

Strategy for Reducing Risks from Natural Hazards in North Smithfield, Rhode Island

Created by the North Smithfield Natural Hazard Mitigation Committee

Adopted by the North Smithfield Town Council October 7, 2019

ACKNOWLEDGMENTS

Members of the North Smithfield Natural Hazard Mitigation Committee

Gary Ezovski, Town Administrator/Public Safety Director
Colonel Peter E. Branconnier, EMA Director
Tom Kravitz, Town Planner
Roberta Moneghan, Assistant Planner/GIS Analyst
Raymond Pendergast, Director of Public Works
Steven R. Reynolds, Police Chief
David Chartier, Fire Chief

ADDITIONAL ACKNOWLEDGMENTS

Gina Raimondo
Governor

Rhode Island Emergency Management Agency
Marc Pappas
Director

Table of Contents

INTRODUCTION	5
What Mitigation Can Do For North Smithfield	5
Community Profile.....	5
Location.....	5
Demographics, Census and Housing.....	6
Brief History>>>>>>>.....	6
Community Development and Development Trends.....	7
National Flood Insurance Program, Community Rating Systems.....	7
PLANNING PROCESS	8
Purpose, Overview and Background.....	8
Public Input.....	9
RISK ASSESSMENT	9
Hazards Affecting North Smithfield	9
Hazard Profile Summary.....	9
Hazard Profiles.....	9
Hurricanes.....	10
Heavy Rains and Floods.....	12
Nor'easters/Snowstorms/Ice.....	14
Significant Hailstorms.....	17
Significant Wind Events.....	18
Significant Lightning Storms.....	20
Earthquakes and Forest fires.....	21
Vulnerable Areas.....	23
Local Dams.....	23
Local Bridges.....	26
Local Roadways Subject to Flooding.....	27
Emergency Shelter.....	29
Residential Homes.....	29
Public Infrastructure.....	29
Tree Damage.....	30
Transportation Services and Public Utilities.....	30
Risk Assessment Matrix.....	31
VULNERABILITY	35
Population at Risk	35
The Economy at Risk	35
Property at Risk.....	35
Future Development Trends.....	36
Preservation of Wetlands.....	36
CAPABILITY	37
ASSESSMENT	
Plans and Regulations	37
Hazard Mitigation Plan	
North Smithfield, RI	

Additional Programs and Departments.....	37
State Resources.....	39
MITIGATION STRATEGY.....	39
2019 Action Plan.....	42
Strategy Adoption.....	46
Implementation, Evaluation and Revision of Strategy.....	47
REFERENCES.....	47
APPENDICES	
Appendix A: Technical and Financial Assistance for Mitigation.....	48
Appendix B: Existing Protection Systems – State and Federal.....	51
Appendix C: North Smithfield Town Council Resolution.....	54
Appendix D: Agendas and Minutes from meetings of Hazard Mitigation Comm.....	55
TABLES	
Hazard Profile Summary	10
Table 1. Major Disasters Since 2010.....	8
Table 2. Hazard Profile Summary.....	10
Table 3. Significant Hurricanes in Rhode Island.....	12
Table 4. Significant Heavy Rain/Flooding for Providence County.....	14
Table 5. Significant Nor'easters/Snowstorms for Providence County.....	16
Table 6. Significant Hailstorms for Providence County	18
Table 7. Significant Wind Events for Providence County	19
Table 8. Significant Lightening Storms for Providence County.....	21
Table 9. History of Earthquakes in Rhode Island	22
Table 10. Dams In North Smithfield.....	24
Table 11 Bridges in North Smithfield Identified in RITIP.....	28
Table 12. Critical Facilities.....	30
Table 13. Summary of Land Use.....	36
MAPS	
Map 1. Critical Facilities in North Smithfield.....	60
Map 2. Risks in North Smithfield	61

Formal Adoption Letter (Town Council) Comes after RIEMA/FEMA approval of DRAFT

1. Introduction

Hazard mitigation is any prudent action taken to eliminate or reduce the long-term risk of life and property damage from natural hazards (e.g. wind, fire, rain, snow, flood, earthquakes, etc.). Hazard mitigation planning is used to identify risks and vulnerabilities associated with natural disasters and to develop mitigation strategies to reduce or eliminate long term risks. This plan update was prepared in accordance with 44 Code of Federal Regulations (CFR) §201.6 and using the FY2015 Hazard Mitigation Assistance (HMA) Unified Guidance.

What Mitigation Can Do for North Smithfield

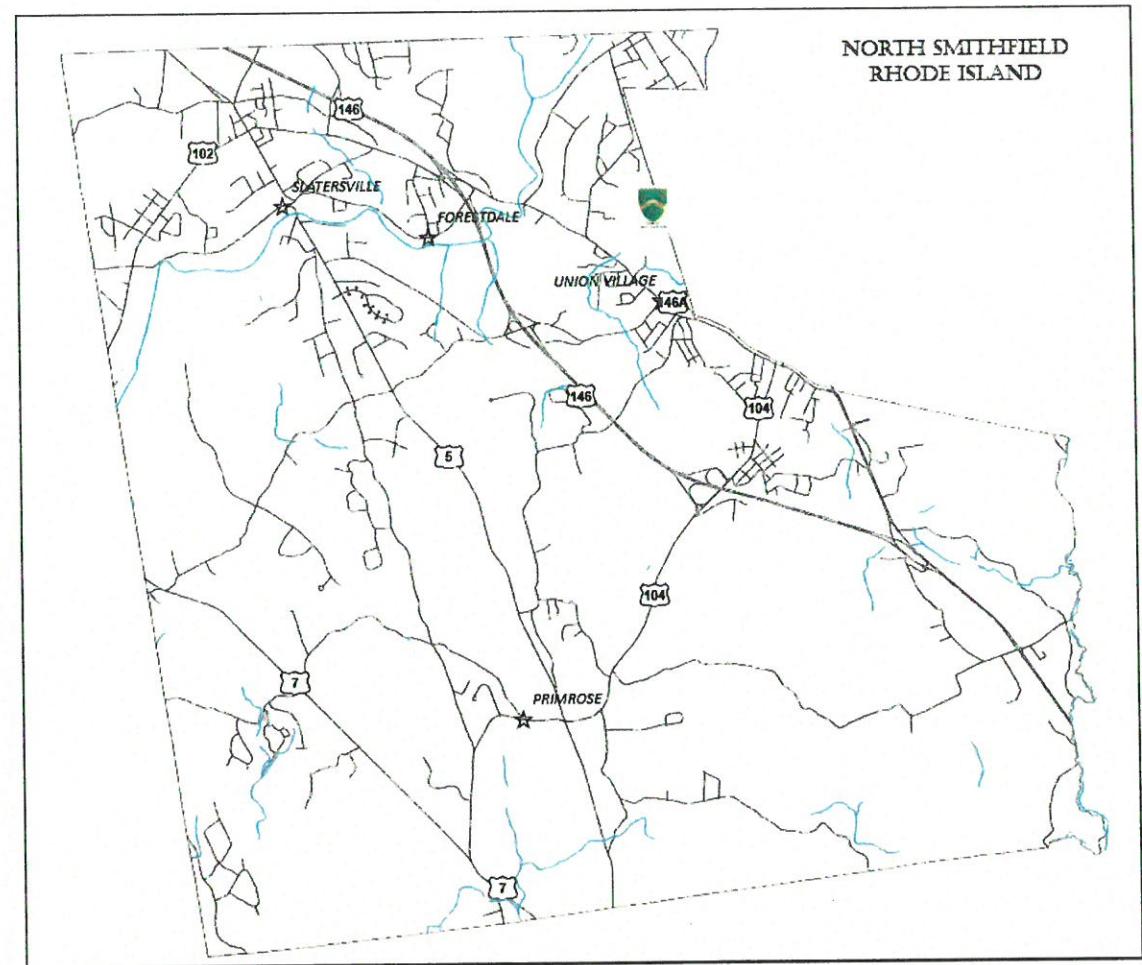
By planning ahead, North Smithfield can minimize the economic and social disruption that may result from natural disasters (destruction of property, loss or interruption of jobs and the loss of businesses). Preventive measures will reduce the impact and reduce the cost of post disaster cleanup.

The adoption and implementation of this hazard mitigation plan will assist North Smithfield in receiving pre- and post-disaster assistance from the Federal Emergency Management Agency with programs such as: FEMA's Pre-Disaster Flood Mitigation Assistance (FMA) Program, FEMA's Post-Disaster Hazard Mitigation Grant Program (HMGP) and FEMA's Pre-Disaster Mitigation Program (PDM).

Community Profile

Location

The Town of North Smithfield is located in the northeast section of Rhode Island, bordered by the Town of Smithfield to the south, City of Woonsocket to the northeast, Burrillville to the west and the state of Massachusetts to the north. Incorporated in 1871, North Smithfield includes the historic villages of Forestdale, Primrose, Waterford, Branch Village, Union Village, Park Square, and Slatersville. North Smithfield has an area of approximately 24.7 square miles. (See Map 1). The Town is served by the following major highways: Interstate 295, RI Route 5, RI Route 7, RI route 146, RI Route 102, RI Route 104 and RI Route 146 A.



Demographics, Census, and Housing

The 2010 U.S. Census reported a total of 11,977 people living in North Smithfield. The 2015 population estimate is 12,314 (U.S. Decennial Census), a 2.9% increase. The number of households grew by 20% between 2000 and 2010. According to the Statewide Planning Information Center population projections, North Smithfield's population is expected to grow by 11.4% by the year 2040 to a total population of 13,331. Based on the current household size of 2.47, North Smithfield can expect 683 new households that will need housing by 2040.

Brief History

The first neighborhood of North Smithfield was Union Village and it initially flourished as a stage coach stop along Great Road (146A). Subsequent small-lot residential growth within and in areas to the north and south of Union Village represented outward suburbanization of Woonsocket which spilled into North Smithfield.

Slaterville, the Nation's first planned mill village, was established in conjunction with the Slater Mill along the Branch River. Forestdale, Branch Village and Waterford were all Branch River valley communities near water-powered mills. Industry is still clustered along or near the Branch River.

Although the villages had a few stores and shops to serve the mill workers, North Smithfield never developed what might be considered a downtown. Woonsocket served this function and at one-time trolley cars extended out to North Smithfield from downtown Woonsocket.

Community Development and Development Trends

Aside from a select few rural areas in the southwestern quadrant of Town, North Smithfield is primarily a suburban residential community with a significant historical heritage and character. The Town maintains the open space and historic character of the town while recognizing the importance of generating tax revenue from commercial enterprise in town as well as providing local services for town residents.

Today there are about five clusters of commercial/retail activity in North Smithfield as follows: highway-oriented businesses along the non-limited access section of Route 146 between the 146A merge and the Lincoln Town line; Park Square area of Eddie Dowling Highway (Route 146A) which is a retail district straddling the North Smithfield/Woonsocket municipal lines; Branch Village area along Route 146A near St. Paul Street serving both local residents and transients; Carpenter's Corner (North Main Street and Route 146A) which is the locus of a shopping center anchored by a supermarket; and the Route 102/South Main Street intersection with highway-oriented business activities.

Small-lot housing, predominantly single-family with scattered two-family units, tends to be concentrated in and around the old mill villages and adjacent to the Woonsocket line. In contrast, the westerly and southerly sections of Town retain a rural and rural-residential character furthered by larger lot zoning requirements. Except for the industrial zone along North Smithfield Industrial Drive and the commercial development along Route 146 in the Sayles Hill Road area, virtually the entire land area to the south of the Providence and Worcester Railroad and to the west of Route 146 is zoned for residential development.

Recent Disaster Declarations

The State of Rhode Island has experienced twelve major disaster declarations in the last twenty two years with five of them being since 2010. Table 1 gives an overview of the significant declarations since 2010.

