



1 Andover

Community Overview

Andover is a rural community on the eastern edge of the Capitol Region with a population of about 3,300. The town is approximately 15.7 square miles and has an elevation of about 400 feet above sea level. Andover is located in the Willimantic River watershed. Several small rivers and streams flow through the town including the Hop and Skungamaug Rivers and their tributaries: Burnap and Staddle Brooks. Bear Swamp Brook runs through the Nathan Hale State Forest located in the northeast corner of town. The State-owned Bishop’s Conservation Area is located in the southwest corner of town and includes the 53-acre Bishop Swamp Pond. Andover Lake is a 155-acre lake in the southeast corner that provides recreational opportunities to members of the private association that owns it. The Doris Chamberlain Nature preserve with small pond and walking trails is located on Route 316 near School Road. The major transportation routes through Andover include state routes 6, 87, and 316. Principal industries include agriculture and small wood and machine shops.

Town staff report that there has been little new development since adoption of the 2014-2019 Capitol Region Natural Hazards Mitigation Plan Update (“2014 HMP”); most construction activity has been related to improvements and renovations of existing structures and has not increased the Town’s exposure to natural hazard risks.

Critical Facilities

Critical Facilities throughout the Capitol Region are listed in Appendix B. In Andover, these include the Volunteer Fire Department, the Andover Police Department, the Andover Elementary School, the Town Hall, the Town Garage, and the Public Library. The Fire Department, Police Department, and Elementary School are located adjacent to one another.

Table 1-1: Critical Facilities, Andover

Facility	Shelter	Generator
Volunteer Fire Department		X
Andover Police Department		
Andover Elementary School	Primary	
Town Hall		Partial
Andover Town Garage		
Andover Public Library		

Andover Elementary School is the primary shelter but is in need of an emergency generator. A generator is also needed for the Town Hall Community Room addition; currently the fire house generator covers the main Town Hall. Installation of a generator at the Town Hall Addition would allow it to be used as a back-up shelter.

Capabilities

Andover's hazard mitigation capabilities include its emergency response departments, shelter, department of public works operations, and relationships with neighboring communities. Hazard mitigation is incorporated, to some degree, into the community's Plan of Conservation and Development (POCD). POCD actions specifically address natural hazards.

Andover addresses drainage complaints as they are reported. The Town has a small budget of approximately \$10,000 per year for tree maintenance, and removes dangerous as they become aware of them, when possible. The Town has a woodchipper for removing fallen trees but does not own a bucket truck. Eversource maintains trees along power lines. Municipal staff report that its tree-maintenance capabilities are lacking.

Andover has established working relationships with neighboring towns for assistance when needed.

New Capabilities

The Town has not permitted any new construction in the FEMA-mapped special flood hazard area (SFHA). A map modernization effort by FEMA is currently underway for Tolland County, but its full extent, and how much of Andover it will cover, is unknown.

The reconstruction of the Bunker Hill Road bridge over the Hop River, historically an area of flood concern, is currently in the design phase. Completion of this project is expected to relieve flooding in this area and better maintain travel on this route during flood events.

Route 6 through Andover and the neighboring towns of Bolton and Coventry was a recent focus of a transportation corridor study and review of economic development opportunities. As a follow-up to this study, the Town anticipates reviewing its zoning regulations to consider revisions that could encourage commercial development at appropriate locations in the corridor. It is thought that focusing development in this way, with hazard risk awareness in mind, will limit risks posed by natural hazards.

Challenges

Challenges Overview

Storm damage from trees resulting in road blockages, power outages and debris accumulation is a major concern of the Town. Andover also contains significant forested land, including State Forest land, which poses some fire risk to residential areas. Andover identifies severe winter weather as its primary concern.

The Town has two areas of localized flooding concern: Bunker Hill Road and the bridge over Hop River, and the bridge on Long Hill Road over the Hop River. Debris accumulation and erosion of stream banks are the main contributors to flooding problems at those locations.

Andover also identifies failure of the dam at Andover Lake as a major concern.



