural hazards likely to affect the Capitol Region and its nearly one million residents, assess vulnerabilities to these hazards, and set forth mitigation strategies that will reduce the loss of life and property, economic disruptions, and the cost of post-disaster recovery for the region's communities. The benefits of preparing a Hazard Mitigation Plan include:

- Improving the region's ability to deal with natural disasters and reduce losses
- Reducing the need for emergency response to natural disasters
- Enabling municipalities to access FEMA Hazard Mitigation Assistance Grants upon formal adoption of an approved plan
- Improving post-disaster recovery implementation

The plan considers the following natural hazards that affect the region:

- Dam Failure
- Drought
- Earthquake
- Flooding
- Forest and Wildland Fires
- Hurricanes and Tropical Storms
- Tornadoes and High Winds
- Severe Winter Storms

The impacts of these natural hazards were evaluated as well as the locations and groups of people particularly vulnerable to the effects of these hazards. Mitigation goals and strategies were developed at both the regional and local levels to reduce or prevent the damages to life and property that can result from these natural hazards. CROCOG and CREPC, in addition to local and other partners, are responsible for implementation of the regional goals contained in this plan. Each participating municipality identified its own mitigation goals and strategies and assumes responsibility for implementation of those measures.

Hazards Impacting the Capitol Region

The Capitol Region is vulnerable to the numerous natural hazards with flooding, winter storms, and high wind events being the natural hazards that most frequently occur with enough severity to cause loss of life or property. To evaluate the impacts of these hazards on our region, we looked at historical accounts of major storms and other events; examined flood insurance claims data and public assistance provided after federally declared disasters; analyzed demographic data and physical features; and used HAZUS-MH, a computer model, to estimate losses due to flooding, hurricanes, and earthquakes.

Loss estimates for each hazard are summarized for each community in Table ES-1 below and range from approximately \$247,000 per year in Andover to nearly \$11,093,000 in Hartford. Details regarding these loss estimates are provided in Section II and each municipal annex of this plan. The annualized loss estimate for the Capitol Region due to natural hazards is estimated at \$84.1 million. The following is a brief summary of the natural hazards affecting the region and our communities.

Table ES-1. Annualized Loss Estimate by Community (in \$1,000s)

Town	Dam Failure	Drought	Earthquakes	Flooding	Hurricanes and Tropical Storms	Severe Winter Storms	Thunderstorms	Tornadoes	Wildfires	Total
Andover	\$0	\$0	\$8	\$1	\$223	\$11	\$1	\$1	\$2	\$247
Avon	\$0	\$0	\$72	\$4	\$1,135	\$163	\$2	\$266	\$4	\$1,646
Berlin	\$0	\$0	\$76	\$11	\$1,245	\$83	\$3	\$291	\$5	\$1,714
Bloomfield	\$0	\$0	\$79	\$15	\$1,284	\$181	\$3	\$301	\$5	\$1,868
Bolton	\$0	\$0	\$13	\$0	\$337	\$19	\$2	\$1	\$2	\$374
Canton	\$0	\$0	\$28	\$10	\$645	\$48	\$1	\$151	\$5	\$888
Columbia	\$0	\$0	\$14	\$1	\$372	\$9	\$2	\$2	\$3	\$403
Coventry	\$1	\$0	\$25	\$4	\$843	\$33	\$5	\$4	\$5	\$920
East Granby	\$0	\$0	\$18	\$2	\$323	\$41	\$1	\$76	\$3	\$464
East Hartford	\$0	\$0	\$150	\$14	\$3,213	\$188	\$7	\$752	\$3	\$4,327
East Windsor	\$0	\$0	\$37	\$8	\$700	\$30	\$1	\$164	\$5	\$945

