Burlington

Burlington is by far the most rural town in the region, with hundreds of acres of protected State Forest and water company lands. Miles of recreational trails cross its woods, while reservoirs in the town are key elements of the public water supply for nearby New Britain. The town's natural setting is prized by its residents, who are few in number; with 8,190 residents in the 30.4 square mile town in 2000, Burlington had a population density of 269 people per square mile.

In 1996 Burlington was ranked the fastest-growing town in Connecticut, and it is projected to grow in coming decades. The Department of Transportation anticipates 3.3% increase in population by 2030—a slightly smaller increase than in the region as a whole. Burlington is also projected to see an 84% increase in number of residents aged 60 and older by 2030. This increase would move the town's population from 18.7% aged 60 and older in 2000 to 32.1% in 2030.

Challenges

Flooding and winter storms both present challenges for Burlington, although those challenges are not uniform across the town. Situated at the edge of the Western Highlands, Burlington experiences large changes in elevation that result in different weather patterns in different areas of town. When the northwest corner of town, elevation of roughly 1100' above sea level, gets a foot of snow, the southeast corner (at 600') might only see an inch or two. The Farmington River makes a loop through the northeast corner of the town, where elevations are low, before heading into Farmington to the east.

Flooding problems in Burlington arise in two main areas: along the brooks that feed into the Farmington River from the northwest, and in the Whigville area, in the southeast. Flooding in both areas impacts residences as well as town infrastructure. Many of the flooding problems involve infrastructural damage arising from a storm in October 2005 which inundated the town with 16" of

rain over the course of 5 days. The storm washed out a number of roads and bridges, and overwhelmed culverts throughout the town. Damage from the storm is still widespread; notable locations include:

- Upson Road: the road was washed out during the 2005 storm. Culverts need to be enlarged.
- Foote Road: Bunnell Brook needs a berm or a larger channel in this area; every time it rains, it floods the recreation facility next to it. 2 FEMA claims were submitted regarding brook modifications in 2005/2006.
- Corey & Hotchkiss Roads: a bridge over Bunnell Brook washed out during the 2005 storm.
- Main Street (in Whigville): a bridge over the Whigville Brook washed out in 2005. The town made temporary repairs in order to reopen the bridge, but permanent repairs need to be made.
- Prospect Street (in Whigville): a bridge over Whigville Brook washed out in 2005 and remained closed for a year. The town made temporary repairs to reopen the bridge, but permanent repairs are still needed.

Other flooding problems in the town arise from persistent conflicts with beavers, which build dams inside culverts and obstruct the flow. The dams can result in surprising problems including landslides, undermined bridges, and road collapses. The culvert at Scoville Road needs to be replaced, partially due to damage from beavers; in heavy rains the road floods and must be closed. The town works to install beaver-proof grates in as many culverts as it can, and clears out debris from the beavers before large storms in order to prevent flooding.

Winter storms also pose challenges for Burlington. The town handles all of its own snow and ice removal without relying on contractors. The topography of the town means that some areas may be inundated with snow and ice while others are barely affected by the same storm. Although zoning regulations require all new construction (since 2005) to bury utility lines, older homes still have above-ground wires, and power is disrupted by fallen tree limbs in Burlington as in the other towns in the Region.

Because of its extensive wooded areas, Burlington experiences a somewhat greater risk of wildfires than do the other towns in the Region.

Current Mitigation and Response Activities

- All new construction (since 2005) must have underground wires for electricity per the zoning regulations; older infrastructure has not been buried
- DEP monitors dams
- Wetlands areas protected since 1970s
- Flood plain regulations limit development within the flood plain
- All schools in town are Red Cross approved shelters and are equipped with generators.
- Town Hall is an emergency warming / cooling center, also has a generator.
- Town uses a reverse-911 notification system for emergencies. Emergency Management also has permission to use the school system notification service and to post emergency messages on the variable-message sign at the High School; this will be possible when the correct software is obtained and installed. The Town received a $40,000 grant to purchase a second sign to be installed on Rte 4 by Town Hall, but cannot install the sign until they receive a zoning variance.
- Key individuals are trained in WebEOC; EMD is hoping to train more in the future.
- The Town participates in the National Flood Insurance Program.