Andover has not experienced a significant wildfire in many years and considers its risk of wildfire to be low due to the low incidence and limited development in the Town. The Town has no public water or pressurized hydrants and relies on cisterns and dry hydrants to supply firefighting water.

Hazard Losses

The economic losses faced by the community from natural hazards can be estimated by reviewing historic, and modeling future, loss figures. Loss estimates are summarized below.

Historic FEMA Payments

FEMA reimburses communities for hazard losses through programs including Public Assistance (PA) and the National Flood Insurance Program (NFIP). Combining PA and private flood insurance payments can give an estimate for total losses to a community.

The NFIP had paid four property damage claims in Andover as of August 2017, totaling \$4,980.94. Andover has had no Repetitive Loss (RL) Property claims to-date.

Total PA reimbursements to the community were as follows:

- Flood Events: \$8,980 (\$473 annually)
- Hurricane Events: \$50,882 (\$2,678 annually)
- Winter Storm Events: \$204,107 (\$10,742 annually)

These are summarized in the tables below.

Table 1-2: Flood Event PA Reimbursements, Andover

Incident	Oct. 2005
Declaration	12/16/05
Disaster No.	1619
Entity	FEMA PA Reimbursement
State	\$480
Nonprofit	\$0
Municipal	\$8,500
Total	\$8,980
Annualized	\$473



Table 1-3: Hurricane Wind Event PA Reimbursements, Andover

Incident	Aug. 2011 (T.S Irene)	Oct. 2012 (Storm Sandy)
Declaration	09/02/11	10/30/12
Disaster #	4023	4087
Entity	FEMA PA Reimbursement	
State	\$213	\$994
Nonprofit	\$15,758	\$0
Municipal	\$21,915	\$12,003
Total	\$37,885	\$12,997
Annualized	\$1,994	\$684

Table 1-4: Winter Storm PA Reimbursements, Andover

Incident	Mar 2003	Jan 2004	Feb 2005	May 2006	Mar 2011	Nov 2011	Mar 2013	Apr 2015
Declaration	3/11/03	1/15/04	2/17/05	5/2/06	3/3/11	11/17/11	3/21/13	4/8/15
Disaster #	4216	4215	4214	4106	4046	3266	3192	3176
Entity	FEMA PA Reimbursement							
State	\$3,354	\$3,469	\$4,958	\$4,513	\$5,647	\$865	\$4,703	\$9,101
Nonprofit	\$15,402	\$20,733	\$24,101	\$10,956	\$20,262	\$12,206	\$31,406	\$27,354
Municipal	\$0	\$0	\$0	\$0	\$3,251	\$1,827	\$0	\$0
Total	\$18,755	\$24,202	\$29,059	\$15,469	\$29,160	\$14,898	\$36,109	\$36,455
Annualized	\$987	\$1,274	\$1,529	\$814	\$1,535	\$784	\$1,900	\$1,919

National Centers for Environmental Information Losses

The National Centers for Environmental Information (NCEI) severe storm database was reviewed to identify events that had impacted the community. The table below summarizes events in that database that were specifically noted as having impacted Andover since 2012.

Table 1-5: NCEI Database Losses since 2012, Andover

Date	Event	Property Damage
7/10/2013	Tornado (EF1)	*\$17,000
2/25/2016	Thunderstorm	\$5,000
Total		\$55,000

*damages from storm divided between multiple communities

NCEI losses under other event categories (such as drought, high wind, flooding, and winter storms) were not specifically noted as impacting Andover, though they did impact Tolland County and nearby towns. NCEI losses are reported in Section II of this Plan.



HAZUS-MH Losses

CRCOG used FEMA’s Hazus-MH model to analyze the risks that the community might face from flooding, hurricanes, and earthquakes. The model estimates economic losses to the town due to damage to buildings and building contents, as well as other economic disruptions. Both residential and commercial structures are addressed. Losses from different hazards are summarized below. Where available, estimates from the previous and current versions of the HMP are provided side-by-side; differences between the two may have been caused by a combination of the following:

- Changes in methodology: such as hazard zone mapping
- Changes in data: such as population and property values
- Changes in the model: this HMP utilized Hazus-MH version 4.0 rather than 2.1
- Other factors: inherent in a complex software like Hazus-MH

More details are available in the Multi-Jurisdictional HMP. Ultimately, changes in the loss estimates reflect the reality that small differences in hazard event features can have a significant impact on losses incurred.

