Multi-Hazard Mitigation Plan

Town of Barrington, Rhode Island

Prepared for **Town of Barrington**
283 County Road
Barrington, Rhode Island 02806

Prepared by  /**Vanasse Hangen Brustlin, Inc.**
10 Dorrance Street, Suite 400
Providence, Rhode Island 02903

July 2010

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List of Acronyms

CFR	Code of Federal Regulations
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
NFIP	National Flood Insurance Program
PDM	Pre-Disaster Mitigation
RIDEM	Rhode Island Department of Environmental Management
RIDOT	Rhode Island Department of Transportation
RIEMA	Rhode Island Emergency Management Agency
RIGIS	Rhode Island Geographic Information System
SLOSH	Sea Lake and Overland Surge from Hurricanes
USGS	U.S. Geological Survey
VHB	Vanasse Hangen Brustlin, Inc.

Multi-Hazard Mitigation Committee Members

Gerald Bessette	Fire Chief
Alan Corvi	Department of Public Works Director
Peter DeAngelis Jr.	Town Manager
Philip Hervey	Town Planner
John LaCross	Police Chief
Victor Teixeira	Emergency Management Director

1.0 Introduction

Multi-hazard mitigation consists of sustained actions taken to permanently reduce or eliminate long-term risks to people and property from the effects of natural hazards such as floods, hurricanes, and snowstorms. Mitigation actions help safeguard personal and public safety, and can significantly reduce the impact of future disasters. By planning ahead, communities can minimize the economic and social disruption often caused by natural disasters. Pre-disaster planning will also help post-disaster operations become more efficient.

The Town of Barrington created this Multi-Hazard Mitigation Plan to identify potential natural hazards that might affect the community, determine the vulnerability of the community to these hazards, and establish clear goals and objectives that mitigate the risks from natural hazards. Mitigation strategies include a mix of physical initiatives to limit the impacts of natural hazards, such as rebuilding riprap walls to protect against coastal erosion, as well as regulatory/ planning initiatives such as revised zoning ordinances, and development of a Town Beach Management Plan.

Formal adoption and implementation of this document will allow Barrington to gain credit points under the Federal Emergency Management Agency's (FEMA) Community Rating System (CRS), which provides discounts on National Flood Insurance Program (NFIP) premiums for property owners in communities that participate in this voluntary program. Regulations pertaining to FEMA's flood mitigation grants and local hazard mitigation plans are provided in the Code of Federal Regulations (CFR), Title 44, Part 201.

Adoption of this Multi-Hazard Mitigation Plan will also increase Barrington's eligibility for federal grants available through FEMA's Hazard Mitigation Assistance Programs, including the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), Repetitive Flood Claims, and Severe Repetitive Loss Claims. In addition, the Rhode Island Emergency Management Agency (RIEMA) gives funding priority to municipalities that have completed a risk assessment and established mitigation projects with detailed information on the cost, timeline, and municipal department responsible for completing the project.

2.0 Community Profile

Barrington is a coastal community located on the east side of Narragansett Bay in Bristol County, Rhode Island. The town covers 15.8 square miles, has 19.6 miles of coastline, and occupies two peninsulas, which are bound by Narragansett Bay to the west and the Palmer and Warren Rivers to the east. The Barrington River separates the two peninsulas, and the Central Bridge and the Barrington Bridge connect the two land masses. The western portion of Barrington includes the business district and is physically connected to the City of East Providence, while East Barrington, which includes the Hampden Meadows neighborhood, is connected to the Town of Swansea, Massachusetts (refer to **Map 1**). No location in Barrington is more than two miles from coastal waters.

Over the course of the past century, Barrington has changed from a primarily agricultural community with a small industrial base to a residential commuter suburb of Providence. Many of the existing coastal homes were originally designed as summer bungalows which have since been winterized and support year-round residents. The town is classified as a medium-density developed community, with significant areas of wetland, public open space, and recreation land. Barrington's population is just under 17,000 people. Census data from 2000 shows that Barrington's population is aging, with the greatest population increase occurring in the 80 years and older cohort. The Town's residents have historically had income levels higher than both the surrounding county and the state.

The community has a relatively small business base, and residential development is the most dominant land use. The Barrington Comprehensive Community Plan, adopted by the Town Council in 2009, categorizes 52 percent (2,790 acres) of Barrington's land as residential, while commercial land comprises just 1.9 percent (101 acres), institutions comprise 3.0 percent (160 acres) and transportation and utilities makes up 0.6 percent (31 acres) of the land. Natural habitats and managed open space make up the remainder of the landscape.

2.1 Planning Process

As required by 44 CFR Part 201.6(d)(3), local jurisdictions must review, revise, and resubmit their Local Multi-Hazard Mitigation Plans to FEMA every five years. In March 2010, members of the Town of Barrington Local Hazard Mitigation Committee

met to discuss updating and revising the Natural Hazards Mitigation Plan that was previously submitted to, and approved by, FEMA in 2004. The Committee was spearheaded by Phil Hervey, the Barrington Town Planner, and included Town employees from several sectors, including the fire and police departments, public works, emergency management, and planning. The Committee reviewed the 2004 Natural Hazard Mitigation Plan. It determined that the document needed a full overhaul, and all sections should be revised and updated to more clearly meet the FEMA requirements outlined in the regulations. Vanasse Hangen Brustlin, Inc. (VHB) (Contractor), an engineering consulting firm in Providence, was contracted to coordinate the preparation of the revised plan. In revising the plan, the Contractor reviewed relevant documents, including the Town's 2009 Comprehensive Community Plan, the State's Natural Hazard Mitigation Plan, and FEMA's local mitigation guidance. To visually aggregate hazard data, the Committee and Contractor used Geographic Information System (GIS) data from the Town, the Rhode Island Geographic Information System (RIGIS) website, the National Climatic Data Center, and other sources.

The general public, business community, and other interested parties were invited to comment on a rough draft of the Natural Hazard Mitigation Plan at a May 4, 2010 meeting of the Town's Planning Board. The meeting was publicized on the websites of the Town of Barrington and the Secretary of State of Rhode Island, on flyers posted in Barrington Town Hall and the Barrington Public Library (refer to **Appendix A**), and via a listserve distributed to members of the planning community. After incorporating comments from the Planning Board, the final draft of the report was presented to the Barrington Town Council on July 15, 2010 (refer to Town Council Meeting Agenda, Item 19 in Appendix A). The Council and the public were invited to provide input and make comments. The Council voted to accept the Plan and directed it be forwarded to FEMA for review and approval. The Plan was forwarded to FEMA on July 19, 2010. On July 22, the FEMA Hazard Mitigation Planning Team provided comments and recommendations to improve the plan. These comments and recommendations have been incorporated into the plan. The corrected plan will be resubmitted to FEMA. If all FEMA requirements have been satisfied, the plan will be sent to RIEMA for concurrence. Upon obtaining RIEMA concurrence, FEMA Region I will issue a letter of conditional approval to the Town indicating that the plan will be approvable once the Council has formally adopted the plan.

The abutter jurisdictions of East Providence, Warren, and Bristol, RI and Seekonk, MA have been or will be provided the opportunity to review and comment this plan prior to formal adoption and during the periodic reviews.

3.0 Risk Assessment

The risk assessment portion of a Multi-Hazard Mitigation Plan contributes to the decision-making process for allocating available resources to mitigation projects. 44 CFR Part 201.6(c)(2) of FEMA's mitigation planning regulations requires local municipalities to provide sufficient hazard and risk information from which to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. This risk assessment includes the identification and detailed descriptions of all hazards and their potential effects on the Town of Barrington, along with an analysis of the vulnerability of the Town to those hazards. Ultimately the risk assessment provides a factual basis for developing proposed mitigation activities and strategies.

For the purposes of this mitigation plan, the following definitions have been used:

- "Hazard" – a source of potential danger or adverse conditions that may occur.
- "Risk" – the estimated impact that a hazard would have on people, services, facilities, and structures in the community. The natural hazard risk assessment describes the magnitude, duration, and probability of potential natural hazard events occurring in Barrington.
- "Vulnerability" – the exposure or susceptibility of the Town to the effects of the identified hazards.

3.1 Hazard Identification

The hazard identification process primarily consisted of reviewing the Town's 2004 Natural Hazards Mitigation Plan, the Rhode Island State Hazard Mitigation Plan from 2005, information from the National Climatic Data Center and the National Weather Service, and relevant newspaper articles on natural hazards. Each hazard was re-assessed to ensure it was still relevant.

As a result of the hazard identification process, the following seven natural hazards were identified as affecting or having the potential to affect the town:

- Hurricanes
- Severe Rainstorms
- Winter Storms

- Hailstorms
- Earthquakes
- Tornadoes
- Wildfires

The most significant effects of natural hazards were identified as:

- Inland and Coastal Flooding
- High Winds
- Ice/ Snow

3.2 Hazard Profiles

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3.2.1 Hurricanes

A hurricane is a tropical cyclone with rotating winds of at least 74 mph, and is usually accompanied by rain, thunder, and lightning. These seasonal storms are spawned by low-pressure depressions moving over warm, tropical waters and occur over the Atlantic Ocean between June and October.

Hurricanes are measured on the Saffir/ Simpson Hurricane Intensity Scale (refer to **Table 1**). While strong winds from hurricanes can pose a threat to life and property, the greatest threat posed by hurricanes in Rhode Island is generally heavy rainfall and flooding caused by storm surge. Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm. When coupled with normal tides, storm surge can raise the mean water level 15 feet or more. Storm surge and hurricanes can also greatly contribute to coastal erosion.

Table 1. Saffir/Simpson Hurricane Intensity Scale

Hurricane Category	Wind Speed (mph)	Storm Surge (ft. above normal sea level)	Damage Potential
1	74-95	4-5	Minimal – Damage primarily to shrubbery and trees; some signs damaged; unanchored mobile homes damaged.
2	96-110	6-8	Moderate – Some trees toppled; some roof coverings damaged; major damage to mobile homes.
3	111-130	9-12	Extensive – Large trees toppled; structural damage to roofs, small homes and utility buildings; older mobile homes destroyed.
4	131-155	13-18	Extreme – Extensive damage to roofs, windows, doors; roof systems on small buildings completely fail; some curtain walls fail; nearly all mobile homes destroyed.
5	>155	>18	Catastrophic – Roof damage is considerable and widespread; window and door damage severe; extensive glass failures; entire buildings could fail.

Source: National Weather Service National Hurricane Center, http://www.nhc.noaa.gov/sshws.shtml

3.2.1.1 Extent and Location

The New England District of the U.S. Army Corps of Engineers, using data from the National Hurricane Center, developed maps depicting the worst case scenario for hurricane surge inundation for Category 1 through 4 hurricanes striking the coast of Rhode Island (refer to **Map 2**). Hurricane surge values were developed using the SLOSH (Sea Lake and Overland Surge from Hurricanes) model, which estimates storm surge heights through hypothetical measures of pressure, size, forward speed, track, and winds. Barrington's coastal location and low elevation makes it particularly susceptible to hurricane-related hazards, and the town's small size means that the majority of properties are vulnerable to hurricane impacts to some degree. It is evident that under this worst case model, even Category 1 and Category 2 hurricanes will produce storm surges that inundate large areas of town, particularly in Hampden Meadows. Because of Barrington's coastal location, hurricanes have the potential to cause erosion, particularly along Barrington's southern and western shores.

3.2.1.2 Previous Occurrences

Rhode Island has experienced seven significant hurricanes (refer to **Table 2**) in the 20th century, starting with the unnamed hurricane of 1938.

Table 2. Significant Hurricanes in Rhode Island in the 20th Century

Date	Name	Category	Total Property Damage (millions)	Deaths
September 21, 1938	N/A	3	100	262
September 14, 1944	N/A	3	2	0
August 31, 1954	Carol	2	200	19
September 11, 1954	Edna	2	0.1	0
August 17-20, 1955	Diane	TS[1]	175	0
September 12, 1960	Donna	2	2.4	0
September 27, 1985	Gloria	2	19.8	2
August 19, 1991	Bob	2	115	0

[1] Tropical Storm

Sources: Rhode Island State Hazard Mitigation Plan, 2005; Town of Barrington Natural Hazards Mitigation Plan, 2004; National Weather Service Forecast Office, Boston, MA, http://www.erh.noaa.gov/box/hurricane/tropicalCycloneReview.shtm.

3.2.1.3 Probability of Future Events

The National Hurricane Center uses satellite imagery, radar, and weather balloons to spot conditions that could trigger a hurricane. Information is gathered and analyzed by computer models that estimate the storm's strength, rate of development, path, and estimated storm surge. Based on this information, a tropical storm warning, a hurricane watch, or a hurricane warning are then issued.

A tropical storm warning is issued if winds of 39 to 73 mph are expected. A hurricane watch is issued for coastal areas when a tropical storm or hurricane conditions threaten within 24 to 36 hours. A hurricane warning is issued for specific coastal areas when hurricane-force winds are expected to strike within 24 hours or less.

According to the National Hurricane Center, approximately six Atlantic tropical storms mature into hurricanes in an average year. The Rhode Island State Hazard Mitigation Plan indicates that Rhode Island is particularly vulnerable to hurricanes due to its geographic location and features such as Narragansett Bay, which can act as a funnel for hurricane surges. The State plan indicates that in any given year, the probability of a hurricane reaching Rhode Island is six percent.

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3.2.2 Severe Rainstorms and Floods

3.2.2.1 Extent and Location

Barrington is a low-lying community virtually surrounded by water and containing approximately 6.9 square miles of inland water. As a result, several areas of town are frequently flooded by heavy rains or storm activity. FEMA has designated flood zones for Rhode Island according to varying levels of flood risk. Each zone reflects the potential severity or type of flooding in the area. High risk areas in Barrington are designated as Zone AE and Zone VE. Zone AE, or the 100-year Flood Zone, identifies areas with a one percent or greater chance of flooding in any given year and where the base flood elevation has been determined. Zone VE identifies the Velocity Zone, which are coastal areas with a one percent or greater chance of flooding with additional hazards associated with storm-induced waves, or velocity action.

The Flood Insurance Rate Maps (FIRMs) for Barrington that are currently available from FEMA and used for this Multi-Hazard Mitigation Plan were made effective November 16, 2006. Newer flood maps for the Town may become available from FEMA in mid-2010. Current flood zone mapping for Barrington shows the Velocity Zone occurring along much of the western and southern coast, where the town is proximate to Narragansett Bay and the Warren River (refer to **Map 3**). Much of the Velocity Zone is dominated by residential development, which may exacerbate the effects of flooding. Areas of undeveloped coastal wetland can be found along Rumstick Point, between Nayatt Point and Town Beach, and along Mussachuck Creek. These areas may help minimize the effects of localized flooding. The 100-year Flood Zone extends inland from the Velocity Zone in most areas, and includes freshwater wetlands such as Brickyard Pond and Echo Lake, and the estuarine wetlands associated with the Barrington River, 100-Acre Cove, and the Palmer River.

3.2.2.2 Previous Occurrences

Barrington regularly experiences storms and heavy rains that result in localized flooding. Several of the most significant recent floods to occur in Bristol County are highlighted in **Table 3**. In March 2010 storms and periods of heavy rain resulted in significant flooding in Rhode Island and resulted in a Presidential Major Disaster Declaration for the state, including Bristol County. Barrington experienced substantial flooding in some areas. As it has done several times in the past, the Rhode Island Department of Transportation (RIDOT) closed the intersection of Middle Highway and Maple Avenue for several days due to flooding from Volpe Pond and associated wetlands. This area has been identified on the currently available FIRM as a minimal flood hazard because it is located well outside 100-year Flood Zone, and even outside the 500-year Flood Zone, or the 0.2 percent chance annual floodplain.

Table 3. Severe Rainfall and Floods in Bristol County, Rhode Island, 1993-2010

Date	Type	Rainfall (inches)	Notes
January 10, 1997	Coastal Flood	N/A	2-4 foot tidal surge in Narragansett Bay. Palmer River flooded some Barrington streets.
March 28, 2005	Flood	3-4	Flooding in poor drainage areas; significant street flooding.
June 7, 2006	Flood	2-4	Some street flooding.
October 28, 2006	Coastal Flood	2-4	Significant coastal flooding; some street flooding.
March 2, 2007	Flood	2-3	Urban, small stream; some street flooding.
February 13, 2008	Flood	2-4	Flooding in streams and poor drainage areas; some minor river flooding; minor wind damage from strong northeast winds, especially along the coast.
March 8, 2008	Coastal Flood	2-3	Minor coastal flooding due to high tide, rough seas, and storm surge.
December 12, 2008	Flood	3-5	Small stream and some street flooding.
March 2010	Flood	8	Upland Way/Maple Avenue/Middle Highway intersection flooded.

Source: National Climatic Data Center, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms,
Rhode Island Department of Transportation, http://www.dot.state.ri.us/Flooded_streets_March2010.asp#Closures

3.2.2.3 Probability of Future Events

While it is difficult to predict flood events, FEMA has determined that properties in Zone AE and Zone VE have a 26 percent chance of flooding over the life of a 30-year mortgage.

3.2.2.4 Dam Failure

Flooding from dam failure represents another possible threat to localized areas of town. Barrington has three dams, all located on the west side of town: the Echo Lake

Dam and the Rhode Island Country Club Dam are three-foot earthen dams that control flow from Echo Lake and Mussachuck Creek, while a third, privately owned dam controls flow from Annawamscutt Brook to Allin's Cove. This dam is located adjacent to an elderly housing complex, and the headwater is lower than the lowest level of the complex. All three dams are located in the 100-year Flood Zone (Zone AE).

Inventoried dams in Rhode Island are classified by size and hazard rating. The size classification provides a relative description of small, medium, or large, based on the storage capacity and height of the impounded water. The hazard classification relates to the probable consequences of failure or misoperation of the dam. The Rhode Island Country Club Dam and the Echo Lake Dam were classified as low hazard dams in the 2009 Annual Dam Safety Report from the Rhode Island Department of Environmental Management. Failure or misoperation of low hazard dams is determined to result in no probable loss of human life and low economic losses.

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3.2.3 Winter Storms

Winter storms are a regular occurrence in Barrington, with snowfall ranging from a few inches to blizzard conditions, including sustained winds or frequent gusts up to 35 mph or greater, and considerable falling snow, broken tree limbs, loss of power, and reduced visibility to less than a quarter mile.