Goals, Objectives, Strategies

Goal: reduce losses of life and property, and minimize economic consequences of natural hazards.

Objective 1: Improve citizen awareness, preparedness, and response time through education

	Strategy	Priority	Lead	Hazard
S1	Develop & distribute a pamphlet about household preparedness & town emergency response services	High	Emergency Management	All
S2	Encourage preparedness workshops in schools	High	Emergency Management	All
S3	Publish preparedness pamphlet and evacuation plan on town website	High	Emergency Management	All
S4	Offer low-cost or no-cost town-wide CPR training	Medium	Emergency Management	All

Objective 2: Improve town infrastructure to better handle hazards

	Strategy	Priority	Lead	Hazard
S1	Upgrade culverts on Upson and Scoville Roads	High	Highway Department	Flooding
S2	Replace culvert on Alto Road at the intersection of Brookside Drive	High	Highway Department	Flooding
S3	Repair/replace bridges as necessary at Prospect Street, Main Street, and the intersection of Covey & Hotchkiss Roads	High	Highway Department	Flooding
S4	Beaver-proof culverts where possible	High	Highway Department	Flooding
S5	Look at widening channel of Bunnell Brook near Foote Road	High	Highway Department	Flooding
S6	Examine possibility of burying older electrical infrastructure in order to curtail disruptions in service	Medium	Highway Department	Winter Storms, Wind Storms

Objective 3: Improve town communications capacities

	Strategy	Priority	Lead	Hazard
S1	Upgrade town radio equipment to 700mhz to ensure interoperability with the state	High	Emergency Management	All
S2	Replace ITAC/ICALL mobile base unit by 2013; upgrade portable units and add one	High	Emergency Management	All
S3	Revise zoning or grant a variance to allow installation of variable-message notification sign on Rte 4 by town hall	High	Emergency Management, Planning & Zoning	All
S4	Install a radio transmission tower between Lake Garda and Whigville, to extend reception to all parts of town and eliminate gaps	Medium	Highway Department	All
S5	Implement a one-touch alert notification system to allow Emergency Management and other first responders to contact each other instantaneously in the event of an emergency	Medium	Emergency Management	All

Objective 4: Improve sheltering capacity for vulnerable populations

	Strategy	Priority	Lead	Hazard
S1	Acquire a generator for the senior center	High	Emergency Management	All

Objective 5: Increase town capacity to plan for, simulate, and respond to hazards

	Strategy	Priority	Lead	Hazard
S1	Equip Fire and Emergency Management vehicles with portable notebook computers and GPS units	High	Emergency Management	All
S2	Develop GIS capacity to assist in emergency planning and response	Medium	Planning	All