Disaster	Identifier	Date	Declaration
Severe Storms and Flooding	DR-1894	3/28/2010	Major Disaster Declaration
Tropical Storm Irene	DR-4027	9/2/2011	Major Disaster Declaration
Hurricane Sandy	DR-4089	11/2/2012	Major Disaster Declaration
Severe Winter Storm and Snowstorm	DR-4107	3/21/2013	Major Disaster Declaration
Severe Winter Storm and Snowstorm	DR-4212	4/2/2015	Major Disaster Declaration

Table 1. Major disasters since 2010

2. Planning Process

Purpose, Overview and Background

The North Smithfield Hazard Mitigation Plan (HMP) represents the Town's approach to mitigate the adverse impacts of natural disasters. This Plan is an update to the 2011 Hazard Mitigation Plan and incorporates new information and data provided by the Hazard Mitigation Committee with members of the Planning department.

The update to the HMP will be used to help prepare residents and town officials to better respond when disasters occur. The Plan also allows North Smithfield to remain eligible for grant funding for mitigation projects that will reduce the impact of future disaster events. The longterm benefits of mitigation planning include:

- Increased understanding of hazards faced by the community
- A more sustainable and disaster resistant community
- Focused used of limited resources on hazards that have the biggest impact on the community
- Reduced long-term impact and damages to human health and structures and reduced repair costs.

A kickoff meeting was conducted with the Town Administrator, Assistant Town Planner, members of the Hazard Mitigation Committee and members of the Emergency Management Agency to review the project scope, coordination and proposed updates to the 2011 plan. (agenda and minutes in Appendix)

Public Input

The draft HMP was posted on the North Smithfield town website for other communities to review and was distributed to everyone who receives the town newsletter electronically. Copies were available at the Town Hall and the Town Hall Annex. Public comment was encouraged.

3. RISK ASSESSMENT

The first step in mitigation is to assess the risk of loss from identified hazards. The risk assessment focuses attention on areas most at risk by evaluating where populations, infrastructure and critical facilities are vulnerable to hazards (see Map 2). This section focuses on assessing the community's risk and vulnerability and corresponds directly with the Risk Assessment Matrix that follows this section.

Hazards affecting North Smithfield

Hazard Profile Summary

The following Hazard Profile Summary lists hazards that have and can affect North Smithfield along with specifics regarding frequency of occurrence, magnitude (% of community affected), speed of onset (warning time available), seasonal pattern, possible effects to the community and risk priority. This Hazard Profile Summary was used to prioritize actions in the Risk Assessment Matrix.

The most comprehensive source for past weather events, the National Climatic Data Center's online database was used to profile the history of these events. History has shown that due to the size of North Smithfield, any event affecting Providence County would affect the entire county in the same manner.

Table 2. Hazard Profile Summary (HPS)

Hazard	Frequency ²	Magnitude ³	Speed of Onset	Seasonal Pattern	Possible Affects	Risk Priority
Hurricane	Likely	Limited	24+ hrs.	June-Nov with Aug & Sept. most likely	Flooding, downed trees, power outages, property damage, loss of life	Medium
Heavy Rains Flooding	Highly likely	Limited	12-24 hrs.	Spring and Summer	Flooding, property damage, roads closed, dams breached	High
Nor'easter Snowstorm	Highly likely	Critical	12-24 hrs.	Winter	Power outages, poor travel conditions, schools/business closed	High
Hail	Possible	Negligible	Minimal	Summer	Property damage	Low
Wind Event	Highly likely	Critical	12-24 hrs.	Any Season	Property damage, power outages, downed trees and limbs	High
Lightning	Highly likely	Negligible	6-12 hrs.	Spring, Summer, Fall	Property damage, fire	Low
Earthquake	Possible	Critical	Minimal	Any Season	Loss of life, property damage, power outages	Low
Wildfire	Possible	Limited to Negligible	Minimal	Any Season	Property damage, environmental damage	Medium

² Highly likely=near 100% probability within the next year; Likely=between 10% and 100% probability within the next year or at least one chance in next 10 years; Possible=between 1% and 10% probability within the next year or at least one chance in next 100 years; Unlikely=less than 1% probability in next 100 years³ Catastrophic=more than 50% of community affected; Critical=25% to 50% affected; Limited= 10% to 25% affected; Negligible=Less than 10% affected.

Hazards

Hurricanes

Hurricanes, which pose a moderate risk to North Smithfield, are most dangerous because of their highly sustained winds, heavy rains and floods. The strain that the winds pose on structures can propel loose objects at high velocities. Felled trees and branches can result in extensive property damage and downed power lines. Loss of power is almost a certainty and since utility poles carry electricity, telephone and cable television wires, the loss of a single pole

can cause widespread issues. Common during and following hurricanes is contamination of water supplies, flooding of sewage treatment facilities and widespread loss of infrastructure (roads, bridges, including public and private property).

Damage to electric power transmission and distribution networks can leave hundreds of residents without power. The National Grid substations who service all of North Smithfield are especially susceptible. Downed power lines and utility poles add to the number of residents without power. Sewer and water infrastructure are also susceptible to the effects of a hurricane event.

Water contamination in North Smithfield effects both the Town and the City of Woonsocket. Woonsocket gets their drinking water from Reservoir #1 and #3 in North Smithfield. Flooding of these areas cause concern for residents in North Smithfield because Woonsocket supplies water to residents in Slatersville, Forestdale and parts of Great Road, Mendon Road and Industrial Drive. Contamination to the reservoir, caused by runoff can have wide-spread impacts to the residents of North Smithfield and the surrounding towns who rely on the water for drinking, bathing and fire-fighting.

Wastewater systems have the potential to be damaged during a hurricane also. Untreated water combined with flood waters can pose health risks for people in the flooded areas. Wastewater from North Smithfield is treated in Woonsocket at the Woonsocket Regional Wastewater Commission. Any problems with water contamination in Woonsocket would directly affect some residents in North Smithfield as well as Woonsocket.

On Sunday August 28, 2011, Tropical Storm Irene hit North Smithfield, with heavy rain and wind gusts of up to 80 mph, resulting in fallen tree limbs, downed power lines, uprooted trees, failed transformers and property damage.

Hurricane Sandy, in October, 2012, left North Smithfield with approximately 3,500 homes without power, several downed trees, and a blown transformer. The threat of long-term power outages and broad impacts of the storm were concerns of the Town. Therefore, in anticipation of possible flooding and power outages, the Town provided citizens access to 1,000 sand bags and Scouter's Hall was designated a "comfort area", providing charging stations for cell phones and other electronic devices. Residents received power again in a day and a half. During the storm, the Main Regional Shelter in Cumberland High School was ready to receive any North Smithfield residents in need of aid. The Town was well prepared for the storm and there were no lasting significant impacts.

Other hurricanes, listed in Table 3, have occurred over the years. Most recently the hurricanes heading toward the Northeast have ended up being downgraded to tropical storms and post-tropical cyclones.

Table 3 – Significant Hurricanes in Rhode Island

Date	Name	Category ¹	Winds (mph)	Property Damage (\$million)	Deaths
September 21, 1938	N/A	3	95	100	262
September 14, 1944	N/A	3	82	2	0
August 31, 1954	Carol	3	110	90	19
September 11, 1954	Edna	3	40	0.1	0
September 12, 1960	Donna	2	58	2.4	0
September 27, 1985	Gloria	2	81	19.8	1
August 19, 1991	Bob	2	63	115	0
August 30, 2011	Irene	Tropical storm	71	75	0
October, 2012	Sandy	Post tropical cyclone	60	10	0

Source: National Climate Data Center

1 Category 1 74-95 mph winds, 4'-5' storm surge; Category 2 96-110 mph winds, 6'-8' storm surge; Category 3 111-130 mph winds, 9'-12' storm surge; Category 4 131-155 mph winds, 13'-18' storm surge; Category 5 winds greater than 155 mph, with a storm surge of greater than 18' source: Saffir-Simpson Hurricane Scale.

Heavy Rains and Floods

Heavy rain is classified by a precipitation rate of 0.3 inches per hour. Flooding in North Smithfield can occur from:

- Bodies of water overflowing their banks, including dams-High risk
- Structural failure of dams-High risk
- Rapid accumulation of runoff or surface water including that caused by steep topography-Low risk
- Hurricane-caused storm surges-Low risk

Typically, the two parameters of most concern for flood planning are:

- Suddenness of onset
 - Flash floods
 - Dam failures
- Flood elevation in relation to
 - Topography

- Structures

Other factors contributing to damage are:

- Velocity or “energy” of moving water
- Debris carried by the water
- Extended duration of flood conditions

The Route 146/146A bridges in North Smithfield have been historically flood prone. There has been serious flooding in the area of Lapre Road and Meadowbrook Drive, near Cherry Brook, properties in the Branch River Redevelopment area bounded by the Branch River and Cherry Brook. A 1968 engineering study documented how the funnel shape of a railroad culvert northeast of Meadowbrook Dr. throttles down the Cherry Brook flow, causing flooding behind it. Worse yet, the inflow side of the culvert allows entry of debris that cannot pass through the outflow side. Increasing the flow capacity of the culvert would be very costly, because RIDEM would require compensatory storage for any increased flow into Woonsocket.



Figure 1 Cherry Brook flooding 2018

Structural work to correct the problems with the culvert on Great Road at Cherry Brook is included in the Rhode Island Transportation Improvement Program (TIPID 6271) to be completed by 2019.

Another area, Cedar Swamp, a 69.5-acre town-owned property remains inaccessible to the public because of regular flooding of access trails due to beaver dams. Homes upstream from Cedar Swamp, near Todd’s Pond, suffer from flooding because the beaver dams do not allow the water to flow. Alternatively, downstream from the dams, flooding has been alleviated on Meadowbrook Drive. The dams allow the slowing of water flow alleviating those flooding issues on the lower side of the dam.

The probability of the occurrence of heavy rain in North Smithfield is high. Rhode Island gets 48 inches of rain per year. The amount of rainfall per year has been increasing. Table 4 illustrates the significant rain and flooding events in Providence County.

Table 4 Significant Heavy Rain/Flooding for Providence County

Date	Rainfall (inches)	Comments
January 28, 1996	1-2"	Minor river flooding along the Blackstone River.
November 1, 1997	2-3"	No damage reported.
February 28, 1998	2-3"	Flooding in poor drainage areas.
February 23, 1998	2"	Flooding in poor drainage areas.
March 8, 1998	2-4"	Scattered power outages, Flood-prone properties flooded, Flooding in poor drainage areas, Blackstone River reached 10.3' at Woonsocket..
June 13, 1998	7-8"	Minor flooding along Blackstone River reaching 9.17', numerous small streams flooded their banks.
October 8, 1998	3-4"	No reports of flooding.
January 3, 1999	3-5"	Flooding in poor drainage areas, no property damage reported.
September 16, 1999	3-4"	Trees downed, scattered power outages, flooding in low-lying areas.
May 26, 2003	2.15"	Flooding in poor drainage areas.
April 14, 2004	2-4"	Minor flooding along the Blackstone River, roads in low lying areas were closed to flooding, no significant damage reported.
March 30-31, 2010	7"-8"	Significant flooding along Cherry Brook and the Branch River with more than \$360,00 in damage claims paid by FEMA.
October 29, 30, 2017	4.67"	Damaging winds and many power outages.

Source: National Climate Data Center

Nor'easters/Snowstorms/Ice

Nor'easters are cyclonic storms which form along the North American coast during fall and winter seasons. The primary hazards agents associated with a Nor'easter are the high sustained winds, heavy rain and snow. The North Smithfield Emergency Operations Plan (EOP) has identified the overall risk of experiencing Nor'easters as "HIGH". Infrastructure, bridges, dams are all susceptible to the effects of a Nor'easter.

Historically, Nor'easters/Snowstorms have resulted in hazardous road conditions, power outages, the closing of schools/businesses, minor accidents and highway travel disruptions. A list of significant nor'easters in Providence are following in Table 5.

On March 13, 2018 the National Weather Service reported that Providence as well as other communities in Rhode Island were experiencing a blizzard. Blizzards have wind gusts of 35 mph or greater, visibility of less than a quarter mile, high snowfall amounts and blowing snow for a period lasting more than three hours. Rhode Island was reported as having wind gusts of 48 to 52 mph and snow depths of approximately 22 inches. Power was knocked out by downed trees and powerlines.

Over the days of October 29-30, 2017, an intense storm brought damaging winds downing trees and triggering over a million power outages, as well as flooding rainfall from New England to New York, New Jersey and Pennsylvania. North Smithfield suffered from widespread power outages with wind gusts of 63 mph and rainfall of 4.67 inches.