Table 1-6: Estimated Damages to Andover from a 1% Annual-Chance Flood

Loss Type	2014 Results	2018 Results
Households Displaced	57	50
People Needing Shelter	40	51
Buildings at Least Moderately Damaged	8	0
Economic Losses		
Residential Building & Content Losses	\$5,870,000	\$4,362,890
Other Building & Content Losses	\$4,400,000	\$3,353,726
Total Building & Content Loss	\$10,290,000	\$7,716,616
Total Business Interruption Losses	\$20,000	\$125,027
TOTAL	\$10,310,000	\$7,841,643

Table 1-7: Estimated Damages to Andover from a 1% Annual-Chance Hurricane

Loss Type	2014 Results (1938 event)	2018 Results (1% track)
Buildings at Least Moderately Damaged	126	1
Buildings Completely Damaged	6	0
Total Debris Generated (tons)	28,188	5625
Truckloads (at 25 tons/truck) of building debris	44	225
Economic Losses		
Residential Building & Content Losses	\$12,660,000	\$1,432,917
Other Building & Content Losses	\$990,000	\$59,433
Total Building & Content Loss	\$14,800,000	\$1,492,350
Total Business Interruption Losses	\$1,150,000	\$82,591
TOTAL LOSSES	\$15,950,000	\$1,574,941



Losses were calculated from a modeled probabilistic earthquake (1% annual-chance of occurrence), as well as for four specific scenarios with epicenters around Connecticut.

Table 1-8: Estimated Damages to Andover from a Probabilistic Earthquake

Loss Type	2018 Results
Wage Loss	\$267
Rent Loss	\$226
Relocation Loss	\$503
Income Loss	\$286
Inventory Loss	\$33
Total Business Disruption	\$1,314
Structural Loss	\$1,061
Non-Structural Loss	\$3,954
Total Building Loss	\$5,015
Total Content Loss	\$1,557
TOTAL LOSSES	\$7,886

Table 1-9: Estimated Damages to Andover from Modeled Earthquake Scenarios

Epicenter Location	Magnitude	Estimated Total Losses
East Haddam	6.4	\$94,657.41
Haddam	5.7	\$21,130.90
Portland	5.7	\$33,274.91
Stamford	5.7	\$699.29

Average Annualized Losses

Average Annualized Loss (AAL) figures are useful tools for comparison of the risks faced from different hazards with different likelihoods of occurring in a given time period. AAL estimates were prepared for each natural hazard which may impact Andover based on the methodologies discussed in Section II of the Multi-Jurisdictional HMP. Dam failure, drought, tornado, and wildfire losses were sourced from the 2014 Connecticut Natural Hazard Mitigation Plan Update, with dam failure data supplemented by the National Performance of Dams Program and the Connecticut Department of Energy & Environmental Protection. Earthquake and hurricane losses were calculated in HAZUS-MH. Losses for flooding came from NFIP claims, for winter storms from Public Assistance Reimbursements, and for thunderstorms from the NCEI database. These are presented in the table below in dollars per year. Note that Hurricanes and Tropical Storms represent the largest share of total annualized losses.

Table 1-10: Average Annualized Losses, Andover

Dam Failure	Drought	Earthquakes	Flooding	Hurricanes and Tropical Storms	Severe Winter Storms	Thunderstorms	Tornadoes	Wildfires	Total
\$203	\$0	\$7,886	\$604	\$223,832	\$10,742	\$1,202	\$960	\$2,027	\$247,457



Losses Summary

A review of the above loss estimates demonstrates that the Town of Andover has experienced significant expenses as a result of natural hazards and is at risk for additional losses if some of the less-frequent events were to occur. These actual and potential losses justify hazard mitigation actions to reduce losses in the future.