3.2.3.1 Extent and Location

Barrington's coastal location makes it somewhat less prone to heavy snowfall than inland communities, but virtually any area of town could be hit by a severe winter storm. Frequent impacts from winter storms include power outages and transportation difficulties, including traffic accidents.

3.2.3.2 Previous Occurrences

Barrington has experienced several notable blizzards and winter storms over the years (refer to **Table 4**). The Blizzard of 1978 is perhaps the most significant and memorable snowstorm to hit Rhode Island, resulting in a virtual shut-down of commerce and transportation across the state for several days, 21 deaths, and millions of dollars of damages.

Table 4. Significant Snowstorms for Bristol County, Rhode Island, 1993-2009

Date	Snowfall (inches)	Notes
December 29, 1993	6-9	
January 7, 1994	N/A	
January 8, 1994	6-10	Power outages and traffic accidents throughout RI.
February 8, 1994	6-9	
February 11, 1994	8-13	Business and transportation disrupted throughout RI.
February 4, 1995	N/A	
January 7, 1996	12-24	Business and transportation disrupted throughout RI; schools closed.
February 2, 1996	6-8	Transportation difficult throughout RI.
March 2, 1996	6-11	Numerous traffic accidents throughout RI.
March 7, 1996	2-7.5	Numerous traffic accidents throughout RI.
April 9, 1996	7-16	Scattered power outages throughout RI.
January 11, 1997	4-7	Numerous traffic accidents throughout RI.
January 31, 1997	N/A	Freezing drizzle; numerous traffic accidents.
March 31, 1997	6-8	Minor power outages; traffic accidents.
April 1, 1997	N/A	Freezing rain and sleet; numerous traffic accidents.
February 25, 1999	N/A	Freezing rain and sleet; numerous traffic accidents.
March 15, 1999	7-12	Transportation difficult throughout RI; schools closed.
February 18, 2000	6-8	Numerous traffic accidents throughout RI.
January 20, 2001	6-8	Minor power outages; traffic accidents.
February 25, 2001	N/A	Freezing rain; numerous traffic accidents.
December 5, 2002	6-8	
February 7, 2003	6-12	Transportation difficult.
February 17, 2003	12-24	Numerous traffic accidents throughout RI.
March 6, 2003	6-10	Numerous traffic accidents throughout RI.
December 5, 2003	10-20	15 inches in Barrington; transportation disrupted.
December 26, 2004	8	Numerous traffic accidents throughout RI.
January 22, 2005	21	Coastal flooding; transportation disrupted.
February 24, 2005	7	
March 1, 2005	9	
February 12, 2006	9-14	
December 13, 2007	12	Transportation disrupted; Providence shut down.
December 19, 2008	10-11	
December 19, 2009	18-21	Transportation difficult; schools closed.

Source: National Climatic Data Center, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

3.2.3.3 Probability of Future Events

There are currently no long-term forecasting methods for determining the probability of a future snowstorm in Barrington.

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3.2.4 Hailstorms

Hail is a showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter. Hail is often associated with severe thunderstorms, and occurs primarily during summer months in Rhode Island.

3.2.4.1 Extent and Location

While significant hailstorms are infrequent in Barrington, there is potential for a hailstorm of any magnitude to strike in virtually any area of town.

3.2.4.2 Previous Occurrences

Hailstorms have been relatively infrequent in Barrington. The National Climatic Data Center lists three hailstorms occurring in Barrington between 1950 and 2009 (refer to **Table 5**).

Table 5. Hailstorms in Barrington, Rhode Island, 1955-2009

Date	Magnitude (size in inches)	Notes
June 22, 1997	1.5	Microburst in W. Barrington in vicinity of Bullocks Cove; damage to boats and trees; fire in apartment caused by lightning.
June 30, 1998	0.88	
July 2, 2004	0.75	
April 2010	N/A	Short storm producing large hail.

Source: National Climatic Data Center, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

3.2.4.3 Probability of Future Events

There are currently no long-term forecasting methods for determining the probability of a future hailstorm in Barrington.

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3.2.5 Earthquakes

An earthquake is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes strike suddenly, violently, and without warning at any time of the year. Earthquakes are measured on a Richter Scale, which is a logarithmic measurement from of the amount of energy released by an earthquake. The Richter Scale ranges from 1 to 10. Earthquakes with a magnitude of at least 4.5 are strong enough to be recorded by sensitive seismographs all over the world. The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of

furniture, damage to chimneys, and ultimately, total destruction. The intensity scale currently used in the United States is the Modified Mercalli Intensity Scale. The scale is composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. Different levels are designated by Roman numerals but the scale does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects.

3.2.5.1 Extent and Location

There are no significant geologic fault lines in Rhode Island or New England, and the U.S. Geological Survey's (USGS) Earthquake Hazards Program identifies all of Rhode Island as occurring in a low seismic risk area (<2%g peak acceleration). Historically, earthquakes originating in other states have been felt in various parts of Rhode Island. Should an earthquake strike or its effects be felt in Barrington, old masonry structures that do not meet current earthquake codes such as Town Hall and the Library/ Senior Center could potentially be at risk of damage or collapse.

3.2.5.2 Previous Occurrences

European settlers in Rhode Island noted the effects of a number of earthquakes beginning in the mid-17th century. These quakes were believed to have originated elsewhere, some as far away as Quebec. In 1883 an earthquake believed to have been centered on Rhode Island was felt (Intensity V effects) from Bristol to Block Island. The largest earthquake to be felt in Rhode Island occurred in 1976 and had Intensity VI effects (felt by all, many frightened; some heavy furniture moved; a few instances of fallen plaster; damage slight) and measured 3.50 on the Richter Scale. **Table 6** highlights historic earthquakes felt in Rhode Island.

Table 6. Earthquakes in Rhode Island

Date	Epicenter	Richter Scale	Effects in RI
February 28, 1925	St. Lawrence River, Canada	7.0	Intensity V effects felt on Block Island and in Providence; Intensity IV in Charlestown.
November 19, 1929	Grand Banks, Newfoundland	7.2	Moderate vibrations were felt on Block Island and at Chepachet, Newport, Providence, and Westerly.
November 1, 1935	Quebec	6.2	Intensity IV effects felt on Block Island and at Providence and Woonsocket.
December 20 & 24, 1940	Lake Ossipee, New Hampshire	N/A	Intensity V effects felt in Newport, Intensity IV effects in Central Falls, Pascoag, Providence, and Woonsocket, and Intensity I - III effects in Kingston, New Shoreham, and Wakefield.
September 4, 1944	Massena, NY		Intensity I - III effects reported in Kingston, Lansdale, Providence, Wakefield, and Woonsocket.
October 16, 1963	Coast of Massachusetts	4.5	Intensity V effects in Chepachet, less intense effects in northern RI.

Date	Epicenter	Richter Scale	Effects in RI
December 7, 1965	N/A	N/A	Windows and doors rattled and trees and bushes were shaken slightly (Intensity V effects) at Warwick. Small objects and furnishings shifted at Bristol.
February 2, 1967	N/A	2.4	Intensity V effects at Middleton, Newport, and North Kingstown, but no damage was sustained; also felt at Adamsville and Jamestown.
February 3, 1973	N/A	N/A	Noises like an explosion or sonic boom shook houses and rattle windows throughout Rhode Island and eastern Massachusetts, but seismographs recorded nothing.
June 14, 1973	Western Maine	5.2	Intensity IV effects in Charlestown, and Intensity I - III at Bristol, East Providence, Harmony, and Providence.
March 11, 1976	N/A	3.5	Intensity VI effects felt from Oakland, Rhode Island, south to Newport.

Source: USGS, Earthquake History of Rhode Island, http://earthquake.usgs.gov/earthquakes/states/rhode_island/history.php

3.2.5.3 Probability of Future Events

The USGS Earthquake Hazards Program identifies all of Rhode Island as occurring in a low seismic risk area (<2%g peak acceleration), therefore the probability of a significant earthquake occurring in the future is low.

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3.2.6 Tornadoes

Tornadoes are spawned by thunderstorms and hurricanes when cold air overrides a layer of warm air, causing the warm air to rise rapidly. The winds produced from hurricanes and wildfires have also been known to produce tornadoes. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. The average tornado moves southwest to northeast, but tornadoes have been known to move in any direction.

3.2.6.1 Extent and Location

According to FEMA, every state is at some risk from tornadoes. Rhode Island is located in FEMA Wind Zone II, which is associated with maximum winds of 160 mph, and is also located in a hurricane-susceptible region. Tornado damage severity is measured by the Fujita Tornado Scale, which assigns numerical values based on wind speeds (refer to **Table 7**). The Fujita Scale ranges from F0 (winds of 40-72 mph) to F5 (winds of 261-318 mph). Winds of 113-157 mph, such as are generally associated with Wind Zone II, are identified as an F2 on the Fujita Scale, and can cause considerable damage: roofs can be torn from houses, mobile homes

demolished, boxcars pushed over, large trees snapped or uprooted, and light-object missiles generated.

Table 7. Fujita Tornado Measurement Scale

Category	Wind Speed	Damage Potential
Category F0	Gale tornado (40-72 mph)	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damage to signs.
Category F1	Moderate tornado (73-112 mph)	Moderate damage. Lower limit is the beginning of hurricane speed; roof surfaces peeled off; mobile homes pushed off foundations; moving cars pushed off roads.
Category F2	Significant tornado (113-157 mph)	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; cars lifted off ground and thrown.
Category F3	Severe tornado (158-206 mph)	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
Category F4	Devastating tornado (207-260 mph)	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
Category F5	Incredible tornado (261-318 mph)	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 yards.

Source: National Oceanic and Atmospheric Administration, http://www.outlook.noaa.gov/tornadoes/fujita.htm

3.2.6.2 Previous Occurrences

Between 1953 and 2004 Rhode Island had an average of zero tornadoes, but on July 23, 2008 an F1 scale tornado began just off of Rumstick Point in Barrington and then moved to land in Warren. The tornado's path was 3.0 miles long and 40 yards wide, with winds reaching speeds of 65-75 mph. The majority of damage was to trees, some of which fell onto powerlines and houses, and was estimated at $45,000. No injuries were reported.

3.2.6.3 Probability of Future Events

Tornadoes are a rare occurrence in Rhode Island, but a risk does exist, particularly during hurricane season (June through October). There is currently no long-term forecasting system that can accurately predict the likelihood of a tornado event in Rhode Island. The National Oceanic and Atmospheric Administration's Storm Prediction Center constantly monitors changing weather conditions and is able to provide short-term tornado predictions; however these predictions order on minutes, rather than days and are thus limited in their ability to predict future events.

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3.2.7 Wildfires

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Heavy fuel contributes to the size and spread of the fire, as do steep slopes, and dry, windy weather conditions.

3.2.7.1 Extent and Location

The U.S. Forest Service has established the National Fire Danger Rating System to determine the daily risk to fire experienced by different regions of the country (refer to **Table 8**). The system uses mathematical formulas including wind speed and fuel type to determine a fire index. The fire indexes are grouped into five groups based on severity, and each group has an associated class rating (Classes 1 through 5) and an associated fire risk level. A fire index of zero occurs when there is snow on the ground or there has been a prolonged period of substantial rain.

Table 8. National Fire Danger Rating System

Fire Index	Rating	Description
0	Class 1	No rating
1-30	Class 2	Low danger
31-60	Class 3	Medium danger
61-80	Class 4	High danger
98+	Class 5	Extreme

Source: Rhode Island Department of Environmental Management, http://www.dem.ri.gov/programs/bnatres/forest/pdf/firewthr.pdf

Based on 2003 land use figures, approximately 20 percent of Barrington is forested (1,087 acres), and approximately one percent is brush (51.5 acres). Wooded areas are localized and generally surrounded by development. Larger forested tracts are located in the vicinity of Brickyard Pond/ Veteran's Park, Haines State Park, and Vitullo Farm on the western side of town, the Hampden Meadows Greenbelt area on the eastern side, the South Road Area at Washington Road, and Nockum Hill near the Swansea/ Seekonk town line. Many of these wooded areas are dominated by forested wetland, but given the proper conditions, these areas could be at risk for wildfire.

3.2.7.2 Previous Occurrences

Significant wildfires have not been known to occur in Barrington, although occasional brush fires have occurred in the wooded parts of town.

3.2.7.3 Probability of Future Events

Rhode Island generally exhibits a humid continental climate, with hot, rainy summers and chilly winters, and thus often has a low or medium (Class 1 or 2) fire class rating. However, dry, windy weather does occur, and fire conditions can be exacerbated by drought, particularly during the summer months. The peak fire season for the state is typically between mid-March and mid-May, when higher fire class ratings do occur periodically.

The probability of a future wildfire varies with seasonal and daily weather conditions, and site-specific vegetation composition. Much of Barrington is relatively flat, including the wooded areas. This flat topography, coupled with the relatively fragmented layout of the Town's woodland tracts and the overall humid weather patterns of the region puts Barrington at a lower risk of a future wildfire.

3.3 Summary of Hazards

The most prevalent natural hazard facing the Town of Barrington is flooding. Flooding may occur quickly or over a period of days and can result from a number of natural hazards. Storm surge from hurricanes and winter storms often results in coastal flooding and erosion. Many neighborhoods along the coast are also located in FEMA-designated Special Flood Hazard Areas including the 100-year Flood Zone or the Velocity Zone, where heavy rains, snowmelt, ice jams, and dam failures can contribute to flooding. Because of Barrington's low, coastal location, relatively flat topography, and large areas of inland water and wetlands, flooding is a pervasive problem throughout many areas.

High winds associated with a variety of seasonal storms including hurricanes, tornadoes, and winter storms, are also a frequent natural hazard in Barrington, particularly along the coastal areas.

Wildfires, earthquakes, and hailstorms are considered to be low-risk natural hazards for Barrington, although all have the potential to occur.

4.0 Vulnerability

As required by 44 CFR Part 201.6(c)(2)(ii), local municipalities must include a description of the jurisdiction's vulnerability to each of the hazards previously identified and described in this report. Vulnerability is defined as the exposure or susceptibility of the Town to the effects of the identified hazards. The vulnerability assessment process helps identify vulnerable points in the community's infrastructure and population and examines structures, including residential and commercial structures; infrastructure, including bridges, roads, and utilities; natural resources and areas subject to environmental vulnerability, such as beaches prone to erosion; and populations, such as children and the elderly.

4.1 Critical Assets

Table 9 identifies Barrington's critical assets, including transportation systems, emergency centers, utility infrastructure, special population centers such as nursing homes and schools, and natural resources, such as beaches and coastal parks. The table also identifies the approximate location of each critical asset, which natural hazards each asset is vulnerable to, and where feasible, an estimate of potential dollar losses from each vulnerable asset.

Table 9. Risk Assessment Matrix for Barrington, Rhode Island

Critical Asset	Location	Ownership	Primary Natural Hazards	Primary Threat
SPECIAL POPULATION CENTERS				
Senior Center (Ground Floor Public Library)	281 County Road	Town	Earthquake	Structural damage
Bay Spring Assisted Living Facility	Bay Spring Avenue	Private	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Barrington Cove Apartments	Bay Spring Avenue	Private	Hurricane – Category 3 storm surge	Flooding
SCHOOLS				
Barrington Christian Academy	9 Old County Road	Private	Hurricane – Category 4 storm surge	Flooding
Barrington Early Childhood Center	448 College Lane	Private	N/A	N/A
Kids Quarters	64 Bay Spring Avenue	Private	Hurricane – Category 4 storm surge	Flooding

Critical Asset	Location	Ownership	Primary Natural Hazards	Primary Threat
Montessori Centre of Barrington	303 Sowams Road	Private	Hurricane – Category 2 storm surge	Flooding
Nayatt School	400 Nayatt Road	Town	Hurricane – Category 2 storm surge	Flooding
Barrington High School	220 Lincoln Avenue	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Barrington Middle School	Middle Highway	Town	Hurricane – Category 3 storm surge	Flooding
Primrose Hill School	Middle Highway	Town	N/A	
Hampden Meadows School	New Meadow Road	Town	Hurricane – Category 4 storm surge	Flooding
Sowams Elementary School	364 Sowams Road	Town	Hurricane – Category 2 storm surge	Flooding
JCC at Temple Habonim-Barrington	165 New Meadow Road	Private	Hurricane – Category 2 storm surge	Flooding
Red Brick School	50 Middle Highway	Private	N/A	N/A
St. Andrew's School	63 Federal Road	Private	N/A	N/A
Tot's Cooperative Nursery School	461 County Road	Private	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
St. Luke School	10 Waldron Avenue	Private	N/A	N/A
EMERGENCY/OPERATING CENTERS				
Fire Station	100 Federal Road	Town	Hurricane – Category 3 storm surge	Flooding
Hampden Meadows Volunteer Fire Department	Sowams Road	Town	Hurricane – Category 2 storm surge	Flooding
Police Station/Public Safety	100 Federal Road	Town	Hurricane – Category 4 storm surge	Flooding
Town Hall	285 County Road	Town	Earthquake	Structural damage
Bay Spring Community Center	17 Blanding Avenue	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Department of Public Works	Upland Way	Town	N/A	N/A
RESIDENTIAL & COMMERCIAL PROPERTIES				
Various	Various	Private	Flood – Coastal flood (Zone VE), 100-year Flood Zone (AE) Hurricane – Category 1-4 storm surge	Flooding
DAMS				
Echo Lake Dam	South Lake Drive	R.I. Country Club	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Rhode Island Country Club Dam	Washington Road	R.I. Country Club	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Unnamed Dam at Barrington Cove Apartments	Bay Spring Avenue	Private	Flood – Coastal flood w/ velocity hazard (Zone VE), 100-year Flood Zone (AE) Hurricane – Category 1/2 storm surge	Flooding
UTILITIES				
Bay Spring Ave Pump Station	Bay Spring Ave	Town	Flood – Coastal flood w/ velocity hazard (Zone VE), 100-year Flood Zone (AE) Hurricane – Category 1/2 storm surge	Flooding

Critical Asset	Location	Ownership	Primary Natural Hazards	Primary Threat
Brickyard Pond Pump Station	Brickyard Pond	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Freemont Pump Station	Freemont Ave	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 1/2 storm surge	Flooding
Police Station Pump Station	Police Cove	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Prince's Pond Pump Station	County Road/ Prince's Pond	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Walnut Road Pump Station	Walnut Road	Town	Hurricane – Category 3/4 storm surge	Flooding
Adam's Point Ejector Station	Adam's Point Road	Town	Flood – Coastal flood (Zone VE) Hurricane – Category 1 storm surge	Flooding
Juniper Street Ejector Station	Juniper Street	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Nayatt Point Ejector Station	Washington Road	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 1/2 storm surge	Flooding
Rumstick Ejector Station	Rumstick Road	Town	Flood – Coastal flood w/ velocity hazard (Zone VE) Hurricane – Category 1/2 storm surge	Flooding
Wampanoag Ejector Station	Wampanoag Trail	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Elm Lane Grinder Station	Elm Lane	Town	Hurricane – Category 4 storm surge	Flooding
Nayatt Road Grinder Station	Nayatt Road	Town	Hurricane – Category 4 storm surge	Flooding
Pheasant Lane Grinder Station	Pheasant Lane	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
Strawberry Drive Grinder Station	Strawberry Drive	Town	Flood – 100-year Flood Zone (AE) Hurricane – Category 2 storm surge	Flooding
National Grid Substation	Maple Avenue	National Grid	Hurricane – Category 2 storm surge Winter Storms	Wind, ice and snow
TRANSPORTATION				
Massasoit Avenue Bridge	Massasoit Avenue	State	Flood – 100-year Flood Zone (AE) Hurricane – Category 1/2 storm surge	Flooding
Barrington River Bridge	County Road/Rte. 114/103	State	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Warren River Bridge	County Road/Rte. 114/103	State	Flood – 100-year Flood Zone (AE) Hurricane – Category 1 storm surge	Flooding
Evacuation Routes	Various	Town, State	Wamapnoag Trail in particular	Flooding
NATURAL RESOURCES				
Town Beach		Town	Flood – Coastal flood (Zone VE), 100-year Flood Zone (AE) Hurricane – Category 1 storm surge Erosion	Flooding, Coastal erosion

Critical Asset	Location	Ownership	Primary Natural Hazards	Primary Threat
Latham Park		Town	Flood – Coastal flood (Zone VE), 100-year Flood Zone (AE) Hurricane – Category 1 storm surge Coastal Erosion	Flooding, Coastal erosion

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4.1.1 Special Population Centers

Barrington has several special population centers, including 15 educational facilities ranging from pre-school to high school, two elderly housing centers, a senior center (located within the Barrington public library at the Peck Center, discussed below), and several group homes for adults with developmental and mental health disabilities. The populations using or inhabiting these facilities may require additional assistance in the event of a natural hazard.