Table 5 Significant Nor'easters/Snowstorms for Providence County

Date	Snowfall (inches)	Comments
March 13, 1993	12"	Blizzard conditions for several hours, roads nearly impassable, most businesses closed early.
March 3, 1994	4.8"	Blowing/drifting snow, schools closed, businesses affected and highway travel disrupted.
December 14, 1995	4"-6"	Schools and businesses closed early, evening commute adversely affected.
December 19, 1995	6"-10"	Most schools and some businesses closed the day after the storm.
January 2, 1996	10"-12"	Snowfall at the rate of .5" to 2" per hr., most schools closed the next day.
January 7, 1996	12"-24"	Heavy snow disrupted transportation systems, closed schools, stores and businesses. Most significant winter storm to hit southern NE in past 20 years.
February 2, 1996	6"-8"	Travel conditions were difficult, no damage reported.
February 16, 1996	5"-7"	Highway travel seriously disrupted for the afternoon rush hour, no damage reported.
March 7, 1996	7.5"	Numerous minor skidding accidents.
April 7, 1996	6"-8"	Heavy, wet snow, no significant travel problems.
April 9, 1996	12"-20"	Heavy, wet snow stuck to trees and power lines causing scattered power outages, less snow accumulated on pavements.
December 6, 1996	6"	Scattered power outages and poor road conditions.
December 7, 1996	4"	No reports of significant damage.
January 11, 1997	6"	Rates up to two inches per hr., minimal effects on travel.
April 1, 1997	24"	Heavy snow and strong winds caused blizzard conditions, travel just about impossible at height of storm, tree limbs and wires downed, schools closed for 2 days, power outages.
December 23, 1997	6"-8"	Slick driving conditions, schools closed early, minor accidents.
February 25, 1999	8"-12"	Schools closed early, hazardous road conditions.

Date	Snowfall (inches)	Comments
March 15, 1999	7"-12"	Poor traveling conditions, schools and businesses closed.
January 25, 2000	4"-8"	Minor accidents reported.
February 18, 2000	6"-8"	Snarled traffic on major highways and created treacherous driving conditions.
December 30, 2000	6"-8"	Storm fell on a Saturday, so no major traffic problems.
January 20, 2001	6"-8"	Storm fell on a weekend so no major traffic problems.
February 5, 2001	7"-15"	Traffic snarled as commuters tried to leave work early, 1,300 customers were left without power.
February 7, 2003	6"-12"	No significant storm damage, main impact was to travel.
February 17, 2003	12"-24"	Storm fell on Presidents Day so travel impact was minimal, some minor accidents due to slippery roads.
March 6, 2003	6"-10"	Dozens of minor accidents due to poor visibility and slippery roads.
December 5, 2003	12"-24"	Major disruption to transportation systems, dozens of minor accidents
March 16, 2004	4"-8"	No major damage reported.
March 16, 2007	7"	Heavy snow and sleet. No major damage reported.
January 12, 2011	6"-10"	Heavy snowfall and strong wind gusts resulted in several roof collapses and transportation disruption.
October 29, 30, 2017		Damaging winds and many power outages

Source: National Climate Data Center

Rhode Island averages 34 inches of snow per year. The United States average is 26 inches of snow per year making the probability of the occurrence of snowstorms high.

Significant Hailstorms

The National Climate Data Center reported several hailstorms that affected North Smithfield in the past with hail ranging in size from 1.00" to 1.75". Those hailstorms are listed in Table 6.

Table 6 Significant Hailstorms for Providence County

Date	Magnitude (size in inches)	Comments
May 25, 1994	1"	Marble-sized hail fell during a thunderstorm.
August 6, 1997	1.5"	Dime-size to ping-pong size hail fell.
May 31, 1998	0.75"	Hail from thunderstorm in northern RI with 60 mph winds.
August 10, 2000	1.75"	Golf ball sized hail fell.
May 21, 2006	0.88"	Nickel-sized hail fell.
June 20, 2006	.75"	Two reports within 10 miles of North Smithfield
July 6, 2007	.75"	One report of hail
July 2, 2008	.88"	One hail report in Lincoln, within 10 miles of North Smithfield
July 18, 2012	2.0"	Four hail reports within 10 miles of North Smithfield

Source: National Climate Data Center

Significant Wind Events

According to the Beaufort Wind Chart used for estimating wind speeds, at 8-12 mph leaves and twigs are in constant motion, 19-24 mph winds cause small trees to sway, 32-38 mph winds are near gale speed and cause whole trees to move, 55-63 mph winds will uproot trees and cause significant structural damage. Wind speeds of 64-73 signify violent storms with widespread structural damage and 84-95 mph winds are considered hurricanes.

In October of 2017 the east coast experienced a bombogenesis defined as a rapid deepening of atmospheric pressure in a storm, which leads to an increase in the ferocity of its winds. The storm knocked down trees, created power outages and caused flooding. Table 7 lists the significant wind events in Providence County with date, time and magnitude.

Table 7 – Significant Wind Events for Providence County

Date	Magnitude (kts or mph)	Comments
January 7, 1995	Gusts + 50 mph	No reports of wind damage.
July 13, 1996	Gusts to 60 mph	Tropical Storm Bertha brought high winds to the area with no damage reported.
March 6, 1997	50-62 mph	Property damaged by falling trees and limbs, scattered power outages.
March 31, 1997	30-40 mph gusts	Widespread power outages.
August 21, 1997	40 mph gusts	Tree limbs downed, isolated power outages.
December 2, 1997	40-50 mph gusts	No damage reported.
February 4, 1998	40 mph gusts	No damage reported.
February 24, 1998	40-56 mph gusts	Strong winds associated with a nor'easter, no damage reported.
March 9, 1998	40-55 mph gusts	Scattered power outages reported.
March 31, 1998	50 mph gusts	Winds associated with a severe thunderstorm downed large tree limbs and wires reported downed.
July 19, 1999	50 mph gusts	Thunderstorm winds downed power lines.
September 16, 1999	50 mph gusts	Tropical Storm Floyd brought high winds that downed branches, trees and wires.
February 14, 2000	50 mph gusts	No wind damage was reported
April 9, 2000	Gusts to 60 mph	High winds associated with a severe thunderstorm downed branches.
December 12, 2000	60 mph gusts	Downed trees, limbs and wires, scattered power outages.
December 17, 2000	60 mph gusts	Downed trees, limbs and power lines, scattered power outages.

Date	Magnitude (kts or mph)	Comments
February 17, 2001	45-55 mph gusts	No reports of wind damage.
October 15, 2003	45-55 mph gusts	Downed trees and large limbs resulted in scattered power outages.
November 13, 2003	50-60 mph gusts	Brought down trees and power lines.
March 8, 2008	60 mph	Heavy rain and strong winds combined with snowmelt contributed to flooding
February 10, 2008	65-70 mph gusts	Tree limbs and wires downed across Rhode Island.
January 25, 2010	60 mph	Damaging winds, tree downed on Rt 146 in North Smithfield
April 29, 2010	40-50 mph gusts	Downed wires and property damage.
December 8, 2011	63 mph	Heavy rain and damaging winds
October 29, 2012	50-60 mph	Superstorm Sandy
January 30, 2013	60-70 mph	Trees downed in Woonsocket
August 2, 2017	50-60 mph	Trees down on Providence Pike at Industrial Drive
October 29, 30, 2017	63 mph	Power outages from trees down

Source: National Climate Data Center; NOAA

Significant Lightning Storms

North Smithfield is moderately at risk from experiencing effects of a severe lightning storm. The National Grid substation and the sewer and water infrastructure are susceptible to the effects of this type of event. Lightning strikes can lead to property damage because of the risk of fire.

Lightning can occur in the colder months during nor'easters. Thundersnow occurs during periods of heavy snowfall, three to four inches per hour. In February Of 2017 thundersnow occurred in Rhode Island and lightening stuck a tree causing major damage (Table 8).

Table 8 Significant Lightning Storms for Providence County

Date	Comments
August 28, 1993	Two homes struck on Durfee Hill Rd in Gloucester, one was severely damaged. Numerous lightning strikes reported in Foster with associated power outages.
September 15, 2000	Lightning struck a house in Central Falls which ignited a gas line causing extensive damage to part of the house.
July 19, 2005	Lightning strike set a transformer on fire, and caused an attic fire and structural damage to a house..
August 4, 2015	44,440 residents in Providence County lost power
February 9, 2017	Thundersnow throughout Rhode Island

Source: National Climate Data Center

There is no universally accepted standard for measuring the strength or magnitude of a lightning storm. Similar to modern tornado characterizations, lightning events are often measured by the damage they produce. Building construction, location, and nearby trees or other tall structures will have a large impact on how vulnerable an individual facility is to a lightning strike. A rough estimate of a structure's likelihood of being struck by lightning can be calculated using the structure's ground surface area, height, and striking distance between the downward-moving tip of the stepped leader (negatively charged channel jumping from cloud to earth) and the object. In general, buildings are more likely to be struck by lightning if they are located on high ground or if they have tall protrusions such as steeples or poles which the stepped leader can jump to.

Earthquakes and Forest Fires

Earthquakes

An earthquake is the result from the sudden release of stored energy in the earth's crust that creates seismic waves. A powerful earthquake could subject North Smithfield to multiple emergency situations requiring activation of the EOP. Rhode Island and the Town of North Smithfield are a low risk for seismic activity with only 34 total earthquakes occurring between 1776 and 2016. Massachusetts and Maine experienced over 400 earthquake events in the same time period. Rhode Islanders have experienced ground shaking from earthquakes in adjacent states but damage has been minimal. The history of earthquakes in Rhode Island is listed in Table 9.

The probability of an earthquake in North Smithfield is **LOW**. Secondary impacts can be felt across the region and therefore there is a risk of minor damages for this type of geologic-related event.

The magnitude of an earthquake is measured on the Richter scale soon after the occurrence. The magnitude, or amount of energy released during an earthquake is calculated using information gathered by a seismograph. Most earthquakes register less than 3 on the Richter scale and are not felt by humans. But the Richter ratings only give a rough idea of the impact of the earthquakes. The destructive power of the quake varies depending on the composition of the ground in the area and the location of the man-made structures in the area.

The Mercalli scale is used to rate the extent of the damage from earthquakes . Mercalli ratings, represented by Roman numerals, are subjective interpretations. Low intensity quakes causing little damage and some vibration may be rated as a II while a rating of XII may be applied if structures are destroyed and the ground is cracked. Mercalli ratings are determined after the earthquake has occurred and scientists have had time to analyze the damage.

Table 9 History of Earthquakes in Rhode Island

Date	Point of Origin	Impact on RI
February 28, 1925	St. Lawrence River region	Intensity V effects felt on Block Island and in Providence. Intensity IV effects felt in Charlestown.
November 19, 1929	Grand Banks of Newfoundland	Moderate vibrations felt on Block Island and in Chepachet, Newport, Providence and Westerly.
November 1, 1935	Quebec, Canada	A magnitude of 6.25 with intensity IV felt on Block Island and in Providence and Woonsocket.
December 20 & 24, 1940	Lake Ossipee, NH	Intensity V effects knocked pictures off walls in Newport. Intensity IV effects were felt at Central Falls, Pascoag, Providence and Woonsocket. Intensity I-III effects were felt at Kingston, New Shoreham and Wakefield.
September 4, 1944	Massena, NY	Intensity I-III was reported in Kingston, Lonsdale, Providence, Wakefield and Woonsocket.
October 16, 1963	Coast of Massachusetts	A magnitude 4.5 quake caused intensity V to be felt in Chepachet with reports of some cracked plaster. There were also reports of rattling windows and dishes and rumbling earth sounds. Other Northern RI locations felt the tremor, but with less intensity.
December 7, 1965	Unknown	Windows and doors shook in Warwick and furniture and small objects moved in Bristol..
February 2, 1967	Unknown	A magnitude 2.4 created intensity V effects in Middletown, Newport, North Kingstown and Jamestown. No damage reported.
February 3, 1973	Unknown	Explosion like or sonic boom noises were heard throughout RI and houses and windows shook, but nothing was reported by seismographs.
June 14, 1973	Western Maine	Intensity IV effects felt at Charlestown and Intensity I-III felt at Bristol, E. Providence, Harmony and Prov.
October 6, 2003	West Warwick	A magnitude of 1.8 caused minor shaking in the community, no damage reported.