Objective 6: Continue Participation in National Flood Insurance Program

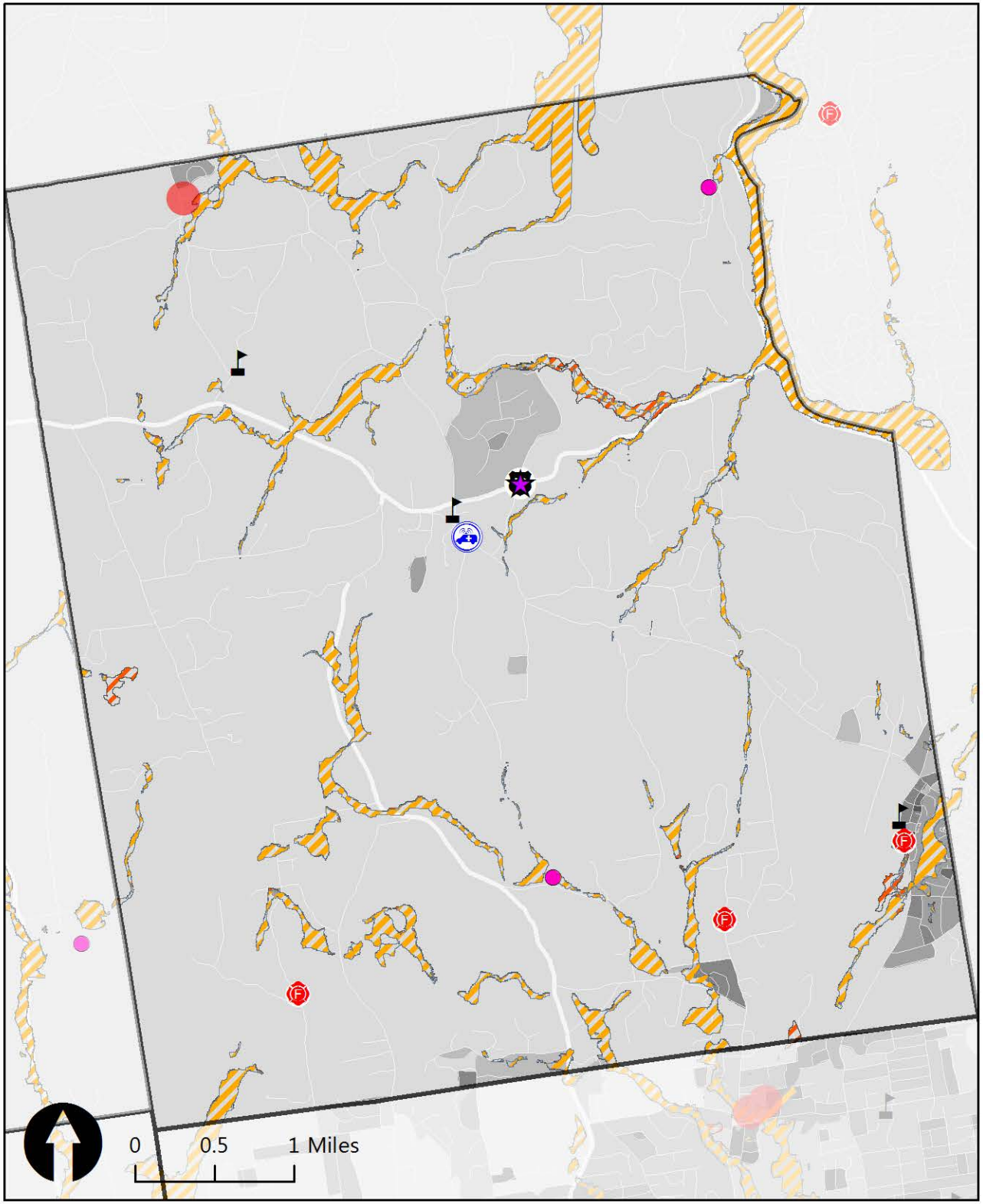
	Strategy	Priority	Lead	Hazard
S1	Continue enforcement of floodplain management ordinances by regulating all new and substantially improved construction in flood zones	High	Planning	Flooding
S2	Work with FEMA to update FIRMs as necessary	High	Public Works	Flooding
S3	Continue to distribute information about the NFIP to homeowners	High	Planning	Flooding
S4	Continue to assist homeowners with amendments to NFIP maps as necessary	High	Planning	Flooding