4.1.1.1 Hurricanes

The Rhode Island Building Code requires residential and commercial structures in the Barrington area to be built to withstand 110 mile per hour winds, or a Category 2 hurricane. The facilities that house and support Barrington's special population centers were mostly built in the latter half of the 20th century and meet this requirement. The senior center, which is housed in the library, an older masonry structure, may not meet this standard. All special needs population centers may be vulnerable to wind-borne damage from higher caliber hurricanes.

Half of Barrington's 15 public and private schools are located in storm surge inundation areas (refer to **Map 4**) based on the SLOSH worst case scenario model. The schools most at risk are Tot's Cooperative Nursery School, which is at risk from storm surge associated with a Category 1 hurricane, and the Montessori Centre of Barrington, Sowams Elementary School, and Barrington High School, which are all at risk for storm surge inundation from a Category 2 hurricane.

Barrington's two existing elderly housing facilities are located on the west side of town in the Bay Spring neighborhood. The Bay Spring Assisted Living facility is at risk for surge inundation from a Category 2 hurricane, while the Barrington Cove Apartments parking lot is at risk from a Category 2 hurricane and the building itself is at risk of storm surge from a Category 3 hurricane.

Barrington has several group homes, at least two of which are at risk from inundation from a Category 2 hurricane. These facilities are located on Upland Way, New meadow Road, and County Road but are not identified on Map 4 for privacy purposes. The East Bay Center, an outpatient mental health facility on County Road, is at risk from inundation from a Category 3 hurricane.

4.1.1.2 Severe Rainstorms and Floods

The majority of Barrington's schools are located outside of both the Velocity Zone and the 100-year Flood Zone (refer to **Map 5**). Tot's Cooperative Nursery School and part of Barrington High School, both located in the vicinity of the Federal Road/ County Road intersection, are situated within the 100-year Flood Zone.

The Bay Spring Assisted Living Facility and the parking lot of the Barrington Cove Apartments are located within the 100-year Flood Zone, as is one of the Town's group homes and the Bay Springs Community Center.

4.1.1.3 Winter Storms

Snowstorms and ice storms would likely have little impact on the actual structures housing Barrington's special needs populations as they are relatively new facilities and have been designed to support current snowloads for the region. The primary impact would be on the populations themselves, which could experience difficulty being transported to and from these facilities. Should a winter storm cause a power outage, these populations may experience additional complications within their facilities. The impacts of snowstorms and other natural hazards on transportation systems are discussed below.

4.1.1.4 Earthquakes

Barrington is generally at a low risk for earthquakes, and the special needs housing and facilities are relatively recent structures which have been built to modern earthquake standards.

4.1.1.5 Tornadoes

Barrington is generally at a low risk for tornadoes; however, educational facilities, and senior and special needs housing in coastal areas may be at a slightly greater risk, due to the close association of tornadoes with hurricanes. Per the standards of the Rhode Island Building Code and the International Building Code on which it is based, all structures in Barrington are designed to withstand wind speeds of 110 miles per hour or a Category F1 tornado.

4.1.1.6 Wildfires

The Hampden Meadows Greenbelt, one of Barrington's larger wooded areas, is bordered by four schools: the Hampden Meadows School, the JCC at Temple Habonim, Sowams Elementary School, and the Montessori Centre. Although most of these facilities are separated from the actual woodland by athletic fields and/ or

parking lots, their proximity to a large tract of forested land may put these structures and their associated populations at higher risk to wildfire damage.

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4.1.2 Residential, Commercial, and Other Structures

Information available from the Town's GIS database suggests there are currently 6,773 parcels or properties in Barrington, and approximately 9,762 buildings (including secondary buildings). Approximately 7,030 buildings are located in parcels described as residential by the Tax Assessor. The rest are located in commercial or industrial parcels, and tax exempt parcels, which include schools, Town operating facilities and emergency centers and churches. It should be noted that 381 parcels in the Town's GIS parcel datalayer have no information available about the classification of the parcel. It appears that at least some of these parcels contain commercial structures. This data gap may ultimately be a vulnerability in and of itself, as determining the primary use of these unclassified parcels during an emergency would take considerable effort.

An additional data gap exists in the building datalayer as it does not contain any information about the primary use of the building (commercial, residential, school, etc.). Although this information can be obtained in a round-about method through the parcel data on which a building overlaps, adding a basic description to the building data would streamline the vulnerability assessment in future versions of the report.

4.1.2.1 Hurricanes

Barrington's coastal location and relatively flat elevation leaves many residential and commercial structures vulnerable to impacts from hurricanes. The Rhode Island Building Code requires structures in Barrington to be built to withstand 110 mile-per-hour winds, or a Category 2 hurricane, but approximately 28 percent of the Town's housing stock was constructed prior to 1940, when building codes were considerably less stringent. These older structures may be at greater risk of damage from a Category 1 or Category 2 hurricane. Should a Category 3 or Category 4 hurricane strike, even more modern residential structures may be vulnerable to wind-borne damage.

Many of Barrington's commercial and residential structures are also vulnerable to coastal surge inundation from hurricanes (refer to **Map 6**). Approximately 5,310 residential and commercial structures (roughly 54 percent of all structures) are located in a hurricane storm surge inundation area. Structures immediately along the coast such as along Willow Way in West Barrington are particularly vulnerable, but inland areas, such as structures in the vicinity of Brickyard Pond, are also vulnerable.

While generally placed inland, several of the Town's facilities and emergency centers are vulnerable to surge inundation from more severe hurricanes (refer to **Map 7**). The SLOSH worst case scenario model shows the Fire Department's portion of the Public Safety Complex on Federal Road inundated under a Category 3 hurricane, while the Police Department section could be inundated under a Category 4 hurricane. The Hampden Meadows fire station is located in an area that could be inundated by a Category 2 hurricane. The hurricane approved shelter for Barrington, Primrose Hill Elementary School on Middle Highway, is located outside of the surge zone for all categories of hurricane. An additional hurricane shelter at the Martin School in Seekonk is available to Barrington residents through an agreement between the towns.

4.1.2.2 Severe Rainstorms and Floods

Approximately 506 structures are located within the 100-year Flood Zone (Zone AE), while approximately 47 structures are located within the Velocity Zone (Zone VE) (refer to **Map 8**). Structures in these flood zones tend to be concentrated in specific coastal neighborhoods, including the Bay Spring neighborhood in West Barrington between Allin's Cove and Bullock's Cove, the Annawamscutt neighborhood south of Allin's Cove, the Adams Point peninsula, the eastern edge of the Jennys Lane National Historic Register District, and north of Osemequin Park, on the west side of County Road. In East Barrington the residences and businesses on the southern tip of Tyler Point are located within the 100-year Flood Zone, including three of the Town's five marinas. The eastern and western edges of the Hampden Meadows neighborhood along the Barrington and Palmer Rivers are also located in the 100-year Flood Zone. Structures located in Zones AE and VE of these various neighborhoods are at greater risk for flood damage than structures located outside these flood zones.

The Town's operating facilities and emergency centers include the Public Safety Complex that houses the Police and Fire Departments, the Hampden Meadows Volunteer Fire Department, the Public Works building, and the Town Hall/ Peck Center Complex. The Town's emergency centers and operating facilities are placed outside of the 100-year Flood Zone (Zone AE) and the Velocity Zone (Zone VE) (refer to **Map 9**).

4.1.2.3 Winter Storms

Some older or dilapidated residential and commercial structures in Barrington could potentially be at risk of roof collapse from severe snowstorms. This risk is likely quite low as there are few old and/ or deteriorated buildings remaining in town. Snowstorms and ice storms also frequently result in power outages. Impacts to utilities due to natural disasters are discussed below.

4.1.2.4 Hailstorms

All structures in Barrington are potentially at a risk to damage from hailstorms, although the risk is relatively low, as storms producing large hailstones are rare in Barrington.

4.1.2.5 Earthquakes

Barrington is located in a low seismic risk area for earthquakes. Per the standards of the Rhode Island Building Code and the International Building Code on which it is currently based, all structures are designed and constructed to resist the effects of earthquake motions based on site-specific elements such as soil profile and ground motion.

Residential structures built in the first half of the 20th century may not conform to these standards and may be at greater risk from earthquake damage. In particular, residential structures located within the National Register Historic Districts on either Alfred Drown Road or Jennys Lane may be susceptible to mild impacts from seismic shaking such as typically occurs in Rhode Island. Few commercial facilities remain in Barrington that were built during the first half of the 20th century, and thus only a handful of commercial structures may be susceptible to mild damage from the typical earthquake tremors felt in Rhode Island. Barrington's Town Hall and Peck Center, which includes the Library/ Senior Center, are historic masonry structures that may be susceptible to mild damage from the typical earthquake tremors felt in Rhode Island.

4.1.2.6 Tornadoes

Barrington is generally at a low risk for tornadoes; however, residential, commercial, and other structures in coastal areas may be at a slightly greater risk than inland structures, due to the close association of tornadoes with hurricanes. Per the standards of the Rhode Island Building Code, all structures in Barrington are designed to withstand wind speeds of 110 miles per hour.

4.1.2.7 Wildfires

Although Barrington's risk of large wildfires is relatively low, residential, commercial, and other structures in the vicinity of Barrington's wooded areas, such as Haines State Park, Veteran's Park, Tall Cedars Conservation Area, and the Hampden Meadows Greenbelt, may be at a higher risk for damages from wildfires.

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4.1.3 Transportation Systems

Barrington has approximately 99 miles of roadway, but only one principal artery or expressway, which is Route 103/ 114, a north-south route that links Barrington with Warren and East Providence. Two bridges located off Route 103/ 114 span the Barrington River: the Massasoit Avenue (Central) Bridge and the Barrington Bridge. The Barrington Bridge is part of the Town's principal artery, and facilitates traffic to Warren.

Barrington also has several minor arterial roads which facilitate travel within the community, including Middle Highway, Nayatt Road, Massasoit Avenue/ New Meadow Road, Sowams Road, and the northern part of Rumstick Road. Collector roads, which serve to collect and distribute traffic between arterials and local roadways, include Washington Road, Lincoln Avenue, Federal Road, Maple Avenue Mathewson Road, and Ferry Lane in West Barrington, and New Meadow Road, and Martin Avenue in East Barrington. Together this assemblage of major and minor arteries and collector roads comprises Barrington's emergency evacuation routes.

Although not a transportation corridor for automobiles, the East Bay Bicycle Path passes through the central portion of Barrington, providing a bike and footpath travel corridor that connects to the city of East Providence and the town of Warren.

4.1.3.1 Hurricanes

Barrington's only expressway, Route 103/ 114, runs along the west side of the Barrington River, ultimately crossing the Barrington and the Palmer Rivers before connecting to Warren (refer to **Map 10**). Due to its coastal location and relatively low elevation in many areas, this important road and evacuation route is subject to storm surge from either a Category 1 or Category 2 hurricane for much of its length (refer to State of Rhode Island Hurricane Evacuation Routes Map). Two of Barrington's minor arterial roadways and hurricane evacuation routes, Middle Highway in West Barrington and Sowams Road in Hampden Meadows, are also at least partly vulnerable to storm surge from Category 1 or Category 2 hurricanes.

Middle Highway is also a primary evacuation route leading to the Town's only approved hurricane shelter, Primrose Hill Elementary School. Portions of several collector roads that serve as evacuation routes are also subject to storm surge from low level hurricanes, including Ferry Lane, Federal Road, and Washington Road in West Barrington, and New Meadow Road in East Barrington.

4.1.3.2 Severe Rainstorms and Floods

Mathewson Road, a collector road which begins at the Barrington River Bridge and runs for approximately one mile south and east along the Barrington and Palmer Rivers, is well known for flooding (refer to **Map 11**). Erosion is causing the seawall on the east side of the road to fall into disrepair, allowing frequent flooding of the road. Several small neighborhood roads south of Mathewson Road in the vicinity of Bourne Lane are also notorious for flooding

During the historic flooding that occurred in Rhode Island in March 2010, the intersection of Maple Avenue, Upland Way, and Middle Highway adjacent to Volpe Pond was under several feet of water. This area is located outside of the 100-year Flood Zone on current FEMA flood maps and flooding was caused by a failed culvert under the bike path. This intersection is also the junction of two evacuation routes, but was impassable for several days during the flood and closed by the Rhode Island Department of Transportation.

4.1.3.3 Earthquakes

Although earthquakes are unlikely in Rhode Island, the Rhode Island Bridge Design Manual requires bridges to be built to withstand seismic forces based on the bridge's classification and site-specific geophysical conditions. The Massasoit Avenue Bridge was built in 1940 and is currently rated structurally deficient by the National Bridge Inventory. A structural deficiency means that elements of the bridge need to be monitored and/ or repaired in order to maintain its structural integrity. Although the Massasoit Avenue Bridge's deficiency rating is not specifically related to earthquake resistance, it suggests that this key transportation component may be more vulnerable to earthquake damage.

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4.1.4 Utilities

Barrington's Town-wide sanitary sewer system has approximately 110 miles of sewer lines, six major pump stations, five ejector stations, four grinder pump stations, and one air release chamber. Based on RIGIS mapping, a few residences remain near the Swansea border and on Rumstick Point that are not currently served by public sewer and use Individual Sewage Disposal Systems (ISDS).

Barrington's only electrical substation is operated by National Grid and located on Maple Avenue, just north of the bike path and Brickyard Pond. The transmission line that provides the Town with electric power runs north from the Barrington Substation along Prince's Hill Avenue to Route 103/ 114, and then travels along Route 103/ 114 north to East Providence as well as south across the Barrington and Palmer Rivers into Warren.

Power outages caused by natural hazards are not only inconvenient, they can have serious impacts on the Town's ability to respond to natural disasters; computer systems can crash, traffic lights can go out, and heating, ventilation, and air conditioning systems can shut down, possibly imperiling residents. The shutdown of utilities can affect most of Barrington's other critical assets, such as transportation, special populations, and commerce.

4.1.4.1 Hurricanes

Eleven of Barrington's 15 sewer pump stations are located in storm surge areas for Category 1 or Category 2 hurricanes under the worst case SLOSH scenario (refer to **Map 12**), including the pump station at Brickyard Pond, which receives the wastewater from the pump stations at Police Cove, Fremont Avenue, and Prince's Pond. The high number of pump stations located in the surge area for Category 1 or Category 2 hurricanes puts the Town's wastewater infrastructure at risk for flooding.

Barrington's electrical substation is located in an area subject to storm surge associated with a Category 3 hurricane. The Town's transmission line is vulnerable to storm surge from a Category 1 or Category 2 hurricane along Route 103/ 114 between St. Andrew's School and Prince's Hill Avenue.

4.1.4.2 Severe Rainstorms and Floods

Twelve of the Town's 15 sewer pump stations are located in either the 100-year Flood Zone (Zone AE) or the Velocity Zone (Zone VE) (refer to **Map 13**). The high number of pump stations located in these flood-prone areas suggests that the wastewater infrastructure is also vulnerable to flooding from non-hurricane flooding events. This can cause raw sewage to overflow the pumps into the surrounding area, creating health risks. In addition, based on RIGIS mapping, several residential structures along Rumstick Road on Rumstick Point are not yet sewered and are located in the 100-Year Flood Zone, possibly leaving the ISDS structures vulnerable to failure from flooding.

The Barrington electrical substation is located outside of the 100-year Flood Zone and the Velocity Zone. However the transmission line that connects to the substation is located within the 100-year Flood Zone in the vicinity of Route 103/ 114 between St. Andrew's School and Prince's Hill Avenue.

4.1.4.3 Winter Storms

Power outages are common during winter storms in Rhode Island, and the potential impacts are dependent on the severity and location of the storm. Of primary concern during the cold season is the loss of power such that the ability to heat homes and businesses is impaired for an extended period of time.

4.1.4.4 Wildfires

The probability of a wildfire in Barrington is generally relatively low, particularly in the vicinity of the transmission line, which is located along well-developed roadways that do not include extensive wooded vegetation. In addition, National Grid, Barrington's electric utility provider, conducts regular tree trimming and vegetation management activities around the substation and along the sub-transmission line, reducing available fuel sources.