Town	Dam Failure	Drought	Earthquakes	Flooding	Hurricanes and Tropical Storms	Severe Winter Storms	Thunderstorms	Tornadoes	Wildfires	Total
Ellington	\$1	\$0	\$34	\$2	\$1,057	\$67	\$6	\$5	\$4	\$1,176
Enfield	\$0	\$0	\$121	\$24	\$2,799	\$385	\$6	\$655	\$6	\$3,996
Farmington	\$0	\$0	\$106	\$39	\$1,589	\$192	\$3	\$372	\$5	\$2,306
Glastonbury	\$0	\$0	\$150	\$5	\$2,158	\$216	\$5	\$505	\$10	\$3,049
Granby	\$0	\$0	\$23	\$3	\$707	\$117	\$1	\$166	\$8	\$1,025
Hartford	\$0	\$0	\$478	\$32	\$7,822	\$910	\$17	\$1,831	\$3	\$11,093
Hebron	\$1	\$0	\$22	\$0	\$656	\$27	\$4	\$3	\$5	\$718
Manchester	\$0	\$0	\$186	\$7	\$3,651	\$381	\$8	\$855	\$5	\$5,093
Mansfield	\$2	\$0	\$79	\$21	\$1,799	\$115	\$10	\$8	\$6	\$2,040
Marlborough	\$0	\$0	\$17	\$3	\$401	\$18	\$1	\$94	\$4	\$538
New Britain	\$0	\$0	\$196	\$26	\$4,589	\$187	\$10	\$1,074	\$2	\$6,084
Newington	\$0	\$0	\$110	\$18	\$1,916	\$153	\$4	\$448	\$2	\$2,651
Plainville	\$0	\$0	\$63	\$28	\$1,111	\$55	\$2	\$260	\$2	\$1,521
Rocky Hill	\$0	\$0	\$76	\$4	\$1,236	\$83	\$3	\$289	\$3	\$1,694
Simsbury	\$0	\$0	\$68	\$16	\$1,474	\$225	\$3	\$345	\$6	\$2,137
Somers	\$1	\$0	\$24	\$13	\$776	\$93	\$4	\$3	\$4	\$918
South Windsor	\$0	\$0	\$128	\$6	\$1,612	\$408	\$3	\$377	\$5	\$2,539
Southington	\$0	\$0	\$87	\$21	\$2,700	\$127	\$6	\$632	\$7	\$3,580
Stafford	\$1	\$0	\$30	\$22	\$819	\$32	\$4	\$4	\$8	\$920
Suffield	\$0	\$0	\$37	\$1	\$986	\$103	\$2	\$231	\$8	\$1,368
Tolland	\$1	\$0	\$34	\$6	\$1,020	\$141	\$5	\$4	\$5	\$1,216
Vernon	\$2	\$0	\$82	\$6	\$1,977	\$259	\$11	\$8	\$2	\$2,347
West Hartford	\$0	\$0	\$221	\$38	\$3,966	\$670	\$8	\$928	\$4	\$5,835
Wethersfield	\$0	\$0	\$75	\$11	\$1,672	\$132	\$4	\$391	\$2	\$2,287
Willington	\$0	\$0	\$12	\$6	\$409	\$24	\$2	\$2	\$4	\$459
Windsor	\$0	\$0	\$95	\$3	\$1,821	\$100	\$4	\$426	\$5	\$2,454
Windsor Locks	\$0	\$0	\$43	\$9	\$783	\$320	\$2	\$183	\$2	\$1,342
Total	\$9	\$0	\$3,116	\$444	\$61,827	\$6,345	\$164	\$12,106	\$170	\$84,181

Hurricanes and Tropical Storms

The Atlantic hurricane season extends from June 1 through November 30 each year. While the Capitol Region is spared the coastal storm surges associated with hurricanes, it is not immune from damaging winds and rain. According to the state's Hazard Mitigation Plan, a moderate Category II hurricane can be expected to hit Connecticut once every 23 to 30 years. A major Category III or IV hurricane may occur before 2040 based on 20th century trends.

In August 2011, Hurricane Irene, which was downgraded to a tropical storm before hitting Connecticut, caused widespread damage to the region and state. Irene was responsible for three deaths associated with flooding and downed wires from falling trees. According to *The Hartford Courant*, insurance companies paid out \$235 million on more than 60,000 claims in Connecticut related to damage from Irene. However, this figure does not include hundreds of millions more in uncovered expenses and cleanup costs for Connecticut's largest electric utility at the time, Connecticut Light and Power (now Eversource). At the height of the storm, some 754,000 residents were without power. Capitol Region



cities and towns were widely affected by downed trees, flooding, and power outages as a result of Irene. Many residents and businesses were without power for over a week. According to the Connecticut Division of Emergency Management and Homeland Security (DEMHS), municipalities, and other local and private nonprofit agencies incurred expenses of over \$3.18 million due to Irene. The municipalities and agencies are eligible for reimbursement of 75% of these costs under FEMA's Public Assistance program.

CRCOG used FEMA's HAZUS-MH software to estimate the extent of physical damage and the economic losses to the region and our communities if we were hit with another hurricane with a 1% annual chance recurrence interval. The HAZUS-MH hurricane model primarily considers wind damage for inland areas such as the Capitol Region, which is not subject to storm surges. The model predicts the region could face economic losses of approximately \$512 million.