Mitigation Strategies and Actions

Noted Hazard Mitigation Needs

Over the course of Plan development, multiple hazard mitigation needs were noted.

The Long Hill Road over Hop River, an area of localized flooding, reportedly needs replacement or repair. The Town may wish to pursue replacement, and to consider impacts of the project on Hop River flooding and road access during flood events, during that project.

Many of the current Town staff are relatively new to the Town, and so don't have local knowledge of historic hazard events and needs. Additionally, as of March 2018, the Town did not have a DPW director. For these reasons, the Town should consider developing a formalized procedure for tracking hazard events in Town and passing that information on to new Town staff. Collecting information on the costs of these events would also be helpful.

There is a private pond in Town that is a good location for a new dry hydrant; a recent change in ownership of the pond presents an opportunity to develop a hydrant at that site.

Andover staff report that its tree maintenance budget is insufficient, and that acquisition of a bucket truck to use for tree removal is desired.

Status of Previous Mitigation Strategies and Actions

The Town of Andover reviewed the mitigation actions proposed in the 2014 HMP and determined the status of each. That information is included in the table below.

Table 1-11: Status of Previous Mitigation Strategies and Actions, Andover

Action #	Action	Notes	Status
GOAL: MINIMIZE LOSS OF LIFE, PROPERTY DAMAGE, AND COMMERCIAL DISRUPTION AND FACILITATE RECOVERY FROM NATURAL HAZARDS.			
Objective 1: Improve warning notification through Reverse-911 and evacuation assistance.			
1.1	Monitor implementation of Reverse-911 system, and plan for updates.	This is an ongoing effort and reclassified as a capability.	Capability
1.2	Educate the public on new warning notification system, sheltering facilities and other emergency preparedness measures.	This action was not completed due to staff and financial constraints.	Carry Forward
1.3	Coordinate with municipal agent for the elderly on special needs population list maintenance.	List exists and was used recently during power outages to help the elderly. Town wishes to pursue improvements.	Carry Forward with Revisions



Action #	Action	Notes	Status
Objective 2: Ensure adequate natural hazard response and recovery through zoning and public works activities.			
2.1	Areas draining into the Hop River will be monitored to identify and prevent future erosion.	Town has identified two bridges in need of replacement; Bunker Hill Road Bridge (currently in design phase) and Long Hill Road Bridge. A larger-scale study of drainage and erosion risk has not been performed.	Carry Forward with Revisions
2.2	Study debris and flooding issues on Parker Bridge Road.	Town monitored site and has not observed additional debris or flooding issues on Parker Bridge Road since the previous HMP. This action is no longer needed.	Drop
2.3	Educate property owners on property maintenance, especially around natural and artificial drainage systems.	This is an ongoing activity for the Town and is considered a capability.	Capability
2.4	Establish a list of, and agreements with, private tree service companies to ensure prompt debris removal service following storms.	This action has not been pursued: currently, contractors bid on an annual basis, giving the Town competitive pricing. However, the Town would like to switch to adding multiples and having a call down list.	Carry Forward with Revisions
2.5	Investigate the CROCOG service sharing initiative, especially surrounding tree and other debris removal equipment.	This action was not completed due to staff and financial constraints.	Carry Forward
Objective 3: Ensure capacity for emergency sheltering of residents.			
3.1	Improve shelter facility, especially sanitary facilities, handicapped accessibility and generator.	Andover has assessed its sheltering capacity and expansion options; it has determined that an emergency generator should be installed at the elementary school to improve that shelter, and another should be installed in the Town Hall Addition so that space can be made into a backup shelter. Those actions are carried forward.	Carry Forward with Revisions
3.2	Investigate animal sheltering alternatives.	Investigation showed that this is not a practical option for the Town.	Drop
Objective 4: Train first responders and provide proper support, including supplies and equipment.			
4.1	Continue to participate in National Incident Management System (NIMS) training.	CERT team trains and drills monthly. Everyone in firehouse is NIMS trained as well. This is a capability.	Capability
4.2	Coordinate with DEEP on maintenance of the Andover Lake Dam and of state forest land for structural integrity of dam, wild fire prevention and emergency response.	Dam is privately owned (by homeowner's association ALPOA) and DEEP is responsible for ensuring maintenance occurs. Town will ensure it is familiar with the status of dam maintenance.	Carry Forward with Revisions
Objective 5: Ensure residents are aware of the gas pipeline that runs through town.			
5.1	Coordinate with pipeline owner on public education and outreach regarding line and public safety.	Has happened as planned and it is the Town's desire to continue this effort through future coordination.	Carry Forward with Revisions