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4.1.5 Coastline

As an East Bay community, Barrington has ample coastline, much of it located in the Velocity Zone or 100-year Flood Zone, and thus subject to erosion from coastal storms and hurricanes. Latham Park and Barrington Town Beach, two coastal areas located within the Velocity Zone, are critical public access points to the shoreline. Both sites are experiencing rapid erosion problems, causing shoreline destabilization at Latham Park, which is protected by riprap, and loss of beachfront at Barrington Town Beach.

Coastal erosion also contributes to flooding issues throughout Barrington's transportation system, including Mathewson Road along the Barrington and Palmer Rivers, and Willow Way in the vicinity of Allin's Cove, and Bourne Lane along the Warren River.

4.2 Summary of Vulnerability of Critical Assets

Due to its coastal location and the potential for the occurrence of various seasonal storms, Barrington's critical assets are more vulnerable to flooding than any other hazard. Hurricane storm surge has perhaps the greatest potential to impact the Town, as surge from even a low level hurricane could flood large sections of Town in a short period of time. Fast moving, widespread flooding has the ability to halt transportation, damage residential and commercial property, and impair important infrastructure such as sewer pump stations. If roads were to become impassable, Barrington's population, including Special Needs populations, could also experience difficulty evacuating and/ or conducting daily activities until flood waters recede. The Town's Public Safety Complex could experience flooding from high caliber hurricanes, but other emergency centers/ operating facilities such as Town Hall and the Department of Public Works are located well beyond the storm surge area identified for any hurricane.

Barrington's critical assets are also at risk from flooding due to other natural hazards besides hurricanes. Winter storms and heavy rains can flood assets located within

the 100-year Flood Zone and the Velocity Zone, including schools, coastal homes, and utility infrastructure.

Winter storms can also present a major obstacle to transportation and impair road functions. Above-ground utilities like transmission and distribution lines can be impaired by strong winds and heavy snow and ice associated with winter storms. Power outages can have secondary effects on the Town's ability to manage emergencies and keep residents safe and warm. Winter storms also regularly contribute to coastal erosion, which then in turn contributes to flooding by reducing the buffer of land between coastal waters and Barrington's developed areas.

Strong wind from a variety of seasonal storms is perhaps the second most significant natural hazard facing Barrington, with the potential to damage structures, impair electric utilities, and block roads and evacuation routes.

Although Barrington faces impacts from other potential natural hazards, including earthquakes, wildfire, and hailstorms, the risk from these hazards is currently quite low, and mitigation efforts are better spent on addressing higher risk flood and wind-related hazards.

4.3 Future Development

Barrington has limited open space available for future development. The Barrington Comprehensive Community Plan, approved in January 2010, calls for development of two key remaining areas to fulfill current land use needs such as affordable and senior housing: the Zion Bible Institute along Middle Highway and the Sowams Nursery land on Sowams Road in Hampden Meadows.

The Zion Bible Institute property is in a low risk area for natural hazards, situated outside of hurricane surge inundation zones and flood zones (refer to **Map 14 and Map 15**). The Sowams Nursery site is partially located within the 100-year Flood Zone on its western and eastern boundaries, but the proposed design for this area does not call for structures to be placed within this zone, although some structures may abut it. The property also spans surge inundation areas associated with all four classes of hurricanes (Categories 1-4). The proposed design for the site includes some residential structures in areas subject to storm surge from a Class 1 or 2 hurricane, which potentially represents a higher risk for these properties.

Additional areas where future development is proposed include Police Cove, where a park and restaurant are proposed, and the lot adjacent to the YMCA, which has been proposed as a potential senior or community center. Police Cove is at risk for flooding, as it is largely located within the 100-year Flood Zone and subject to storm surge from a Category 1 hurricane. A properly designed park in this area could possibly contribute to flood water storage. The area of the proposed senior center adjacent to the YMCA is located outside of the 100-year and Velocity Flood Zones,

but is subject to storm surge from Categories 2 and 3 hurricanes. Virtually the entire area around Brickyard Pond is subject to storm surge from a Category 2 hurricane, which could conceivably make it difficult for seniors to travel from this area in the event of sudden storm-related flooding.

Due to the limited availability of property for private homes in Barrington, it is likely that there will be increased pressure on the Town to allow development in potentially unsuitable areas, particularly along the shoreline. It is essential to the protection of Barrington's residents and their property to avoid placing homes in the hazard areas described in this report.

4.4 Existing and Ongoing Mitigation Measures

Natural hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Barrington has already implemented several mitigation actions to reduce the vulnerability of the Town's critical assets to natural hazards.

■

4.4.1 Asset: Special Population Centers

4.4.1.1 Hazard: Hurricanes, Tornadoes, and Earthquakes

4.4.1.1.1 Existing Mitigation Measures

4.4.1.1.1.1 Building Codes

Barrington's senior housing, group homes, and schools are designed to withstand 110–mile-per-hour winds, equal to a Category 2 hurricane or a Category F1 tornado. These special population centers have also been designed and constructed to resist the effects of earthquake motions based on site-specific elements such as soil profile and ground motion.

■

4.4.2 Asset: Residential, Commercial, and Other Structures

4.4.2.1 Hazard – Hurricanes and Severe Rainstorms/Floods

4.4.2.1.1 Existing Mitigation Measures

4.4.2.1.1.1 Regulations and Ordinances

The Town has enacted a number of regulatory restrictions designed to reduce the potential impacts of flooding to property by limiting development in and around wetlands and flood-prone areas. In 1994 the Town adopted a Wetlands Overlay District Zoning Ordinance that requires a special use permit from the Zoning Board for proposed activities within the 100-foot wetland setback. The ordinance also prohibits any reduction in flood storage capacity, and the storage of materials or equipment which could cause damage under flood conditions. In addition, the ordinance requires any construction occurring in the Velocity Zone to take place above the mean high tide line. As part of an update to the Town's zoning regulations to be adopted later this year, Barrington will consider prohibiting senior housing from being located in the Velocity Zone.

4.4.2.1.1.2 Acquisition of Freshwater/Inland Wetlands

To reduce the potential impacts to structures and property due to flooding associated with hurricanes and heavy rains, Barrington has worked to protect and acquire wetlands, which serve as a natural buffer and storage area for flood waters. Recent acquisitions of wetland property include the Brickyard Pond wetlands, a 10-acre site surrounding Brickyard Pond behind the Barrington Shopping Center, and the Vitullo Farm on Wampanoag Trail, which contains wetland features in the center of the site.

4.4.2.1.1.3 Building Codes

Current building codes in Barrington require structures to be able to withstand 110-mile-per-hour winds, or a Category 2 hurricane. The Town's Building Inspector is responsible for ensuring new structures meet building code requirements.

4.4.2.1.1.4 Location of Emergency Centers and Town Facilities

In 2000 a Public Safety Complex housing both the Police and Fire Departments was built on Federal Road, an area outside of the 100-year Flood Zone and beyond the surge inundation areas for Category 1 and 2 hurricanes. This action allowed the Police Department to move from the previous location at 95 County Road, located in the 100-year Flood Zone on the west side of the Barrington River. The Town's other operating facilities, including Town Hall and the Department of Public Works, are located outside of the 100-year Flood Zone and surge inundation areas for Category 1

and 2 hurricanes. Although Barrington only has one hurricane-approved shelter, Primrose Hill Elementary School, the Town has signed agreements with the Towns of East Providence, and Seekonk and Rehoboth, Massachusetts that allows Barrington residents to use the hurricane shelters in those communities in the event of a Category 3 or 4 hurricane.

4.4.2.1.1.5 National Flood Insurance Program

Barrington is a member of the National Flood Insurance Program, a federal program created by Congress in 1968 that makes flood insurance available to communities that enact minimum floodplain management regulations. In addition, Barrington is enrolled in the Community Rating System, which is an NFIP program that provides incentives for NFIP communities to complete activities that reduce flood hazard risk. Completion of specified activities reduces the insurance premiums of policyholders in the community. Membership in both the NFIP and CRS are important existing mitigation measures the Town has taken against flooding. **Table 10** provides NFIP data for Barrington. Based on this data, there are no repetitive flood loss properties in Barrington. Repetitive flood loss properties are properties that are currently insured through the NFIP for which two or more losses of at least $1,000 each have been paid within any 10-year period since 1978.

Table 10. National Flood Insurance Program Data for Barrington, Rhode Island

Total Number Policies	Policies in 100-year Flood Zones (A Zones)	Policies in 100-year Flood Zones (V Zones)	Policies in Other Flood Zones	Total Value of Premiums	Insurance in Force	Total Number of Closed Paid Losses	Amount of Closed Paid Losses:
1,071	506	47	518	$1,179,932	$295,833,600	110	$355,937

4.4.2.2 Hazard – Earthquakes

4.4.2.2.1 Existing Mitigation Measures

4.4.2.2.1.1 Building Codes

Current building codes in Barrington require residential and commercial structures to be designed and constructed to resist the effects of earthquake motions based on site-specific elements such as soil profile and ground motion. In addition, bridges must be built to withstand seismic forces based on the bridge's classification and site-specific geophysical conditions. The State of Rhode Island is currently creating a new bridge adjacent to the Barrington Bridge which will meet the most recent earthquake standards outlined in the State's building code.

4.4.2.3 Hazard – Tornadoes

4.4.2.3.1 Existing Mitigation Measures

4.4.2.3.1.1 Building Codes

Current building codes in Barrington require structures to be able to withstand 110 mile per hour winds, or a Category F1 tornado.

■

4.4.3 Asset: Transportation Systems

4.4.3.1 Hazard – Hurricanes and Severe Rainstorms/Floods

4.4.3.1.1 Existing Mitigation Measures

4.4.3.1.1.1 Posted Evacuation Route

Barrington has a posted evacuation route signs throughout town indicating the best route to follow in the event of flooding (refer to **Map 10A, RIEMA Hurricane Evacuation Route Map**).

■

4.4.4 Asset: Utilities

4.4.4.1 Hazard – Hurricanes, Severe Rainstorms/Floods, and Wildfires

4.4.4.1.1 Existing Mitigation Measures

4.4.4.1.1.1 Vegetation Maintenance

National Grid maintains vegetation along the Town's electric transmission line, regularly removing dead and/ or dying trees, branches, and other potential hazards that could cause power outages during a hurricane or flood. In 2006 the Department of Public Works worked with National Grid to trim trees and vegetation along the Town's evacuation routes. Barrington has also signed an agreement with a FEMA-approved vendor for post-storm debris management in the event of a hurricane.

■

4.4.5 Asset: Coastline

4.4.5 Hazard – Hurricanes and Severe Rainstorms/Floods

4.4.5.1 Existing Mitigation Measures

4.4.5.1.1 Protection and Restoration of Coastline

Barrington has worked with the State of Rhode Island and conservation organizations such as the Barrington Conservation Land Trust and Save the Bay to restore degraded wetlands in critical areas, which helps reduce the risk of damages from flooding events. In 2005, restoration of the Walker Farm Marsh was completed, increasing the size of the marsh to 15 acres and addressing problems on the site from historic alterations, including roads and dam structures. This property separates Route 103/ 114 from the Barrington River and 100-Acre Cove, and is vital for storing flood waters. In 2006 a significant wetland restoration project was completed that restored approximately 11 acres of degraded coastal wetlands at the mouth of Allin's Cove. This project was also critical for halting erosion of the shoreline along Byway Road, which had the potential to undermine the structural integrity of the road. In 2007 restoration work was completed along Mussachuck Creek, restoring the tidal flow and aquatic system after sand buildup restricted the inlet.

Barrington has developed master plans for two coastal areas that are of concern: Latham Park and Barrington Beach. Each of these plans would restore coastal protection features, stabilize shorelines, and enhance public access at the site. These plans are currently conceptual and have not been brought to construction. A portion of the Beach Plan, including a new beach house with restrooms and office space, is expected to be built in 2010. The new building will be elevated to meet floodplain elevation requirements.

5.0 Mitigation

Hazard mitigation planning is the process of identifying and implementing policies, procedures, and actions to minimize or eliminate impacts to people, property, and natural resources from natural hazards. Based on the preceding risk assessment and vulnerability analysis, Barrington's Multi-Hazard Mitigation Committee identified several mitigation goals to help the Town reduce the impacts from natural hazards, and developed objectives and specific actions designed to achieve these goals.

Goals are general, long-term guidelines that present a broad vision. Objectives define strategies or implementation steps taken to achieve the identified goals. Mitigation actions are specific actions that help achieve goals and objectives. Goals were developed to be consistent with State Hazard Mitigation Goals, and given a timeframe for completion:

- Short term goals = 0-6 months
- Medium-term goals = 6-18 months
- Long-term goals = 5 years

5.1 Goals and Objectives

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5.1.1 Mitigation Goals

As identified in the previous sections of this plan, the most prevalent threats to the town of Barrington are flooding and wind-related damage. To address these threats and their potential impact on the Town, the Multi-Hazard Mitigation Committee established mitigation goals and objectives. Many of the goals and objectives listed are continued from the previous mitigation plan approved in 2004. As part of the development process, each goal and objective was reviewed to validate relevancy. To facilitate consistency, each goal, objective and mitigation action was reviewed in relationship to the goals and objectives provided in the State of Rhode Island 2005 Hazard Mitigation Plan. The goals, objectives and supporting actions outlined in Barrington's September 2004 Hazard Mitigation Plan were assessed to determine their current validity for inclusion in this update. Where necessary, new goals were defined to support the achievement of the overall mitigation strategy. Additionally, goals and objectives were reviewed to ensure they support the long-term vision of

the Town and support a sustained program of hazard reduction and/ or elimination. The goals established by the Multi-Hazard Mitigation Committee are:

- **Goal 1:** Reduce impacts from flooding and erosion
- **Goal 2:** Protect essential services and infrastructure
- **Goal 3:** Establish conditions for improved post-disaster recovery

■

5.1.2 Mitigation Objectives

Objectives have been crafted to support the achievement of the above goals. These objectives are intended to guide the strategy used in goal achievement. The Multi-Hazard Mitigation Committee prioritized the selection of objectives that support multiple goals. The selected objectives are:

- **Objective 1:** Incorporate hazard mitigation review in all development projects.
- **Objective 2:** Repair and maintain coastal areas susceptible to erosion.
- **Objective 3:** Enhance Geographic Information Systems (GIS) capabilities to support assessment and planning activities.
- **Objective 4:** Maintain and improve critical infrastructure durability to include instituting protective measures for systems and facilities.
- **Objective 5:** Continue to manage property development and land use through creation and enforcement of appropriate zoning ordinances.
- **Objective 6:** Develop and implement public outreach programs to improve individual preparedness.
- **Objective 7:** Develop and maintain debris management plans to improve post-disaster recovery efforts.
- **Objective 8:** Complete the establishment of the wetland/ coastal velocity overlay zone.
- **Objective 9:** Continue land management and open space acquisition per the Comprehensive Community Plan.

■

5.1.3 Mitigation Actions

Mitigation actions have been identified to support the overall strategy of loss reduction. To support clarity and uniformity with other jurisdiction hazard mitigation plans, mitigation actions have been organized into the following categories:

1. Prevention
2. Property Protection
3. Public Education and Awareness
4. Natural Resource Protection
5. Post-Disaster Opportunities

To provide the Town with realistic mitigation options, the Multi-Hazard Mitigation Committee vetted the preliminary list of actions using the STAPLEE method as outline in FEMA 386-3. This process helped eliminate and prioritize those mitigation actions that support achieving the Town's goals and objectives. The STAPLEE process reviewed each identified action based on the following criteria:

- **Social** – The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of community acceptance.

- **Technical** – It is important to determine whether the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Determine whether the alternative action is a whole or partial solution, or not a solution at all.

- **Administrative** – Under this part of the evaluation criteria, examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine whether the jurisdiction has the personnel and administrative capabilities necessary to implement the action or whether outside help will be needed.

- **Political** – Understanding how the current community and State political leadership feels about issues related to the environment, economic development, safety, and emergency management. This will provide valuable insight into the level of political support for mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability.

- **Legal** – Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, determine whether the jurisdiction has the legal authority at the appropriate levels to implement the action or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities. Identify the unit of government undertaking the mitigation action and include an analysis of the interrelationships between local, regional, State and Federal Governments. Legal authority is likely to have a significant role later in the process when the State or community will have to determine how mitigation activities can be carried out, and to what extent mitigation policies and programs can be enforced.

- **Economic** – Every local and State government experiences budget constraints at one time or another. Cost-effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt. State and local governments with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it

can be funded, at least in part, by outside sources. "Big ticket" mitigation actions, such as large-scale acquisition and relocation, are often considered for implementation in a post-disaster scenario when additional Federal or State funding for mitigation may be available.

- **Environmental** – Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as NEPA, to keep in mind when using Federal funds. Jurisdictions will need to evaluate whether there would be negative consequences to environmental assets, such as threatened and endangered species, wetlands, and other protected natural or cultural resources.

In addition to the general precepts for reviewing the cost-effectiveness of mitigation actions contained in the STAPLEE methodology, the prioritization of mitigation actions will include a Benefit-Cost Analysis (BCA) to identify the most advantageous options. The BCA will be accomplished based on FEMA guidance to ensure that calculations meet established Office of Management and Budget (OMB) guidelines.

The following mitigation actions have been identified as most feasible for implementation with the resources available or reasonably attainable:

Action	Status	Timeframe
Develop Storm Preparedness Plan for Marine Interests	Completed	Completed
Relocate Police Station	Completed	Completed
Install CodeRED™ Notification System	Activation July 10	Completed
Establish Wetland/Coastal Velocity Zone Overlay	Partially Completed	Long-Term
Acquire Open Space	Ongoing	Long-Term
Remove Hazardous Tree Limbs	Ongoing	Medium-Term
Regular Tree Trimming Program	Ongoing	Medium-Term
Public Information Signage	Ongoing	Medium-Term
Debris Management	Ongoing	Medium-Term
Coastal Damage Assessment & Recovery	Post-disaster	Long-Term
Coastal Erosion/Shoreline Stabilization	New	Long-Term
Infrastructure Protection	New	Long-Term

Each of the five categories of mitigation actions follows with recommendations:

1. PREVENTION

A. Acquire Open Space

Revise the list of identified open space areas to be acquired and encourage their acquisition (or protection) by the Town or private conservation organizations.