Floods

Flooding can occur as a result of other natural hazards such as heavy precipitation, hurricanes, winter storms, snow melt, ice jams, or dam failures. The Capitol Region's numerous rivers and streams, as well as its urbanized areas, make floods and flash floods a regular risk. Individuals and local governments face significant economic loss, risks to public safety, and degraded waterways from flooding. There is not a "flood season" per se in Connecticut; however, waterways are normally higher during spring and are thus especially vulnerable to flooding from intense precipitation. Significant flooding can also occur as a result of hurricanes and tropical storms. According to the 2014 Connecticut Natural Hazard Mitigation Plan, major flooding of small rivers and loss of life can be expected every 5 to 10 years throughout the state. Major flooding of larger rivers, such as the Connecticut and Farmington, with loss of life and structural damage can be expected once every 30 years. Historic and widespread floods occurred in 1936, 1938, 1955, and 1982.

An analysis of claims filed under the National Flood Insurance Program (NFIP) in the Capitol Region demonstrates the potential for losses due to flooding. Since the program's inception, over 1,860 claims resulting in payments of nearly \$15.1 million have been filed in the Capitol Region as of January 2018. West Hartford has had the highest number of overall flood loss claims, followed by Farmington, New Britain, and Simsbury. Farmington and West Hartford have also had the highest overall flood loss payments.

Of these claims, 436 were repetitive loss claims (i.e., more than one claim over \$1,000 has been filed for flood damages to an insured building over a 10-year period). Approximately 144 properties have experienced repetitive losses in the Capitol Region. These losses have resulted in payments of approximately \$5.5 million. West Hartford has the highest number of repetitive flood claims, followed by Simsbury. Farmington, West Hartford, and Newington have had the highest repetitive flood loss payments.

To help assess the risks we face from major flooding, CRCOG used FEMA's HAZUS-MH loss estimation program to model the effects of flooding at the local level. The following table shows the damages each town in the region might face from a flood with a 1% probability of occurring in any given year (i.e., the 100-year flood) and the average annualized losses from a flood in any given year. As can be seen, losses due to a 1% annual chance flood could be particularly high for the communities of East Hartford and Vernon. Farmington and West Hartford are at the highest risk of receiving flood damage based on the annualized losses.

Significant areas of the Capitol Region are vulnerable to flooding. About 8.5%, or 56,827 acres, of the Capitol Region is located in floodplains. Over half of this land is zoned residential. Without restrictions on development in floodplains, lives and property are at risk.

Table ES-2. HAZUS-MH 1% Annual Chance Event and Annualized Losses due to Flood

Town	Total Losses (1% Annual Chance Flood)	Annualized Loss	Town	Total Losses (1% Annual Chance Flood)	Annualized Loss
Andover	\$7,873,000	\$604	Mansfield	\$30,104,000	\$21,012
Avon	\$69,855,000	\$4,336	Marlborough	\$9,538,000	\$3,072
Berlin	\$64,802,000	\$11,056	New Britain	\$33,351,000	\$25,570
Bloomfield	\$51,811,000	\$15,468	Newington	\$43,598,000	\$18,126
Bolton	\$1,193,000	\$319	Plainville	\$44,482,000	\$28,279
Canton	\$34,106,000	\$10,062	Rocky Hill	\$9,069,000	\$4,308
Columbia	\$23,278,000	\$817	Simsbury	\$48,070,000	\$16,181
Coventry	\$20,206,000	\$4,003	Somers	\$7,719,000	\$13,384
East Granby	\$7,882,000	\$1,892	South Windsor	\$67,123,000	\$6,145
East Hartford	\$141,861,000	\$14,434	Southington	\$64,141,000	\$20,510
East Windsor	\$35,996,000	\$7,939	Stafford	\$57,649,000	\$22,378
Ellington	\$14,633,000	\$2,197	Suffield	\$10,683,000	\$829
Enfield	\$57,001,000	\$24,479	Tolland	\$9,139,000	\$5,873
Farmington	\$78,659,000	\$39,353	Vernon	\$118,795,000	\$6,336
Glastonbury	\$94,366,000	\$5,044	West Hartford	\$88,125,000	\$38,288
Granby	\$11,670,000	\$3,231	Wethersfield	\$93,308,000	\$11,181
Hartford	\$60,966,000	\$31,832	Willington	\$3,971,000	\$6,145
Hebron	\$3,709,000	\$207	Windsor	\$89,805,000	\$2,991
Manchester	\$32,957,000	\$7,035	Windsor Locks	\$8,716,000	\$9,355

Dam Failure

Dams provide vital benefits to our region such as water supply, power generation, flood control, and recreation, but in the event of failure, they can pose a threat to lives and property. Dam failure can happen for a number of reasons including as a result of natural disasters such as structural failure due to earthquakes or overtopping due to heavy precipitation. Dams in Connecticut are regulated by the Department of Energy & Environmental Protection (DEEP).