Active Mitigation Strategies and Actions

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

Each of the following actions has been prioritized based on FEMA guidelines, listed from highest to lowest priority, and numbered.

Action #1	
Enter the Sustainable CT program through Registration and review actions that can be undertaken to pursue Certification. Make progress with the actions related to hazard mitigation.	
Goal	4. Increase the use of natural, "green," or "soft" hazard mitigation measures, such as open space preservation and green infrastructure.
Category	Natural Resources Protection
Lead	Planning
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	01/2019 - 12/2019
Priority	High

Action #2	
Coordinate with municipal agent for the elderly to update the special needs population list.	
Goal	8. Ensure community character and social equity are addressed in mitigation activities
Category	Preparedness & Emergency Response
Lead	Emergency Management
Cost	\$10,000 - \$25,000
Funding	Town Operating Budget / DEMHS
Timeframe	07/2019 - 06/2020
Priority	High

Action #3	
Educate the public on new warning notification system, sheltering facilities and other emergency preparedness measures.	
Goal	6. Improve public outreach, education, and warning systems
Category	Education & Awareness
Lead	Emergency Management
Cost	\$10,000 - \$25,000
Funding	Town Operating Budget / Grants
Timeframe	07/2019 - 06/2021
Priority	High



Action #4

Complete replacement of Bunker Hill Road Bridge

Goal	5. Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.
Category	Structural Projects
Lead	Public Works
Cost	More than \$100,000
Funding	Grants
Timeframe	07/2019 - 06/2020
Priority	High

Action #5

Conduct outreach to local small businesses with the aim of preventing the accidental release and pollution from chemicals stored and used at their facilities during or following natural hazard events.

Goal	6. Improve public outreach, education, and warning systems
Category	Education & Awareness
Lead	Planning, in coordination with DEEP
Cost	\$0 - \$10,000
Funding	Materials & Resources Provided by CT DEEP
Timeframe	01/2019 - 12/2019
Priority	Medium

Action #6

Develop a formalized procedure for tracking hazard events in Town and passing that information onto new Town Staff. Collecting and tracking information on event costs & losses should be part of that procedure.

Goal	3. Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies
Category	Education & Awareness
Lead	Emergency Management
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	01/2020 - 12/2020
Priority	Medium



Action #7

Pursue agreement with landowner of the small private pond that is a good location for a dry hydrant to install a dry hydrant at that site.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Fire Department
Cost	\$0 - \$10,000
Funding	Town Operating Budget / CT DEEP
Timeframe	07/2020 - 06/2021
Priority	Medium

Action #8

On an at-least annual basis, check on the status of maintenance of the Andover Lake Dam and determine whether Town intervention is required.

Goal	1. Minimize the impact of natural hazards on physical buildings and infrastructure
Category	Prevention
Lead	Public Works
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	01/2019 - 12/2023
Priority	Medium

Action #9

Participate in EMI courses or the seminars and annual conference held by the Connecticut Association of Flood Managers.

Goal	3. Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies
Category	Education & Awareness
Lead	Planning
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	07/2019 - 06/2024
Priority	Medium



Action #10

Install emergency generator at the elementary school to improve its sheltering capabilities.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Emergency Management
Cost	\$10,000 - \$25,000
Funding	Town Operating Budget / DEMHS
Timeframe	07/2019 - 06/2020
Priority	Medium

Action #11

Review the LID Manual developed by the Northwest Hills Council of Governments and determine whether LID can be incorporated locally to increase rural resiliency.