Source: US Geological Survey; Earthquake History of Rhode Island

Fire

The remote locations of many of the fire prone areas dictate that brush fires are fought by the fire department utilizing a brush truck and hand tanks. Most fire prone areas in town, with a few exceptions, are sparsely settled and the potential for damage to homes is low. There have been no reported instances of brush fires, permitted or accidental, causing damage to structures.

The Town has an open burning ordinance that permits burning by approval of the fire chief by permit only and in months October through May only. Burning is to be no closer than 30 feet from the road or structure. Specific details of the open burning ordinance can be found in the North Smithfield General Ordinance Article IV Section 5.7-57 through Section 5.7-62.

Article 5.7 of the North Smithfield Land Development and Subdivision Regulations has requirements for fire suppression in new developments as well as specifications. Developers must ensure adequate water supply and proper access for emergency fire apparatus.

Vulnerable Areas

Dams

North Smithfield has twenty-one dams public and private. Over time dams weaken and the risk of dam failure is greater than ever. Development continues in locations downstream from dams impacting the functionality of the dams. The risk of dam failure is greater than ever. In order to mitigate life and property loss, dam owners are instructed to follow public policy and must use direct and indirect ways to achieve safety.

In 2007, The Rhode Island Department of Environmental Management (RIDEM) implemented a dam safety program to bring the state into compliance with federal regulations. This includes dam inspections. The Town's EOP includes a section on Dam Safety. Table 10 is a list of all the dams in North Smithfield. Five dams have a hazard class of H indicating a high probability of dam failure or mis-operation.

Table 10 Dams in North Smithfield

Dam Name	Dam #	River	Notes	Hazard Class
*Blackstone	393	Blackstone River		L
*Slater'sville Upper Intermediate	045	Branch River		L
Slater'sville Upper Trench Return # 1	044	Branch River		L
Slater'sville Reservoir Upper Dam	043	Branch River		H
Slater'sville Reservoir Middle Dam	046	Branch River		H
Slater'sville Reservoir Lower Dam	047	Branch River	Rockfill, masonry, earth	S
*Woonsocket Reservoir #3	068	Crookfall Brook		H
Forestdale Pond Dam	048	Branch River	Identified as unsafe; owner unknown therefore no enforcement	H
O'Hara Pond Dam	053	Trout Brook		L
Winsor Farm Pond	491	Rankin Brook		L
Pratt Pond Dam	055	Dawley Brook		L
Todd's Pond Dam	067	Cherry Brook		S
Primrose Pond Lower Dam	107	Woonasquatucket River		L
Mingola Pond Dam	417	Woonasquatucket River		L
Cesario Pond Dam	418	Woonasquatucket River		L
Gardner Farm Pond Dam	460	Woonasquatucket River		L
Fly & Fish Club	416	Trout Brook		L

Dam Name	Dam #	River	Notes	Hazard Class
Fort Farm Pond Dam # 1	539	Trout Brook		L
Chester St Pond	599	Unnamed Stream		L
Bourget Court Pond	631	Trout Brook		L
Karen Marie Drive Pond	632	Rankin Brook		L

Hazard Class refers to probable consequences of failure or mis-operation: H-high, S-significant, L-low

**-Under authority of Federal Energy Regulatory Commission (FERC)*

Source: dem.ri.gov/programs/benviron/

<http://www.dem.ri.gov/programs/benviron/compinsp/pdf/damlist.pdf>

Local Bridges

All bridges are subject to the hazards identified in this document; floods, wind, earthquakes, Nor'easters, hurricanes and heavy rains. Mitigation is critical to protect life and property, reduce liability from damage to property, keep evacuation routes clear in case of emergency, and avoid disruption of the local and regional economy.

The Rhode Island Department of Transportation (RIDOT) is responsible for administering the statewide bridge monitoring program. Currently 23.5 percent of the bridges in Rhode Island are structurally deficient (SD). This ranks Rhode Island last in the nation in overall bridge condition.

There are seventeen bridges located in North Smithfield identified on the RI Transportation Improvement Program (TIP) FFY 2018-2027. Seven of those bridges need major rehabilitation while the other ten require work for preservation, work to extend the useful service life of the structure. Table 11 lists all the bridges that appear on the RI TIP in North Smithfield.

The RIDOT Route 146 Corridor Bridge Project has recently been completed replacing the Woonsocket Hill Road Bridge and is currently rehabilitating the Pound Hill Road Bridge. The structurally deficient steel bridge on Woonsocket Hill Road carries 1,000 vehicles per day on over Route 146. The Pound Hill Road Bridge is a concrete bridge and carries over 40,000 vehicles per day on Route 146 over Pound Hill Road.

The Slatersville Stone Arch Bridge, over the Branch River has recently rehabilitated to strengthen the existing stone arches. This bridge is the oldest documented masonry bridge in Rhode Island, built in 1855. The bridge work consists of reinforcing the stone arch by using steel bars within the arch stones. A wider superstructure will feature new sidewalks. The stone arches will be cleaned and repointed. This bridge was completed at the end of 2018.

Table 11 Bridges in North Smithfield identified in RITIP

Bridge Name	Bridge Number	Road Carried	Crossing
Union Village RR Bridge	010701	RT 146A	Rt 146A Great Rd at Slatersville Sec RR
Branch River Bridge	*010801	RT 146A	Branch River Bridge at Rt 146A
Slatersville Stone Arch Bridge	*027301	RI 5 Providence Pike	RT 5 Providence Pk at Branch River
Spring Brook Bridge	044001	RT 146 NB	RT 146NB at Rt 146AA
Farnum Bridge	020201		RI 104 and RI 5 Greenville at Chrystal Lake Brook
Farnum Pike NB Bridge	*044101	RT 146 NB	Farnum Pike NB ramp at Rt 146 NB
Woonsocket Hill Rd Bridge	*044201	Rt 146N	Woonsocket Hill Rd Bridge at RT 146 N
Pound Hill Rd Bridge	119101	RT 146	Pound Hill Rd Bridge at Cherry Brook
Forestdale Bridge	044501	RT 146	Rt 146 NS Exp at Branch River
Main ST		School St	RT 146
Great Rd Bridge	119201	RT 146A Great Rd	RI 146 A Great Rd at RI 146 N Smithfield Exp
Old Great Rd Bridgwe	044801	Rt 146	Old Great Rd
Central St Bridge	*044901	Central St	Central St Bridge #449
Tow Path Road	049601	Canal St	Canal St at canal
Great Rd Culvert	044701	Great Rd	Gread Rd Culvert at Cherry Brook
Pound Hill Bridge	*044301	Rt 146N	Pound Hill Rd Bridge at Rt 146
Farnum Bridge	*044121	Rt 146S	Farnum Pike SB Bridge at 146 SB

*Major rehabilitation needed

Source: http://www.planning.ri.gov/documents/tip/2018/STIP_Full-10-15-18.pdf

Local roadways subject to Flooding

Except for Route 146 (the North Smithfield Expressway) and sections of Route 146A between Park Square and Route 146, virtually the entire street system in North Smithfield is comprised of two-lane roadways of varying pavement widths. The predominant east-west traffic circulation is served by: Main Street, School Street, St. Paul Street, Pound Hill Road, Sayles Hill Road and Greenville Road which are the principal east-west roadways. Although Victory

Highway (Route 102) serves east-west flows in North Smithfield, it is also a north-south road passing through the more rural sections of northern Rhode Island. The major north south routes in town are Route 146 and 146A, Providence Pike, Douglas Pike and Black Plain Road. Any roadways within the Town are subject to flooding and can be vulnerable to natural hazards such as hurricanes and heavy rains. The main problems have been in the Cherry Brook area south of Great Road. Damage to roadways and insufficient infrastructure causes a flooding of homes, disruption of evacuation routes and damage, disruption of arterial traffic flow and increases in the cost of cleanup in the case of a hazard event. Monitoring and repair of roadways will reduce the risk of downstream flooding and reduce the liability for damage to property and improve overall public safety.

Emergency Shelter

The emergency shelter, located at the North Smithfield Junior/Senior High School, is included in the list of critical facilities that are vulnerable and at risk. These shelters are evaluated according to the Shelter Vulnerability Criteria contained in the American Red Cross (ARC) publication 4496, Guidelines for Hurricane Evacuation Shelter Selection and were developed using hurricane studies, hazard information and research. Hurricane shelters must operate in a manner to ensure the public's safety.

North Smithfield utilizes the high school as an emergency shelter with a capacity of 500. The middle school is used for overflow from the high school and has the capacity for 250 people. The North Smithfield Elementary School is the shelter for disabled residents and has a capacity of 200.

Residential Homes

Residential homes are located throughout the town of North Smithfield. Homes are subject to the natural hazards of hurricanes, wind events, ice storms, nor'easters, fire and heavy rain. Economic and social hardships to residents are suffered when damage occurs to residential homes. Hazards also disrupt the local and regional economy and most importantly these hazards can cause loss of life.

The benefits of mitigating the effects of natural hazards have on homes are the protection of life and property, continued local economy, minimization of economic and social hardship and overall public safety.

Public Infrastructure

The Town has identified critical facilities and infrastructure with the highest relative vulnerability to the effects of hazard events including power outages from those events. These facilities include hospitals, nursing homes, pumping stations, fire, police, rescue, emergency management, town hall buildings, sewer infrastructure and phone lines. These buildings are located throughout the town of North Smithfield (Map 2). Table 12 lists the critical Town-owned public buildings. St. Antoine Residence is the only nursing home in North Smithfield and is located at 10 Rhodes Avenue. National Grid substations are located at 76 and 231 Greenville Road.

Natural hazards such as flooding, fires, nor'easters, hurricanes, wind events, snow storms, ice storms, earthquakes and heavy rain are potentially damaging to these structures. The damage can cause disruption in emergency services and loss of life or injury.

Table 12 Critical facilities

Facility	Address
Town Hall	1 Main St
Town Hall Annex	575 Smithfield Rd
NS Police	575 Smithfield Rd
Primrose Fire Station	1470 Providence Pike
North Smithfield Fire Station	685 St. Paul St
North Smithfield Emergency Mgmt Services	575 Smithfield Rd
North Smithfield Library	20 Main St
North Smithfield Middle School	1850 Providence Pk
North Smithfield High School	412 Greenville Rd
North Smithfield Elementary School	2214 Providence Pk
Halliwell Elementary School	358 Victory Highway

Tree Damage

Tree damage is possible throughout the Town of North Smithfield. Trees are subject to hazards such as hurricanes, wind storms, ice storms and nor'easters. Heavy rain can cause destruction caused by downed trees also. Damage to trees can cause injury and/or loss of life. Property may be damaged or lost. Tree damage can also interfere with traffic flow on arterial roads and evacuation routes, disrupt the local economy, disrupt communication, cause power outages and cause environmental damage.

Mitigating the effects of hazards on trees throughout North Smithfield will protect life and property and reduce the liability from damage to private property. Mitigation will ensure open communication, maintain traffic flow and evacuation route use and protect the local and regional economy from disruption.

Transportation Services and Public Utilities

North Smithfield is served by several means of public transportation. Rhode Island Public Transit Authority (RIPTA) provides bus service to communities in Rhode Island. Rhode Island's T.F. Green Airport, located in Warwick, was recently expanded and upgraded and provides both international and domestic jet service. Amtrak and Massachusetts Bay Transit Authority (MBTA) provide rail service from stations in Providence while Amtrak offers additional service from Kingston as well.

North Smithfield is served by the following utilities

- National Grid Gas and Electric
- Cox Communications
- Verizon

Risk Assessment Matrix

The Hazard Profile Summary on page 36-35 was used to create the following Risk Assessment Matrix. The Town of North Smithfield Natural Hazard Mitigation Committee in reviewing the natural hazards that can impact the Town, completed the following Risk Assessment Matrix. In completing this matrix, the committee identified areas in town that are at risk and are vulnerable to costly damage and loss of life. The vulnerable areas have been ranked by which mitigation strategy would produce the greatest benefit for the Town and its residents.