According to the DEEP, there are hundreds of dams in the Capitol Region. The majority of these are either Class A (low hazard) or Class AA (negligible hazard); failure of a Class A dam would lead to minimal economic loss and may cause damage to agricultural land or unpaved roadways while failure of a Class AA dam would cause negligible loss or damage. Dams of concern for hazard mitigation are those in classes BB, B, and C. In the Capitol Region, 61 dams are Class C, or high hazard, dams. Failure of a Class C dam would result in probable loss of life, major damage to habitable structures, damage to major highways, and great economic loss. There are 53 Class B, or significant hazard, dams in the Region. Failure in these dams would result in similar but less severe damage. Finally, there are 146 Class BB, or moderate hazard, dams in the region. Failure of one of these dams would result in damage to normally unoccupied structures or local roadways or would cause moderate economic loss; no loss of life would be expected. The state estimates there are nearly 12,000 people in Hartford County and 4,150 people in Tolland County within the mapped dam inundation areas of high and significant hazard dams. The

Capitol Region includes most of, although not all, the municipalities in Hartford and Tolland Counties, thus the regional population exposed to this risk is likely less than 2 percent.

Severe Winter Storms

Connecticut is subject to blizzards, ice storms, and nor'easters - storms characterized by strong, possibly damaging northeasterly winds. The Capitol Region receives an average annual snowfall of about 40" although snowfall amounts vary widely from year to year and can vary dramatically across the region in any given storm. Severe winter storms can result in damage to buildings and infrastructure, loss of life, and disruptions to regional transportation and communication systems. Half of all federal disaster declarations for Connecticut since 1954 have followed major winter or snowstorms. Federal assistance is frequently used to offset the snow/ice removal costs that the state and municipalities incur. For example, a federal emergency was declared for the February 11-12, 2006, snowstorm in several counties in Connecticut (including Hartford and Tolland) to help share the costs of snow removal. In 2011, FEMA obligated over \$74 million in Public Assistance funds to the State of Connecticut to reimburse state agencies, local governments, and eligible private nonprofit organizations for costs associated with the January 11-12, 2011, snowstorm and Storm Alfred in October. The frequency, intensity, and timing of winter storms dramatically impacts snow removal budgets. Storm Alfred was particularly costly for municipalities because of the heavy debris loads resulting from the high number of fully leafed trees downed in this storm. Municipalities also incur higher labor costs for snow removal on weekends and holidays.

Tornadoes/High Winds

Connecticut averages approximately three tornadoes every 2 years; however, in the first week and a half of July 2013 four tornadoes hit the state including three that touched down in the Capitol Region. Hartford and Litchfield Counties are at the highest risk for tornadoes within the state based on historical patterns and locations of their occurrence. Between 1950 and 2003, Hartford County experienced 14 tornadoes, and Tolland County experienced 10. Between 2006 and 2018, Connecticut experienced 23 tornadoes. Three of these were in Hartford County and two in Tolland County. The Capitol Region experienced three tornadoes in 2013. Four tornadoes severely impacted Connecticut during one storm in May 2018 although none were located in the Capitol Region. On October 2, 2018, an EF1 tornado touched down in New Canaan, and an EF-0 was reported in the Capitol Region in Mansfield.

Typically, tornadoes occur between April and October. High winds and microbursts (strong straight-line downburst winds) can also inflict damage to property and result in injuries.

One of the country's most destructive tornadoes touched down in Windsor Locks and Windsor on October 3, 1979. The F4 tornado had winds in excess of 200 miles per hour (mph) and tore an 11-mile path from Windsor to Suffield. The tornado killed 3 people, injured 500, and caused an estimated \$250 million (\$776,385,000 in 2011 dollars) in damage, in part because it struck the New England Air Museum, destroying several planes and hangars.

Earthquake

Connecticut has a moderate risk of earthquakes based on the frequency of their occurrence, not the intensity of individual earthquakes. Between 1568 and 1989, the state had 137 recorded earthquakes. The Capitol Region experienced 17 between 1837 and 2018. Of those where the magnitude was known, all were under magnitude 4.0. A strong earthquake centered in central Connecticut and thought to be 3.8 magnitude occurred on August 9, 1840.