Lead: Conservation Commission, Town Council
Financing options: FEMA grants, land acquisition bonds (state and municipal), land bank and RIDEM
Cost: Variable
Timeframe: Long-term
Status: Ongoing

B. Establish a Wetland/Coastal Velocity Overlay Zone

In 1990 following the work of the Barrington Land Conservation Trust regarding the identification of wetlands in Barrington and their relative need for protection, the Barrington Conservation Commission introduced a proposal for a wetlands protection ordinance. The purpose of the ordinance was to provide for Town regulation over the impacts of development on all wetland areas. The ordinance, adopted in 1994, controls such matters as setback of structures, vegetation removal, dumping and filling, use of herbicides and pesticides and general impact on the integrity of wetlands.

The present recommendation expands this concept to include areas within the coastal velocity zone as well. The proposed overlay would be based on the FEMA FIRM mapping of coastal velocity areas, with associated regulations that are put into place when an application for development (or a clear violation) occurs.

The ordinance could be administered through a site plan review process, involving a review board composed of representatives from the Conservation Commission, Planning Board, and Town staff. Projects outside the coastal velocity zone would be identified as such by the review board, while those projects that do would be reviewed, and potentially modified, according to the standards established in the ordinance.

Lead: Town planner
Other responsible parties: Zoning Board, Planning Board, Conservation Commission
Financing options: Town budget
Cost: Staff time
Timeframe: Long-term
Status: A wetlands overlay district was established as part of the zoning ordinance rewrite in 1994 (Article XXV). It requires the granting of a special use permit by the Zoning Board of Review, with advisory review by the Conservation Commission, prior to any development within 100 feet of either a coastal wetland or a freshwater wetland one-half acre or greater in size. Velocity zone requirements, proposed in the Town's 1992 Comprehensive Plan, have not been drafted.

C. Improve Geographic Information Systems (GIS) capabilities to support assessment and planning activities

A data gap exists within the parcel and the building data available from the Town's GIS database. Currently nearly 400 parcels in the parcel dataset are lacking use classification information (i.e., residential property, commercial property, etc.). This information should be added as a general bookkeeping measure, but may also be critical during an emergency. An additional data gap exists in the building dataset, as it does not contain any actual information about the primary use of the building (commercial, residential, school, etc.). Although this information can be obtained in a round-about method through the parcel data on which a building sits, adding a basic description of the primary use of the building to the building dataset would streamline the vulnerability assessment in future versions of the report. Streamlining the GIS data for parcels and buildings will improve the Town's ability to prepare for, respond to, and recover from disasters.

Lead: Town planner
Other responsible parties: Zoning Board, Planning Board, Conservation Commission
Financing options: Town budget
Cost: Staff time
Timeframe: Medium-term
Status: New

2. PROPERTY PROTECTION

A. Remove Hazardous Tree Limbs

Remove dead or dangerous tree limbs and trees near private homes, Town government structures, school facilities and near power lines.

Lead: Utility companies in public right-of-ways and private owners on private property
Other responsible parties: Public Works Department, fire chief, utility companies and private owners
Financing options: Town budget
Cost: $5,000 annually
Timeframe: Medium-term
Status: Ongoing. Public Works maintains trees in Town rights of way.

B. Regular Tree Trimming Program (Annual)

Work with local utility companies to develop a program for regular tree trimming.

Lead: Public Works Department

Other responsible parties: fire chief, local EMA director, RI DOT, RI DEM and local utility companies
Financing options: Town budget and support from local utility companies
Cost: Regular maintenance cost
Timeframe: Short-term (continuous)
Status: Ongoing. (DPW has a tree maintenance program for trees in public rights of way)

C. Relocate Police Station

The old police station was located in a floodplain. The facility has been relocated to the new Public Safety Complex which is removed from the river's edge.

Lead:
Financing options: ACTION
Cost: ACCOMPLISHED

Status: A new Public Safety Complex which houses both the Fire and Police Departments was constructed in 1999-2000 on land purchased by the Town on Federal Road (100 Federal Road).

D. Close Endangered Public Space before Storm

Before a major storm, the Police Department and Harbormaster will keep people away from Town Beach and parking lot as well as nearby access roads and mooring areas.

Lead: Police Department
Other responsible parties: Public Works Department, Fire Chief, EMA Director
Financing options: Town budget
Cost: Staff time
Timeframe: Short-term
Status: Ongoing

E. Protect Personal Property and Transportation Infrastructure Susceptible to Coastal Flooding

See item 4.A. Repair and maintain coastal areas susceptible to erosion

3. PUBLIC EDUCATION AND AWARENESS

A. Signage

Use informational signs at areas of historic flooding showing the 1938 surge elevations along the bay and rivers and update as necessary based on March 2010 flooding. These signs could be as simple as a painted blue ring around a telephone

pole or a plaque indicating where floodwaters have reached previously. It is especially important to include inland areas where the risk isn't so obvious.

Lead: Public Works Department
Other responsible parties: State floodplain manager and NWS
Financing Options: Town budget
Cost: Minimal
Timeframe: Medium-term
Status: Not completed

B. Public Outreach

Outreach to community members through orchestrated public forums, radio, television, and the Town website are useful for disseminating preparedness information for emergency situations, especially during hurricane season immediately before an event. To better prepare community members and reinforce individual preparedness measures, Town agencies can communicate alerts/ warnings to help reduce vulnerability and improve recovery. Direct contact with special populations such as those who are particularly vulnerable, due to location or age and infirmity, should be established to ensure their understanding of procedures immediately before and after an event. Other categories of information that would be important to disseminate are: community services available for disaster relief, safety precautions during clean-up operations, location of hazardous areas.

Lead: Town Planner
Other Responsible Parties: Town Planner
Financing Options: Town budget
Cost: Minimal
Timeframe: Long-term
Status: New

C. Public Notification

The Reverse 911 system has been replaced by a CodeRED™ Emergency Notification System. The CodeRED™ Emergency Notification System will facilitate a more rapid citizen notification and warning in advance of or during a disaster. System testing is scheduled for July 2010 with implementation to follow immediately.

Lead: Fire & Police Chiefs
Financing Options: Town budget
Cost: Minimal
Timeframe: Long-term
Status: Completed (pending testing and acceptance)

4. NATURAL RESOURCE PROTECTION

A. Repair and maintain coastal areas susceptible to erosion

Latham Park and Barrington Town Beach, two coastal areas located within the Velocity Zone, are critical public access points to the shoreline. Both sites are experiencing erosion problems, causing shoreline destabilization at Latham Park, which is partially protected by riprap, and loss of beachfront at Barrington Town Beach. Coastal erosion also contributes to flooding issues throughout Barrington's transportation system, and increases the vulnerability of home and facilities located in the erosion prone areas. Continued erosion also has an adverse impact on the economic vitality of the Town.

As noted earlier, Barrington has developed master plans for the two coastal areas that are of concern: Latham Park and Barrington Beach. Each of these plans would restore coastal protection features, stabilize shorelines, and enhance public access at the site. These plans are currently conceptual and have not been brought to construction; however, a portion of the Town Beach plan is anticipated to be developed in 2010-2011.

Lead: Town planner
Other responsible parties: Zoning Board, Planning Board, Conservation Commission, Public Works Department
Financing options: FEMA HMA, Town budget
Cost: TBD
Timeframe: Long-term
Status: New

5. POST DISASTER OPPORTUNITIES

A. Debris Management

Establish plans for debris removal and disposal to include rental of tub grinder at disposal site. A separate area must be assigned for different types of materials to include hazardous objects (such as propane tanks) that may be mixed in with other debris. Engage a contractor to develop a debris management plan which includes pre-identification and affiliated documentation to establish approved temporary collection sites and coordinate final disposal with appropriate State agencies. Establish pre-event contracts with vendors capable of supporting the Public Works Department in collecting, transporting, and separating post-disaster debris.

Lead: Public Works Department
Other responsible parties: RI DOT, RI DEM and local utility companies
Financing options: Town budget, FEMA HMA
Cost: Pre-event: $20,000
Post Event: TBD
Timeframe: Depends on storm activity

B. Coastal Damage Assessment and Recovery

The Harbor Management Plan defines the role of the Harbormaster to lead the effort for post-storm damage assessment along the waterfront. He/ she will assist in recovery of locally moored boats and marine related interests to open the waterways for public use.

Lead: Harbor Commission, Town Council to adopt the Harbor Management Plan in 2004.
Other responsible parties: Harbormaster
Financing Options: Town budget
Cost: Regular budget
Timeframe: Post-storm
Status: Ongoing. See Appendix F in Harbor Management Plan.

5.2 Evaluation and Monitoring

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5.2.1 Plan Maintenance

Section 201.6(c)(4) of 44 CFR requires a formal plan maintenance process to ensure that the Town Mitigation Plan remains an active and relevant document. The plan maintenance process includes a method and schedule for monitoring, evaluating, and updating the plan at least every five years. The maintenance consists of four main elements:

- Monitoring, Evaluating, and Updating the Plan
- Monitoring Progress of Mitigation Activities
- Incorporation into Existing Planning Mechanisms
- Continued Member and Stakeholder Involvement

The Plan should be reviewed every six months, either at a scheduled meeting of the Town Hazard Mitigation Committee or another Town committee as deemed appropriate by the Town Council. Meeting minutes must be kept along with supporting project related documentation. At least annually, the Town's Hazard Mitigation Plan will go through a formal review, evaluation, and possible update.

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5.2.2 Plan Monitoring

The Town Planner will be responsible for the overall monitoring of the plan. These responsibilities will include:

- Monitoring the implementation of the plan.
- Confirming and clarifying the responsibilities assigned to the various agencies for implementing the elements of the plan.
- Facilitating the acquisition of and securing the funding sources for the action items.
- Monitoring and documenting the implementation of the action items
- Facilitating the plan revision process.

The Town Planner will provide an annual update of the plan and the status of mitigation actions to the Town Council. The Hazard Mitigation Committee will assist the Town Planner in the preparation of this report. The progress of the plan's mitigation measures, implementing projects, and actions will be addressed. The report will focus on any newly available information that would change the hazard profiles, risk assessments, vulnerability assessments, and capability assessments within the Barrington Hazard Mitigation Plan with the emphasis on updating , as necessary the maps and tables of the plan. This report will contain summarized and consolidated information about new hazard events that have recently occurred. Any information about hazards that are not evaluated in the plan will also be included in these reports.

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5.2.3 Plan Evaluation

The evaluation process for the plan will occur throughout its lifespan. The Hazard Mitigation Committee will meet annually or after each disaster to evaluate the planning process, evaluate the functionality and effectiveness of the plan. The evaluation and assessment meetings will be open to the general public, business community, and other interested parties, to include abutter jurisdictions. The meetings will be publicized on the websites of the Town of Barrington and the Secretary of State of Rhode Island, on flyers posted in Barrington Town Hall and the Barrington Public Library, and via a listserve distributed to members of the planning community. During the evaluation of the planning process, the Committee will, at minimum, evaluate the following criteria:

- The effectiveness of the planning team in terms of having appropriate members on the team, having appropriate roles assigned to the different members, conducting efficient and productive meetings, and following useful procedures.
- The involvement of the public in terms of providing appropriate information and knowledge about the plan and its implementation.
- The process of data gathering and analysis in terms of whether data gathering procedures are working.
- The involvement of other agencies in terms of whether necessary coordination has been able to occur and whether the coordination has been effective.

FEMA's How-to Guide #4 provides a worksheet to assist in the evaluation of the planning team effectiveness. At their meetings, the Committee will evaluate the

effectiveness of the mitigation actions of the plan and their effectiveness in appropriately communicating with the public.

During post-disaster recovery, the Committee will determine if the plan appropriately anticipated the disaster damage and intensity. The Committee will also determine if there are any relevant mitigation actions necessary for the recovery efforts that are not addressed as actions in the plan. The Committee may re-evaluate the hazard profiles, risk assessments, vulnerability assessments, and capability assessments to verify if the hazard information in the plan reflects the recent hazard event.

The effectiveness of the implemented actions in mitigating damage or loss of life in the recent disaster will also be considered in a post disaster analysis. Based on the effects of the disaster, the range and priority of specific hazard mitigation actions may be changed. These analyses may result in unforeseen efforts, such as additional hazard research, which will be used to modify the plan either immediately or during the next scheduled update.

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5.2.4 Plan Update

44 CFR Part 201.6(d)(3) requires local multi-hazard mitigation plans to be updated every five (5) years. FEMA publishes guidance for preparing and maintaining multi-hazard mitigation plans in the Local Multi-Hazard Mitigation Planning Guidance and the FEMA 386 "How-To" series. During the update process the Multi-Hazard Mitigation Planning Committee should review the strategy to validate currency and relevance. In addition the Committee should review:

Review natural hazard occurrences
Changes in land use
New construction, structure modifications
Changes in demographics
Community mitigation and response capabilities
Priorities of the community
Status of mitigation actions and projects

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Figures

Map 1

Barrington, Rhode Island

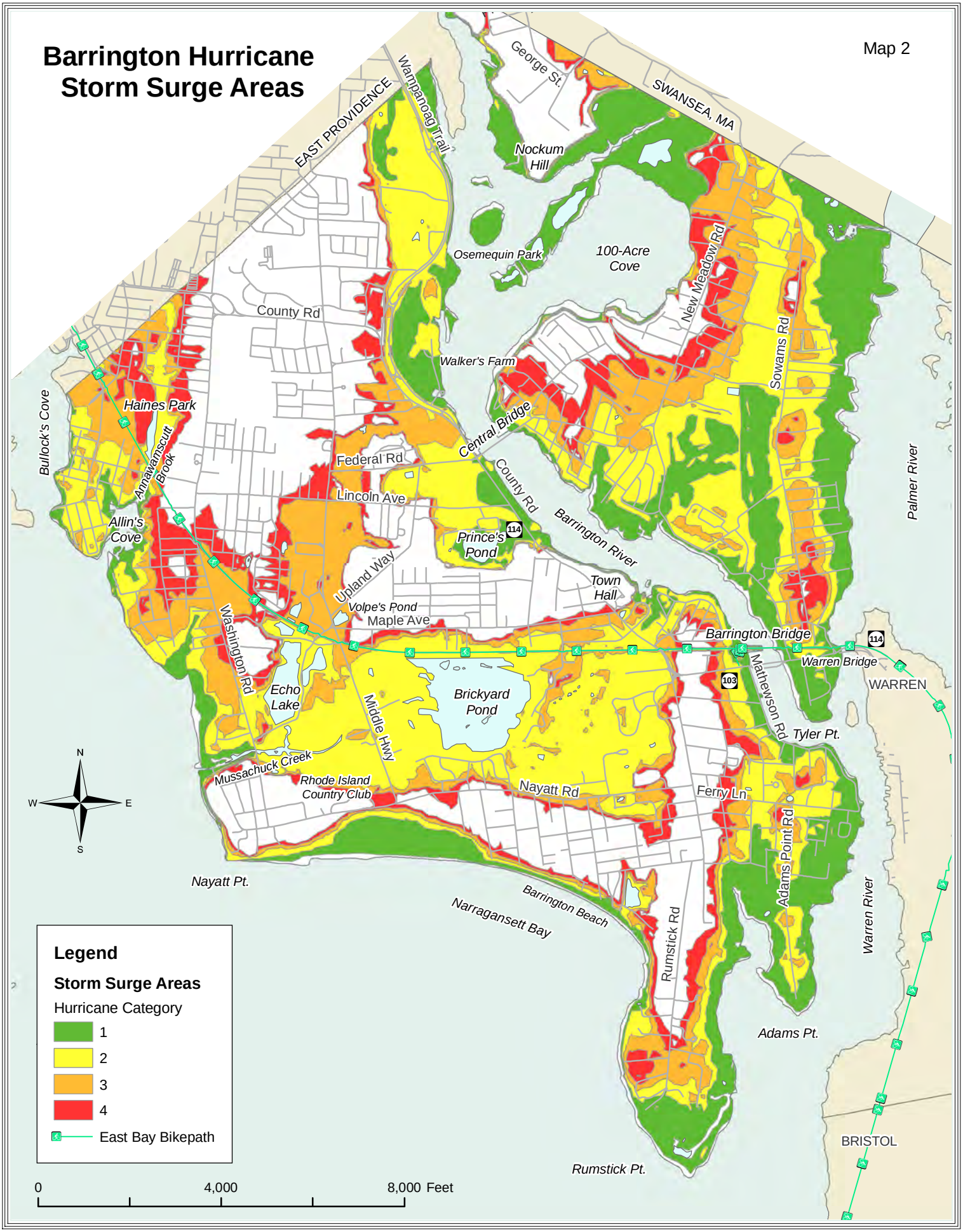
Barrington Multi-Hazard Mitigation Plan, July 2010

SOURCES: Town GIS, RIGIS

VHB Vanasse Hangen Brustlin, Inc.