Goal	1. Minimize the impact of natural hazards on physical buildings and infrastructure
Category	Prevention
Lead	Planning
Cost	\$10,000 - \$25,000
Funding	Town Operating Budget
Timeframe	07/2021 - 06/2022
Priority	Medium

Action #12

Perform a study of the Hop River channel and watershed to identify drainage problems and erosion risk zones.

Goal	3. Improve institutional awareness and understanding of natural hazard impacts and mitigation within municipal governments and other decision-making bodies
Category	Prevention
Lead	Public Works
Cost	\$25,000 - \$50,000
Funding	CT DEEP / DEMHS
Timeframe	07/2021 - 06/2022
Priority	Medium



Action #13

Initiate replacement of Long Hill Road Bridge. Consider impacts of that project on Hop River flooding and road access.

Goal	5. Improve the resilience of local and regional utilities and infrastructure using strategies including adaptation, hardening, and creating redundancies.
Category	Structural Projects
Lead	Public Works
Cost	More than \$100,000
Funding	Grants
Timeframe	07/2020 - 06/2022
Priority	Medium

Action #14

Establish a call-down list of private tree service companies that can be recruited to conduct debris removal and emergency tree maintenance following storms.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Public Works
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	07/2021 - 06/2023
Priority	Low

Action #15

Investigate the CRCOG service sharing initiative, especially surrounding tree and other debris removal equipment.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Public Works
Cost	\$0 - \$10,000
Funding	Town Operating Budget
Timeframe	07/2021 - 06/2023
Priority	Low



Action #16

Implement an education and outreach initiative related to the pipeline that passes through town and public safety.

Goal	6. Improve public outreach, education, and warning systems
Category	Education & Awareness
Lead	Emergency Management
Cost	\$0 - \$10,000
Funding	Town Operating Budget / Grants / DEMHS
Timeframe	01/2022 - 12/2023
Priority	Low

Action #17

Install emergency generator at the Town Hall Addition to make progress on converting that space into a backup shelter.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Emergency Management
Cost	\$10,000 - \$25,000
Funding	Town Operating Budget / DEMHS
Timeframe	07/2020 - 06/2021
Priority	Low

Action #18

Coordinate with CT SHPO to conduct historic resource surveys, focusing on areas within natural hazard risk zones (such as flood or wildfire hazard zones and areas near steep slopes), to support identification of vulnerable historic properties and preparation of resiliency plans across the state. This action leverages existing resources and best practices for protection of historic and cultural resources through an ongoing statewide initiative by CT SHPO.

Goal	8. Ensure community character and social equity are addressed in mitigation activities
Category	Property Protection
Lead	Planning, in coordination with SHPO
Cost	\$10,000 - \$25,000
Funding	SHPO
Timeframe	07/2021 - 06/2023
Priority	Low



Action #19

Acquire a bucket truck to use for tree maintenance and removal.

Goal	7. Improve the emergency response capabilities of the region and its communities
Category	Preparedness & Emergency Response
Lead	Public Works
Cost	More than \$100,000
Funding	Town Operating Budget / Grants
Timeframe	01/2023 - 12/2023
Priority	Low






Capitol Region Natural Hazards Mitigation Plan Update









Andover, Connecticut

Flood Plains, Dams & Critical Facilities

Dam Hazard Class



-  BB, A, AA OR Unclassified
-  Class B - Significant Hazard
-  Class C - High Hazard

Critical Facilities

-  Fire Station
-  Police Station
-  School
-  Healthcare Facility
-  Town Facility
-  Waste Water Facility
-  Emergency Center
-  NRHP Buildings/Sites

 NRHP Districts/Areas

FEMA Flood Hazard Area

-  100 Year Flood Zone
-  500 Year Flood Zone

Data Sources: FEMA, National Register of Historic Places, CT DEEP, CRCOG, ESRI



99 Realty Drive Cheshire, CT 06410
 (203) 271-1773 Fax: (203) 272-9733
www.miloneandmacbroom.com