Magnitude 3.0 to 3.9 earthquakes are often felt by people up to 100 miles away from the epicenter but rarely cause damage. Magnitude 4.0 to 4.9 earthquakes cause shaking of objects indoors but generally cause none to slight damage. Magnitude 5.0 to 5.9 earthquakes can cause moderate to major damage to poorly constructed buildings but none to slight damage to other buildings. Connecticut incorporated building codes for seismic activity into the state building code in 1992. There were no requirements prior to that. So, while the risk for a very damaging earthquake is relatively low in the region, some structures may be impacted by less intense earthquakes depending on the soil and integrity of the structure.

Using FEMA's HAZUS-MH software, CRCOG analyzed a probabilistic suite of earthquake scenarios to estimate the potential loss to property and life. Based on these scenarios, the annualized loss estimate for the region is \$3.1 million, with Hartford and West Hartford having the highest annualized losses based on their built-up environments.

These simulations highlight the significance of the location of the epicenter to the damages that could be expected. A moderately strong earthquake centered near a more populated, built-up area would be expected to result in considerably more damage than one located in a more remote area. Based on our history and geology, the Capitol Region's vulnerability to damaging earthquakes is low. The damages we are likely to face here from earthquakes are much lower than in other parts of the nation and world.

Drought

Droughts periodically occur in Connecticut and can have serious consequences. While a drought does not pose immediate threats to life and property, it can have severe economic, environmental and social consequences. A lack of precipitation can affect not only agricultural production but also tourism, water utilities, residential wells, businesses, and more. Connecticut experienced notable droughts in 1957, 1964-67, 1980-81, 2002, 2012, and 2015-16. The 2012 drought affected Hartford, Tolland, and Windham Counties from April 12 through April 24. According to the National Oceanic & Atmospheric Association (NOAA) Storm Events Database, rivers and streams were most affected as most ran at record low levels during the spring runoff season. The main impact of this meteorological drought was periods of very high fire danger.

A meteorological drought was most recently declared for 2015-16. During the 2015-16 drought, many water utilities imposed voluntary or mandatory water conservation and restriction measures on their customers. Such restrictions can impact customers including businesses. As the state's 2014 Natural Hazard Mitigation Plan notes, predicting the future occurrences of drought within any given time period is difficult.

Forest and Wildland Fires

Forest or wildland fires can cause not only long-term damage to vegetation and ecosystems but also damage to developments, especially as residential development has increased in woodland areas. In the last 25 years, a few forest fires have occurred in the Capitol Region including a brush fire in April 1999 in Vernon, which burned about 40 acres and came within 100 feet of homes in a nearby neighborhood, and a fire in April 2005, which burned 8 acres along the Farmington River in Avon. The scale of these fires is much less than those experienced in the western and midwestern United States; nonetheless, forest fires here pose a risk to lives and property, especially at the urban/woodland interface.

Mitigation Strategy

To address the impacts of these natural hazards, the planning committee and local and regional staff reexamined the goals, objectives, and strategic mitigation activities proposed in the 2014 Plan as well as assessed our experiences with natural disasters of the last 5 years and considered input from the public and other stakeholders in order to develop a blueprint for better protecting our region over the next 5 years. Each mitigation action was prioritized, and responsible agencies, potential funding sources, and time frames for implementing the projects were identified. What follows is a brief outline of the regional and local strategies proposed.

Regional Goals, Objectives, and Mitigation Actions

Because of the regional nature of natural hazards and common concerns, some mitigation activities are better addressed at the regional level by CRCOG; however, the means to carry out certain activities may not be available to regional agencies but are available to municipalities. For example, CRCOG cannot enact laws and regulations, levy taxes, or enter into construction contracts. This section establishes our regional strategy for addressing natural hazards and sets out the mitigation actions that may best be undertaken by CRCOG on a regional level.

Goal: Minimize the loss of life and property and economic disruptions that can result from natural hazards.

Objective 1: Improve stormwater management and groundwater recharge throughout the region to prevent increased flooding and lessen the effects of drought.

Mitigation Actions:

- 1.1 Encourage all municipalities in the region to adopt regulations that incorporate or refer to recommended practices from the most current Connecticut *Stormwater Quality Manual*, Connecticut *Guidelines for Erosion and Sedimentation Control* and, in particular, those that promote low impact development and green infrastructure techniques. This will encourage development that is in harmony with natural drainage systems.
- 1.2 Foster improved understanding of the importance of stream management, maintenance of natural drainage channels, and use of green infrastructure practices among municipal staff, inland wetlands commissions, and planning and zoning commissions through education.