Barrington Hurricane Storm Surge Areas

Map 2



Legend

Storm Surge Areas

Hurricane Category

- 1
- 2
- 3
- 4

East Bay Bikepath

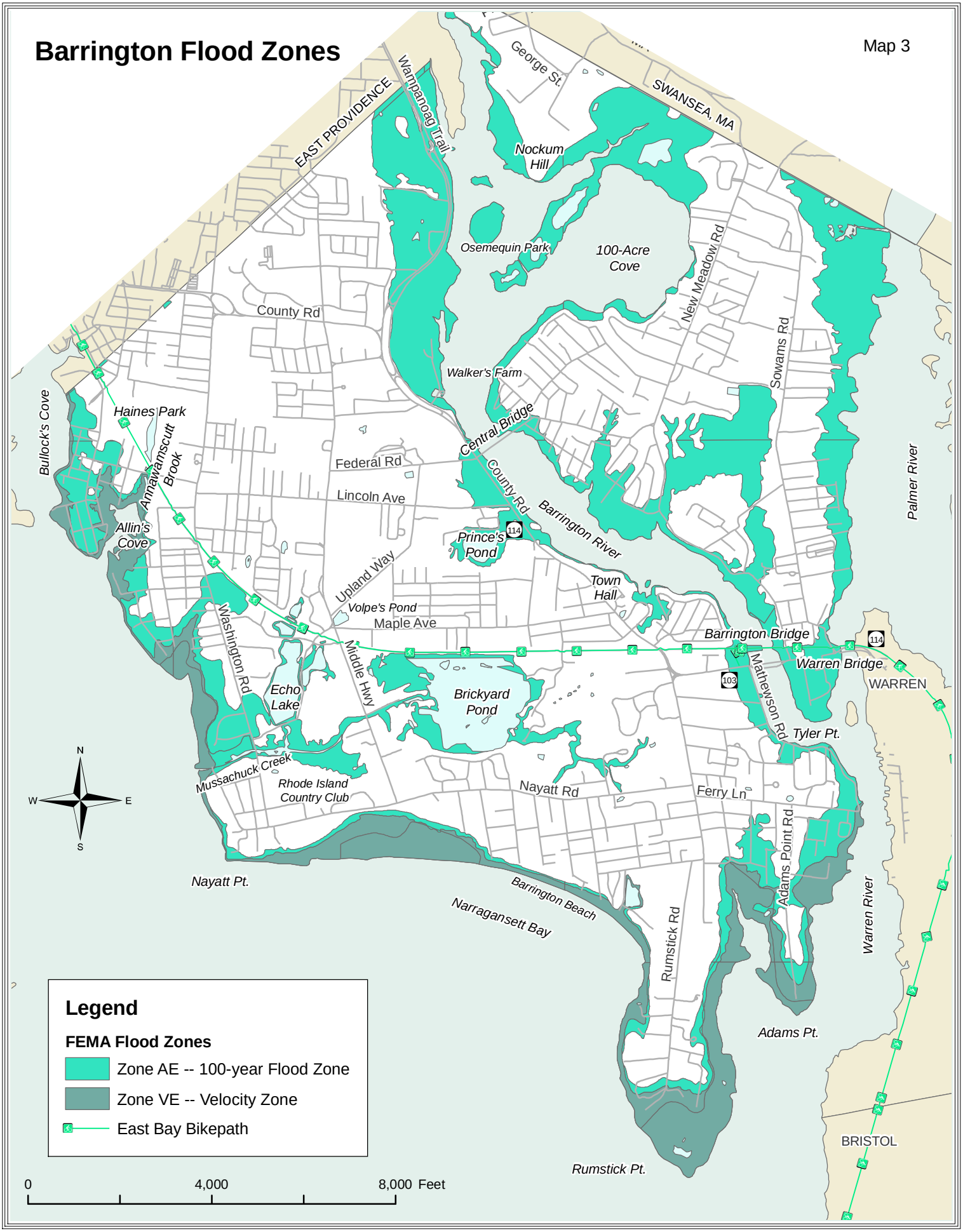
Barrington Multi-Hazard Mitigation Plan, July 2010

SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Flood Zones

Map 3



Legend

FEMA Flood Zones

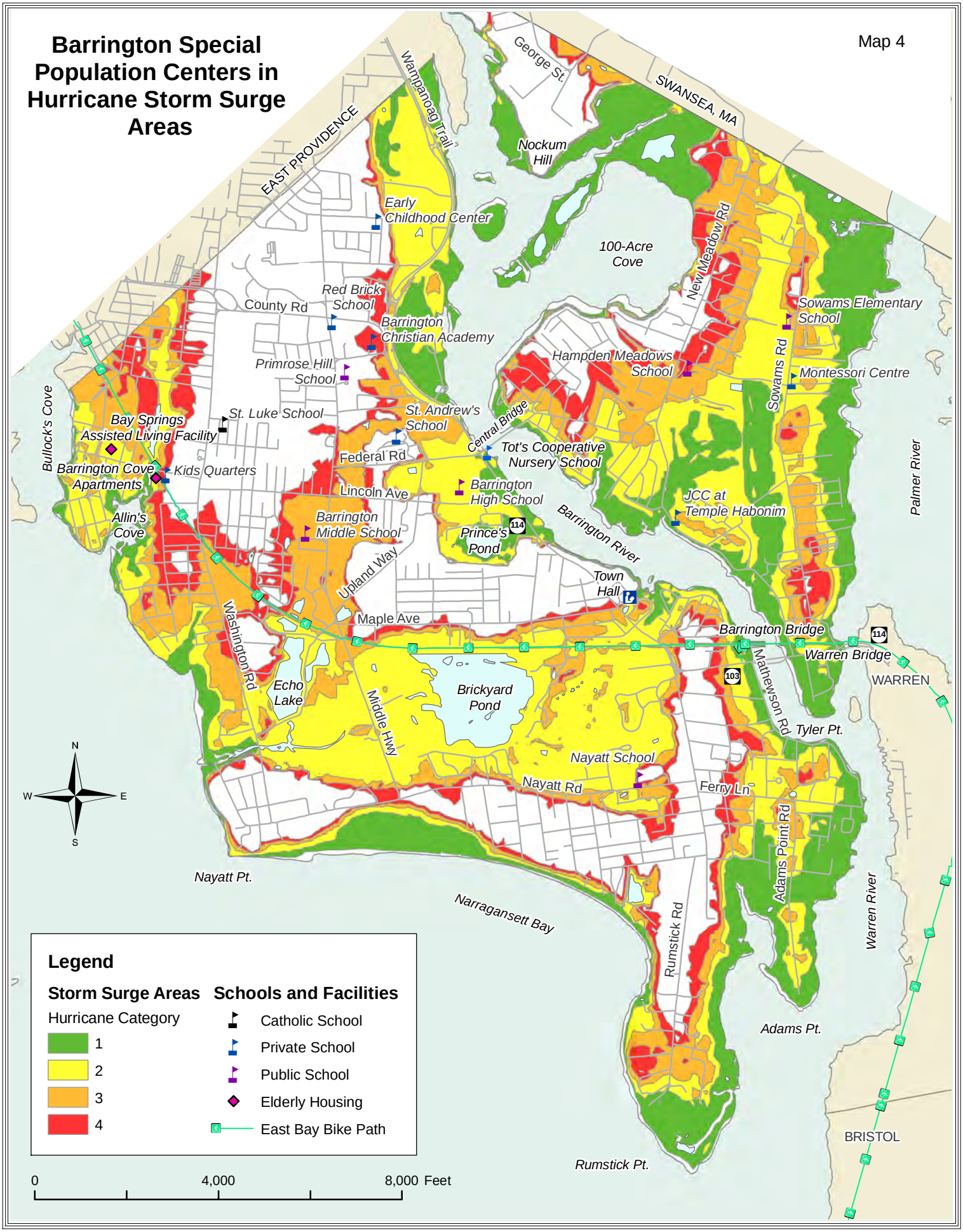
- Zone AE -- 100-year Flood Zone
- Zone VE -- Velocity Zone
- East Bay Bikepath

SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Special Population Centers in Hurricane Storm Surge Areas

Map 4



Legend

Storm Surge Areas

Hurricane Category

- 1
- 2
- 3
- 4

Schools and Facilities

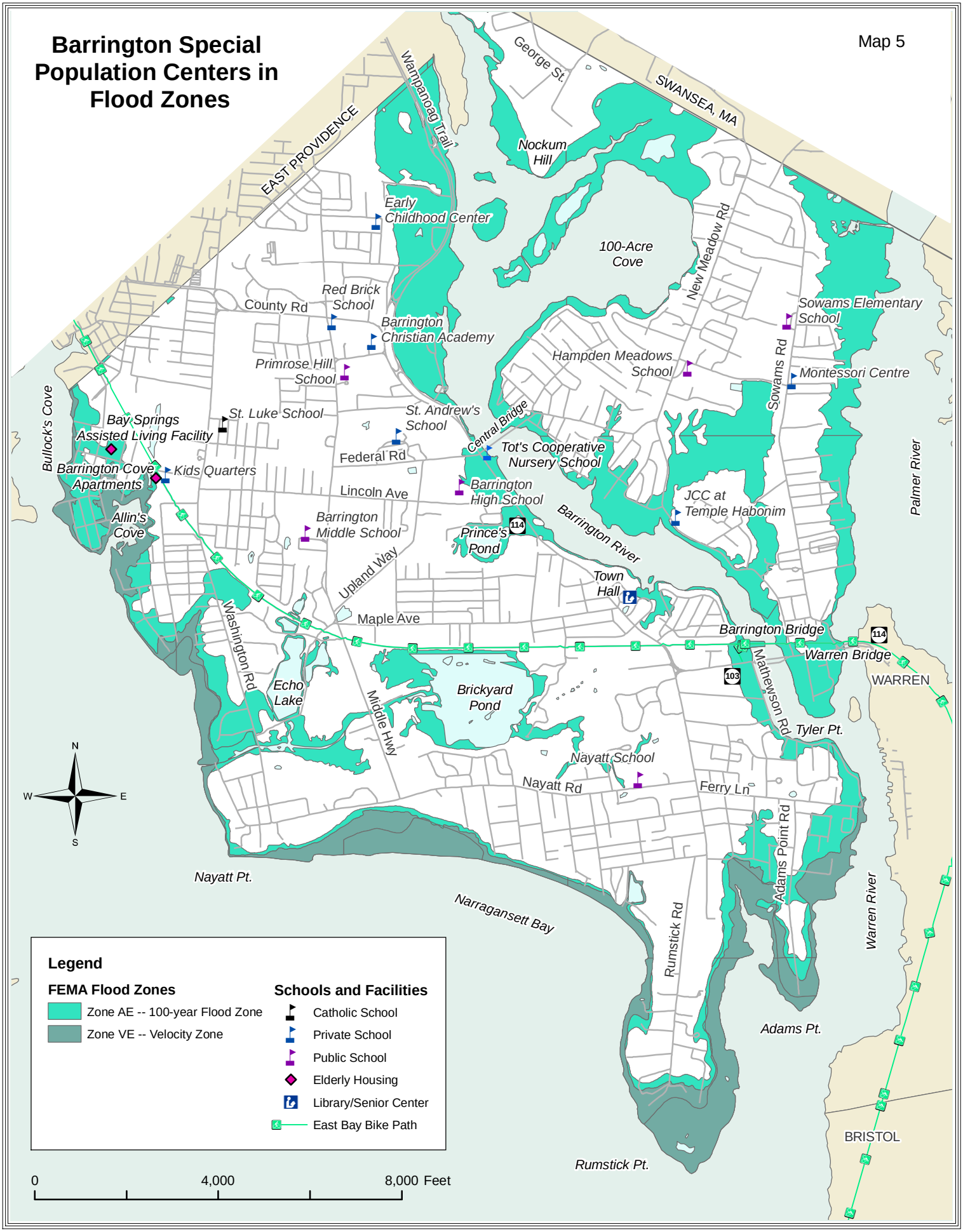
- Catholic School
- Private School
- Public School
- Elderly Housing
- East Bay Bike Path

SOURCES: Town GIS, RIGIS

VHB Vanasse Hangen Brustlin, Inc.

Barrington Special Population Centers in Flood Zones

Map 5



Legend

FEMA Flood Zones

- Zone AE -- 100-year Flood Zone
- Zone VE -- Velocity Zone

Schools and Facilities

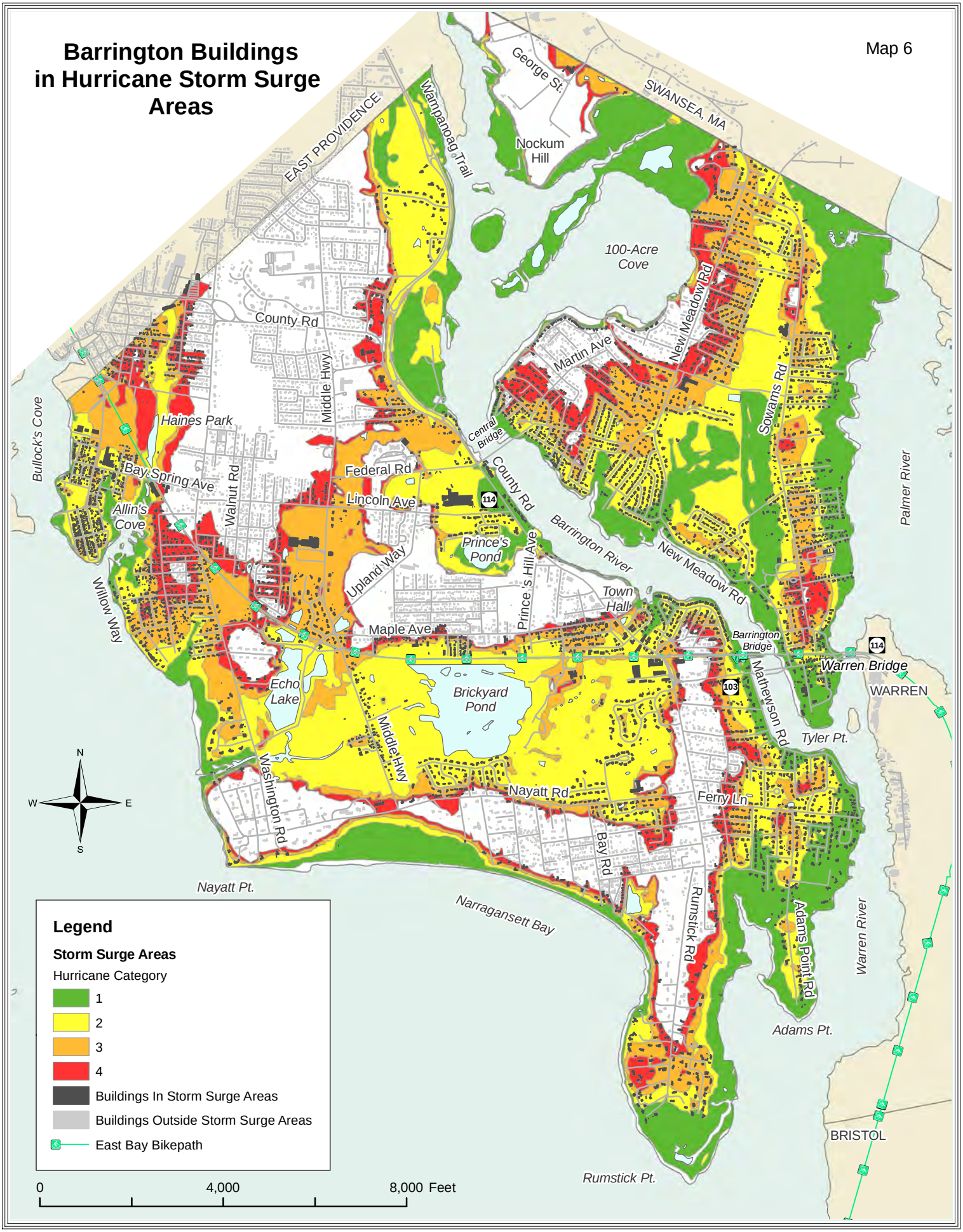
- Catholic School
- Private School
- Public School
- Elderly Housing
- Library/Senior Center
- East Bay Bike Path

SOURCES: Town GIS, RIGIS

VHB Vanasse Hangen Brustlin, Inc.

Barrington Buildings in Hurricane Storm Surge Areas

Map 6

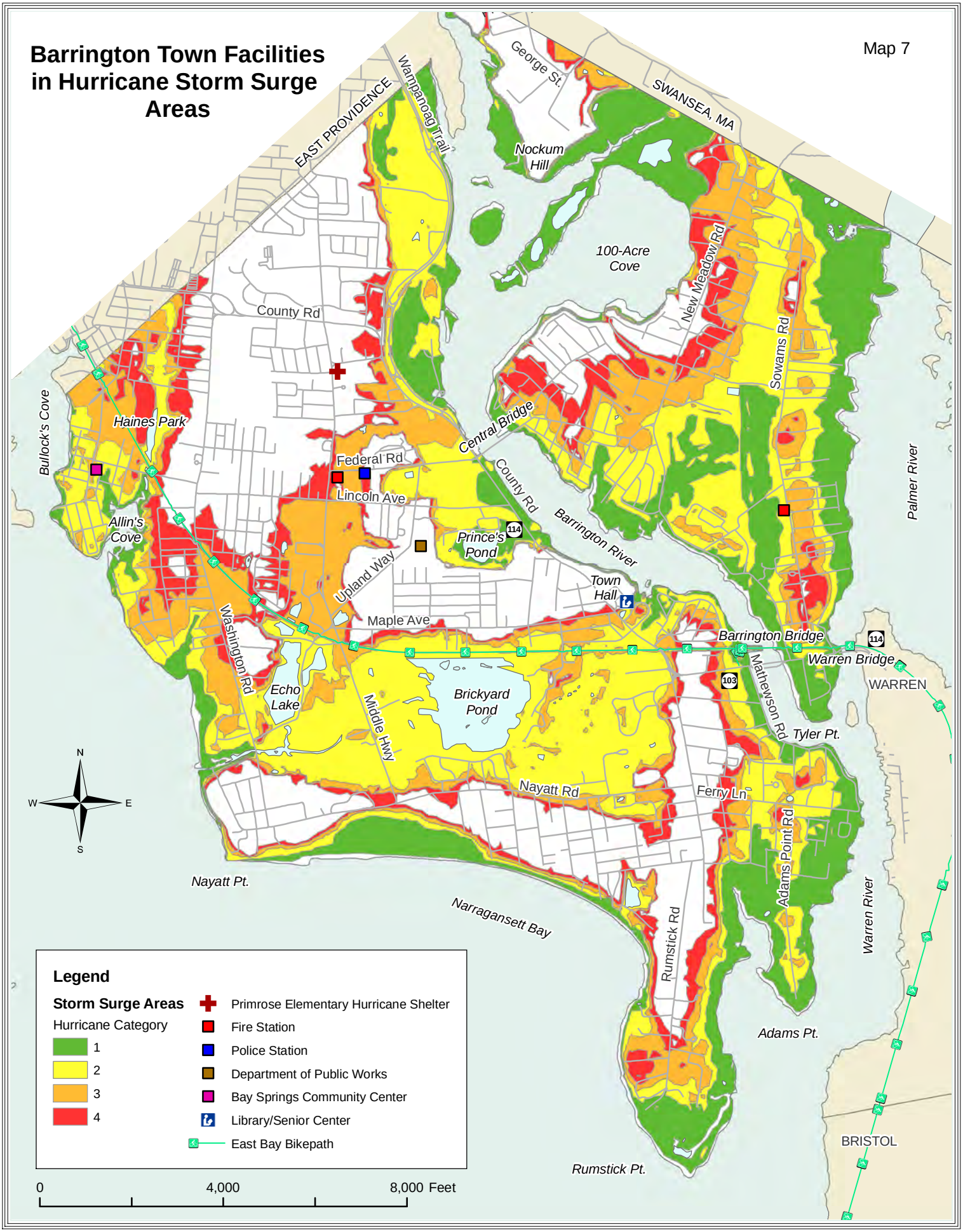


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Town Facilities in Hurricane Storm Surge Areas