4. VULNERABILITY

Vulnerability indicates what is likely to be damaged by the identified hazards and how severe that damage could be. After identifying types and areas of risk, a vulnerability analysis can help to determine the gaps in the community.

Population at Risk

The use of mass care facilities during an emergency is dependent on a variety of variables. These variables include warning time, public awareness of the hazard, levels of encouragement from public officials, and the availability of shelters. As mentioned before there is an approved mass care facility located within the Town, which is the Junior/Senior High School located at 412 Greenville Road. This is an approved shelter by the American Red Cross that can operate as a mass care facility and it is not located in a flood zone. In addition to this, another mass care facility is located at Cumberland High School.

The Economy at Risk

Although many of the residents of North Smithfield commute to jobs outside the community, there are several areas of manufacturing and industry within this community as well as numerous smaller businesses that would be severely affected if a natural disaster were to occur. Most of these businesses are not located in a floodplain; however, if a severe winter storm or hurricane were to happen, where businesses needed to be closed for extended periods of time, some of them may not be able to recover. Steps need to be taken to address this issue with the business community and help them to take the proper mitigation actions to help them recover quicker after a disaster happens. The most recent Comprehensive Plan states that steps need to be taken to attract new businesses as well as maintain current ones. Taking proactive steps to help the business community be prepared should be one of the ways the Town can accomplish this.

Property at Risk

Flood ordinances have regulated development in flood plains and mandated structures lowest floor elevation to be above the 100-year base flood elevation. Some portions of the Town experience frequent street and basement flooding during heavy rain. In addition, there are several dams in town that have been classified as being a significant to high hazard which could also pose a potential threat to properties in the vicinity as well as downstream from these dams if they were to fail.

FEMA lists that 34 properties in North Smithfield are insured by the NFIP with a total value of over \$10,269,400 as of December 31, 2017. From 1978 through 2018, there were 11 losses in North Smithfield through the NFIP with \$267,144.67 in total payments to policyholders. The majority of flooding problems within the Town of North Smithfield stems from street flooding

in poor drainage areas and flooded property in low-lying areas. There were two repetitive loss properties in town, both were residential.

In addition to flood hazards, property in North Smithfield is also at risk from wind. Wind events are generally normal for Rhode Island and regularly occur each year. Winter storms and Nor'easters cause high winds in the winter months and severe thunderstorms are prevalent in the spring and summer seasons. Tropical events or hurricanes provide high winds in late summer and fall. Most damage that occurs to property from this hazard is due mainly to fallen trees and limbs.

Future Development Trends

As with all the other communities in Rhode Island, North Smithfield continues to grow in terms of new residential development. In the period from 1990 to 2000, there was an increase of 490 housing units in the community. This type of growth not only consumes more land, it also lends itself to more school age children being brought into the Town which can cause a strain on the already crowded schools. Commercial/Industrial development is also on the rise in North Smithfield which brings with it more employment opportunities, but also increases the daytime population, that along with the residential population may need to be evacuated and sheltered during a natural disaster.

Table 13 Summary of Land Use

Land Use	Acres	Percent
Residential	3,287	21.5
Commercial	273	1.3
Industrial	217	1.4
Public Lands, Roads	672	4.2
Gravel, Junkyards & Landfills	391	2.4
Recreation, Open Space, Conservation	1,494	9.3
Agricultural	670	4.2
Undeveloped Lands	8,467	53.2
Water	552	3.4
Total Land	16,021	100.0%

Preliminary population projections from the Statewide Planning Program show a continued slow growth rate for North Smithfield. Since the 2005, only 60 acres of land have commercialized.

Preservation of Wetlands

The environmental and economic values of wetlands are endless, and becoming more realized over time. Wetlands play an important role in flood control. Wetlands collect and detain flood waters, reducing their force and destructiveness, which is readily

Risk Assessment Matrix Rank	Vulnerable Area	Risk Area	Location	Ownership	Natural Hazard	Primary Problem	Mitigation Benefits	Risk Historic=H Probable=P
1	Local Dams	1	See Table 9	Public and private	Flooding Hurricane Heavy Rain Earthquake Wind event	Damage to property Loss of life Economic loss	Rehabilitation	P
2	Local Bridges	2	See Table 10	Local and state owned	Hurricane Wind event Heavy Rain Earthquake Nor'easter Ice/Snow			H
3	Townwide Roads subject to flooding	3	Greenville Road North Main Street Cherry Brook south Great Rd, Lapre Rd, Cross St, Carlton Ave., Green St., Mechanic St., School St. and Meadowbrook Drive	Public and private	*Flooding *Hurricane *Heavy Rain	*Disruption of arterial traffic flow *Disruption of evacuation routes *Damage to private property *Cost of cleanup Homes flooded	*Reduce risk of downstream flooding, property damage *Public safety *Maintain evacuation routes *Reduce liability for damage to private property *Decrease costs of cleanup	H
4	Emergency Shelter	4	NS Jr./Sr. High School	Public	*Hurricane *Wind Events *Nor-easters	*Loss/damage of lives and property *Loss of communication with Public Safety Personnel	*Public safety *Maintain shelters *Protect economic and social well-being	P
5	Residential Home	1,2 3,	Town-wide	Private	*Hurricane *Wind Event *Ice Storm *Nor'easters *Fire *Heavy Rain *Flood *Earthquake	*Economic and social hardship	*public safety *Prevent/minimize economic and social damage	H & P
6	Public Infrastructure	2,	Town Hall NS Fire Station #1 NS Fire Station #2 NS Municipal Annex	Public	*Hurricane *Wind Event *Nor-easters	*Damage to communications *Disruption of emergency services	*Minimize disruption to emergency services *Public safety	H & P

Risk Assessment Matrix Rank	Vulnerable Area	Risk Area	Location	Ownership	Natural Hazard	Primary Problem	Mitigation Benefits	Risk Historic=H Probable=P
			NS Police Department			*Loss/damage of lives and property	*Protection of essential services	
7	Tree Damage	2	Town-wide	Public & Private	*Hurricane *Windstorm *Ice Storm *Nor-easters	*Loss of drinking water, heat, communication *Power outages	*Maintain communication systems *Protection of essential services	H & P
8	Local Dams subject to flooding or posing a risk for failure	1	Forestdale Pond Slaterville Res. Middle Slaterville Res. Upper Woonsocket Res. #1 Woonsocket Res. #2	Private Private Private Public Public	*Flood *Wind Event *Earthquake *Heavy Rain	*Loss of life and infrastructure *Damage to property downstream	*Decrease potential for dam failure *Reduce liability for damage to private property *public safety	P
9	Industries in the Floodplain	1	Town-wide	Private	*Heavy Rain *Flood *Nor-easters	*Hazardous waste contamination *Public safety *Loss/damage of lives and property	*Minimize contamination to residential areas *Decrease costs of cleanup *Public safety	H & P
10	Forested areas	3	Town-wide	Public & Private	*Fire	*Loss of lives and property *Public safety *Lack of ingress and egress	*Public safety *Better access to fire source *Decrease risk to lives and property	H & P

apparent in southern states where over fifty percent of wetlands have been eliminated. Wetlands also provide a valuable, natural service regarding water quality. Wetlands absorb and filtrate pollutants that could otherwise degrade the quality of water in rivers, lakes, and ponds. Wetlands provide necessary spawning/rearing habitat and food supply for freshwater fish. Wetlands also provide the critical habitat for most waterfowl, as well as an enormous diversity of plants and animals. Additional benefits of wetlands include: groundwater recharge, erosion control, land formation, and recreation.

5. CAPABILITY ASSESSMENT

This capability assessment is used to evaluate the Town's capabilities, pre- and post-disaster hazard management policies, plans, programs and regulations which reduce disaster losses or could be used to reduce losses in the future. Another purpose of the capability assessment is to highlight successes, identify shortcomings, and to lay the groundwork for possible improvement.

North Smithfield recognizes that the inclusion of mitigation initiatives would not only benefit the community by reducing human suffering, damages and the costs of recovery, but would also help build and maintain the sustainability and economic health of the Town. Mitigation planning elements and new maps will be incorporated as necessary during the regular updates or as required. The following details the Town's existing plans, ongoing programs, and policies.

Plans, Regulations and Plans

The Town is in the process of reviewing a new 2018 **Comprehensive Plan**. North Smithfield's Comprehensive Plan identifies actions that can be taken to address increased development pressures, economic stability, open space and recreation issues, and public infrastructure and facilities. It outlines goals, policies, issues, and actions to provide a framework for everyday operations within the Town. North Smithfield has recognized the importance of incorporating mitigation initiatives (both Pre- and Post-Disaster) into the Comprehensive Plan.

Participation in the **National Flood Insurance Program (NFIP)** allows North Smithfield residents to purchase flood insurance at lower rates to protect properties against losses due to flooding. However, North Smithfield does not currently participate in FEMA's **Community Rating System (CRS)** Program. Participation in FEMA's CRS would allow flood insurance policy holders a 10% discount on their premiums, and is suggested in the mitigation actions section of this plan.

The Town works regularly with other communities along the Blackstone River Valley to protect valuable natural resources and preserve open space along the river which has helped to reduce flooding and pollution risks.

The Town has an updated **Emergency Operations Plan (EOP)**. This plan addresses the response to extraordinary emergency situations associated with natural, man-made, and technological

Hazard Mitigation Plan
North Smithfield, RI

disasters. The Town's Emergency Operations Plan further addresses pre- and post-disaster strategies to effectively deal with the hazards addressed in this plan such as hurricane and flooding evacuation, public warning and sheltering during natural disasters.

The **North Smithfield Zoning Ordinance**, developed and maintained in accordance with the North Smithfield Comprehensive Plan and chapter 22.2 of Rhode Island General Laws, was designed to manage growth and land use. Section 6.18 of the Zoning Ordinance, Special Flood Hazard Areas and Flood Fringe Lands, was written to ensure public safety; minimize hazards to persons and property from flooding, to protect watercourses from encroachment and to maintain the capability of floodplains to retain and carry off floodwaters. Section 17.5 Environmental impact assessment requires applicants to minimize flooding and erosion and requires environmental impact analysis of proposed developments.

The **Land Development and Subdivision Regulations (LDSR)**, addresses minimizing hazards to persons and property from inland flooding. Adequate drainage must be provided around slopes, encroachments are prohibited in the regulatory flood zones, and subdivisions must minimize flood damage. The LDSR addresses safety from fire, flood and other hazards.

Additional Programs and Departments

The **Planning Board and Department** studies and prepares plans for the utilization of the resources and satisfaction of the needs of the town, with reference to its physical growth and development as affecting the health, safety, and general welfare of the people and the economy and efficiency of community life. The board shall prepare and adopt a comprehensive plan for the development and improvement of the town. The board may be assigned tasks by the town council in connection with the physical growth and development of the town. Elements from the Planning Board's work on the LDSR, Comprehensive Plan and Zoning Ordinance are incorporated into the Hazard Mitigation Plan.

The **North Smithfield Emergency Management Agency/Homeland Security**'s mission is to protect lives and property when major emergencies threaten public safety in North Smithfield. The North Smithfield Emergency Agency works toward the coordination of an effective townwide response to two types of disasters: natural and man-made. Natural disasters are major storms, i.e. snow, ice, hurricanes, tornadoes, flooding, and severe weather extremes (high heat or cold), earthquakes. Man-made disasters can be technological disasters including hazardous material incidents, nuclear, biological or radiological, cyber terrorism. As the local Homeland Security agency we will plan for dealing with and responding to terrorism threats either foreign or homegrown.

The EMA has 20 active volunteer members. Nearly all are Red Cross certified in CPR and basic First Aid as well as traffic control. Some members are now licensed amateur radio operators. Most have completed Community Emergency Response Team training. Many have completed other training such as the use of gas masks, radio operation, search & rescue, crowd control, Hazard Mitigation Plan
North Smithfield, RI

shelter management, skywarn severe weather observation and reporting. Homeland Security training includes terrorist incident response, radiological, biological and chemical detection.

The responsibilities of the **North Smithfield Public Works Department** are to maintain existing facilities, including roadways, drainage systems, bridges, culverts and town parks. The HMP will help the public works department prioritize projects and facilitate grant funding applications. This department works with National Grid in the event of an emergency involving storm debris, downed utility lines and downed trees. Public Works is also responsible for sidewalk repair and construction, roadway reconstruction and paving, street sweeping, snow plowing and sanding, drainage maintenance repair, pot hole repair and brush cutting.