Objective 2: Assist municipalities in implementing hazard mitigation strategies.

Mitigation Actions:

- 2.1 Work with member municipalities to maintain this regional Natural Hazard Mitigation Plan with updates at least every 5 years.
- 2.2 Annually notify communities of the opportunities to apply for mitigation funds under the PDM and FMA programs and notify communities of HMGP opportunities as applicable. Provide letters of support when appropriate.

- 2.3 Incorporate additional natural hazard mitigation concerns into the regional Plan of Conservation and Development if it is updated in 2019-2024, and provide specific instructions to municipalities to address natural hazard mitigation in local Plans of Conservation and Development as they are updated.
- 2.4 Encourage municipalities to participate in the National Flood Insurance Program's Community Rating System by hosting an information workshop.

Objective 3: Assist municipalities in minimizing risks associated with power disruptions.

Mitigation Actions:

- 3.1 Encourage the installation of generators at critical facilities and in developments serving the elderly or special need populations, or development of microgrids to serve the same purpose, through outreach and associated work with local officials to determine which facilities still do not possess standby power but require it.

Objective 4: Assist municipalities in minimizing risks associated with droughts.

Mitigation Actions:

- 4.1 Assist municipalities that do not currently have drought ordinances in enacting such ordinances to enable the enforcement of water conservation, and assist with messaging and notifications regarding droughts. These actions should be consistent with guidance resulting from implementation of the State Water Plan (2018) and the Coordinated Water System Plan (2018) as well as the updated Connecticut Drought Preparedness and Response Plan.

Municipal Goals, Objectives, and Mitigation Actions

Each of the 38 municipalities in the Capitol Region also reassessed its goals, objectives, and strategic mitigation actions from the 2014 Plan and developed a new strategic course of action for the upcoming 5 years. While many are unique to the individual communities, there are commonalities among the actions proposed, and most communities have proposed a range of activities including public education and awareness; natural resource protection; plans, studies, and regulatory actions; structural projects and modifications to buildings, facilities, and infrastructure; as well as measures to improve preparedness and emergency response.

Table ES-3: Summary of Types of Mitigation Projects Proposed by Community

Mitigation Project Type	Education & Awareness	Natural Resources Protection	Preparedness & Emergency Response	Prevention	Structural Projects	Property Protection
Andover	5	1	7	3	2	1
Avon	2	1	5	4	1	3

Mitigation Project Type	Education & Awareness	Natural Resources Protection	Preparedness & Emergency Response	Prevention	Structural Projects	Property Protection
Berlin	2	1	2	3	2	4
Bloomfield	7	2	5	5	0	4
Bolton	5	1	8	5	7	1
Canton	3	1	4	2	1	4
Columbia	3	2	2	1	4	2
Coventry	3	1	7	11	8	2
East Granby	3	2	5	4	0	2
East Hartford	4	1	4	6	1	4
East Windsor	4	2	5	3	3	2
Ellington	2	1	2	3	1	1
Enfield	3	1	1	2	1	3
Farmington	3	1	3	3	2	4
Glastonbury	5	1	0	5	2	3
Granby	7	4	5	9	3	2
Hartford	3	1	3	2	2	3
Hebron	2	1	1	5	1	1
Manchester	4	1	1	1	2	5
Mansfield	8	1	7	6	3	3
Marlborough	2	1	3	2	1	2
New Britain	6	1	3	4	5	3
Newington	2	1	2	5	0	3
Plainville	6	2	9	12	6	3
Rocky Hill	2	0	0	1	1	3
Simsbury	4	2	2	7	8	4
Somers	5	1	5	2	3	2
South Windsor	4	1	7	3	1	4
Southington	4	1	5	3	1	3
Stafford	2	1	6	1	3	1
Suffield	4	1	1	4	0	1
Tolland	6	1	4	3	6	1
Vernon	2	1	3	1	2	4
West Hartford	4	1	10	6	3	5
Wethersfield	2	1	3	3	11	5
Willington	4	1	5	7	2	1

Mitigation Project Type	Education & Awareness	Natural Resources Protection	Preparedness & Emergency Response	Prevention	Structural Projects	Property Protection
Windsor	3	0	4	5	2	4
Windsor Locks	5	1	3	3	10	3