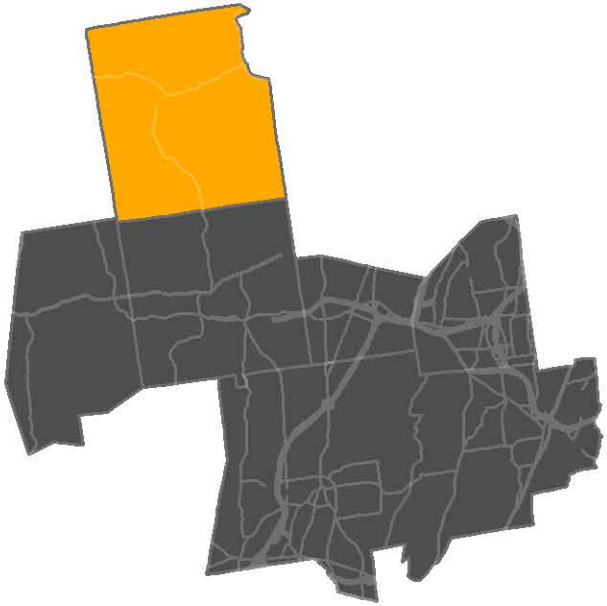
Contributors

Scott Tharau (Highway Foreman), Bob Gleason (Emergency Management Director & Deputy Fire Chief), Ted Scheidel (former First Selectman), Charles Kirchofer (former Building Official), James Thompson, P.E. (Town Engineer), Richard Miller (Inland Wetlands & Watercourses)

Flood Zones & Critical Facilities

Burlington





Critical Facilites

- Power_Plant
- Hospitals
- Ambulance
- Fire
- Police
- Waste Water
- Schools
- Primary Shelters
- RLP Zone
- Class C Dams
- Town Halls

Flood Zones

- 100 Year Flood
- 500 Year Flood

Pop/square mile

- 0 - 1,000
- 1,000 - 2,000
- 2,000 - 3,000
- 3,000 - 4,000
- 4,000 - 5,000
- 5,000 - 10,000
- 10,000+

Hazus-MH: Flood Event Report

Region Name: Burlington

Flood Scenario: Flood100

Print Date Wednesday, October 1, 2014

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Connecticut

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 30 square miles and contains 168 census blocks. The region contains over 3 thousand households and has a total population of 9,422 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 3,673 buildings in the region with a total building replacement value (excluding contents) of 745 million dollars (2006 dollars). Approximately 92.51% of the buildings (and 85.52% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 1,690 buildings in the region which have an aggregate total replacement value of 317 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1

Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	637,499	85.5%
Commercial	62,138	8.3%
Industrial	24,650	3.3%
Agricultural	3,034	0.4%
Religion	5,658	0.8%
Government	2,265	0.3%
Education	10,218	1.4%
Total	**745,462**	**100.00%**

Table 2

Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	460,553	84.7%
Commercial	44,205	8.1%
Industrial	19,828	3.6%
Agricultural	2,525	0.5%
Religion	4,703	0.9%
Government	2,265	0.4%
Education	9,804	1.8%
Total	**543,883**	**100.00%**

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds.
There are 4 schools, 1 fire stations, 1 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	CCRPA Disaster Resilience
Scenario Name:	Flood100
Return period Analyzed:	100
Analysis Option Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 2 buildings will be at least moderately damaged. This is over 5% of the total number of buildings in the scenario. There are an estimated 2 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5.3 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agricultural	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Total	**0**		**0**		**0**		**0**		**0**		**2**	

Table 4: Expected Building Damage by Building Type

Building	1-10		11-20		21-30		31-40		41-50		Substantially	
Type	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Building Damage by Occupancy

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	1	0	0	0
Hospitals	0	0	0	0
Police Stations	1	0	0	0
Schools	4	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 832 tons of debris will be generated. Of the total amount, Finishes comprises 44% of the total, Structure comprises 33% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 33 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 140 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 95 people (out of a total population of 9,422) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 11.49 million dollars, which represents 2.11 % of the total replacement value of the scenario buildings

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 11.49 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 75.30% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	5.80	0.45	0.32	0.04	6.61
	Content	2.85	1.10	0.62	0.22	4.78
	Inventory	0.00	0.02	0.07	0.00	0.10
	Subtotal	**8.65**	**1.57**	**1.01**	**0.26**	**11.49**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
ALL	**Total**	**8.65**	**1.57**	**1.01**	**0.26**	**11.49**

Appendix A: County Listing for the Region

Connecticut

- Hartford

Appendix B: Regional Population and Building Value Data

		Building Value (thousand of dollars)		
	Population	Residential	Non-Residential	Total
Connecticut				
Hartford	9,422	637,499	107,963	745,462
Total	9,422	637,499	107,963	745,462
Total Study Region	9,422	637,499	107,963	745,462