The **North Smithfield Police and Fire Departments** are responsible for the safety and wellbeing of the town residents. The **North Smithfield Fire & Rescue Service** is a combination of methods, materials physical assets and human resources strategically positioned to respond against threat of fire and emergency medical service need 24 hours a day, 7 days a week, 365 days a year.

The Fire Department provides fire and rescue services including fire suppression, Rhode Island Department of Health EMT-Cardiac Level Services, Technical Rescue, and First Response Hazardous Materials response. They also provide prevention services to include code compliance, plans review, and public education.

The **North Smithfield Town Council** is the policy-determining body of the town. The **Town Administrator** has the power to declare an emergency affecting the public peace, health, safety, comfort and welfare of the inhabitants of the town and for the protection of persons and property by Town Charter. The Town Council may by ordinance ratify the action of the administrator and/or direct him to take additional or different action in dealing with the emergency and may by resolution declare the emergency closed

State Resources.

The Town of North Smithfield is responsible for enforcing the **Rhode Island State Building Code** to ensure the building activities throughout the Town are in compliance with zoning laws and standards. The RI building codes contain safeguards and specify minimum requirements necessary to protect public health, safety and welfare in the built environment. Building codes provide for protection from fire, structure collapse and general deterioration. The Rhode Island Code consists of uniform regulations to control construction, reconstruction, repair, removal, demolition, and inspection of all buildings.

6. Mitigation Strategy

With today's modern technology, forecasting and weather tracking systems organizations are capable of providing several days' warning prior to a major event. The mass media is also able Hazard Mitigation Plan
North Smithfield, RI

to provide updates about storm strength and location to the public. On a regional scale, the local National Weather Service office in Norton, MA, provides regional weather forecasts, complete with watches and warnings if necessary.

Preparatory actions can be taken before a major winter event, hurricane or Nor'easter occurs. With others, like severe thunderstorms or tornadoes, conditions can worsen very quickly and little advance notice may be available. An earthquake can occur without any warning. Even with extensive media coverage, there will still be those who are not informed of a forecasted event.

An Emergency Evacuation Route Map has been developed for public use. It includes key locations such as the main routes to use in the event of an evacuation, shelter locations, critical facilities, fire and police stations, tow truck/fuel locations and schools.

Depending on the type of event, the Town Administrator, will decide when, or if there is a need to open the Emergency Operations Center (EOC). If it is opened early, minimal staff will increase based on weather intelligence. The Town Administrator, the Public Safety Director, EMA, the Public Works Director, Fire and Police will decide the following:

- Closing of Town buildings
- Restricting access to identified risk areas (roadways, highways and evacuation zones)
- Opening of mass care facilities
- Timing and ordering evacuations
- Communicating and coordinating with other jurisdictions
- Suspending normal local government operations (i.e. closing Town Hall, etc.)
- Early release for non-essential workers (may be recalled for emergency duty)
- Receiving preparation and staffing status from local emergency response organizations
- Reporting to the State about local EOC readiness, commencement of Situation Reports

After consultation with the police department, fire department and public works director, the superintendent of schools will determine whether the schools will be open or closed.

North Smithfield will ensure that multiple means of connectivity are available to receive National Weather Service (NWS) Watches and Warnings. When a NWS watch or warning is issued, emergency communication is essential. North Smithfield will ensure effective communication during a serious weather event by:

- Testing emergency communications and back-ups
- Distributing hand-held radios to key personnel who normally rely on cell and landline phones
- Placing amateur radio operators on stand-by
- Fueling and testing emergency generators that power communications equipment

In the case of mass care facilities, North Smithfield will ensure the following criteria are followed:

- Accessibility and safe locations of mass care facilities
- Structural safety (ensure that facilities selected for mass care have not been damaged by the event)
- Provisions for back-up power and communications
- Provisions for food and water

Before any major weather/natural hazard event, North Smithfield will:

- Verify necessary food and supplies are on hand
- Review department equipment to ensure it is functional for the storm
- Verify fueling arrangements for all vehicles
- Test all emergency equipment and verify communications to/from the EOC.
- Review and verify the locations of staging areas for materials and equipment
- Confirm mutual aid agreement/contract statuses with private firms regarding emergency services
- Verify with electric utilities that key facilities are part of the priority restoration list
- Prepare and inspect all facilities for storm preparedness
- Monitor weather reports

North Smithfield can also request support from the State Emergency Management Agency (RIEMA). RIEMA can act as a medium for State and Federal resources and equipment. Other state agencies, such as the State Police, State Fire Marshall, State Environmental Management and the State Health Department may also be requested to support emergency operations.

The purpose is to develop a consequence management plan for preparing, responding to, and recovering from the effects of a severe weather/natural hazard event striking the Town of North Smithfield or the nearby region. The plan, in conjunction with other related emergency plans and procedures, serves as a guide for Town officials to ensure effective severe weather/natural hazard preparedness, response, and recovery.

In completing the risk and vulnerability analysis, the North Smithfield Hazard Mitigation Committee considered projects and actions that would reduce the Town's vulnerability to the identified hazards. The Risk Assessment Matrix presented on page 33 is the basis for the mitigation actions presented in the following section. The Committee considered the following actions to be the objectives of this plan and prioritized each action using criteria based on historical damage, safety of the population, property protection and consistency with Town-wide goals and objectives. Issues and objectives were aligned to public health risks, evacuation and mass care considerations, disruption of essential services and potential economic losses to the Town. Because there are no records on file for previous damage, the Committee utilized the Hazard Profile Summary to determine what natural event poses the greatest danger to the community and what areas would be affected. From here, the Committee devised the Risk

Assessment Matrix and assigned priority to each risk area and associated actions using a “round-table” discussion format of general consensus as to prioritize the order of each action and its associated benefit. The actions were prioritized by those which are most likely to occur in the community (i.e. flooding vs. forest fire) and which would benefit the community the greatest with the limited funding that is presently available.

The North Smithfield Hazard Mitigation Committee determined that the identified objectives could be met by considering actions aligned to the following:

- Planning and Regulations
- Property Protection, Structural Projects and Maintenance (acquisition, elevation, flood gates, sewers, repairs)
- Public Information and Outreach, Incentive Programs
- Emergency Services (Protection of Critical facilities)
- Post Disaster Opportunities

This Committee has worked to set goals and objectives that are bounded by a time frame and are compatible and consistent with State Hazard Mitigation Goals. Upon submittal of this plan to RIEMA, the State Hazard Mitigation Committee (SHMC) is expected to review and approve these goals and objectives to ensure consistency with the statewide goals and objectives. The time frame used for this strategy is as follows:

- Short term – 0-6 month
- Medium term – 6 – 18 months
- Long term – 18 months – 5 years

7. 2019 Action Plan

The following actions are from the 2011 HMP and were derived from the Risk Assessment Matrix on page 26 to identify areas at risk, offer mitigation strategies and consider benefits. Each action reflects the existing conditions, discusses the project, assigns responsible parties and if known, lists an estimated cost. All Actions that were completed will be identified as such. Those not completed will remain on the list of Actions. Multiple actions associated with a vulnerable area reflect Town priorities as to those that will benefit the community the most and are simply prioritized high, medium, or low. Other relevant departments/ agencies that can offer support to the project are also identified, as well as funding options. Communication Capability within Risk Area #1 was determined to be the most important action to be completed and the most immediate. NSEMA, police, fire, administration and school officials will devise a plan to use the new NSEMA location as a command station. Procedures will be developed and documented. This plan will be updated when this action is completed.

Risk Area # 1 – Goal: Protect citizens and property from the effects of wind events.

Existing conditions – Wind events are frequent within the Town and cause power outages as well as create communication problems for public safety personnel.

Action 1 – Communication Capability

If phone service is interrupted during a wind event, radio communication will be essential and radio communication at the emergency shelter needs to be improved, therefore, evaluate the capability of existing public safety communication equipment, determine areas where communication is difficult and upgrade equipment as necessary to ensure continued communication during wind events.

Mowry Fire Tower on Woonsocket Hill Road is a 65 foot steel tower with a 10 foot by 10 foot wooden cab. The Tower is used to house communication antennas and equipment for state and local agencies. The structure and security of the Tower are of a concern and will be evaluated and repaired.

Priority: High

Responsible Party: Emergency Management Director

In Coordination With: All public safety agencies

When: Long term

Resources available: Capital budget

Benefit: Continuation of essential communications during an event; public safety

Estimated costs: Unknown

Action 2 – Tree Cutting Within the Town Right-of-Way-Not Completed

Limbs and trees within the Town right-of-way may pose a hazard to property and cause power failure during wind events, therefore, the Town will purchase a bucket truck that will allow the Town crews to reach greater heights to clear trees and limbs that may create a problem within the Town's right-of-way.

Medium Priority.

Responsible Party: Director of Public Works

In Coordination With: Department of Public Works

When: Long-term

Resources available: Capital budget

Benefit: Protection of critical infrastructure/essential services during an event

Estimated Cost: Unknown

Risk Area # 2 – Goal: Protect the citizens and property that are vulnerable to flooding.

Existing conditions – There are two streets within Town that continually flood during periods of heavy rains. Also, many of the dams that are in Town are privately owned which causes maintenance enforcement to be an issue.

Action 3 – Cherry Brook Watershed Management -Not completed

The Town will commission a hydrological study of the Cherry Brook watershed with the intent to design an emergency detention system in a natural depression on the southwest side of Route 146. The Town acquired 69 acres of land in 2010. This land can store 40-60 acre feet of stormwater behind flashboards in an oversized culvert that runs under Route 146. The Town will commission DiPrete Engineering to complete a Hydrologic Study of the area and recommend solutions.

Priority: High

Responsible Party: Planning Department

In Coordination With: Planning Department, Rhode Island Department of Transportation, RI Department of Environmental Management

When: Short term

Resources available: Budget item

Benefit: Minimize downstream flooding, continued public safety

Estimated Cost: To be determined

A large cedar swamp flows out to the sometimes obstructed Cherry Brook. The best available flood management option has been to keep channels and culverts clear of debris. A railroad bridge culvert and two preceding culverts restrict peak flow even without debris. A 1968 engineering study estimated that enlarging the bridge culvert would cost more than \$100,000, but that would cause more flooding in Woonsocket as the brook flows to the Blackstone River.

About 40% of the Cherry Brook watershed lies to the southwest of Route 146, and its flow can be controlled at an oversized culvert under the highway just north of the Greenville Rd intersection.

Contour data (GIS) were used to find a natural basin and potential detention area in the Cherry Brook watershed. The Town received a 69-acre land donation in this area with a 40 acre natural bowl that is being used to store stormwater during major storms. Flashboards at the 146 culvert could effectively dam 2-3 feet of water.

Action 4 – Infrastructure Improvements to Flood-Prone Roads- Not completed

The Town will work with RIDOT to evaluate how to improve drainage improvements on town roads which are prone to flood during heavy rain events.

Priority: High

Responsible Party: Director of Public Works

In Coordination With: North Smithfield Department of Public Works, Rhode Island Department of Transportation, North Smithfield Planning Department

When: Short term

Resources available: Rhode Island Department of Transportation, Town funding

Benefit: Maintain evacuation routes, continued public safety

Estimated Cost: Unknown

The North Smithfield Public Works department regularly inspects and cleans catch basins and outfalls.

Action 5 – Improved Emergency Operation Center (EOC).- *Not completed-in progress*

Toward the end of 2019 the EOC will be relocated from its current location to the basement of the new North Smithfield Town Hall (Kendall Dean School). The EOC will serve as a Unified Command Center where responders from Police, Fire, EMA, and Public Works will command, control and coordinate emergency response. The facility will house a generator as well as communication equipment. National Grid will join forces with the Town in case of utility emergencies.

Action 6 – Public Education and Outreach *Completed*

The Town has contacted the owners of private dams and informed them that periodic inspection, maintenance and repair are essential to minimize risk of failure during heavy rain/flood events. The Town has a Dam Emergency Action Plan within the EOP.