Table ES-4: Summary by Community of Mitigation Projects for Each Goal

Hazard Mitigation Goal	Minimize the impact of natural hazards on physical buildings and infrastructure.	Ensure Municipal Codes and Regulations support hazard mitigation.	Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies.	Increase the use of natural, "green," or "soft" hazard mitigation measures such as open space preservation and green infrastructure.	Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.	Improve public outreach, education, and warning systems.	Improve the emergency response capabilities of the region and its communities.	Ensure community character and social equity are addressed in mitigation activities.	Minimize the economic impact of hazard damages.
Andover	2	0	3	1	2	3	6	2	0
Avon	2	0	1	1	4	2	4	2	0
Berlin	4	2	1	1	2	1	2	1	0
Bloomfield	3	1	3	2	2	6	5	1	0
Bolton	12	0	1	1	4	5	4	1	0
Canton	6	0	1	1	0	2	4	1	0
Columbia	6	0	1	1	1	2	2	1	0
Coventry	6	0	4	2	8	1	8	3	0
East Granby	1	0	3	2	3	1	5	1	0
East Hartford	6	0	5	1	1	2	4	1	0
East Windsor	4	0	2	3	0	2	6	2	0
Ellington	1	0	2	1	2	1	2	1	0

Hazard Mitigation Goal										
	Minimize the impact of natural hazards on physical buildings and infrastructure.	Ensure Municipal Codes and Regulations support hazard mitigation.	Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies.	Increase the use of natural, "green," or "soft" hazard mitigation measures such as open space preservation and green infrastructure.	Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.	Improve public outreach, education, and warning systems.	Improve the emergency response capabilities of the region and its communities.	Ensure community character and social equity are addressed in mitigation activities.	Minimize the economic impact of hazard damages.	
Enfield	4	0	1	1	1	2	1	1	0	
Farmington	5	0	3	1	1	1	3	2	0	
Glastonbury	3	4	1	2	1	4	0	1	0	
Granby	5	5	3	3	3	4	5	2	0	
Hartford	5	0	1	1	1	1	3	2	0	
Hebron	3	1	1	1	0	1	3	1	0	
Manchester	4	1	2	1	2	3	0	1	0	
Mansfield	6	1	3	3	3	8	3	1	0	
Marlborough	3	0	1	1	1	1	3	1	0	
New Britain	8	1	2	2	2	4	1	2	0	
Newington	3	0	1	1	2	1	4	1	0	
Plainville	8	4	4	4	4	5	8	1	0	
Rocky Hill	2	0	1	0	2	1	0	1	0	
Simsbury	10	3	2	2	3	1	2	2	2	
Somers	2	2	1	1	2	5	3	1	1	
South Windsor	4	0	2	1	4	3	5	1	0	
Southington	3	2	1	1	0	2	6	2	0	
Stafford	2	0	1	2	1	3	4	1	0	
Suffield	2	1	1	1	1	3	1	1	0	
Tolland	4	1	2	1	3	4	5	1	0	
Vernon	5	0	1	1	0	1	3	1	1	
West Hartford	7	1	3	1	2	2	10	2	1	
Wethersfield	16	0	1	1	1	1	3	1	1	
Willington	5	2	2	2	2	2	4	1	0	

Hazard Mitigation Goal	Minimize the impact of natural hazards on physical buildings and infrastructure.	Ensure Municipal Codes and Regulations support hazard mitigation.	Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies.	Increase the use of natural, "green," or "soft" hazard mitigation measures such as open space preservation and green infrastructure.	Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.	Improve public outreach, education, and warning systems.	Improve the emergency response capabilities of the region and its communities.	Ensure community character and social equity are addressed in mitigation activities.	Minimize the economic impact of hazard damages.
Windsor	4	2	2	0	4	2	4	0	0
Windsor Locks	2	1	1	1	12	3	4	1	0

Planning Process

The update planning process began in 2017 when FEMA awarded CROG a Pre-Disaster Mitigation Planning Grant to update its multi-jurisdictional natural hazard mitigation plan. This Plan Update was developed in collaboration with CREPC, the region's 38 municipalities, and DESPP/DEMHS. As in 2013-2014, ESF-5 Emergency Management served as the planning committee for the update process and provided guidance to the project. A consultant (Milone & MacBroom, Inc. of Cheshire, Connecticut) was retained to provide technical support and coordinate efforts to involve officials from each town. Milone & MacBroom, Inc. assembled a team of subconsultants (Dewberry, Jamie Caplan Consulting, and Punchard Consulting) working on state and local hazard mitigation plans in Connecticut in parallel with the CROG planning process to provide its expertise and input. Finally, members of the public were provided opportunities to provide input throughout the development of the Plan Update.