Map 7

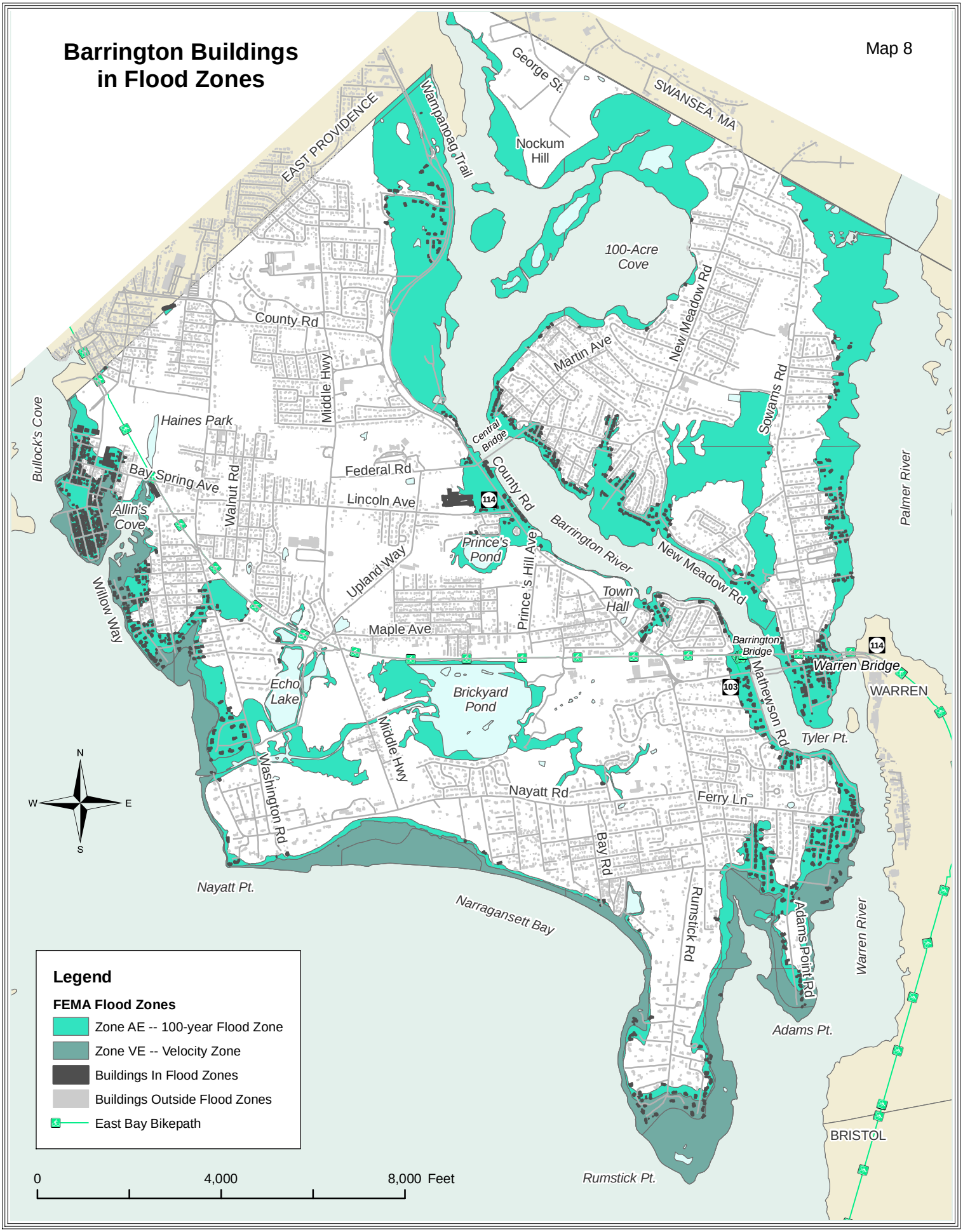


SOURCES: Town GIS, RIGIS

VHB Vanasse Hangen Brustlin, Inc.

Barrington Buildings in Flood Zones

Map 8

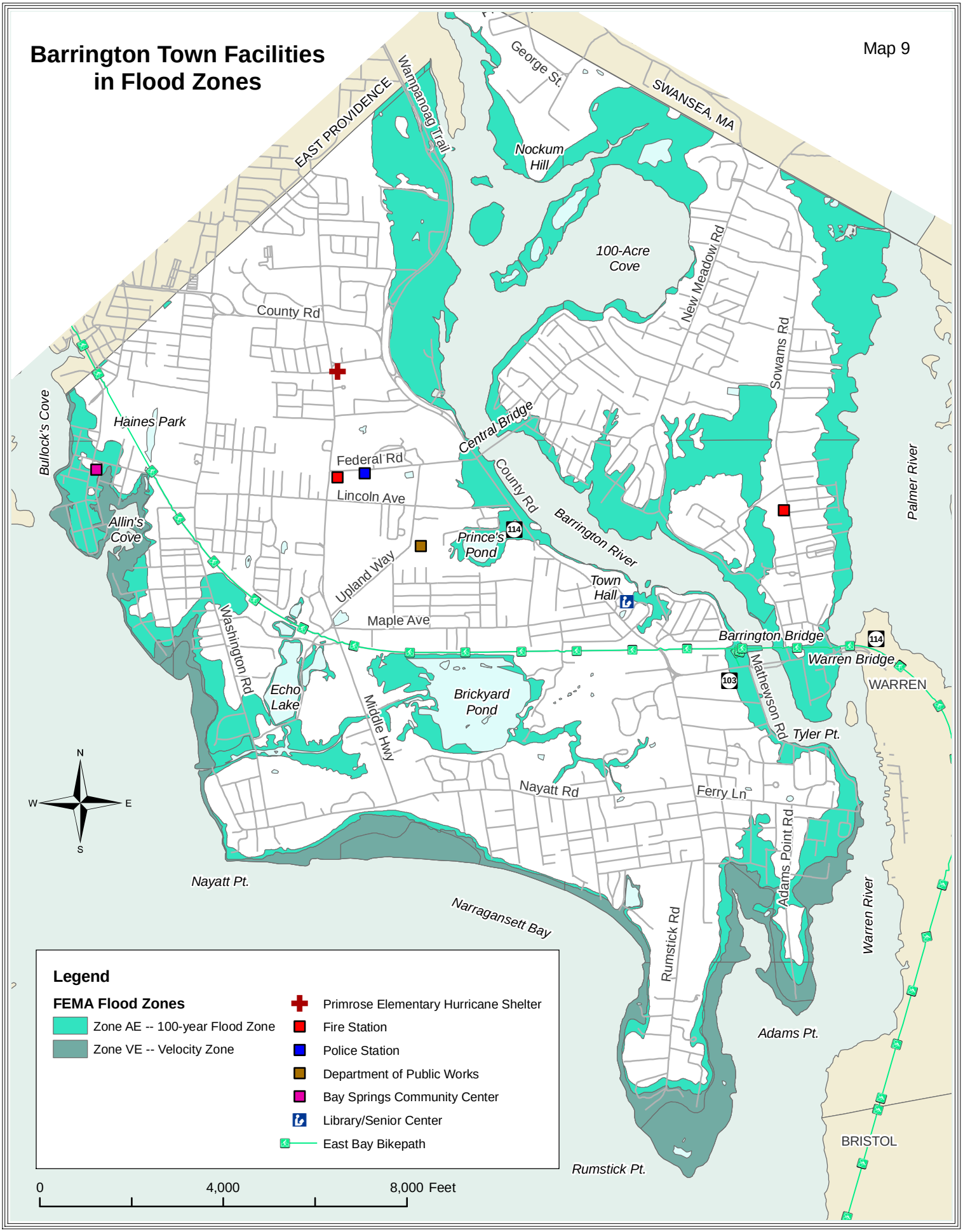


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Town Facilities in Flood Zones

Map 9

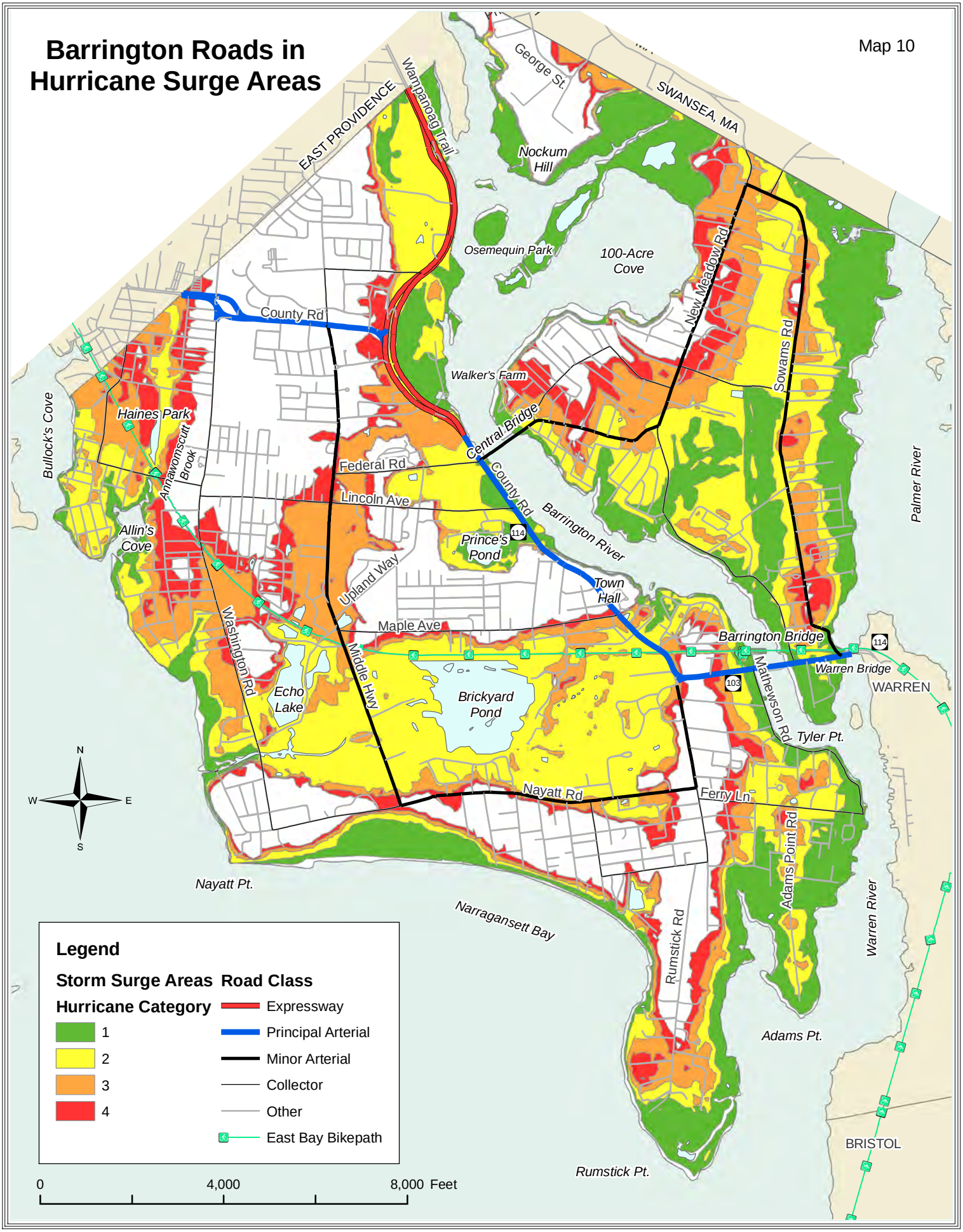


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Roads in Hurricane Surge Areas

Map 10

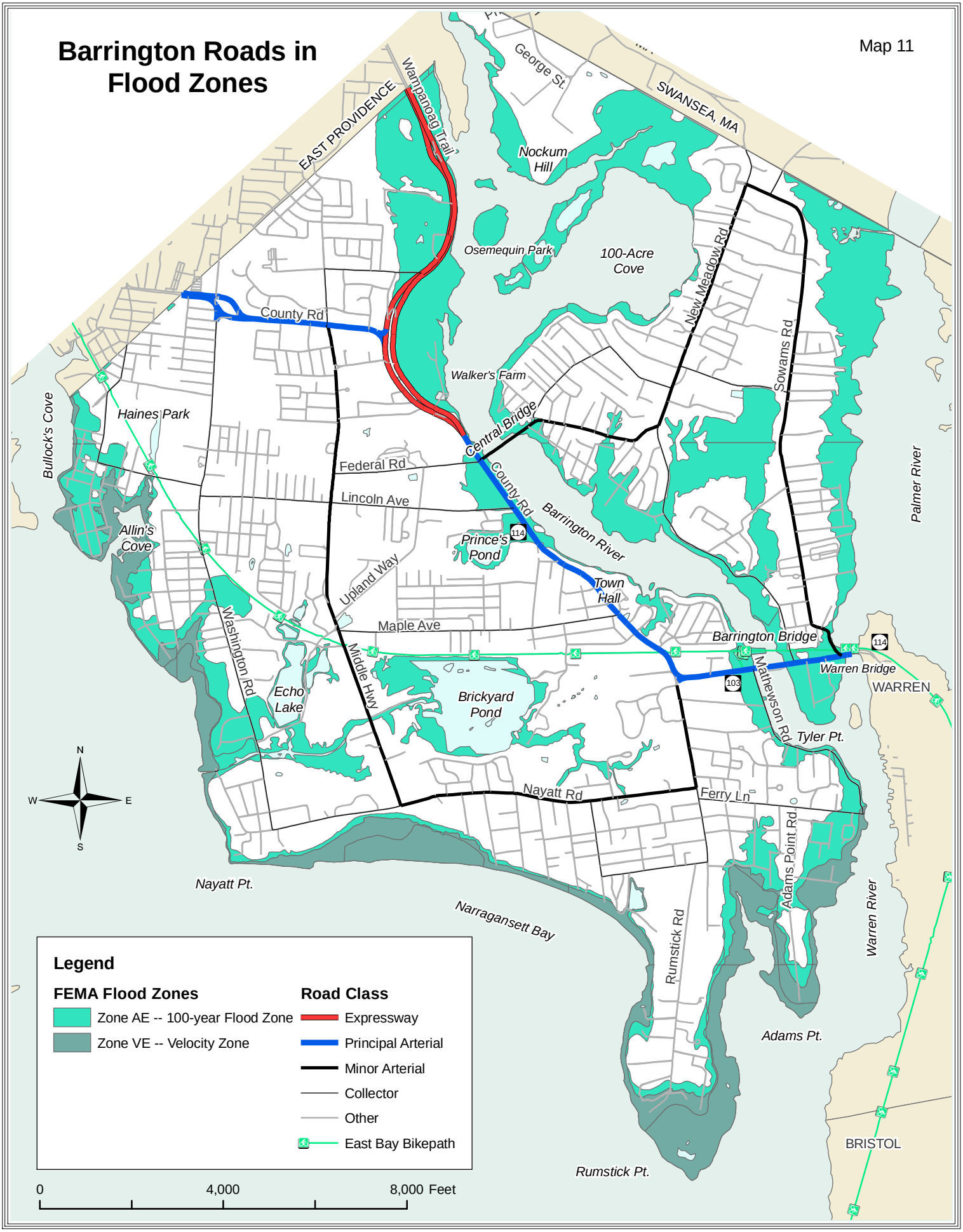


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Roads in Flood Zones

Map 11

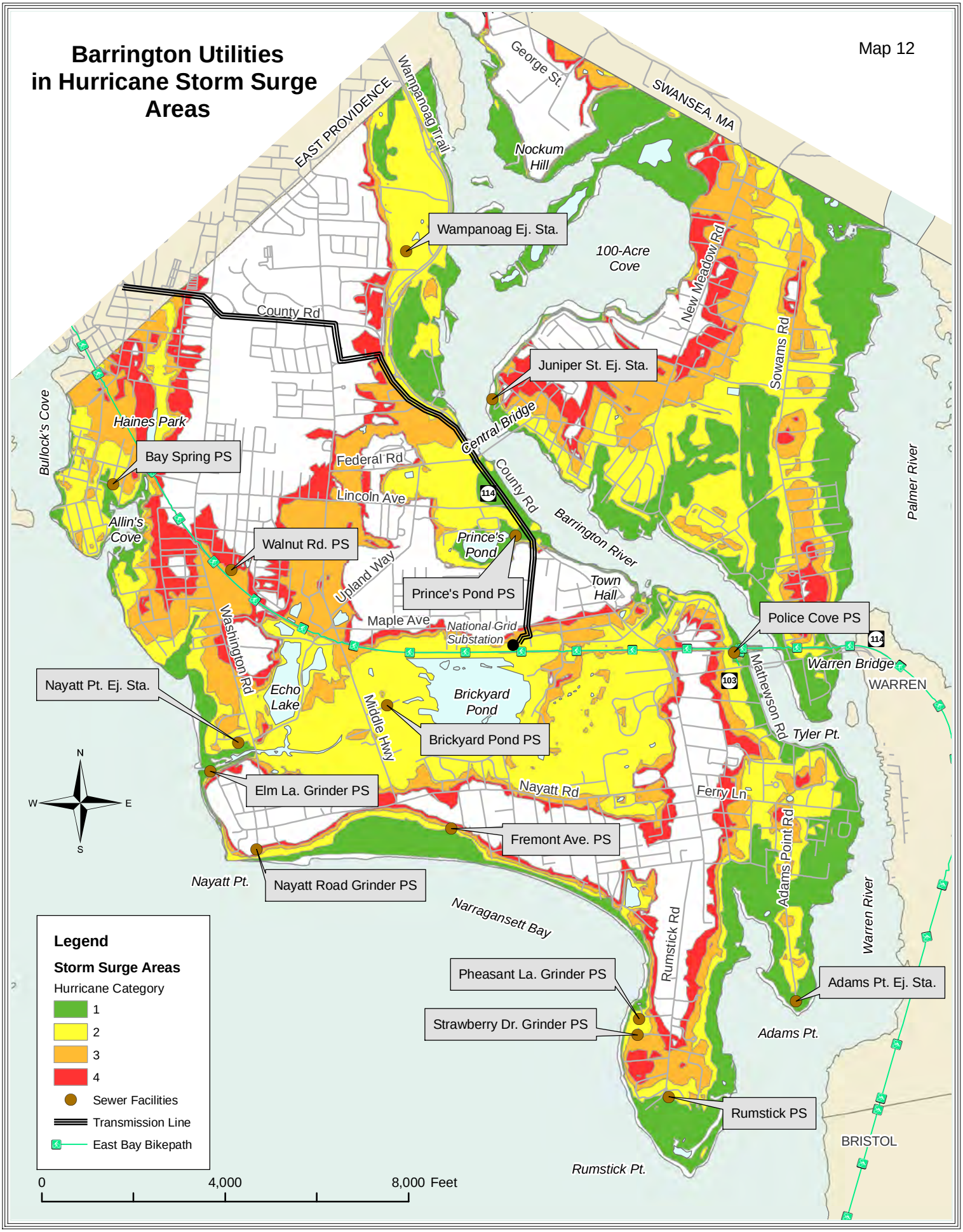


SOURCES: Town GIS, RIGIS

VHB Vanasse Hangen Brustlin, Inc.