Priority: Medium

Responsible Party: Director of Emergency Management Agency

In Coordination With: Department of Public Works

When: Short term

Benefit: Minimize risk of failure and protection of life and property

Estimated Cost: None

Other Mitigation Actions

Town residents are encouraged to register for CodeRED to be notified by the EMA response team in the event of emergency situations or critical community alerts. Notices that may be sent include evacuation notices, bio-terrorism alerts, boil water notice and missing children reports. CodeRED enables local EMA and government officials to communicate time sensitive, personalized messages via voice, email and text messaging. CodeRED is fully integrated with the

Integrated Public Alert & Warning System (IPAWS) to send alerts via the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems

Strategy Adoption

The North Smithfield Natural Hazard Mitigation Committee unanimously adopted this plan and forwarded it to the RIEMA for approval by the State Hazard Mitigation Committee, the executive director of the RIEMA and then FEMA Region I. After FEMA approval the Plan was forwarded to the Town Council for their review and approval. The Town Council approved the Plan on October 7, 2019 (a copy of the resolution is attached in Appendix C).

Implementation, Evaluation and Revision of Strategy

Implementation

Once the Plan is approved by FEMA, the responsible parties will begin the actions that have been assigned to them. Implementation will be based on what actions will benefit the community the most to mitigate the risk as previously determined by the Committee using the benefits listed under each action. Each department/agency will be responsible for reporting progress to the Emergency Management Director.

The Committee has also suggested that this Plan be incorporated into the present (as well as future) Comprehensive Plan to ensure that all of the Town's plans are working towards the same goal of protecting the community. This will also allow for continued public involvement by engaging the community in updates of all Town Plans.

Evaluation

The Committee will meet review the progress of each action and make any revisions that are necessary to ensure the objective is met. At the annual review the Committee will remove those actions that have been completed and include new actions that arise based on the changing needs of the community. New actions will be prioritized using a formal prioritization method (e.g. STAPLEE) to help the Committee ensure that actions are receiving the proper priority.

Revision

A formal revision of the Plan will take place every five (5) years and all review and revision meetings will be open to the public and advertised as such to encourage further community involvement. In the event of a natural disaster, the plan will be reviewed after the event to see if further revision is needed at that time. After the five year update, a copy will be forwarded to the RIEMA to incorporate the changes into the State Plan.

REFERENCES

Flood Insurance Study for the Town of North Smithfield, Rhode Island, Providence County. Federal Emergency Management Agency. 2012.

National Climatic Data Center. National Oceanic and Atmospheric Administration. National Climatic Data Website – www.ncdc.noaa.gov .

Rhode Island 2014 Hazard Mitigation Plan Update

Rhode Island State Transportation Improvement Plan (STIP)
<http://www.planning.ri.gov/planning-areas/transportation/tip.php>

State of Rhode Island 2017 Annual Report to the Governor on the Activities of the Dam Safety Program

State Mitigation Planning Key Topics Bulletins: Mitigation Strategy October 2016
https://www.fema.gov/media-library-data/1478260600306-117bda8ab179bd301b0b61b52a143485/StateMitigationPlanning_MS_Bulletin_V9_508.pdf

State and Local Mitigation Planning How-To Series. FEMA. FEMA, July 26, 2013.

Town of North Smithfield draft Comprehensive Plan, 2018.

Town of North Smithfield Emergency Operations Plan, 2016

Wildland Fire Assessment System - <https://www.wfas.net/>
www.dot.ri.gov/documents/news/SD_Bridges_RhodeworksBridges6_18_2015.pdf

www.geostat.org/data/north-smithfield-ri/dams

www.dem.ri.gov/programs/benviron/compinsp/pdf/damrpt13.pdf

<https://rules.sos.ri.gov/regulations/part/250-130-05-1>

<http://www.dem.ri.gov/programs/benviron/compinsp/pdf/damlist.pdf>

<https://www.wpri.com/news/local-news/r-i-state-of-emergency-declared-10-times-in-20-years/1043942074>

https://www.nsmithfieldri.org/sites/northsmithfieldri/files/uploads/codered_faqs.pdf

Hazard Mitigation Plan
North Smithfield, RI

APPENDIX A – Technical and Financial Assistance for Mitigation

State Resources

Coastal Resources Center
University of Rhode Island
Narragansett Bay Campus
Narragansett, RI 02882
(401) 874-6224

Rhode Island Builders Association
The Terry Lane Corporation
Terry Lane
Glocester, RI 02814
(401) 568-8006

RI Coastal Resources Management Council **Rhode Island Department of Business Regulations**
Stedman Government Center
4808 Tower Hill Road
Wakefield, RI 02879
(401) 222-2476

233 Richmond Street
Providence, RI 02903
(401) 222-2246

Department of Administration
Division Of Planning
One Capitol Hill
Providence, RI 02908
(401) 222-6478

Rhode Island Emergency Management Agency
645 New London Avenue
Cranston, RI 02920
(401) 946-9996

Department of Environmental Management
Division of Parks and Recreation
235 Promenade St.
Providence, RI 02908
(401) 222-6800

Public Utilities Commission
100 Orange Street
Providence, RI 02903
(401) 222-3500 ext. 153

Rhode Island Dept of Transportation
Department of Transportation-Design
2 Capitol Hill, Room 231D
Providence, RI 02903
(401) 222-2053

RI State Fire Marshal's Office
560 Jefferson Blvd
Warwick, RI 02886
(401) 889-5555

Rhode Island Banking Commission
Associate Director
33 Richmond St
Providence, RI 02903
(401) 222-2405

State of Rhode Island Building Committee Office
Building Commissioner's Office
560 Jefferson Blvd
Warwick, RI 02886
(401) 889-5550

National Weather Service
Hazard Mitigation Plan
North Smithfield, RI

Forecast Office
46 Commerce Way
Norton, MA 02766

Federal Emergency Management Agency
Region I Office
99 High St
Boston, MA 02110
(877) 336-2734

Small Business Administration
380 Westminster St
Room 511
Providence, RI
(410)528-4561

U.S. Army Corps of Engineers
New England District
696 Virginia Rd
Concord, MA 01742
(978)318-8238

U.S. Department of Agriculture
Natural Resources Conservation Service
(formerly Soil Conservation Service)
451 West Street
Amherst, MA 01002
(413) 253-4362

U.S. Fish and Wildlife Service
Southern New England
50 Bend Rd
Charlestown, RI 02813

Other Resources

The Association of State Floodplain Managers (ASFPM)
Professional association with a membership of almost 1,000 state employees that assists communities with the NFIP. ASFPM has developed a series of technical and topical research papers and a series of proceedings from their annual conferences. Many mitigation "success

U.S. Department of Housing and Urban Development
Comm Development Block Grants
Thomas-O'Neill Federal Building
10 Causeway Street
Boston, MA 02222
(617)994-8200

U.S. Department of the Interior
15 State Street, 8th floorBoston
Boston, MA 02019

U.S. Department of the Interior
National Park Service
Charlestown Navy Yard
Boston, MA 02129
(617) 242-5601

U.S. Environmental Protection Agency – Region I
5 Post Office Square
Boston, MA 02203
(617) 918-1111

U.S. Geological Society
MA/RI Water Science Center
10 Bearfoot Rd
Northborough, MA 01532

stories" have been documented through these resources and provide a good starting point for planning.

Floodplain Management Resources Center

Free library and referral service of the ASFPM for floodplain management publication. Co-located with the Natural Hazards Center at the University of Colorado in Boulder, staff can use keywords to identify useful publications from the more than 900 flood-related documents in the library.

Institute for Business and Home Safety (IBHS) (formerly Insurance Institute for Property Loss Reduction)

An insurance industry sponsored, nonprofit organization dedicated to reducing losses – deaths, injuries and property damage – resulting from natural hazards. IBHS efforts are directed at five specific hazards: flood, windstorm, hail, earthquake and wildfire. Through its public education efforts and information center, IBHS communicates the results of its research and statistical gathering, as well as mitigation information, to a broad audience.

Volunteer Organizations

Organization, such as the American Red Cross, the Salvation Army, Habitat for Humanity, Interfaith and the Mennonite Disaster Service are often available to help after disasters. Service organization, such as the Lions, Elks and VFW are also available. These organizations have helped others with food, shelter, clothing, money, etc. Habitat for Humanity and the Mennonite Disaster Service provide skilled labor to help rebuild damaged buildings incorporating mitigation or flood proofing concepts. The offices of individual organizations can be contacted directly or the FEMA Regional office may be able to assist.

Flood Relief Funds

After a disaster, local businesses, residents and out-of-town groups often donate money to local relief funds. They may be managed by the local government, one or more local churches or an ad hoc committee. No government disaster declaration is needed. Local officials should recommend that the funds be held until an applicant exhausts all sources of public disaster assistance. Doing so allows the funds to be used for mitigation and other projects that cannot be funded elsewhere.

New England States Emergency Consortium (NESEC) – Lakeside Office Park

NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Brochures and videotapes are available on such topics as earthquake preparedness, mitigation and hurricane safety tips. NESEC maintains a world wide web home page that is accessible at <http://www.serve.com/NESEC>.

The New England Floodplain and Stormwater Managers Association (NEFSMA)

Professional organization for New England floodplain and stormwater managers. Provides workshops, conferences and a newsletter to membership and interested individuals and companies. NEFSMA home page is accessible at <http://www.seacoast.com/~nefsma>.

APPENDIX B – Existing Protection Systems – State and Federal

State of Rhode Island

Earthquakes and Hurricanes:

A certain amount of funding is allotted to each state per year based on a risk formula for earthquakes. Coastal states are allocated funds based on a risk formula for hurricanes. Each state receiving such funds has the ability to grant project funds to a community. There is not a match requirement on the part of the community, but the funds are limited and are generally only available once a year. The projects or products proposed for such funding must demonstrate that earthquake or hurricane risk will be reduced or eliminated and that the proposed projects or product is a cost-effective measure (a stringent cost/benefit analysis need not be performed). Information about the amount of funding available per year and the state requirements for eligibility and performance may be obtained from the RIEMA at (401) 946-9996.

Economic/Community Development

There may be programs existing to help flood proof homes using Community Development Block Grant funds. There may be housing assistance programs in the community that can be used following a major flood, achieving both the objectives of reducing flood damage and improving the community's housing stock (see Appendix A, "Federal Resources", for more information).

Evacuation Plans and Systems

The community's emergency operations center should have evacuation plans in place. For communities near a nuclear power plant, evacuation plans are required and may also be used for flood evacuation. The RIEMA may have additional evacuation plan information.

Land Use Restrictions

There are several federal and state regulations that serve to restrict land use in certain areas that may help reduce flood hazard vulnerability. If the community has open land owned by the state or federal government, examine what restrictions are placed on its development. In addition, the state Wetlands Protection Act regulates the development of all lands identified as significant to the protection of resources identified in the act.

Septic Systems

If there are areas in the community not served by a public sewer system, state septic system regulation influence development and may be a consideration for mitigation alternatives that include rebuilding and elevation of structures. Specific design requirements must be met for any construction in coastal velocity zones or river floodways. Generally, an inspection of a septic system is required if there is a change in use of the structure, an increase in flow or failed system. Limited inspections are required if the footprint of the structure is being changed.

Upgrades are required by the state if an inspection reveals a failed system. However, local regulations may be more restrictive than state requirements, requiring inspections or upgrades in other cases.

Warning Systems and Emergency Operations Plans:

The community may have a flood warning system in place and should have a plan for response to flooding.

Federal Government

Community Rating System (CRS)

A voluntary initiative of the NFIP, the CRS was developed to encourage communities to perform activities that exceed the minimum NFIP floodplain management standards. If a community participating in the CRS performs activities that include maintaining records for floodplain development, publicizing the flood hazard, improving flood data and conducting floodplain management planning, then the flood insurance premiums paid by policy holders in the community will be reduced by 5 to 45 percent. Developing a flood mitigation plan will help communities gain additional credit under the CRS.