The hazards included in the planning process in 2017-2018 were those profiled and analyzed 5 years earlier. Importantly, they were the same as the hazards included in the 2014 Connecticut Natural Hazard Mitigation Plan and its update (to be adopted in 2019).

As the hazards analyses were undertaken, the consultant team led meetings with municipal officials to initiate updates to individual city and town plans. These meetings were held in each of the 38 municipalities and included local staff from a variety of departments including administration, planning, emergency management, police, fire, public health, public works, and engineering. In some towns, citizens and elected officials also participated. The consultant team conducted the following meetings locally over a 5-month period (November 2017 through March 2018) with municipal officials to conduct the local update process:

Table ES-5: Summary of Local Planning Meeting Dates and Attendance

Municipality	Local Planning Meeting Date
Andover	3/29/2018
Avon	1/16/2018
Berlin	11/9/2017
Bloomfield	12/20/2017
Bolton	2/16/2018
Canton	12/6/2017
Columbia	2/16/2018
Coventry	12/18/2017
East Granby	12/14/2017
East Hartford	1/18/2018
East Windsor	11/28/2017
Ellington	1/16/2018
Enfield	2/26/2018
Farmington	1/12/2018
Glastonbury	12/20/2017
Granby	12/14/2017
Hartford	12/13/2017
Hebron	2/13/2018
Manchester	12/20/2017
Mansfield	12/13/2017
Marlborough	2/6/2018
New Britain	11/27/2017
Newington	11/9/2017
Plainville	11/6/2017
Rocky Hill	11/10/2017
Simsbury	12/19/2017
Somers	11/20/2017
South Windsor	12/20/2017
Southington	11/14/2017
Stafford	3/29/2018
Suffield	11/28/2017
Tolland	1/10/2018
Vernon	1/11/2018
West Hartford	11/29/2017
Wethersfield	12/5/2017
Willington	2/13/2018
Windsor	12/18/2017
Windsor Locks	12/11/2017

To review prior goals, objectives, and actions and to strategize about new mitigation initiatives, CRCOG and the consultant team sought the advice of the CREPC planning committee at workshops held on January 23, March 27, and September 12, 2018. The meetings were attended by municipal officials from most of the Capitol Region communities as well as representatives from DEEP, the State Historic Preservation Office (SHPO), and the Connecticut Institute for Resilience and Climate Adaptation (CIRCA). The consultant team presented and described mitigation success stories; a number of proposed mitigation initiatives with assistance from DEEP, SHPO, and CIRCA; and reported on additional strategies/actions based on our findings and discussions with local officials at the individual municipal meetings. These meetings led to the new initiatives described in this update such as the historic resources resiliency, addressing spills from small businesses, Municipal Separate Storm Sewer System (MS4) stormwater registration compliance, regional critical facilities, etc.

A variety of means were used to inform the public of the planning process and to gain public input on hazards, areas and issues of concern, and mitigation measures. These specific outreach efforts include public meetings, web postings, and an internet-based public survey. From the survey and public meetings, we found there is strong support for: 1) activities that will mitigate and accelerate recovery from, damage to utilities, infrastructure, and critical facilities (especially the power grid); 2) providing assistance to vulnerable populations; and 3) public education and outreach, public warning system improvements, and emergency response trainings. There is less support for mitigation actions involving floodproofing, drought ordinances, and building-earthquake analysis. Natural and recreational resource recovery, as well as tourism and business recovery, are the lowest priorities for most respondents.

Plan Implementation and Maintenance

Upon approval of the Plan Update by FEMA, each municipality's governing body as well as CRCOG's Policy Board will need to formally adopt the Plan Update. CREPC will also be asked to append this plan to the Regional Emergency Support Plan (RESP).

Implementation of the strategies contained within this plan will depend largely on the availability of resources. Each municipality and CRCOG will have to consider the costs, availability of funding, and impacts of each strategy individually. The CRCOG Policy Development & Planning Department will be responsible for regional strategies and coordination with CRCOG Public Safety staff. The planning subcommittee of CREPC (ESF-5), which provided guidance to this project, will monitor progress on its implementation with assistance from CRCOG staff. The subcommittee will conduct annual outreach to municipalities to ascertain progress on proposed mitigation actions.

For more information on natural hazard mitigation planning, please visit CRCOG's website – <http://crcog.org/2016/05/30/natural-hazards-mitigation-planning/>.