Barrington Utilities in Hurricane Storm Surge Areas

Map 12



Legend

Storm Surge Areas

Hurricane Category

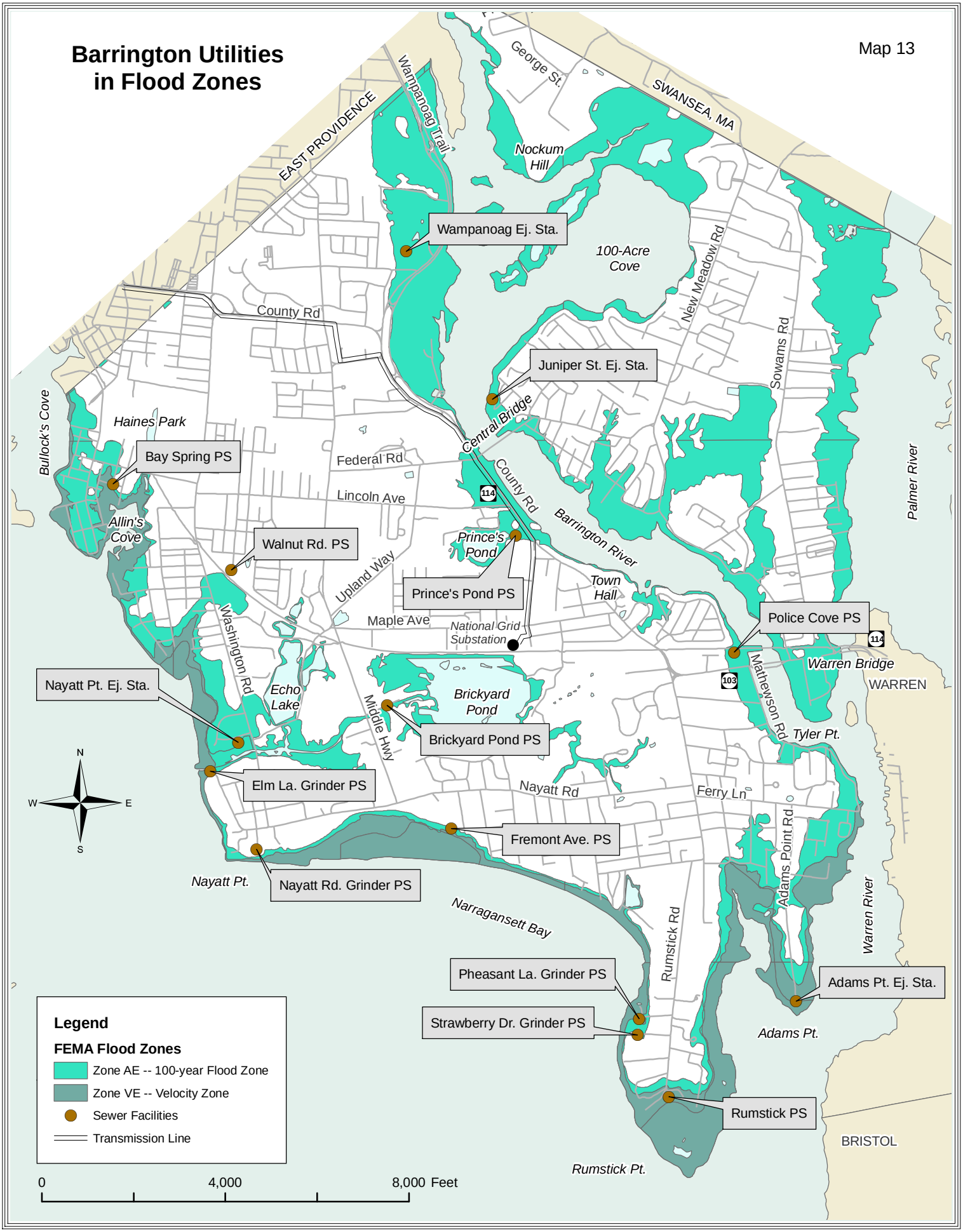
- 1
- 2
- 3
- 4
- Sewer Facilities
- Transmission Line
- East Bay Bikepath

SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Utilities in Flood Zones

Map 13

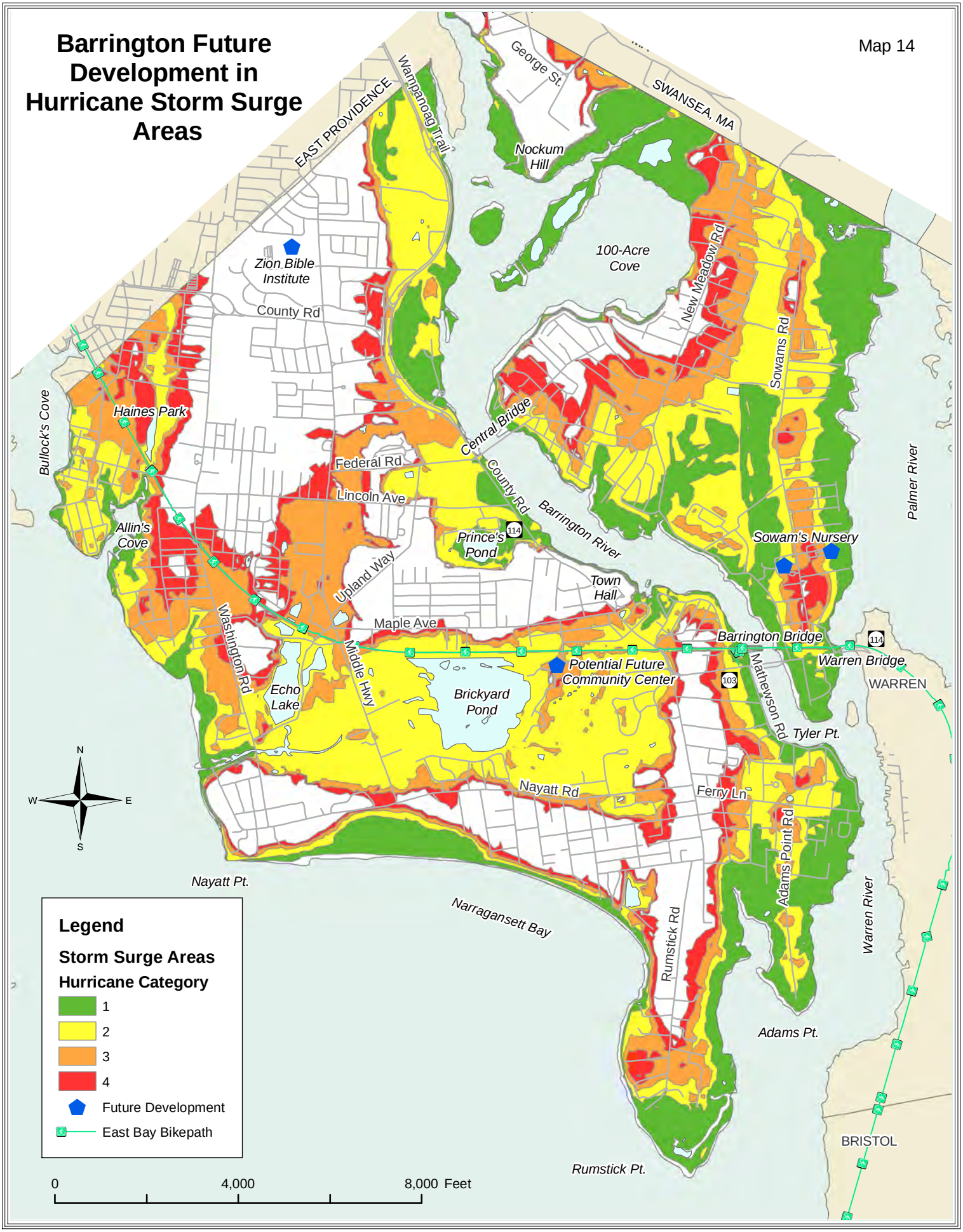


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Future Development in Hurricane Storm Surge Areas

Map 14

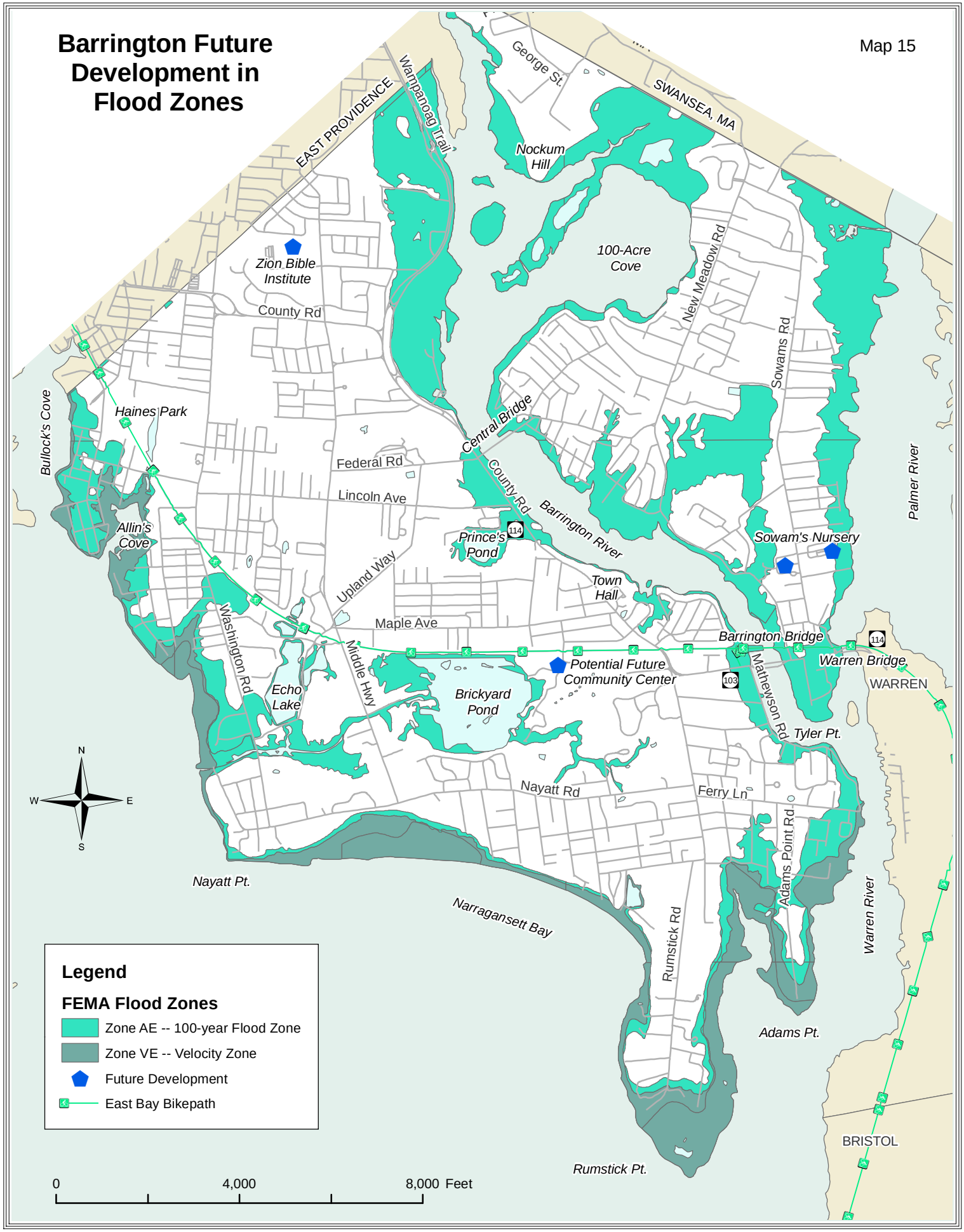


SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Barrington Future Development in Flood Zones

Map 15



SOURCES: Town GIS, RIGIS

Vanasse Hangen Brustlin, Inc.

Appendix A

Floods. Hurricanes. Blizzards.

Your input is needed to help the Town prepare for and limit the impact of future natural hazards.

What: Planning Board discussion of Hazard Mitigation Plan.

When: Tuesday, May 4, 2010

(Planning Board meeting starts at 7 p.m.)

Where: Town Council Chamber, 2nd Floor, Town Hall

BARRINGTON PLANNING BOARD

Regular Business Meeting
Tuesday, May 4, 2010 at 7:00 p.m.
Town Council Chamber, 2nd Floor, Town Hall - 283 County Road

AGENDA

1. Call to Order
2. Roll Call and Determination of Quorum
3. Consent Agenda
   - 3.1 Approve Minutes: April 7, 2010 Business Meeting (CA)
4. Public Hearings
   - 4.1 (continued) Master Plan application for the proposed expansion of the YMCA, 70 West Street (Open Space-Active zone, Lots 96, 206 and 243 on Assessor's Plat 24). The Greater Providence YMCA is proposing to demolition portions of the existing building as part of plans to build a two-story facility totaling 44,000 square feet. The plans call continuing the utilization of land owned by the YMCA and the Town of Barrington to provide parking.
5. Old Business
   None
6. New Business
   None
7. Reports & Special Items
   - 7.1 Hazard Mitigation Plan Update
   - 7.2 Police Cove Update
   - 7.3 Community Center/Teen Center Update
8. Comments - Board Members, Council Liaison & Town Planner
9. Refer Violations of Plan Approval to Town for Enforcement
10. Adjournment

The Town of Barrington will provide accommodations needed to ensure equal participation in all meetings. Please contact the Town Clerk's office prior to the meeting so arrangements can be made to provide such assistance. A request for accommodations can be made in writing to 283 County Road or by calling 401-247-1900, Ext. 301 (voice) or call 711 "Relay" if you are a TDY OR TDD user. The Barrington Town Hall, Barrington Public Library and Barrington Public Safety Building are accessible to the disabled.

All items listed with a (CA) are to be considered routine by the Planning Board and will be enacted by one motion. There will be no separate discussion of these items unless a member of the Board, or a member of the public so requests, in which event the item will be removed from Consent Agenda (CA) consideration and considered in its normal sequence on the agenda.

All regular meetings shall adjourn no later than 11:00 p.m. unless extended beyond that time by a concurring vote of not less than four members, except that at the Chair's discretion the meeting may by extended to conclude consideration of any specific item of business begun prior to 11:00 P.M. All work sessions shall adjourn no later than 10:00 p.m. unless extended in accordance with the above procedure.

Posted on April 29, 2010 at Barrington Town Hall, Barrington Public Library, the Town of Barrington Website and the R.I. Secretary of State Website

BARRINGTON TOWN COUNCIL MEETING
THURSDAY, JULY 15, 2010 @ 7:30 P.M.
BARRINGTON HIGH SCHOOL AUDITORIUM

Agenda

1. Call to Order

2. Pledge of Allegiance

3. Announcement(s): Request for Tri-Town Council Meeting to Discuss Draft RFP for Performance Audit of Bristol County Water Authority

*4. Adopt Town Council Minutes of June 7, 2010 Meetings

*5. Utility Petition(s)

*6. Monthly Department Reports: Fire Chief, Police Chief/Animal Control Official, Building Official, Public Works Director, Town Planner, Town Solicitor, Finance Director, Tax Assessor, Senior Services Director, Library Director, Barrington Adult Youth Team Coordinator and Town Clerk

*7. Abatement List

*8. Surplus Property

*9. Block Party – Roberta Drive

10. Public Comment (two minute statement) - To the public: This agenda item is for members of the public to speak regarding a topic that is not already on the agenda. Please indicate that you would like to speak by raising your hand. When you are recognized, please approach the microphone in front of the Council.

11. Request for Investigation Pursuant to Section 2-1-5 of the Town Charter

12. Schedule Special Meeting to Discuss Privatizing Refuse Collection Services

13. LNG WG Coastal Communities Resolution

14. County Road Affordable Housing Update

15. Hampden Meadows Management Plan

16. Public Hearing: Ordinance #2010-3 Salaries, Non-Union Employees
Ordinance #2010-4 Zoning, Outdoor Seating

17. Safety of Latham Park Playground Equipment Report

18. Barrington Beach Improvements

19. Presentation of Updated Hazard Mitigation Plan

20. Resignations: Stephen B. Story, Website Committee
Jim Hasenfus, School Committee

21. Department of Public Works Bid – Refuse Bags

22. Request Board of Elections to Hold Special Election on November 2, 2010 for School Committee Vacancy

23. Set Agenda for August 2, 2010 Town Council Meeting

24. Executive Session in Accordance with RIGL 42-46-5 (a) (2) Litigation/Collective Bargaining

25. Adjourn

CONSENT AGENDA: All items with an asterisk (*) are considered to be routine by the Town Council and will be enacted by one motion. There will be no separate discussion on these items unless a council member or citizen so request and the request is for good cause in which event the item will be removed from the consent agenda and will be considered in its normal sequence on the agenda.

The Town of Barrington will provide accommodations needed to ensure equal participation in all meetings. Please contact the Town Clerk's office prior to the meeting so arrangements can be made to provide such assistance. A request for accommodations can be made in writing to 283 County Road or by calling 401-247-1900, Ext. 301 (voice) or call 711 "Relay" if you are a TDY OR TDD user. The Barrington Town Hall, Barrington Public Library, Barrington High School and Barrington Public Safety Building are accessible to the disabled.

Posted on July 13, 2010 at Barrington Town Hall, Barrington Public Library, Town of Barrington Web Site and Secretary of State Web Site.

Appendix B