Hazard Mitigation Grant Program

Also known as the 404 Program or HMGP, this program is available only after a federally declared disaster occurs. It represents an additional 15 percent of all infrastructure and individual assistance funds that are provided to states to repair damages and recover from losses and is administered by the state in partnership with FEMA. Having a plan or completed mitigation action matrix prior to a disaster event is required by FEMA and is extremely helpful in meeting the states' deadlines for applications and ensuring the project is eligible and technically feasible. It provides 75/25 matching grants on a competitive basis to state, local and tribal governments, as well as to certain nonprofit organization that can be matched by either cash or in-kind services. The grants are specifically directed toward reducing future hazard losses and can be used for projects protecting property and resources against the damaging effects of floods, earthquakes, wind and other hazards. Specific activities encouraged under the HMGP include acquiring damaged structures to turn the land over to the community for open space or recreation use, relocating damaged or damage-prone structures out of the hazard area and retrofitting properties to resist the damaging effects of disasters. Retrofitting can include wet- or dry-flood proofing, elevation of the structure above flood level, elevation of utilities or proper anchoring of the structure.

Two programs that have been authorized under the National Flood Insurance Reform Act of 1994 include the Flood Mitigation Assistance (FMA) program and a provision for increased cost of compliance (ICC) coverage. FMA makes grants available on a pre-disaster basis for flood mitigation planning and activities, including acquisition, relocation and retrofitting of structures. FMA grants for mitigation projects will be available only to those communities with

approved hazard mitigation plans. ICC coverage has recently been implemented for all new NFIP policies and renewals and is intended to be “mitigation insurance” to allow homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$15,000. A certain amount of funding is allotted to each state per year based on a risk formula for floods. Each state has the discretion to award funds to communities or to state government agencies. States may use whatever criteria or method they choose to award the funds as long as the applicant and the proposal are eligible. The program may fund up to 75 percent of the total cost of the proposed project, with a minimum of 25 percent of the cost coming from the community. A minimum of half the community share must be cash or “hard match”. Funds can also be granted to communities to help them prepare local flood mitigation plans. The same match requirements apply. Once a community receives a planning grant, however, it is not eligible to receive additional planning grants for another five years. For further information on the FMA program or ICC coverage, contact the RIEMA at (401) 946-9996.

National Flood Insurance Program (NFIP)

All of Rhode Island’s 39 municipalities participate in the NFIP. This program is a direct agreement between the federal government and the local community that flood insurance will be made available to residents in exchange for community compliance with minimum floodplain management regulations. Communities participating in the NFIP must:

- o Adopt the flood insurance rate maps as an overlay regulatory district
- o Require that all new construction or substantial improvement to existing structures in the flood hazard area be elevated or (if nonresidential) flood proofed to the identified flood level on the maps
- o Require design techniques to minimize flood damage for structures being built in high hazard areas, such as floodways or velocity zones

In return for community adoption of these standards, any structure in that community is eligible for protection by flood insurance, which covers property owners from losses due to inundation from surface water of any source. Coverage for land subsidence, sewer backup and water seepage is also available subject to the conditions outlined in the NFIP standard policy (see Appendix A, “Federal Resources”, for contacts regarding insurance coverage and purchase). Since homeowners insurance does not cover flooding, a community’s participation in the NFIP is vital to protecting property in the floodplain as well as being essential to ensure that federally backed mortgages and loans can be used to finance flood prone property.

APPENDIX C – North Smithfield Town Council Resolution

TOWN OF NORTH SMITHFIELD
STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
TOWN COUNCIL RESOLUTION

WHEREAS, The Town of North Smithfield has developed a Hazard Mitigation Plan as directed by the Federal Emergency Management Agency (FEMA) and the Rhode Island Emergency Management Agency (RIEMA), and

WHEREAS, The North Smithfield Hazard Mitigation Plan was developed by the North Smithfield Planning Department and North Smithfield Hazard Mitigation Committee, and

WHEREAS, North Smithfield's Hazard Mitigation Plan now has been given official and final approval by the Federal Emergency Management Agency and the Rhode Island Emergency Management Agency (RIEMA), and

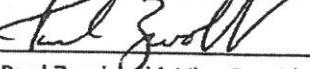
NOW, THEREFORE, BE IT RESOLVED, that the North Smithfield Town Council adopts the North Smithfield Hazard

Mitigation Plan approved by the Federal Emergency Management Agency this 11th day of October 2019.

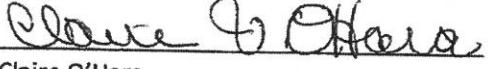
NORTH SMITHFIELD TOWN COUNCIL



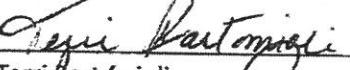
Paul Vadenais, President



Paul Zwolenski, Vice President



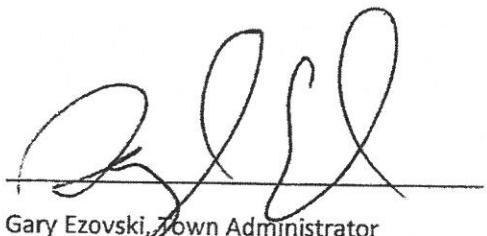
Claire O'Hara



Terri Bartomiooli



Douglas Osier, Jr.



Gary Ezovski, Town Administrator



Lillian Silva Scott, Town Clerk

APPENDIX D – Agendas and Minutes from meetings of Hazard Mitigation Committee

Town of North Smithfield
Hazard Mitigation Committee Meeting
Town Hall, 1 Main Street.

HMP Agenda for Thursday, June 21, 2018 - 3:00 PM

1. Roll Call
2. Project history
3. State review process
4. Comments on updated of HMP document
5. Next meeting
6. Adjournment

Individuals requesting interpreter services for the hearing impaired must call RI Relay at 1-800-745-5555 seventy-two (72) hours in advance of the meeting date.

Town of North Smithfield
Hazard Mitigation Committee Meeting
Town Hall, 1 Main Street.

HMP Minutes for Thursday, June 21, 2018 - 3:00 PM

1. Roll Call

Present: Gary Ezovski, Town Administrator, Tom Kravitz, Town Planner; Raymond Pendergast, Public Works Director; Chief Jeff Jillson, North Smithfield Fire and Rescue Services; Scott Lentz, Business Representative; Peter Branconnier, EMA Director.

2. Project history

3. State review process

4. Comments on updated of HMP document

5. Next meeting

6. Adjournment

Town of North Smithfield
Hazard Mitigation Plan (HMP) Committee Meeting
Town Hall, 1 Main Street.

HMP Agenda for Thursday, January 1, 2019 - 10:00 AM

1. Roll Call
2. Comments on update of HMP document
3. Adjournment

Town of North Smithfield
Hazard Mitigation Committee Meeting
Town Hall, 1 Main Street.

HMP Minutes for Thursday, January 10, 2019 – 10:00 AM

Roll Call

Present: Gary Ezovski, Town Administrator, Tom Kravitz, Town Planner; Raymond Pendergast, Public Works Director; Chief David Chartier, North Smithfield Fire and Rescue Services; Peter Branconnier, EMA Director, Chief of North Smithfield Police, Steven Reynolds and North Smithfield Police Captain Stephen Riccitelli

Comments on update of HMP document

Adjournment

**Town of North Smithfield Planning Board Meeting
Primrose Fire Station, 1470 Providence Pike**

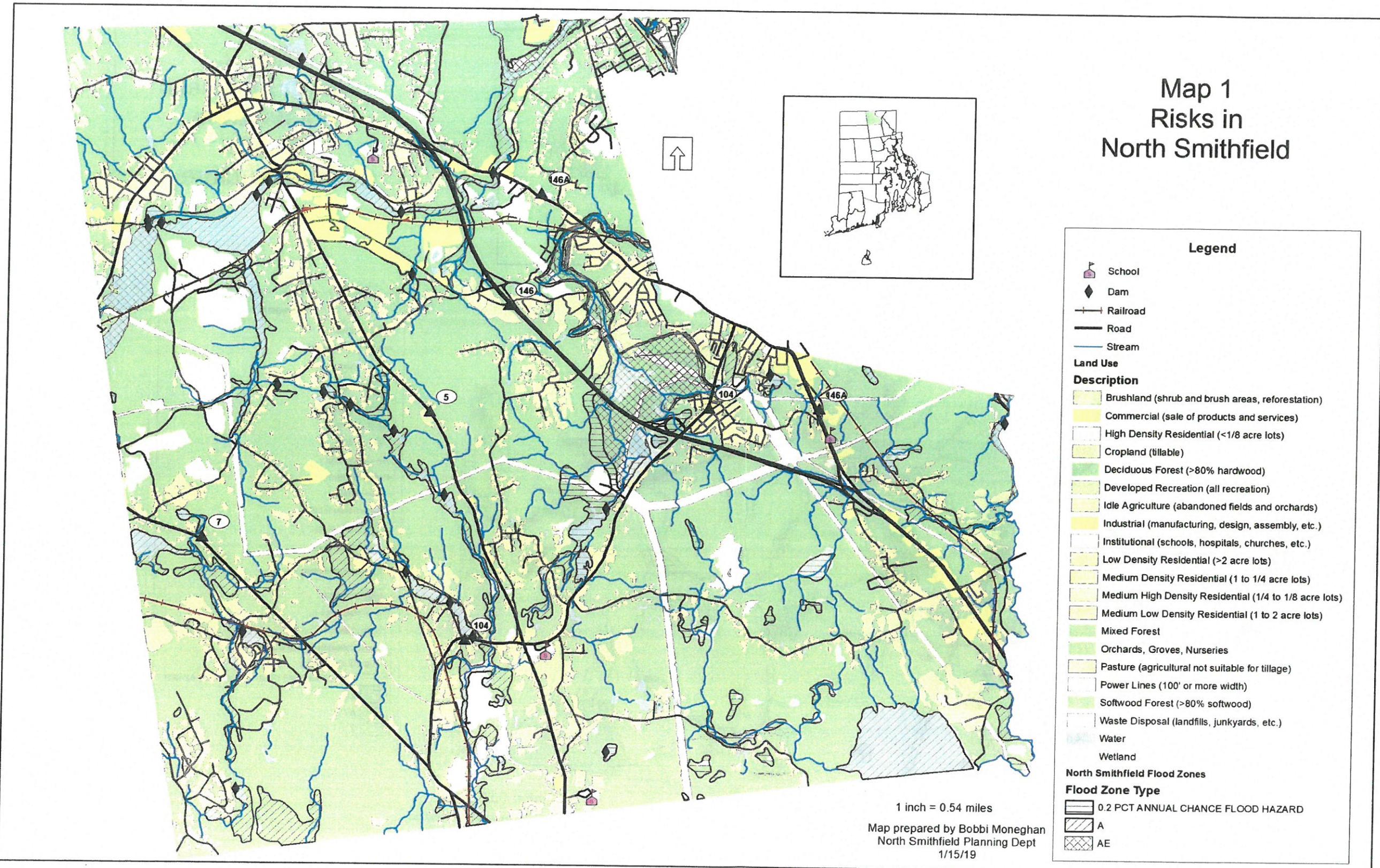
Planning Agenda for Thursday, February 7, 2019 - 7:00 PM

1. Roll Call
2. Minutes: Draft minutes from December 6 and December 20, 2018.
3. Disclosure: This is where anyone can disclose potential conflicts on matters before the Planning Board.
4. Disclosure and Notice: Planning Board members shall disclose any ex parte communications about any contested or material adjudicatory facts or opinions concerning the merits of any application before the Planning Board.
5. For discussion, consideration and action – 2019/20 Capital Budget including 5-year projection.
6. For discussion, consideration and action – High Rocks Condominium – 1 Tupperware Drive - Major Land Development – Construction status update / Final Plan Application.
7. For discussion, consideration and action – TPE Rhode Island Solar Holdings 1 LLC – Plat 7, Lots: 12, 14, 23, 24, 101, 102, 103, 104, and 105 – Minor Land Development - Combined Preliminary & Final Site Plan Review.
8. For discussion, consideration and action - 2019 Draft of Hazard Mitigation Plan.
9. Adjournment

Individuals requesting interpreter services for the hearing impaired must call RI Relay at 1-800-745-5555 seventy-two (72) hours in advance of the meeting date.

Agenda posted at Town Hall, Town Hall Annex and RI Secretary of State website.

Map 1 Risks in North Smithfield



Map 2
North Smithfield
Flood Zone
Public
Infrastructure

